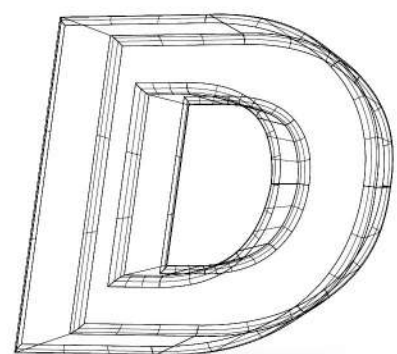




ALUMINUM & COPPER CUTTING SERIES

D MILL



D

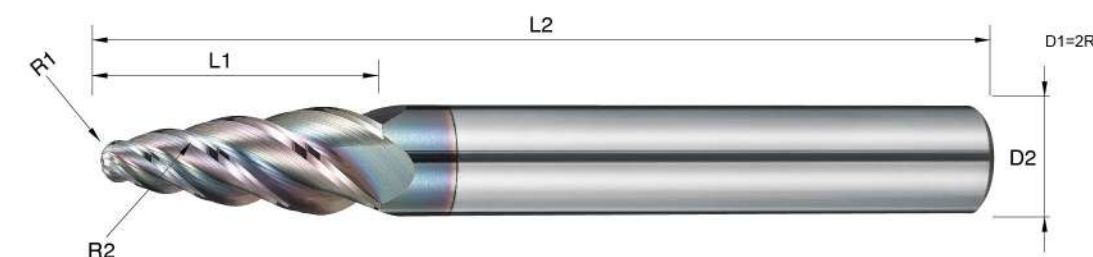
D MILL

DBTR



Aluminum & Copper cutting series / 4 Flute / Taper Barrel Type

N



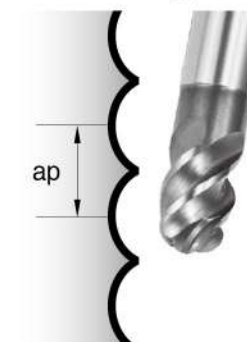
• FEATURES

- 4 Flute Barrel Type for Aluminum.
- Larger radius edge in the cutting area together with multi-flute design brings higher milling efficiency.
- Compared to ball nose end mills, Barrel Type has wider ap stepover to reduce machining time.
- Lower cusp height Improves surface finish.
- D-X Coating: Excellent wear resistance and heat resistant.

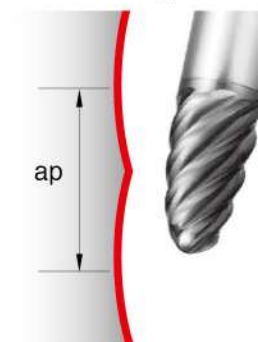
• ITEMS

Order No.	Radius R1	Radius R2	Flute Length L1	O.A.L. L2	unit: mm Shank Dia D2
					D1=2R
DBTR 10100D06	R1.0	R100	20.5	75	6
DBTR 15095D08	R1.5	R95	22.0	75	8
DBTR 20090D10	R2.0	R90	24.5	100	10
DBTR 20085D12	R2.0	R85	27.0	100	12

Standard Type



Barrel Type



D

D MILL

DB

MG

2

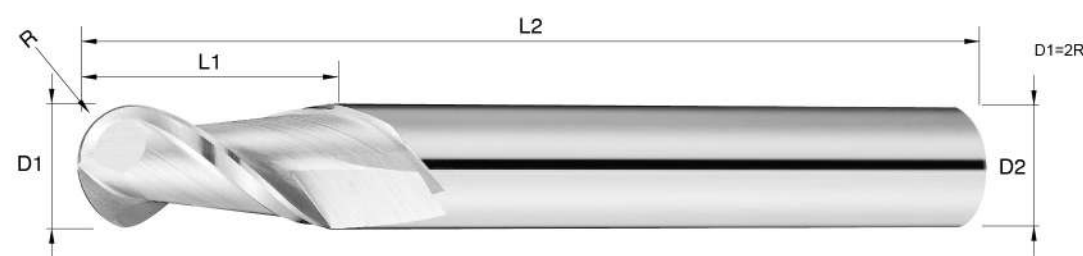
45°

Finishing

Cutting
Data
p.248

Aluminum & Copper cutting series / 2 Flute / Ball Nose

N



• FEATURES

- 2 Flute Ball Nose for Aluminum.
- Helix Angle(Degrees): 45
- Profiling.

• ITEMS

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

unit: mm

D

D MILL

DESV

S
MG

2

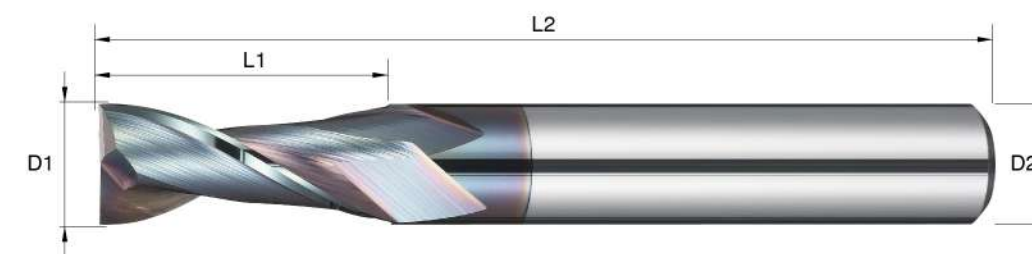
30°

D-X

Finishing

Aluminum & Copper cutting series / 2 Flute / Square

N



• FEATURES

- 2 Flute Square for Aluminum.
- Fine & bright workpiece surface after processed.
- D-X Coating: Excellent wear resistance and heat resistant.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
DESV 0306	3.0	9	50	6
DESV 0406	4.0	12	50	6
DESV 0506	5.0	15	50	6
DESV 0606	6.0	18	50	6
DESV 0808	8.0	20	60	8
DESV 1010	10.0	30	75	10
DESV 1212	12.0	30	75	12

unit: mm

D

DES

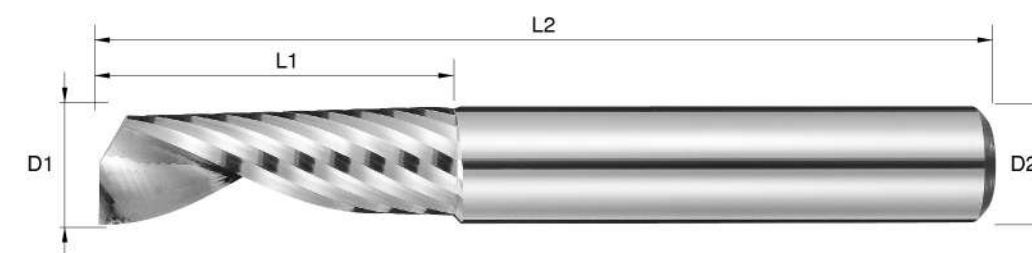
S
MG1
Flutes

30°

Finishing
Semi-
Finishing

Aluminum & Copper cutting series / 1 Flute / Square

N



• FEATURES

- Single Flute Square for Aluminum.
- Fine & bright workpiece surface after processed.
- SMG 0.4µm Micro Grain Carbide features excellent wear resistance.

• ITEMS

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

unit: mm

DB

END MILLS

DESV, DES

END MILLS

D

D MILL

DEA

MG

2

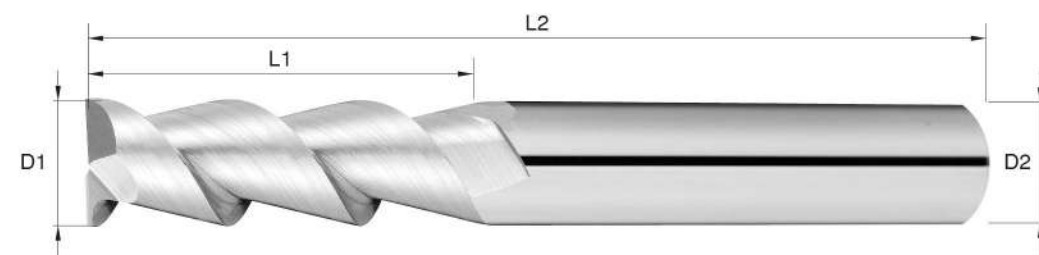
55°

Finishing

Cutting
Data
p.248

Aluminum & Copper cutting series / 2 Flute / Square

N



• FEATURES

- 2 Flute Square for Aluminum.
- Helix Angle: 55°
- Fine & bright workpiece surface after processed.
- Planing, Slotting, and Side Milling.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	unit: mm	
				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	

D

D MILL

DEB

MG

2

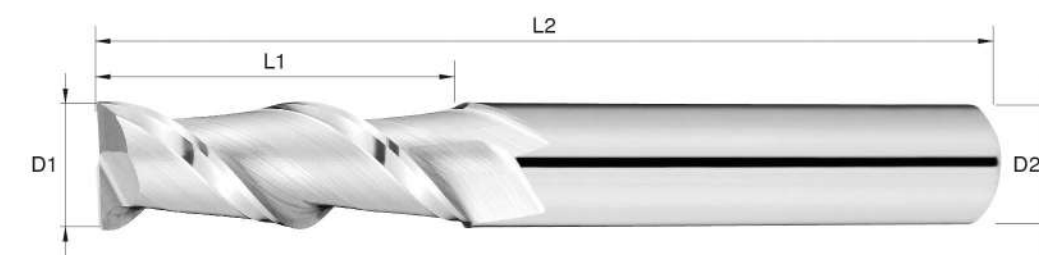
45°

Finishing

Cutting
Data
p.248

Aluminum & Copper cutting series / 2 Flute / Square

N



• FEATURES

- 2 Flute Square for Aluminum.
- Helix Angle: 45°
- Planing, Slotting, and Side Milling.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	unit: mm	
				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	

D

D MILL

DEC

MG

3

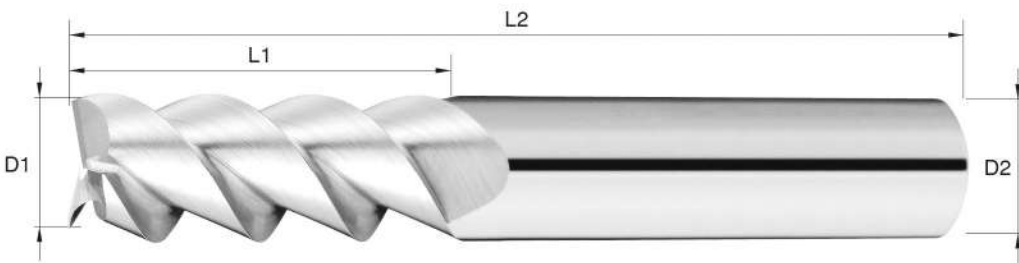
55°

Finishing

Cutting Data P.248

Aluminum & Copper cutting series / 3 Flute / Square

N



• FEATURES

- 3 Flute Square for Aluminum.
- Helix Angle: 55°
- Fine & bright workpiece surface after processed.
- Planing, Slotting, and Side Milling.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	unit: mm
				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

D

D MILL

DED

MG

3

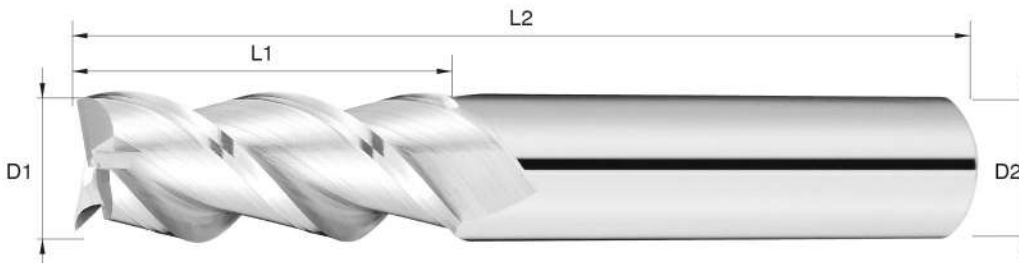
45°

Finishing

Cutting Data P.248

Aluminum & Copper cutting series / 3 Flute / Square

N



• FEATURES

- 3 Flute Square for Aluminum.
- Helix Angle: 45°
- Planing, Slotting, and Side Milling.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	unit: mm
				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

D

D MILL

DEDP

MG

3

45°

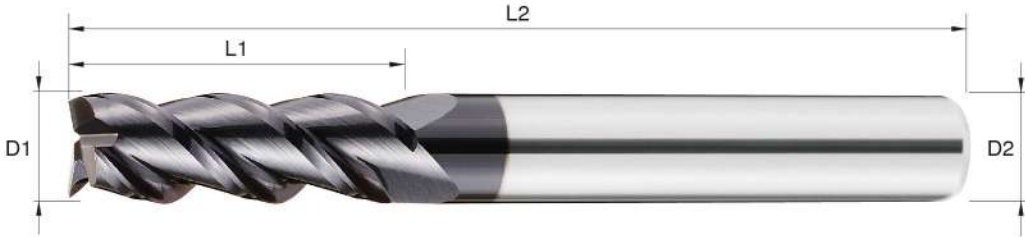
DLC

Finishing

Cutting Data
p.248

Aluminum & Copper cutting series / 3 Flute / Square

N



• FEATURES

- 3 Flute Square for Aluminum.
- DLC Coating: High thermal conductivity and low coefficient of friction. Excellent for Aluminum Alloy.
- Helix Angle: 45°

• ITEMS

Order No.	unit: mm			
	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

D

D MILL

DEL

MG

3

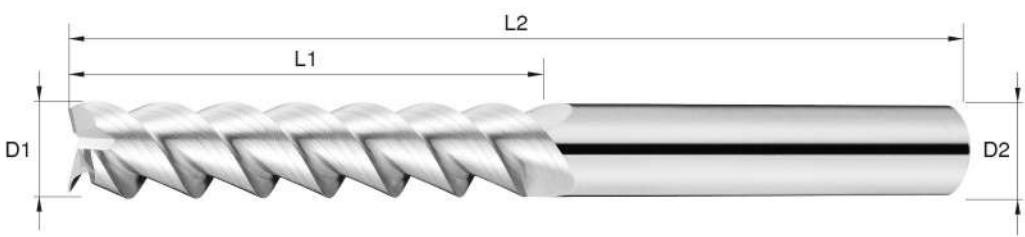
55°

Finishing

Cutting Data
p.249

Aluminum & Copper cutting series / 3 Flute / Long Flute / Square

N



• FEATURES

- Long flute 3 Flute Square for Aluminum.
- Extended flute length for greater depth of cut.
- Planing, Slotting, and Side Milling.

• ITEMS

Order No.	unit: mm			
	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

D

D MILL

DEPW

Aluminum & Copper cutting series / 3 Flute / Square

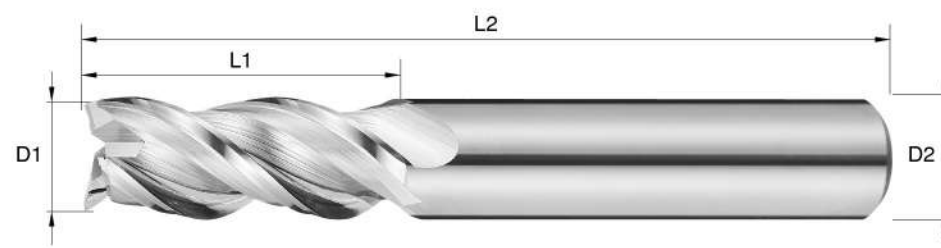
S
MG

3

39°/40°/41°

Cutting
Data
p.249

N



• FEATURES

- 3 Flute Square for Aluminum.
- Variable helix angle for great stability and anti-vibration. Large flute gullet for better chip removal.
- Suitable for both roughing and finishing.

• ITEMS

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

D

D MILL

DEPWS

Aluminum & Copper cutting series / 3 Flute / Square

S
MG

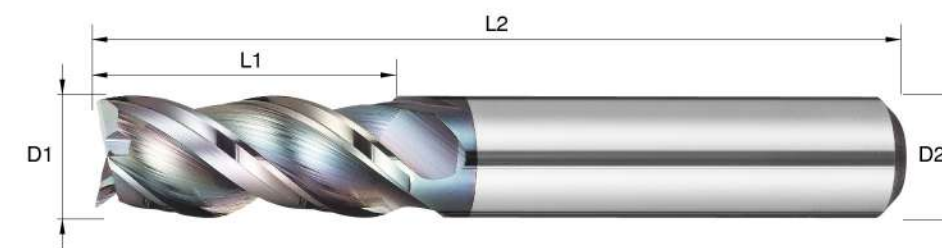
3

39°/40°/41°

D-X

Cutting
Data
p.249

N



• FEATURES

- 3 Flute Square for Aluminum.
- Variable helix angle for great stability and anti-vibration. Large flute gullet for better chip removal.
- D-X Coating: Excellent wear resistance and heat resistant.

• ITEMS

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

D

D MILL

DEG

MG

3

Rough

38°

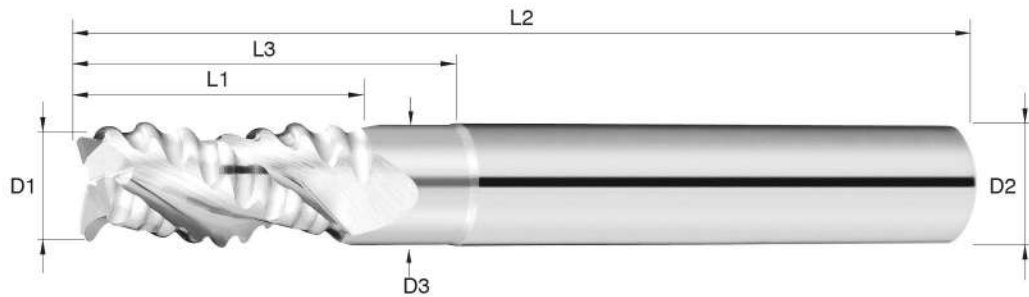
Roughing

Semi-Finishing

Cutting Data p.250

Aluminum & Copper cutting series / 3 Flute / Roughing / Square

N



• FEATURES

- Roughing 3 Flute Square for Aluminum.
- Unique flute cutting edge especially designed for rough milling.
- Chip breaker design dedicated to excellent chip removal ability.

• ITEMS

Order No.	unit: mm					
	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

D

D MILL

DFR

S
MG

3

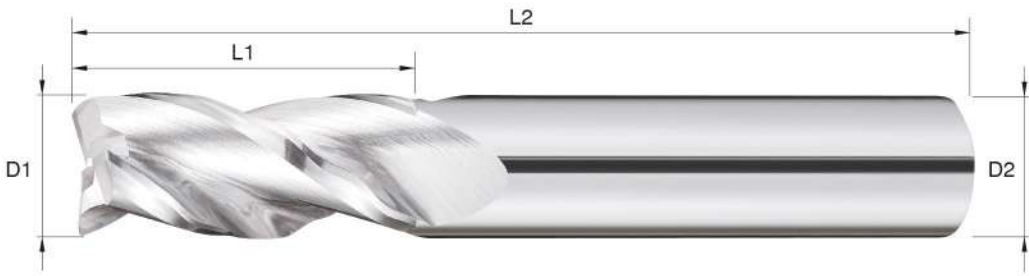
45°

Roughing

Semi-Finishing

Aluminum & Copper cutting series / 3 Flute / Square

N



• FEATURES

- Roughing 3 Flute Square for Aluminum.
- Wave-shaped peripheral cutting edge design brings great chip removal.
- Fine & bright workpiece surface after processed.

• ITEMS

Order No.	unit: mm			
	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

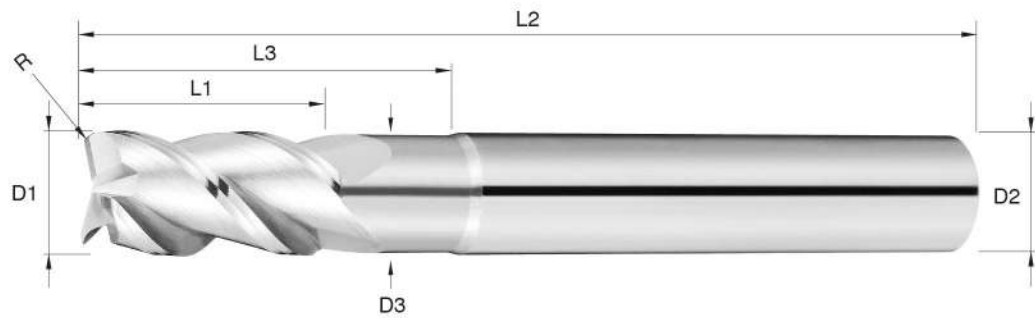
D MILL

DRC



Aluminum & Copper cutting series / 3 Flute / Corner Radius

N



• FEATURES

- 3 Flute Corner Radius for Aluminum.
- Great performance when profile milling at high speed.

• ITEMS

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	unit: mm
							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

D

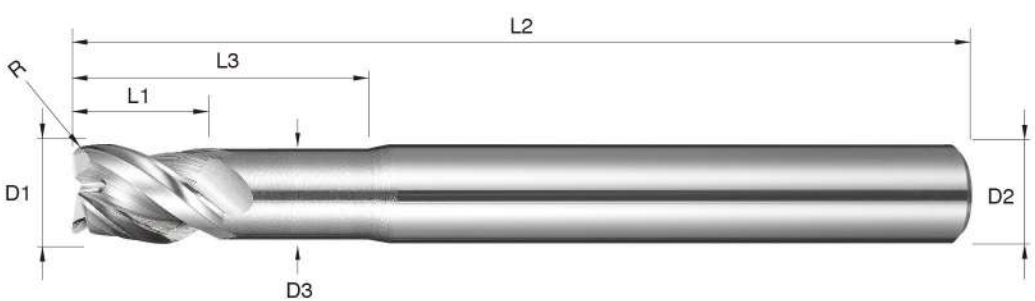
D MILL

DEPWR



Aluminum & Copper cutting series / 3 Flute / Corner Radius

N



• FEATURES

- 3 Flute Corner Radius for Aluminum.
- Variable helix angle for great stability and anti-vibration. Large flute gullet for better chip removal.
- Great performance when profile milling at high speed.

• ITEMS

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	unit: mm
							Shank Dia D2
DEPWR 0305	3.0	0.5	2.8	4.5	9	50	6
DEPWR 0405	4.0	0.5	3.7	6	12	50	6
DEPWR 0605	6.0	0.5	5.5	9	18	60	6
DEPWR 0610	6.0	1	5.5	9	18	60	6
DEPWR 0805	8.0	0.5	7.3	12	24	75	8
DEPWR 0810	8.0	1	7.3	12	24	75	8
DEPWR 1005	10.0	0.5	9.2	15	30	80	10
DEPWR 1010	10.0	1	9.2	15	30	80	10
DEPWR 1205	12.0	0.5	11	18	36	110	12
DEPWR 1210	12.0	1	11	18	36	110	12
DEPWR 1605	16.0	0.5	14.5	24	48	110	16
DEPWR 1610	16.0	1	14.5	24	48	110	16

DRC

END MILLS

DEPWR

END MILLS

D

D MILL

DBX

MG

2

45°

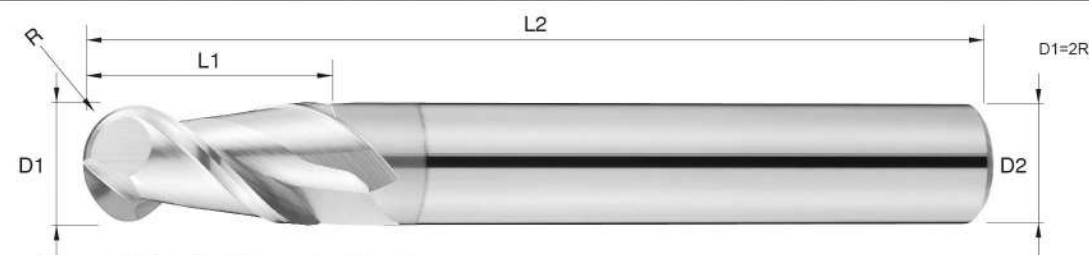
CRN

Finishing

Cutting
Data
P.248

Aluminum & Copper cutting series / 2 Flute / Ball Nose

N



• FEATURES

- 2 Flute Ball Nose for Aluminum.
- CRN Coating possesses high thermal conductivity and low coefficient of friction excellent for Copper Alloy.

unit: mm

• ITEMS

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

D

DEDX

MG

3

45°

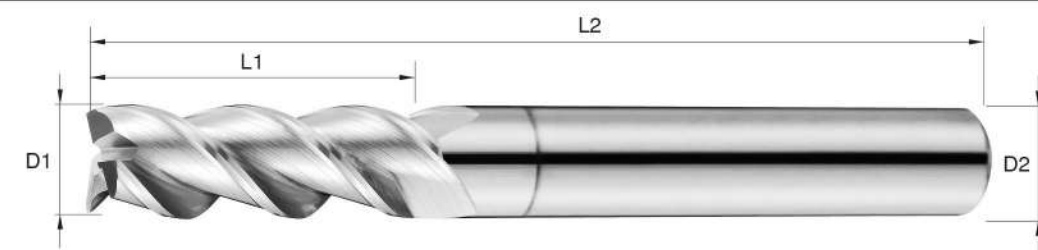
CRN

Finishing

Cutting
Data
P.248

Aluminum & Copper cutting series / 3 Flute / Square

N



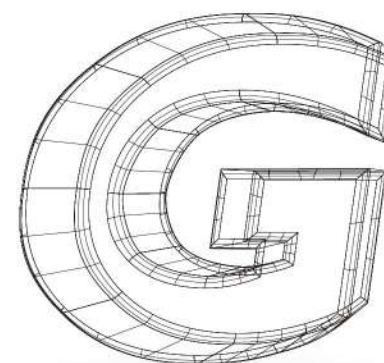
• FEATURES

- 3 Flute Square for Aluminum.
- CRN Coating possesses high thermal conductivity and low coefficient of friction excellent for Copper Alloy.

unit: mm

• ITEMS

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



GRAPHITE CUTTING SERIES

G.pro



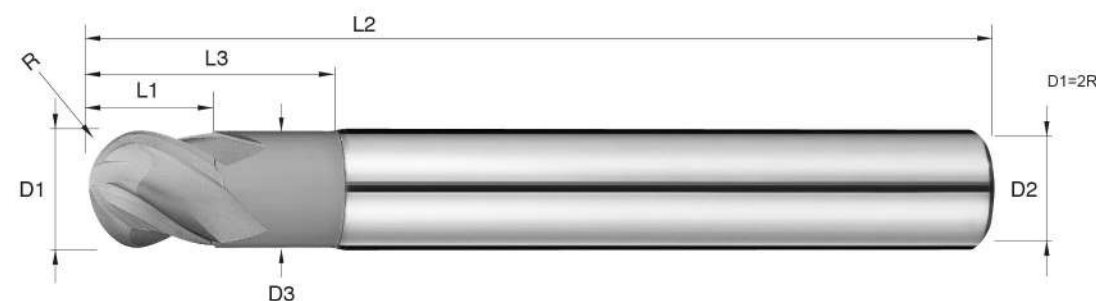
G.pro

SGBB

Graphite cutting series / 4 Flute / Ball Nose



N



• FEATURES

- 4 Flute Ball Nose for Graphite.
- CVD Diamond Coating maximize abrasion resistance and extend tool life.
- GMG carbide material with perfect anti-vibration, suitable for CVD Diamond Coating.

• ITEMS

Order No.	Radius	Neck Dia	Flute Length	Effective Length	O.A.L.	Shank Dia
	R	D3	L1	L3	L2	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

unit: mm



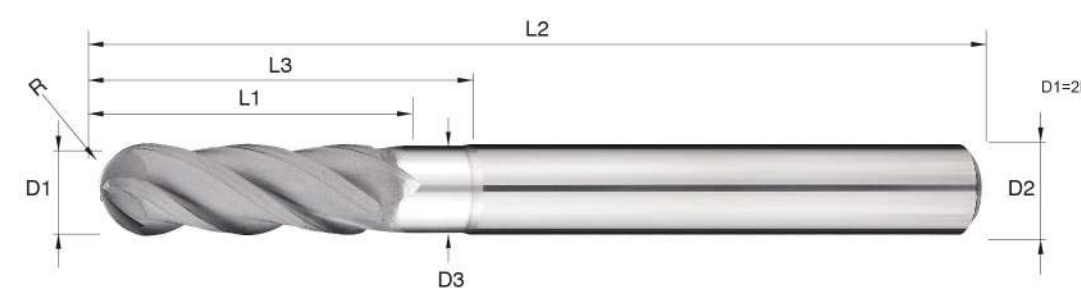
G.pro

SGBF

Graphite cutting series / 4 Flute / Ball Nose



N



• FEATURES

- 4 Flute Ball Nose for Graphite.
- CVD Diamond Coating maximize abrasion resistance and extend tool life.
- GMG Carbide material with perfect anti-vibration, suitable for CVD Diamond Coating.

• ITEMS

Order No.	Radius	Neck Dia	Flute Length	Effective Length	O.A.L.	Shank Dia
	R	D3	L1	L3	L2	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

unit: mm



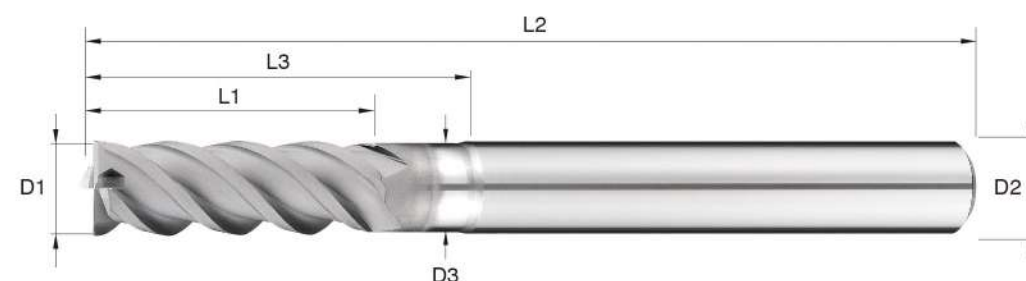
G.pro

SGEB

Graphite cutting series / 4 Flute / Square



N



• FEATURES

- 4 Flute Square for Graphite.
- CVD Diamond Coating maximize abrasion resistance and extend tool life.
- GMG Carbide material with perfect anti-vibration, suitable for CVD Diamond Coating.

• ITEMS

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	unit: mm	
						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	



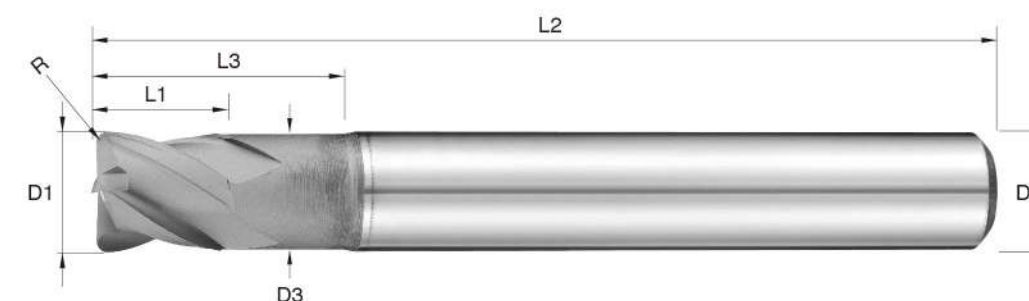
G.pro

SGRD

Graphite cutting series / 4 Flute / Corner Radius



N



• FEATURES

- 4 Flute Corner Radius for Graphite.
- CVD Diamond Coating maximize abrasion resistance and extend tool life.
- GMG Carbide material with perfect anti-vibration, suitable for CVD Diamond Coating.

• ITEMS

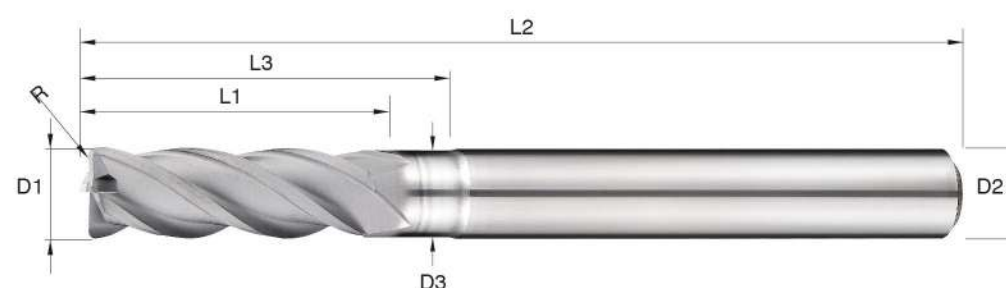
Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	unit: mm	
							Shank Dia D2	
SGRD 0403	4.0	0.3	3.88	4	8	50	4	
SGRD 0405	4.0	0.5	3.88	4	8	50	4	
SGRD 0603	6.0	0.3	5.80	6	12	50	6	
SGRD 0605	6.0	0.5	5.80	6	12	50	6	
SGRD 0805	8.0	0.5	7.70	8	16	60	8	
SGRD 1010	10.0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



G.pro

SGRB

Graphite cutting series / 4 Flute / Corner Radius



• FEATURES

- 4 Flute Corner Radius for Graphite.
- CVD Diamond Coating maximize abrasion resistance and extend tool life.
- GMG Carbide material with perfect anti-vibration, suitable for CVD Diamond Coating.

• ITEMS

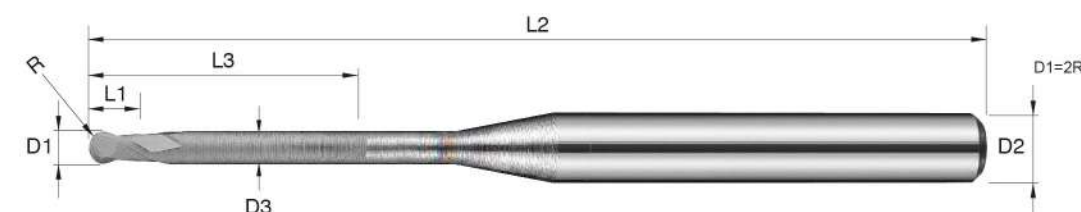
Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	unit: mm
							Shank Dia D2
SGRB 0403	4.0	0.3	3.88	20	25	75	4
SGRB 0403A	4.0	0.3	3.88	20	25	100	4
SGRB 0405	4.0	0.5	3.88	20	25	75	4
SGRB 0405A	4.0	0.5	3.88	20	25	100	4
SGRB 0603	6.0	0.3	5.80	25	30	75	6
SGRB 0603A	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

Graphite cutting series / 2 Flute / Long Neck / Ball Nose



• FEATURES

- Long Neck 2 Flute Ball Nose for Graphite.
- CVD Diamond Coating maximize abrasion resistance and extend tool life.
- GMG Carbide material with perfect anti-vibration, suitable for CVD Diamond Coating.

• ITEMS

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	unit: mm
						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

Graphite cutting series / 4 Flute / Long Neck / Square



N



• FEATURES

- Long Neck 4 Flute Square for Graphite.
- CVD Diamond Coating maximize abrasion resistance and extend tool life.
- GMG Carbide material with perfect anti-vibration, suitable for CVD Diamond Coating.

• ITEMS

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2	unit: mm
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	



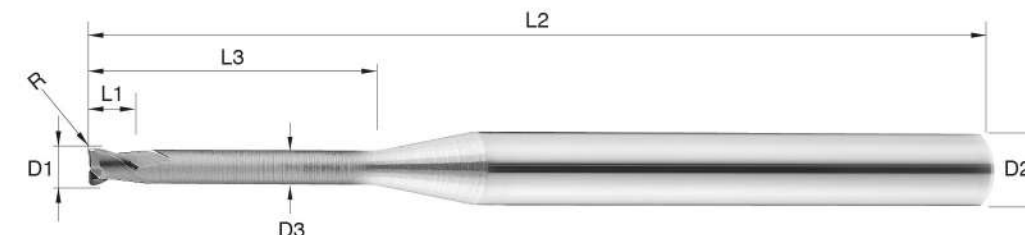
G.pro

SGRS

Graphite cutting series / 2 & 4 Flute / Long Neck / Corner Radius



N



• FEATURES

- Long neck 2 & 4 Flute Corner Radius for Graphite.
- CVD Diamond Coating maximize abrasion resistance and extend tool life.
- GMG Carbide material with perfect anti-vibration, suitable for CVD Diamond Coating.

• ITEMS

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2	unit: mm	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

A

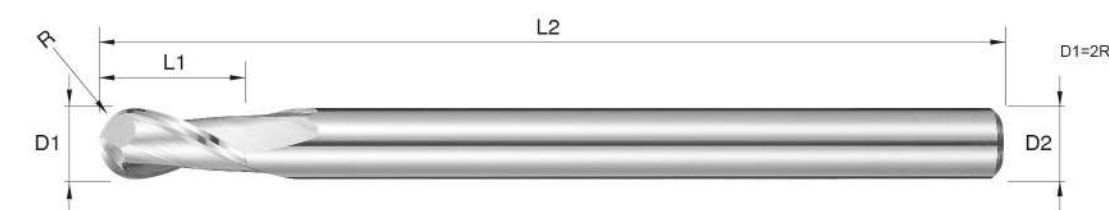
AX MILL

APB



Resin & Acrylic cutting series / 2 Flute / Ball Nose

A.B.S



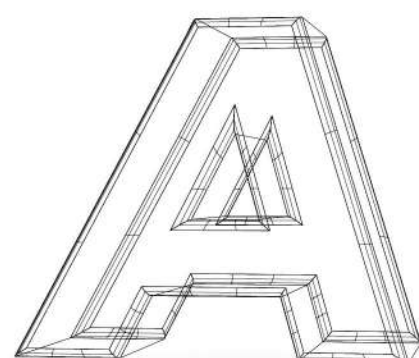
• FEATURES

- 2 Flute Ball Nose for A.B.S
- Special angle ground for fine workpiece surface after processed.
- SMG 0.4μm Micro Grain Carbide features excellent wear resistance.

• ITEMS

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
APB 0104	R0.5	3	50	4
APB 0154	R0.75	4	50	4
APB 0204	R1	5	50	4
APB 0304	R1.5	8	50	4
APB 0404	R2	10	50	4
APB 0606	R3	12	75	6
APB 0808	R4	16	100	8
APB 1010	R5	20	100	10
APB 1212	R6	24	100	12

unit: mm



RESIN & ACRYLIC CUTTING SERIES

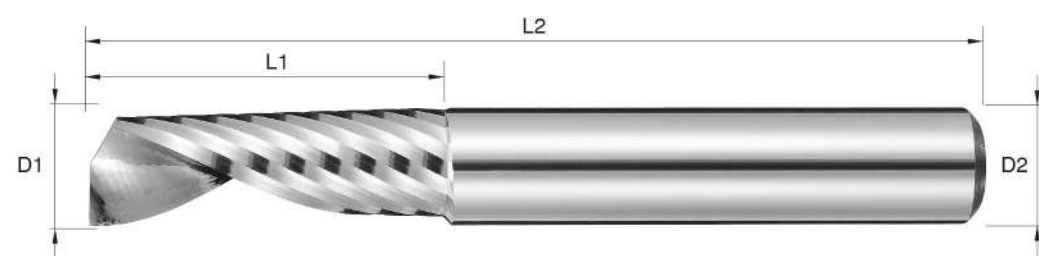
AX MILL

APES

Resin & Acrylic cutting series / 1 Flute / Square



A.B.S



• FEATURES

- Single Flute Square for A.B.S
- Sharp edge design brings excellent machining accuracy and fine, bright workpiece surface.
- SMG 0.4μm Micro Grain Carbide features excellent wear resistance.

• ITEMS

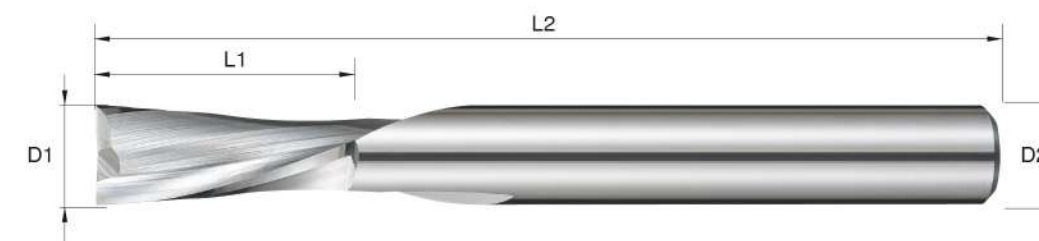
Order No.	unit: mm			
	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
APES 0206	2.0	6	50	6
APES 0306	3.0	9	50	6
APES 0406	4.0	12	50	6
APES 0506	5.0	15	50	6
APES 0606	6.0	18	50	6
APES 0808	8.0	20	60	8
APES 1010	10.0	30	75	10
APES 1212	12.0	30	75	12

APEB

Resin & Acrylic cutting series / 2 Flute / Square



A.B.S

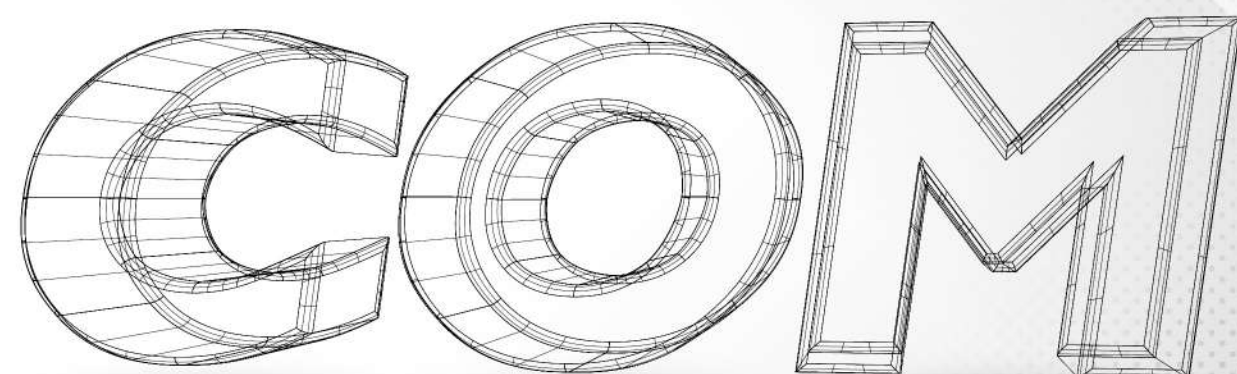


• FEATURES

- 2 Flute square for A.B.S
- Left hand spiral, right hand cut end mill can push the chip down to remove, not to lift it up.
- Sharp edge design brings excellent machining accuracy and fine, bright workpiece surface.

• ITEMS

Order No.	unit: mm			
	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
APEB 0406	4.0	15	75	4
APEB 0606	6.0	15	75	6
APEB 0808	8.0	20	75	8
APEB 1010	10.0	25	100	10
APEB 1212	12.0	30	100	12



CFRP MACHINING SERIES

COM.pro

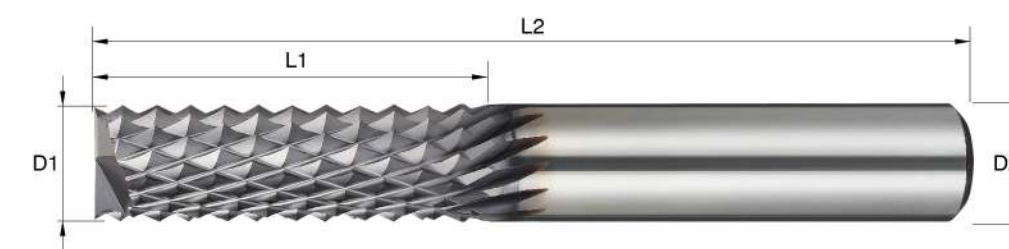
COM

COM.pro

CFPA



CFRP machining series / 10 & 12 Flute / Square / for CFRP



• FEATURES

- Roughing 10 & 12 Flute Square for CFRP.
- CVD Diamond Coating to maximize wear resistance and extend tool life.
- Unique cutting edge design to reduce cutting force. Excellent performance for roughing.

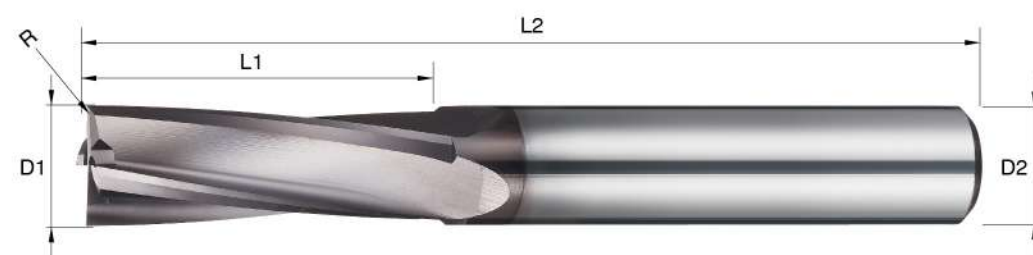
• ITEMS

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

unit: mm

CFRA

CFRP machining series / 4 Flute / Square / for CFRP

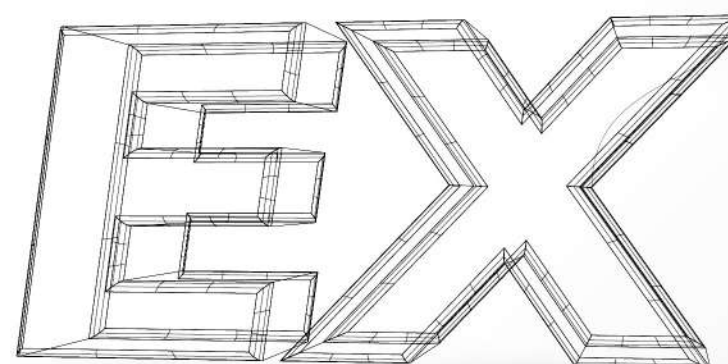


• FEATURES

- Finishing 4 Flute Square for CFRP.
- CVD Diamond Coating to maximize wear resistance and extend tool life.
- Unique cutting edge design to reduce cutting force. Excellent performance for finishing.

• ITEMS

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

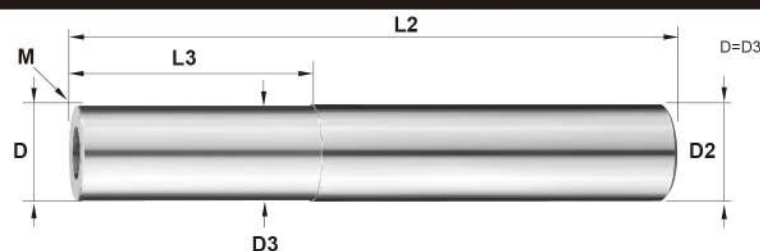
**EXCHANGEABLE HEAD END MILLS SERIES****MAGIC SHANK**

EX

MAGIC SHANK

EX2CS

Exchangeable Head End Mills series / Carbide Shank



• FEATURES

- Special Carbide material with great anti-vibration.
- Shank Dia: 10.0~25.0 mm; OAL: 100~300 mm

• ITEMS

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

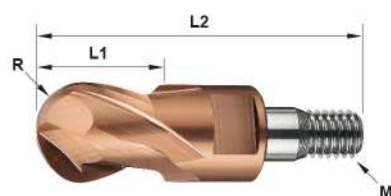
unit: mm

EX

EX2SB



Exchangeable Head End Mills series / 2 Flute / Ex Ball Nose



• FEATURES

- Combination of Carbide and Stainless steel: Greater anti-vibration and wear resistance.
- i8 Coating: High temperature resistance and low wear.

• ITEMS

Order No.	Radius R	Flute Length L1	Thread M	O.A.L. L2
EX2SB 1010	R5	10	M5	32
EX2SB 1212	R6	11	M6	40
EX2SB 1616	R8	16	M8	48
EX2SB 2020	R10	20	M10	55

unit: mm

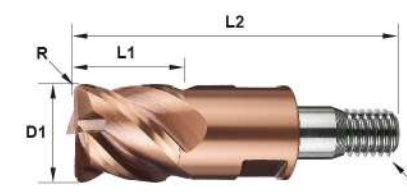
EX

MAGIC SHANK

EX2SRD



Exchangeable Head End Mills series / 4 Flute / Ex Corner Radius



• FEATURES

- Combination of Carbide and Stainless steel: Greater anti-vibration and wear resistance.
- i8 Coating: High temperature resistance and low wear.

• ITEMS

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

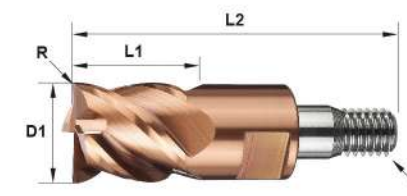
unit: mm

EX

EX2SEB



Exchangeable Head End Mills series / 4 Flute / Ex Square



• FEATURES

- Combination of Carbide and Stainless steel: Greater anti-vibration and wear resistance.
- i8 Coating: High temperature resistance and low wear.

• ITEMS

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

unit: mm

EX

MAGIC SHANK

EX2DPW



Exchangeable Head End Mills series / 3 Flute / EX Square

N



• FEATURES

- Variable helix angle for great stability and anti-vibration. Large flute gullet for better chip removal.
- Suitable for both roughing and finishing.

• ITEMS

unit: mm				
Order No.	Diameter D1	Flute Length L1	Thread M	O.A.L. L2
EX2DPW 1010	10.0	10	M5	32
EX2DPW 1212	12.0	12	M6	40
EX2DPW 1616	16.0	16	M8	48
EX2DPW 2020	20.0	20	M10	55

EX

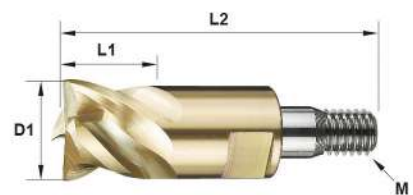
EX2SIW



Exchangeable Head End Mills series / 4 Flute / EX Square

M

S

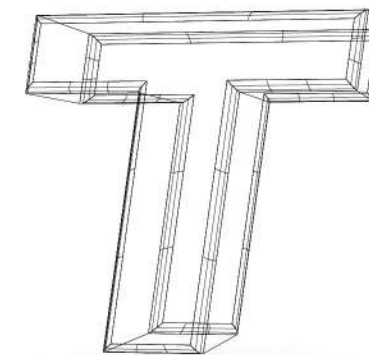


• FEATURES

- Variable helix angle and unequal flute spacing offer great stability and anti-vibration.
- G-plus Coating: Higher efficiency and longer tool life.

• ITEMS

unit: mm				
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



THREAD MILLING SERIES

T.pro

T

T.pro

EMT

Thread milling series / Internal Threading

MG

HRC
55

G100

Finishing
Semi-FinishingCutting
Data
P.252

H

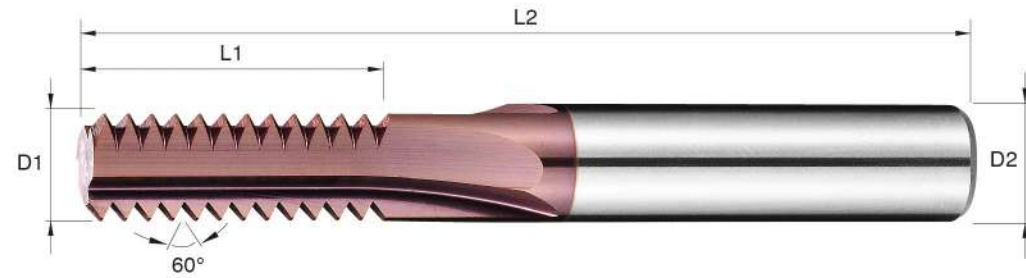
P

K

M

S

N



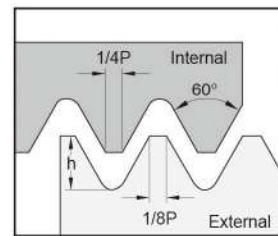
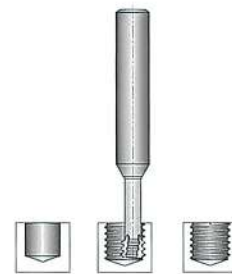
• FEATURES

- New cutting edge better than old design to improve chip removal.
- Straight Flute for higher efficiency.

• ITEMS

Order No.	Thread SIZE	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2	Flute
EMT 03P050	M3x0.5	2.2	5.5	50	6	3
EMT 04P070	M4x0.7	3.1	7.7	50	6	3
EMT 05P080	M5x0.8	3.6	9.6	50	6	3
EMT 06P100	M6x1.0	4.0	11.0	50	6	3
EMT 08P125	M8x1.25	5.0	15.0	50	6	3
EMT 10P150	M10x1.5	7.0	18.0	60	8	3
EMT 12P175	M12x1.75	8.0	21.0	60	8	3
EMT 16P200	M16x2.0	10.0	28.0	75	10	3
EMT 20P250	M20x2.5	14.0	35.0	100	14	4

unit: mm



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

T

T.pro

EMTW

Thread milling series / Internal Threading / Helical Flute

S
MGHRC
60

G100

Finishing
Semi-Finishing

H

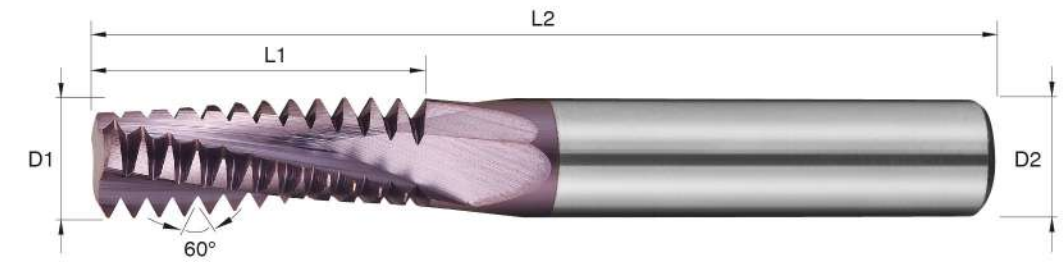
P

K

M

S

N



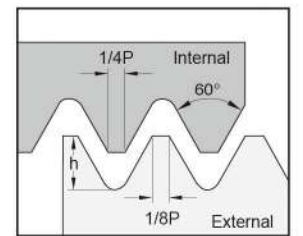
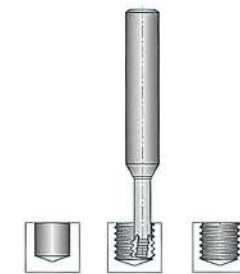
• FEATURES

- New cutting edge better than old design to improve chip removal.
- Helical Flute can reduce cutting force.
- Fine workpiece surface after processing.

• ITEMS

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

unit: mm



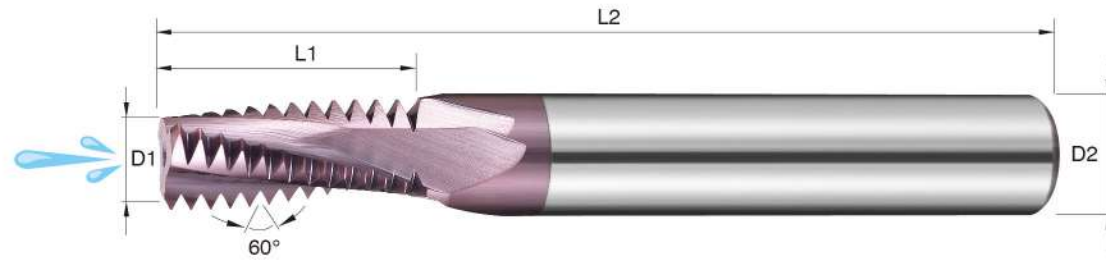
Defined by: R262 (DIN 13)
Tolerance class: 6g/6H

EMTH

Thread milling series / Internal Threading / Helical Flute / Hole Coolant



H P K M S N



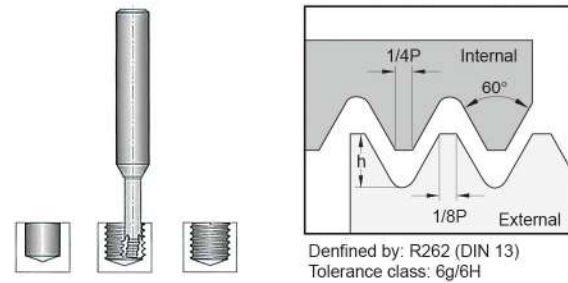
• FEATURES

- New cutting edge better than old design to improve chip removal.
- Straight coolant holes to lower down the heat and for better chip removal.

• ITEMS

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

unit: mm

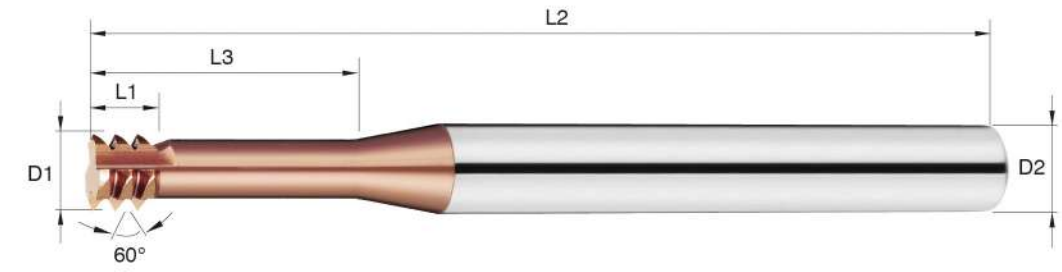


EMTS

Thread milling series / Internal Threading



H P K M S N



• FEATURES

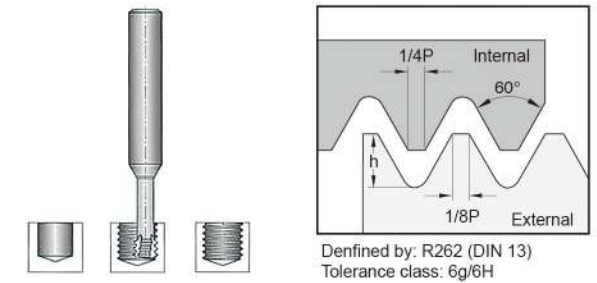
- New cutting edge better than old design to improve chip removal.
- Excellent for thread milling in great depth.
- i8 Coating: High temperature resistance and low wear.

• ITEMS

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

unit: mm

Flute Length (L1) = Pitch x 3



EMTF

Thread milling series / Internal Threading

MG

HRC
55

G100

Finishing
Semi-FinishingCutting
Data
P.252

H

P

K

M

S

N



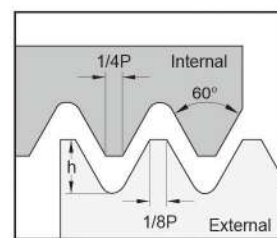
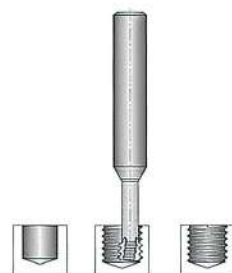
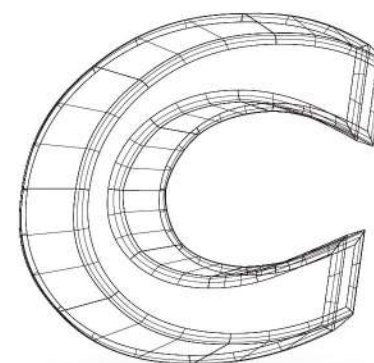
• FEATURES

- New cutting edge better than old design to improve chip removal.
- Excellent for thread milling in great depth.
- G100 Coating for General steel.

• ITEMS

Order No.	Thread SIZE	Diameter D1	Effective Length L3	O.A.L. L2	Shank Dia D2	Flute	unit: mm
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

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

CHAMFERING SERIES

C.pro

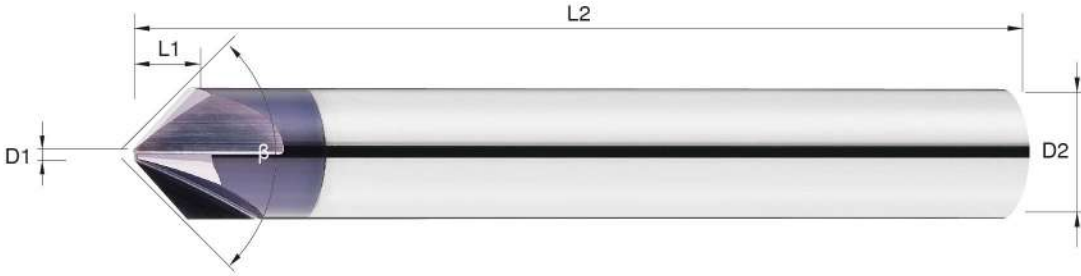


C.pro

ECM



Chamfering series / 4 Flute / Straight Chamfering



• FEATURES

- Straight Chamfering 4 Flute design to prevent sudden fracturing.
- Short chip breaker groove design can reduce vibration.

• ITEMS

Order No.	unit: mm			
	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

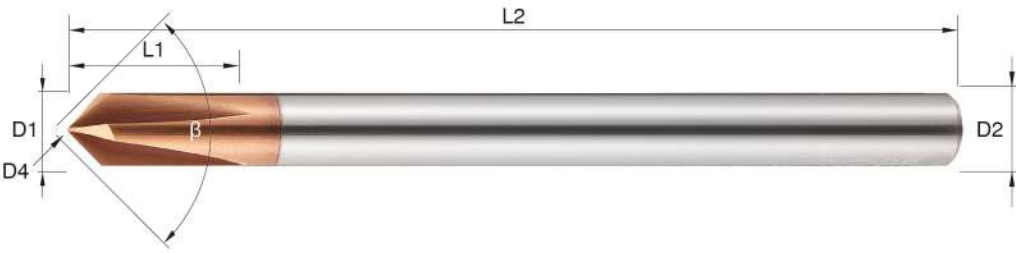


C.pro

ECMP



Chamfering series / 4 Flute / Straight Chamfering



• FEATURES

- Straight Chamfering 4 Flute design to prevent sudden fracturing.
- Unique chip breaker groove design brings effective chip removal.

• ITEMS

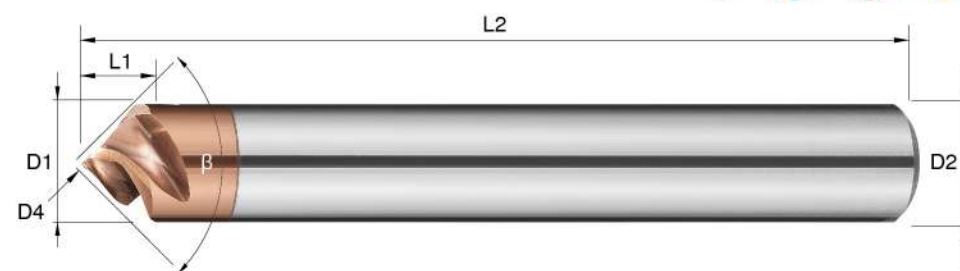
Order No.	unit: mm				
	Diameter D1	Tip Diameter D4	Flute Length L1	O.A.L. L2	Shank Dia D2
ECMP 0404	4.0	0.2	9	50	4
ECMP 0406	4.0	0.2	9	50	6
ECMP 0404B	4.0	0.2	9	100	4
ECMP 0606	6.0	0.2	12	50	6
ECMP 0606B	6.0	0.2	12	110	6
ECMP 0808	8.0	0.2	15	60	8
ECMP 0808B	8.0	0.2	15	110	8
ECMP 1010	10.0	0.2	16	75	10
ECMP 1010A	10.0	0.2	16	110	10
ECMP 1212	12.0	0.2	18	75	12



C.pro

ECMV

Chamfering series / 3 Flute / Straight Chamfering



• FEATURES

- Sharp helix flute design with best helix angle brings good sharpness and prevent burrs occurring.
- End cutting edge design can do V-grooving and chamfering.

• ITEMS

Order No.	Diameter D1	Tip Diameter D4	Flute Length L1	O.A.L. L2	Shank Dia D2
ECMV 0404	4.0	0.2	1.5	50	4
ECMV 0406	4.0	0.2	1.5	50	6
ECMV 0606	6.0	0.2	2	50	6
ECMV 0808	8.0	0.2	3	60	8
ECMV 1010	10.0	0.2	4	75	10
ECMV 1212	12.0	0.2	5	75	12

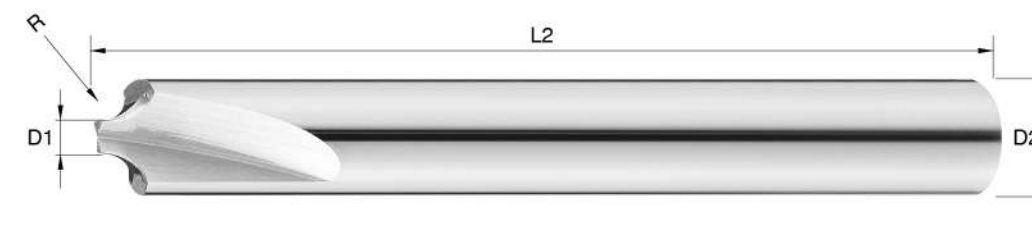
unit: mm



C.pro

ECR

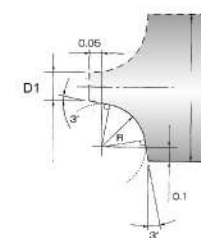
Chamfering series / 2 Flute / Corner Rounding



• FEATURES

- 2 Flute Corner Rounding for HRC55.
- Radius design can do chamfering R0.5 ~ R6.0.

• ITEMS



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

unit: mm

**EMCR**

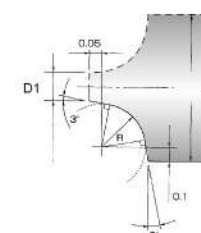
Chamfering series / 2 Flute / Micro Diameter Corner Rounding



• FEATURES

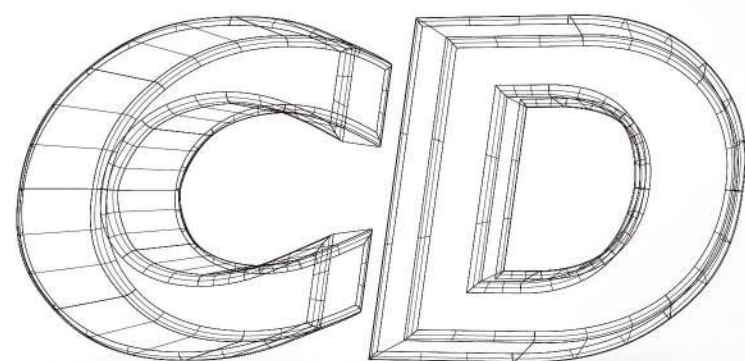
- 2 Flute Micro Diameter Corner Rounding for HRC55.
- Radius design can do chamfering R0.25 ~ R0.45.

• ITEMS



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

unit: mm



CARBIDE DRILLS SERIES

CD

CD

CD

ESD

MG

90°
β

HRC
40

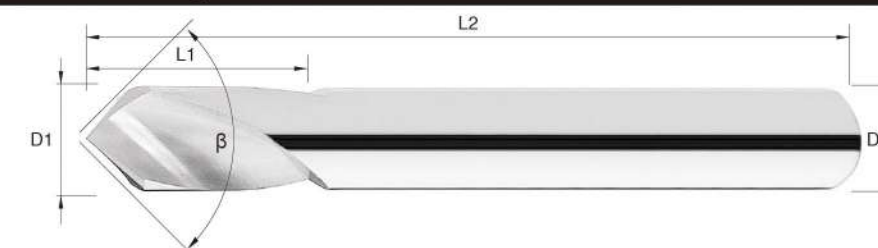
Finishing
Semi-Finishing

Carbide drills series / Spot Drills

H

P

K



• FEATURES

- Point angles design brings outstanding hole position accuracy.
- Cutting edge design can do chamfering.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	unit: mm
				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

CD

ESD2

MG

120°
β

HRC
40

Finishing
Semi-Finishing

Carbide drills series / Spot Drills

H

P

K

• FEATURES

- Point angles design brings outstanding hole position accuracy.
- Cutting edge design can do chamfering.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	unit: mm
				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

CD

CD

ESDC

MG

90°
βHRC
40

TiAlN

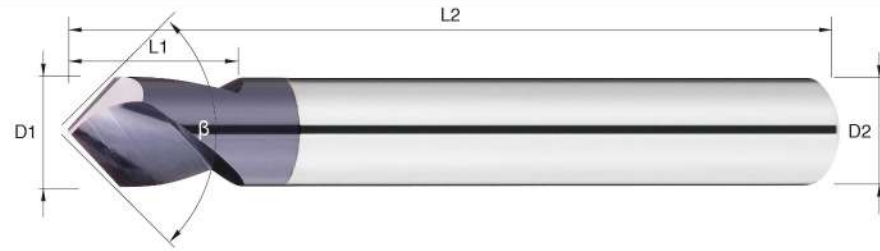
Finishing
Semi-Finishing

Carbide drills series / Spot Drills

H

P

K



• FEATURES

- Point angles design brings outstanding hole position accuracy.
- Cutting edge design can do chamfering.

• ITEMS

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

unit: mm

CD

CD

ESDS

MG

90°
βHRC
40

TiAlN

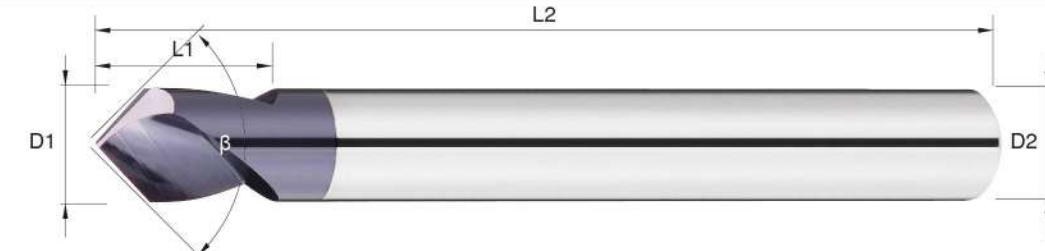
Finishing
Semi-Finishing

Carbide drills series / Long Shank Spot Drills

H

P

K



• FEATURES

- Point angles design brings outstanding hole position accuracy.
- Cutting edge design can do chamfering.

• ITEMS

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

unit: mm

CD

ESDA

MG

120°
βHRC
40

TiAlN

Finishing
Semi-Finishing

Carbide drills series / Spot Drills

H

P

K

• FEATURES

- Point angles design brings outstanding hole position accuracy.
- Cutting edge design can do chamfering.

• ITEMS

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

unit: mm

CD

ESDL

MG

120°
βHRC
40

TiAlN

Finishing
Semi-Finishing

Carbide drills series / Long Shank Spot Drills

H

P

K

• FEATURES

- Point angles design brings outstanding hole position accuracy.
- Cutting edge design can do chamfering.

• ITEMS

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

unit: mm

CD

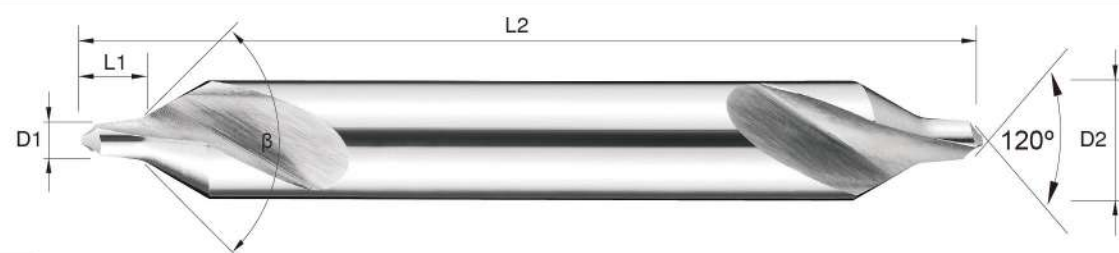
CD

CCD

Carbide drills series / Center Drills



H P K



• FEATURES

- Point angles design brings outstanding location and hole position accuracy.
- 0.6μm Carbide material with excellent toughness.

• ITEMS

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

unit: mm

CD

CCDA

Carbide drills series / Center Drills



H P K

• FEATURES

- Point angles design brings outstanding location and hole position accuracy.
- 0.6μm Carbide material with excellent toughness.

• ITEMS

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

unit: mm

CD

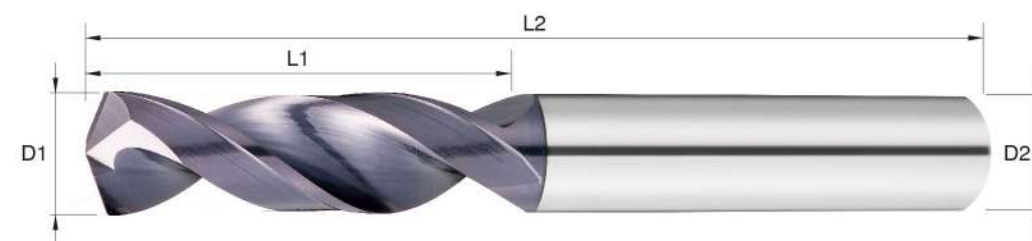
CD

CD

Carbide drills series / Carbide Drills



H P K



• FEATURES

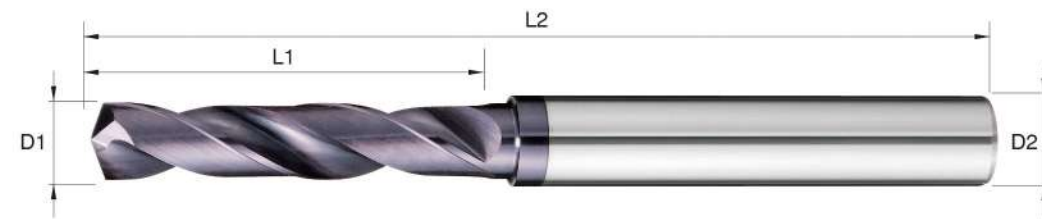
- Allow stable chip formation to prevent cutting edge from cracking.
- Special flute shape design can make chips into small pieces and remove chips quickly.

Order No.	Dia D1	Flute Length L1	O.A.L. L2	Order No.	Dia D1	Flute Length L1	O.A.L. L2	Order No.	Dia D1	Flute Length L1	O.A.L. L2
CD 020	2.0	12	38	CD 055	5.5	28	66	CD 090	9.0	40	84
CD 021	2.1	12	38	CD 056	5.6	28	66	CD 091	9.1	40	84
CD 022	2.2	13	40	CD 057	5.7	28	66	CD 092	9.2	40	84
CD 023	2.3	13	40	CD 058	5.8	28	66	CD 093	9.3	40	84
CD 024	2.4	14	43	CD 059	5.9	28	66	CD 094	9.4	40	84
CD 025	2.5	14	43	CD 060	6.0	28	66	CD 095	9.5	40	84
CD 026	2.6	14	43	CD 061	6.1	31	70	CD 096	9.6	43	89
CD 027	2.7	16	46	CD 062	6.2	31	70	CD 097	9.7	43	89
CD 028	2.8	16	46	CD 063	6.3	31	70	CD 098	9.8	43	89
CD 029	2.9	16	46	CD 064	6.4	31	70	CD 099	9.9	43	89
CD 030	3.0	16	46	CD 065	6.5	31	70	CD 100	10.0	43	89
CD 031	3.1	18	49	CD 066	6.6	31	70	CD 102	10.2	43	89
CD 032	3.2	18	49	CD 067	6.7	31	70	CD 105	10.5	43	89
CD 033	3.3	18	49	CD 068	6.8	34	74	CD 110	11.0	47	95
CD 034	3.4	20	52	CD 069	6.9	34	74	CD 115	11.5	47	95
CD 035	3.5	20	52	CD 070	7.0	34	74	CD 120	12.0	51	102
CD 036	3.6	20	52	CD 071	7.1	34	74	CD 125	12.5	51	102
CD 037	3.7	20	52	CD 072	7.2	34	74	CD 130	13.0	51	102
CD 038	3.8	22	55	CD 073	7.3	34	74				
CD 039	3.9	22	55	CD 074	7.4	34	74				
CD 040	4.0	22	55	CD 075	7.5	34	74				
CD 041	4.1	22	55	CD 076	7.6	37	79				
CD 042	4.2	22	55	CD 077	7.7	37	79				
CD 043	4.3	24	58	CD 078	7.8	37	79				
CD 044	4.4	24	58	CD 079	7.9	37	79				
CD 045	4.5	24	58	CD 080	8.0	37	79				
CD 046	4.6	24	58	CD 081	8.1	37	79				
CD 047	4.7	24	58	CD 082	8.2	37	79				
CD 048	4.8	26	62	CD 083	8.3	37	79				
CD 049	4.9	26	62	CD 084	8.4	37	79				
CD 050	5.0	26	62	CD 085	8.5	37	79				
CD 051	5.1	26	62	CD 086	8.6	40	84				
CD 052	5.2	26	62	CD 087	8.7	40	84				
CD 053	5.3	26	62	CD 088	8.8	40	84				
CD 054	5.4	28	66	CD 089	8.9	40	84				

unit: mm

CDA**MG****DIN**
6537**30°****h6****h7****140°****TiAlN****3xD****Finishing**
Semi-Finishing**Cutting**
Data
P.253

Carbide drills series / Carbide Drills

H**P****K****FEATURES**

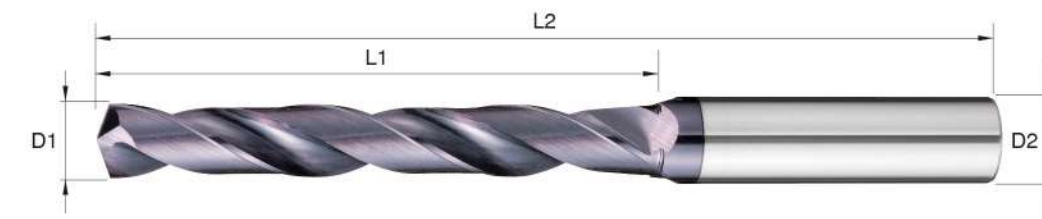
- Allow stable chip formation to prevent cutting edge from cracking.
- Special flute shape design can make chips into small pieces and remove chips quickly.

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDA 030	3.0	20	62	6.0	CDA 065	6.5	34	79	8.0	CDA 100	10.0	47	89	10.0
CDA 031	3.1	20	62	6.0	CDA 066	6.6	34	79	8.0	CDA 101	10.1	55	102	12.0
CDA 032	3.2	20	62	6.0	CDA 067	6.7	34	79	8.0	CDA 102	10.2	55	102	12.0
CDA 033	3.3	20	62	6.0	CDA 068	6.8	34	79	8.0	CDA 103	10.3	55	102	12.0
CDA 034	3.4	20	62	6.0	CDA 069	6.9	34	79	8.0	CDA 104	10.4	55	102	12.0
CDA 035	3.5	20	62	6.0	CDA 070	7.0	34	79	8.0	CDA 105	10.5	55	102	12.0
CDA 036	3.6	20	62	6.0	CDA 071	7.1	41	79	8.0	CDA 106	10.6	55	102	12.0
CDA 037	3.7	20	62	6.0	CDA 072	7.2	41	79	8.0	CDA 107	10.7	55	102	12.0
CDA 038	3.8	24	66	6.0	CDA 073	7.3	41	79	8.0	CDA 108	10.8	55	102	12.0
CDA 039	3.9	24	66	6.0	CDA 074	7.4	41	79	8.0	CDA 109	10.9	55	102	12.0
CDA 040	4.0	24	66	6.0	CDA 075	7.5	41	79	8.0	CDA 110	11.0	55	102	12.0
CDA 041	4.1	24	66	6.0	CDA 076	7.6	41	79	8.0	CDA 111	11.1	55	102	12.0
CDA 042	4.2	24	66	6.0	CDA 077	7.7	41	79	8.0	CDA 112	11.2	55	102	12.0
CDA 043	4.3	24	66	6.0	CDA 078	7.8	41	79	8.0	CDA 113	11.3	55	102	12.0
CDA 044	4.4	24	66	6.0	CDA 079	7.9	41	79	8.0	CDA 114	11.4	55	102	12.0
CDA 045	4.5	24	66	6.0	CDA 080	8.0	41	79	8.0	CDA 115	11.5	55	102	12.0
CDA 046	4.6	24	66	6.0	CDA 081	8.1	47	89	10.0	CDA 116	11.6	55	102	12.0
CDA 047	4.7	24	66	6.0	CDA 082	8.2	47	89	10.0	CDA 117	11.7	55	102	12.0
CDA 048	4.8	28	66	6.0	CDA 083	8.3	47	89	10.0	CDA 118	11.8	55	102	12.0
CDA 049	4.9	28	66	6.0	CDA 084	8.4	47	89	10.0	CDA 119	11.9	55	102	12.0
CDA 050	5.0	28	66	6.0	CDA 085	8.5	47	89	10.0	CDA 120	12.0	55	102	12.0
CDA 051	5.1	28	66	6.0	CDA 086	8.6	47	89	10.0	CDA 125	12.5	60	107	14.0
CDA 052	5.2	28	66	6.0	CDA 087	8.7	47	89	10.0	CDA 130	13.0	60	107	14.0
CDA 053	5.3	28	66	6.0	CDA 088	8.8	47	89	10.0	CDA 135	13.5	60	107	14.0
CDA 054	5.4	28	66	6.0	CDA 089	8.9	47	89	10.0	CDA 140	14.0	60	107	14.0
CDA 055	5.5	28	66	6.0	CDA 090	9.0	47	89	10.0	CDA 145	14.5	65	115	16.0
CDA 056	5.6	28	66	6.0	CDA 091	9.1	47	89	10.0	CDA 150	15.0	65	115	16.0
CDA 057	5.7	28	66	6.0	CDA 092	9.2	47	89	10.0	CDA 155	15.5	65	115	16.0
CDA 058	5.8	28	66	6.0	CDA 093	9.3	47	89	10.0	CDA 160	16.0	65	115	16.0
CDA 059	5.9	28	66	6.0	CDA 094	9.4	47	89	10.0	CDA 165	16.5	73	123	18.0
CDA 060	6.0	28	66	6.0	CDA 095	9.5	47	89	10.0	CDA 170	17.0	73	123	18.0
CDA 061	6.1	34	79	8.0	CDA 096	9.6	47	89	10.0	CDA 175	17.5	73	123	18.0
CDA 062	6.2	34	79	8.0	CDA 097	9.7	47	89	10.0	CDA 180	18.0	73	123	18.0
CDA 063	6.3	34	79	8.0	CDA 098	9.8	47	89	10.0	CDA 185	18.5	79	131	20.0
CDA 064	6.4	34	79	8.0	CDA 099	9.9	47	89	10.0	CDA 190	19.0	79	131	20.0
										CDA 195	19.5	79	131	20.0
										CDA 200	20.0	79	131	20.0

unit: mm

CDB**MG****DIN**
6537**30°****h6****h7****140°****TiAlN****5xD****Finishing**
Semi-Finishing**Cutting**
Data
P.253

Carbide drills series / Carbide Drills

H**P****K****FEATURES**

- Allow stable chip formation to prevent cutting edge from cracking.
- Special flute shape design can make chips into small pieces and remove chips quickly.

Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDB 030	3.0	28	66	6.0	CDB 065	6.5	53	91	8.0	CDB 100	10.0	61	103	10.0
CDB 031	3.1	28	66	6.0	CDB 066	6.6	53	91	8.0	CDB 101	10.1	71	118	12.0
CDB 032	3.2	28	66	6.0	CDB 067	6.7	53	91	8.0	CDB 102	10.2	71	118	12.0
CDB 033	3.3	28	66	6.0	CDB 068	6.8	53	91	8.0	CDB 103	10.3	71	118	12.0
CDB 034	3.4	28	66	6.0	CDB 069	6.9	53	91	8.0	CDB 104	10.4	71	118	12.0
CDB 035	3.5	28	66	6.0	CDB 070	7.0	53	91	8.0	CDB 105	10.5	71	118	12.0
CDB 036	3.6	28	66	6.0	CDB 071	7.1	53	91	8.0	CDB 106	10.6	71	118	12.0
CDB 037	3.7	28	66	6.0	CDB 072	7.2	53	91	8.0	CDB 107	10.7	71	118	12.0
CDB 038	3.8	36	74	6.0	CDB 073	7.3	53	91	8.0	CDB 108	10.8	71	118	12.0
CDB 039	3.9	36	74	6.0	CDB 074	7.4	53	91	8.0	CDB 109	10.9	71	118	12.0
CDB 040	4.0	36	74	6.0	CDB 075	7.5	53	91	8.0	CDB 110	11.0	71	118	12.0
CDB 041	4.1	36	74	6.0	CDB 076	7.6	53	91	8.0	CDB 111	11.1	71	118	12.0
CDB 042	4.2	36	74	6.0	CDB 077	7.7	53	91	8.0	CDB 112	11.2	71	118	12.0
CDB 043	4.3	36	74	6.0	CDB 078	7.8	53	91	8.0	CDB 113	11.3	71	118	12.0
CDB 044	4.4	36	74	6.0	CDB 079	7.9	53	91	8.0	CDB 114	11.4	71	118	12.0
CDB 045	4.5	36	74	6.0	CDB 080	8.0	53	91	8.0	CDB 115	11.5	71	118	12.0
CDB 046	4.6	36	74	6.0	CDB 081	8.1	61	103	10.0	CDB 116	11.6	71	118	12.0
CDB 047	4.7	36	74	6.0	CDB 082	8.2	61	103	10.0	CDB 117	11.7	71	118	12.0
CDB 048	4.8	44	82	6.0	CDB 083	8.3	61	103	10.0	CDB 118	11.8	71	118	12.0
CDB 049	4.9	44	82	6.0	CDB 084	8.4	61	103	10.0	CDB 119	11.9	71	118	12.0
CDB 050	5.0	44	82	6.0	CDB 085	8.5	61	103	10.0	CDB 120	12.0	71	118	12.0
CDB 051	5.1	44	82	6.0	CDB 086	8.6	61	103	10.0	CDB 125	12.5	77	124	14.0
CDB 052	5.2	44	82	6.0	CDB 087	8.7	61	103	10.0	CDB 130	13.0	77	124	14.0
CDB 053	5.3	44	82	6.0	CDB 088	8.8	61	103	10.0	CDB 135	13.5	77	124	14.0
CDB 054	5.4	44	82	6.0	CDB 089	8.9	61	103	10.0	CDB 140	14.0	77	124	14.0
CDB 055	5.5	44	82	6.0	CDB 090	9.0	61	103	10.0	CDB 145	14.5	83	133	16.0
CDB 056	5.6	44	82	6.0	CDB 091	9.1	61	103	10.0	CDB 150	15.0	83	133	16.0
CDB 057	5.7	44	82	6.0	CDB 092	9.2	61	103	10.0	CDB 155	15.5	83	133	16.0
CDB 058	5.8	44	82	6.0	CDB 093	9.3	61	103	10.0	CDB 160	16.0	83	133	16.0
CDB 059	5.9	44	82	6.0	CDB 094	9.4	61	103	10.0	CDB 165	16.5	93	143	18.0
CDB 060	6.0	44	82	6.0	CDB 095	9.5	61	103	10.0	CDB 170	17.0	93	143	18.0
CDB 061	6.1	53	91	8.0	CDB 096	9.6	61	103	10.0	CDB 175	17.5	93	143	18.0
CDB 062	6.2	53	91	8.0	CDB 097	9.7	61	103	10.0	CDB 180	18.0	93	143	18.0
CDB 063	6.3	53	91	8.0	CDB 098	9.8	61	103	10.0	CDB 185	18.5	101	153	20.0
CDB 064	6.4	53	91	8.0	CDB 099	9.9	61	103	10.0	CDB 190	19.0	101	153	20.0
										CDB 195	19.5	101	153	20.0
										CDB 200	20.0	101	153	20.0

unit: mm

CD

CD

CDC

MG

DIN 6537

30°

h6

h7

140°

TiAlN

8xD

Finishing
Semi-Finishing

Cutting
Data
P.253

Carbide drills series / Carbide Drills

H

P

K



• FEATURES

- Allow stable chip formation to prevent cutting edge from cracking.
- Special flute shape design can make chips into small pieces and remove chips quickly.

unit: mm														
Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDC 030	3.0	34	72	6.0	CDC 065	6.5	76	114	8.0	CDC 100	10.0	95	142	10.0
CDC 031	3.1	34	72	6.0	CDC 066	6.6	76	114	8.0	CDC 101	10.1	114	162	12.0
CDC 032	3.2	34	72	6.0	CDC 067	6.7	76	114	8.0	CDC 102	10.2	114	162	12.0
CDC 033	3.3	34	72	6.0	CDC 068	6.8	76	114	8.0	CDC 103	10.3	114	162	12.0
CDC 034	3.4	34	72	6.0	CDC 069	6.9	76	114	8.0	CDC 104	10.4	114	162	12.0
CDC 035	3.5	34	72	6.0	CDC 070	7.0	76	114	8.0	CDC 105	10.5	114	162	12.0
CDC 036	3.6	34	72	6.0	CDC 071	7.1	76	114	8.0	CDC 106	10.6	114	162	12.0
CDC 037	3.7	34	72	6.0	CDC 072	7.2	76	114	8.0	CDC 107	10.7	114	162	12.0
CDC 038	3.8	43	81	6.0	CDC 073	7.3	76	114	8.0	CDC 108	10.8	114	162	12.0
CDC 039	3.9	43	81	6.0	CDC 074	7.4	76	114	8.0	CDC 109	10.9	114	162	12.0
CDC 040	4.0	43	81	6.0	CDC 075	7.5	76	114	8.0	CDC 110	11.0	114	162	12.0
CDC 041	4.1	43	81	6.0	CDC 076	7.6	76	114	8.0	CDC 111	11.1	114	162	12.0
CDC 042	4.2	43	81	6.0	CDC 077	7.7	76	114	8.0	CDC 112	11.2	114	162	12.0
CDC 043	4.3	43	81	6.0	CDC 078	7.8	76	114	8.0	CDC 113	11.3	114	162	12.0
CDC 044	4.4	43	81	6.0	CDC 079	7.9	76	114	8.0	CDC 114	11.4	114	162	12.0
CDC 045	4.5	43	81	6.0	CDC 080	8.0	76	114	8.0	CDC 115	11.5	114	162	12.0
CDC 046	4.6	43	81	6.0	CDC 081	8.1	95	142	10.0	CDC 116	11.6	114	162	12.0
CDC 047	4.7	43	81	6.0	CDC 082	8.2	95	142	10.0	CDC 117	11.7	114	162	12.0
CDC 048	4.8	57	95	6.0	CDC 083	8.3	95	142	10.0	CDC 118	11.8	114	162	12.0
CDC 049	4.9	57	95	6.0	CDC 084	8.4	95	142	10.0	CDC 119	11.9	114	162	12.0
CDC 050	5.0	57	95	6.0	CDC 085	8.5	95	142	10.0	CDC 120	12.0	114	162	12.0
CDC 051	5.1	57	95	6.0	CDC 086	8.6	95	142	10.0					
CDC 052	5.2	57	95	6.0	CDC 087	8.7	95	142	10.0					
CDC 053	5.3	57	95	6.0	CDC 088	8.8	95	142	10.0					
CDC 054	5.4	57	95	6.0	CDC 089	8.9	95	142	10.0					
CDC 055	5.5	57	95	6.0	CDC 090	9.0	95	142	10.0					
CDC 056	5.6	57	95	6.0	CDC 091	9.1	95	142	10.0					
CDC 057	5.7	57	95	6.0	CDC 092	9.2	95	142	10.0					
CDC 058	5.8	57	95	6.0	CDC 093	9.3	95	142	10.0					
CDC 059	5.9	57	95	6.0	CDC 094	9.4	95	142	10.0					
CDC 060	6.0	57	95	6.0	CDC 095	9.5	95	142	10.0					
CDC 061	6.1	76	114	8.0	CDC 096	9.6	95	142	10.0					
CDC 062	6.2	76	114	8.0	CDC 097	9.7	95	142	10.0					
CDC 063	6.3	76	114	8.0	CDC 098	9.8	95	142	10.0					
CDC 064	6.4	76	114	8.0	CDC 099	9.9	95	142	10.0					

CD

CD

CDAC

MG

DIN 6537

30°

h6

h7

140°

i8

3xD

Finishing
Semi-Finishing

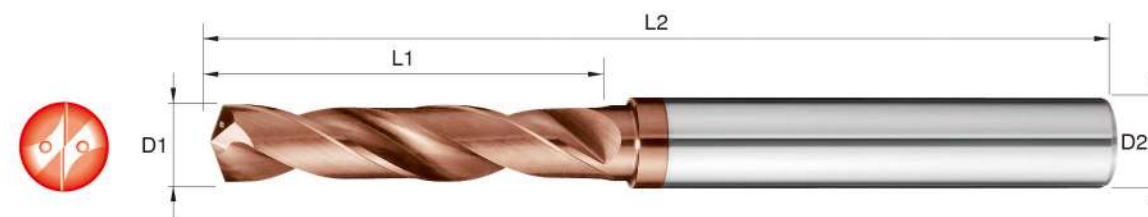
Cutting
Data
P.253

Carbide drills series / Internal coolant / Carbide Drills

H

P

K



• FEATURES

- Allow stable chip formation to prevent cutting edge from cracking.
- Special flute shape design can make chips into small pieces and remove chips quickly.
- Double helix coolant hole to bring down machining temperature and help chip removal.

unit: mm														
Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDAC 030	3.0	20	62	6.0	CDAC 065	6.5	34	79	8.0	CDAC 100	10.0	47	89	10.0
CDAC 031	3.1	20	62	6.0	CDAC 066	6.6	34	79	8.0	CDAC 101	10.1	55	102	12.0
CDAC 032	3.2	20	62	6.0	CDAC 067	6.7	34	79	8.0	CDAC 102	10.2	55	102	12.0
CDAC 033	3.3	20	62	6.0	CDAC 068	6.8	34	79	8.0	CDAC 103	10.3	55	102	12.0
CDAC 034	3.4	20	62	6.0	CDAC 069	6.9	34	79	8.0	CDAC 104	10.4	55	102	12.0
CDAC 035	3.5	20	62	6.0	CDAC 070	7.0	34	79	8.0	CDAC 105	10.5	55	102	12.0
CDAC 036	3.6	20	62	6.0	CDAC 071	7.1	41	79	8.0	CDAC 106	10.6	55	102	12.0
CDAC 037	3.7	20	62	6.0	CDAC 072	7.2	41	79	8.0	CDAC 107	10.7	55	102	12.0
CDAC 038	3.8	24	66	6.0	CDAC 073	7.3	41	79	8.0	CDAC 108	10.8	55	102	12.0
CDAC 039	3.9	24	66	6.0	CDAC 074	7.4	41	79	8.0	CDAC 109	10.9	55	102	12.0
CDAC 040	4.0	24	66	6.0	CDAC 075	7.5	41	79	8.0	CDAC 110	11.0	55	102	12.0
CDAC 041	4.1	24	66	6.0	CDAC 076	7.6	41	79	8.0	CDAC 111	11.1	55	102	12.0
CDAC 042	4.2	24	66	6.0	CDAC 077	7.7	41	79	8.0	CDAC 112	11.2	55	102	12.0
CDAC 043	4.3	24	66	6.0	CDAC 078	7.8	41	79	8.0	CDAC 113	11.3	55	102	12.0
CDAC 044	4.4	24	66	6.0	CDAC 079	7.9	41	79	8.0	CDAC 114	11.4	55	102	12.0
CDAC 045	4.5	24	66	6.0	CDAC 080	8.0	41	79	8.0	CDAC 115	11.5	55	102	12.0
CDAC 046	4.6	24	66	6.0	CDAC 081	8.1	47	89	10.0	CDAC 116	11.6	55	102	12.0
CDAC 047	4.7	24	66	6.0	CDAC 082	8.2	47	89	10.0	CDAC 117	11.7	55	102	12.0
CDAC 048	4.8	28	66	6.0	CDAC 083	8.3	47	89	10.0	CDAC 118	11.8	55	102	12.0
CDAC 049	4.9	28	66	6.0	CDAC 084	8.4	47	89	10.0	CDAC 119	11.9	55	102	12.0
CDAC 050	5.0	28	66	6.0	CDAC 085	8.5	47	89	10.0	CDAC 120	12.0	55	102	12.0
CDAC 051	5.1	28	66	6.0	CDAC 086	8.6	47	89	10.0	CDAC 125	12.5	60	107	14.0
CDAC 052	5.2	28	66	6.0	CDAC 087	8.7	47	89	10.0	CDAC 130	13.0	60	107	14.0
CDAC 053	5.3	28	66	6.0	CDAC 088	8.8	47	89	10.0	CDAC 135	13.5	60	107	14.0
CDAC 054	5.4	28	66	6.0	CDAC 089	8.9	47	89	10.0	CDAC 140	14.0	60	107	14.0
CDAC 055	5.5	28	66	6.0	CDAC 090	9.0	47	89	10.0	CDAC 145	14.5	65	115	16.0
CDAC 056	5.6	28	66	6.0	CDAC 091	9.1	47	89	10.0	CDAC 150	15.0	65	115	16.0
CDAC 057	5.7	28	66	6.0	CDAC 092	9.2	47	89	10.0	CDAC 155	15.5	65	115	16.0
CDAC 058	5.8	28	66	6.0	CDAC 093	9.3	47	89	10.0	CDAC 160	16.0	65	115	16.0
CDAC 059	5.9	28	66	6.0	CDAC 094	9.4	47	89	10.0	CDAC 165	16.5	73	123	18.0
CDAC 060	6.0	28	66	6.0	CDAC 095	9.5	47	89	10.0	CDAC 170	17.0	73	123	18.0
CDAC 061	6.1	34	79	8.0	CDAC 096	9.6	47	89	10.0	CDAC 175	17.5	73	123	18.0
CDAC 062	6.2	34	79	8.0	CDAC 097	9.7	47	89	10.0	CDAC 180	18.0	73	123	18.0
CDAC 063	6.3	34	79	8.0	CDAC 098	9.8	47	89	10.0	CDAC 185	18.5	79	131	20.0
CDAC 064	6.4	34	79	8.0	CDAC 099	9.9	47	89	10.0	CDAC 190	19.0	79	131	20.0
										CDAC 195	19.5	79	131	20.0
										CDAC 200	20.0	79	131	20.0

CD

CD

CDBC

MG

DIN 6537

30°

h6

h7

140°

i8

5xD

Finishing
Semi-Finishing

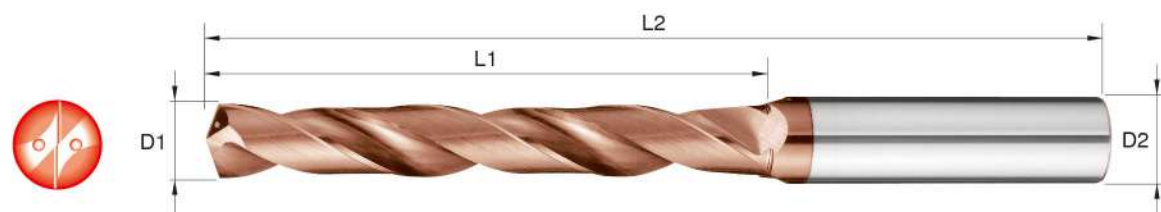
Cutting
Data
P.253

Carbide drills series / Internal coolant / Carbide Drills

H

P

K



• FEATURES

- Allow stable chip formation to prevent cutting edge from cracking.
- Special flute shape design can make chips into small pieces and remove chips quickly.
- Double helix coolant hole to bring down machining temperature and help chip removal.

unit: mm														
Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDBC 030	3.0	28	66	6.0	CDBC 065	6.5	53	91	8.0	CDBC 100	10.0	61	103	10.0
CDBC 031	3.1	28	66	6.0	CDBC 066	6.6	53	91	8.0	CDBC 101	10.1	71	118	12.0
CDBC 032	3.2	28	66	6.0	CDBC 067	6.7	53	91	8.0	CDBC 102	10.2	71	118	12.0
CDBC 033	3.3	28	66	6.0	CDBC 068	6.8	53	91	8.0	CDBC 103	10.3	71	118	12.0
CDBC 034	3.4	28	66	6.0	CDBC 069	6.9	53	91	8.0	CDBC 104	10.4	71	118	12.0
CDBC 035	3.5	28	66	6.0	CDBC 070	7.0	53	91	8.0	CDBC 105	10.5	71	118	12.0
CDBC 036	3.6	28	66	6.0	CDBC 071	7.1	53	91	8.0	CDBC 106	10.6	71	118	12.0
CDBC 037	3.7	28	66	6.0	CDBC 072	7.2	53	91	8.0	CDBC 107	10.7	71	118	12.0
CDBC 038	3.8	36	74	6.0	CDBC 073	7.3	53	91	8.0	CDBC 108	10.8	71	118	12.0
CDBC 039	3.9	36	74	6.0	CDBC 074	7.4	53	91	8.0	CDBC 109	10.9	71	118	12.0
CDBC 040	4.0	36	74	6.0	CDBC 075	7.5	53	91	8.0	CDBC 110	11.0	71	118	12.0
CDBC 041	4.1	36	74	6.0	CDBC 076	7.6	53	91	8.0	CDBC 111	11.1	71	118	12.0
CDBC 042	4.2	36	74	6.0	CDBC 077	7.7	53	91	8.0	CDBC 112	11.2	71	118	12.0
CDBC 043	4.3	36	74	6.0	CDBC 078	7.8	53	91	8.0	CDBC 113	11.3	71	118	12.0
CDBC 044	4.4	36	74	6.0	CDBC 079	7.9	53	91	8.0	CDBC 114	11.4	71	118	12.0
CDBC 045	4.5	36	74	6.0	CDBC 080	8.0	53	91	8.0	CDBC 115	11.5	71	118	12.0
CDBC 046	4.6	36	74	6.0	CDBC 081	8.1	61	103	10.0	CDBC 116	11.6	71	118	12.0
CDBC 047	4.7	36	74	6.0	CDBC 082	8.2	61	103	10.0	CDBC 117	11.7	71	118	12.0
CDBC 048	4.8	44	82	6.0	CDBC 083	8.3	61	103	10.0	CDBC 118	11.8	71	118	12.0
CDBC 049	4.9	44	82	6.0	CDBC 084	8.4	61	103	10.0	CDBC 119	11.9	71	118	12.0
CDBC 050	5.0	44	82	6.0	CDBC 085	8.5	61	103	10.0	CDBC 120	12.0	71	118	12.0
CDBC 051	5.1	44	82	6.0	CDBC 086	8.6	61	103	10.0	CDBC 125	12.5	77	124	14.0
CDBC 052	5.2	44	82	6.0	CDBC 087	8.7	61	103	10.0	CDBC 130	13.0	77	124	14.0
CDBC 053	5.3	44	82	6.0	CDBC 088	8.8	61	103	10.0	CDBC 135	13.5	77	124	14.0
CDBC 054	5.4	44	82	6.0	CDBC 089	8.9	61	103	10.0	CDBC 140	14.0	77	124	14.0
CDBC 055	5.5	44	82	6.0	CDBC 090	9.0	61	103	10.0	CDBC 145	14.5	83	133	16.0
CDBC 056	5.6	44	82	6.0	CDBC 091	9.1	61	103	10.0	CDBC 150	15.0	83	133	16.0
CDBC 057	5.7	44	82	6.0	CDBC 092	9.2	61	103	10.0	CDBC 155	15.5	83	133	16.0
CDBC 058	5.8	44	82	6.0	CDBC 093	9.3	61	103	10.0	CDBC 160	16.0	83	133	16.0
CDBC 059	5.9	44	82	6.0	CDBC 094	9.4	61	103	10.0	CDBC 165	16.5	93	143	18.0
CDBC 060	6.0	44	82	6.0	CDBC 095	9.5	61	103	10.0	CDBC 170	17.0	93	143	18.0
CDBC 061	6.1	53	91	8.0	CDBC 096	9.6	61	103	10.0	CDBC 175	17.5	93	143	18.0
CDBC 062	6.2	53	91	8.0	CDBC 097	9.7	61	103	10.0	CDBC 180	18.0	93	143	18.0
CDBC 063	6.3	53	91	8.0	CDBC 098	9.8	61	103	10.0	CDBC 185	18.5	101	153	20.0
CDBC 064	6.4	53	91	8.0	CDBC 099	9.9	61	103	10.0	CDBC 190	19.0	101	153	20.0
										CDBC 195	19.5	101	153	20.0
										CDBC 200	20.0	101	153	20.0

CD

CD

CDCC

MG

DIN 6537

30°

h6

h7

140°

i8

8xD

Finishing
Semi-Finishing

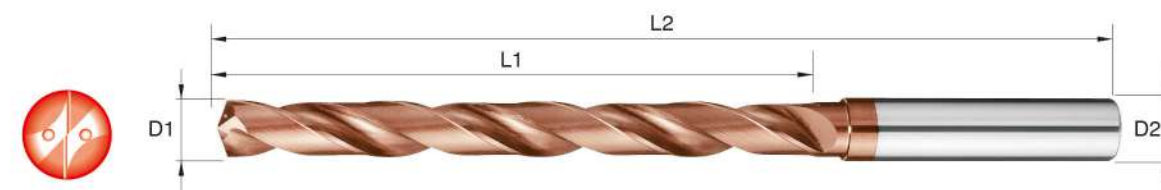
Cutting
Data
P.253

Carbide drills series / Internal coolant / Carbide Drills

H

P

K

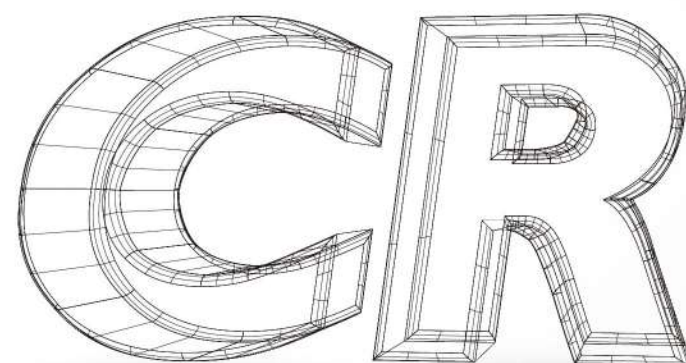


• FEATURES

- Allow stable chip formation to prevent cutting edge from cracking.
- Special flute shape design can make chips into small pieces and remove chips quickly.
- Double helix coolant hole to bring down machining temperature and help chip removal.

• ITEMS

unit: mm														
Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Dia D1	Flute Length L1	Overall Length L2	Shank Dia D2
CDCC 030	3.0	34	72	6.0	CDCC 065	6.5	76	114	8.0	CDCC 095	9.5	95	142	10.0
CDCC 031	3.1	34	72	6.0	CDCC 066	6.6	76	114	8.0	CDCC 096	9.6	95	142	10.0
CDCC 032	3.2	34	72	6.0	CDCC 067	6.7	76	114	8.0	CDCC 097	9.7	95	142	10.0
CDCC 033	3.3	34	72	6.0	CDCC 068	6.8	76	114	8.0	CDCC 098	9.8	95	142	10.0
CDCC 034	3.4	34	72	6.0	CDCC 069	6.9	76	114	8.0	CDCC 099	9.9	95	142	10.0
CDCC 035	3.5	34	72	6.0	CDCC 070	7.0	76	114	8.0	CDCC 100	10.0	95	142	10.0
CDCC 036	3.6	34	72	6.0	CDCC 071	7.1	76	114	8.0					
CDCC 037	3.7	34	72	6.0	CDCC 072	7.2	76	114	8.0					
CDCC 038	3.8	43	81	6.0	CDCC 073	7.3	76	114	8.0					
CDCC 039	3.9	43	81	6.0	CDCC 074	7.4	76	114	8.0					
CDCC 040	4.0	43	81	6.0	CDCC 075	7.5	76	114	8.0					
CDCC 041	4.1	43	81	6.0	CDCC 076	7.6	76	114	8.0					
CDCC 042	4.2	43	81	6.0	CDCC 077	7.7	76	114	8.0					
CDCC 043	4.3	43	81	6.0	CDCC 078	7.8	76	114	8.0					
CDCC 044	4.4	43	81	6.0	CDCC 079	7.9	76	114	8.0					
CDCC 045	4.5	43	81	6.0	CDCC 080	8.0	76	114	8.0					
CDCC 046	4.6	43	81	6.0	CDCC 081	8.1	95	142	10.0					
CDCC 047	4.7	43	81	6.0	CDCC 082	8.2	95	142	10.0					
CDCC 048	4.8	57	95	6.0	CDCC 083	8.3	95	142	10.0					
CDCC 049	4.9	57	95	6.0	CDCC 084	8.4	95	142	10.0					
CDCC 050	5.0	57	95	6.0	CDCC 085	8.5	95	142	10.0					
CDCC 051	5.1	57	95	6.0	CDCC 086	8.6	95	142	10.0					
CDCC 052	5.2	57	95	6.0	CDCC 087	8.7	95	142	10.0					
CDCC 053	5.3	57	95	6.0	CDCC 088	8.8	95	142	10.0					
CDCC 054	5.4	57	95	6.0	CDCC 089	8.9	95	142	10.0					
CDCC 055	5.5	57	95	6.0	CDCC 090	9.0	95	142	10.0					
CDCC 056	5.6	57	95	6.0	CDCC 091	9.1	95	142	10.0					
CDCC 057	5.7	57	95	6.0	CDCC 092	9.2	95	142	10.0					
CDCC 058	5.8	57	95	6.0	CDCC 093	9.3	95	142	10.0					
CDCC 059	5.9	57	95	6.0	CDCC 094	9.4	95	142	10.0					
CDCC 060	6.0	57	95	6.0	CDCC 095	9.5	95	142	10.0					
CDCC 061	6.1	76	114	8.0	CDCC 096	9.6	95	142	10.0					
CDCC 062	6.2	76	114	8.0	CDCC 097	9.7	95	142	10.0					
CDCC 063	6.3	76	114	8.0	CDCC 098	9.8	95	142	10.0					
CDCC 064	6.4	76	114	8.0	CDCC 099	9.9	95	142	10.0					



CARBIDE REAMERS SERIES

CR

CR

CD

CRA

MG

7°

m5

HRC 45

Finishing

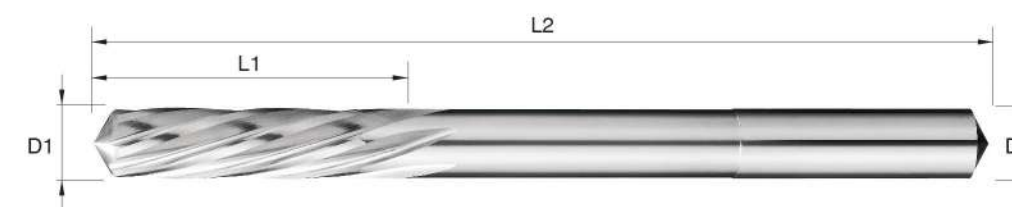
Cutting Data P.253

Carbide reamers series / Carbide Reamers

H

P

K



• FEATURES

- The cutting edge with designed angles to reduce cutting force for better anti-vibration.
- Precision ground cutting edge for higher accuracy. Fine surface after finishing.

Order No.	Dia D1	Flute Length L1	Overall Length L2	Flutes	Order No.	Dia D1	Flute Length L1	Overall Length L2	Flutes	Order No.	Dia D1	Flute Length L1	Overall Length L2	Flutes
CRA 020	2.0	11	49	4	CRA 055	5.5	26	93	6	CRA 090	9.0	36	125	6
CRA 021	2.1	11	49	4	CRA 056	5.6	26	93	6	CRA 091	9.1	36	125	6
CRA 022	2.2	12	53	4	CRA 057	5.7	26	93	6	CRA 092	9.2	36	125	6
CRA 023	2.3	12	53	4	CRA 058	5.8	26	93	6	CRA 093	9.3	36	125	6
CRA 024	2.4	14	57	4	CRA 059	5.9	26	93	6	CRA 094	9.4	36	125	6
CRA 025	2.5	14	57	4	CRA 060	6.0	26	93	6	CRA 095	9.5	36	125	6
CRA 026	2.6	14	57	4	CRA 061	6.1	28	101	6	CRA 096	9.6	38	133	6
CRA 027	2.7	15	61	4	CRA 062	6.2	28	101	6	CRA 097	9.7	38	133	6
CRA 028	2.8	15	61	4	CRA 063	6.3	28	101	6	CRA 098	9.8	38	133	6
CRA 029	2.9	15	61	4	CRA 064	6.4	28	101	6	CRA 099	9.9	38	133	6
CRA 030	3.0	15	61	4	CRA 065	6.5	28	101	6	CRA 100	10.0	38	133	6
CRA 031	3.1	16	65	4	CRA 066	6.6	28	101	6	CRA 101	10.1	38	133	6
CRA 032	3.2	16	65	4	CRA 067	6.7	31	101	6	CRA 102	10.2	38	133	6
CRA 033	3.3	16	65	4	CRA 068	6.8	31	109	6	CRA 103	10.3	38	133	6
CRA 034	3.4	18	70	4	CRA 069	6.9	31	109	6	CRA 104	10.4	38	133	6
CRA 035	3.5	18	70	4	CRA 070	7.0	31	109	6	CRA 105	10.5	38	133	6
CRA 036	3.6	18	70	4	CRA 071	7.1	31	109	6	CRA 106	10.6	38	133	6
CRA 037	3.7	18	70	4	CRA 072	7.2	31	109	6	CRA 107	10.7	41	142	6
CRA 038	3.8	19	75	4	CRA 073	7.3	31	109	6	CRA 108	10.8	41	142	6
CRA 039	3.9	19	75	4	CRA 074	7.4	31	109	6	CRA 109	10.9	41	142	6
CRA 040	4.0	19	75	4	CRA 075	7.5	31	109	6	CRA 110	11.0	41	142	6
CRA 041	4.1	19	75	4	CRA 076	7.6	33	117	6	CRA 111	11.1	41	142	6
CRA 042	4.2	19	75	4	CRA 077	7.7	33	117	6	CRA 112	11.2	41	142	6
CRA 043	4.3	21	80	4	CRA 078	7.8	33	117	6	CRA 113	11.3	41	142	6
CRA 044	4.4	21	80	4	CRA 079	7.9	33	117	6	CRA 114	11.4	41	142	6
CRA 045	4.5	21	80	4	CRA 080	8.0	33	117	6	CRA 115	11.5	41	142	6
CRA 046	4.6	21	80	6	CRA 081	8.1	33	117	6	CRA 116	11.6	41	142	6
CRA 047	4.7	21	80	6	CRA 082	8.2	33	117	6	CRA 117	11.7	41	142	6
CRA 048	4.8	23	86	6	CRA 083	8.3	33	117	6	CRA 118	11.8	41	142	6
CRA 049	4.9	23	86	6	CRA 084	8.4	33	117	6	CRA 119	11.9	44	151	6
CRA 050	5.0	23	86	6	CRA 085	8.5	33	117	6	CRA 120	12.0	44	151	6
CRA 051	5.1	23	86	6	CRA 086	8.6	36	125	6					
CRA 052	5.2	23	86	6	CRA 087	8.7	36	125	6					
CRA 053	5.3	23	86	6	CRA 088	8.8	36	125	6					
CRA 054	5.4	26	93	6	CRA 089	8.9	36	125	6					

unit: mm

DT

DENTAL END MILLS

DEN.pro

HGT®

HG TECHNOLOGY CO., LTD. <http://www.hgt.com.tw>

DT

DEN.pro

TOBF

MG

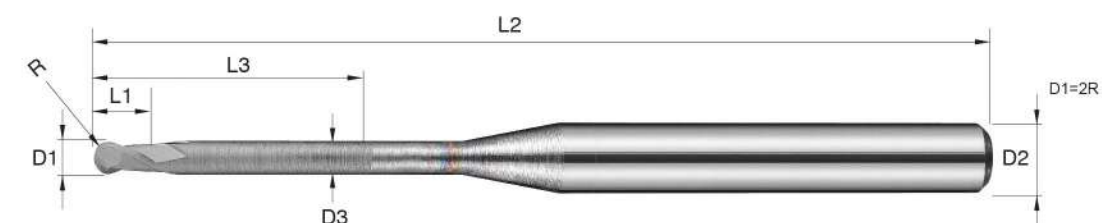
2

30°

Diamond

Finishing
Semi-Finishing

Dental end mills / 2 Flute / Long Neck / Ball Nose / for ZrO2



unit: mm

• ITEMS

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

TOBF
| END MILLS |

TTBF



Dental end mills / 2 Flute / Long Neck / Ball Nose / for CoCr . Titanium



unit: mm

• ITEMS

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

TTFA



Dental end mills / 2 Flute / Long Neck / Square / for CoCr . Titanium



unit: mm

• ITEMS

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

DT

DEN.pro

TTRAT
MG

2

30°

R

G-plus

Finishing
Semi-Finishing

Dental end mills / 2 Flute / Long Neck / Corner Radius / for CoCr . Titanium



unit: mm

• ITEMS

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

DT

DEN.pro

TWBFT
MG

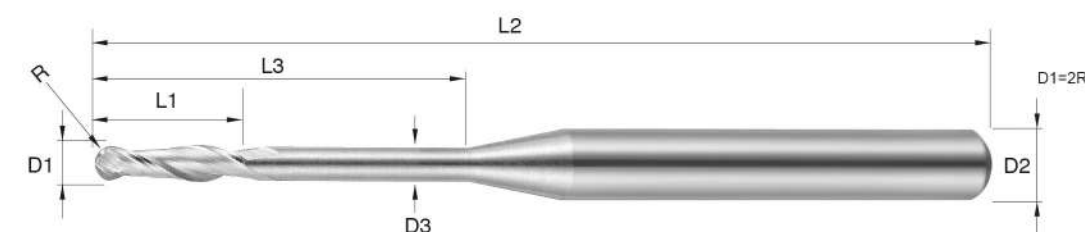
2

30°

R

Finishing
Semi-Finishing

Dental end mills / 2 Flute / Long Neck / Ball Nose / for PMMA. Wax



unit: mm

• ITEMS

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

DT

TTRBT
MG

4

30°

R

G-plus

Finishing
Semi-Finishing

Dental end mills / 4 Flute / Long Neck / Corner Radius / for CoCr . Titanium



unit: mm

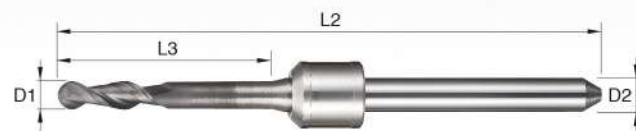
• ITEMS

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

Amann Girrbach

Compatible with:

TAZ



Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TAZ-00610	0.6	10	47	3	Ball Nose	2	Diamond	Zirconia
TAZ-01016	1.0	16	47	3	Ball Nose	2	Diamond	Zirconia
TAZ-02518	2.5	18	47	3	Ball Nose	2	Diamond	Zirconia

unit: mm

TAT



Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TAT-01008	1.0	8	43	3	Ball Nose	4	G-plus	CoCr./Titanium
TAT-02008	2.0	8	43	3	Ball Nose	4	G-plus	CoCr./Titanium

unit: mm

imes-icore

Compatible with:

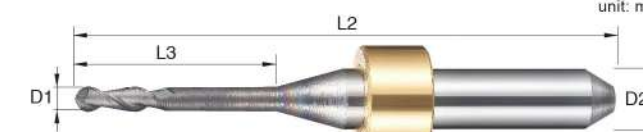
TIZ3



Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TIZ3-00610	0.6	10	48	3	Ball Nose	2	Diamond	Zirconia
TIZ3-01016	1.0	16	48	3	Ball Nose	2	Diamond	Zirconia
TIZ3-02518	2.5	18	48	3	Ball Nose	2	Diamond	Zirconia

unit: mm

TIZ6



Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TIZ6-01016	1.0	16	53	6	Ball Nose	2	Diamond	Zirconia
TIZ6-02520	2.5	20	53	6	Ball Nose	2	Diamond	Zirconia

unit: mm

TIT6

Compatible with machine models / CORITEC 350i,450i(do).650i



Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TIT6-00604	0.6	4	50	6	Ball Nose	2	G-plus	CoCr./Titanium
TIT6-01010	1.0	10	50	6	Ball Nose	2	G-plus	CoCr./Titanium
TIT6-01512	1.5	12	50	6	Ball Nose	2	G-plus	CoCr./Titanium
TIT6-02012	2.0	12	50	6	Ball Nose	2	G-plus	CoCr./Titanium
TIT6-03016	3.0	16	50	6	Ball Nose	2	G-plus	CoCr./Titanium

unit: mm

TIT3

Compatible with machine models / CORITEC one,150i,250i,350i,450i



Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TIT3-00616	0.6	16	50	3	Ball Nose	2	G-plus	CoCr./Titanium
TIT3-01010	1.0	10	50	3	Ball Nose	2	G-plus	CoCr./Titanium
TIT3-01512	1.5	12	50	3	Ball Nose	2	G-plus	CoCr./Titanium
TIT3-02012	2.0	12	50	3	Ball Nose	2	G-plus	CoCr./Titanium
TIT3-03016	3.0	16	50	3	Ball Nose	2	G-plus	CoCr./Titanium

unit: mm

Roland

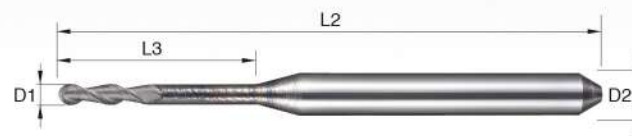
Compatible with:

TRZ

Compatible with machine models / DWX-4/50/51/52

Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TRZ-00610	0.6	10	50	4	Ball Nose	2	Diamond	Zirconia
TRZ-01014	1.0	14	50	4	Ball Nose	2	Diamond	Zirconia
TRZ-02018	2.0	18	50	4	Ball Nose	2	Diamond	Zirconia

unit: mm



TRT

Compatible with machine models / DWX-4/50/51/52

Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TRT-00606	0.6	6	50	4	Ball Nose	2	G-plus	CoCr./Titanium
TRT-01012	1.0	12	50	4	Ball Nose	2	G-plus	CoCr./Titanium
TRT-02014	2.0	14	50	4	Ball Nose	2	G-plus	CoCr./Titanium

unit: mm



vhf

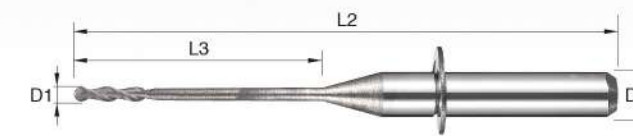
Compatible with:

TVZS

Compatible with machine models / K1,K3,K4,N4+,Z4

Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TVZS-01016	1.0	16	35	3	Ball Nose	2	Diamond	Zirconia
TVZS-02018	2.0	18	35	3	Ball Nose	2	Diamond	Zirconia

unit: mm

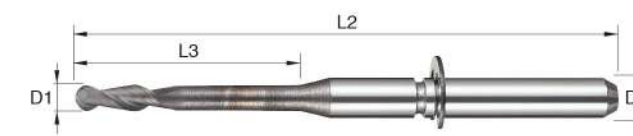


TVZM

Compatible with machine models / S1,S2,S5,K5+,R5,E5

Order No.	Cut Diameter D1	Neck Length L3	O.A.L. L2	Shank Dia D2	End Type	Number of flutes	Coating	Application
TVZM-01016	1.0	16	40	3	Ball Nose	2	Diamond	Zirconia
TVZM-02020	2.0	20	40	3	Ball Nose	2	Diamond	Zirconia

unit: mm



SOLID CARBIDE TOOLS

INCH SPECIFICATION

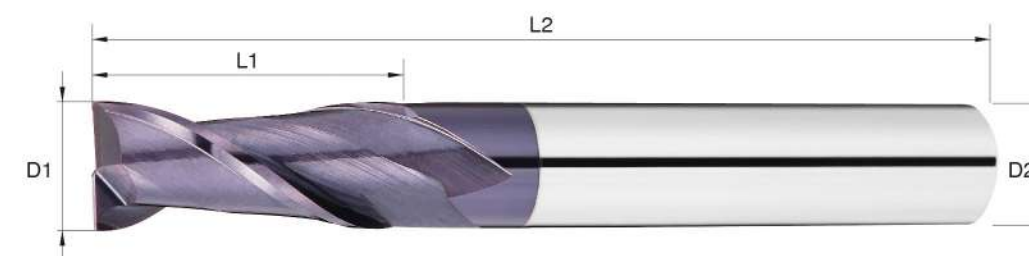


E EFFICIENCY MILLS

INCH IEA



Efficiency end mills series / 2 Flute / Square



• FEATURES

- 2 Flute Square for up to HRC55.
- Low/High alloy steel, cast steel, tool steel, and Cast iron.
- TiAlN Coating for General steel.

• ITEMS

unit: inch

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IEA 031A	1/32	3/32	1-1/2	1/8
IEA 046A	3/64	7/64	1-1/2	1/8
IEA 062A	1/16	1/4	1-1/2	1/8
IEA 078A	5/64	3/16	1-1/2	1/8
IEA 093A	3/32	3/8	1-1/2	1/8
IEA 109A	7/64	3/8	1-1/2	1/8
IEA 125A	1/8	1/2	1-1/2	1/8
IEA 140A	9/64	1/2	2	3/16
IEA 156A	5/32	9/16	2	3/16
IEA 171A	11/64	5/8	2	3/16
IEA 187A	3/16	5/8	2	3/16
IEA 203A	13/64	5/8	2-1/2	1/4
IEA 218A	7/32	5/8	2-1/2	1/4
IEA 234A	15/64	3/4	2-1/2	1/4
IEA 250A	1/4	3/4	2-1/2	1/4
IEA 312A	5/16	13/16	2-1/2	5/16
IEA 375A	3/8	1	2-1/2	3/8
IEA 437A	7/16	1	2-3/4	7/16
IEA 500A	1/2	1	3	1/12
IEA 625A	5/8	1-1/4	3-1/2	5/8
IEA 750A	3/4	1-1/2	4	3/4

• TOLERANCE

unit: inch

D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

E

EFFICIENCY MILLS

INCH

IEB

Efficiency end mills series / 4 Flute / Square

MG

4

35°

HRC

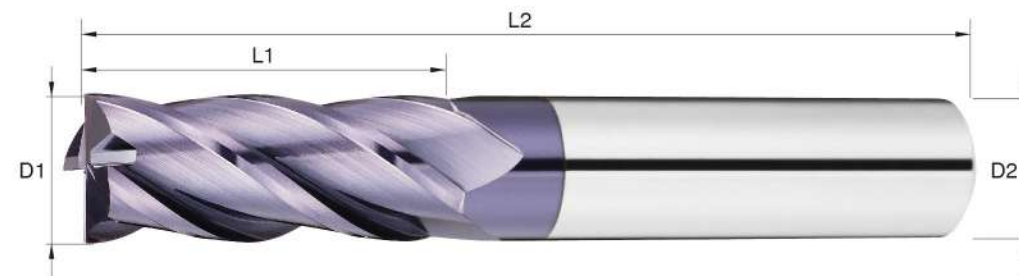
55

TiAlN

Finishing
Semi-Finishing

P

K



• FEATURES

- 4 Flute Square for up to HRC55.
- Low/High alloy steel, cast steel, tool steel, and Cast iron.
- TiAlN Coating for General steel.

• ITEMS

Order No.	unit: inch			
	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IEB 031A	1/32	3/32	1-1/2	1/8
IEB 062A	1/16	1/4	1-1/2	1/8
IEB 078A	5/64	3/16	1-1/2	1/8
IEB 093A	3/32	3/8	1-1/2	1/8
IEB 109A	7/64	3/8	1-1/2	1/8
IEB 125A	1/8	1/2	1-1/2	1/8
IEB 140A	9/64	1/2	2	3/16
IEB 156A	5/32	9/16	2	3/16
IEB 171A	11/64	5/8	2	3/16
IEB 187A	3/16	5/8	2	3/16
IEB 203A	13/64	5/8	2-1/2	1/4
IEB 218A	7/32	5/8	2-1/2	1/4
IEB 234A	15/64	3/4	2-1/2	1/4
IEB 250A	1/4	3/4	2-1/2	1/4
IEB 312A	5/16	13/16	2-1/2	5/16
IEB 375A	3/8	1	2-1/2	3/8
IEB 437A	7/16	1	2-3/4	7/16
IEB 500A	1/2	1	3	1/2
IEB 562A	9/16	1-1/8	3-1/2	9/16
IEB 625A	5/8	1-1/4	3-1/2	5/8
IEB 750A	3/4	1-1/2	4	3/4

• TOLERANCE

unit: inch			
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

E

EFFICIENCY MILLS

INCH

IELC

Efficiency end mills series / 2 Flute / Long Flute / Square

MG

2

35°

HRC

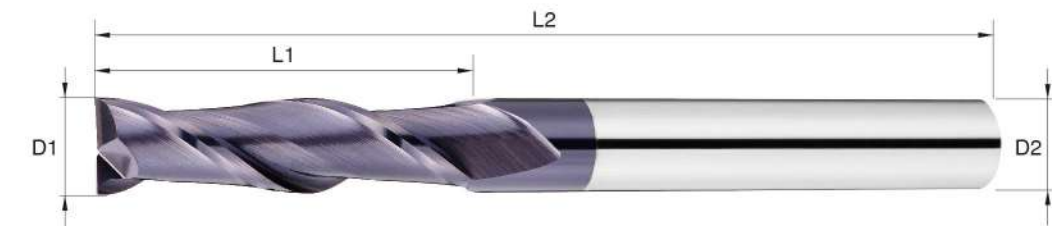
55

TiAlN

Finishing
Semi-Finishing

P

K



• FEATURES

- Long Flute 2 Flute Square for up to HRC55.
- Extended flute length (L1) suitable for deep side milling.
- TiAlN Coating for General steel.

• ITEMS

Order No.	unit: inch			
	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IELC 125A-S	1/8	3/4	2	1/8
IELC 187A-L	3/16	1-1/8	3	3/16
IELC 250A-S	1/4	1-1/8	3	1/4
IELC 312A	5/16	1-5/8	4	5/16
IELC 375A	3/8	2	4	3/8
IELC 500A	1/2	2	4	1/2
IELC 625A	5/8	3	6	5/8
IELC 750A	3/4	3	6	3/4

• TOLERANCE

unit: inch			
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

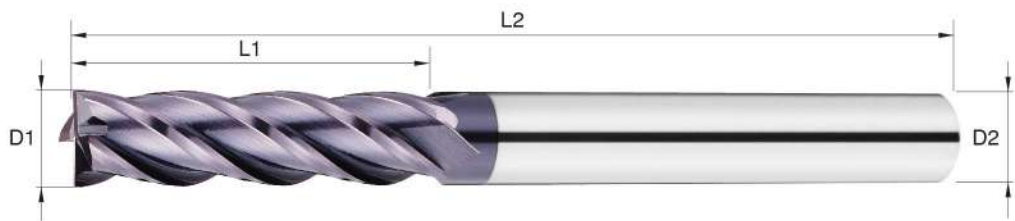
E EFFICIENCY MILLS

INCH **IELD**

Efficiency end mills series / 4 Flute / Long Flute / Square



P K



• FEATURES

- Long Flute 4 Flute Square for up to HRC55.
- Extended flute length (L1) suitable for deep side milling.
- TiAlN Coating for General steel.

• ITEMS

unit: inch				
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IELD 062A	1/16	0.312"	3	1/8
IELD 093A	3/32	0.55"	3	1/8
IELD 125A-S	1/8	3/4	2	1/8
IELD 156A	5/32	1-1/8	3	3/16
IELD 187A-L	3/16	1-1/8	3	3/16
IELD 250A-S	1/4	1-1/8	3	1/4
IELD 312A	5/16	1-5/8	4	5/16
IELD 375A	3/8	2	4	3/8
IELD 500A	1/2	2	4	1/2
IELD 625A	5/8	3	6	5/8
IELD 750A	3/4	3	6	3/4

• TOLERANCE

unit: inch			
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

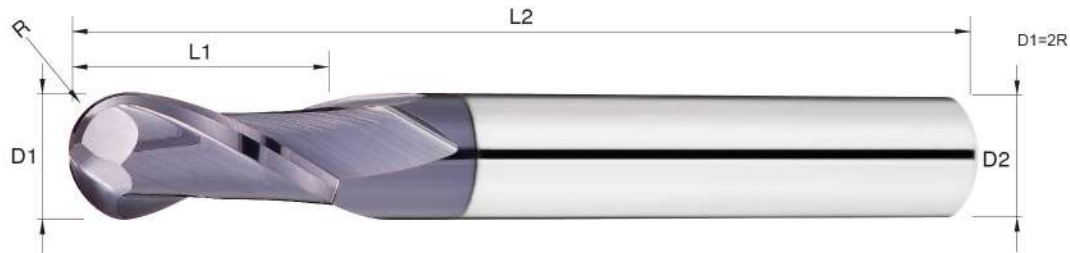
E EFFICIENCY MILLS

INCH **IBA**

Efficiency end mills series / 2 Flute / Ball Nose



P K



• FEATURES

- 2 Flute Ball Nose for workpiece up to HRC55.
- Low/High alloy steel, cast steel, tool steel, and Cast iron.
- TiAlN Coating for General steel.

• ITEMS

unit: inch				
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IBA 125A	1/8	1/2	1-1/2	1/8
IBA 156A	5/32	9/16	2	3/16
IBA 187A	3/16	5/8	2	3/16
IBA 218A	7/32	5/8	2-1/2	1/4
IBA 250A	1/4	3/4	2-1/2	1/4
IBA 312A	5/16	13/16	2-1/2	5/16
IBA 375A	3/8	1	2-1/2	3/8
IBA 437A	7/16	1	2-3/4	7/16
IBA 500A	1/2	1	3	1/2
IBA 625A	5/8	1-1/4	3-1/2	5/8
IBA 750A	3/4	1-1/4	4	3/4

• TOLERANCE

unit: inch			
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

E

EFFICIENCY MILLS

INCH

IBB

Efficiency end mills series / 4 Flute / Ball Nose

MG

4

30°

HRC

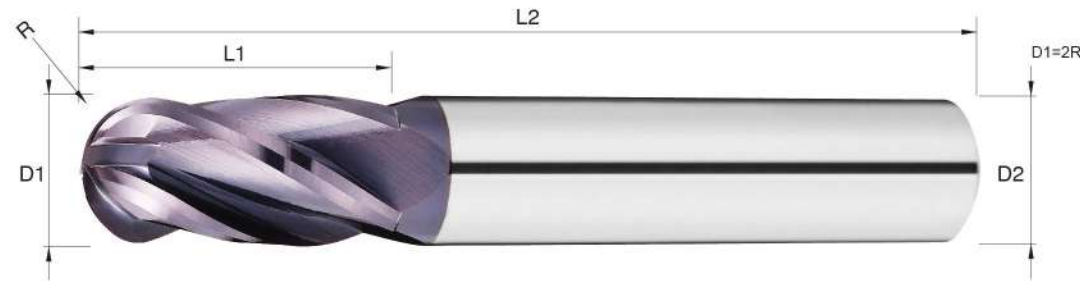
55

TiAlN

Finishing
Semi-Finishing

P

K



• FEATURES

- 4 Flute Ball Nose for workpiece up to HRC55.
- Low/High alloy steel, cast steel, tool steel, and Cast iron.
- TiAlN Coating for General steel.

• ITEMS

Order No.	unit: inch			
	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IBB 046A	3/64	7/64	1-1/2	1/8
IBB 062A	1/16	1/4	1-1/2	1/8
IBB 125A	1/8	1/2	1-1/2	1/8
IBB 156A	5/32	9/16	2	3/16
IBB 187A	3/16	5/8	2	3/16
IBB 218A	7/32	5/8	2-1/2	1/4
IBB 250A	1/4	3/4	2-1/2	1/4
IBB 312A	5/16	13/16	2-1/2	5/16
IBB 375A	3/8	1	2-1/2	3/8
IBB 437A	7/16	1	2-3/4	7/16
IBB 500A	1/2	1	3	1/2
IBB 625A	5/8	1-1/4	3-1/2	5/8
IBB 750A	3/4	1-1/2	4	3/4

• TOLERANCE

unit: inch			
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

E

EFFICIENCY MILLS

INCH

IBALF

Efficiency end mills series / 2 Flute / Ball Nose

MG

2

30°

HRC

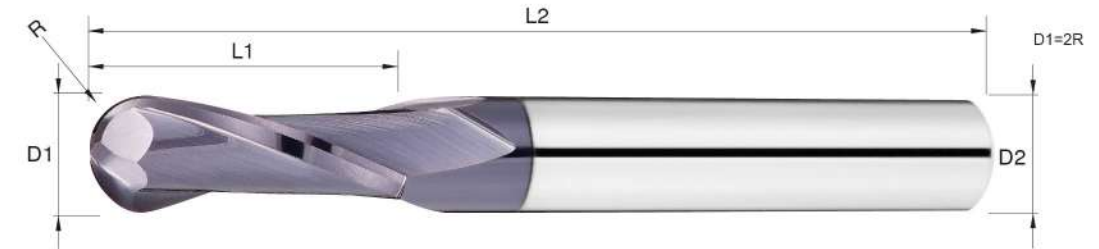
55

TiAlN

Finishing
Semi-Finishing

P

K



• FEATURES

- Long Flute 2 Flute Ball Nose for workpiece up to HRC55.
- Low/High alloy steel, cast steel, tool steel, and Cast iron.
- TiAlN Coating for General steel.

• ITEMS

Order No.	unit: inch			
	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IBALF 125A-S	1/8	3/4	2	1/8
IBALF 187A-L	3/16	1-1/8	3	3/16
IBALF 250A-S	1/4	1-1/8	3	1/4
IBALF 312A	5/16	1-5/8	4	5/16
IBALF 375A	3/8	2	4	3/8
IBALF 500A	1/2	2	4	1/2
IBALF 625A	5/8	3	6	5/8
IBALF 750A	3/4	3	6	3/4

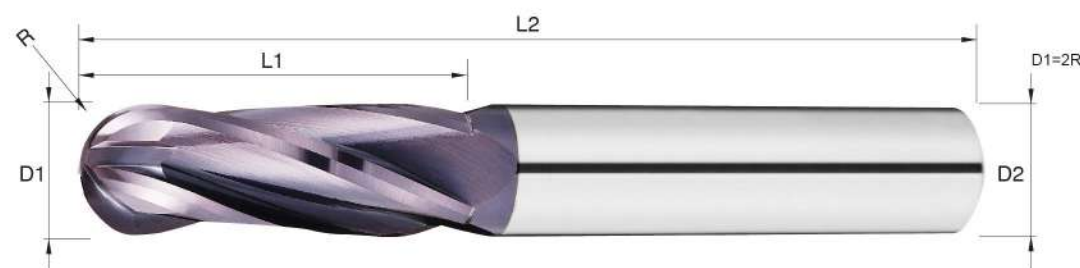
• TOLERANCE

unit: inch			
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

E EFFICIENCY MILLS

INCH **IBBLF**

Efficiency end mills series / 4 Flute / Ball Nose



• FEATURES

- Long Flute 4 Flute Ball Nose for workpiece up to HRC55.
- Low/High alloy steel, cast steel, tool steel, and Cast iron.
- TiAlN Coating for General steel.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IBBLF 125A-S	1/8	3/4	2	1/8
IBBLF 187A-L	3/16	1-1/8	3	3/16
IBBLF 250A-S	1/4	1-1/8	3	1/4
IBBLF 312A	5/16	1-5/8	4	5/16
IBBLF 375A	3/8	2	4	3/8
IBBLF 500A	1/2	2	4	1/2
IBBLF 625A	5/8	3	6	5/8
IBBLF 750A	3/4	3	6	3/4

unit: inch

• TOLERANCE

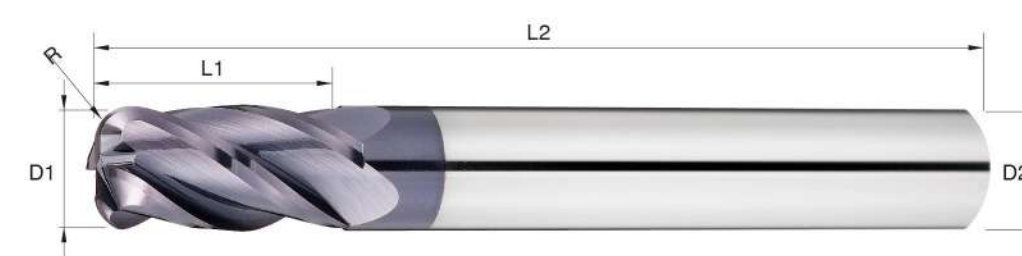
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

unit: inch

E EFFICIENCY MILLS

INCH **IRB**

Efficiency end mills series / 4 Flute / Corner Radius



• FEATURES

- 4 Flute Corner Radius for up to HRC55.
- Low/High alloy steel, cast steel, tool steel, and Cast iron.
- TiAlN Coating for General steel.

• ITEMS

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
IRB 125R015	1/8	0.015	1/2	1-1/2	1/8
IRB 125R030	1/8	0.03	1/2	1-1/2	1/8
IRB 187R015	3/16	0.015	5/8	2	3/16
IRB 187R030	3/16	0.03	5/8	2	3/16
IRB 250R015	1/4	0.015	3/4	2-1/2	1/4
IRB 250R030	1/4	0.03	3/4	2-1/2	1/4
IRB 250R045	1/4	0.045	3/4	2-1/2	1/4
IRB 312R015	5/16	0.015	13/16	2-1/2	5/16
IRB 312R030	5/16	0.03	13/16	2-1/2	5/16
IRB 312R045	5/16	0.045	13/16	2-1/2	5/16
IRB 375R015	3/8	0.015	1	2-1/2	3/8
IRB 375R030	3/8	0.03	1	2-1/2	3/8
IRB 375R045	3/8	0.045	1	2-1/2	3/8
IRB 375R060	3/8	0.06	1	2-1/2	3/8
IRB 437R015	7/16	0.015	1	2-3/4	7/16
IRB 437R030	7/16	0.03	1	2-3/4	7/16
IRB 437R045	7/16	0.045	1	2-3/4	7/16
IRB 437R060	7/16	0.06	1	2-3/4	7/16
IRB 437R090	7/16	0.09	1	2-3/4	7/16
IRB 500R015	1/2	0.015	1	3	1/2
IRB 500R030	1/2	0.03	1	3	1/2
IRB 500R045	1/2	0.045	1	3	1/2
IRB 500R060	1/2	0.06	1	3	1/2
IRB 500R090	1/2	0.09	1	3	1/2
IRB 500R125	1/2	0.125	1	3	1/2

unit: inch

• TOLERANCE

D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

unit: inch

E EFFICIENCY MILLS

INCH

IRC

MG

4

35°

R

HRC 55

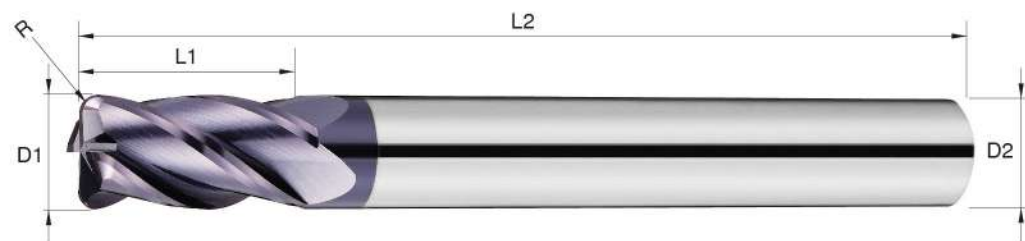
TiAlN

Finishing
Semi-Finishing

Efficiency end mills series / 4 Flute / Long Shank Corner Radius

P

K



• FEATURES

- Long shank 4 Flute Corner Radius for up to HRC55.
- Extended overall length for greater depth of cut.
- TiAlN Coating for General steel.

• ITEMS

unit: inch					
Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
IRC 250R020	1/4	0.02	3/4	4	1/4
IRC 250R030	1/4	0.03	3/4	4	1/4
IRC 250R045	1/4	0.045	3/4	4	1/4
IRC 312R020	5/16	0.02	13/16	4	5/16
IRC 312R030	5/16	0.03	13/16	4	5/16
IRC 312R045	5/16	0.045	13/16	4	5/16
IRC 375R020	3/8	0.02	1	4	3/8
IRC 375R030	3/8	0.03	1	4	3/8
IRC 375R045	3/8	0.045	1	4	3/8
IRC 375R060	3/8	0.06	1	4	3/8
IRC 375R090	3/8	0.09	1	4	3/8
IRC 375R125	3/8	0.125	1	4	3/8
IRC 500R020	1/2	0.02	1	4	1/2
IRC 500R030	1/2	0.03	1	4	1/2
IRC 500R045	1/2	0.045	1	4	1/2
IRC 500R060	1/2	0.06	1	4	1/2
IRC 500R090	1/2	0.09	1	4	1/2
IRC 500R125	1/2	0.125	1	4	1/2

• TOLERANCE

unit: inch			
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

S SUPER MILL

INCH

ISW

S

MG

4

35°/38°

α° β°

HRC 60

i8

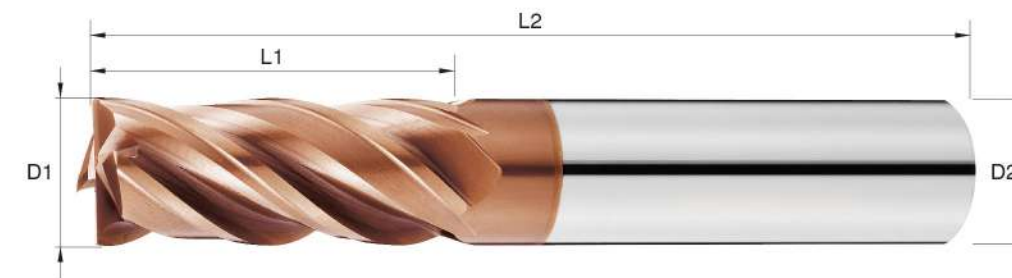
Finishing
Semi-Finishing

HSC & HHC series / 4 Flute / Square

H

P

K



• FEATURES

- 4 Flute Square for up to HRC60.
- Variable helix angle and unequal flute spacing designed for stability and anti-vibration.
- i8 Coating: High temperature and low wear resistance.

• ITEMS

unit: inch				
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ISW-062	1/16	11/64	2	1/8
ISW-125	1/8	3/8	2	1/8
ISW-187	3/16	7/16	2	3/16
ISW-250	1/4	5/8	2-1/2	1/4
ISW-312	5/16	13/16	2-1/2	5/16
ISW-375	3/8	7/8	2-1/2	3/8
ISW-500	1/2	1-1/4	3	1/2
ISW-625	5/8	1-5/8	3-1/2	5/8
ISW-750	3/4	1-3/4	4	3/4

• TOLERANCE

unit: inch			
D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

S

SUPER MILL

INCH

ISWR

S
MG

4

35°/38°

 $\alpha^\circ \neq \beta^\circ$

R

HRC
60

i8

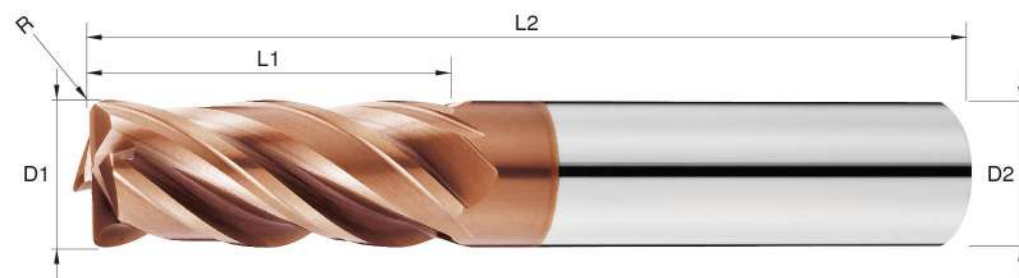
Finishing
Semi-Finishing

HSC & HHC series / 4 Flute / Corner Radius

H

P

K



• FEATURES

- 4 Flute Corner Radius for up to HRC60.
- Variable helix angle and unequal flute spacing designed for stability and anti-vibration.
- i8 Coating: High temperature resistance and low wear.

• ITEMS

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
ISWR-062R020	1/16	0.02	11/64	2	1/8
ISWR-125R020	1/8	0.02	3/8	2	1/8
ISWR-187R020	3/16	0.02	7/16	2	3/16
ISWR-250R020	1/4	0.02	5/8	2-1/2	1/4
ISWR-312R020	5/16	0.02	13/16	2-1/2	5/16
ISWR-375R020	3/8	0.02	7/8	2-1/2	3/8
ISWR-500R020	1/2	0.02	1-1/4	3	1/2
ISWR-625R020	5/8	0.02	1-5/8	3-1/2	5/8
ISWR-750R020	3/4	0.02	1-3/4	4	3/4

unit: inch

• TOLERANCE

D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

unit: inch

I

I.pro

INCH

IIA

S
MG

4

37°/40°

 $\alpha^\circ \neq \beta^\circ$

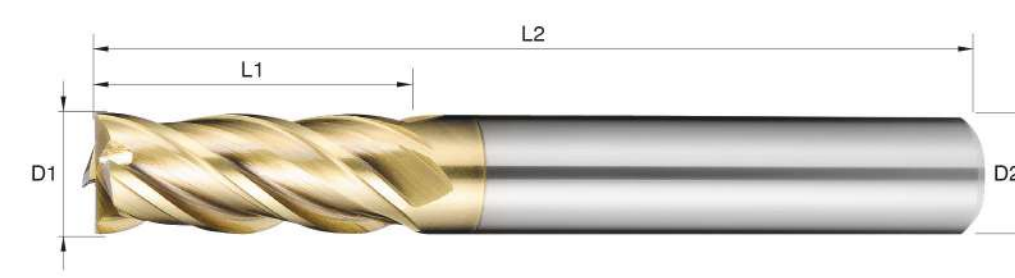
G-plus

Finishing
Semi-Finishing

Titanium & Stainless cutting series / 4 Flute / Square

M

S



• FEATURES

- 4 Flute Square for Stainless Steel, Titanium & Ti alloys, and High temp. alloy.
- Variable helix angle and unequal flute spacing offer great stability and anti-vibration.
- G-plus Coating: Excellent wear resistance and heat resistance.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IIA-125	1/8	3/8	1/8	2
IIA-187	3/16	7/16	3/16	2
IIA-250	1/4	5/8	1/4	2-1/2
IIA-312	5/16	13/16	5/16	2-1/2
IIA-375	3/8	7/8	3/8	2-1/2
IIA-500	1/2	1-1/4	1/2	3
IIA-625	5/8	1-5/8	5/8	3-1/2

unit: inch

• TOLERANCE

D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

unit: inch

I

I.pro

INCH

IIAR

S

MG

4

37°/40°

α°≠β°

R

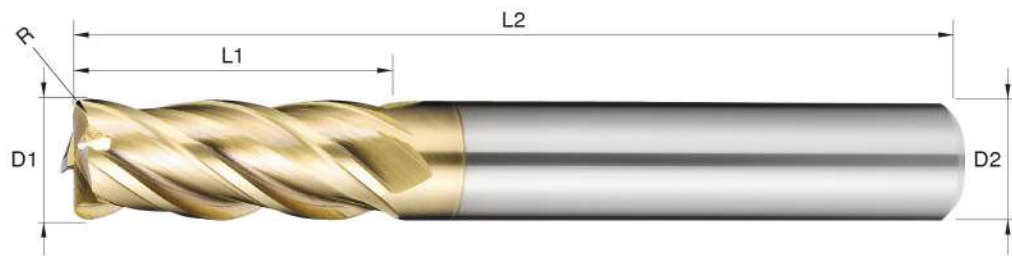
G-plus

Finishing
Semi-Finishing

Titanium & Stainless cutting series / 4 Flute / Corner Radius

M

S



• FEATURES

- 4 Flute Corner Radius for Stainless Steel, Titanium & Ti alloys, and High temp. alloy.
- Variable helix angle and unequal flute spacing offer great stability and anti-vibration.
- G-plus Coating: Excellent wear resistance and heat resistant.

• ITEMS

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
IIAR-125R020	1/8	0.02	3/8	2	1/8
IIAR-187R020	3/16	0.02	7/16	2	3/16
IIAR-250R020	1/4	0.02	5/8	2-1/2	1/4
IIAR-312R020	5/16	0.02	13/16	2-1/2	5/16
IIAR-375R020	3/8	0.02	7/8	2-1/2	3/8
IIAR-500R020	1/2	0.02	1-1/4	3	1/2
IIAR-625R020	5/8	0.02	1-5/8	3-1/2	5/8

• TOLERANCE

D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

D

D MILL

INCH

IAES

S

MG

3

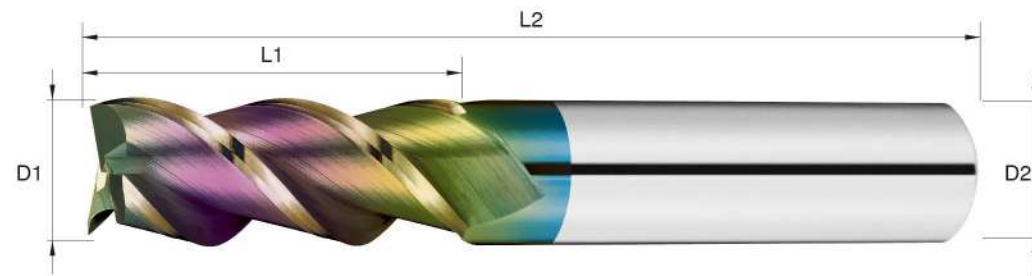
45°

DLC-X

Finishing

Aluminum & Copper cutting series / 3 Flute / Square

N



• FEATURES

- 3 Flute Square End for Aluminum.
- Helix Angle: 45°
- Planing, Slotting, and Side Milling.
- DLC-X Coating: Reduce friction coefficient and improve chip removal efficiency.

• ITEMS

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
IAES 125	1/8	3/8	2	1/8
IAES 187	3/16	7/16	2	3/16
IAES 250	1/4	5/8	2-1/2	1/4
IAES 312	5/16	13/16	2-1/2	5/16
IAES 375	3/8	7/8	2-1/2	3/8
IAES 500	1/2	1-1/4	3	1/2
IAES 625	5/8	1-5/8	3-1/2	5/8

• TOLERANCE

D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

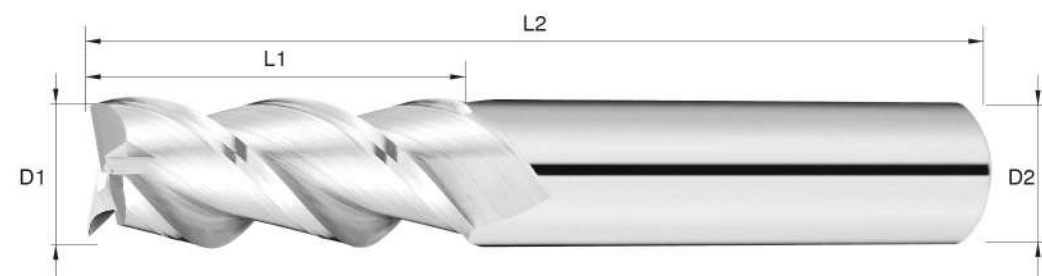
D
D MILL

INCH
IAE

S
MG
3
45°
Finishing

Aluminum & Copper cutting series / 3 Flute / Square

N



FEATURES

- 3 Flute Square for Aluminum.
- Helix Angle: 45°
- Planing, Slotting, and Side Milling.

ITEMS

Order No.	Diameter D1	Flute Length L1	Shank Dia D2	O.A.L. L2
IAE 125	1/8	3/8	1/8	2
IAE 187	3/16	7/16	3/16	2
IAE 250	1/4	5/8	1/4	2-1/2
IAE 312	5/16	13/16	5/16	2-1/2
IAE 375	3/8	7/8	3/8	2-1/2
IAE 500	1/2	1-1/4	1/2	3
IAE 625	5/8	1-5/8	5/8	3-1/2

TOLERANCE

D1	Tolerance	D2	Tolerance
1/32 ~ 3/4	+0.000 / -0.0012	.1182 ~ 1.000	h6

V70

HARDENED STEELS HRC70 SERIES

Recommended cutting condition for V70B

MATERIAL	Hardened Steels SKD61, SKT4		Hardened Steels SKD11, SKH51		Hardened Steels SKH, HAP	
HARDNESS	~HRC55		~HRC65		~HRC70	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R1.5	22000	2200	18000	1800	10500	850
R2	16500	2200	13500	1800	8000	850
R2.5	13400	2200	11000	1850	6400	850
R3	11300	2300	9100	1850	5500	850
R4	8600	2350	7000	1900	4100	850
R5	7000	2350	5600	1900	3200	850
R6	5800	2300	4700	1850	2700	850

Depth of cut



HRC55
ap=0.1 D1
ae=0.3 D1



HRC65
ap=0.06 D1
ae=0.18 D1

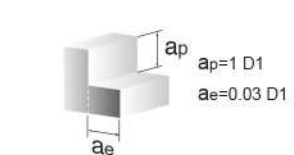


HRC70
ap=0.05 D1
ae=0.15 D1

Recommended cutting condition for V70R

MATERIAL	Hardened Steels SKD61, SKT4		Hardened Steels SKD11, SKH51		Hardened Steels SKS, SKH	
HARDNESS	~HRC55		~HRC65		~HRC70	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
6	5050	420	4000	260	3500	200
8	3800	400	3000	250	2700	180
10	3050	360	2400	240	2100	160
12	2520	360	2000	230	1800	150

Depth of cut

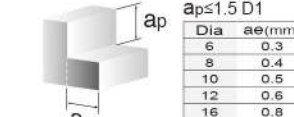


ap=1 D1
ae=0.03 D1

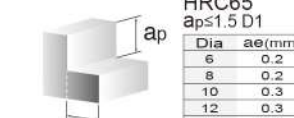
Recommended cutting condition for V70E

MATERIAL	Hardened Steels SKD61, SKT4		Hardened Steels SKD11		Hardened Steels SKS, SKH	
HARDNESS	~HRC55		~HRC65		~HRC70	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
6	13000	4600	6400	2400	4200	1450
8	10000	4600	4800	2400	3200	1450
10	7700	4600	4000	2400	2600	1450
12	6400	3800	3200	1900	2200	1200
16	4800	2900	2400	1400	1600	900

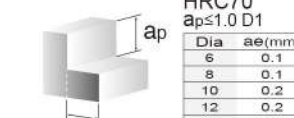
Depth of cut



Dia	ae(mm)
6	0.3
8	0.4
10	0.5
12	0.6
16	0.8



Dia	ae(mm)
6	0.2
8	0.2
10	0.3
12	0.3
16	0.5



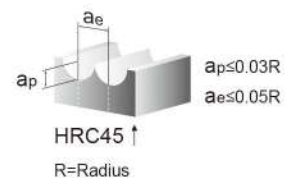
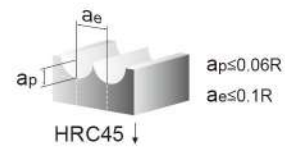
Dia	ae(mm)
6	0.1
8	0.1
10	0.2
12	0.2
16	0.3

CUTTING CONDITION

• Recommended cutting condition for **QBMS**

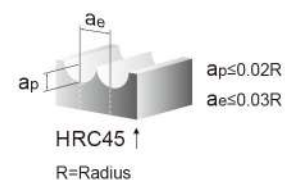
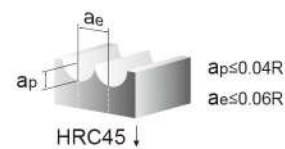
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R0.1	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.15	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.2	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.25	32000	600 - 700	32000	500 - 600	25000	400 - 500
R0.3	32000	600 - 700	32000	500 - 600	25000	400 - 500
R0.35	32000	700 - 800	32000	600 - 700	25000	500 - 600
R0.4	32000	900 - 1000	32000	800 - 900	25000	600 - 700
R0.45	32000	1000 - 1100	32000	900 - 1000	25000	600 - 700

• Depth of cut

• Recommended cutting condition for **QB, QBGS, QBN, QBX, QBHN, QBHX, QBL.S.M.L, QBL.SX.MX.LX**

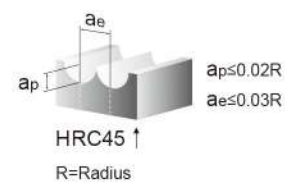
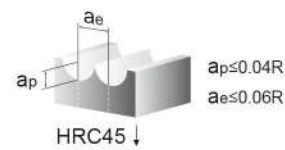
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R1	23000	2000	22000	1800	16000	900
R1.5	16000	2000	15000	1800	11000	900
R2	15000	2400	14000	2000	10000	1300
R3	17000	5500	14000	5000	9000	1500
R4	12000	4000	9000	3000	6200	1400
R5	9000	3500	7000	2800	5200	900
R6	8000	2800	6500	1800	4300	800
R8	7000	2000	5000	1500	3300	700

• Depth of cut

• Recommended cutting condition for **QBP**

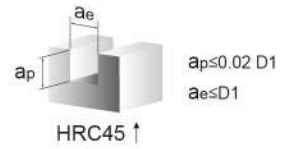
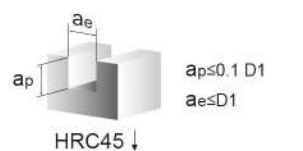
MATERIAL	Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Alloy Steels . Tool Steels SKD61		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R1	45000	2000	18000	1500	12000	1200
R1.5	42000	2000	18000	1500	12000	1200
R2	15000	3000	18000	1500	12000	1200
R3	13000	5000	11000	3500	8000	1700
R4	9000	3000	8000	2000	4000	1400
R5	7500	2500	6500	1800	3500	1300

• Depth of cut

• Recommended cutting condition for **QEMS**

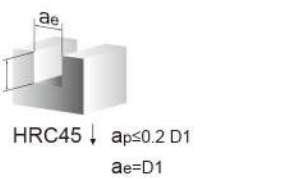
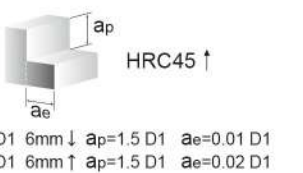
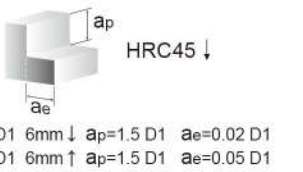
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
0.2	40000	100 - 300	30000	80 - 250	15000	50 - 150
0.3	40000	100 - 350	30000	80 - 300	15000	50 - 200
0.4	40000	100 - 400	25000	80 - 350	10000	50 - 250
0.5	40000	100 - 500	25000	80 - 400	10000	50 - 250
0.6	38000	100 - 600	25000	80 - 500	8000	50 - 250
0.7	36000	100 - 700	20000	80 - 600	8000	50 - 250
0.8	34000	100 - 800	20000	80 - 700	8000	50 - 250
0.9	32000	100 - 1000	20000	80 - 800	8000	50 - 250

• Depth of cut

• Recommended cutting condition for **QEB, QEBGS, QEBN**

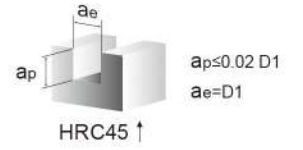
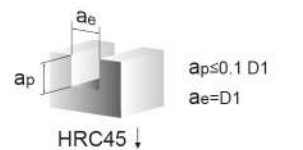
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
3	20000	2000	16000	1000	9000	500
4	19000	2000	12000	1300	6000	550
5	13000	1800	10000	1400	5000	500
6	10000	3000	8000	1500	4500	700
8	8000	3200	5000	1300	3500	600
10	7000	3000	4500	1200	3000	500
12	5000	2000	4000	1100	2000	500
16	4000	1800	3500	1000	1800	450
20	3500	1600	3000	1000	1300	450
3	20000	2000	20000	1200	16000	1200
4	16000	2000	16000	1200	12000	1300
5	13000	1800	13000	1100	10000	1400
6	10000	3000	10000	2100	8000	1500
8	8000	2900	8000	1800	6000	1400
10	7000	2800	6000	1700	5000	1300
12	5000	2300	5500	1700	4500	1200
16	3500	1800	4500	1800	3500	1200
20	3000	1400	3000	1500	2600	1100

• Depth of cut

• Recommended cutting condition for **QEX**

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
3	9000	600	5500	310	3500	220
4	6000	600	5000	400	2200	220
5	4800	750	4000	400	1700	240
6	4500	800	3800	420	1600	300
8	3500	820	2800	420	1000	300
10	3000	820	1800	420	900	300
12	2000	820	1600	350	800	300
16	1500	650	1000	300	500	150
20	1200	600	900	300	400	150

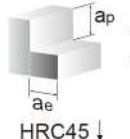
• Depth of cut

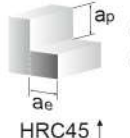


• Recommended cutting condition for **QELB**

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
6	4500	800	3800	420	1600	300
8	3500	820	2800	420	1000	300
10	3000	820	1800	420	900	300
12	2000	820	1600	350	800	300

• Depth of cut

 $a_p = 1.5 D1$
 $a_e = 0.1 D1$
HRC45 ↓

 $a_p = 1 D1$
 $a_e = 0.05 D1$
HRC45 ↑

• Recommended cutting condition for **QBF**

MATERIAL		Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80			
Radius(R)	EFFECTIVE LENGTH	SPEED (min ⁻¹)	FEED mm / min	DEPTH OF CUT a_p (mm)	
R0.25	4	30000 - 40000	200 - 650	0.015	
	6	30000 - 40000	200 - 650	0.013	
R0.3	4	27000 - 40000	180 - 650	0.025	
	6	27000 - 40000	180 - 650	0.015	
R0.4	6	25000 - 40000	400 - 750	0.025	
	8	25000 - 40000	400 - 750	0.025	
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	
R0.6	8	22000 - 25000	500 - 600	0.05	
	12	22000 - 25000	500 - 600	0.03	
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	
R0.8	8	13000 - 18000	350 - 800	0.08	
	12	13000 - 18000	350 - 800	0.06	
	16	13000 - 18000	350 - 800	0.05	
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	

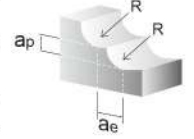
• Depth of cut

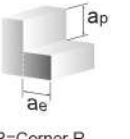
 a_e
 a_p
 $R < 1 \quad a_e < 0.1R$
 $R > 1 \quad a_e < 0.2R$
 $R = \text{Radius}$

• Recommended cutting condition for **QRD, QRDGS, QRDN, QRHN, QRHX, QERC, QRHLX**

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
2	26000	1600	16500	1000	7500	300
3	19000	1800	12000	1200	5400	360
4	16000	3200	10000	1900	4800	480
5	14000	3300	8000	2000	3800	500
6	12000	3600	7200	2200	3500	650
8	9600	4000	5600	2200	2700	750
10	7000	3400	4400	1700	2100	650
12	6000	2800	3600	1400	1800	600

• Depth of cut

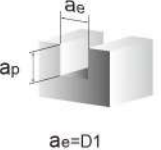
 $a_p \leq 0.02R$
 $a_e \leq 0.02R$
HRC45 ↓

 $a_p \leq D1$
 $a_e \leq 0.02 D1$
HRC45 ↑
 $R = \text{Corner R}$

• Recommended cutting condition for **QEFAS**

MATERIAL		Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80		
Dia.(D1)	EFFECTIVE LENGTH	SPEED (min ⁻¹)	FEED mm / min	DEPTH OF CUT a_p (mm)
1	4	25000	1500	0.05
	6	25000	1500	0.03
	10	25000	1500	0.01
1.5	4	15000	1200	0.10
	8	15000	1200	0.05
	10	15000	1200	0.025
	12	15000	1200	0.018
2	8	12000	900	0.20
	10	8800	700	0.12
	12	7500	600	0.05
	16	7000	500	0.02
3	8	8000	600	0.50
	12	8000	600	0.45
	16	5500	450	0.18
	20	4000	300	0.15
	10	6000	400	0.70
	16	6000	400	0.40

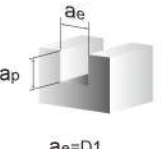
• Depth of cut

 a_e
 a_p
 $a_e = D1$

• Recommended cutting condition for **QRFAS**

MATERIAL		Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80		
Dia.(D1)	EFFECTIVE LENGTH	SPEED (min ⁻¹)	FEED mm / min	DEPTH OF CUT a_p (mm)
1	4	30000	2200	0.15
	6	30000	2200	0.12
	8	30000	2200	0.12
	10	30000	2200	0.12
1.5	4	25000	1800	0.20
	6	25000	1800	0.18
	8	25000	1800	0.15
	10	25000	1800	0.15
	12	25000	1800	0.15
2	8	20000	1500	0.30
	10	20000	1500	0.30
	12	20000	1500	0.25
	16	20000	1500	0.25
3	8	12000	900	0.40
	12	12000	900	0.40
	16	12000	900	0.30
	20	12000	900	0.30

• Depth of cut

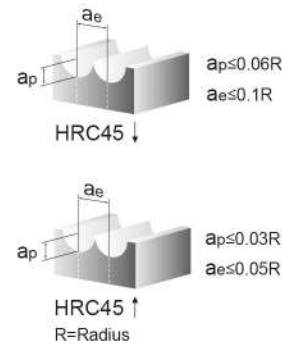
 a_e
 a_p
 $a_e = D1$

SUPER MILL FOR HRC60 STEELS SERIES

• Recommended cutting condition for SBM, SBMV

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	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R0.1	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.15	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.2	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.25	32000	600 - 700	32000	500 - 600	25000	400 - 500
R0.3	32000	600 - 700	32000	500 - 600	25000	400 - 500
R0.35	32000	700 - 800	32000	600 - 700	25000	500 - 600
R0.4	32000	900 - 1000	32000	800 - 900	25000	600 - 700
R0.45	32000	1000 - 1100	32000	900 - 1000	25000	600 - 700

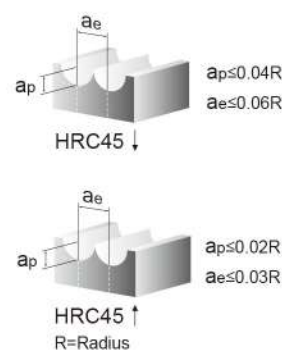
• Depth of cut



• Recommended cutting condition for SB, SBK, SBX, SBLs.M.L, SBLsX.MX.LX

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	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R0.5	45000	2000	45000	1800	28000	1000
R1	23000	2000	22000	1800	16000	900
R1.5	16000	2000	15000	1800	11000	900
R2	15000	2400	14000	2000	10000	1300
R3	13000	3200	11000	2000	9000	1500
R4	9000	2300	8000	1500	6200	1400
R5	7500	1900	6500	1200	5200	900
R6	6300	1600	5500	1000	4300	800
R8	4500	1200	3800	800	3300	700

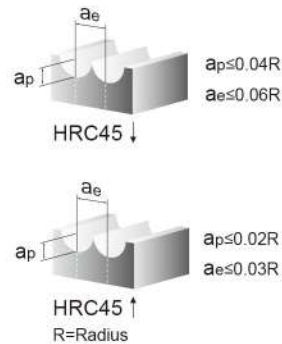
• Depth of cut



• Recommended cutting condition for SBB

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	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R2	15000	3000	14000	2600	10000	1700
R3	13000	4000	11000	2600	9000	1900
R4	9000	2900	8000	1900	6200	1800
R5	7500	2400	6500	1500	5200	1100
R6	6300	2100	5500	1300	4300	1000
R8	4500	1500	3800	1000	3300	900
R10	3700	1200	3200	750	2600	600

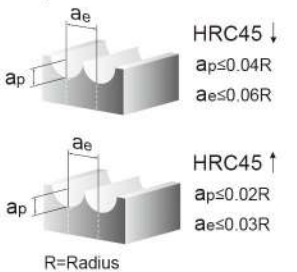
• Depth of cut



• Recommended cutting condition for SBC, SBCX

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	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R1	23000	2000	22000	1800	16000	900
R1.5	16000	2000	15000	1800	11000	900
R2	15000	2400	14000	2000	10000	1300
R3	13000	3200	11000	2000	9000	1500

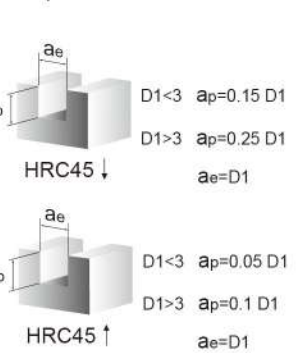
• Depth of cut



• Recommended cutting condition for SEA, SELA

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
1	20000	80	15000	45	11000	30
1.5	13600	135	10000	60	9000	40
2	9600	150	8500	50	6000	45
3	6500	200	5800	75	4000	60
4	5500	250	4000	80	3200	60
5	4500	300	3000	80	2500	70
6	4000	300	2500	80	2200	70
8	3500	350	2200	90	1700	70
10	3000	400	2000	90	1500	70
12	2500	400	1500	100	1000	70
16	2000	400	1200	100	800	70

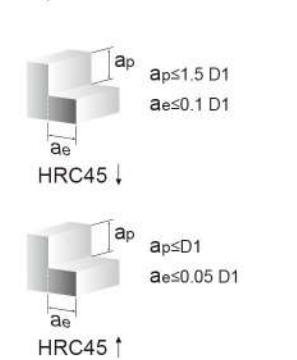
• Depth of cut



• Recommended cutting condition for SEB, SEK, SEX, SELB

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
1	22000	400	18000	200	9000	140
1.5	12000	500	11000	280	5200	150
2	10000	550	10000	280	4600	170
3	9000	600	5500	310	3500	220
4	6000	600	5000	400	2200	220
5	4800	750	4000	400	1700	240
6	4500	800	3800	420	1600	300
8	3500	820	2800	420	1000	300
10	3000	820	1800	420	900	300
12	2000	820	1600	350	800	300
16	1500	650	1000	300	500	150
20	1200	600	900	300	400	150

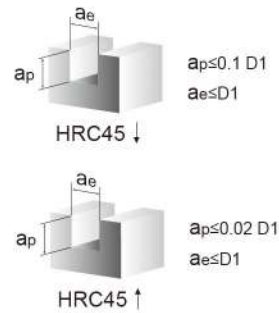
• Depth of cut



• Recommended cutting condition for SEM, SEMV

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
0.2	40000	100 - 300	30000	80 - 250	15000	50 - 150
0.3	40000	100 - 350	30000	80 - 300	15000	50 - 200
0.4	40000	100 - 400	25000	80 - 350	10000	50 - 250
0.5	40000	100 - 500	25000	80 - 400	10000	50 - 250
0.6	38000	100 - 600	25000	80 - 500	8000	50 - 250
0.7	36000	100 - 700	20000	80 - 600	8000	50 - 250
0.8	34000	100 - 800	20000	80 - 700	8000	50 - 250
0.9	32000	100 - 1000	20000	80 - 800	8000	50 - 250

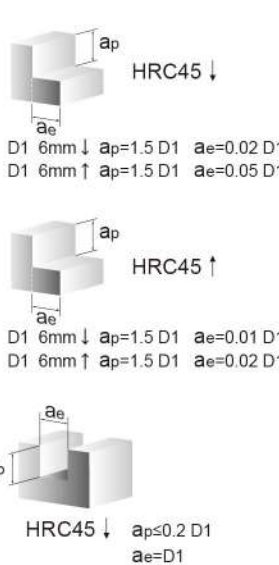
• Depth of cut



• Recommended cutting condition for SEP

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	
Dia. (D1)		SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Side Milling	3	20000	2000	16000	1000	9000	500
	4	19000	2000	12000	1300	6000	550
	5	13000	1800	10000	1400	5000	500
	6	10000	3000	8000	1500	4500	700
	8	8000	3200	5000	1300	3500	600
	10	7000	3000	4500	1200	3000	500
	12	5000	2000	4000	1100	2000	500
	16	4000	1800	3500	1000	1800	450
20	3500	1600	3000	1000	1300	450	
Grooving	3	20000	2000	20000	1200	16000	1200
	4	16000	2000	16000	1200	12000	1300
	5	13000	1800	13000	1100	10000	1400
	6	10000	3000	10000	2100	8000	1500
	8	8000	2900	8000	1800	6000	1400
	10	7000	2800	6000	1700	5000	1300
	12	5000	2300	5500	1700	4500	1200
	16	3500	1800	4500	1800	3500	1200
20	3000	1400	3000	1500	2600	1100	

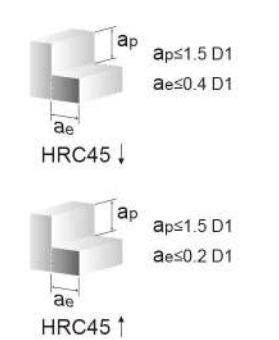
• Depth of cut



• Recommended cutting condition for SEW

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
3	22000	1800	16000	1300	10000	800
4	15000	1400	12000	1250	7000	700
5	13000	1600	10000	1400	6000	650
6	11500	1650	8500	1300	5000	800
8	8000	1800	6500	1350	3500	700
10	7000	1800	5000	1400	2800	750
12	6000	1700	4000	1300	2300	650
16	3560	1500	3000	1250	1800	700
20	3000	1450	2500	1250	1500	780

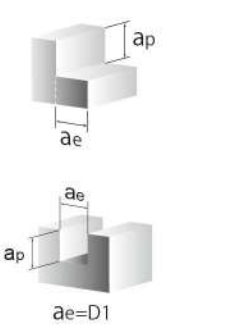
• Depth of cut



• Recommended cutting condition for SEPC

MATERIAL		Carbon Steels/Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels	
		SS/S45C/SCM/FC		SKD11/SKD61...		SUS304/SUS316L...	
Depth of cut		ap:1.0D1 ae:0.5D1		ap:1.0D1 ae:0.3D1		ap:1.0D1 ae:0.2D1	
Dia. (D1)		SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min
Side Milling	2	19100	860	12740	380	9550	430
	2.5	15280	915	10200	300	7640	460
	3	12740	955	8490	765	6370	570
	3.5	10920	980	7280	655	5460	570
	4	9550	1140	6370	760	4780	570
	4.5	8490	1020	5660	760	4250	640
	5	7640	1030	5090	680	3800	680
	6	6370	1140	4250	640	3200	670
	8	4780	1140	3180	480	2390	570
	10	3820	1140	2550	460	1910	510
	12	3180	950	2120	440	1590	470

• Depth of cut

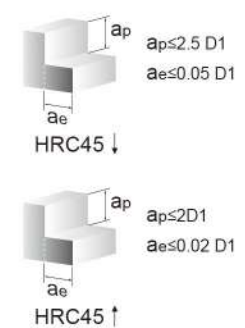


MATERIAL		Carbon Steels/Alloy Steels/Cast Irons SS/S45C/SCM/FC		Pre-Hardened Steels SKD11/SKD61...		Stainless Steels SUS304/SUS316L...	
Depth of cut		ap:1.0D1		ap:0.5D1		ap:0.3D1	
Dia. (D1)		SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min
Slotting	2	19100	510	12740	300	9550	345
	2.5	15280	640	10200	240	7640	370
	3	12740	660	8490	530	6370	450
	3.5	10920	680	7280	460	5460	450
	4	9550	800	6370	530	4780	450
	4.5	8490	710	5660	530	4250	510
	5	7640	720	5090	470	3800	540
	6	6370	800	4250	510	3200	530
	8	4780	800	3180	380	2390	450
	10	3820	800	2550	370	1910	400
	12	3180	670	2120	350	1590	380

• Recommended cutting condition for SELD

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
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

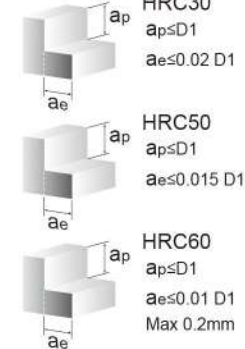
• Depth of cut



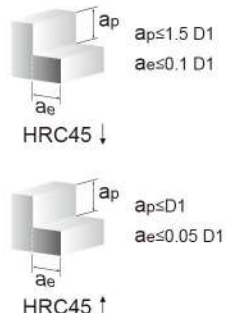
• Recommended cutting condition for SHA

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
6	12000	3000	8000	2000	5600	1400
8	9000	2400	6700	1900	3600	1200
10	6900	2100	5000	1600	3000	900
12	6000	2400	4300	1700	2400	1000
16	4500	2100	2500	1000	1600	700

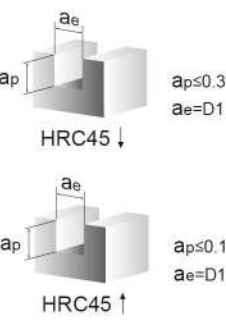
• Depth of cut



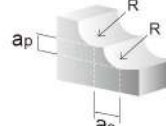
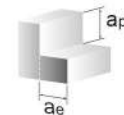
• Recommended cutting condition for **SEZ**

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11		• Depth of cut 
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	
4	6000	600	5000	400	2200	220	HRC45 ↓ ap≤1.5 D1 ae≤0.1 D1
5	4800	750	4000	400	1700	240	
6	4500	800	3800	420	1600	300	
8	3500	820	2800	420	1000	300	
10	3000	820	1800	420	900	300	
12	2000	820	1600	350	800	300	HRC45 ↑ ap≤D1 ae≤0.05 D1

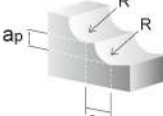
• Recommended cutting condition for **SRA, SRC**

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11		• Depth of cut 
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	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	HRC45 ↓ ap≤0.3 D1 ae=D1
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	HRC45 ↑ ap≤0.15 D1 ae=D1

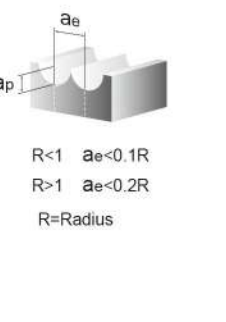
• Recommended cutting condition for **SRW, SRB, SRD, SRDX, SRK, SERC, SERCX**

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11		• Depth of cut  ap≤0.02R ae≤0.02R HRC45
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	 ap≤D1 ae≤0.02 D1 HRC45 R=Corner R
2	26000	1600	16500	1000	7500	300	
3	19000	1800	12000	1200	5400	360	
4	16000	3200	10000	1900	4800	480	
5	14000	3300	8000	2000	3800	500	
6	12000	3600	7200	2200	3500	650	
8	9600	4000	5600	2200	2700	750	
10	7000	3400	4400	1700	2100	650	
12	6000	2800	3600	1400	1800	600	
16	4500	2000	2800	1000	1400	450	

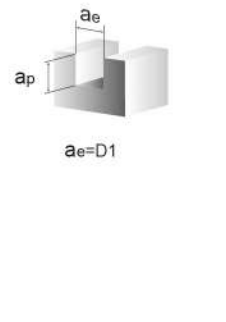
• Recommended cutting condition for **SRP**

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11		• Depth of cut  $a_p \leq 0.02R$ $a_e \leq 0.02R$ HRC45
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	 $a_p \leq 0.3 D1$ $a_e = D1$ R=Corner R
6	12000	12000	8000	8000	5000	4000	
8	10000	10000	8000	8000	6000	4800	
10	7000	5000	6000	4000	4500	2000	
12	5000	7000	4000	5000	3000	3000	

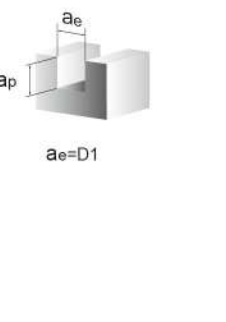
• Recommended cutting condition for **SBF . SBFV**

MATERIAL	Alloy Steels . Tool Steels . Hardened Steels S45C, SCM, S50C, SKS, SCr, SNCM, SKD11, SKD61, NAK80				• Depth of cut 
Radius(R)	EFFECTIVE LENGTH	SPEED (min ⁻¹)	FEED mm / min	DEPTH OF CUT ap (mm)	
R0.25	4	30000 - 40000	200 - 650	0.015	
	6	30000 - 40000	200 - 650	0.013	
R0.3	4	27000 - 40000	180 - 650	0.025	
	6	27000 - 40000	180 - 650	0.015	
R0.4	6	25000 - 40000	400 - 750	0.025	
	8	25000 - 40000	400 - 750	0.025	
R0.5	6	20000 - 32000	300 - 750	0.04	
	8	20000 - 32000	300 - 750	0.03	
R0.6	10	20000 - 32000	300 - 750	0.025	
	12	20000 - 32000	300 - 750	0.015	
R0.75	8	22000 - 25000	500 - 600	0.05	
	12	22000 - 25000	500 - 600	0.03	
R0.8	8	18000 - 20000	350 - 550	0.07	
	12	18000 - 20000	350 - 550	0.04	
R1.0	16	18000 - 20000	350 - 550	0.03	
	20	18000 - 20000	350 - 550	0.02	
R1.5	8	13000 - 18000	350 - 800	0.08	
	12	13000 - 18000	350 - 800	0.06	
R2.0	16	13000 - 18000	350 - 800	0.05	
	8	12000 - 17000	500 - 900	0.10	
R1.0	12	12000 - 17000	500 - 900	0.10	
	16	12000 - 17000	500 - 900	0.07	
R1.5	20	12000 - 17000	500 - 900	0.04	
	8	8000 - 11000	500 - 700	0.17	
R2.0	10	8000 - 11000	500 - 700	0.15	
	16	8000 - 11000	500 - 700	0.14	
R2.0	20	8000 - 11000	500 - 700	0.12	
	25	8000 - 11000	500 - 700	0.10	
R2.0	10	5000 - 8000	400 - 600	0.18	
	15	5000 - 8000	400 - 600	0.17	
R2.0	20	5000 - 8000	400 - 600	0.16	
	25	5000 - 8000	400 - 600	0.15	
R2.0	30	5000 - 8000	400 - 600	0.14	

• Recommended cutting condition for **SEFA, SEFAV**

MATERIAL	Alloy Steels . Tool Steels . Hardened Steels S45C, SCM, S50C, SKS, SCr, SNCM, SKD11, SKD61, NAK80				• Depth of cut 
Dia.(D1)	EFFECTIVE LENGTH	SPEED (min ⁻¹)	FEED mm / min	DEPTH OF CUT ap (mm)	
1	4	25000	1500	0.05	
	6	25000	1500	0.03	
1.5	10	25000	1500	0.01	
	4	15000	1200	0.10	
2	8	15000	1200	0.05	
	10	15000	1200	0.025	
3	12	15000	1200	0.018	
	8	12000	900	0.20	
2	10	8800	700	0.12	
	12	7500	600	0.05	
3	16	7000	500	0.02	
	10	8000	600	0.50	
3	12	8000	600	0.45	
	16	5500	450	0.18	
3	20	4000	300	0.15	
	25	6000	400	0.10	

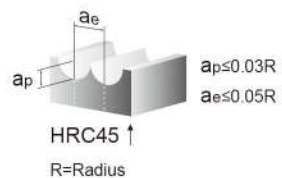
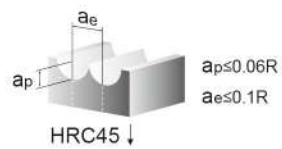
• Recommended cutting condition for **SEF . SEFV**

MATERIAL	Alloy Steels . Tool Steels . Hardened Steels S45C, SCM, S50C, SKS, SCr, SNCM, SKD11, SKD61, NAK80				• Depth of cut 
Dia.(D1)	EFFECTIVE LENGTH	SPEED (min ⁻¹)	FEED mm / min	DEPTH OF CUT ap (mm)	
1	4	30000	2200	0.15	
	6	30000	2200	0.12	
1.5	8	30000	2200	0.12	
	10	30000	2200	0.12	
2	4	25000	1800	0.20	
	6	25000	1800	0.18	
3	8	25000	1800	0.15	
	10	25000	1800	0.15	
3	12	25000	1800	0.15	
	8	20000	1500	0.30	
3	10	20000	1500	0.30	
	12	20000	1500	0.25	
3	16	20000	1500	0.25	
	8	12000	900	0.40	
3	12	12000	900	0.40	
	16	12000	900	0.30	
3	20	12000	900	0.30	

• Recommended cutting condition for **BM**

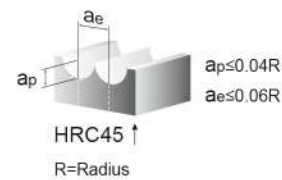
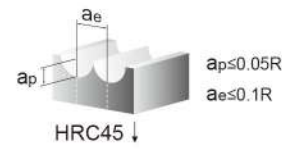
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R0.1	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.15	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.2	32000	500 - 600	32000	400 - 500	25000	300 - 400
R0.25	32000	600 - 700	32000	500 - 600	25000	400 - 500
R0.3	32000	600 - 700	32000	500 - 600	25000	400 - 500
R0.35	32000	700 - 800	32000	600 - 700	25000	500 - 600
R0.4	32000	900 - 1000	32000	800 - 900	25000	600 - 700
R0.45	32000	1000 - 1100	32000	900 - 1000	25000	600 - 700

• Depth of cut

• Recommended cutting condition for **BA, BS, BLS, BLM, BLL**

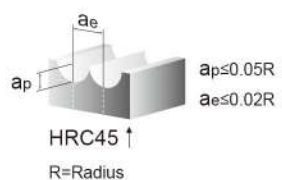
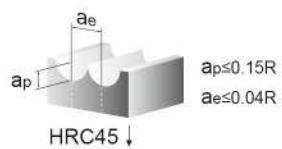
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R0.5	45000	800	35000	600	20000	200
R1	23000	800	18000	600	10000	200
R1.5	16000	1000	12000	600	6500	200
R2	12000	1000	9500	700	5000	300
R3	8000	1100	6000	700	3500	300
R4	6000	1200	5000	800	2500	350
R5	5000	1100	4000	800	2000	350
R6	4000	1000	3000	700	1500	300
R8	3000	1000	2000	700	1000	300

• Depth of cut

• Recommended cutting condition for **BB**

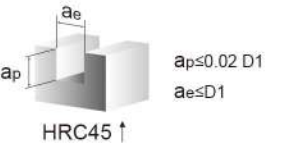
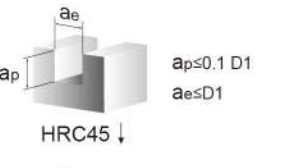
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Radius (R)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
R2	12000	1200	9500	900	5000	400
R3	8000	1400	6000	900	3500	500
R4	6000	1600	5000	1000	2500	600
R5	5000	1400	4000	1000	2000	600
R6	4000	1200	3000	900	1500	500
R8	3000	1200	2500	900	1000	500
R10	2500	1000	2000	600	900	300

• Depth of cut

• Recommended cutting condition for **EM**

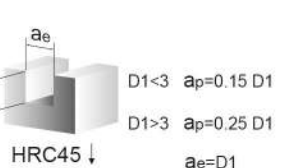
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
0.4	40000	100 - 400	25000	80 - 350	10000	50 - 250
0.5	40000	100 - 500	25000	80 - 400	10000	50 - 250
0.6	38000	100 - 600	25000	80 - 500	8000	50 - 250
0.7	36000	100 - 700	20000	80 - 600	8000	50 - 250
0.8	34000	100 - 800	20000	80 - 700	8000	50 - 250
0.9	32000	100 - 1000	20000	80 - 800	8000	50 - 250

• Depth of cut

• Recommended cutting condition for **EA, ES, ELA**

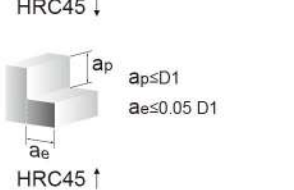
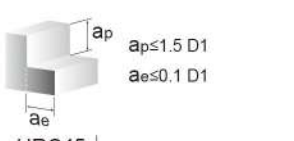
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
1	20000	80	15000	45	11000	30
1.5	13600	135	10000	60	9000	40
2	9600	150	8500	50	6000	45
3	6500	200	5800	75	4000	60
4	5500	250	4000	80	3200	60
5	4500	300	3000	80	2500	70
6	4000	300	2500	80	2200	70
8	3500	350	2200	90	1700	70
10	3000	400	2000	90	1500	70
12	2500	400	1500	100	1000	70
16	2000	400	1200	100	800	70

• Depth of cut

• Recommended cutting condition for **EB, ELB**

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	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
1	22000	400	18000	200	9000	140
1.5	12000	500	11000	280	5200	150
2	10000	550	10000	280	4600	170
3	9000	600	5500	310	3500	220
4	6000	600	5000	400	2200	220
5	4800	750	4000	400	1700	240
6	4500	800	3800	420	1600	300
8	3500	820	2800	420	1000	300
10	3000	820	1800	420	900	300
12	2000	820	1600	350	800	300
16	1500	650	1000	300	500	150
20	1200	600	900	300	400	150

• Depth of cut



• Recommended cutting condition for **EC, EP**

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11		• Depth of cut  $a_p \leq 1.5 D1$ $a_e \leq 0.2 D1$
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	
3	8000	550(300)	5500	300(100)	3500	200 (95)	
4	6500	550(300)	4500	300(100)	2200	200 (95)	
5	5000	800(400)	3600	350(120)	1800	210(100)	
6	4000	800(400)	2800	350(120)	1500	210(110)	
8	3500	800(400)	2600	350(120)	1300	210(100)	
10	2500	800(400)	2000	350(120)	1100	210(100)	
12	1800	750(350)	1500	350(120)	700	210(100)	
16	1400	700(300)	1000	300(100)	500	170 (70)	

() : Grooving

HRC45 ↓



$a_p \leq D1$
 $a_e \leq 0.05 D1$

HRC45 ↑



$a_p \leq 0.05 D1$
 $a_e \leq D1$

• 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		• Depth of cut  $a_p \leq 0.15 D1$ $a_e = D1$ HRC45 ↓  $a_p \leq 0.02 D1$ $a_e = D1$ HRC45 ↑
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	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	

• 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		• Depth of cut  $a_p \leq 2.5 D1$ $a_e \leq 0.05 D1$
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	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	HRC45 ↓
3	2500	60	2000	50	800	20	
4	2000	80	1700	70	700	30	 $a_p \leq 2D1$ $a_e \leq 0.02 D1$ HRC45 ↑
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	

• Recommended cutting condition for **ED**

MATERIAL		Carbon Steels..		Stainless Steels		Titanium		• Depth of cut
		SS/S45C/SCM/FC		SUS304/SUS316L		Ti6AL-4V		
Depth of cut		ap:1D1 ae:0.5D1		ap:1D1 ae:0.5D1		ap:1D1 ae:0.5D1		▶ Side Milling
Dia. (D1)		Speed (min ⁻¹)	Feed mm/min	Speed (min ⁻¹)	Feed mm/min	Speed (min ⁻¹)	Feed mm/min	
Side Milling	3	12730	1020	8490	440	8490	440	
	4	9550	1150	6370	500	6370	500	
	5	7640	1220	5095	510	5095	510	
	6	6370	1220	4250	510	4250	510	
	8	4780	1150	3185	550	3185	550	
	10	3820	1220	2550	580	2550	580	
	12	3180	1020	2125	510	2125	510	
16	2390	960	1595	450	1595	450		

MATERIAL		Carbon Steels..		Stainless Steels		Titanium		• Depth of cut
		SS/S45C/SCM/FC		SUS304/SUS316L		Ti6AL-4V		
Depth of cut		ap:1D1		ap:1D1		ap:1D1		▶ Slotting
Dia. (D1)		Speed (min ⁻¹)	Feed mm/min	Speed (min ⁻¹)	Feed mm/min	Speed (min ⁻¹)	Feed mm/min	
Slotting	3	11450	590	7400	240	7400	240	
	4	8590	680	5600	250	5600	250	
	5	6870	750	4500	300	4500	300	
	6	5730	840	3700	330	3700	330	
	8	4300	820	2800	330	2800	330	
	10	3430	850	2200	340	2200	340	
	12	2860	760	1900	310	1900	310	
16	2150	720	1400	280	1400	280		

• 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		• Depth of cut  $a_p \leq 1.5 D1$ $a_e \leq 0.1 D1$
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	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	HRC45 ↓
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	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		• Depth of cut  $a_p \leq 3 D1$ $a_e \leq 0.01 D1$
HARDNESS	~HRC30		~HRC50		~HRC60		
Dia. (D1)	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	HRC45 ↓
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	HRC45 ↑

• Recommended cutting condition for **EG, EGA**

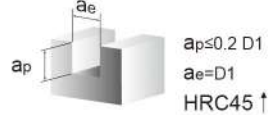
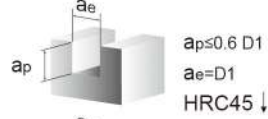
MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
	~HRC30		~HRC50		~HRC60	
HARDNESS						
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Side Milling	6	5500	550	3000	310	1150
	8	4600	550	2500	310	920
	10	3700	550	2000	310	730
	12	3000	500	1700	310	600
	16	2300	520	1200	310	460
Grooving	6	4400	440	2400	250	920
	8	3600	440	2000	250	730
	10	3000	440	1600	250	580
	12	2400	440	1350	250	480
	16	1800	440	960	250	370

• Depth of cut

Side Milling



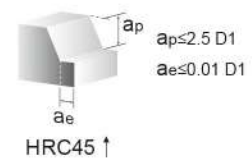
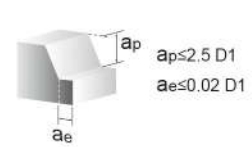
Grooving



• Recommended cutting condition for **ET, ETL (Dia I-4)**

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
	~HRC30		~HRC50		~HRC60	
HARDNESS						
Dia. (D1)	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

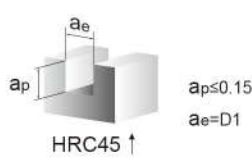
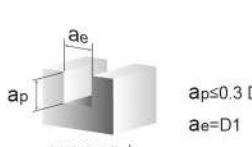
• Depth of cut



• 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	
	~HRC30		~HRC50		~HRC60	
HARDNESS						
Dia. (D1)	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

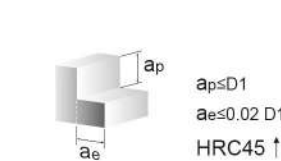
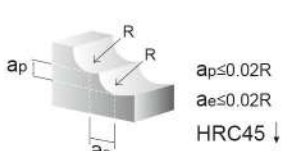
• Depth of cut



• Recommended cutting condition for **ERB, ERC**

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
	~HRC30		~HRC50		~HRC60	
HARDNESS						
Dia. (D1)	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

• Depth of cut

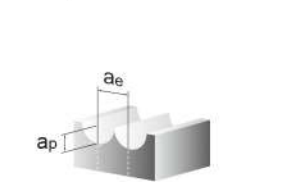


R=Corner R

• Recommended cutting condition for **BF**

MATERIAL		Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80		
Radius(R)	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	0.10
	12	12000 - 17000	500 - 900	0.10
	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
R2.0	25	8000 - 11000	500 - 700	0.10
	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

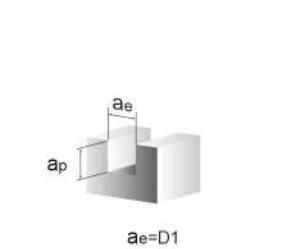
• Depth of cut



• 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	
	~HRC30		~HRC50		~HRC60	
HARDNESS						
Dia.(D1)	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	0.10		
	8	15000	1200	0.05		
	10	15000	1200	0.025		
	12	15000	1200	0.018		
2	8	12000	900	0.20		
	10	8800	700	0.12		
	12	7500	600	0.05		
	16	7000	500	0.02		
3	8	8000	600	0.50		
	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		

• Depth of cut



• Recommended cutting condition for **SBBIV**

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

• Depth of cut

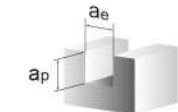
• Recommended cutting condition for **SEIV**

MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
	ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1	
Depth of cut	ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Side Milling	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		
MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
	ap=0.5D1 ae=1D1		ap=0.2D1 ae=1D1		ap=0.2D1 ae=1D1	
Depth of cut	ap=0.5D1 ae=1D1		ap=0.2D1 ae=1D1		ap=0.2D1 ae=1D1	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Slotting	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



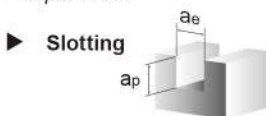
• Slotting

• Recommended cutting condition for **SEPS**

MATERIAL	Carbon Steels..		Alloy Steels.Tool Steels		Stainless Steels	
	SS/S45C/SCM/FC		SCr.SNCM.SKD11.SKD61.NAK80...		SUS304/SUS316/Ti6AL-4V..	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min
3	11000	770	9100	400	7700	350
4	8400	1000	6700	500	5600	370
5	7000	1000	5300	500	4500	380
6	5600	1000	4500	540	3700	400
8	4200	900	3400	500	2800	420
10	4000	800	2700	440	2300	470
12	2800	700	2300	400	1900	460
16	2100	600	1700	350	1400	340
20	1800	500	1400	280	1100	270

• Depth of cut

▶ Slotting



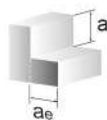
Diameter (D1)	ap(mm)
3	1.5
4	2.0
5	2.5
6	3.0
8	4.0
10	5.0
12	6.0
16	6.0
20	6.0

• Recommended cutting condition for **SEIV**

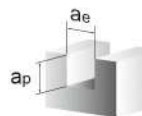
MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
	ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1	
Depth of cut	ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Side Milling	6	4600 590	4600 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		
MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
	ap=0.5D1 ae=1D1		ap=0.2D1 ae=1D1		ap=0.2D1 ae=1D1	
Depth of cut	ap=0.5D1 ae=1D1		ap=0.2D1 ae=1D1		ap=0.2D1 ae=1D1	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Slotting	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

• Recommended cutting condition for **SIBV**

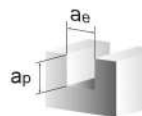
MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
	ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1	
Depth of cut	ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Side Milling	6	4600 740	4600 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		
MATERIAL	Stainless Steels		Titanium alloy		Inconel 718	
	ap=0.5D1 ae=1D1		ap=0.2D1 ae=1D1		ap=0.2D1 ae=1D1	
Depth of cut	ap=0.5D1 ae=1D1		ap=0.2D1 ae=1D1		ap=0.2D1 ae=1D1	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Slotting	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

• Recommended cutting condition for **SHAIV**

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
Slotting	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		

• Depth of cut

• Side Milling

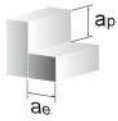


• Recommended cutting condition for *SEGIV*

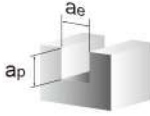
MATERIAL		SUS304/SUS316L		Ti6AL-4V		Inconel 718	
Depth of cut		ap=1D1 ae=0.3D1		ap=1D1 ae=0.3D1		ap=1D1 ae=0.2D1	
Side Milling	Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
	6	2650	210	1590	125	1060	65
	8	1990	240	1200	120	800	50
	10	1590	255	960	155	640	50
	12	1330	240	800	160	530	55
	16	990	200	600	130	400	50
	20	800	165	480	110	320	50
MATERIAL		SUS304/SUS316L		Ti6AL-4V		Inconel 718	
Depth of cut		ap=1D1 ae=D1		ap=0.5D1 ae=D1		ap=0.3D1 ae=D1	
Slotting	Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
	6	2650	210	1590	125	1060	65
	8	1990	240	1200	120	800	50
	10	1590	255	960	155	640	50
	12	1330	240	800	160	530	55
	16	990	200	600	130	400	50
	20	800	165	480	110	320	50

• Depth of cut

• Side Milling



• Slotting

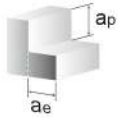


• Recommended cutting condition for *SRIPV*

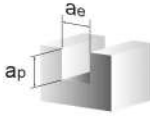
MATERIAL		Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut		ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1		ap=1D1 ae=0.05D1	
Side Milling	Dia. (D1)	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
	6	4600	590	4600	590	2600	230
	8	3500	560	3500	560	2000	220
	10	2700	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
MATERIAL		Stainless Steels		Titanium alloy		Inconel 718	
Depth of cut		ap=0.5D1 ae=1D1		ap=0.2D1 ae=1D1		ap=0.2D1 ae=1D1	
Slotting	Dia. (D1)	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

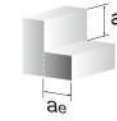


• Recommended cutting condition for *SIW*

MATERIAL		Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
Depth of cut		ap:1D1 ae:0.2D1		ap:1D1 ae:0.2D1		ap:1D1 ae:0.2D1		ap:1D1 ae:0.1D1		ap:1D1 ae:0.05D1	
Side Milling	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	12730	1530	8490	510	6370	440	6370	440	3200	90
	4	9550	1530	6370	510	4780	500	4780	500	2400	96
	5	7640	1530	5100	510	3820	510	3820	510	1910	96
	6	6370	1530	4250	680	3180	510	3180	510	1595	96
	8	4780	1530	3180	760	2390	550	2390	550	1195	100
	10	3820	1530	2550	710	1910	580	1910	580	955	110
	12	3180	1270	2120	590	1590	510	1590	510	800	96
	16	2390	1145	1590	510	1190	450	1190	450	600	96
	20	1910	1070	1270	460	955	410	955	410	480	96
MATERIAL		Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
Depth of cut		ap:1D1		ap:0.5D1		ap:0.5D1		ap:0.1D1		ap:0.05D1	
Slotting	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	11450	590	6660	270	5830	200	5830	200	2880	35
	4	8590	680	5040	320	4380	200	4380	200	2160	43
	5	6870	750	4050	360	3500	240	3500	240	1720	48
	6	5730	840	3330	400	3700	270	3700	270	1440	56
	8	4300	820	2520	410	2190	270	2190	270	1080	50
	10	3430	850	1980	420	1750	280	1750	280	860	48
	12	2860	760	1710	370	1460	250	1460	250	720	46
	16	2150	720	1260	340	1095	220	1095	220	540	43
	20	1710	680	990	320	875	215	875	215	430	41

• Depth of cut

• Side Milling



• Slotting

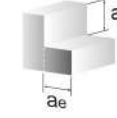


• Recommended cutting condition for *SIRW*

MATERIAL		Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
Depth of cut		ap:1.5D1 ae:0.2D1		ap:1D1 ae:0.05D1		ap:1D1 ae:0.1D1		ap:0.8D1 ae:0.05D1		ap:0.8D1 ae:0.05D1	
Side Milling	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	19900	1200	11150	800	10350	415	10350	415	5890	190
	3	13270	1330	7430	595	6900	550	6900	550	3930	250
	4	9950	1190	5570	670	5180	520	5180	520	2950	240
	5	7960	1270	4460	625	4140	500	4140	500	2360	230
	6	6630	1460	3710	670	3450	520	3450	520	1960	300
	8	4970	1390	2780	700	2590	465	2590	465	1470	280
	10	3980	1270	2230	625	2070	480	2070	480	1200	250
	12	3320	1260	1860	560	1730	450	1730	450	980	220
MATERIAL		Carbon Steels Alloy Steels/Cast Irons		Pre-Hardened Steels		Stainless Steels		Titanium Alloys		Superalloy	
Depth of cut		ap:0.8D1		ap:0.2D1		ap:0.4D1		ap:0.2D1		ap:0.1D1	
Slotting	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	17500	700	8760	420	9550	230	9550	230	4780	115
	3	11670	700	5840	420	6370	230	6370	230	3180	115
	4	8750	700	4380	350	4780	215	4780	215	2390	105
	5	7000	840	3500	420	3820	230	3820	230	1910	115
	6	5840	840	2920	410	3180	240	3180	240	1590	120
	8	4380	875	2190	395	2390	215	2390	215	1190	104
	10	3500	880	1750	370	1910	230	1910	230	950	115
	12	2920	800	1460	350	1590	215	1590	215	800	105

• Depth of cut

• Side Milling



• Slotting



• Recommended cutting condition for **DB, DBX**

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85		• Depth of cut
Radius (R)	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	

• Recommended cutting condition for **DEA, DEB**

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85		• Depth of cut
Dia. (D1)	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)	4400	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

• Recommended cutting condition for **DEC, DED, DEDP, DEDX**

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85		• Depth of cut
Dia. (D1)	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)	4400	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

• Recommended cutting condition for **DEL**

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85		• Depth of cut
Dia. (D1)	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

• Recommended cutting condition for **DEPW, DEPWS**

MATERIAL	Aluminums A1050/A1070		Aluminum Alloys A2017/A5052/A7075		Aluminum Alloy Castings AC/ADC		• Depth of cut
Depth of cut	ap:1.5D1	ae:0.3D1	ap:1.5D1	ae:0.3D1	ap:1.5D1	ae:0.3D1	• Side Milling
Dia. (D1)	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min	
3	20000	3600	20000	3000	20000	3600	
4	20000	3600	20000	3000	19900	3600	
5	20000	3600	17200	3000	15920	3600	
6	15920	3340	14330	3000	13270	2790	
8	11940	2860	10750	2580	9950	2380	
10	9550	2580	8600	2400	7960	2150	
12	7960	2390	7160	2150	6630	1990	

MATERIAL	Aluminums A1050/A1070		Aluminum Alloys A2017/A5052/A7075		Aluminum Alloy Castings AC/ADC		• Slotting
Depth of cut	ap:1.0D1	ae:0.3D1	ap:1.0D1	ae:0.3D1	ap:1.0D1	ae:0.3D1	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min	
3	18000	2700	19100	2700	14860	2700	
4	15920	2300	15920	2300	11140	2300	
5	12740	2300	14000	2000	8920	1600	
6	10620	1910	11670	1750	7430	1330	
8	7960	1910	8750	1750	5570	1330	
10	6370	1720	7000	1680	4460	1200	
12	5300	1590	5840	1570	3710	1110	

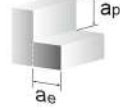
• Recommended cutting condition for **DEG**

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	32000	9200	16000	3700
8	24000	9000	12000	3600
10	18000	8200	9000	3200
12	15000	7800	7600	3000
16	11500	7200	5700	2900

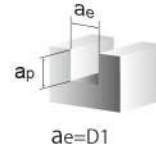
MATERIAL	Aluminum Alloys		Aluminum Alloy Castings	
	A2017/A5052/A7075		AC/ADC	
Depth of cut	ap:1D1		ap:1D1	
Dia. (D1)	SPEED (min ⁻¹)	FEED mm/min	SPEED (min ⁻¹)	FEED mm/min
6	32000	7400	16000	3000
8	24000	7200	12000	2900
10	18000	6500	9000	2600
12	15000	6200	7600	2500
16	11500	5800	5700	2300

• Depth of cut

• Side Milling



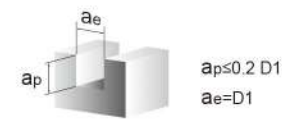
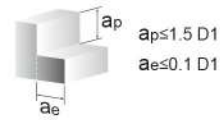
• Slotting

• Recommended cutting condition for **DRC**

MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min	SPEED (min ⁻¹)	FEED mm / min
Dia. (D1)						
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

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

• Depth of cut

**MAGIC SHANK** EXCHANGEABLE HEAD END MILLS SERIES• 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

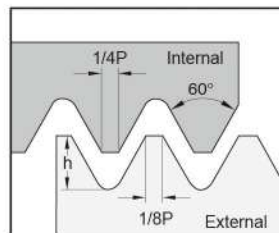
• Recommended cutting condition for **EX2SEB** (HRC30~HRC60)

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

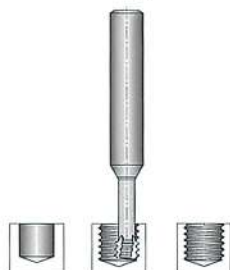
Depth of cut: 0.15mm

- 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	



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

- 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

- Recommended cutting condition for *ECMP*

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	0.03~0.04	0.02~0.03	0.015~0.03	0.04~0.07
6	0.03~0.04	0.02~0.03	0.015~0.03	0.04~0.07
8	0.03~0.07	0.03~0.05	0.025~0.05	0.07~0.09
10	0.03~0.07	0.03~0.05	0.025~0.05	0.07~0.09
12	0.03~0.07	0.03~0.05	0.025~0.05	0.07~0.09

fz = Feed per Tooth

- Recommended cutting condition for *ECMV*

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	0.03~0.04	0.02~0.03	0.015~0.03	0.04~0.07
6	0.03~0.04	0.02~0.03	0.015~0.03	0.04~0.07
8	0.03~0.07	0.03~0.05	0.025~0.05	0.07~0.09
10	0.03~0.07	0.03~0.05	0.025~0.05	0.07~0.09
12	0.03~0.07	0.03~0.05	0.025~0.05	0.07~0.09

fz = Feed per Tooth

- Recommended cutting condition for *CD 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	
	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	
	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*

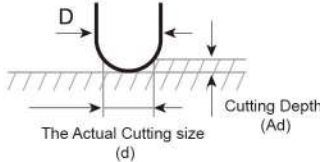
Dia. (mm)	Vc (m/min)		Dia. (mm)	Feed (mm/rev)	
	Carbon Steels, Alloy Steels ~HRC40	Alloy Steels, Tool Steels HRC45~		Carbon Steels, Alloy Steels ~HRC40	Alloy Steels, Tool Steels HRC45~
2.0	14	8	2.0	0.05	0.04
3.0	14	8	3.0	0.08	0.06
4.0	14	8	4.0	0.10	0.08
5.0	14	8	5.0	0.10	0.08
6.0	14	8	6.0	0.12	0.10
8.0	14	8	8.0	0.16	0.12
10.0	14	8	10.0	0.20	0.16
12.0	14	8	12.0	0.20	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.

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



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

Calculation for Cutting Speed, Spindle Speed and Feed

Cutting Speed V = $\frac{\pi \times D \times N}{1000}$
Spindle Speed N = $V \div \pi \div D \times 1,000$
Feed F = N x fz x 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 problem 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)	2 0 ~ 4 0	4 0 ~ 8 0
Alloy Steels (SCM.SKD)	2 0 ~ 3 5	3 5 ~ 6 0
Prehardened Steels (NAK.HPM)	1 5 ~ 3 0	3 0 ~ 5 0
Stainless Steels (SUS304)	5 ~ 2 0	1 0 ~ 3 0
Hardened Steels (SKD61.HRC60)	-	2 0 ~ 4 0

Comparison Table of Hardness

Rockwell Hardness C Scale 150kg Brale	Diamond Pyramid Hardness Number, Vickers	Brinell Hardness Standard 10mm Ball 29.42kN	Rockwell Hardness A Scale 60kg Brale	Shore Scleroscope Hardness Number	Approx Tensile Strength N/mm²
(HRC)	(HV)	(HB)	(HRA)	(HS)	
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 Runout of End Mill	1.Use a right and precise collet chuck. 2.Minimize the runout 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 ·When processing, the workpiece will be dissolved then stick on the tool flute ·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