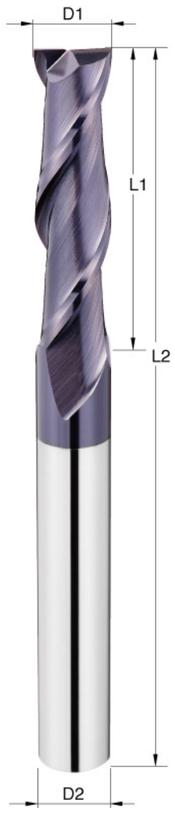
EFFICIENCY MILLS

ELC

▶ **Long Flute / Square / for** P K

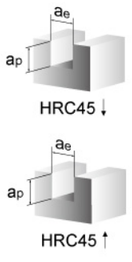
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ELC **0204**	2.0	12	50	4
ELC **0304**	3.0	20	50	4
ELC **0404**	4.0	25	75	4
ELC **0506**	5.0	30	75	6
ELC **0606**	6.0	30	75	6
ELC **0808**	8.0	40	100	8
ELC **1010**	10.0	40	100	10
ELC **1212**	12.0	45	100	12



MG
2 Flutes
35°
HRC 55
TiaLN
Finishing
Semi-Finishing
Planing
Slotting

▼ *Depth of cut*



ap≤0.15 D1
ae=D1

ap≤0.02 D1
ae=D1

▼ *Recommended cutting condition for ELC*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min
2	3000	25	1700	20	1000	15
3	2300	35	1900	25	800	10
4	2000	45	1600	35	650	15
5	1800	40	1400	40	600	20
6	1700	60	1300	50	550	25
8	1300	60	1000	50	450	25
10	1000	60	800	50	350	25
12	800	60	700	50	300	25

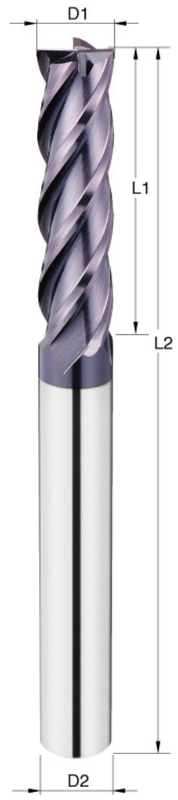
EFFICIENCY MILLS

ELD

▶ **Long Flute / Square / for** P K

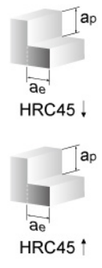
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ELD **0204**	2.0	15	50	4
ELD **0304**	3.0	20	50	4
ELD **0404**	4.0	25	75	4
ELD **0506**	5.0	30	75	6
ELD **0606**	6.0	30	75	6
ELD **0808**	8.0	40	100	8
ELD **1010**	10.0	40	100	10
ELD **1212**	12.0	45	100	12
ELD **1616**	16.0	60	150	16
ELD **2020**	20.0	60	150	20



MG
4 Flutes
35°
HRC 55
TiaLN
Finishing
Semi-Finishing
Planing
Side

▼ *Depth of cut*



ap≤2.5 D1
ae≤0.05 D1

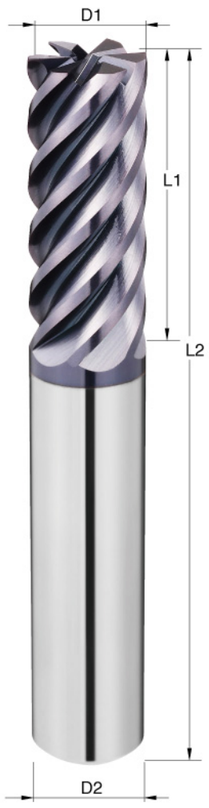
ap≤2D1
ae≤0.02 D1

▼ *Recommended cutting condition for ELD*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min
2	3000	50	2500	40	1000	15
3	2500	60	2000	50	800	20
4	2000	80	1700	70	700	30
5	1800	110	1500	85	600	40
6	1500	110	1400	75	550	50
8	1300	110	1100	75	450	50
10	1000	110	800	75	300	50
12	900	110	700	75	250	40
16	800	95	500	70	150	20
20	500	80	400	60	120	20

EFFICIENCY MILLS

EH



MG

6 Flutes

45°

HRC 55

TiaLN

Finishing

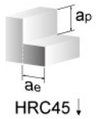
Side

▶ Square / for P K

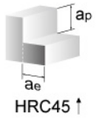
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EH **0606**	6.0	16	50	6
EH **0808**	8.0	20	60	8
EH **1010**	10.0	25	75	10
EH **1212**	12.0	30	75	12
EH **1616**	16.0	40	100	16
EH **2020**	20.0	45	100	20

▼ *Depth of cut*



ap≤1.5 D1
ae≤0.1 D1
HRC45 ↓



ap≤D1
ae≤0.05 D1
HRC45 ↑

▼ *Recommended cutting condition for EH*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	5500	1000	4500	850	3800	650
8	4000	1000	3500	850	3000	650
10	3300	1000	3100	850	2400	650
12	3000	900	2500	700	2000	600
16	2500	700	2000	550	1500	450
20	1800	550	1500	420	1200	380

EFFICIENCY MILLS

EHL

MG

6 Flutes

45°

HRC 55

TiaLN

Finishing

Side

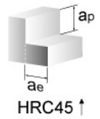
▶ Long Flute / Square / for P K

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EHL **0606**	6.0	24	75	6
EHL **0808**	8.0	32	75	8
EHL **1010**	10.0	40	100	10
EHL **1212**	12.0	45	100	12
EHL **1616**	16.0	64	150	16
EHL **2020**	20.0	75	150	20

▼ *Depth of cut*

ap≤3 D1
ae≤0.01 D1
HRC45 ↓



ap≤3 D1
ae≤0.005 D1
HRC45 ↑

▼ *Recommended cutting condition for EHL*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	1900	400	1500	300	1200	220
8	1500	380	1100	280	900	200
10	1200	360	850	260	750	190
12	1000	340	700	230	650	180
16	750	280	550	200	450	150
20	600	240	450	170	350	120

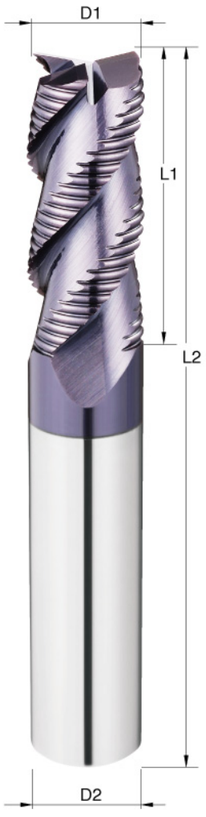
EFFICIENCY MILLS

EG

▶ **Roughing / Square / for** P K

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EG **0606**	6.0	16	50	6
EG **0808**	8.0	20	60	8
EG **1010**	10.0	25	75	10
EG **1212**	12.0	30	75	12
EG **1616**	16.0	40	100	16
EG **2020**	20.0	45	100	20



MG

3 Flutes

Fine

45°

HRC 55

TiaLN

Roughing

Slotting

Side

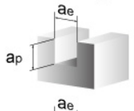
▼ *Depth of cut*

Side Milling

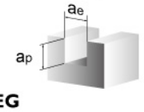
ap≤1.5 D1
ae≤0.3 D1
HRC45 ↓

ap≤D1
ae≤0.05 D1
HRC45 ↑

Grooving



ap≤0.6 D1
ae=D1
HRC45 ↓



ap≤0.2 D1
ae=D1
HRC45 ↑

▼ *Recommended cutting condition for EG*

MATERIAL		Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS		~HRC30		~HRC50		~HRC60	
DIAMETER		SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min
Side Milling	6	5500	550	3000	310	1150	120
	8	4600	550	2500	310	920	120
	10	3700	550	2000	310	730	120
	12	3000	500	1700	310	600	120
	16	2300	520	1200	310	460	120
Grooving	6	4400	440	2400	250	920	100
	8	3600	440	2000	250	730	100
	10	3000	440	1600	250	580	100
	12	2400	440	1350	250	480	100
	16	1800	440	960	250	370	100

EFFICIENCY MILLS

EGA

▶ **Roughing / Square / for** P K

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EGA **0606**	6.0	16	50	6
EGA **0808**	8.0	20	60	8
EGA **1010**	10.0	25	75	10
EGA **1212**	12.0	30	75	12
EGA **1616**	16.0	40	100	16
EGA **2020**	20.0	45	100	20

MG

4 Flutes

Fine

35°

HRC 55

TiaLN

Roughing

Slotting

Side

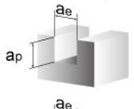
▼ *Depth of cut*

Side Milling

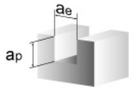
ap≤1.5 D1
ae≤0.3 D1
HRC45 ↓

ap≤D1
ae≤0.05 D1
HRC45 ↑

Grooving



ap≤0.6 D1
HRC45 ↓



ap≤0.2 D1
HRC45 ↑

▼ *Recommended cutting condition for EGA*

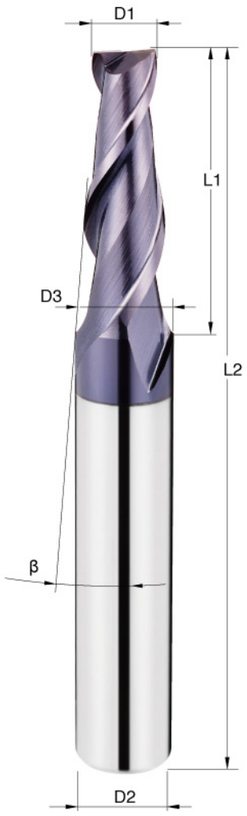
MATERIAL		Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS		~HRC30		~HRC50		~HRC60	
DIAMETER		SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min
Side Milling	6	5500	550	3000	310	1150	120
	8	4600	550	2500	310	920	120
	10	3700	550	2000	310	730	120
	12	3000	500	1700	310	600	120
	16	2300	520	1200	310	460	120
Grooving	6	4400	440	2400	250	920	100
	8	3600	440	2000	250	730	100
	10	3000	440	1600	250	580	100
	12	2400	440	1350	250	480	100
	16	1800	440	960	250	370	100

EFFICIENCY MILLS

ETL

▶ Long Flute . Taper / for P K

unit: mm



MG
2 Flutes
35°
HRC 55
TiAlN
Finishing
Semi-Finishing
Side

Order No.	Small Mill Dia D1	Flute Length L1	Taper Angle ß	Large Mill Dia D3	O.A.L. L2	Shank Dia D2
ETL **01005**	1.0	10	30'	1.17	50	4
ETL **01010**	1.0	10	1°	1.35	50	4
ETL **01015**	1.0	10	1° 30'	1.52	50	4
ETL **01020**	1.0	10	2°	1.70	50	4
ETL **01025**	1.0	10	2° 30'	1.87	50	4
ETL **01030**	1.0	10	3°	2.05	50	4
ETL **01050**	1.0	10	5°	2.74	50	4
ETL **01070**	1.0	10	7°	3.44	50	4
ETL **01505**	1.5	10	30'	1.67	50	4
ETL **01510**	1.5	10	1°	1.87	50	4
ETL **01515**	1.5	10	1° 30'	2.02	50	4
ETL **01520**	1.5	10	2°	2.20	50	4
ETL **01525**	1.5	10	2° 30'	2.37	50	4
ETL **01530**	1.5	10	3°	2.55	50	4
ETL **02005**	2.0	13	30'	2.22	50	4
ETL **02010**	2.0	13	1°	2.45	50	4
ETL **02015**	2.0	13	1° 30'	2.68	50	4
ETL **02020**	2.0	13	2°	2.90	50	4
ETL **02025**	2.0	13	2° 30'	3.13	50	4
ETL **02030**	2.0	13	3°	3.36	50	4
ETL **02050**	2.0	13	5°	4.27	50	6
ETL **02505**	2.5	15	30'	2.76	50	4
ETL **02510**	2.5	15	1°	3.03	50	4
ETL **02515**	2.5	15	1° 30'	3.29	50	4
ETL **02520**	2.5	15	2°	3.56	50	4
ETL **02525**	2.5	15	2° 30'	3.81	50	4
ETL **02530**	2.5	15	3°	4.07	50	6
ETL **02550**	2.5	15	5°	5.13	50	6
ETL **03005**	3.0	20	30'	3.35	60	6
ETL **03010**	3.0	20	1°	3.70	60	6
ETL **03015**	3.0	20	1° 30'	4.05	60	6
ETL **03020**	3.0	20	2°	4.39	60	6
ETL **03025**	3.0	20	2° 30'	4.65	60	6
ETL **03030**	3.0	20	3°	5.10	60	6
ETL **03050**	3.0	20	5°	6.50	60	8
ETL **04005**	4.0	25	30'	4.44	60	6
ETL **04010**	4.0	25	1°	4.88	60	6
ETL **04015**	4.0	25	1° 30'	5.13	60	6
ETL **04020**	4.0	25	2°	5.75	60	6
ETL **04025**	4.0	25	2° 30'	6.19	60	8
ETL **04030**	4.0	25	3°	6.62	60	8
ETL **04050**	4.0	25	5°	8.38	75	10

▼ *Depth of cut*

ap≤2.5 D1
ae≤0.02 D1
HRC45 ↓

ap≤2.5 D1
ae≤0.01 D1
HRC45 ↑

▼ *Recommended cutting condition for ETL*

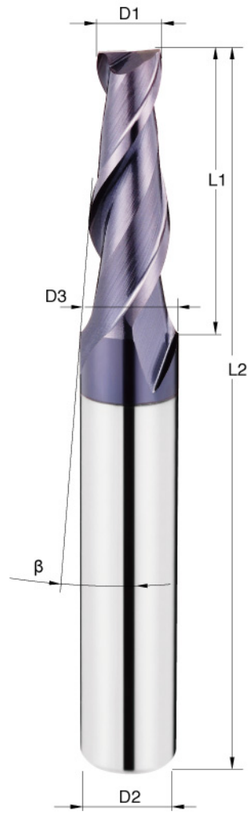
MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
1	12000	65	6800	40	2500	15
1.5	9600	70	5200	45	2000	15
2	7500	85	4000	48	1500	18
2.5	6800	100	3700	60	1700	20
4	3500	120	1800	60	600	20

EFFICIENCY MILLS

ET

▶ Taper Flute / for P K

unit: mm

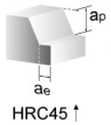


MG
2 Flutes
35°
HRC 55
TiAlN
Finishing
Semi-Finishing
Side

Order No.	Small Mill Dia D1	Flute Length L1	Taper Angle ß	Large Mill Dia D3	O.A.L. L2	Shank Dia D2
ET **005005**	0.5	2	30'	0.53	50	4
ET **005010**	0.5	2	1°	0.57	50	4
ET **005015**	0.5	2	1° 30'	0.60	50	4
ET **005020**	0.5	2	2°	0.64	50	4
ET **005025**	0.5	2	2° 30'	0.67	50	4
ET **005030**	0.5	2	3°	0.71	50	4
ET **005050**	0.5	2	5°	0.85	50	4
ET **005070**	0.5	2	7°	0.99	50	4
ET **005100**	0.5	2	10°	1.21	50	4
ET **010005**	1.0	4	30'	1.07	50	4
ET **010010**	1.0	4	1°	1.14	50	4
ET **010015**	1.0	4	1° 30'	1.21	50	4
ET **010020**	1.0	4	2°	1.28	50	4
ET **010025**	1.0	4	2° 30'	1.35	50	4
ET **010030**	1.0	4	3°	1.42	50	4
ET **010050**	1.0	4	5°	1.70	50	4
ET **010070**	1.0	4	7°	1.98	50	4
ET **010100**	1.0	4	10°	2.41	50	4
ET **015005**	1.5	5	30'	1.59	50	4
ET **015010**	1.5	5	1°	1.67	50	4
ET **015015**	1.5	5	1° 30'	1.76	50	4
ET **015020**	1.5	5	2°	1.85	50	4
ET **015025**	1.5	5	2° 30'	1.93	50	4
ET **015030**	1.5	5	3°	2.02	50	4
ET **015050**	1.5	5	5°	2.37	50	4
ET **015070**	1.5	5	7°	2.72	50	4
ET **015100**	1.5	5	10°	3.26	50	4
ET **020005**	2.0	6	30'	2.10	50	4
ET **020010**	2.0	6	1°	2.21	50	4
ET **020015**	2.0	6	1° 30'	2.31	50	4
ET **020020**	2.0	6	2°	2.41	50	4
ET **020025**	2.0	6	2° 30'	2.52	50	4
ET **020030**	2.0	6	3°	2.62	50	4
ET **020050**	2.0	6	5°	3.05	50	4
ET **020070**	2.0	6	7°	3.47	50	4
ET **020100**	2.0	6	10°	4.11	50	4
ET **025005**	2.5	8	30'	2.64	50	4
ET **025010**	2.5	8	1°	2.78	50	4
ET **025015**	2.5	8	1° 30'	2.91	50	4
ET **025020**	2.5	8	2°	3.05	50	4
ET **025025**	2.5	8	2° 30'	3.20	50	4
ET **025030**	2.5	8	3°	3.33	50	4
ET **025050**	2.5	8	5°	3.90	50	4
ET **025070**	2.5	8	7°	4.46	50	6
ET **025100**	2.5	8	10°	5.32	50	6
ET **030005**	3.0	10	30'	3.17	50	6
ET **030010**	3.0	10	1°	3.35	50	6
ET **030015**	3.0	10	1° 30'	3.52	50	6
ET **030020**	3.0	10	2°	3.69	50	6
ET **030025**	3.0	10	2° 30'	3.87	50	6
ET **030030**	3.0	10	3°	4.05	50	6
ET **030050**	3.0	10	5°	4.75	50	6
ET **030070**	3.0	10	7°	5.46	50	6
ET **030100**	3.0	10	10°	6.53	60	8
ET **040005**	4.0	15	30'	4.26	50	6
ET **040010**	4.0	15	1°	4.52	50	6
ET **040015**	4.0	15	1° 30'	4.79	50	6
ET **040020**	4.0	15	2°	5.04	50	6
ET **040025**	4.0	15	2° 30'	5.31	50	6
ET **040030**	4.0	15	3°	5.57	50	6

▼ *Depth of cut*

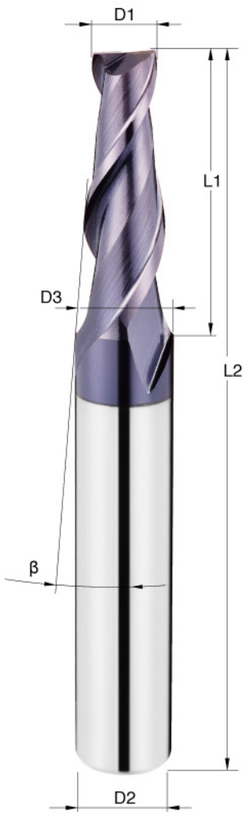
ap≤2.5 D1
ae≤0.02 D1
HRC45 ↓



ap≤2.5 D1
ae≤0.01 D1
HRC45 ↑

EFFICIENCY MILLS

ET



MG

2 Flutes

35°

HRC 55

TiAlN

Finishing Semi-Finishing

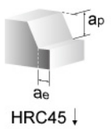
Side

▶ Taper Flute / for P K

unit: mm

Order No.	Small Mill Dia D1	Flute Length L1	Taper Angle ß	Large Mill Dia D3	O.A.L. L2	Shank Dia D2
ET **040050**	4.0	15	5°	6.62	60	8
ET **040070**	4.0	15	7°	7.68	60	8
ET **050005**	5.0	20	30'	5.34	60	6
ET **050010**	5.0	20	1°	5.70	60	6
ET **050015**	5.0	20	1° 30'	6.04	60	8
ET **050020**	5.0	20	2°	6.39	60	8
ET **050025**	5.0	20	2° 30'	6.74	60	8
ET **050030**	5.0	20	3°	7.10	60	8
ET **050050**	5.0	20	5°	8.50	75	10
ET **050070**	5.0	20	7°	9.91	75	10
ET **060005**	6.0	20	30'	6.35	60	8
ET **060010**	6.0	20	1°	6.70	60	8
ET **060015**	6.0	20	1° 30'	7.05	60	8
ET **060020**	6.0	20	2°	7.40	60	8
ET **060025**	6.0	20	2° 30'	7.75	60	8
ET **060030**	6.0	20	3°	8.10	60	8
ET **060050**	6.0	20	5°	9.50	75	10
ET **080005**	8.0	25	30'	8.44	75	10
ET **080010**	8.0	25	1°	8.87	75	10
ET **080015**	8.0	25	1° 30'	9.31	75	10
ET **080020**	8.0	25	2°	9.74	75	10
ET **080025**	8.0	25	2° 30'	10.18	75	12
ET **080030**	8.0	25	3°	10.62	75	12
ET **080050**	8.0	25	5°	12.37	100	16
ET **100005**	10.0	35	30'	10.61	100	12
ET **100010**	10.0	35	1°	11.22	100	12
ET **100015**	10.0	35	1° 30'	11.83	100	12
ET **100020**	10.0	35	2°	12.44	100	16
ET **100025**	10.0	35	2° 30'	13.06	100	16
ET **100030**	10.0	35	3°	13.67	100	16
ET **100050**	10.0	35	5°	16.12	100	16

▼ *Depth of cut*



ap≤2.5 D1
ae≤0.02 D1

HRC45 ↓

ap≤2.5 D1
ae≤0.01 D1

HRC45 ↑

▼ *Recommended cutting condition for ET*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
1	12000	65	6800	40	2500	15
1.5	9600	70	5200	45	2000	15
2	7500	85	4000	48	1500	18
2.5	6800	100	3700	60	1700	20
4	3500	120	1800	60	600	20
6	2500	150	1600	80	550	25
8	2000	150	1200	80	450	25
10	1500	150	1000	80	350	25

EFFICIENCY MILLS

ERA

MG

2 Flutes

35°

R

HRC 55

TiAlN

Finishing Semi-Finishing

Slotting

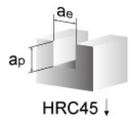
Profiling

▶ Corner Radius / for P K

unit: mm

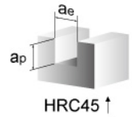
Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
ERA **0302**	3.0	0.2	6	50	3
ERA **0305**	3.0	0.5	6	50	3
ERA **0402**	4.0	0.2	8	50	4
ERA **0405**	4.0	0.5	8	50	4
ERA **0410**	4.0	1.0	8	50	4
ERA **0602**	6.0	0.2	12	50	6
ERA **0605**	6.0	0.5	12	50	6
ERA **0610**	6.0	1.0	12	50	6
ERA **0615**	6.0	1.5	12	50	6
ERA **0620**	6.0	2.0	12	50	6
ERA **0803**	8.0	0.3	16	60	8
ERA **0805**	8.0	0.5	16	60	8
ERA **0810**	8.0	1.0	16	60	8
ERA **0815**	8.0	1.5	16	60	8
ERA **0820**	8.0	2.0	16	60	8
ERA **1005**	10.0	0.5	20	75	10
ERA **1010**	10.0	1.0	20	75	10
ERA **1015**	10.0	1.5	20	75	10
ERA **1020**	10.0	2.0	20	75	10
ERA **1030**	10.0	3.0	20	75	10
ERA **1205**	12.0	0.5	24	75	12
ERA **1210**	12.0	1.0	24	75	12
ERA **1215**	12.0	1.5	24	75	12
ERA **1220**	12.0	2.0	24	75	12
ERA **1230**	12.0	3.0	24	75	12

▼ *Depth of cut*



ap≤0.3 D1
ae=D1

HRC45 ↓



ap≤0.15 D1
ae=D1

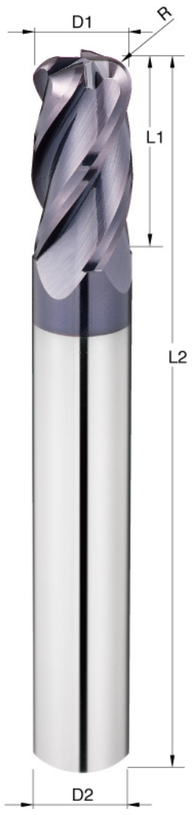
HRC45 ↑

▼ *Recommended cutting condition for ERA*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
3	7600	180	4800	120	2900	50
4	6500	260	4000	160	2500	55
5	5500	270	3200	160	2000	60
6	4800	300	2900	170	1800	70
8	3700	325	2200	170	1500	85
10	2900	280	1700	140	1100	70
12	2400	230	1400	120	1000	65
16	1800	170	1100	90	700	45

EFFICIENCY MILLS

ERB



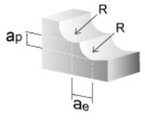
MG
4 Flutes
35°
R
HRC 55
TiaLN
Finishing
Semi-Finishing
Side
Profiling

▶ Corner Radius / for P K

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
ERB **0302**	3.0	0.2	6	50	3
ERB **0302.4**	3.0	0.2	6	50	4
ERB **0305**	3.0	0.5	6	50	3
ERB **0305.4**	3.0	0.5	6	50	4
ERB **0310**	3.0	1.0	6	50	3
ERB **0310.4**	3.0	1.0	6	50	4
ERB **0402**	4.0	0.2	8	50	4
ERB **0405**	4.0	0.5	8	50	4
ERB **0410**	4.0	1.0	8	50	4
ERB **0602**	6.0	0.2	12	50	6
ERB **0605**	6.0	0.5	12	50	6
ERB **0610**	6.0	1.0	12	50	6
ERB **0615**	6.0	1.5	12	50	6
ERB **0620**	6.0	2.0	12	50	6
ERB **0803**	8.0	0.3	16	60	8
ERB **0805**	8.0	0.5	16	60	8
ERB **0810**	8.0	1.0	16	60	8
ERB **0815**	8.0	1.5	16	60	8
ERB **0820**	8.0	2.0	16	60	8
ERB **1005**	10.0	0.5	20	75	10
ERB **1010**	10.0	1.0	20	75	10
ERB **1015**	10.0	1.5	20	75	10
ERB **1020**	10.0	2.0	20	75	10
ERB **1030**	10.0	3.0	20	75	10
ERB **1205**	12.0	0.5	24	75	12
ERB **1210**	12.0	1.0	24	75	12
ERB **1215**	12.0	1.5	24	75	12
ERB **1220**	12.0	2.0	24	75	12
ERB **1230**	12.0	3.0	24	75	12

▼ *Depth of cut*



ap≤0.02R
ae≤0.02R
HRC45 ↓

ap≤D1
ae≤0.02 D1
HRC45 ↑

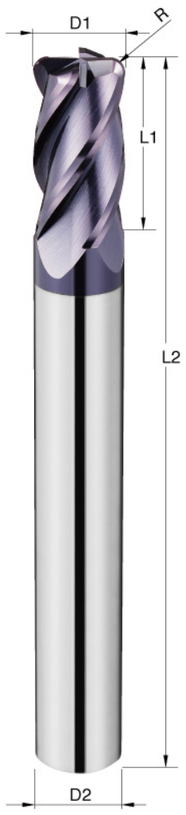
R=Corner R

▼ *Recommended cutting condition for ERB*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
3	9500	450	6000	290	3600	120
4	8000	800	5000	480	3200	160
5	6800	820	4000	500	2500	170
6	6000	900	3600	530	2300	220
8	4600	1000	2800	530	1800	250
10	3500	850	2200	420	1400	220
12	3000	720	1800	350	1200	200
16	2300	520	1400	250	900	150

EFFICIENCY MILLS

ERC



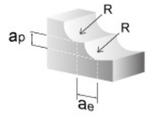
MG
4 Flutes
35°
R
HRC 55
TiaLN
Finishing
Semi-Finishing
Side
Profiling

▶ Long Shank Corner Radius / for P K

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
ERC **0605**	6.0	0.5	12	75	6
ERC **0605A**	6.0	0.5	12	100	6
ERC **0610**	6.0	1.0	12	75	6
ERC **0610A**	6.0	1.0	12	100	6
ERC **0805**	8.0	0.5	16	100	8
ERC **0810**	8.0	1.0	16	100	8
ERC **1005**	10.0	0.5	20	100	10
ERC **1010**	10.0	1.0	20	100	10
ERC **1020**	10.0	2.0	20	100	10
ERC **1205**	12.0	0.5	24	100	12
ERC **1210**	12.0	1.0	24	100	12
ERC **1220**	12.0	2.0	24	100	12

▼ *Depth of cut*



ap≤0.02R
ae≤0.02R
HRC45 ↓

ap≤D1
ae≤0.02 D1
HRC45 ↑

R=Corner R

▼ *Recommended cutting condition for ERC*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	4800	2560	2900	330	1800	140
8	3700	620	2200	330	1500	160
10	2900	530	1700	260	1100	140
12	2400	450	1400	220	1000	125

EFFICIENCY MILLS

BF

▶ Long Neck / Ball Nose / for P K

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
BF **01006**	R0.5	0.95	2	6	50	4
BF **01008**	R0.5	0.95	2	8	50	4
BF **01010**	R0.5	0.95	2	10	50	4
BF **01012**	R0.5	0.95	2	12	50	4
BF **01508**	R0.75	1.45	3	8	50	4
BF **01510**	R0.75	1.45	3	10	50	4
BF **01512**	R0.75	1.45	3	12	50	4
BF **01516**	R0.75	1.45	3	16	50	4
BF **01520**	R0.75	1.45	3	20	50	4
BF **02008**	R1.0	1.92	4	8	50	4
BF **02010**	R1.0	1.92	4	10	50	4
BF **02012**	R1.0	1.92	4	12	50	4
BF **02016**	R1.0	1.92	4	16	50	4
BF **02020**	R1.0	1.92	4	20	50	4
BF **03008**	R1.5	2.90	6	8	50	6
BF **03010**	R1.5	2.90	6	10	50	6
BF **03012**	R1.5	2.90	6	12	50	6
BF **03016**	R1.5	2.90	6	16	50	6
BF **03020**	R1.5	2.90	6	20	75	6
BF **03025**	R1.5	2.90	6	25	75	6
BF **04012**	R2.0	3.88	8	12	50	6
BF **04016**	R2.0	3.88	8	16	50	6
BF **04020**	R2.0	3.88	8	20	50	6
BF **04025**	R2.0	3.88	8	25	75	6
BF **04030**	R2.0	3.88	8	30	75	6

MG

2 Flutes

30°

HRC 55

TiaLN

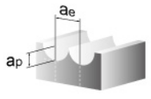
Finishing Semi-Finishing

Profiling

▼ *Depth of cut*

R<1 ae<0.1R

R>1 ae<0.2R



R=Radius

▼ *Recommended cutting condition for BF*

MATERIAL		Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80		
RADIUS	EFFECTIVE LENGTH	SPEED (min^{-1})	FEED mm / min	DEPTH OF CUT ap (mm)
R0.5	6	20000 - 32000	300 - 750	0.04
	8	20000 - 32000	300 - 750	0.03
	10	20000 - 32000	300 - 750	0.025
	12	20000 - 32000	300 - 750	0.015
R0.75	8	18000 - 20000	350 - 550	0.07
	12	18000 - 20000	350 - 550	0.04
	16	18000 - 20000	350 - 550	0.03
	20	18000 - 20000	350 - 550	0.02
R1.0	8	12000 - 17000	500 - 900	0.1
	12	12000 - 17000	500 - 900	0.1
	16	12000 - 17000	500 - 900	0.07
	20	12000 - 17000	500 - 900	0.04
R1.5	8	8000 - 11000	500 - 700	0.17
	10	8000 - 11000	500 - 700	0.15
	16	8000 - 11000	500 - 700	0.14
	20	8000 - 11000	500 - 700	0.12
	25	8000 - 11000	500 - 700	0.1
R2.0	10	5000 - 8000	400 - 600	0.18
	15	5000 - 8000	400 - 600	0.17
	20	5000 - 8000	400 - 600	0.16
	25	5000 - 8000	400 - 600	0.15
	30	5000 - 8000	400 - 600	0.14

EFFICIENCY MILLS

EFA

▶ Long Neck / Square / for P K

unit: mm

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
EFA **01006**	1.0	0.95	3	6	50	4
EFA **01008**	1.0	0.95	3	8	50	4
EFA **01010**	1.0	0.95	3	10	50	4
EFA **01012**	1.0	0.95	3	12	50	4
EFA **01508**	1.5	1.45	4	8	50	4
EFA **01510**	1.5	1.45	4	10	50	4
EFA **01512**	1.5	1.45	4	12	50	4
EFA **01516**	1.5	1.45	4	16	50	4
EFA **02008**	2.0	1.92	6	8	50	4
EFA **02010**	2.0	1.92	6	10	50	4
EFA **02012**	2.0	1.92	6	12	50	4
EFA **02016**	2.0	1.92	6	16	50	4
EFA **02020**	2.0	1.92	6	20	50	4
EFA **02510**	2.5	2.40	8	10	50	4
EFA **02512**	2.5	2.40	8	12	50	4
EFA **02516**	2.5	2.40	8	16	50	4
EFA **02520**	2.5	2.40	8	20	50	4
EFA **03010**	3.0	2.90	8	10	50	6
EFA **03012**	3.0	2.90	8	12	50	6
EFA **03016**	3.0	2.90	8	16	50	6
EFA **03020**	3.0	2.90	8	20	75	6
EFA **03025**	3.0	2.90	8	25	75	6

MG

2 Flutes

35°

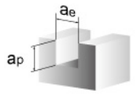
HRC 55

TiaLN

Finishing Semi-Finishing

Slotting

▼ *Depth of cut*



ae=D1

▼ *Recommended cutting condition for EFA*

MATERIAL		Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...	Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...	Hardened Steels SKD11
DIAMETER	EFFECTIVE LENGTH	SPEED (min^{-1})	FEED mm / min	DEPTH OF CUT ap (mm)
1	4	25000	1500	0.05
	6	25000	1500	0.03
	10	25000	1500	0.01
1.5	4	15000	1200	0.1
	8	15000	1200	0.05
	10	15000	1200	0.025
	12	15000	1200	0.018
2	8	12000	900	0.2
	10	8800	700	0.12
	12	7500	600	0.05
	16	7000	500	0.02
3	8	8000	600	0.5
	12	8000	600	0.45
	16	5500	450	0.18
	20	4000	300	0.15
4	10	6000	400	0.7
	16	6000	400	0.4

▲ Pingxi Sky Lantern Festival

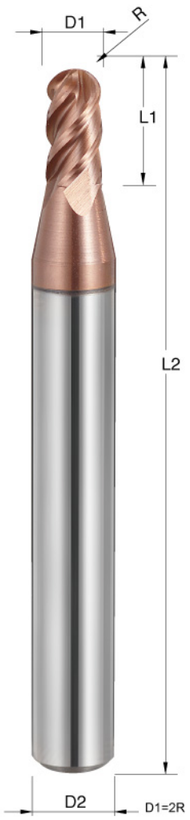
I.pro

SBBI

▶ Ball Nose / for M S

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
SBBI **0306**	R1.5	6	50	6
SBBI **0406**	R2	8	50	6
SBBI **0506**	R2.5	10	50	6
SBBI **0606**	R3	12	50	6
SBBI **0808**	R4	16	60	8
SBBI **1010**	R5	20	75	10
SBBI **1212**	R6	24	75	12



S MG

4 Flutes

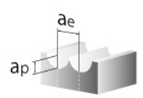
45°

G300

Finishing Semi-Finishing

Profiling

▼ *Depth of cut*



▼ *Recommended cutting condition for SBBI*

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:0.25-1.2mm ae:0.75-3mm		ap:0.25-1.2mm ae:0.75-3mm		ap:0.25-1.2mm ae:0.75-3mm		ap:0.25-1.2mm ae:0.75-3mm		ap:0.13-0.6mm ae:0.3-1.2mm	
Radius (R)	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min
R1.5	19100	2900	19100	2900	12740	1500	12740	1500	3180	254
R2	14330	2500	14330	2500	9550	1350	9550	1350	2390	191
R2.5	11460	2230	11460	2230	7640	1190	7640	1190	1910	191
R3	9550	1900	9550	1900	6370	1110	6370	1110	1590	160
R4	7160	1700	7160	1700	4780	1090	4780	1090	1190	140
R5	5730	1600	5730	1600	3820	1030	3820	1030	960	135
R6	4780	1590	4780	1590	3190	1020	3190	1020	800	110

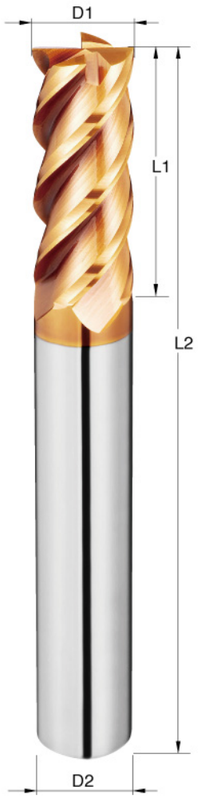
I.pro

SEI

▶ **Square / for** M S

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEI **0306**	3.0	8	50	6
SEI **0406**	4.0	11	50	6
SEI **0506**	5.0	13	50	6
SEI **0606**	6.0	16	50	6
SEI **0808**	8.0	20	60	8
SEI **1010**	10.0	25	75	10
SEI **1212**	12.0	30	75	12
SEI **1616**	16.0	40	100	16
SEI **2020**	20.0	45	100	20



S MG
4 Flutes
45°
G300
Finishing
Semi-Finishing
Planing
Side
Slotting

▼ *Recommended cutting condition for SEI*

Side Milling

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut	a_p=1D1 a_e=0.05D1		a_p=1D1 a_e=0.05D1		a_p=1D1 a_e=0.05D1	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	4600	590	4600	590	2600	230
8	3500	560	3500	560	2000	220
10	2700	535	2700	535	1600	200
12	2400	520	2400	520	1400	170
16	1700	450	1700	450	1000	130
20	1400	450	1400	450	800	100

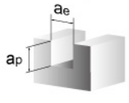
Slotting

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut	a_p=0.5D1 a_e=1D1		a_p=0.2D1 a_e=1D1		a_p=0.2D1 a_e=1D1	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	3000	375	2600	335	1200	105
8	2200	360	2000	320	900	90
10	1800	335	1600	310	750	80
12	1500	330	1300	300	600	70
16	1100	290	1000	250	450	50
20	900	290	800	250	360	40

▼ *Depth of cut*

▶ **Side Milling**

▶ **Slotting**



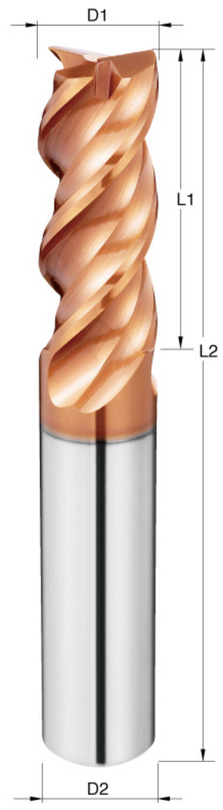
I.pro

SEPS

▶ **Square / for** M S

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEPS **0306**	3.0	8	50	6
SEPS **0406**	4.0	11	50	6
SEPS **0506**	5.0	13	50	6
SEPS **0606**	6.0	16	50	6
SEPS **0808**	8.0	20	60	8
SEPS **1010**	10.0	25	75	10
SEPS **1212**	12.0	30	75	12
SEPS **1616**	16.0	40	100	16
SEPS **2020**	20.0	45	100	20

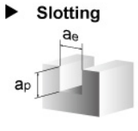


S MG
3 Flutes
45°
HELICA
Roughing
Finishing
Semi-Finishing
Side
Slotting

▼ *Depth of cut*

Diameter (D1)	ap(mm)
3	1.5
4	2.0
5	2.5
6	3.0
8	4.0
10	5.0
12	6.0
16	6.0
20	6.0

▶ **Slotting**



▼ *Recommended cutting condition for SEPS*

Slotting

Material	Carbon Steels..		Alloy Steels.Tool Steels		Stainless Steels	
	SS/S45C/SCM/FC		SCr.SNCM.SKD11.SKD61.NAK80···		SUS304/SUS316/Ti6AL-4V..	
Diameter (D1)	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min
3.0	11000	770	9100	400	7700	350
4.0	8400	1000	6700	500	5600	370
5.0	7000	1000	5300	500	4500	380
6.0	5600	1000	4500	540	3700	400
8.0	4200	900	3400	500	2800	420
10.0	4000	800	2700	440	2300	470
12.0	2800	700	2300	400	1900	460
16.0	2100	600	1700	350	1400	340
20.0	1800	500	1400	280	1100	270

I.pro

SEPI

▶ **Square / for** M S

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEPI **0306**	3.0	8	50	6
SEPI **0406**	4.0	11	50	6
SEPI **0506**	5.0	13	50	6
SEPI **0606**	6.0	16	50	6
SEPI **0808**	8.0	20	60	8
SEPI **1010**	10.0	25	75	10
SEPI **1212**	12.0	30	75	12
SEPI **1616**	16.0	40	100	16
SEPI **2020**	20.0	45	100	20

S MG
4 Flutes
45°
G300
Roughing
Finishing
Semi-Finishing
Side
Slotting

▼ *Recommended cutting condition for SEPI*

Side Milling

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut	a_p=1D1 a_e=0.05D1		a_p=1D1 a_e=0.05D1		a_p=1D1 a_e=0.05D1	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	4600	590	4600	590	2600	230
8	3500	560	3500	560	2000	220
10	2700	535	2700	535	1600	200
12	2400	520	2400	520	1400	170
16	1700	450	1700	450	1000	130
20	1400	450	1400	450	800	100

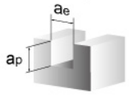
Slotting

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut	a_p=0.5D1 a_e=1D1		a_p=0.2D1 a_e=1D1		a_p=0.2D1 a_e=1D1	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	3000	375	2600	335	1200	105
8	2200	360	2000	320	900	90
10	1800	335	1600	310	750	80
12	1500	330	1300	300	600	70
16	1100	290	1000	250	450	50
20	900	290	800	250	360	40

▼ *Depth of cut*

▶ **Side Milling**

▶ **Slotting**



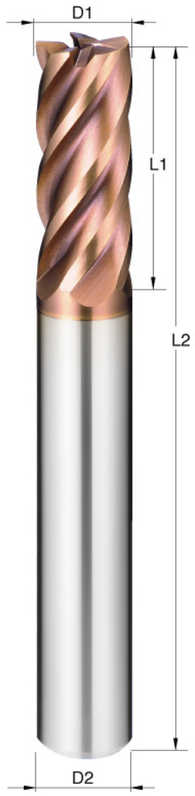
I.pro

SIB

▶ **Square / for** M S

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SIB **0306**	3.0	8	50	6
SIB **0406**	4.0	11	50	6
SIB **0506**	5.0	13	50	6
SIB **0606**	6.0	16	50	6
SIB **0808**	8.0	20	60	8
SIB **1010**	10.0	25	75	10
SIB **1212**	12.0	30	75	12
SIB **1616**	16.0	40	100	16
SIB **2020**	20.0	45	100	20



S MG
5 Flutes
37°
α°≠β°
G300
Finishing
Semi-Finishing
Planing
Side
Slotting

▼ *Recommended cutting condition for SIB*

Side Milling

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut	a_p=1D1 a_e=0.05D1		a_p=1D1 a_e=0.05D1		a_p=1D1 a_e=0.05D1	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	4600	740	4600	740	2600	290
8	3500	700	3500	700	2000	275
10	2700	670	2700	670	1600	250
12	2400	650	2400	650	1400	210
16	1700	560	1700	560	1000	160
20	1400	560	1400	560	800	120

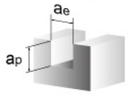
Slotting

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut	a_p=0.5D1 a_e=1D1		a_p=0.2D1 a_e=1D1		a_p=0.2D1 a_e=1D1	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	3000	470	2600	420	1200	130
8	2200	450	2000	400	900	110
10	1800	420	1600	390	750	100
12	1500	410	1300	370	600	85
16	1100	360	1000	310	450	60
20	900	360	800	310	360	50

▼ *Depth of cut*

▶ **Side Milling**

▶ **Slotting**



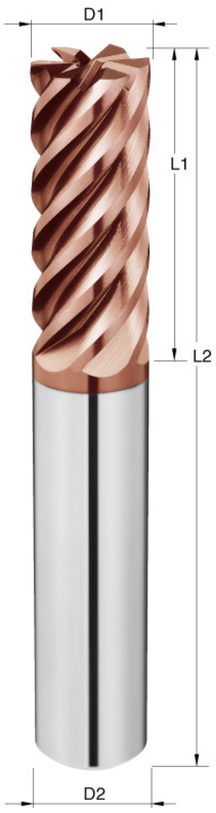
I.pro

SHAI

▶ **Square / for** M S

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SHAI **0606**	6.0	16	50	6
SHAI **0808**	8.0	20	60	8
SHAI **1010**	10.0	25	75	10
SHAI **1212**	12.0	30	75	12
SHAI **1616**	16.0	40	100	16



S MG

6 Flutes

45°

G300

Finishing

Side

▼ *Depth of cut*

▶ **Side Milling**

▼ *Recommended cutting condition for SHAI*

Side Milling

Material	Stainless Steels		Titanium Alloys		Superalloy	
	SUS304/SUS316L..		Ti6AL-4V..		Inconel 718..	
Depth of cut	ap:D1 ae:0.05D1		ap:D1 ae:0.05D1		ap:D1 ae:0.05D1	
Dia. (D1)	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min
6	4250	920	3700	800	2100	320
8	3200	900	2800	790	1600	300
10	2550	760	2200	670	1300	260
12	2100	840	1850	740	1100	230
16	1600	740	1400	640	800	180

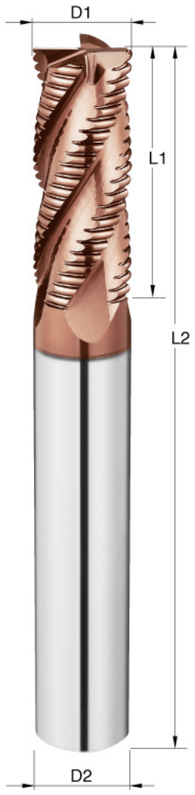
I.pro

SEGI

▶ **Roughing Square / for** M S

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEGI **0606**	6.0	16	50	6
SEGI **0808**	8.0	20	60	8
SEGI **1010**	10.0	25	75	10
SEGI **1212**	12.0	30	75	12
SEGI **1616**	16.0	40	100	16
SEGI **2020**	20.0	45	100	20



S MG

4 Flutes

45°

Fine

G300

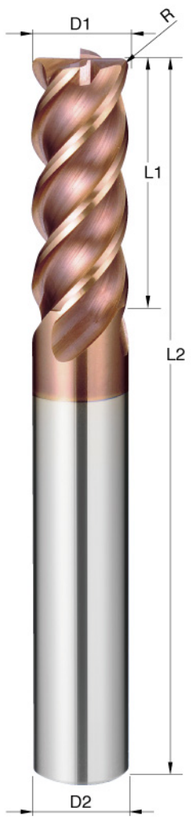
Roughing

Slotting

Side

I.pro

SRIP



▶ Corner Radius / for M S

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
SRIP **0305**	3.0	0.5	8	50	6
SRIP **0405**	4.0	0.5	11	50	6
SRIP **0605**	6.0	0.5	16	50	6
SRIP **0610**	6.0	1.0	16	50	6
SRIP **0805**	8.0	0.5	20	60	8
SRIP **0810**	8.0	1.0	20	60	8
SRIP **1005**	10.0	0.5	25	75	10
SRIP **1010**	10.0	1.0	25	75	10
SRIP **1205**	12.0	0.5	30	75	12
SRIP **1210**	12.0	1.0	30	75	12

▼ *Recommended cutting condition for SRIP*

Side Milling

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut	a_p=1D1 a_e=0.05D1		a_p=1D1 a_e=0.05D1		a_p=1D1 a_e=0.05D1	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	4600	590	4600	590	2600	230
8	3500	560	3500	560	2000	220
10	2700	535	2700	535	1600	200
12	2400	520	2400	520	1400	170
16	1700	450	1700	450	1000	130
20	1400	450	1400	450	800	100

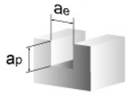
Slotting

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut	a_p=0.5D1 a_e=1D1		a_p=0.2D1 a_e=1D1		a_p=0.2D1 a_e=1D1	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
6	3000	375	2600	335	1200	105
8	2200	360	2000	320	900	90
10	1800	335	1600	310	750	80
12	1500	330	1300	300	600	70
16	1100	290	1000	250	450	50
20	900	290	800	250	360	40

▼ *Depth of cut*

▶ **Side Milling**

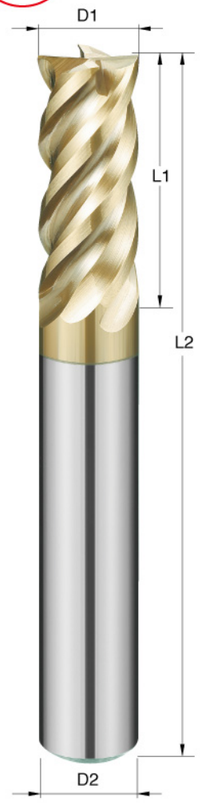
▶ **Slotting**



I.pro

SIW

NEW



▶ Square / for M S

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SIW **0306**	3.0	8	50	6
SIW **0406**	4.0	11	50	6
SIW **0506**	5.0	13	50	6
SIW **0606**	6.0	16	50	6
SIW **0808**	8.0	20	60	8
SIW **1010**	10.0	25	75	10
SIW **1212**	12.0	30	75	12
SIW **1616**	16.0	40	100	16
SIW **2020**	20.0	45	100	20

▼ *Recommended cutting condition for SIW*

Side Milling

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1Dc ae:0.2Dc		ap:1Dc ae:0.2Dc		ap:1Dc ae:0.2Dc		ap:1Dc ae:0.1Dc		ap:1Dc ae:0.05Dc	
Dia. (D1)	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min
3.0	12730	1530	8490	510	6370	440	6370	440	3200	90
4.0	9550	1530	6370	510	4780	500	4780	500	2400	96
5.0	7640	1530	5100	510	3820	510	3820	510	1910	96
6.0	6370	1530	4250	680	3180	510	3180	510	1595	96
8.0	4780	1530	3180	760	2390	550	2390	550	1195	100
10.0	3820	1530	2550	710	1910	580	1910	580	955	110
12.0	3180	1270	2120	590	1590	510	1590	510	800	96
16.0	2390	1145	1590	510	1190	450	1190	450	600	96
20.0	1910	1070	1270	460	955	410	955	410	480	96

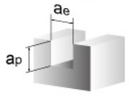
Slotting

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1Dc		ap:0.5Dc		ap:0.5Dc		ap:0.1Dc		ap:0.05Dc	
Dia. (D1)	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min	Speed (min^{-1})	Feed mm/min
3.0	11450	590	6660	270	5830	200	5830	200	2880	35
4.0	8590	680	5040	320	4380	200	4380	200	2160	43
5.0	6870	750	4050	360	3500	240	3500	240	1720	48
6.0	5730	840	3330	400	3700	270	3700	270	1440	56
8.0	4300	820	2520	410	2190	270	2190	270	1080	50
10.0	3430	850	1980	420	1750	280	1750	280	860	48
12.0	2860	760	1710	370	1460	250	1460	250	720	46
16.0	2150	720	1260	340	1095	220	1095	220	540	43
20.0	1710	680	990	320	875	215	875	215	430	41

▼ *Depth of cut*

▶ **Side Milling**

▶ **Slotting**



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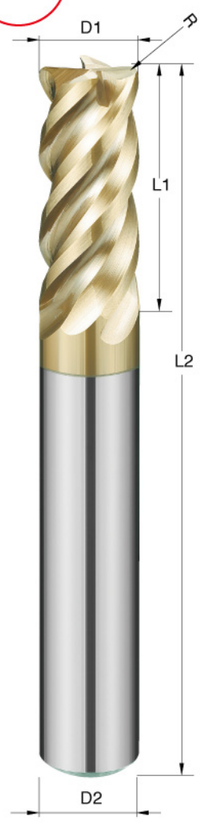
SIRW

NEW



S MG

4 Flutes

40°/43°

α°≠β°

R

G-plus

Side

Slotting

▶ Corner Radius / for M S

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
SIRW **0305**	3.0	0.5	7.5	50	6
SIRW **0405**	4.0	0.5	10	50	6
SIRW **0605**	6.0	0.5	15	50	6
SIRW **0610**	6.0	1	15	50	6
SIRW **0805**	8.0	0.5	20	60	8
SIRW **0810**	8.0	1	20	60	8
SIRW **1005**	10.0	0.5	25	75	10
SIRW **1010**	10.0	1	25	75	10
SIRW **1205**	12.0	0.5	30	75	12
SIRW **1210**	12.0	1	30	75	12

▼ *Recommended cutting condition for SIRW*

Side Milling

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD/NAK		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1.5Dc	ae:0.2Dc	ap:1Dc	ae:0.05Dc	ap:1Dc	ae:0.1Dc	ap:0.8Dc	ae:0.05Dc	ap:0.8Dc	ae:0.05Dc
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
2.0	19900	1200	11150	800	10350	415	10350	415	5890	190
3.0	13270	1330	7430	595	6900	550	6900	550	3930	250
4.0	9950	1190	5570	670	5180	520	5180	520	2950	240
5.0	7960	1270	4460	625	4140	500	4140	500	2360	230
6.0	6630	1460	3710	670	3450	520	3450	520	1960	300
8.0	4970	1390	2780	700	2590	465	2590	465	1470	280
10.0	3980	1270	2230	625	2070	480	2070	480	1200	250
12.0	3320	1260	1860	560	1730	450	1730	450	980	220

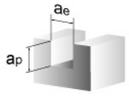
Slotting

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:0.8Dc		ap:0.2Dc		ap:0.4Dc		ap:0.2Dc		ap:0.1Dc	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
2.0	17500	700	8760	420	9550	230	9550	230	4780	115
3.0	11670	700	5840	420	6370	230	6370	230	3180	115
4.0	8750	700	4380	350	4780	215	4780	215	2390	105
5.0	7000	840	3500	420	3820	230	3820	230	1910	115
6.0	5840	840	2920	410	3180	240	3180	240	1590	120
8.0	4380	875	2190	395	2390	215	2390	215	1190	104
10.0	3500	880	1750	370	1910	230	1910	230	950	115
12.0	2920	800	1460	350	1590	215	1590	215	800	105

▼ *Depth of cut*

▶ **Side Milling**

▶ **Slotting**



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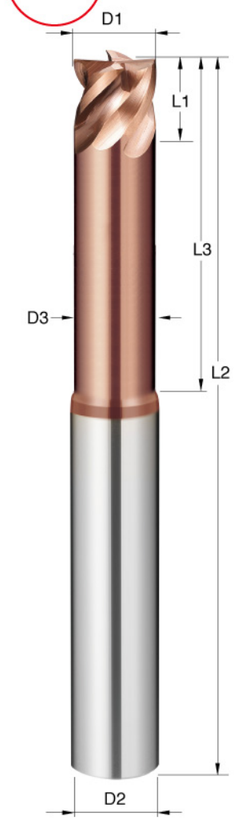
NECKPRO 5D(E)

NEW



S MG

4 Flutes

40°/43°

α°≠β°

i8

Side

Slotting

▶ Long Neck / Square / for M S P

unit: mm

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
NECKPRO5D(E)-**0306**	3.0	2.9	4.5	15	70	6
NECKPRO5D(E)-**0406**	4.0	3.88	6	20	70	6
NECKPRO5D(E)-**0506**	5.0	4.8	7.5	25	70	6
NECKPRO5D(E)-**0606**	6.0	5.8	9	30	70	6
NECKPRO5D(E)-**0808**	8.0	7.7	12	40	80	8
NECKPRO5D(E)-**1010**	10.0	9.6	15	50	100	10
NECKPRO5D(E)-**1212**	12.0	11.5	18	60	110	12

Carbon Steels	Alloy Steels	Pre-Hardened Steel	Hardened Steels		Stainless Steels	Aluminum Alloys	Heat resistant Alloy	Titanium Alloys
~HB225	HB225~352	HRC~48	HRC~56	HRC~65				
◎	◎	○			◎		◎	◎

▼ *Recommended cutting condition for NECKPRO 5D(E)*

Side Milling

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1Dc	ae:0.5Dc	ap:1Dc	ae:0.5Dc	ap:1Dc	ae:0.5Dc	ap:1Dc	ae:0.5Dc	ap:1D c	ae:0.05Dc
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
3.0	8000	640	5600	320	4800	270	4800	270	3200	90
4.0	6000	640	4200	320	3500	280	3500	280	2400	96
5.0	4800	670	3360	340	2900	290	2900	290	1910	96
6.0	4000	720	2800	360	2400	290	2400	290	1595	96
8.0	3000	600	2100	300	1800	290	1800	290	1195	100
10.0	2400	670	1700	340	1500	300	1500	300	955	110
12.0	2000	600	1500	300	1300	280	1300	280	800	96

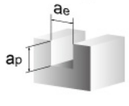
Slotting

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1Dc		ap:1Dc		ap:1Dc		ap:0.5Dc		ap:0.5Dc	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
3.0	7000	560	4900	255	4400	245	4400	245	3200	90
4.0	5500	550	3900	280	3500	280	3500	280	2400	96
5.0	4400	620	3000	300	2700	270	2700	270	1910	96
6.0	3700	590	2600	310	2400	280	2350	280	1595	96
8.0	2600	625	1900	300	1700	270	1700	270	1195	100
10.0	2200	615	1500	300	1350	270	1350	270	955	110
12.0	1800	575	1300	260	1200	260	1200	260	800	96

▼ *Depth of cut*

▶ **Side Milling**

▶ **Slotting**



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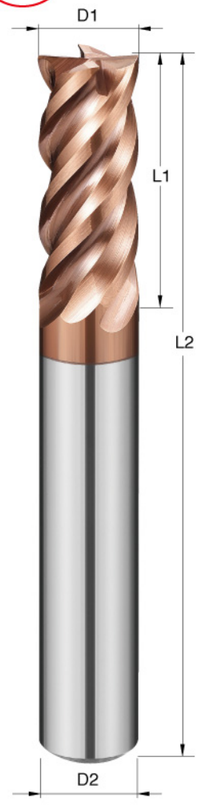
SUSPRO(E)

NEW



S MG

4 Flutes

40°/43°

α°≠β°

i8

Planing

Side

Slotting

▶ Square / for M S P

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SUSPRO(E)-**0104**	1.0	3	50	4
SUSPRO(E)-**0204**	2.0	6	50	4
SUSPRO(E)-**0306**	3.0	8	50	6
SUSPRO(E)-**0406**	4.0	11	50	6
SUSPRO(E)-**0506**	5.0	13	50	6
SUSPRO(E)-**0606**	6.0	16	50	6
SUSPRO(E)-**0708**	7.0	20	60	8
SUSPRO(E)-**0808**	8.0	20	60	8
SUSPRO(E)-**0910**	9.0	25	75	10
SUSPRO(E)-**1010**	10.0	25	75	10
SUSPRO(E)-**1112**	11.0	28	75	12
SUSPRO(E)-**1212**	12.0	30	75	12
SUSPRO(E)-**1616**	16.0	40	100	16
SUSPRO(E)-**2020**	20.0	45	100	20

Carbon Steel	Alloy Steel	Pre-Hardened Steel	Hardened Steel		Stainless Steel	Aluminum	Heat-resistant Alloy	Titanium
~HB225	HB225~352	HRC~48	HRC~56	HRC~65				
◎	◎	○			◎		◎	◎

▼ *Recommended cutting condition for SUSPRO(E)*

Side Milling

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1Dc ae:0.2Dc		ap:1Dc ae:0.2Dc		ap:1Dc ae:0.2Dc		ap:1Dc ae:0.1Dc		ap:1Dc ae:0.05Dc	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
1	38210	1220	25480	710	18840	390	18840	390	9550	80
2	19108	1070	12740	510	9550	420	9550	420	4775	87
3.0	12730	1530	8490	510	6370	440	6370	440	3200	90
4.0	9550	1530	6370	510	4780	500	4780	500	2400	96
5.0	7640	1530	5100	510	3820	510	3820	510	1910	96
6.0	6370	1530	4250	680	3180	510	3180	510	1595	96
7.0	5460	1740	3640	730	2730	550	2730	550	1365	100
8.0	4780	1530	3180	760	2390	550	2390	550	1195	100
9.0	4250	1530	2830	790	2120	580	2120	580	1040	110
10.0	3820	1530	2550	710	1910	580	1910	580	955	110
12.0	3180	1270	2120	590	1590	510	1590	510	800	96
16.0	2390	1145	1590	510	1190	450	1190	450	600	96
20.0	1910	1070	1270	460	955	410	955	410	480	96

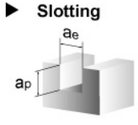
Slotting

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1Dc		ap:0.5Dc		ap:0.5Dc		ap:0.1Dc		ap:0.05Dc	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
1	34390	415	19740	190	17500	140	17500	140	8900	25
2	17200	500	9870	230	8750	170	8750	170	4290	30
3.0	11450	590	6660	270	5830	200	5830	200	2880	35
4.0	8590	680	5040	320	4380	200	4380	200	2160	43
5.0	6870	750	4050	360	3500	240	3500	240	1720	48
6.0	5730	840	3330	400	3700	270	3700	270	1440	56
7.0	4910	820	2880	410	2500	270	2500	270	1230	50
8.0	4300	820	2520	410	2190	270	2190	270	1080	50
9.0	3820	820	2250	410	1940	270	1940	270	940	48
10.0	3430	850	1980	420	1750	280	1750	280	860	48
12.0	2860	760	1710	370	1460	250	1460	250	720	46
16.0	2150	720	1260	340	1095	220	1095	220	540	43
20.0	1710	680	990	320	875	215	875	215	430	41

▼ *Depth of cut*

▶ **Side Milling**

▶ **Slotting**



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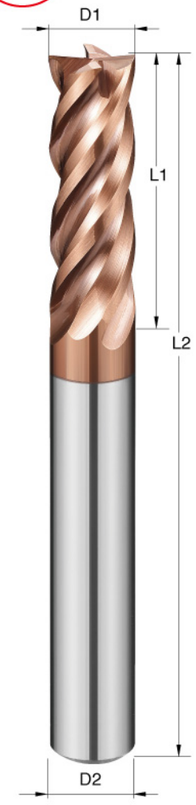
SUSPRO(E)-L

NEW



S MG

4 Flutes

40°/43°

α°≠β°

i8

Planing

Side

Slotting

▶ Square / for M S P

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SUSPRO(E)-**0306L**	3.0	10	60	6
SUSPRO(E)-**0406L**	4.0	13	60	6
SUSPRO(E)-**0506L**	5.0	15	60	6
SUSPRO(E)-**0606L**	6.0	19	60	6
SUSPRO(E)-**0708L**	7.0	22	65	8
SUSPRO(E)-**0808L**	8.0	25	65	8
SUSPRO(E)-**0910L**	9.0	28	80	10
SUSPRO(E)-**1010L**	10.0	31	80	10
SUSPRO(E)-**1112L**	11.0	34	83	12
SUSPRO(E)-**1212L**	12.0	37	83	12
SUSPRO(E)-**1616L**	16.0	49	110	16
SUSPRO(E)-**2020L**	20.0	61	130	20

Carbon Steel	Alloy Steel	Pre-Hardened Steel	Hardened Steel		Stainless Steel	Aluminum	Heat-resistant Alloy	Titanium
~HB225	HB225~352	HRC~48	HRC~56	HRC~65				
◎	◎	○			◎		◎	◎

▼ *Recommended cutting condition for SUSPRO(E)-L*

Side Milling

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1Dc ae:0.2Dc		ap:1Dc ae:0.2Dc		ap:1Dc ae:0.2Dc		ap:1Dc ae:0.1Dc		ap:1Dc ae:0.05Dc	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
3.0	12730	1020	7400	400	6370	440	6370	440	3200	90
4.0	9550	1150	5600	420	4780	500	4780	500	2400	96
5.0	7640	1220	4500	430	3820	510	3820	510	1910	96
6.0	6370	1220	3700	430	3180	510	3180	510	1595	96
7.0	5460	1150	3200	450	2730	550	2730	550	1365	100
8.0	4780	1150	2800	450	2390	550	2390	550	1195	100
9.0	4250	1220	2500	460	2120	580	2120	580	1040	110
10.0	3820	1220	2200	460	1910	580	1910	580	955	110
12.0	3180	1020	1900	410	1590	510	1590	510	800	96
16.0	2390	960	1400	380	1190	450	1190	450	600	96
20.0	1910	920	1100	360	955	410	955	410	480	96

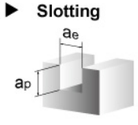
Slotting

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1Dc		ap:0.5Dc		ap:0.5Dc		ap:0.1Dc		ap:0.05Dc	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
3.0	11450	410	6660	265	5830	230	5830	230	2880	35
4.0	8590	480	5040	240	4380	225	4380	225	2160	43
5.0	6870	530	4050	240	3500	210	3500	210	1720	48
6.0	5730	590	3330	240	3700	295	3700	295	1440	56
7.0	4910	570	2880	230	2500	250	2500	250	1230	50
8.0	4300	570	2520	250	2190	260	2190	260	1080	50
9.0	3820	570	2250	225	1940	230	1940	230	940	48
10.0	3430	570	1980	235	1750	210	1750	210	860	48
12.0	2860	600	1710	205	1460	175	1460	175	720	46
16.0	2150	570	1260	200	1095	175	1095	175	540	43
20.0	1710	540	990	160	875	140	875	140	430	41

▼ *Depth of cut*

▶ **Side Milling**

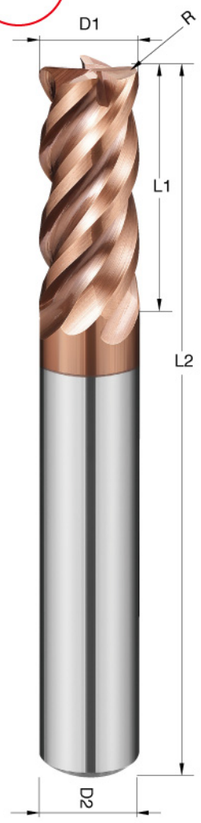
▶ **Slotting**



ae=Dc

RAPRO(E)

NEW



S MG

4 Flutes

40°/43°

α°≠β°

R

HRC 60

i8

Side

Profiling

▶ Corner Radius / for M S P

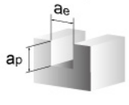
unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
RAPRO(E)-0204R01	2.0	0.1	5	50	4
RAPRO(E)-0204R02	2.0	0.2	5	50	4
RAPRO(E)-0204R03	2.0	0.3	5	50	4
RAPRO(E)-0306R01	3.0	0.1	7.5	50	6
RAPRO(E)-0306R02	3.0	0.2	7.5	50	6
RAPRO(E)-0306R03	3.0	0.3	7.5	50	6
RAPRO(E)-0306R04	3.0	0.4	7.5	50	6
RAPRO(E)-0306R05	3.0	0.5	7.5	50	6
RAPRO(E)-0406R01	4.0	0.1	10	50	6
RAPRO(E)-0406R02	4.0	0.2	10	50	6
RAPRO(E)-0406R03	4.0	0.3	10	50	6
RAPRO(E)-0406R04	4.0	0.4	10	50	6
RAPRO(E)-0406R05	4.0	0.5	10	50	6
RAPRO(E)-0406R1	4.0	1	10	50	6
RAPRO(E)-0506R02	5.0	0.2	12.5	50	6
RAPRO(E)-0506R03	5.0	0.3	12.5	50	6
RAPRO(E)-0506R05	5.0	0.5	12.5	50	6
RAPRO(E)-0506R1	5.0	1	12.5	50	6
RAPRO(E)-0606R03	6.0	0.3	15	50	6
RAPRO(E)-0606R04	6.0	0.4	15	50	6
RAPRO(E)-0606R05	6.0	0.5	15	50	6
RAPRO(E)-0606R1	6.0	1	15	50	6
RAPRO(E)-0606R1.5	6.0	1.5	15	50	6
RAPRO(E)-0606R2	6.0	2	15	50	6
RAPRO(E)-0808R03	8.0	0.3	20	60	8
RAPRO(E)-0808R04	8.0	0.4	20	60	8
RAPRO(E)-0808R05	8.0	0.5	20	60	8
RAPRO(E)-0808R1	8.0	1	20	60	8
RAPRO(E)-0808R1.5	8.0	1.5	20	60	8
RAPRO(E)-0808R2	8.0	2	20	60	8
RAPRO(E)-1010R03	10.0	0.3	25	75	10
RAPRO(E)-1010R04	10.0	0.4	25	75	10
RAPRO(E)-1010R05	10.0	0.5	25	75	10
RAPRO(E)-1010R1	10.0	1	25	75	10
RAPRO(E)-1010R1.5	10.0	1.5	25	75	10
RAPRO(E)-1010R2	10.0	2	25	75	10
RAPRO(E)-1010R3	10.0	3	25	75	10
RAPRO(E)-1212R05	12.0	0.5	30	75	12
RAPRO(E)-1212R1	12.0	1	30	75	12
RAPRO(E)-1212R1.5	12.0	1.5	30	75	12
RAPRO(E)-1212R2	12.0	2	30	75	12
RAPRO(E)-1212R3	12.0	3	30	75	12

▼ *Depth of cut*

▶ **Side Milling**

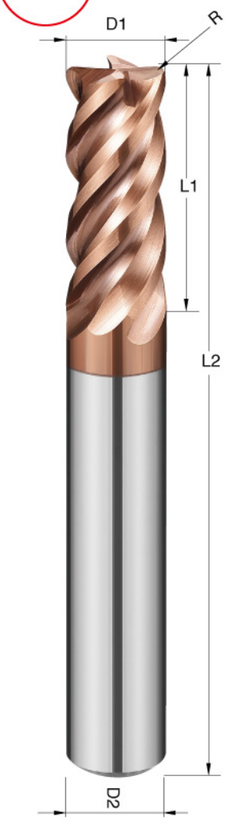
▶ **Slotting**



ae=Dc

RAPRO(E)

NEW



S MG

4 Flutes

40°/43°

α°≠β°

R

HRC 60

i8

Side

Profiling

▶ Corner Radius / for M S P

Carbon Steels	Alloy Steels	Pre-Hardened Steel	Hardened Steels		Stainless Steels	Aluminum Alloys	Heat resistant Alloy	Titanium Alloys
~HB225	HB225~352	HRC~48	HRC~56	HRC~65				
◎	◎	◎	○		◎		◎	◎

▼ *Recommended cutting condition for RAPRO(E)*

Side Milling

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD/NAK		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:1.5Dc	ae:0.2Dc	ap:1Dc	ae:0.05Dc	ap:1Dc	ae:0.1Dc	ap:0.8Dc	ae:0.05Dc	ap:0.8Dc	ae:0.05Dc
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
2.0	19900	1200	11150	800	10350	415	10350	415	5890	190
3.0	13270	1330	7430	595	6900	550	6900	550	3930	250
4.0	9950	1190	5570	670	5180	520	5180	520	2950	240
5.0	7960	1270	4460	625	4140	500	4140	500	2360	230
6.0	6630	1460	3710	670	3450	520	3450	520	1960	300
8.0	4970	1390	2780	700	2590	465	2590	465	1470	280
10.0	3980	1270	2230	625	2070	480	2070	480	1200	250
12.0	3320	1260	1860	560	1730	450	1730	450	980	220

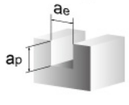
Slotting

Material	Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
	SS/S45C/SCM/FC		SKD11/SKD61···		SUS304/SUS316L···		Ti6AL-4V···		Inconel 718···	
Depth of cut	ap:0.8Dc		ap:0.2Dc		ap:0.4Dc		ap:0.2Dc		ap:0.1Dc	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
2.0	17500	700	8760	420	9550	230	9550	230	4780	115
3.0	11670	700	5840	420	6370	230	6370	230	3180	115
4.0	8750	700	4380	350	4780	215	4780	215	2390	105
5.0	7000	840	3500	420	3820	230	3820	230	1910	115
6.0	5840	840	2920	410	3180	240	3180	240	1590	120
8.0	4380	875	2190	395	2390	215	2390	215	1190	104
10.0	3500	880	1750	370	1910	230	1910	230	950	115
12.0	2920	800	1460	350	1590	215	1590	215	800	105

▼ *Depth of cut*

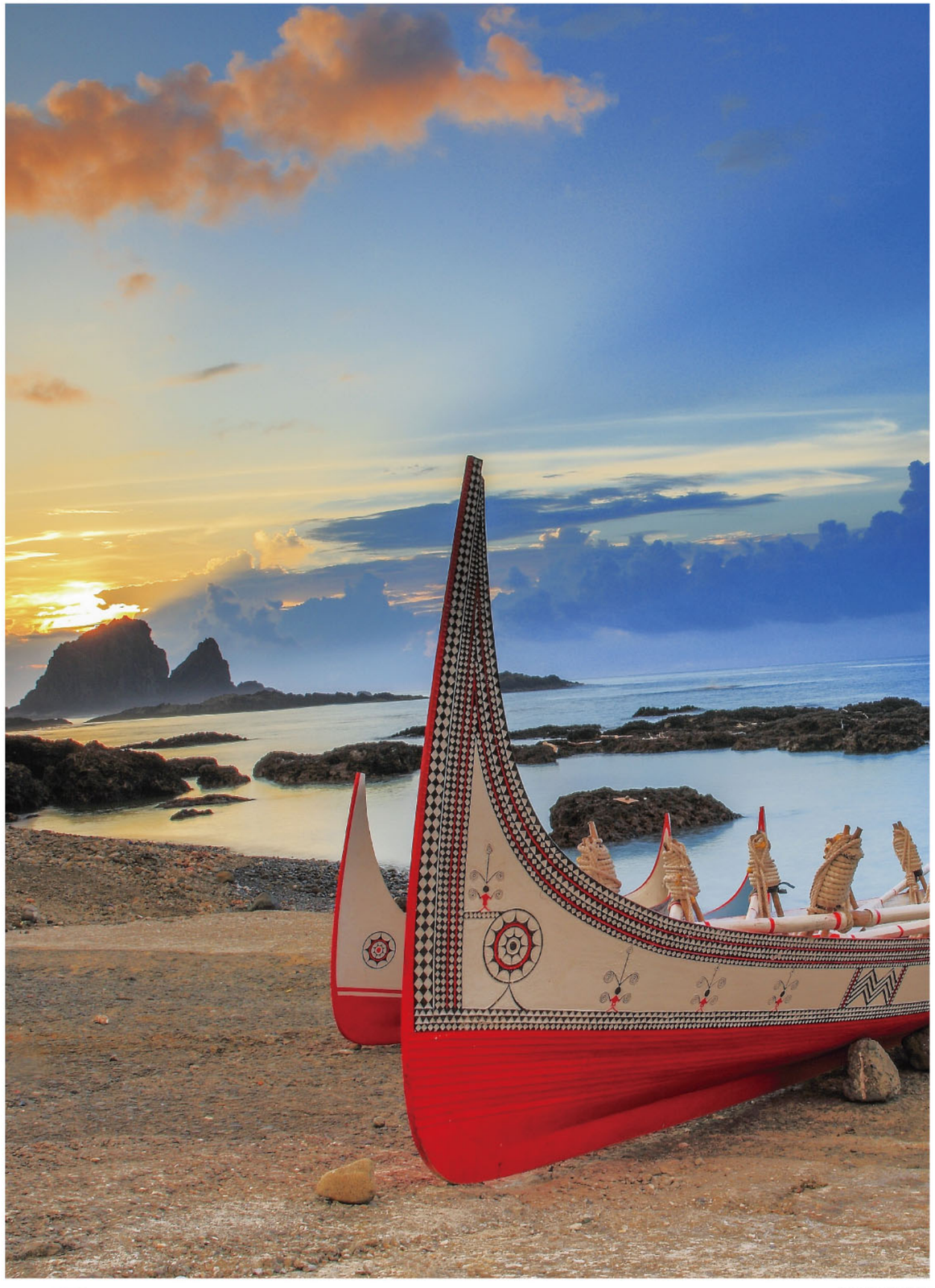
▶ **Side Milling**

▶ **Slotting**



ae=Dc

▲ International Balloon Festival

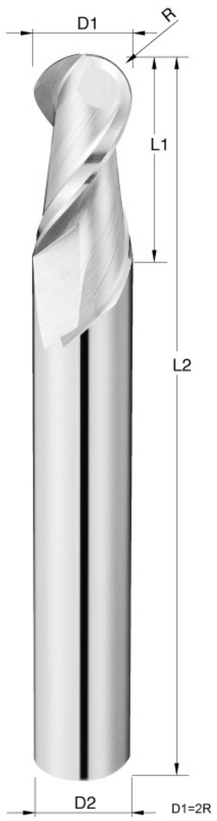


▲ Orchid Island

D **D MILL** *Aluminum & Copper cutting series*

D MILL

DB



MG

2 Flutes

45°

Finishing

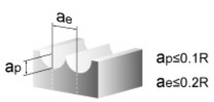
Profiling

▶ Ball Nose / for N

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
DB **0104**	R0.5	3	50	4
DB **0154**	R0.75	4	50	4
DB **0204**	R1	6	50	4
DB **0303**	R1.5	6	50	3
DB **0404**	R2	8	50	4
DB **0606**	R3	12	50	6
DB **0808**	R4	16	60	8
DB **1010**	R5	20	75	10
DB **1212**	R6	24	75	12

▼ *Depth of cut*



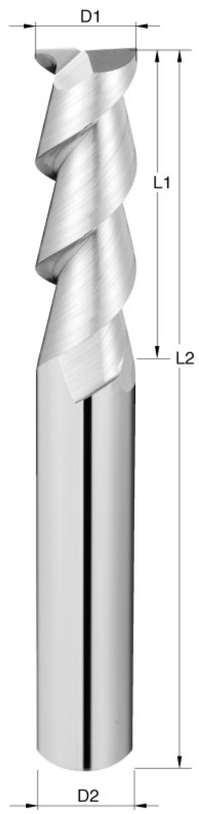
R=Radius

▼ *Recommended cutting condition for DB*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
RADIUS	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
R0.5	50000	2300	37000	2000	50000	1400
R0.75	50000	3000	28000	2000	50000	1800
R1	44000	4000	18500	2000	44000	2500
R1.5	28000	4000	11500	2000	28000	2500
R2	22000	4000	8800	2000	22000	2500
R3	16000	4000	6400	2000	16000	2500
R4	12000	4000	4800	2000	12000	2500
R5	10000	4000	4000	2000	10000	2500
R6	8000	4000	3200	2000	8000	2500

D MILL

DEA



MG

2 Flutes

55°

Finishing

Planing

Slotting

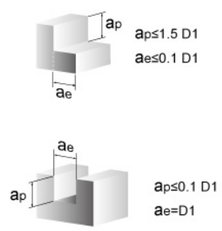
Side

▶ Square / for N

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DEA **0106**	1.0	3	50	6
DEA **0206**	2.0	6	50	6
DEA **0306**	3.0	9	50	6
DEA **0406**	4.0	12	50	6
DEA **0506**	5.0	15	50	6
DEA **0606**	6.0	18	50	6
DEA **0808**	8.0	20	60	8
DEA **1010**	10.0	30	75	10
DEA **1212**	12.0	30	75	12
DEA **1616**	16.0	45	100	16

▼ *Depth of cut*



▼ *Recommended cutting condition for DEA*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
2	37000	2000(800)	16000	850(350)	20000	1100(450)
3	35000	2000(900)	14000	850(450)	18000	1100(550)
4	26000	2000(1100)	11000	850(550)	13000	1100(660)
5	21000	2000(1100)	9000	850(550)	10000	1100(660)
6	17000	2000(1100)	7000	850(550)	9000	1100(660)
8	13000	2000(1100)	5500	850(650)	7000	1100(800)
10	11000	2000(1300)	7000	850(650)	5500	1100(800)
12	8800	2000(1300)	3600	850(800)	4500	1100(800)
16	6500	2000(1100)	3000	850(550)	3500	1100(900)

( ):Grooving

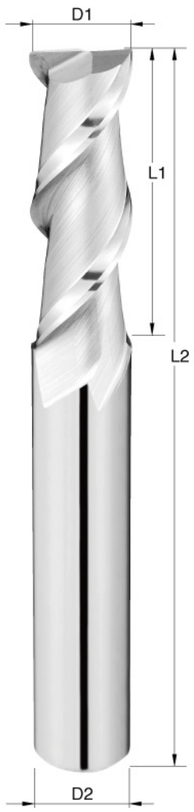
D MILL

DEB

▶ Square / for N

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DEB **0106**	1.0	3	50	6
DEB **0206**	2.0	6	50	6
DEB **0306**	3.0	9	50	6
DEB **0406**	4.0	12	50	6
DEB **0506**	5.0	15	50	6
DEB **0606**	6.0	18	50	6
DEB **0808**	8.0	20	60	8
DEB **1010**	10.0	30	75	10
DEB **1212**	12.0	30	75	12
DEB **1616**	16.0	45	100	16



MG

2 Flutes

45°

Finishing

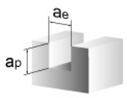
Planing

Slotting

Side

▼ *Depth of cut*

ap≤1.5 D1
ae≤0.1 D1



ap≤0.1 D1
ae=D1

▼ *Recommended cutting condition for DEB*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
2	37000	2000(800)	16000	850(350)	20000	1100(450)
3	35000	2000(900)	14000	850(450)	18000	1100(550)
4	26000	2000(1100)	11000	850(550)	13000	1100(660)
5	21000	2000(1100)	9000	850(550)	10000	1100(660)
6	17000	2000(1100)	7000	850(550)	9000	1100(660)
8	13000	2000(1100)	5500	850(650)	7000	1100(800)
10	11000	2000(1300)	7000	850(650)	5500	1100(800)
12	8800	2000(1300)	3600	850(800)	4500	1100(800)
16	6500	2000(1100)	3000	850(550)	3500	1100(900)

( ):Grooving

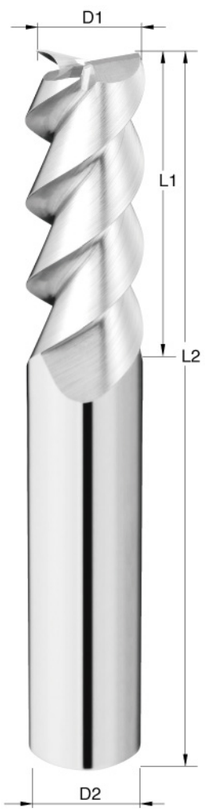
D MILL

DEC

▶ Square / for N

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DEC **0206**	2.0	6	50	6
DEC **0306**	3.0	9	50	6
DEC **0406**	4.0	12	50	6
DEC **0506**	5.0	15	50	6
DEC **0606**	6.0	18	50	6
DEC **0808**	8.0	20	60	8
DEC **1010**	10.0	30	75	10
DEC **1212**	12.0	30	75	12
DEC **1616**	16.0	45	100	16
DEC **2020**	20.0	45	100	20



MG

3 Flutes

55°

Finishing

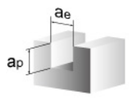
Planing

Slotting

Side

▼ *Depth of cut*

ap≤1.5 D1
ae≤0.2 D1



ap≤D1
ae=D1

▼ *Recommended cutting condition for DEC*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
2	37000	2400(950)	16000	1000(380)	20000	1300(500)
3	35000	2400(1050)	14000	1000(500)	18000	1300(600)
4	26000	2400(1200)	11000	1000(600)	13000	1300(720)
5	21000	2400(1200)	9000	1000(600)	10000	1300(720)
6	17000	2400(1200)	7000	1000(600)	9000	1300(720)
8	13000	2400(1200)	5500	1000(700)	7000	1300(880)
10	11000	2400(1400)	7000	1000(700)	5500	1300(880)
12	8800	2400(1400)	3600	1000(880)	4500	1300(880)
16	6500	2400(1200)	3000	1000(600)	3500	1300(1000)
20	5300	2400(1200)	2200	1000(600)	2500	1300(700)

( ):Grooving

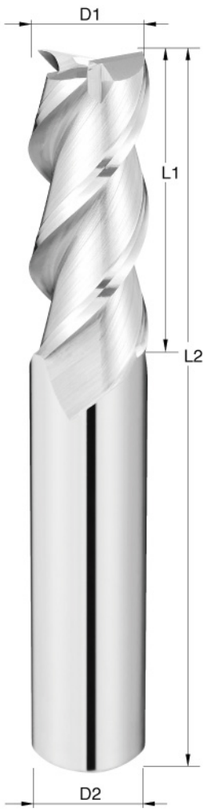
D MILL

DED

▶ Square / for N

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DED **0206**	2.0	6	50	6
DED **0306**	3.0	9	50	6
DED **0406**	4.0	12	50	6
DED **0506**	5.0	15	50	6
DED **0606**	6.0	18	50	6
DED **0808**	8.0	20	60	8
DED **1010**	10.0	30	75	10
DED **1212**	12.0	30	75	12
DED **1616**	16.0	45	100	16
DED **2020**	20.0	45	100	20



MG

3 Flutes

45°

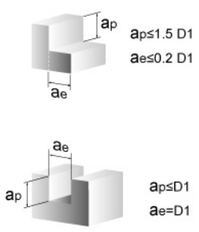
Finishing

Planing

Slotting

Side

▼ *Depth of cut*



▼ *Recommended cutting condition for DED*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
2	37000	2400(950)	16000	1000(380)	20000	1300(500)
3	35000	2400(1050)	14000	1000(500)	18000	1300(600)
4	26000	2400(1200)	11000	1000(600)	13000	1300(720)
5	21000	2400(1200)	9000	1000(600)	10000	1300(720)
6	17000	2400(1200)	7000	1000(600)	9000	1300(720)
8	13000	2400(1200)	5500	1000(700)	7000	1300(880)
10	11000	2400(1400)	7000	1000(700)	5500	1300(880)
12	8800	2400(1400)	3600	1000(880)	4500	1300(880)
16	6500	2400(1200)	3000	1000(600)	3500	1300(1000)
20	5300	2400(1200)	2200	1000(600)	2500	1300(700)

( ):Grooving

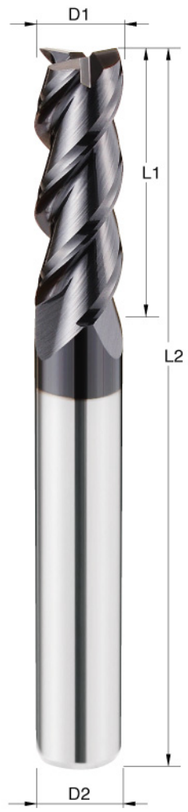
D MILL

DEDP

▶ Square / for N

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DEDP **0206**	2.0	6	50	6
DEDP **0306**	3.0	9	50	6
DEDP **0406**	4.0	12	50	6
DEDP **0506**	5.0	15	50	6
DEDP **0606**	6.0	18	50	6
DEDP **0808**	8.0	20	60	8
DEDP **1010**	10.0	30	75	10
DEDP **1212**	12.0	30	75	12
DEDP **1616**	16.0	45	100	16
DEDP **2020**	20.0	45	100	20



MG

3 Flutes

45°

DLC

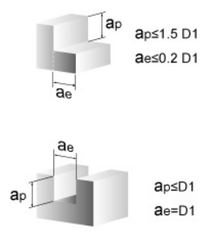
Finishing

Planing

Slotting

Side

▼ *Depth of cut*



▼ *Recommended cutting condition for DEDP*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
2	37000	2400(950)	16000	1000(380)	20000	1300(500)
3	35000	2400(1050)	14000	1000(500)	18000	1300(600)
4	26000	2400(1200)	11000	1000(600)	13000	1300(720)
5	21000	2400(1200)	9000	1000(600)	10000	1300(720)
6	17000	2400(1200)	7000	1000(600)	9000	1300(720)
8	13000	2400(1200)	5500	1000(700)	7000	1300(880)
10	11000	2400(1400)	7000	1000(700)	5500	1300(880)
12	8800	2400(1400)	3600	1000(880)	4500	1300(880)
16	6500	2400(1200)	3000	1000(600)	3500	1300(1000)
20	5300	2400(1200)	2200	1000(600)	2500	1300(700)

( ):Grooving

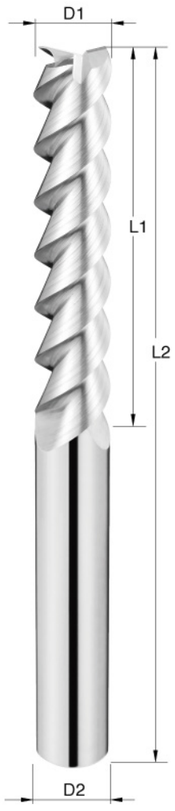
D MILL

DEL

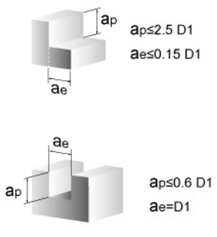
▶ **Long Flute / Square / for** N

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DEL **0206**	2.0	9	75	6
DEL **0306**	3.0	12	75	6
DEL **0406**	4.0	16	75	6
DEL **0506**	5.0	20	75	6
DEL **0606**	6.0	25	75	6
DEL **0808**	8.0	32	75	8
DEL **1010**	10.0	50	100	10
DEL **1212**	12.0	50	100	12
DEL **1616**	16.0	65	150	16
DEL **2020**	20.0	75	150	20



▼ *Depth of cut*



▼ *Recommended cutting condition for DEL*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min	SPEED (min⁻¹)	FEED mm / min
2	30000	600(500)	15000	250(250)	18000	300(300)
3	26000	600(500)	11000	250(250)	13500	300(350)
4	20000	600(550)	8500	250(250)	10000	300(350)
5	15600	600(550)	6700	250(200)	8000	300(350)
6	13500	600(550)	5500	250(200)	6700	300(350)
8	10000	600(600)	4200	250(200)	5000	300(350)
10	7500	600(600)	3300	250(200)	4000	300(350)
12	6700	600(600)	2700	250(200)	3400	300(350)
16	5000	600(500)	2300	250(200)	2500	300(350)
20	4000	600(500)	1700	250(200)	2000	300(350)

( ):Grooving

D MILL

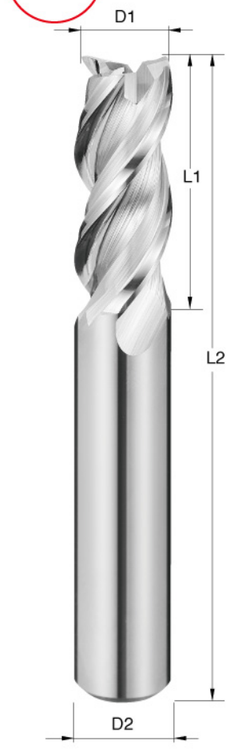
AL3PRO

NEW

▶ **Long Flute / Square / for** N

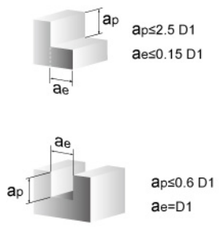
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
AL3PRO-**0306**	3.0	8	50	6
AL3PRO-**0406**	4.0	11	50	6
AL3PRO-**0506**	5.0	13	50	6
AL3PRO-**0606**	6.0	16	50	6
AL3PRO-**0808**	8.0	20	65	8
AL3PRO-**1010**	10.0	25	80	10
AL3PRO-**1212**	12.0	30	80	12
AL3PRO-**1616**	16.0	50	110	16
AL3PRO-**2020**	20.0	60	150	20



Carbon Steels	Alloy Steels	Pre-Hardened Steel	Hardened Steels		Stainless Steels	Aluminum Alloys	Heat resistant Alloy	Titanium Alloys
~HB225	HB225~352	HRC~48	HRC~56	HRC~65				
						◎		

▼ *Depth of cut*



ae=Dc

▼ *Recommended cutting condition for AL3PRO*

Side Milling

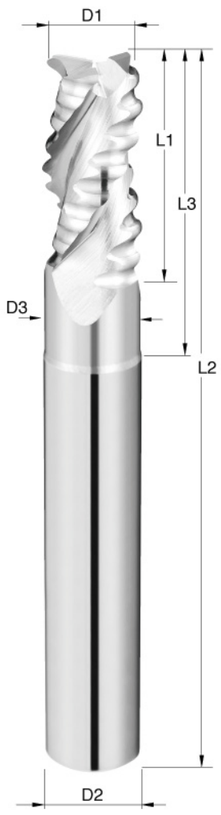
Material	Aluminums		Aluminum Alloys		Aluminum Alloy Castings	
	A1050/A1070		A2017/A5052/A7075		AC/ADC	
Depth of cut	ap:1.5Dc	ae:0.3Dc	ap:1.5Dc	ae:0.3Dc	ap:1.5Dc	ae:0.3Dc
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
3.0	20000	3600	20000	3000	20000	3600
4.0	20000	3600	20000	3000	19900	3600
5.0	20000	3600	17200	3000	15920	3600
6.0	15920	3340	14330	3000	13270	2790
8.0	11940	2860	10750	2580	9950	2380
10.0	9550	2580	8600	2400	7960	2150
12.0	7960	2390	7160	2150	6630	1990

Slotting

Material	Aluminums		Aluminum Alloys		Aluminum Alloy Castings	
	A1050/A1070		A2017/A5052/A7075		AC/ADC	
Depth of cut	ap:1.0Dc	ae:0.3Dc	ap:1.0Dc	ae:0.3Dc	ap:1.0Dc	ae:0.3Dc
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
3.0	18000	2700	19100	2700	14860	2700
4.0	15920	2300	15920	2300	11140	2300
5.0	12740	2300	14000	2000	8920	1600
6.0	10620	1910	11670	1750	7430	1330
8.0	7960	1910	8750	1750	5570	1330
10.0	6370	1720	7000	1680	4460	1200
12.0	5300	1590	5840	1570	3710	1110

D MILL

DEG



▶ **Roughing / Square / for N**

unit: mm

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
DEG **0606**	6.0	5.80	12	18	50	6
DEG **0808**	8.0	7.70	16	24	60	8
DEG **1010**	10.0	9.60	20	30	75	10
DEG **1212**	12.0	11.50	24	36	75	12
DEG **1616**	16.0	15.40	32	45	100	16

▼ *Recommended cutting condition for DEG*

Side Milling

Material	Aluminum Alloys		Aluminum Alloy Castings	
	A2017/A5052/A7075		AC/ADC	
Depth of cut	ap:1D1 ae:0.5D1		ap:1D1 ae:0.5D1	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
6.0	32000	9200	16000	3700
8.0	24000	9000	12000	3600
10.0	18000	8200	9000	3200
12.0	15000	7800	7600	3000
16.0	11500	7200	5700	2900

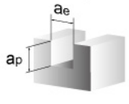
Slotting

Material	Aluminum Alloys		Aluminum Alloy Castings	
	A2017/A5052/A7075		AC/ADC	
Depth of cut	ap:1D1		ap:1D1	
Dia. (D1)	Speed (min⁻¹)	Feed mm/min	Speed (min⁻¹)	Feed mm/min
6.0	32000	7400	16000	3000
8.0	24000	7200	12000	2900
10.0	18000	6500	9000	2600
12.0	15000	6200	7600	2500
16.0	11500	5800	5700	2300

▼ *Depth of cut*

▶ **Side Milling**

▶ **Slotting**



ae=Dc

D MILL

DFR

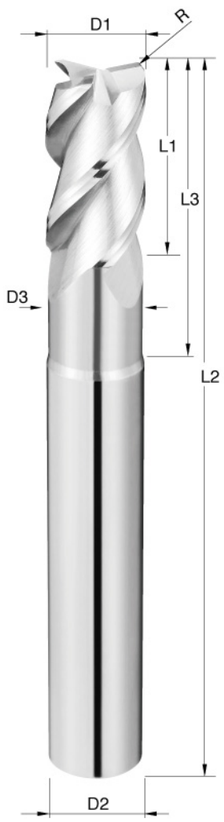
▶ **Square / for N**

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DFR **0606**	6.0	16	50	6
DFR **0808**	8.0	20	60	8
DFR **1010**	10.0	25	75	10
DFR **1212**	12.0	30	75	12
DFR **1616**	16.0	40	100	16
DFR **2020**	20.0	45	100	20

D MILL

DRC



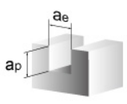
▶ Corner Radius / for N

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L L2	Shank Dia D2
DRC **0305**	3.0	0.5	2.90	6	9	50	6
DRC **0405**	4.0	0.5	3.88	8	12	50	6
DRC **0605**	6.0	0.5	5.80	12	18	50	6
DRC **0610**	6.0	1.0	5.80	12	18	50	6
DRC **0805**	8.0	0.5	7.70	16	24	60	8
DRC **0810**	8.0	1.0	7.70	16	24	60	8
DRC **1002**	10.0	0.2	9.60	20	30	75	10
DRC **1005**	10.0	0.5	9.60	20	30	75	10
DRC **1010**	10.0	1.0	9.60	20	30	75	10
DRC **1202**	12.0	0.2	11.50	24	36	75	12
DRC **1205**	12.0	0.5	11.50	24	36	75	12
DRC **1210**	12.0	1.0	11.50	24	36	75	12
DRC **1603**	16.0	0.3	15.40	30	40	100	16
DRC **1605**	16.0	0.5	15.40	30	40	100	16
DRC **1610**	16.0	1.0	15.40	30	40	100	16
DRC **1630**	16.0	3.0	15.40	30	40	100	16

▼ *Depth of cut*

ap≤1.5 D1
ae≤0.1 D1



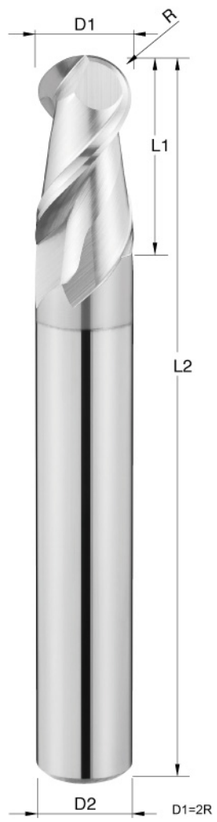
ap≤0.2 D1
ae=D1

▼ *Recommended cutting condition for DRC*

MATERIAL		Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER		SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
Side Milling	3	25000	1000	25000	1000	9000	350
	4	18000	1200	18000	1200	7000	400
	5	15000	1300	15000	1300	6000	450
	6	12000	1400	12000	1400	5000	500
	8	9000	1500	9000	1500	4000	550
	10	7000	1800	7000	1800	3000	600
	12	6000	1900	6000	1900	2500	650
	16	4500	1900	4500	1900	1500	650
Grooving	3	25000	800	25000	800	9000	350
	4	18000	800	18000	800	7000	400
	5	15000	900	15000	900	6000	450
	6	12000	1000	12000	1000	5000	500
	8	9000	1000	9000	1000	4000	550
	10	7000	1200	7000	1200	3000	600
	12	6000	1300	6000	1300	2500	650
	16	4500	1300	4500	1300	1500	650

D MILL

DBX

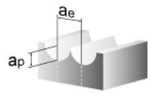


▶ Ball Nose / for N

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
DBX **0104**	R0.5	3	50	4
DBX **0154**	R0.75	4	50	4
DBX **0204**	R1	6	50	4
DBX **0303**	R1.5	6	50	3
DBX **0404**	R2	8	50	4
DBX **0606**	R3	12	50	6
DBX **0808**	R4	16	60	8
DBX **1010**	R5	20	75	10
DBX **1212**	R6	24	75	12

▼ *Depth of cut*



ap≤0.1R
ae≤0.2R

R=Radius

▼ *Recommended cutting condition for DBX*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
RADIUS	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
R0.5	50000	2300	37000	2000	50000	1400
R0.75	50000	3000	28000	2000	50000	1800
R1	44000	4000	18500	2000	44000	2500
R1.5	28000	4000	11500	2000	28000	2500
R2	22000	4000	8800	2000	22000	2500
R3	16000	4000	6400	2000	16000	2500
R4	12000	4000	4800	2000	12000	2500
R5	10000	4000	4000	2000	10000	2500
R6	8000	4000	3200	2000	8000	2500

D MILL

DEDX

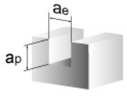
▶ **Square / for** N

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DEDX **0206**	2.0	6	50	6
DEDX **0306**	3.0	9	50	6
DEDX **0406**	4.0	12	50	6
DEDX **0506**	5.0	15	50	6
DEDX **0606**	6.0	18	50	6
DEDX **0808**	8.0	20	60	8
DEDX **1010**	10.0	30	75	10
DEDX **1212**	12.0	30	75	12
DEDX **1616**	16.0	45	100	16
DEDX **2020**	20.0	45	100	20

▼ *Depth of cut*

ap≤1.5 D1
ae≤0.2 D1



ap≤D1
ae=D1

▼ *Recommended cutting condition for DEDX*

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min	SPEED (min^{-1})	FEED mm / min
2	37000	2400(950)	16000	1000(380)	20000	1300(500)
3	35000	2400(1050)	14000	1000(500)	18000	1300(600)
4	26000	2400(1200)	11000	1000(600)	13000	1300(720)
5	21000	2400(1200)	9000	1000(600)	10000	1300(720)
6	17000	2400(1200)	7000	1000(600)	9000	1300(720)
8	13000	2400(1200)	5500	1000(700)	7000	1300(880)
10	11000	2400(1400)	7000	1000(700)	5500	1300(880)
12	8800	2400(1400)	3600	1000(880)	4500	1300(880)
16	6500	2400(1200)	3000	1000(600)	3500	1300(1000)
20	5300	2400(1200)	2200	1000(600)	2500	1300(700)

( ):Grooving

▲ TAROKO NATIONAL PARK

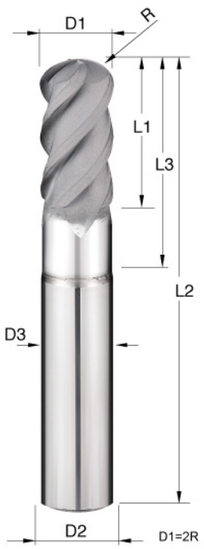
G.pro

SGBB

▶ **Ball Nose / for** N

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SGBB **0404**	R2	3.88	4	8	50	4
SGBB **0606**	R3	5.80	6	12	50	6
SGBB **0808**	R4	7.70	8	16	60	8
SGBB **1010**	R5	9.60	10	20	75	10
SGBB **1212**	R6	11.50	12	20	75	12



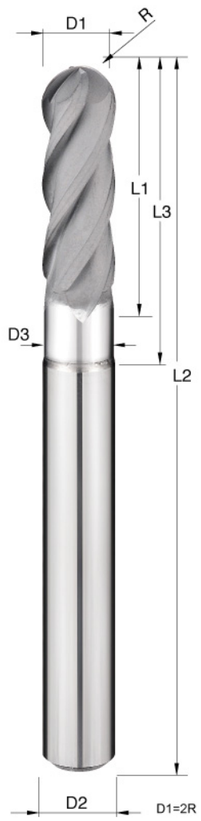
G.pro

SGBF

▶ **Ball Nose / for** N

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SGBF **0404**	R2	3.88	20	25	75	4
SGBF **0404A**	R2	3.88	20	25	100	4
SGBF **0606**	R3	5.80	25	30	75	6
SGBF **0606A**	R3	5.80	25	30	100	6
SGBF **0606B**	R3	5.80	25	30	150	6
SGBF **0808**	R4	7.70	30	40	100	8
SGBF **0808B**	R4	7.70	30	40	150	8
SGBF **1010**	R5	9.60	30	40	100	10
SGBF **1010B**	R5	9.60	30	40	150	10
SGBF **1212**	R6	11.50	30	40	100	12
SGBF **1212B**	R6	11.50	30	40	150	12



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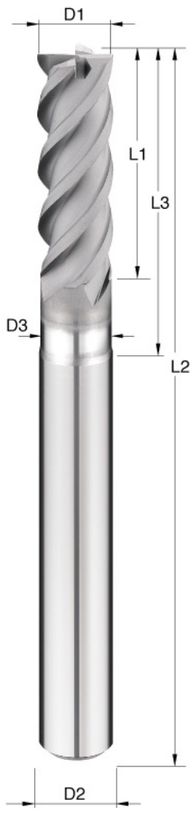
SGEB



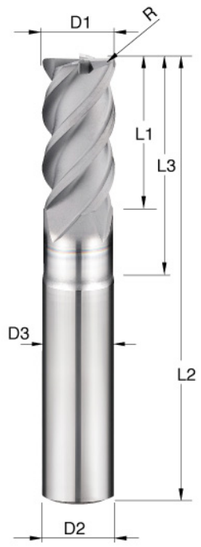
▶ Square / for N

unit: mm

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SGEB **0404**	4.0	3.88	20	25	75	4
SGEB **0404A**	4.0	3.88	20	25	100	4
SGEB **0606**	6.0	5.80	25	30	75	6
SGEB **0606A**	6.0	5.80	25	30	100	6
SGEB **0606B**	6.0	5.80	25	30	150	6
SGEB **0808**	8.0	7.70	30	40	100	8
SGEB **0808B**	8.0	7.70	30	40	150	8
SGEB **1010**	10.0	9.60	30	40	100	10
SGEB **1010B**	10.0	9.60	30	40	150	10
SGEB **1212**	12.0	11.50	30	40	100	12
SGEB **1212B**	12.0	11.50	30	40	150	12

G.pro

SGRD



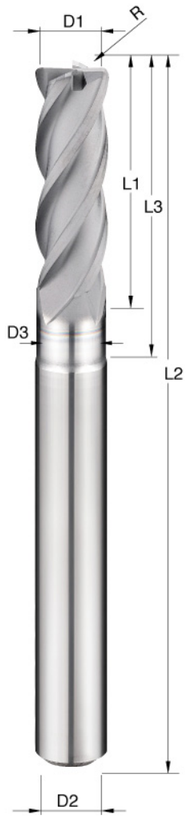
▶ Corner Radius / for N

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L L2	Shank Dia D2
SGRD **0403**	4.0	0.3	3.88	4	8	50	4
SGRD **0405**	4.0	0.5	3.88	4	8	50	4
SGRD **0603**	6.0	0.3	5.80	6	12	50	6
SGRD **0605**	6.0	0.5	5.80	6	12	50	6
SGRD **0805**	8.0	0.5	7.70	8	16	60	8
SGRD **1010**	10.0	1.0	9.60	10	20	75	10
SGRD **1210**	12.0	1.0	11.50	12	20	75	12

G.pro

SGRB



▶ Corner Radius / for N

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L L2	Shank Dia D2
SGRB **0403**	4.0	0.3	3.88	20	25	75	4
SGRB **0403A**	4.0	0.3	3.88	20	25	100	4
SGRB **0405**	4.0	0.5	3.88	20	25	75	4
SGRB **0405A**	4.0	0.5	3.88	20	25	100	4
SGRB **0603**	6.0	0.3	5.80	25	30	75	6
SGRB **0603A**	6.0	0.3	5.80	25	30	100	6
SGRB **0603B**	6.0	0.3	5.80	25	30	150	6
SGRB **0605**	6.0	0.5	5.80	25	30	75	6
SGRB **0605A**	6.0	0.5	5.80	25	30	100	6
SGRB **0605B**	6.0	0.5	5.80	25	30	150	6
SGRB **0805**	8.0	0.5	7.70	30	40	100	8
SGRB **0805B**	8.0	0.5	7.70	30	40	150	8
SGRB **1010**	10.0	1.0	9.60	30	40	100	10
SGRB **1010B**	10.0	1.0	9.60	30	40	150	10
SGRB **1210**	12.0	1.0	11.50	30	40	100	12
SGRB **1210B**	12.0	1.0	11.50	30	40	150	12

G.pro

SGBS

▶ Long Neck / Ball Nose / for N

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SGBS **01006**	R0.5	0.95	1.5	6	50	4
SGBS **01008**	R0.5	0.95	1.5	8	50	4
SGBS **01010**	R0.5	0.95	1.5	10	50	4
SGBS **01012**	R0.5	0.95	1.5	12	50	4
SGBS **01508**	R0.75	1.45	2	8	50	4
SGBS **01510**	R0.75	1.45	2	10	50	4
SGBS **01512**	R0.75	1.45	2	12	50	4
SGBS **01516**	R0.75	1.45	2	16	50	4
SGBS **01520**	R0.75	1.45	2	20	50	4
SGBS **02008**	R1	1.92	3	8	50	4
SGBS **02010**	R1	1.92	3	10	50	4
SGBS **02012**	R1	1.92	3	12	50	4
SGBS **02016**	R1	1.92	3	16	50	4
SGBS **02020**	R1	1.92	3	20	50	4
SGBS **03016**	R1.5	2.90	4	16	50	4
SGBS **03025**	R1.5	2.90	4	25	75	4
SGBS **04020**	R2	3.88	5	20	50	4
SGBS **04030**	R2	3.88	5	30	75	4

G.pro

SGES

▶ **Long Neck / Square / for** N

unit: mm

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SGES **01006**	1.0	0.95	1.5	6	50	4
SGES **01008**	1.0	0.95	1.5	8	50	4
SGES **01010**	1.0	0.95	1.5	10	50	4
SGES **01510**	1.5	1.45	2	10	50	4
SGES **01512**	1.5	1.45	2	12	50	4
SGES **01516**	1.5	1.45	2	16	50	4
SGES **02010**	2.0	1.92	3	10	50	4
SGES **02012**	2.0	1.92	3	12	50	4
SGES **02016**	2.0	1.92	3	16	50	4
SGES **02020**	2.0	1.92	3	20	50	4
SGES **03016**	3.0	2.90	4	16	50	4
SGES **03020**	3.0	2.90	4	20	50	4
SGES **03025**	3.0	2.90	4	25	75	4
SGES **04020**	4.0	3.88	5	20	50	4
SGES **04030**	4.0	3.88	5	30	75	4

G.pro

SGRS

▶ **Long Neck / Corner Radius / for** N

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L L2	Shank Dia D2	Flutes
SGRS **01008**	1.0	0.2	0.95	1.0	8	50	4	2
SGRS **01010**	1.0	0.2	0.95	1.0	10	50	4	2
SGRS **01012**	1.0	0.2	0.95	1.0	12	50	4	2
SGRS **01016**	1.0	0.2	0.95	1.0	16	50	4	2
SGRS **01020**	1.0	0.2	0.95	1.0	20	50	4	2
SGRS **01508**	1.5	0.2	1.45	1.5	8	50	4	2
SGRS **01510**	1.5	0.2	1.45	1.5	10	50	4	2
SGRS **01512**	1.5	0.2	1.45	1.5	12	50	4	2
SGRS **01516**	1.5	0.2	1.45	1.5	16	50	4	2
SGRS **01520**	1.5	0.2	1.45	1.5	20	50	4	2
SGRS **02010**	2.0	0.2	1.92	2.0	10	50	4	4
SGRS **02012**	2.0	0.2	1.92	2.0	12	50	4	4
SGRS **02016**	2.0	0.2	1.92	2.0	16	50	4	4
SGRS **02020**	2.0	0.2	1.92	2.0	20	50	4	4
SGRS **03020**	3.0	0.2	2.90	3.0	20	50	4	4
SGRS **03025**	3.0	0.2	2.90	3.0	25	75	4	4
SGRS **030201**	3.0	0.5	2.90	3.0	20	50	4	4
SGRS **030251**	3.0	0.5	2.90	3.0	25	75	4	4
SGRS **04020**	4.0	0.2	3.88	4.0	20	50	4	4
SGRS **04030**	4.0	0.2	3.88	4.0	30	75	4	4
SGRS **040201**	4.0	0.5	3.88	4.0	20	50	4	4
SGRS **040301**	4.0	0.5	3.88	4.0	30	75	4	4

▲ Sansiantai / The East Coast Seashore

TOBF

▶ Long Neck / Ball Nose / for ZrO_2

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
TOBF **00610.3**	R0.3	0.56	2.5	10	50	3
TOBF **00812.3**	R0.4	0.76	3.0	12	50	3
TOBF **01016.3**	R0.5	0.95	4.0	16	50	3
TOBF **01018.3**	R0.5	0.95	4.0	18	50	3
TOBF **01518.3**	R0.75	1.45	4.0	18	50	3
TOBF **02020.3**	R1	1.92	4.5	20	50	3
TOBF **02025.3**	R1	1.92	4.5	25	50	3
TOBF **02522.3**	R1.25	2.40	4.5	22	50	3
TOBF **02525.3**	R1.25	2.40	4.5	25	50	3
TOBF **03025.3**	R1.5	2.90	6.0	25	50	3
TOBF **00610.4**	R0.3	0.56	2.5	10	50	4
TOBF **01018.4**	R0.5	0.95	4.0	18	50	4
TOBF **02020.4**	R1	1.92	4.5	20	50	4
TOBF **02522.4**	R1.25	2.40	4.5	22	50	4
TOBF **00610.6**	R0.3	0.56	2.5	10	50	6
TOBF **00812.6**	R0.4	0.76	3.0	12	50	6
TOBF **01016.6**	R0.5	0.95	4.0	16	50	6
TOBF **01018.6**	R0.5	0.95	4.0	18	50	6
TOBF **01518.6**	R0.75	1.45	4.0	18	50	6
TOBF **02020.6**	R1	1.92	4.5	20	50	6
TOBF **02025.6**	R1	1.92	4.5	25	50	6
TOBF **02522.6**	R1.25	2.40	4.5	22	50	6
TOBF **02525.6**	R1.25	2.40	4.5	25	50	6
TOBF **03025.6**	R1.5	2.90	6.0	25	50	6

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TTBF

▶ Long Neck / Ball Nose / for CoCr . Titanium

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
TTBF **00810.4**	R0.4	0.76	3.5	10	50	4
TTBF **01012.4**	R0.5	0.95	3.5	12	50	4
TTBF **01514.4**	R0.75	1.45	4.0	14	50	4
TTBF **02016.4**	R1	1.92	4.0	16	50	4
TTBF **02518.4**	R1.25	2.40	4.5	18	50	4
TTBF **03022.4**	R1.5	2.90	5.5	22	50	4
TTBF **00808.6**	R0.4	0.76	3.5	8	50	6
TTBF **01008.6**	R0.5	0.95	3.5	8	50	6
TTBF **01010.6**	R0.5	0.95	3.5	10	50	6
TTBF **01012.6**	R0.5	0.95	3.5	12	50	6
TTBF **01512.6**	R0.75	1.45	4.0	12	50	6
TTBF **01516.6**	R0.75	1.45	4.0	16	50	6
TTBF **02012.6**	R1	1.92	4.0	12	50	6
TTBF **02016.6**	R1	1.92	4.0	16	50	6
TTBF **02514.6**	R1.25	2.40	4.5	14	50	6
TTBF **02518.6**	R1.25	2.40	4.5	18	50	6
TTBF **03015.6**	R1.5	2.90	5.5	15	50	6
TTBF **03017.6**	R1.5	2.90	5.5	17	50	6
TTBF **03022.6**	R1.5	2.90	5.5	22	50	6

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TTFA

▶ Long Neck / Square / for CoCr . Titanium

unit: mm

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
TTFA **00505.4**	0.5	0.46	1.0	5	50	4
TTFA **00808.4**	0.8	0.76	1.2	8	50	4
TTFA **00910.4**	0.9	0.85	1.2	10	50	4
TTFA **01015.4**	1.0	0.95	1.5	15	50	4
TTFA **01215.4**	1.2	1.15	1.5	15	50	4
TTFA **01516.4**	1.5	1.45	2.0	16	50	4
TTFA **01616.4**	1.6	1.54	2.5	16	50	4
TTFA **01816.4**	1.8	1.92	2.5	16	50	4
TTFA **02016.4**	2.0	1.92	3.0	16	50	4
TTFA **02518.4**	2.5	2.40	3.0	18	50	4

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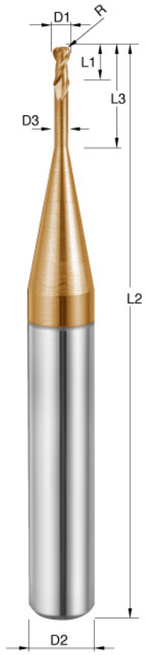
TTRA

▶ Long Neck / Corner Radius / for CoCr . Titanium

unit: mm



Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
TTRA **01015.4**	1.0	0.1	0.95	1.5	15	50	4
TTRA **01215.4**	1.2	0.1	1.15	1.5	15	50	4
TTRA **01516.4**	1.5	0.2	1.45	2.0	16	50	4
TTRA **01816.4**	1.8	0.2	1.73	2.5	16	50	4
TTRA **02016.4**	2.0	0.2	1.92	3.0	16	50	4
TTRA **02518.4**	2.5	0.2	2.40	3.0	18	50	4

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TTRB

▶ Long Neck / Corner Radius / for CoCr . Titanium

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
TTRB **02012.6**	2.0	0.2	1.92	4.0	12	50	6
TTRB **03014.6**	3.0	0.3	2.90	5.0	14	50	6
TTRB **03018.6**	3.0	0.3	2.90	5.0	18	50	6
TTRB **04016.6**	4.0	0.4	3.88	6.0	16	50	6

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TCBF

▶ Long Neck / Ball Nose / for Composites

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
TCBF **00812.6**	R0.4	0.76	3.5	12	50	6
TCBF **01014.6**	R0.5	0.95	3.5	14	50	6
TCBF **01516.6**	R0.75	1.45	4.0	16	50	6
TCBF **02018.6**	R1	1.92	4.0	18	50	6
TCBF **02520.6**	R1.25	2.40	4.5	20	50	6
TCBF **03025.6**	R1.5	2.90	5.5	25	50	6

DEN.pro

TWBF

▶ Long Neck / Ball Nose / for PMMA. Wax

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
TWBF **00812.4**	R0.4	0.76	3.5	12	50	4
TWBF **01016.4**	R0.5	0.95	3.5	16	50	4
TWBF **01518.4**	R0.75	1.45	4.0	18	50	4
TWBF **02020.4**	R1	1.92	4.0	20	50	4
TWBF **02525.4**	R1.25	2.40	4.5	25	50	4
TWBF **03025.4**	R1.5	2.90	5.5	25	50	4

▲ Snow Scene Of Hehuan Mountain

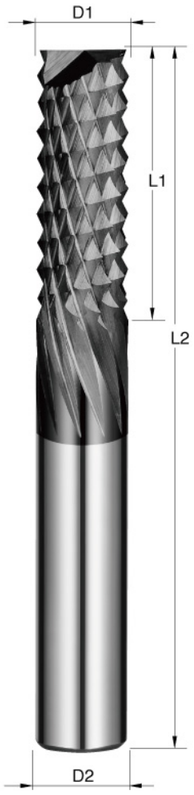
COM.pro

CFPA

▶ Square / for CFRP

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2	Flutes
CFPA **0606**	6.0	18	75	6	10
CFPA **0808**	8.0	24	75	8	10
CFPA **1010**	10.0	30	100	10	12
CFPA **1212**	12.0	36	100	12	12



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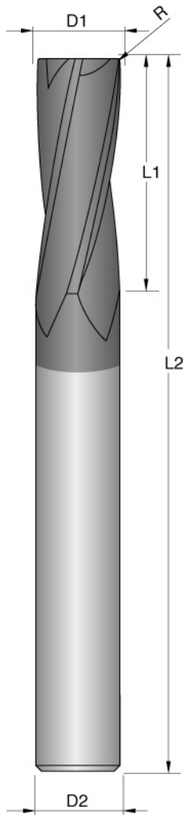
CFRA

▶ Corner Radius / for CFRP

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
CFRA **0602**	6.0	0.2	18	75	6
CFRA **0802**	8.0	0.2	24	75	8
CFRA **1002**	10.0	0.2	30	100	10
CFRA **1202**	12.0	0.2	36	100	12

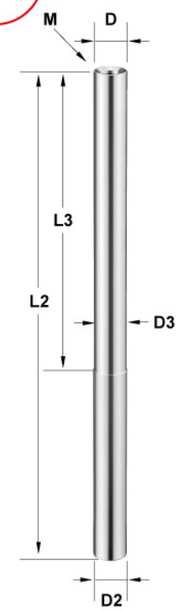


▲ Taiwan Tea

MAGIC SHANK

EX2CS

NEW



D=D3

▶ Carbide Shank

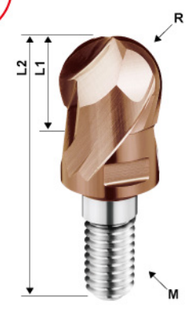
unit: mm

Order No.	Neck Dia D	Shank Dia D2	Neck Length L3	Thread M	O.A.L. L2
EX2CS **10100**	9.7	10.0	40	M5	100
EX2CS **10150**	9.7	10.0	90	M5	150
EX2CS **12100**	11.7	12.0	40	M6	100
EX2CS **12150**	11.7	12.0	90	M6	150
EX2CS **12200**	11.7	12.0	110	M6	200
EX2CS **16100**	15.5	16.0	40	M8	100
EX2CS **16150**	15.5	16.0	90	M8	150
EX2CS **16200**	15.5	16.0	110	M8	200
EX2CS **20100**	19.5	20.0	40	M10	100
EX2CS **20150**	19.5	20.0	90	M10	150
EX2CS **20200**	19.5	20.0	110	M10	200
EX2CS **20250**	19.5	20.0	150	M10	250

MAGIC SHANK

EX2SB

NEW



▶ Ex Ball Nose / for H P K

unit: mm

S MG | 2 Flutes | 30° | HRC 60 | i8 | Finishing Semi-Finishing | Profiling

Order No.	Radius R	Flute Length L1	Thread M	O.A.L. L2
EX2SB **1010**	R5	10	M5	32
EX2SB **1212**	R6	12	M6	40
EX2SB **1616**	R8	16	M8	48
EX2SB **2020**	R10	20	M10	55

MAGIC SHANK

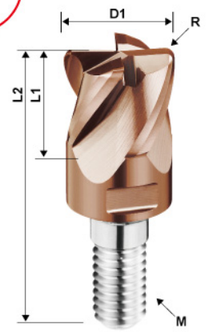
EX2SRD

▶ Ex Corner Radius / for H P K

unit: mm

S MG | 4 Flutes | 45° | HRC 60 | R | i8 | Finishing Semi-Finishing | Profiling | Side

NEW



Order No.	Diameter D1	Corner R R	Flute Length L1	Thread M	O.A.L. L2
EX2SRD **1005**	10.0	0.5	10	M5	32
EX2SRD **1010**	10.0	1.0	10	M5	32
EX2SRD **1205**	12.0	0.5	12	M6	40
EX2SRD **1210**	12.0	1.0	12	M6	40
EX2SRD **1605**	16.0	0.5	16	M8	48
EX2SRD **1610**	16.0	1.0	16	M8	48
EX2SRD **2010**	20.0	1.0	20	M10	55
EX2SRD **2020**	20.0	2.0	20	M10	55

MAGIC SHANK

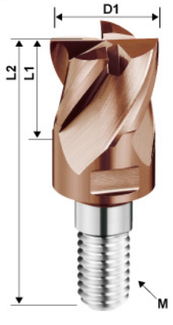
EX2SEB

▶ Ex Square / for H P K

unit: mm

S MG | 4 Flutes | 45° | HRC 60 | i8 | Finishing Semi-Finishing | Planing | Side

NEW



Order No.	Diameter D1	Flute Length L1	Thread M	O.A.L. L2
EX2SEB **1010**	10.0	10	M5	32
EX2SEB **1212**	12.0	12	M6	40
EX2SEB **1616**	16.0	16	M8	48
EX2SEB **2020**	20.0	20	M10	55

MAGIC SHANK

EX2AL3

▶ EX Square / for N

unit: mm

S MG | 3 Flutes | 39°/40°/41° | Finishing Semi-Finishing | Planing | Side

NEW

Order No.	Diameter D1	Flute Length L1	Thread M	O.A.L. L2
EX2AL3 **1010**	10.0	10	M5	32
EX2AL3 **1212**	12.0	12	M6	40
EX2AL3 **1616**	16.0	16	M8	48
EX2AL3 **2020**	20.0	20	M10	55

MAGIC SHANK

EX2SIW

▶ EX Square / for M S

unit: mm

S MG | 4 Flutes | 40°/43° | α°≠β° | G-plus | Finishing Semi-Finishing | Planing | Side

NEW

Order No.	Diameter D1	Flute Length L1	Thread M	O.A.L. L2
EX2SIW **1010**	10.0	10	M5	32
EX2SIW **1212**	12.0	12	M6	40
EX2SIW **1616**	16.0	16	M8	48
EX2SIW **2020**	20.0	20	M10	55

▼ *Recommended cutting condition for EX2SB (HRC30~HRC60)*

Item No.	R	O.A.L	HRC30 - HRC60 SPEED min^{-1}	FEED mm / min
EX2SB 1010	R5	150	6000	1200
EX2SB 1212	R6	150	5500	1500
EX2SB 1212	R6	200	4000	1000
EX2SB 1616	R8	150	5500	2000
EX2SB 1616	R8	200	3800	1000
EX2SB 2020	R10	150	4800	2000
EX2SB 2020	R10	200	4000	800
EX2SB 2020	R10	250	2600	500

Depth Of Cut: 0.15mm

▼ *Recommended cutting condition for EX2SRD (HRC30~HRC60)*

Item No.	D x R	O.A.L	HRC30 - HRC60 SPEED min^{-1}	FEED mm / min
EX2SRD 1005	10.0 x 0.5	150	5800	1000
EX2SRD 1205	12.0 x 0.5	150	5500	1200
EX2SRD 1205	12.0 x 0.5	200	4000	350
EX2SRD 1605	16.0 x 0.5	150	5000	2000
EX2SRD 1605	16.0 x 0.5	200	3800	800
EX2SRD 2010	20.0 x 1.0	150	4500	2000
EX2SRD 2010	20.0 x 1.0	200	3800	800
EX2SRD 2010	20.0 x 1.0	250	2600	400

Depth Of Cut: 0.15mm

▼ *Recommended cutting condition for EX2SEB (HRC30~HRC60)*

Item No.	D	O.A.L	HRC30 - HRC60 SPEED min^{-1}	FEED mm / min
EX2SEB 1010	10.0	150	5000	800
EX2SEB 1212	12.0	150	4800	1000
EX2SEB 1212	12.0	200	3800	400
EX2SEB 1616	16.0	150	4200	1000
EX2SEB 1616	16.0	200	3600	400
EX2SEB 2020	20.0	150	4200	1500
EX2SEB 2020	20.0	200	3200	600
EX2SEB 2020	20.0	250	2500	300

Depth Of Cut: 0.15mm

▲ Snow Scene of Hehuan Mountain

T.pro

EMT

▶ **Internal Threading / for** H P K M S N

unit: mm

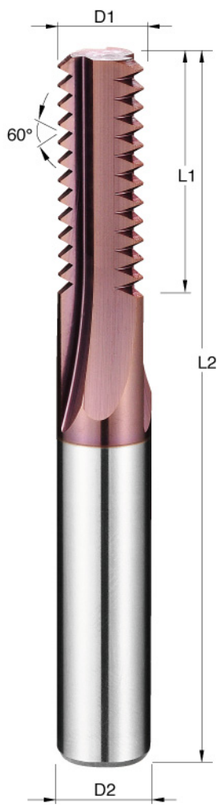
Order No.	Thread SIZE	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2	Flute
EMT **03P050**	M3x0.5	2.2	5.3	50	6	3
EMT **04P070**	M4x0.7	3.1	7.4	50	6	3
EMT **05P080**	M5x0.8	3.6	9.2	50	6	3
EMT **06P100**	M6x1.0	4.0	10.5	50	6	3
EMT **08P125**	M8x1.25	5.0	14.4	50	6	3
EMT **10P150**	M10x1.5	7.0	17.3	60	8	3
EMT **12P175**	M12x1.75	8.0	20.1	60	8	3
EMT **16P200**	M16x2.0	10.0	27.0	75	10	3
EMT **20P250**	M20x2.5	14.0	33.8	100	14	4

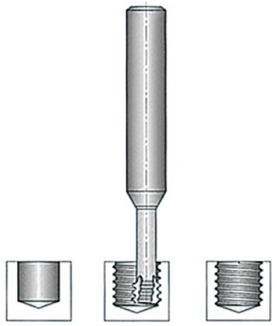
MG

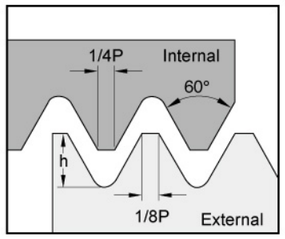
HRC 55

G100

Finishing / Semi-Finishing







Denfined by: R262 (DIN 13)
Tolerance class: 6g/6H

▼ *Recommended cutting condition for EMT*

Work Hardness (HRC)	Vc (m/min)	Tool Dia (mm) / Feed f (mm/tooth)								
		2.2	3.1	3.6	4.0	5.0	7.0	8.0	10.0	14.0
HRC45-55	50-60	0.015	0.02	0.025	0.03	0.035	0.05	0.055	0.07	0.1
HRC55-60	40-50	0.012	0.015	0.02	0.025	0.03	0.035	0.04	0.05	0.08

T.pro

EMTW

▶ **Internal Threading / Helical Flutes / for** H P K M S N

unit: mm

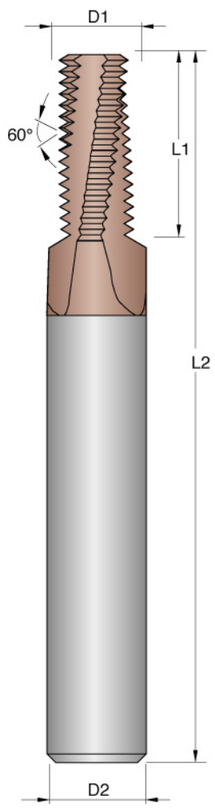
Order No.	Thread SIZE	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2	Flute
EMTW **03P050**	M3x0.5	2.2	5.3	50	6	3
EMTW **04P070**	M4x0.7	3.1	7.4	50	6	3
EMTW **05P080**	M5x0.8	3.6	9.2	50	6	3
EMTW **06P100**	M6x1.0	4.0	10.5	50	6	3
EMTW **08P125**	M8x1.25	5.0	14.4	50	6	3
EMTW **10P150**	M10x1.5	7.0	17.3	60	8	3
EMTW **12P175**	M12x1.75	8.0	20.1	60	8	3
EMTW **16P200**	M16x2.0	10.0	27.0	75	10	3
EMTW **20P250**	M20x2.5	14.0	33.8	100	14	4

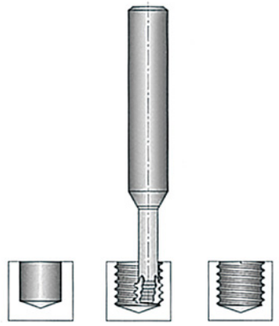
S MG

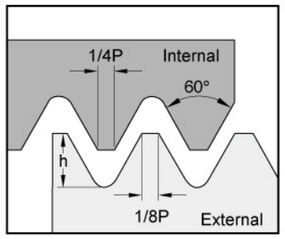
HRC 60

G100

Finishing / Semi-Finishing







Denfined by: R262 (DIN 13)
Tolerance class: 6g/6H

T.pro

EMTH

► Internal Threading / Helical Flutes / Hole Coolant / for H P K M S N

unit: mm

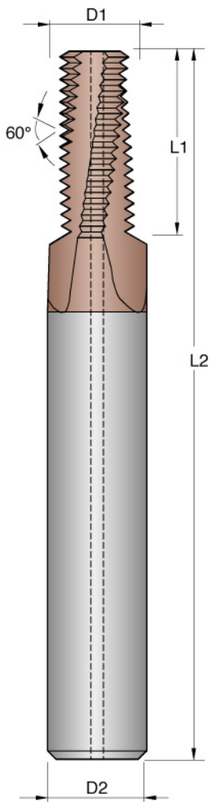
Order No.	Thread SIZE	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2	Flute
EMTH **04P070**	M4x0.7	3.1	7.4	50	6	3
EMTH **05P080**	M5x0.8	3.8	9.2	50	6	3
EMTH **06P100**	M6x1.0	4.6	10.5	50	6	3
EMTH **08P125**	M8x1.25	6.0	14.4	50	6	3
EMTH **10P150**	M10x1.5	7.8	17.3	60	8	3
EMTH **12P175**	M12x1.75	9.0	20.1	75	10	3
EMTH **16P200**	M16x2.0	11.8	27.0	75	12	3
EMTH **20P250**	M20x2.5	15.0	33.8	100	16	4

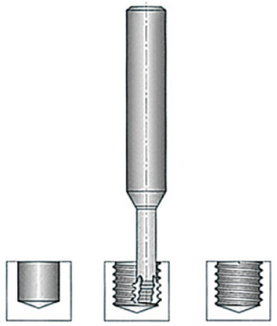
S MG

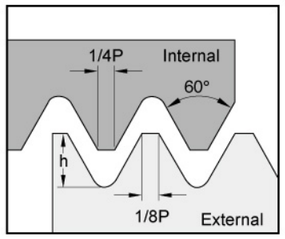
HRC 60

G100

Finishing / Semi-Finishing







Denfined by: R262 (DIN 13)
Tolerance class: 6g/6H

T.pro

EMTS

▶ Internal Threading / for H P K M S N

unit: mm

Order No.	Thread SIZE	Diameter D1	Effective Length L3	O.A.L. L2	Shank Dia D2	Flute
EMTS **03P050**	M3x0.5	2.35	10	50	6	3
EMTS **04P070**	M4x0.7	3.10	13	50	6	3
EMTS **05P080**	M5x0.8	3.80	16	50	6	3
EMTS **06P100**	M6x1.0	4.65	20	75	6	3
EMTS **08P125**	M8x1.25	5.95	24	75	6	3

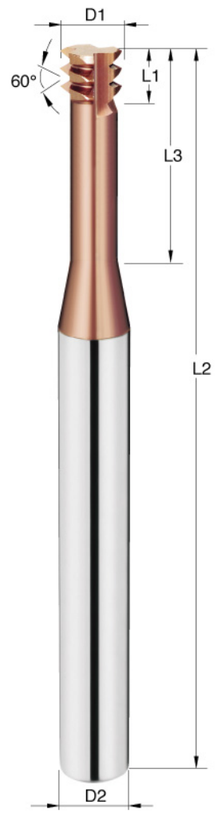
Flute Length (**L1**) = Pitch x 3

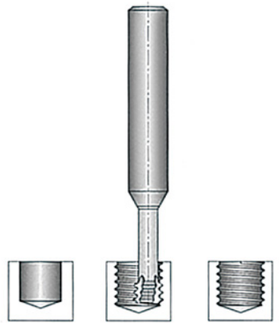
S MG

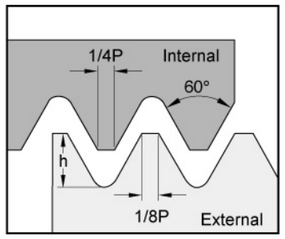
HRC 60

i8

Finishing / Semi-Finishing







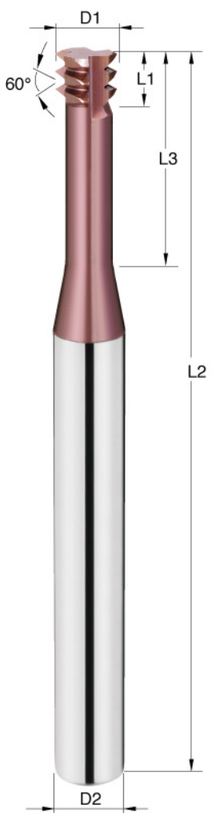
Denfined by: R262 (DIN 13)
Tolerance class: 6H

▼ *Recommended cutting condition for EMTS*

Work Hardness (HRC)	Vc (m/min)	Tool Dia (mm) / Feed f (mm/tooth)				
		3.5	3.1	3.8	4.65	5.95
HRC45-55	50-60	0.015	0.02	0.025	0.03	0.035
HRC55-60	40-50	0.012	0.015	0.02	0.025	0.03

T.pro

EMTF



MG

HRC 55

G100

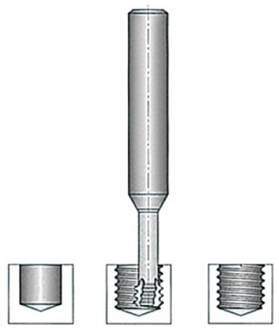
Finishing
Semi-Finishing

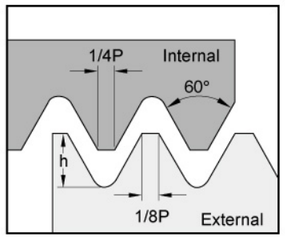
▶ Internal Threading / for H P K M S N

unit: mm

Order No.	Thread SIZE	Diameter D1	Effective Length L3	O.A.L. L2	Shank Dia D2	Flute
EMTF **03P050**	M3x0.5	2.35	6	50	6	3
EMTF **04P070**	M4x0.7	3.10	8	50	6	3
EMTF **05P080**	M5x0.8	3.80	12	50	6	3
EMTF **06P100**	M6x1.0	4.65	14	50	6	3
EMTF **08P125**	M8x1.25	5.95	18	50	6	3
EMTF **10P150**	M10x1.5	7.80	25	60	8	3
EMTF **12P175**	M12x1.75	9.00	25	75	10	3

Flute Length (**L1**) = Pitch x 3





Denfined by: R262 (DIN 13)
Tolerance class: 6H

▼ *Recommended cutting condition for EMTF*

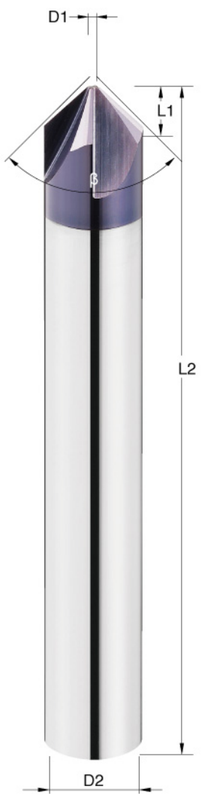
Work Hardness (HRC)	Vc (m/min)	Tool Dia (mm) / Feed f (mm/tooth)						
		2.35	3.1	3.8	4.65	5.95	7.8	9.0
HRC45-55	50-60	0.015	0.02	0.025	0.03	0.035	0.05	0.055
HRC55-60	40-50	0.012	0.015	0.02	0.025	0.03	0.035	0.04

▲ Alishan Mountain Railway

C.pro Chamfering series

C.pro

ECM



MG
4 Flutes
90° ß
HRC 55
TiaLN
Finishing Semi-Finishing
Side

▶ **Straight Chamfering / for** H P K M S N

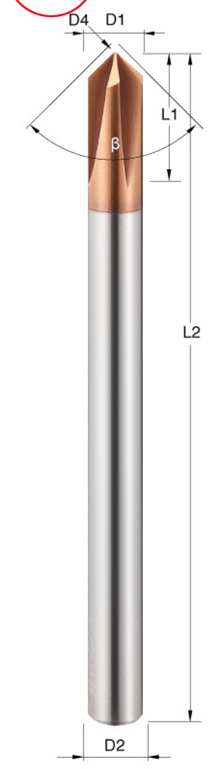
unit: mm

Order No.	Tip Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ECM **0104**	1.0	1.5	50	4
ECM **0206**	2.0	2.0	50	6
ECM **0208**	2.0	3.0	60	8
ECM **0210**	2.0	4.0	75	10
ECM **0212**	2.0	5.0	75	12

C.pro

4VPRO

NEW



S MG
4 Flutes
90° ß
HRC 55
i8
Finishing Semi-Finishing
Side

▶ **Straight Chamfering / for** H P K M S N

unit: mm

Order No.	Diameter D1	Tip Diameter D4	Flute Length L1	O.A.L. L2	Shank Dia D2
4VPRO-**0404**	4.0	0.2	9	50	4
4VPRO-**0406**	4.0	0.2	9	50	6
4VPRO-**040L**	4.0	0.2	9	100	4
4VPRO-**060**	6.0	0.2	12	50	6
4VPRO-**060L**	6.0	0.2	12	110	6
4VPRO-**080**	8.0	0.2	15	60	8
4VPRO-**080L**	8.0	0.2	15	110	8
4VPRO-**100**	10.0	0.2	16	75	10
4VPRO-**100L**	10.0	0.2	16	110	10
4VPRO-**120**	12.0	0.2	18	75	12

Carbon Steels	Alloy Steels	Pre-Hardened Steel	Hardened Steels		Stainless Steels	Aluminum Alloys	Heat resistant Alloy	Titanium Alloys
~HB225	HB225~352	HRC~48	HRC~56	HRC~65				
◎	◎	◎			○	○	○	○

▼ *Recommended cutting condition for 4VPRO*

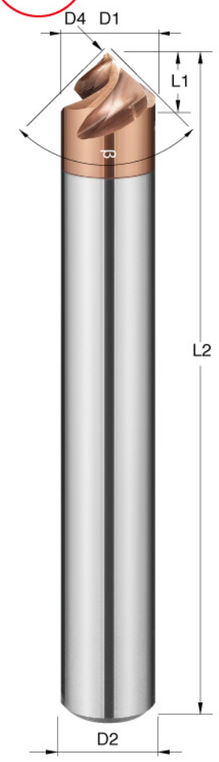
Material	Carbon Steels/Cast Irons	Alloy Steels	Stainless Steels	Aluminum Alloys
	SS/S45C/FC	SCM/SKD	SUS304/SUS316L…	A2017/A5052/A7075
Cutting Speed (V)	50～80 m/min	35～60 m/min	20～40 m/min	100～150 m/min
Dia. (D1)	fz mm/min	fz mm/min	fz mm/min	fz mm/min
4.0	0.03～0.04	0.02～0.03	0.015～0.03	0.04～0.07
6.0	0.03～0.04	0.02～0.03	0.015～0.03	0.04～0.07
8.0	0.03～0.07	0.03～0.05	0.025～0.05	0.07～0.09
10.0	0.03～0.07	0.03～0.05	0.025～0.05	0.07～0.09
12.0	0.03～0.07	0.03～0.05	0.025～0.05	0.07～0.09

fz = Feed per Tooth

C.pro

3VPRO

NEW



S MG

3 Flutes

90° ß

HRC 55

i8

Finishing Semi-Finishing

Side

▶ Straight Chamfering / for H P K M S N

unit: mm

Order No.	Diameter D1	Tip Diameter D4	Flute Length L1	O.A.L. L2	Shank Dia D2
3VPRO-**0404**	4.0	0.2	1.5	50	4
3VPRO-**0406**	4.0	0.2	1.5	50	6
3VPRO-**060**	6.0	0.2	2	50	6
3VPRO-**080**	8.0	0.2	3	60	8
3VPRO-**100**	10.0	0.2	4	75	10
3VPRO-**120**	12.0	0.2	5	75	12

Carbon Steels	Alloy Steels	Pre-Hardened Steel	Hardened Steels		Stainless Steels	Aluminum Alloys	Heat resistant Alloy	Titanium Alloys
~HB225	HB225~352	HRC~48	HRC~56	HRC~65				
◎	◎	◎			◎	○	◎	◎

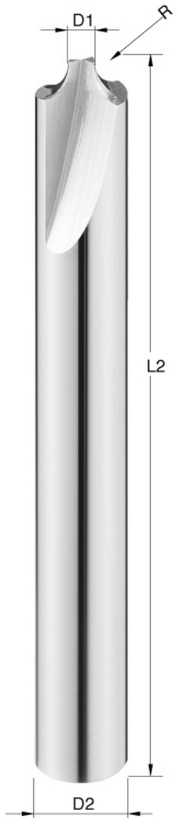
▼ *Recommended cutting condition for 3VPRO*

Material	Carbon Steels/Cast Irons	Alloy Steels	Stainless Steels	Aluminum Alloys
	SS/S45C/FC	SCM/SKD	SUS304/SUS316L…	A2017/A5052/A7075
Cutting Speed (V)	50～80 m/min	35～60 m/min	20～40 m/min	100～150 m/min
Dia. (D1)	fz mm/min	fz mm/min	fz mm/min	fz mm/min
4.0	0.03～0.04	0.02～0.03	0.015～0.03	0.04～0.07
6.0	0.03～0.04	0.02～0.03	0.015～0.03	0.04～0.07
8.0	0.03～0.07	0.03～0.05	0.025～0.05	0.07～0.09
10.0	0.03～0.07	0.03～0.05	0.025～0.05	0.07～0.09
12.0	0.03～0.07	0.03～0.05	0.025～0.05	0.07～0.09

fz = Feed per Tooth

C.pro

ECR



MG

2 Flutes

HRC 55

Finishing Semi-Finishing

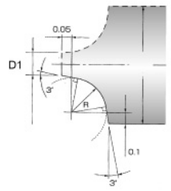
Side

Side

▶ Corner Rounding / for H P K M S N

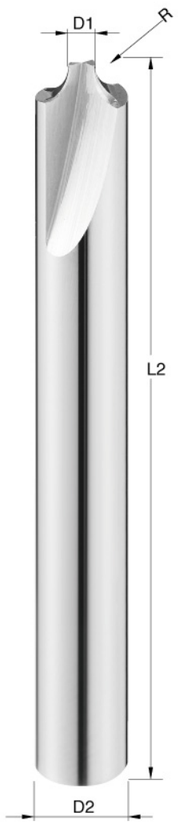
unit: mm

Order No.	Radius R	Pilot Diameter D1	O.A.L. L2	Shank Dia D2
ECR **0104**	R0.5	1.5	50	4
ECR **0154**	R0.75	1.5	50	4
ECR **0204**	R1.0	1.5	50	4
ECR **0256**	R1.25	1.5	50	6
ECR **0306**	R1.5	1.5	50	6
ECR **0356**	R1.75	1.5	50	6
ECR **0406**	R2.0	1.5	50	6
ECR **0508**	R2.5	1.5	60	8
ECR **0608**	R3.0	1.5	60	8
ECR **0812**	R4.0	2.0	75	12
ECR **1016**	R5.0	3.0	100	16
ECR **1216**	R6.0	3.0	100	16



C.pro

EMCR



MG

2 Flutes

HRC 55

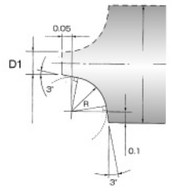
Finishing Semi-Finishing

Side

Side

▶ **Micro Diameter Corner Rounding / for** H P K M S N unit: mm

Order No.	Radius R	Pilot Diameter D1	O.A.L. L2	Shank Dia D2
EMCR **0054**	R0.25	1.1	50	4
EMCR **0064**	R0.3	1.2	50	4
EMCR **0074**	R0.35	1.3	50	4
EMCR **0084**	R0.4	1.4	50	4
EMCR **0094**	R0.45	1.5	50	4



▲ Taiwan's Eastern Coast

CD

ESD

ESD ▶ Spot Drills / for H P K

unit: mm

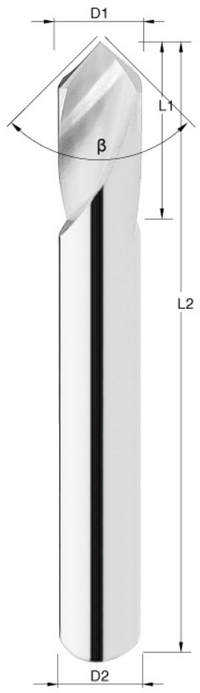
Order No.	Diameter D1	Flute Length L1	O.A.L L2	Shank Dia D2
ESD **0303**	3.0	6	50	3
ESD **0404**	4.0	8	50	4
ESD **0606**	6.0	12	50	6
ESD **0808**	8.0	16	60	8
ESD **1010**	10.0	20	75	10
ESD **1212**	12.0	24	75	12
ESD **1616**	16.0	30	100	16
ESD **2020**	20.0	30	100	20

MG

90° ß

HRC 40

Finishing / Semi-Finishing



ESD2

ESD2 ▶ Spot Drills / for H P K

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L L2	Shank Dia D2
ESD2 **0303**	3.0	6	50	3
ESD2 **0404**	4.0	8	50	4
ESD2 **0606**	6.0	12	50	6
ESD2 **0808**	8.0	16	60	8
ESD2 **1010**	10.0	20	75	10
ESD2 **1212**	12.0	24	75	12
ESD2 **1616**	16.0	30	100	16
ESD2 **2020**	20.0	30	100	20

MG

120° ß

HRC 40

Finishing / Semi-Finishing

CD

ESDC

ESDC ▶ Spot Drills / for H P K

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L L2	Shank Dia D2
ESDC **0303**	3.0	6	50	3
ESDC **0404**	4.0	8	50	4
ESDC **0606**	6.0	12	50	6
ESDC **0808**	8.0	16	60	8
ESDC **1010**	10.0	20	75	10
ESDC **1212**	12.0	24	75	12
ESDC **1616**	16.0	30	100	16
ESDC **2020**	20.0	30	100	20

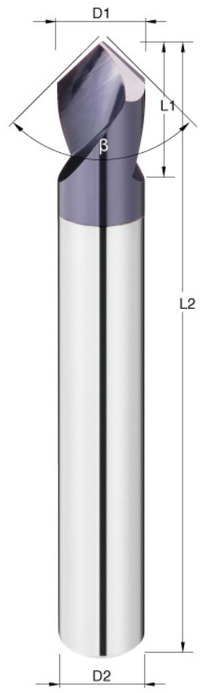
MG

90° ß

HRC 40

TiaLN

Finishing / Semi-Finishing



ESDA

ESDA ▶ Spot Drills / for H P K

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L L2	Shank Dia D2
ESDA **0303**	3.0	6	50	3
ESDA **0404**	4.0	8	50	4
ESDA **0606**	6.0	12	50	6
ESDA **0808**	8.0	16	60	8
ESDA **1010**	10.0	20	75	10
ESDA **1212**	12.0	24	75	12
ESDA **1616**	16.0	30	100	16
ESDA **2020**	20.0	30	100	20

MG

120° ß

HRC 40

TiaLN

Finishing / Semi-Finishing

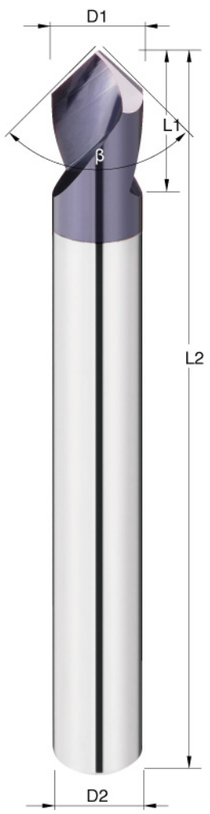
CD

ESDS

ESDS ▶ Long Shank Spot Drills / for H P K

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ESDS **0606**	6.0	12	100	6
ESDS **0808**	8.0	16	100	8
ESDS **1010**	10.0	20	100	10
ESDS **1212**	12.0	24	100	12
ESDS **1616**	16.0	30	150	16
ESDS **2020**	20.0	30	150	20



MG

90° ß

HRC 40

TiaLN

Finishing Semi-Finishing

ESDL

ESDL ▶ Long Shank Spot Drills / for H P K

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ESDL **0606**	6.0	12	100	6
ESDL **0808**	8.0	16	100	8
ESDL **1010**	10.0	20	100	10
ESDL **1212**	12.0	24	100	12
ESDL **1616**	16.0	30	150	16
ESDL **2020**	20.0	30	150	20

MG

120° ß

HRC 40

TiaLN

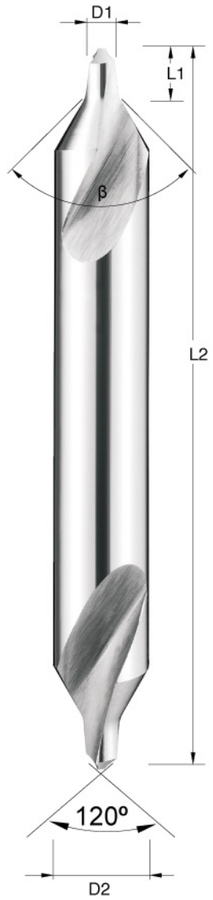
Finishing Semi-Finishing

CD

CCD

CCD ▶ Center Drills / for H P K

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
CCD **0050**	0.50	0.8	38	3
CCD **0080**	0.80	1.1	38	3
CCD **0100**	1.00	1.3	38	3
CCD **0125**	1.25	1.6	38	3
CCD **0160**	1.60	2.0	38	4
CCD **0200**	2.00	2.5	50	5
CCD **0250**	2.50	3.1	50	6
CCD **0315**	3.15	3.9	60	8
CCD **0400**	4.00	5.0	75	10
CCD **0500**	5.00	6.3	75	12



MG

60° ß

HRC 55

Finishing Semi-Finishing

CCDA

CCDA ▶ Center Drills / for H P K

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
CCDA **0050**	0.50	0.8	38	3
CCDA **0080**	0.80	1.1	38	3
CCDA **0100**	1.00	1.3	38	3
CCDA **0125**	1.25	1.6	38	3
CCDA **0160**	1.60	2.0	38	4
CCDA **0200**	2.00	2.5	50	5
CCDA **0250**	2.50	3.1	50	6
CCDA **0315**	3.15	3.9	60	8
CCDA **0400**	4.00	5.0	75	10
CCDA **0500**	5.00	6.3	75	12

MG

90° ß

HRC 55

Finishing Semi-Finishing

CD

MG

DIN 6539

30°

h6

h7

120° CD005~019

140° CD020~130

TiaLN

3xD

Finishing Semi-Finishing

▶ Carbide Drills / for H P K

Order No.	Dia D1	Flute Length L1	O.A.L. L2
CD **020**	2.0	12	38
CD **021**	2.1	12	38
CD **022**	2.2	13	40
CD **023**	2.3	13	40
CD **024**	2.4	14	43
CD **025**	2.5	14	43
CD **026**	2.6	14	43
CD **027**	2.7	16	46
CD **028**	2.8	16	46
CD **029**	2.9	16	46
CD **030**	3.0	16	46
CD **031**	3.1	18	49
CD **032**	3.2	18	49
CD **033**	3.3	18	49
CD **034**	3.4	20	52
CD **035**	3.5	20	52
CD **036**	3.6	20	52
CD **037**	3.7	20	52
CD **038**	3.8	22	55
CD **039**	3.9	22	55
CD **040**	4.0	22	55
CD **041**	4.1	22	55
CD **042**	4.2	22	55
CD **043**	4.3	24	58
CD **044**	4.4	24	58
CD **045**	4.5	24	58
CD **046**	4.6	24	58
CD **047**	4.7	24	58
CD **048**	4.8	26	62
CD **049**	4.9	26	62
CD **050**	5.0	26	62
CD **051**	5.1	26	62
CD **052**	5.2	26	62
CD **053**	5.3	26	62
CD **054**	5.4	28	66
CD **055**	5.5	28	66
CD **056**	5.6	28	66
CD **057**	5.7	28	66
CD **058**	5.8	28	66
CD **059**	5.9	28	66
CD **060**	6.0	28	66
CD **061**	6.1	31	70
CD **062**	6.2	31	70
CD **063**	6.3	31	70
CD **064**	6.4	31	70
CD **065**	6.5	31	70
CD **066**	6.6	31	70
CD **067**	6.7	31	70
CD **068**	6.8	34	74
CD **069**	6.9	34	74

Order No.	Dia D1	Flute Length L1	O.A.L. L2
CD **070**	7.0	34	74
CD **071**	7.1	34	74
CD **072**	7.2	34	74
CD **073**	7.3	34	74
CD **074**	7.4	34	74
CD **075**	7.5	34	74
CD **076**	7.6	37	79
CD **077**	7.7	37	79
CD **078**	7.8	37	79
CD **079**	7.9	37	79
CD **080**	8.0	37	79
CD **081**	8.1	37	79
CD **082**	8.2	37	79
CD **083**	8.3	37	79
CD **084**	8.4	37	79
CD **085**	8.5	37	79
CD **086**	8.6	40	84
CD **087**	8.7	40	84
CD **088**	8.8	40	84
CD **089**	8.9	40	84
CD **090**	9.0	40	84
CD **091**	9.1	40	84
CD **092**	9.2	40	84
CD **093**	9.3	40	84
CD **094**	9.4	40	84
CD **095**	9.5	40	84
CD **096**	9.6	43	89
CD **097**	9.7	43	89
CD **098**	9.8	43	89
CD **099**	9.9	43	89
CD **100**	10.0	43	89
CD **102**	10.2	43	89
CD **105**	10.5	43	89
CD **110**	11.0	47	95
CD **115**	11.5	47	95
CD **120**	12.0	51	102
CD **125**	12.5	51	102
CD **130**	13.0	51	102

Cutting Data ▶ P.195

CDA

MG

DIN 6537

30°

h6

h7

140°

TiaLN

3xD

Finishing Semi-Finishing

▶ Carbide Drills / for H P K

unit: mm

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDA **030**	3.0	20	62	6.0
CDA **031**	3.1	20	62	6.0
CDA **032**	3.2	20	62	6.0
CDA **033**	3.3	20	62	6.0
CDA **034**	3.4	20	62	6.0
CDA **035**	3.5	20	62	6.0
CDA **036**	3.6	20	62	6.0
CDA **037**	3.7	20	62	6.0
CDA **038**	3.8	24	66	6.0
CDA **039**	3.9	24	66	6.0
CDA **040**	4.0	24	66	6.0
CDA **041**	4.1	24	66	6.0
CDA **042**	4.2	24	66	6.0
CDA **043**	4.3	24	66	6.0
CDA **044**	4.4	24	66	6.0
CDA **045**	4.5	24	66	6.0
CDA **046**	4.6	24	66	6.0
CDA **047**	4.7	24	66	6.0
CDA **048**	4.8	28	66	6.0
CDA **049**	4.9	28	66	6.0
CDA **050**	5.0	28	66	6.0
CDA **051**	5.1	28	66	6.0
CDA **052**	5.2	28	66	6.0
CDA **053**	5.3	28	66	6.0
CDA **054**	5.4	28	66	6.0
CDA **055**	5.5	28	66	6.0
CDA **056**	5.6	28	66	6.0
CDA **057**	5.7	28	66	6.0
CDA **058**	5.8	28	66	6.0
CDA **059**	5.9	28	66	6.0
CDA **060**	6.0	28	66	6.0
CDA **061**	6.1	34	79	8.0
CDA **062**	6.2	34	79	8.0
CDA **063**	6.3	34	79	8.0
CDA **064**	6.4	34	79	8.0
CDA **065**	6.5	34	79	8.0
CDA **066**	6.6	34	79	8.0
CDA **067**	6.7	34	79	8.0
CDA **068**	6.8	34	79	8.0
CDA **069**	6.9	34	79	8.0
CDA **070**	7.0	34	79	8.0
CDA **071**	7.1	41	79	8.0
CDA **072**	7.2	41	79	8.0
CDA **073**	7.3	41	79	8.0
CDA **074**	7.4	41	79	8.0
CDA **075**	7.5	41	79	8.0
CDA **076**	7.6	41	79	8.0
CDA **077**	7.7	41	79	8.0
CDA **078**	7.8	41	79	8.0
CDA **079**	7.9	41	79	8.0
CDA **080**	8.0	41	79	8.0
CDA **081**	8.1	47	89	10.0
CDA **082**	8.2	47	89	10.0
CDA **083**	8.3	47	89	10.0
CDA **084**	8.4	47	89	10.0

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDA **085**	8.5	47	89	10.0
CDA **086**	8.6	47	89	10.0
CDA **087**	8.7	47	89	10.0
CDA **088**	8.8	47	89	10.0
CDA **089**	8.9	47	89	10.0
CDA **090**	9.0	47	89	10.0
CDA **091**	9.1	47	89	10.0
CDA **092**	9.2	47	89	10.0
CDA **093**	9.3	47	89	10.0
CDA **094**	9.4	47	89	10.0
CDA **095**	9.5	47	89	10.0
CDA **096**	9.6	47	89	10.0
CDA **097**	9.7	47	89	10.0
CDA **098**	9.8	47	89	10.0
CDA **099**	9.9	47	89	10.0
CDA **100**	10.0	47	89	10.0
CDA **101**	10.1	55	102	12.0
CDA **102**	10.2	55	102	12.0
CDA **103**	10.3	55	102	12.0
CDA **104**	10.4	55	102	12.0
CDA **105**	10.5	55	102	12.0
CDA **106**	10.6	55	102	12.0
CDA **107**	10.7	55	102	12.0
CDA **108**	10.8	55	102	12.0
CDA **109**	10.9	55	102	12.0
CDA **110**	11.0	55	102	12.0
CDA **111**	11.1	55	102	12.0
CDA **112**	11.2	55	102	12.0
CDA **113**	11.3	55	102	12.0
CDA **114**	11.4	55	102	12.0
CDA **115**	11.5	55	102	12.0
CDA **116**	11.6	55	102	12.0
CDA **117**	11.7	55	102	12.0
CDA **118**	11.8	55	102	12.0
CDA **119**	11.9	55	102	12.0
CDA **120**	12.0	55	102	12.0
CDA **125**	12.5	60	107	14.0
CDA **130**	13.0	60	107	14.0
CDA **135**	13.5	60	107	14.0
CDA **140**	14.0	60	107	14.0
CDA **145**	14.5	65	115	16.0
CDA **150**	15.0	65	115	16.0
CDA **155**	15.5	65	115	16.0
CDA **160**	16.0	65	115	16.0
CDA **165**	16.5	73	123	18.0
CDA **170**	17.0	73	123	18.0
CDA **175**	17.5	73	123	18.0
CDA **180**	18.0	73	123	18.0
CDA **185**	18.5	79	131	20.0
CDA **190**	19.0	79	131	20.0
CDA **195**	19.5	79	131	20.0
CDA **200**	20.0	79	131	20.0

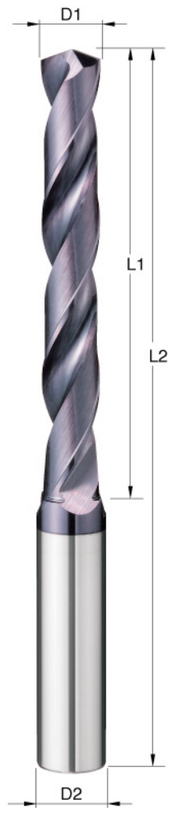
Cutting Data ▶ P.195

CD

CDB

▶ Carbide Drills / for H P K

unit: mm



MG

DIN 6537

30°

h6

h7

140°

TiaLN

5xD

Finishing Semi-Finishing

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDB 030	3.0	28	66	6.0
CDB 031	3.1	28	66	6.0
CDB 032	3.2	28	66	6.0
CDB 033	3.3	28	66	6.0
CDB 034	3.4	28	66	6.0
CDB 035	3.5	28	66	6.0
CDB 036	3.6	28	66	6.0
CDB 037	3.7	28	66	6.0
CDB 038	3.8	36	74	6.0
CDB 039	3.9	36	74	6.0
CDB 040	4.0	36	74	6.0
CDB 041	4.1	36	74	6.0
CDB 042	4.2	36	74	6.0
CDB 043	4.3	36	74	6.0
CDB 044	4.4	36	74	6.0
CDB 045	4.5	36	74	6.0
CDB 046	4.6	36	74	6.0
CDB 047	4.7	36	74	6.0
CDB 048	4.8	44	82	6.0
CDB 049	4.9	44	82	6.0
CDB 050	5.0	44	82	6.0
CDB 051	5.1	44	82	6.0
CDB 052	5.2	44	82	6.0
CDB 053	5.3	44	82	6.0
CDB 054	5.4	44	82	6.0
CDB 055	5.5	44	82	6.0
CDB 056	5.6	44	82	6.0
CDB 057	5.7	44	82	6.0
CDB 058	5.8	44	82	6.0
CDB 059	5.9	44	82	6.0
CDB 060	6.0	44	82	6.0
CDB 061	6.1	53	91	8.0
CDB 062	6.2	53	91	8.0
CDB 063	6.3	53	91	8.0
CDB 064	6.4	53	91	8.0
CDB 065	6.5	53	91	8.0
CDB 066	6.6	53	91	8.0
CDB 067	6.7	53	91	8.0
CDB 068	6.8	53	91	8.0
CDB 069	6.9	53	91	8.0
CDB 070	7.0	53	91	8.0
CDB 071	7.1	53	91	8.0
CDB 072	7.2	53	91	8.0
CDB 073	7.3	53	91	8.0
CDB 074	7.4	53	91	8.0
CDB 075	7.5	53	91	8.0
CDB 076	7.6	53	91	8.0
CDB 077	7.7	53	91	8.0
CDB 078	7.8	53	91	8.0
CDB 079	7.9	53	91	8.0
CDB 080	8.0	53	91	8.0
CDB 081	8.1	61	103	10.0
CDB 082	8.2	61	103	10.0
CDB 083	8.3	61	103	10.0
CDB 084	8.4	61	103	10.0

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDB 085	8.5	61	103	10.0
CDB 086	8.6	61	103	10.0
CDB 087	8.7	61	103	10.0
CDB 088	8.8	61	103	10.0
CDB 089	8.9	61	103	10.0
CDB 090	9.0	61	103	10.0
CDB 091	9.1	61	103	10.0
CDB 092	9.2	61	103	10.0
CDB 093	9.3	61	103	10.0
CDB 094	9.4	61	103	10.0
CDB 095	9.5	61	103	10.0
CDB 096	9.6	61	103	10.0
CDB 097	9.7	61	103	10.0
CDB 098	9.8	61	103	10.0
CDB 099	9.9	61	103	10.0
CDB 100	10.0	61	103	10.0
CDB 101	10.1	71	118	12.0
CDB 102	10.2	71	118	12.0
CDB 103	10.3	71	118	12.0
CDB 104	10.4	71	118	12.0
CDB 105	10.5	71	118	12.0
CDB 106	10.6	71	118	12.0
CDB 107	10.7	71	118	12.0
CDB 108	10.8	71	118	12.0
CDB 109	10.9	71	118	12.0
CDB 110	11.0	71	118	12.0
CDB 111	11.1	71	118	12.0
CDB 112	11.2	71	118	12.0
CDB 113	11.3	71	118	12.0
CDB 114	11.4	71	118	12.0
CDB 115	11.5	71	118	12.0
CDB 116	11.6	71	118	12.0
CDB 117	11.7	71	118	12.0
CDB 118	11.8	71	118	12.0
CDB 119	11.9	71	118	12.0
CDB 120	12.0	71	118	12.0
CDB 125	12.5	77	124	14.0
CDB 130	13.0	77	124	14.0
CDB 135	13.5	77	124	14.0
CDB 140	14.0	77	124	14.0
CDB 145	14.5	83	133	16.0
CDB 150	15.0	83	133	16.0
CDB 155	15.5	83	133	16.0
CDB 160	16.0	83	133	16.0
CDB 165	16.5	93	143	18.0
CDB 170	17.0	93	143	18.0
CDB 175	17.5	93	143	18.0
CDB 180	18.0	93	143	18.0
CDB 185	18.5	101	153	20.0
CDB 190	19.0	101	153	20.0
CDB 195	19.5	101	153	20.0
CDB 200	20.0	101	153	20.0

Cutting Data ▶ P.195

CD

CDC

▶ Carbide Drills / for H P K

MG

DIN 6537

30°

h6

h7

140°

TiaLN

8xD

Finishing Semi-Finishing

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDC 030	3.0	34	72	6.0
CDC 031	3.1	34	72	6.0
CDC 032	3.2	34	72	6.0
CDC 033	3.3	34	72	6.0
CDC 034	3.4	34	72	6.0
CDC 035	3.5	34	72	6.0
CDC 036	3.6	34	72	6.0
CDC 037	3.7	34	72	6.0
CDC 038	3.8	43	81	6.0
CDC 039	3.9	43	81	6.0
CDC 040	4.0	43	81	6.0
CDC 041	4.1	43	81	6.0
CDC 042	4.2	43	81	6.0
CDC 043	4.3	43	81	6.0
CDC 044	4.4	43	81	6.0
CDC 045	4.5	43	81	6.0
CDC 046	4.6	43	81	6.0
CDC 047	4.7	43	81	6.0
CDC 048	4.8	57	95	6.0
CDC 049	4.9	57	95	6.0
CDC 050	5.0	57	95	6.0
CDC 051	5.1	57	95	6.0
CDC 052	5.2	57	95	6.0
CDC 053	5.3	57	95	6.0
CDC 054	5.4	57	95	6.0
CDC 055	5.5	57	95	6.0
CDC 056	5.6	57	95	6.0
CDC 057	5.7	57	95	6.0
CDC 058	5.8	57	95	6.0
CDC 059	5.9	57	95	6.0
CDC 060	6.0	57	95	6.0
CDC 061	6.1	76	114	8.0
CDC 062	6.2	76	114	8.0
CDC 063	6.3	76	114	8.0
CDC 064	6.4	76	114	8.0
CDC 065	6.5	76	114	8.0
CDC 066	6.6	76	114	8.0
CDC 067	6.7	76	114	8.0
CDC 068	6.8	76	114	8.0
CDC 069	6.9	76	114	8.0
CDC 070	7.0	76	114	8.0
CDC 071	7.1	76	114	8.0
CDC 072	7.2	76	114	8.0
CDC 073	7.3	76	114	8.0
CDC 074	7.4	76	114	8.0
CDC 075	7.5	76	114	8.0

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDC 076	7.6	76	114	8.0
CDC 077	7.7	76	114	8.0
CDC 078	7.8	76	114	8.0
CDC 079	7.9	76	114	8.0
CDC080	8.0	76	114	8.0
CDC 081	8.1	95	142	10.0
CDC 082	8.2	95	142	10.0
CDC 083	8.3	95	142	10.0
CDC 084	8.4	95	142	10.0
CDC 085	8.5	95	142	10.0
CDC 086	8.6	95	142	10.0
CDC 087	8.7	95	142	10.0
CDC 088	8.8	95	142	10.0
CDC 089	8.9	95	142	10.0
CDC 090	9.0	95	142	10.0
CDC 091	9.1	95	142	10.0
CDC 092	9.2	95	142	10.0
CDC 093	9.3	95	142	10.0
CDC 094	9.4	95	142	10.0
CDC 095	9.5	95	142	10.0
CDC 096	9.6	95	142	10.0
CDC 097	9.7	95	142	10.0
CDC 098	9.8	95	142	10.0
CDC 099	9.9	95	142	10.0
CDC 100	10.0	95	142	10.0
CDC 101	10.1	114	162	12.0
CDC 102	10.2	114	162	12.0
CDC 103	10.3	114	162	12.0
CDC 104	10.4	114	162	12.0
CDC 105	10.5	114	162	12.0
CDC 106	10.6	114	162	12.0
CDC 107	10.7	114	162	12.0
CDC 108	10.8	114	162	12.0
CDC 109	10.9	114	162	12.0
CDC 110	11.0	114	162	12.0
CDC 111	11.1	114	162	12.0
CDC 112	11.2	114	162	12.0
CDC 113	11.3	114	162	12.0
CDC 114	11.4	114	162	12.0
CDC 115	11.5	114	162	12.0
CDC 116	11.6	114	162	12.0
CDC 117	11.7	114	162	12.0
CDC 118	11.8	114	162	12.0
CDC 119	11.9	114	162	12.0
CDC 120	12.0	114	162	12.0

Cutting Data ▶ P.195

CD

CDAC

▶ **Internal coolant / Carbide Drills / for** H P K

MG

DIN 6537

30°

h6

h7

140°

i8

3xD

Finishing Semi-Finishing

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDAC 030	3.0	20	62	6.0
CDAC 031	3.1	20	62	6.0
CDAC 032	3.2	20	62	6.0
CDAC 033	3.3	20	62	6.0
CDAC 034	3.4	20	62	6.0
CDAC 035	3.5	20	62	6.0
CDAC 036	3.6	20	62	6.0
CDAC 037	3.7	20	62	6.0
CDAC 038	3.8	24	66	6.0
CDAC 039	3.9	24	66	6.0
CDAC 040	4.0	24	66	6.0
CDAC 041	4.1	24	66	6.0
CDAC 042	4.2	24	66	6.0
CDAC 043	4.3	24	66	6.0
CDAC 044	4.4	24	66	6.0
CDAC 045	4.5	24	66	6.0
CDAC 046	4.6	24	66	6.0
CDAC 047	4.7	24	66	6.0
CDAC 048	4.8	28	66	6.0
CDAC 049	4.9	28	66	6.0
CDAC 050	5.0	28	66	6.0
CDAC 051	5.1	28	66	6.0
CDAC 052	5.2	28	66	6.0
CDAC 053	5.3	28	66	6.0
CDAC 054	5.4	28	66	6.0
CDAC 055	5.5	28	66	6.0
CDAC 056	5.6	28	66	6.0
CDAC 057	5.7	28	66	6.0
CDAC 058	5.8	28	66	6.0
CDAC 059	5.9	28	66	6.0
CDAC 060	6.0	28	66	6.0
CDAC 061	6.1	34	79	8.0
CDAC 062	6.2	34	79	8.0
CDAC 063	6.3	34	79	8.0
CDAC 064	6.4	34	79	8.0
CDAC 065	6.5	34	79	8.0
CDAC 066	6.6	34	79	8.0
CDAC 067	6.7	34	79	8.0
CDAC 068	6.8	34	79	8.0
CDAC 069	6.9	34	79	8.0
CDAC 070	7.0	34	79	8.0
CDAC 071	7.1	41	79	8.0
CDAC 072	7.2	41	79	8.0
CDAC 073	7.3	41	79	8.0
CDAC 074	7.4	41	79	8.0
CDAC 075	7.5	41	79	8.0
CDAC 076	7.6	41	79	8.0
CDAC 077	7.7	41	79	8.0
CDAC 078	7.8	41	79	8.0
CDAC 079	7.9	41	79	8.0
CDAC 080	8.0	41	79	8.0
CDAC 081	8.1	47	89	10.0
CDAC 082	8.2	47	89	10.0
CDAC 083	8.3	47	89	10.0
CDAC 084	8.4	47	89	10.0

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDAC 085	8.5	47	89	10.0
CDAC 086	8.6	47	89	10.0
CDAC 087	8.7	47	89	10.0
CDAC 088	8.8	47	89	10.0
CDAC 089	8.9	47	89	10.0
CDAC 090	9.0	47	89	10.0
CDAC 091	9.1	47	89	10.0
CDAC 092	9.2	47	89	10.0
CDAC 093	9.3	47	89	10.0
CDAC 094	9.4	47	89	10.0
CDAC 095	9.5	47	89	10.0
CDAC 096	9.6	47	89	10.0
CDAC 097	9.7	47	89	10.0
CDAC 098	9.8	47	89	10.0
CDAC 099	9.9	47	89	10.0
CDAC 100	10.0	47	89	10.0
CDAC 101	10.1	55	102	12.0
CDAC 102	10.2	55	102	12.0
CDAC 103	10.3	55	102	12.0
CDAC 104	10.4	55	102	12.0
CDAC 105	10.5	55	102	12.0
CDAC 106	10.6	55	102	12.0
CDAC 107	10.7	55	102	12.0
CDAC 108	10.8	55	102	12.0
CDAC 109	10.9	55	102	12.0
CDAC 110	11.0	55	102	12.0
CDAC 111	11.1	55	102	12.0
CDAC 112	11.2	55	102	12.0
CDAC 113	11.3	55	102	12.0
CDAC 114	11.4	55	102	12.0
CDAC 115	11.5	55	102	12.0
CDAC 116	11.6	55	102	12.0
CDAC 117	11.7	55	102	12.0
CDAC 118	11.8	55	102	12.0
CDAC 119	11.9	55	102	12.0
CDAC 120	12.0	55	102	12.0
CDAC 125	12.5	60	107	14.0
CDAC 130	13.0	60	107	14.0
CDAC 135	13.5	60	107	14.0
CDAC 140	14.0	60	107	14.0
CDAC 145	14.5	65	115	16.0
CDAC 150	15.0	65	115	16.0
CDAC 155	15.5	65	115	16.0
CDAC 160	16.0	65	115	16.0
CDAC 165	16.5	73	123	18.0
CDAC 170	17.0	73	123	18.0
CDAC 175	17.5	73	123	18.0
CDAC 180	18.0	73	123	18.0
CDAC 185	18.5	79	131	20.0
CDAC 190	19.0	79	131	20.0
CDAC 195	19.5	79	131	20.0
CDAC 200	20.0	79	131	20.0

Cutting Data ▶ P.195

CD

CDBC

▶ **Internal coolant / Carbide Drills / for** H P K

MG

DIN 6537

30°

h6

h7

140°

i8

5xD

Finishing Semi-Finishing

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDBC 030	3.0	28	66	6.0
CDBC 031	3.1	28	66	6.0
CDBC 032	3.2	28	66	6.0
CDBC 033	3.3	28	66	6.0
CDBC 034	3.4	28	66	6.0
CDBC 035	3.5	28	66	6.0
CDBC 036	3.6	28	66	6.0
CDBC 037	3.7	28	66	6.0
CDBC 038	3.8	36	74	6.0
CDBC 039	3.9	36	74	6.0
CDBC 040	4.0	36	74	6.0
CDBC 041	4.1	36	74	6.0
CDBC 042	4.2	36	74	6.0
CDBC 043	4.3	36	74	6.0
CDBC 044	4.4	36	74	6.0
CDBC 045	4.5	36	74	6.0
CDBC 046	4.6	36	74	6.0
CDBC 047	4.7	36	74	6.0
CDBC 048	4.8	44	82	6.0
CDBC 049	4.9	44	82	6.0
CDBC 050	5.0	44	82	6.0
CDBC 051	5.1	44	82	6.0
CDBC 052	5.2	44	82	6.0
CDBC 053	5.3	44	82	6.0
CDBC 054	5.4	44	82	6.0
CDBC 055	5.5	44	82	6.0
CDBC 056	5.6	44	82	6.0
CDBC 057	5.7	44	82	6.0
CDBC 058	5.8	44	82	6.0
CDBC 059	5.9	44	82	6.0
CDBC 060	6.0	44	82	6.0
CDBC 061	6.1	53	91	8.0
CDBC 062	6.2	53	91	8.0
CDBC 063	6.3	53	91	8.0
CDBC 064	6.4	53	91	8.0
CDBC 065	6.5	53	91	8.0
CDBC 066	6.6	53	91	8.0
CDBC 067	6.7	53	91	8.0
CDBC 068	6.8	53	91	8.0
CDBC 069	6.9	53	91	8.0
CDBC 070	7.0	53	91	8.0
CDBC 071	7.1	53	91	8.0
CDBC 072	7.2	53	91	8.0
CDBC 073	7.3	53	91	8.0
CDBC 074	7.4	53	91	8.0
CDBC 075	7.5	53	91	8.0
CDBC 076	7.6	53	91	8.0
CDBC 077	7.7	53	91	8.0
CDBC 078	7.8	53	91	8.0
CDBC 079	7.9	53	91	8.0
CDBC 080	8.0	53	91	8.0
CDBC 081	8.1	61	103	10.0
CDBC 082	8.2	61	103	10.0
CDBC 083	8.3	61	103	10.0
CDBC 084	8.4	61	103	10.0

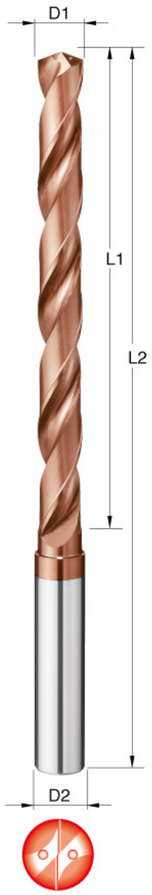
Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDBC 085	8.5	61	103	10.0
CDBC 086	8.6	61	103	10.0
CDBC 087	8.7	61	103	10.0
CDBC 088	8.8	61	103	10.0
CDBC 089	8.9	61	103	10.0
CDBC 090	9.0	61	103	10.0
CDBC 091	9.1	61	103	10.0
CDBC 092	9.2	61	103	10.0
CDBC 093	9.3	61	103	10.0
CDBC 094	9.4	61	103	10.0
CDBC 095	9.5	61	103	10.0
CDBC 096	9.6	61	103	10.0
CDBC 097	9.7	61	103	10.0
CDBC 098	9.8	61	103	10.0
CDBC 099	9.9	61	103	10.0
CDBC 100	10.0	61	103	10.0
CDBC 101	10.1	71	118	12.0
CDBC 102	10.2	71	118	12.0
CDBC 103	10.3	71	118	12.0
CDBC 104	10.4	71	118	12.0
CDBC 105	10.5	71	118	12.0
CDBC 106	10.6	71	118	12.0
CDBC 107	10.7	71	118	12.0
CDBC 108	10.8	71	118	12.0
CDBC 109	10.9	71	118	12.0
CDBC 110	11.0	71	118	12.0
CDBC 111	11.1	71	118	12.0
CDBC 112	11.2	71	118	12.0
CDBC 113	11.3	71	118	12.0
CDBC 114	11.4	71	118	12.0
CDBC 115	11.5	71	118	12.0
CDBC 116	11.6	71	118	12.0
CDBC 117	11.7	71	118	12.0
CDBC 118	11.8	71	118	12.0
CDBC 119	11.9	71	118	12.0
CDBC 120	12.0	71	118	12.0
CDBC 125	12.5	77	124	14.0
CDBC 130	13.0	77	124	14.0
CDBC 135	13.5	77	124	14.0
CDBC 140	14.0	77	124	14.0
CDBC 145	14.5	83	133	16.0
CDBC 150	15.0	83	133	16.0
CDBC 155	15.5	83	133	16.0
CDBC 160	16.0	83	133	16.0
CDBC 165	16.5	93	143	18.0
CDBC 170	17.0	93	143	18.0
CDBC 175	17.5	93	143	18.0
CDBC 180	18.0	93	143	18.0
CDBC 185	18.5	101	153	20.0
CDBC 190	19.0	101	153	20.0
CDBC 195	19.5	101	153	20.0
CDBC 200	20.0	101	153	20.0

Cutting Data ▶ P.195

CD

CDCC

▶ **Internal coolant / Carbide Drills / for** H P K



MG

DIN 6537

30°

h6

h7

140°

i8

8xD

Finishing

Semi-Finishing

Cutting Data ▶ P.195

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDCC **030**	3.0	34	72	6.0
CDCC **031**	3.1	34	72	6.0
CDCC **032**	3.2	34	72	6.0
CDCC **033**	3.3	34	72	6.0
CDCC **034**	3.4	34	72	6.0
CDCC **035**	3.5	34	72	6.0
CDCC **036**	3.6	34	72	6.0
CDCC **037**	3.7	34	72	6.0
CDCC **038**	3.8	43	81	6.0
CDCC **039**	3.9	43	81	6.0
CDCC **040**	4.0	43	81	6.0
CDCC **041**	4.1	43	81	6.0
CDCC **042**	4.2	43	81	6.0
CDCC **043**	4.3	43	81	6.0
CDCC **044**	4.4	43	81	6.0
CDCC **045**	4.5	43	81	6.0
CDCC **046**	4.6	43	81	6.0
CDCC **047**	4.7	43	81	6.0
CDCC **048**	4.8	57	95	6.0
CDCC **049**	4.9	57	95	6.0
CDCC **050**	5.0	57	95	6.0
CDCC **051**	5.1	57	95	6.0
CDCC **052**	5.2	57	95	6.0
CDCC **053**	5.3	57	95	6.0
CDCC **054**	5.4	57	95	6.0
CDCC **055**	5.5	57	95	6.0
CDCC **056**	5.6	57	95	6.0
CDCC **057**	5.7	57	95	6.0
CDCC **058**	5.8	57	95	6.0
CDCC **059**	5.9	57	95	6.0
CDCC **060**	6.0	57	95	6.0
CDCC **061**	6.1	76	114	8.0
CDCC **062**	6.2	76	114	8.0
CDCC **063**	6.3	76	114	8.0
CDCC **064**	6.4	76	114	8.0
CDCC **065**	6.5	76	114	8.0
CDCC **066**	6.6	76	114	8.0
CDCC **067**	6.7	76	114	8.0
CDCC **068**	6.8	76	114	8.0
CDCC **069**	6.9	76	114	8.0
CDCC **070**	7.0	76	114	8.0
CDCC **071**	7.1	76	114	8.0
CDCC **072**	7.2	76	114	8.0
CDCC **073**	7.3	76	114	8.0
CDCC **074**	7.4	76	114	8.0
CDCC **075**	7.5	76	114	8.0

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDCC **076**	7.6	76	114	8.0
CDCC **077**	7.7	76	114	8.0
CDCC **078**	7.8	76	114	8.0
CDCC **079**	7.9	76	114	8.0
CDCC **080**	8.0	76	114	8.0
CDCC **081**	8.1	95	142	10.0
CDCC **082**	8.2	95	142	10.0
CDCC **083**	8.3	95	142	10.0
CDCC **084**	8.4	95	142	10.0
CDCC **085**	8.5	95	142	10.0
CDCC **086**	8.6	95	142	10.0
CDCC **087**	8.7	95	142	10.0
CDCC **088**	8.8	95	142	10.0
CDCC **089**	8.9	95	142	10.0
CDCC **090**	9.0	95	142	10.0
CDCC **091**	9.1	95	142	10.0
CDCC **092**	9.2	95	142	10.0
CDCC **093**	9.3	95	142	10.0
CDCC **094**	9.4	95	142	10.0
CDCC **095**	9.5	95	142	10.0
CDCC **096**	9.6	95	142	10.0
CDCC **097**	9.7	95	142	10.0
CDCC **098**	9.8	95	142	10.0
CDCC **099**	9.9	95	142	10.0
CDCC **100**	10.0	95	142	10.0

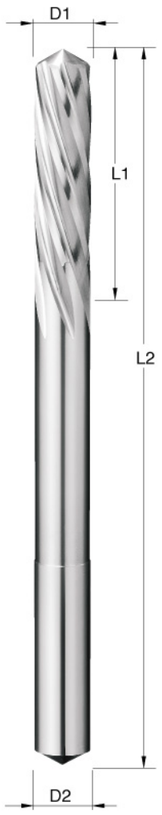
▲ Yangmingshan National Park

CR

CRA

▶ **Carbide Reamers / for** H P K

unit: mm



MG

7°

HRC 45

Finishing

Order No.	Dia D1	Flute Length L1	Overall Length L2	Flutes
CRA020	2.0	11	49	4
CRA021	2.1	11	49	4
CRA022	2.2	12	53	4
CRA023	2.3	12	53	4
CRA024	2.4	14	57	4
CRA025	2.5	14	57	4
CRA026	2.6	14	57	4
CRA027	2.7	15	61	4
CRA028	2.8	15	61	4
CRA029	2.9	15	61	4
CRA030	3.0	15	61	4
CRA031	3.1	16	65	4
CRA032	3.2	16	65	4
CRA033	3.3	16	65	4
CRA034	3.4	18	70	4
CRA035	3.5	18	70	4
CRA036	3.6	18	70	4
CRA037	3.7	18	70	4
CRA038	3.8	19	75	4
CRA039	3.9	19	75	4
CRA040	4.0	19	75	4
CRA041	4.1	19	75	4
CRA042	4.2	19	75	4
CRA043	4.3	21	80	4
CRA044	4.4	21	80	4
CRA045	4.5	21	80	4
CRA046	4.6	21	80	6
CRA047	4.7	21	80	6
CRA048	4.8	23	86	6
CRA049	4.9	23	86	6
CRA050	5.0	23	86	6
CRA051	5.1	23	86	6
CRA052	5.2	23	86	6
CRA053	5.3	23	86	6
CRA054	5.4	26	93	6
CRA055	5.5	26	93	6
CRA056	5.6	26	93	6
CRA057	5.7	26	93	6
CRA058	5.8	26	93	6
CRA059	5.9	26	93	6
CRA060	6.0	26	93	6
CRA061	6.1	28	101	6
CRA062	6.2	28	101	6
CRA063	6.3	28	101	6
CRA064	6.4	28	101	6
CRA065	6.5	28	101	6
CRA066	6.6	28	101	6
CRA067	6.7	31	101	6
CRA068	6.8	31	109	6
CRA069	6.9	31	109	6

Order No.	Dia D1	Flute Length L1	Overall Length L2	Flutes
CRA070	7.0	31	109	6
CRA071	7.1	31	109	6
CRA072	7.2	31	109	6
CRA073	7.3	31	109	6
CRA074	7.4	31	109	6
CRA075	7.5	31	109	6
CRA076	7.6	33	117	6
CRA077	7.7	33	117	6
CRA078	7.8	33	117	6
CRA079	7.9	33	117	6
CRA080	8.0	33	117	6
CRA081	8.1	33	117	6
CRA082	8.2	33	117	6
CRA083	8.3	33	117	6
CRA084	8.4	33	117	6
CRA085	8.5	33	117	6
CRA086	8.6	36	125	6
CRA087	8.7	36	125	6
CRA088	8.8	36	125	6
CRA089	8.9	36	125	6
CRA090	9.0	36	125	6
CRA091	9.1	36	125	6
CRA092	9.2	36	125	6
CRA093	9.3	36	125	6
CRA094	9.4	36	125	6
CRA095	9.5	36	125	6
CRA096	9.6	38	133	6
CRA097	9.7	38	133	6
CRA098	9.8	38	133	6
CRA099	9.9	38	133	6
CRA100	10.0	38	133	6
CRA101	10.1	38	133	6
CRA102	10.2	38	133	6
CRA103	10.3	38	133	6
CRA104	10.4	38	133	6
CRA105	10.5	38	133	6
CRA106	10.6	38	133	6
CRA107	10.7	41	142	6
CRA108	10.8	41	142	6
CRA109	10.9	41	142	6
CRA110	11.0	41	142	6
CRA111	11.1	41	142	6
CRA112	11.2	41	142	6
CRA113	11.3	41	142	6
CRA114	11.4	41	142	6
CRA115	11.5	41	142	6
CRA116	11.6	41	142	6
CRA117	11.7	41	142	6
CRA118	11.8	41	142	6
CRA119	11.9	44	151	6
CRA120	12.0	44	151	6

Cutting Data ▶ P.195

■ Recommended cutting condition

▼ *Recommended cutting condition for CDA CDB CDAC CDBC*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	HRC35		HRC45		HRC55	
DIAMETER	Vc (m / min)	FEED (mm / rev.)	Vc (m / min)	FEED (mm / rev.)	Vc (m / min)	FEED (mm / rev.)
2	110-140	0.05-0.08	85-115	0.05-0.07	25-50	0.02-0.03
3	110-140	0.12-0.15	85-115	0.08-0.11	25-50	0.04-0.48
4	110-140	0.16-0.20	85-115	0.10-0.15	25-50	0.05-0.06
5	110-140	0.16-0.20	85-115	0.10-0.15	25-50	0.05-0.06
6	110-140	0.20-0.24	85-115	0.12-0.18	25-50	0.06-0.08
8	110-140	0.25-0.30	85-115	0.16-0.23	25-50	0.08-0.11
10	110-140	0.31-0.32	85-115	0.20-0.30	25-50	0.10-0.12
12	110-140	0.31-0.38	85-115	0.20-0.30	25-50	0.10-0.12
16	110-140	0.40-0.48	85-115	0.25-0.38	25-50	0.12-0.15
20	110-140	0.50-0.65	85-115	0.30-0.48	25-50	0.16-0.20

▼ *Recommended cutting condition for CDC CDCC*

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	HRC35		HRC45		HRC55	
DIAMETER	Vc (m / min)	FEED (mm / rev.)	Vc (m / min)	FEED (mm / rev.)	Vc (m / min)	FEED (mm / rev.)
3	110-140	0.08-0.11	85-115	0.05-0.08	25-50	0.02-0.03
4	110-140	0.10-0.15	85-115	0.06-0.11	25-50	0.03-0.04
5	110-140	0.10-0.15	85-115	0.06-0.11	25-50	0.03-0.04
6	110-140	0.12-0.18	85-115	0.08-0.15	25-50	0.05-0.06
8	110-140	0.16-0.23	85-115	0.11-0.18	25-50	0.06-0.07
10	110-140	0.20-0.30	85-115	0.14-0.24	25-50	0.07-0.09
12	110-140	0.20-0.30	85-115	0.14-0.24	25-50	0.08-0.10

▼ *Recommended cutting condition for CRA*

Dia. (mm)	Vc (m/min) Carbon Steels, Alloy Steels ~HRC40	Vc (m/min) Alloy Steels, Tool Steels HRC45~
2.0	14	8
3.0	14	8
4.0	14	8
5.0	14	8
6.0	14	8
8.0	14	8
10.0	14	8
12.0	14	8

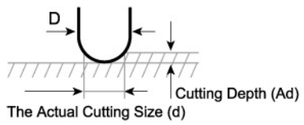
Dia. (mm)	Feed (mm/rev) Carbon Steels, Alloy Steels ~HRC40	Feed (mm/rev) Alloy Steels, Tool Steels HRC45~
2.0	0.05	0.04
3.0	0.08	0.06
4.0	0.1	0.08
5.0	0.1	0.08
6.0	0.12	0.1
8.0	0.16	0.12
10.0	0.2	0.16
12.0	0.2	0.16

Ball Nose End Milling Real Diameter

		(Ad) Depth of Cut (mm)														
Ball : R	Dia.	0.01	0.02	0.03	0.04	0.05	0.08	0.1	0.15	0.2	0.3	0.5	0.8	1.0	2.0	3.0
0.1	0.2	0.087	0.12	0.143	0.16	0.173	0.196	0.2	------	------	------	------	------	------	------	------
0.2	0.4	0.125	0.174	0.211	0.24	0.265	0.32	0.35	0.39	0.4	------	------	------	------	------	------
0.3	0.6	0.154	0.215	0.262	0.299	0.332	0.41	0.45	0.52	0.57	0.6	------	------	------	------	------
0.4	0.8	0.178	0.25	0.304	0.349	0.387	0.48	0.53	0.62	0.69	0.77	0.77	------	------	------	------
0.5	1	0.199	0.28	0.341	0.392	0.436	0.54	0.6	0.71	0.8	0.92	1	------	------	------	------
1	2	0.282	0.398	0.486	0.56	0.624	0.78	0.87	1.05	1.2	1.43	1.73	1.96	2	------	------
1.5	3	0.346	0.488	0.597	0.688	0.768	0.97	1.08	1.31	1.5	1.8	2.24	2.65	2.83	2.83	------
2	4	0.399	0.564	0.69	0.796	0.889	1.12	1.25	1.52	1.74	2.11	2.65	3.2	3.46	4	------
2.5	5	0.447	0.631	0.772	0.891	0.995	1.25	1.4	1.71	1.96	2.37	3	3.67	4	4.9	4.9
3	6	0.489	0.692	0.846	0.977	1.091	1.38	1.54	1.87	2.15	2.62	3.32	4.08	4.47	5.66	6
4	8	0.565	0.799	0.978	1.129	1.261	1.59	1.78	2.17	2.5	3.04	3.87	4.8	5.29	6.93	7.75
5	10	0.632	0.894	1.094	1.262	1.411	1.78	1.99	2.43	2.8	3.41	4.36	5.43	6	8	9.17
6	12	0.693	0.979	1.198	1.383	1.546	1.95	2.18	2.67	3.07	3.75	4.8	5.99	6.63	8.94	10.39
7	14	0.748	1.058	1.295	1.495	1.67	2.11	2.36	2.88	3.32	4.05	5.2	6.5	7.21	9.8	11.49
8	16	0.8	1.131	1.384	1.598	1.786	2.26	2.52	3.08	3.56	4.34	5.57	6.97	7.75	10.58	12.49
9	18	0.848	1.199	1.468	1.695	1.895	2.39	2.68	3.27	3.77	4.61	5.92	7.42	8.25	11.31	13.42
10	20	0.894	1.264	1.548	1.787	1.997	2.52	2.82	3.45	3.98	4.86	6.24	7.84	8.72	12	14.28

Calculation of Real Dia.

$$d=2\sqrt{Ad\,(D-Ad)}$$



Spindle Speed Table

Dia	V (m/min)														
ø	20	30	40	50	60	70	80	90	100	120	150	180	200	250	300
0.5	12740	19110	25480	31850	38220	44590	50960	57320	63690	76430	95540	114650	127390	159240	191080
0.6	10620	15920	21230	26540	31850	37150	42460	47770	53080	63690	79620	95540	106160	132700	159240
0.7	9100	13650	18200	22750	27300	31850	36400	40950	45500	54590	68240	81890	90990	113740	136490
0.8	7960	11940	15920	19900	23890	27870	31850	35830	39810	47770	59710	71660	79620	99520	119430
0.9	7080	10620	14150	17690	21230	24770	28310	31850	35390	42640	53080	63690	70770	88460	106160
1	6370	9550	12740	15920	19110	22290	25480	28660	31850	38220	47770	57320	63390	79620	95540
2	3180	4780	6370	7960	9550	11150	12740	14330	15920	19110	23890	28660	31850	39810	47770
3	2120	3180	4250	5310	6370	7430	8490	9550	10620	12740	15920	19110	21230	26540	31850
4	1590	2390	3180	3980	4780	5570	6370	7170	7960	9550	11940	14330	15920	19900	23890
5	1270	1910	2550	3180	3820	4460	5100	5730	6370	7640	9550	11460	12740	15920	19110
6	1060	1590	2120	2650	3180	3720	4250	4780	5310	6370	7960	9550	10620	13270	15920
8	800	1190	1590	1990	2390	2790	3180	3580	3980	4780	5970	7170	7960	9950	11940
10	640	960	1270	1590	1910	2230	2550	2870	3180	3820	4780	5730	6370	7960	9550
12	530	800	1060	1330	1590	1860	2120	2390	2650	3180	3980	4780	5310	6630	7960
14	450	680	910	1140	1360	1590	1820	2050	2270	2730	3410	4090	4550	5690	6820
15	420	640	850	1060	1270	1490	1700	1910	2120	2550	3180	3820	4250	5310	6370
16	400	600	800	1000	1190	1390	1590	1790	1990	2390	2990	3580	3980	4980	5970
20	320	480	640	800	960	1110	1270	1430	1590	1910	2390	2870	3180	3980	4780
25	250	380	510	640	760	890	1020	1150	1270	1530	1910	2290	2550	3180	3820

$$V=\frac{\pi D N}{1000}$$

$$F=N \times Z \times f$$

V	Cutting Speed (m/min)
π	Circular constant (3.14)
D	Diameter (mm)
N	RPM (min^{-1})

Z	Number of Flutes
f	Feed per Tooth (mm/Tooth)
F	Feed (mm/min)

Calculation for Cutting Speed, Spindle Speed and Feed

Cutting Speed (V) = $\frac{\pi \times D \times N}{1{,}000}$

Spindle Speed (N) = $V \div \pi \div D \times 1{,}000$

Feed (F) = $N \times fz \times Z$

Feed per Tooth (fz) = $\frac{F}{N \times Z}$

V = Cutting Speed (m/min)
π = 3.14 The circular Constant
D = Diameter (mm)
N = RPM (min^{-1})
F = Feed (mm/min)
fz = Feed per Tooth (mm/tooth)
Z = Number of Flutes

Selection of Number of Flute

	2-Flutes	*3-Flutes*	*4-Flutes*	*6-Flutes*
Slotting	◎	◎	○	×
Side Milling	○	◎	◎	◎

Generally 2-flutes and 3-flutes are selected for slotting because of the larger chip pocket.
4-flutes and 6-flutes are recommended for side milling as no promble of chip disposal.

Cutting Speed (V)

Appropriate Cutting Speed should be decided by parameters such as tool material, diameter, length of cut, work material, cutting machine, rigidity of tool holder, machining configuration, accuracy, cutting fluid, and etc.
Generally tool material and work material are main factors to determine the Cutting Speed.

Work Materials	*Cutting Speed (m/min)*	
	Carbide	*Coated Carbide*
Carbon Steels (S50C)	20~40	40~80
Alloy Steels (SCM.SKD)	20~35	35~60
Prehardened Steels (NAK.HPM)	15~30	30~50
Stainless Steels (SUS304)	5~20	10~30
Hardened Steels (SKD61.HRC60)	-	20~40

Feed per Tooth (fz)

Feed per Tooth is an important element for efficient machining which should be determined by parameters such as tool diameter,type, work material, cutting machine, rigidity of tool holder, machining configuration, accuracy and cutting depth.

Diameter(mm)	*Feed per tooth (mm/tooth)*	
	2-Flutes	*4-Flutes*
1	0.001~0.005	
6	0.02~0.04	0.01~0.03
10	0.04~0.08	0.03~0.06
20	0.08~0.12	0.06~0.1

Comparison Table of Hardness

Rockwell Hardness C Scale 150kg Brale (HRC)	Diamond Pyramid Hardness Number, Vickers (HV)	Brinell Hardness Standard 10mm Ball 29.42kN (HB)	Rockwell Hardness A Scale 60kg Brale (HRA)	Shore Scleroscope Hardness Number (HS)	Approx Tensile Strength N/mm^2
68	940	-	85.6	97	-
67	900	-	85.5	95	-
66	865	-	84.5	92	-
65	832	-	83.9	91	-
64	800	-	83.4	88	-
63	772	-	82.8	87	-
62	746	-	82.3	85	-
61	720	-	81.8	83	-
60	697	-	81.2	81	-
59	674	-	80.7	80	-
58	653	-	80.1	78	-
57	633	-	79.6	76	-
56	613	-	79.0	75	-
55	595	-	78.5	74	2079
54	577	-	78.0	72	2010
53	560	-	77.4	71	1952
52	544	500	76.8	69	1883
51	528	487	76.3	68	1824
50	513	475	75.9	67	1755
49	498	464	75.2	66	1687
48	484	451	74.7	64	1639
47	471	442	74.1	63	1578
46	458	432	73.6	62	1530
45	446	421	73.1	60	1481
44	434	409	72.5	58	1432
43	423	400	72.0	57	1383
42	412	390	71.5	56	1334
41	402	381	70.9	55	1294
40	392	371	70.4	54	1245
39	382	362	69.9	52	1216
38	372	353	69.4	51	1177
37	363	344	68.9	50	1157
36	354	336	68.4	49	1118
35	345	327	67.9	48	1079
34	336	319	67.4	47	1059
33	327	311	66.8	46	1030
32	318	301	66.3	44	1000
31	310	294	65.8	43	981
30	302	286	65.3	42	952
29	294	279	64.7	41	932
28	285	271	64.3	41	912
27	279	264	63.8	40	883
26	272	258	63.3	38	863
25	266	253	62.8	38	843
24	260	247	62.4	37	824
23	254	243	62.0	36	804
22	248	237	61.5	35	785
21	243	231	61.0	35	775
20	238	226	60.5	34	755
(18)	230	219	-	33	736
(16)	222	212	-	32	706
(14)	213	203	-	31	677
(12)	204	194	-	29	647
(10)	196	187	-	28	618
(8)	188	179	-	27	598
(6)	180	171	-	26	579
(4)	173	165	-	25	549
(2)	166	158	-	24	530
(0)	160	152	-	24	520

Factors for End Mill Operation

Factor	Instruction and Advice
Rigidity of Machine	1.Use a right machine. 2.Adjust cutting conditions according to the rigidity of machine.
Collet Chuck and Run out of End Mill	1.Use a right and precise collet chuck. 2.Minimize the run out of end mill.
Work Clamp	1.Work piece must be firmly clamped. 2.In case work piece cannot be firmly clamped, relieve cutting condition.
Cutting Fluid and Chips	1.Give a sufficient cutting fluid. 2.Recommend water-base cutting fluid for heavy cutting. 3.Some end mills apply dry cutting only. 4.Use air blow for dry cutting. 5.Remove chips from working area.
Selection of End Mill	1.Select most suitable end mills according to work material and dimension. 2.Refer to the index table on front page.
Cutting Conditions	1.Refer to recommended milling condition table. 2.It is necessary to adjust conditions according to the machine rigidity and clamping condition of work piece.
Overhang of End Mill from tool holder	1.Overhang of end mill must be as short as possible from tool holder. 2.In case overhang cannot be shorten, relieve cutting condition.

■ Troubleshooting for End Mill Operation

Symptoms of troubles	Cause	Solution
Chattering	·Excessive spindle speed ·Excessive feed ·Excessive long of effective length or overhang of end mill ·Work piece is not firmly clamped ·Wear of cutting edge progressed ·Excessive chucking runout	·Reduce spindle speed ·Reduce feed ·Adjust effective length and overhang as short as possible ·Clamped work piece firmly ·Use new end mill or regrind ·Adjust chucking runout
Breakage of end mill	·Excessive depth of cut ·Chips clogged ·Excessive feed per tooth ·Wear of cutting edge progressed	·Reduce depth of cut ·Adjust coolant nozzle to right direction to dispose chips ·Reduce feed per tooth ·Use new end mill or regrind
Chipping of cutting edge	·Excessive depth of cut ·Excessive feed ·Work piece is not firmly clamped ·Excessive spindle speed ·Excessive long of effective length or overhang of end mill ·Wear of cutting edge progressed ·Bullt up edge ·Excessive cooling	·Reduce depth of cut ·Reduce feed ·Clamped work piece firmly ·Reduce spindle speed ·Adjust effective length and overhang as short as possible ·Use new end mill or regrind ·Choose appropriate coating ·Use air blow or oil mist
Abnormal wear	·Excessive spindle speed ·Tool low feed	·Reduce spindle speed ·Increase feed
Clogging and Depositing	·Chips are not well disposed ·Excessive feed ·Excessive depth of cut ·Inappropriate number of flute ·Wear of cutting edge progressed	·Adjust coolant nozzle to right direction to dispose chips ·Reduce feed ·Reduce depth of cut ·Use fewer flutes end mill ·Use new end mill or regrind
Deflection of end mill	·Excessive feed ·Excessive depth of cut ·Excessive long of effective length or overhang of end mill ·Large helix angle of flutes	·Reduce feed ·Reduce depth of cut ·Adjust effective length and overhang as short as possible ·Use smaller helix angle
Burr on finished surface	·Wear of cutting edge progressed ·Small helix angle of flutes ·Excessive depth of cut	·Use new end mill or regrind ·Use smaller helix angle ·Reduce depth of cut
Poor surface roughness	·Wear of cutting edge progressed ·Chips bite ·Excessive feed ·Excessive long of effective length or overhang of end mill ·Too low spindle speed ·Stock removals vary for finishing ·Excessive chucking runout	·Use new end mill or regrind ·Use coolant to remove chips ·Reduce feed ·Adjust effective length and overhang as short as possible ·Increase spindle speed ·Improve semi-finishing process ·Adjust chucking runout
Poor machining accuracy	·Inconsistent thermal extension of spindle ·Stock removals vary for finishing ·Excessive feed ·Excessive chucking runout	·Warm up spindle by idling before starting operation ·Improve semi-finishing process ·Reduce feed ·Adjust chucking runout