HG TECHNOLOGY CO., LTD.
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www.hgt.com.tw

HGT SOLID CARBIDE TOOLS

SOLID CARBIDE TOOLS

HGT®

- Magic Cutting Series
- High Speed Cutting & High Hard Cutting Series
- Economical class Ball Nose End Mills Series
- Economical class Square End Mills Series
- Thread Milling Series
- Chamfering Series
- Aluminum & Copper Cutting Series
- Magic Shank Series
- Carbide Drills Series
- Carbide Reamers Series

VER. 2013-2014

Created the largest **Profit .** Improve and Elevate the **Quality.**

2013.03.2000 Gider Graphic Design

INTRODUCTION

HG TECHNOLOGY CO., LTD.,

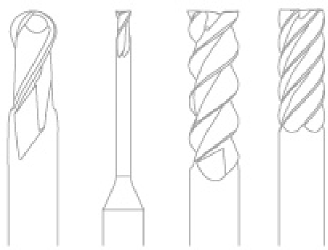
located at Changhua, Taiwan, dedicated to developing, designing, producing, and marketing cutting tools, comprises professionals with sophisticated processing experience that provide extensive services and ensure total customer satisfaction.

Our service range extensively covers 3C, semiconductor, medical care equipment, aerospace, and precision molding industries.

HG Technology continuously develops more advanced processing technologies based on the enterprise philosophy of extending the lifespan of tools, increasing work efficiencies, minimizing production costs in terms of wear and tear of tools, and maximizing customer benefits.

For HGT Cutting Tools, from material to finished products,
HG Technology insists on utilizing the processes provided by the original European manufacturers for the production. We only use high quality and stable German Carbide Rods, German and Swiss 6-axis CNC Grinding machines, advanced Swiss Coating technologies, and sophisticated German Digital Measuring Instruments.

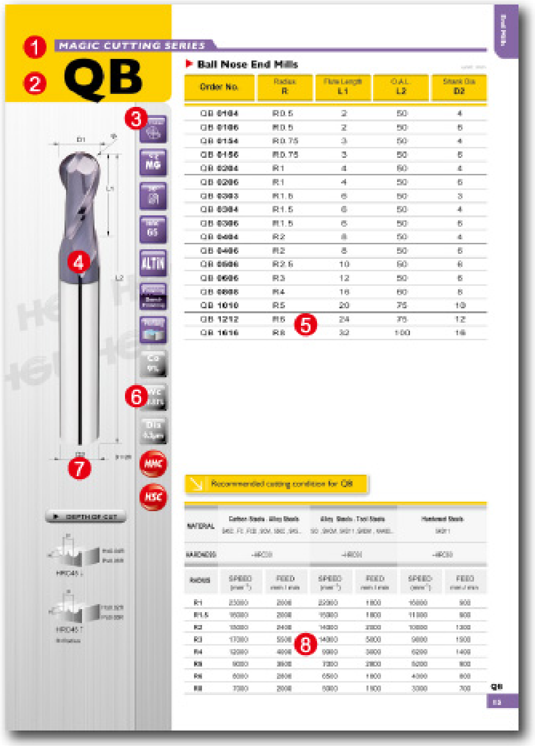
With reasonable prices and stable quality, HG Technology has an expanding sales network that currently covers more than 30 countries throughout the world. Based on the enterprise philosophy of maximizing customer's benefits, HG Technology continuously refines itself and grows together with all its customers.



Always improve and elevate the quality,
in order let our customers keep the best competition.

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

ITEM PAGE STRUCTURE



1. Product Name
2. Item Code
3. Icons
4. Product Image
5. Product specification
6. Product Material
7. Product diagram
8. Recommended cutting condition

THE SYSTEM CODE INTRODUCES

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HGT SOLID CARBIDE TOOLS

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RECOMMENDED APPLICATION

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	SEM p.77	SEMX p.78	SEF p.79	SEFX p.80	SEFA p.81
	SEFAX p.82	BM p.103	BF p.105	EM p.116	EFA p.118
Stainless Steels	SEI p.70	SEPS p.72	SEPI p.73	SRIP p.90	
Titanium Alloy	SIA p.69	SEI p.70	SIB p.71	SHAI p.96	SEGI p.98
Graphit	SGBF p.60	SGEB p.74	SGRB p.94		
Aluminum Alloy	DB p.140	DEA p.142	DEB p.143	DEC p.144	DED p.145
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Copper Alloy	ED p.110	DBX p.141	DEDX p.146		

TOLERANCE

Square End Mills (mm)

Flute Dia.	Dia. Tolerance
1.0	0~ -0.020
1.5	0~ -0.020
2.0	0~ -0.020
2.5	0~ -0.020
3.0	0~ -0.020
4.0	0~ -0.020
5.0	0~ -0.020
6.0	0~ -0.025
8.0	0~ -0.030
10.0	0~ -0.035
12.0	0~ -0.040
16.0	0~ -0.040
20.0	0~ -0.040

Shank Dia. (h6)	Shank Tolerance
ø 3	0~ -0.008
ø 4	0~ -0.008
ø 6	0~ -0.008
ø 8	0~ -0.008
ø 10	0~ -0.009
ø 12	0~ -0.011
ø 16	0~ -0.011
ø 20	0~ -0.013

Ball Nose End Mills (mm)

Flute Dia.	R Tolerance
R0.5	±0.01
R1	±0.01
R1.5	±0.01
R2	±0.01
R2.5	±0.01
R3	±0.01
R4	±0.01
R5	±0.01
R6	±0.015
R8	±0.02
R10	±0.02

Shank Dia. (h6)	Shank Tolerance
ø 3	0~ -0.008
ø 4	0~ -0.008
ø 6	0~ -0.008
ø 8	0~ -0.008
ø 10	0~ -0.009
ø 12	0~ -0.011
ø 16	0~ -0.011
ø 20	0~ -0.013

Corner Radius End Mills (mm)

Flute Dia.	Dia. Tolerance	R Tolerance
3.0	0.000~ -0.020	+0.02~0
4.0	0.000~ -0.020	+0.02~0
6.0	-0.005~ -0.025	+0.02~0
8.0	-0.010~ -0.025	+0.03~0
10.0	-0.010~ -0.030	+0.03~0
12.0	-0.010~ -0.035	+0.03~0
16.0	-0.010~ -0.040	+0.03~0

Shank Dia. (h6)	Shank Tolerance
ø 3	0~ -0.008
ø 4	0~ -0.008
ø 6	0~ -0.008
ø 8	0~ -0.008
ø 10	0~ -0.009
ø 12	0~ -0.011
ø 16	0~ -0.011
ø 20	0~ -0.013

Recommended cutting attention

1. In order to get the processing efficiency exactly and extend the life of cutters, please must use the Balanced Chucks with high rigidity and high accuracy.
2. When processing, the length of cutters stretch work clip just enough for working, when have to extend the length of milling cutter, must to reduce the Spindle Speed and Feed Speed.
3. When processing, once have the abnormal noice and vibration, must adjust to the suitable cutting condition, otherwise will reduce the life or break the cutter.
4. Please choice the correct Cutting Oil in order to get the best effect.
5. To use the cutting condition will get the different results, because of the machine, work clip or Program etc...
so suggest when processing, please star from 50% cutting data,Then get more.

SOLID CARBIDE TOOLS

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ICONS

Flutes

Helix Angle (0° , 5° , 7° , 25° , 30° , 35° , 45° , 55°)

Work Material Hardness (40 , 55 , 60, 65)

Coating

Roughing Pitch

Corner Radius (0.1 , 0.2 , 0.3 , 0.5 , 1 , 1.5 , 2)

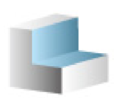
Tip Angle (60° , 90° , 120°)

Applications

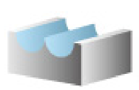
Statistics for Drills

Drills Type | Drills Type | Drills Type | DIN Code | DIN Code | Shank Diament Tolerance | Cutting Flute Tolerance | Helix Angle | Tip Angle

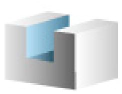
DEPTH OF CUT



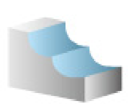
Side Milling



Profiling



Slotting

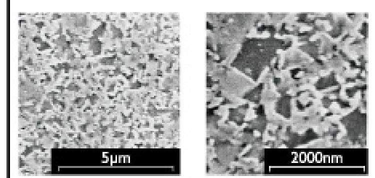


Radius Cutting

SOLID CARBIDE

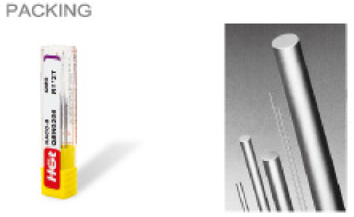
QMG

ISO-Classification		K10-K30
Diameter	(mm)	1.2-32.2
Co	(%)	9.0
$W/C+cr_3c_2+vc$	(%)	91.0
Density	(g/cm³)	14.40
HV_{30}	(kg/mm²)	1920
HRA	(ISO3738)	93.9
K_{IC}	($MNm^{-3/2}$)	9.3
TRS	(N/mm²)	> 4000
	A	≤ 02
Porosity	B	00
	C	00
WC-grain size	(μm)	0.2-0.5



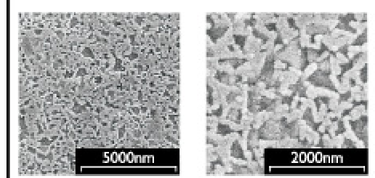
Co %	9
WC incl. Doping (%)	89.83
Tungsten Carbide α	ø0.2μm

PACKING



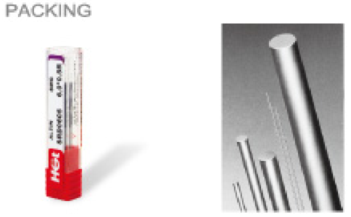
SMG

ISO-Classification		K40-K50
Diameter	(mm)	1.2-42.2
Co	(%)	12.0
$W/C+cr_3c_2+vc$	(%)	88.0
Density	(g/cm³)	14.05
HV_{30}	(kg/mm²)	1680
HRA	(ISO3738)	92.5
K_{IC}	($MNm^{-3/2}$)	10.0
TRS	(N/mm²)	> 4000
	A	≤ 02
Porosity	B	00
	C	00
WC-grain size	(μm)	0.5



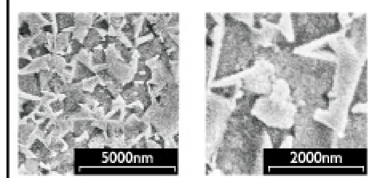
Co %	12
WC incl. Doping (%)	88
Tungsten Carbide α	ø0.4μm

PACKING



MG

ISO-Classification		K40-K50
Diameter	(mm)	1.2-42.2
Co	(%)	10.0
$W/C+cr_3c_2+vc$	(%)	90.0
Density	(g/cm³)	14.5
HV_{30}	(kg/mm²)	1610
HRA	(ISO3738)	92.3
K_{IC}	($MNm^{-3/2}$)	10.5
TRS	(N/mm²)	> 4000
	A	≤ 02
Porosity	B	00
	C	00
WC-grain size	(μm)	0.6



Co %	10
WC incl. Doping (%)	90
Tungsten Carbide α	ø0.6μm

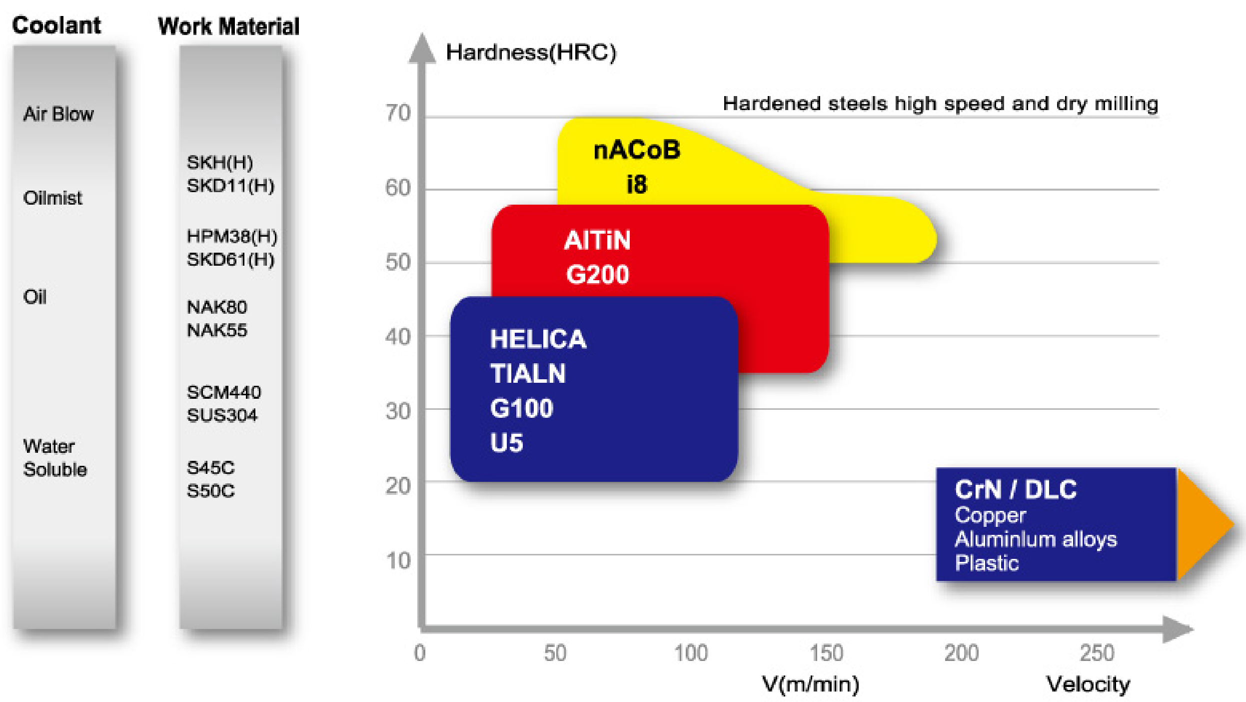
PACKING

HARD COATIING PROPERTIES

Coating Type	Symbol Color	Nanohard-ness(GPa)	Thickness (μm)	Friction Coifficient	Max usage Temp(°C)	Coating Temp(°C)
TIALN	BLACK	30	1 - 4	0.4	800	450↑
AlTiN	BLACK	38	1 - 4	0.6	900	450↑
nACoB	VIOLET-BLUE	45	1 - 4	0.45	1200	400↑
HELICA	COPPER	30	1 - 4	0.25	1000	480↑
CrN	METAL-SILVER	18	1 - 7	0.4	700	200 - 400
DLC	BLACK	20	1 - 3	0.15	400	150 - 250
G100	BURGUNDY-VIOLET	33	1 - 4	0.3	500	
G200	BLUE-GREY	34	1 - 4	0.55	850	
G300	SOFE GOLD	35	1 - 4	0.4	800	
i8	GOLD-BRASS	47	1 - 4	0.45	900	
U5	RED-BRASS	35	1 - 4	0.4	1100	
Aldura	BLACK	32	1 - 4	0.35	1100	

COATING APPLICATIONS

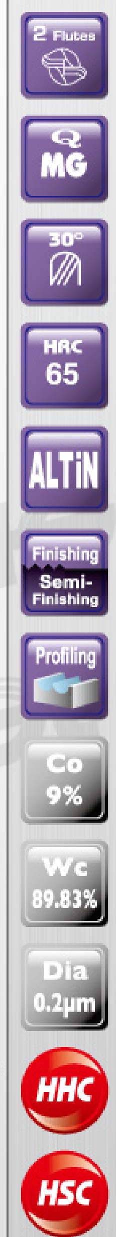
Coating Type	Symbol Color	Introduce coating on different materials
TIALN	BLACK	General steel for wet cutting (HRC35-45)
AlTiN	BLACK	High Hard steel for Dry cutting (HRC45-65)
nACoB	VIOLET-BLUE	High Hard steel for Dry cutting (HRC55-65)
HELICA	COPPER	General steel, Cast iron, with special flute design and work on Stainless steel(EX: SEPS)
CrN	METAL-SILVER	Copper Alloy
DLC	BLACK	Aluminum Alloy
G100	BURGUNDY-VIOLET	General steel for wet cutting (HRC35-45)
G200	BLUE-GREY	High Hard steel for Dry and wet cutting (HRC55-65)
G300	SOFE GOLD	Tough material, ex: Titanium Alloy, Nickel Alloy ,Stainless steel and Heat-resistant alloy
i8	GOLD-BRASS	High Hard steel for Dry and wet cutting(HRC55-65)
U5	RED-BRASS	High Hard steel for Dry and wet cutting (HRC55-60)
Aldura	BLACK	High Hard steel for Dry cutting (HRC55-65)
Diamond		Graphite



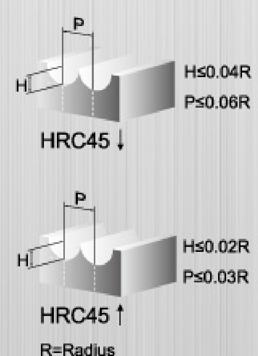
MAGIC CUTTING SERIES

Q MAGIC CUTTING SERIES

QB



▶ DEPTH OF CUT



▶ Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
QB **0104**	R0.5	2	50	4
QB **0106**	R0.5	2	50	6
QB **0154**	R0.75	3	50	4
QB **0156**	R0.75	3	50	6
QB **0204**	R1	4	50	4
QB **0206**	R1	4	50	6
QB **0303**	R1.5	6	50	3
QB **0304**	R1.5	6	50	4
QB **0306**	R1.5	6	50	6
QB **0404**	R2	8	50	4
QB **0406**	R2	8	50	6
QB **0506**	R2.5	10	50	6
QB **0606**	R3	12	50	6
QB **0808**	R4	16	60	8
QB **1010**	R5	20	75	10
QB **1212**	R6	24	75	12
QB **1616**	R8	32	100	16

Recommended cutting condition for QB

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

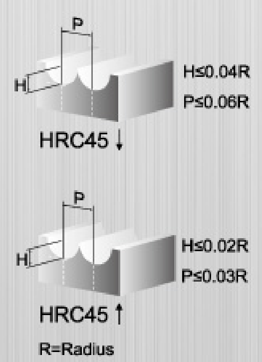
QBG

Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
QBG **0404**	R2	8	50	4
QBG **0606**	R3	12	50	6
QBG **0808**	R4	16	60	8
QBG **1010**	R5	20	75	10
QBG **1212**	R6	24	75	12

DEPTH OF CUT

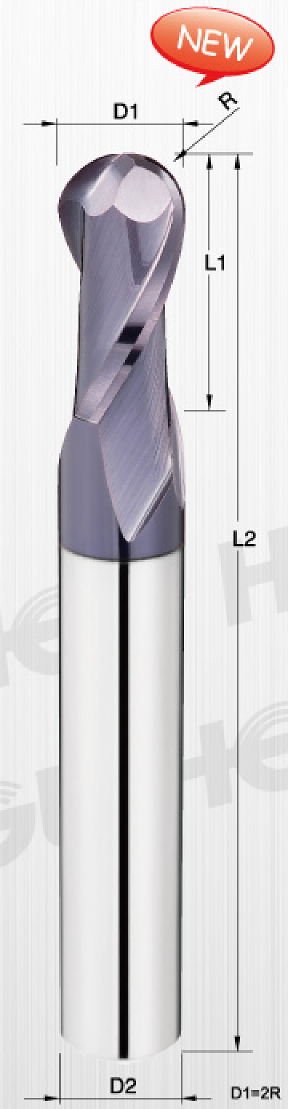


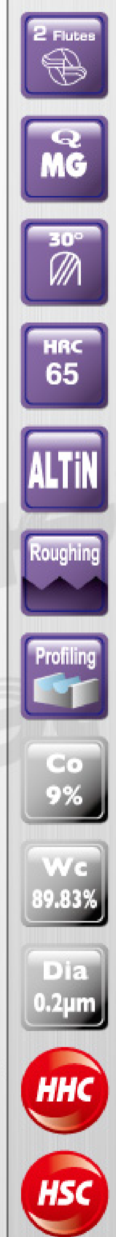
Recommended cutting condition for QBG

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QBR



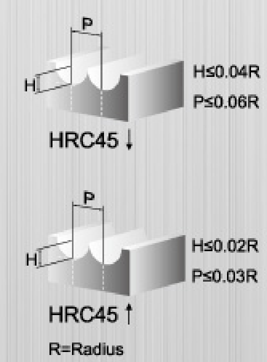


Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
QBR **0104**	R0.5	2	50	4
QBR **0154**	R0.75	3	50	4
QBR **0204**	R1	4	50	4
QBR **0306**	R1.5	6	50	6
QBR **0406**	R2	8	50	6
QBR **0506**	R2.5	10	50	6
QBR **0606**	R3	12	50	6
QBR **0808**	R4	16	60	8
QBR **1010**	R5	20	75	10
QBR **1212**	R6	24	75	12

DEPTH OF CUT



Recommended cutting condition for QBR

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

QBN

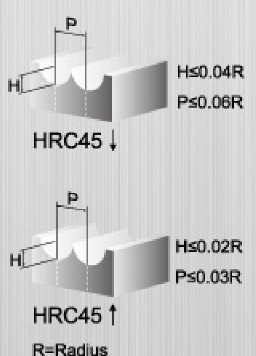
Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
QBN 0104	R0.5	2	50	4
QBN 0106	R0.5	2	50	6
QBN 0154	R0.75	3	50	4
QBN 0156	R0.75	3	50	6
QBN 0204	R1	4	50	4
QBN 0206	R1	4	50	6
QBN 0303	R1.5	6	50	3
QBN 0304	R1.5	6	50	4
QBN 0306	R1.5	6	50	6
QBN 0404	R2	8	50	4
QBN 0406	R2	8	50	6
QBN 0506	R2.5	10	50	6
QBN 0606	R3	12	50	6
QBN 0808	R4	16	60	8
QBN 1010	R5	20	75	10
QBN 1212	R6	24	75	12
QBN 1616	R8	32	100	16

2 Flutes · MG · 30° · HRC 65 · nAcoB · Finishing Semi-Finishing · Profiling · Co 9% · Wc 89.83% · Dia 0.2μm · HHC · HSC

DEPTH OF CUT



Recommended cutting condition for QBN

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

QBX

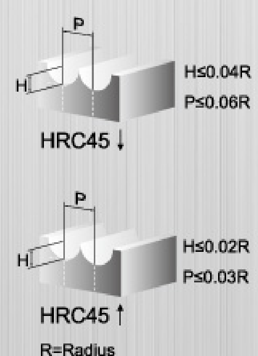
Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
QBX 0104	R0.5	2	50	4
QBX 0154	R0.75	3	50	4
QBX 0204	R1	4	50	4
QBX 0306	R1.5	6	50	6
QBX 0406	R2	8	50	6
QBX 0506	R2.5	10	50	6
QBX 0606	R3	12	50	6
QBX 0808	R4	16	60	8
QBX 1010	R5	20	75	10
QBX 1212	R6	24	75	12
QBX 1616	R8	32	100	16

2 Flutes · MG · 30° · HRC 65 · i8 · Finishing Semi-Finishing · Profiling · Co 9% · Wc 89.83% · Dia 0.2μm · HHC · HSC

DEPTH OF CUT

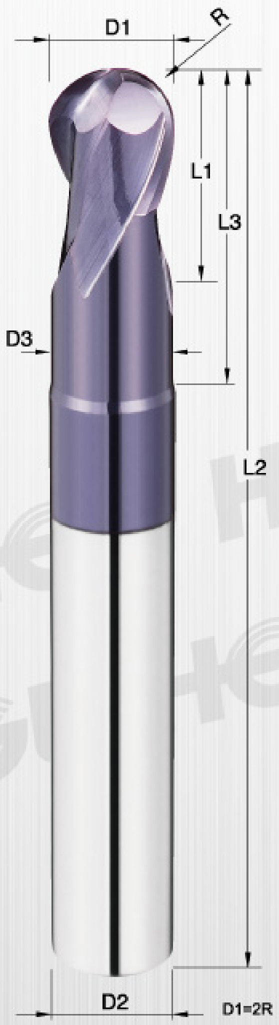


Recommended cutting condition for QBX

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QBH

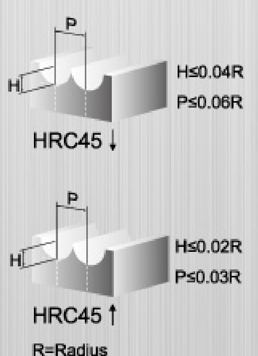


Ball Nose End Mills

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QBH 0104	R0.5	0.95	1	3	50	4
QBH 0154	R0.75	1.45	1	3	50	4
QBH 0204	R1	1.92	2	5	50	4
QBH 0306	R1.5	2.90	3	8	50	6
QBH 0406	R2	3.88	4	10	50	6
QBH 0506	R2.5	4.80	5	13	50	6
QBH 0606	R3	5.80	6	15	50	6
QBH 0808	R4	7.70	8	20	60	8
QBH 1010	R5	9.60	10	25	75	10
QBH 1212	R6	11.50	12	30	75	12

DEPTH OF CUT

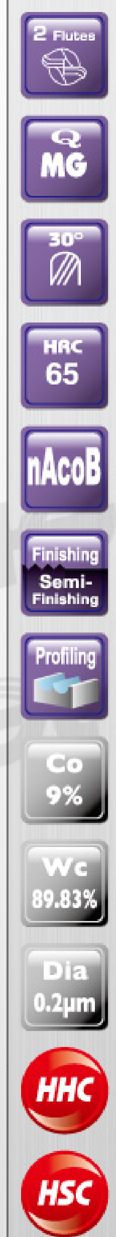


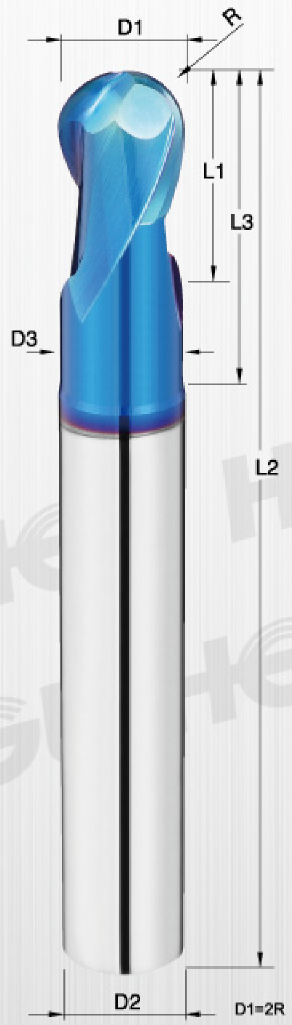
Recommended cutting condition for QBH

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QBHN



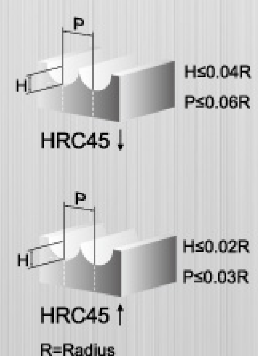


Ball Nose End Mills

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QBHN 0104	R0.5	0.95	1	3	50	4
QBHN 0154	R0.75	1.45	1	3	50	4
QBHN 0204	R1	1.92	2	5	50	4
QBHN 0306	R1.5	2.90	3	8	50	6
QBHN 0406	R2	3.88	4	10	50	6
QBHN 0506	R2.5	4.80	5	13	50	6
QBHN 0606	R3	5.80	6	15	50	6
QBHN 0808	R4	7.70	8	20	60	8
QBHN 1010	R5	9.60	10	25	75	10
QBHN 1212	R6	11.50	12	30	75	12

DEPTH OF CUT



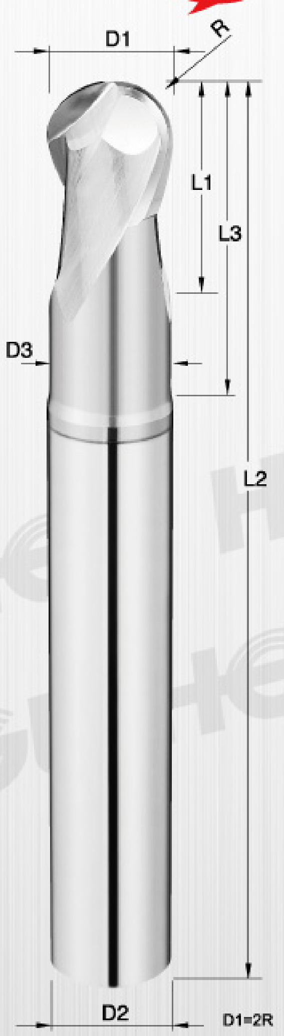
Recommended cutting condition for QBHN

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QBHV

NEW

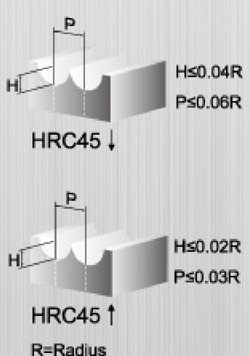


Ball Nose End Mills

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QBHV **0104**	R0.5	0.95	1	3	50	4
QBHV **0154**	R0.75	1.45	1	3	50	4
QBHV **0204**	R1	1.92	2	5	50	4
QBHV **0306**	R1.5	2.90	3	8	50	6
QBHV **0406**	R2	3.88	4	10	50	6
QBHV **0506**	R2.5	4.80	5	13	50	6
QBHV **0606**	R3	5.80	6	15	50	6
QBHV **0808**	R4	7.70	8	20	60	8
QBHV **1010**	R5	9.60	10	25	75	10
QBHV **1212**	R6	11.50	12	30	75	12

DEPTH OF CUT

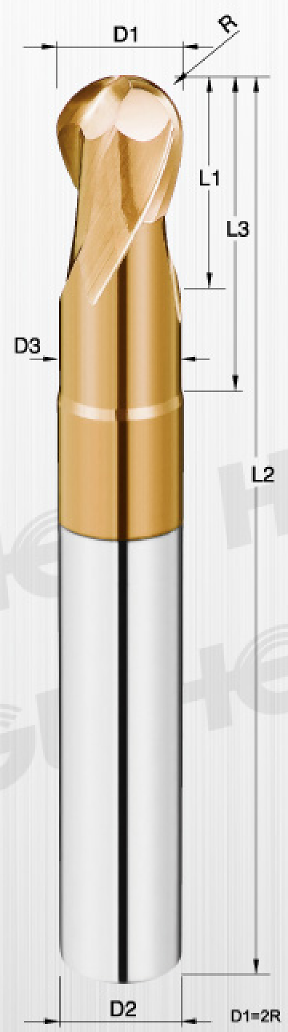


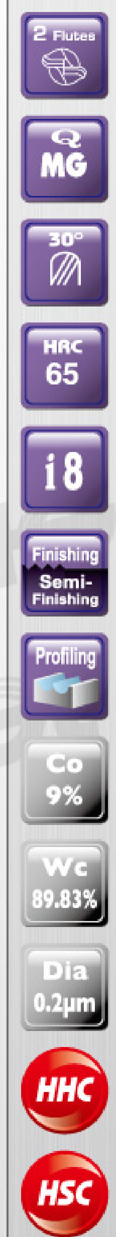
Recommended cutting condition for QBHV

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QBHX



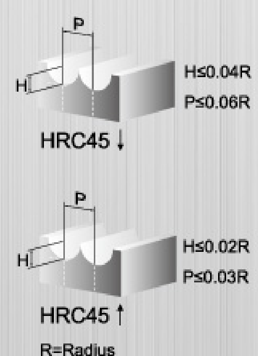


Ball Nose End Mills

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QBHX **0104**	R0.5	0.95	1	3	50	4
QBHX **0154**	R0.75	1.45	1	3	50	4
QBHX **0204**	R1	1.92	2	5	50	4
QBHX **0306**	R1.5	2.90	3	8	50	6
QBHX **0406**	R2	3.88	4	10	50	6
QBHX **0506**	R2.5	4.80	5	13	50	6
QBHX **0606**	R3	5.80	6	15	50	6
QBHX **0808**	R4	7.70	8	20	60	8
QBHX **1010**	R5	9.60	10	25	75	10
QBHX **1212**	R6	11.50	12	30	75	12

DEPTH OF CUT



Recommended cutting condition for QBHX

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QBLS
QBLM
QBLL

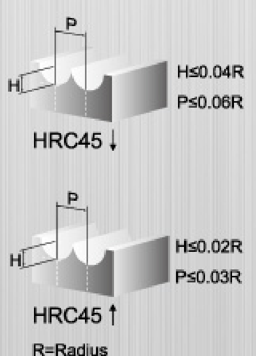
2 Flutes
MG
30°
HRC 65
ALTiN
Finishing
Semi-Finishing
Profiling
Co 9%
Wc 89.83%
Dia 0.2µm
HHC
HSC

▶ Long Shank / Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
QBLS 0206	R1	4	75	6
QBLS 0306	R1.5	6	75	6
QBLS 0406	R2	8	75	6
QBLS 0506	R2.5	10	75	6
QBLS 0606	R3	12	75	6
QBLS 0808	R4	16	75	8
QBLM 0606	R3	12	100	6
QBLM 0808	R4	16	100	8
QBLM 1010	R5	20	100	10
QBLM 1212	R6	24	100	12
QBLL 1010	R5	20	150	10
QBLL 1212	R6	24	150	12
QBLL 1616	R8	32	150	16
QBLL 2020	R10	40	150	20

▶ DEPTH OF CUT

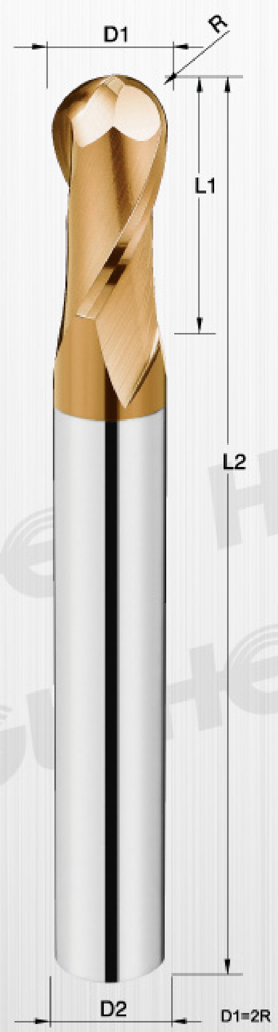


Recommended cutting condition for QBLS.QBLM.QBLL

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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
R4	9000	2300	8000	1500	6200	1400
R5	7500	1900	6500	1200	5200	900
R6	6300	1600	5500	1000	4300	800

MAGIC CUTTING SERIES

QBLSX
QBLMX
QBLLX



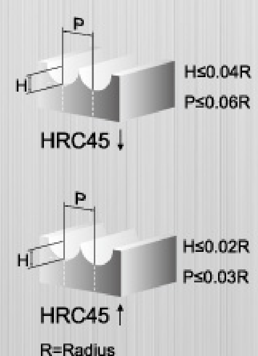
2 Flutes
MG
30°
HRC 65
i8
Finishing
Semi-Finishing
Profiling
Co 9%
Wc 89.83%
Dia 0.2µm
HHC
HSC

▶ Long Shank / Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
QBLSX 0206	R1	4	75	6
QBLSX 0306	R1.5	6	75	6
QBLSX 0406	R2	8	75	6
QBLSX 0506	R2.5	10	75	6
QBLSX 0606	R3	12	75	6
QBLSX 0808	R4	16	75	8
QBLMX 0606	R3	12	100	6
QBLMX 0808	R4	16	100	8
QBLMX 1010	R5	20	100	10
QBLMX 1212	R6	24	100	12
QBLLX 1010	R5	20	150	10
QBLLX 1212	R6	24	150	12
QBLLX 1616	R8	32	150	16
QBLLX 2020	R10	40	150	20

▶ DEPTH OF CUT



Recommended cutting condition for QBLSX.QBLMX.QBLLX

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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
R4	9000	2300	8000	1500	6200	1400
R5	7500	1900	6500	1200	5200	900
R6	6300	1600	5500	1000	4300	800

QBP

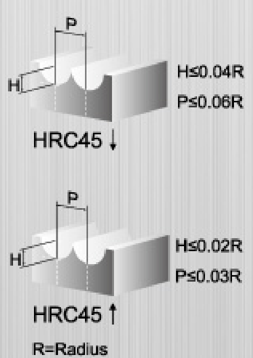
Power Ball Nose End Mills

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QBP 0104	R0.5	0.95	1	3	50	4
QBP 0154	R0.75	1.45	2	5	50	4
QBP 0206	R1	1.92	3	6	50	6
QBP 0306	R1.5	2.90	4	8	50	6
QBP 0306A	R1.5	2.90	4	8	75	6
QBP 0406	R2	3.88	5	10	50	6
QBP 0406A	R2	3.88	5	10	75	6
QBP 0606	R3	5.80	6	12	50	6
QBP 0606A	R3	5.80	6	16	75	6
QBP 0808	R4	7.70	8	16	60	8
QBP 0808A	R4	7.70	8	25	100	8
QBP 1010	R5	9.60	10	20	75	10
QBP 1010A	R5	9.60	10	30	100	10
QBP 1212	R6	11.50	12	25	75	12
QBP 1212A	R6	11.50	12	35	100	12

2 Flutes
MG
5°
HRC 65
ALTiN
Roughing
Semi-Finishing
Profiling
Co 9%
Wc 89.83%
Dia 0.2μm
HHC
HSC

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

QBPG

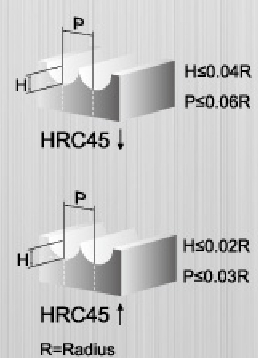
Power Ball Nose End Mills

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QBPG 0606	R3	5.80	6	12	50	6
QBPG 0606A	R3	5.80	6	16	75	6
QBPG 0808	R4	7.70	8	16	60	8
QBPG 0808A	R4	7.70	8	25	100	8
QBPG 1010	R5	9.60	10	20	75	10
QBPG 1010A	R5	9.60	10	30	100	10
QBPG 1212	R6	11.50	12	25	75	12
QBPG 1212A	R6	11.50	12	35	100	12

2 Flutes
MG
5°
HRC 65
Aldura
Roughing
Semi-Finishing
Profiling
Co 9%
Wc 89.83%
Dia 0.2μm
HHC
HSC

DEPTH OF CUT



Recommended cutting condition for QBPG

MATERIAL	Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Alloy Steels . Tool Steels SKD61		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
RADIUS	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QBM

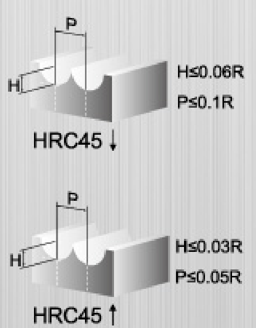
Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
QBM 0024	R0.1	0.4	50	4
QBM 0034	R0.15	0.6	50	4
QBM 0044	R0.2	0.8	50	4
QBM 0054	R0.25	1.0	50	4
QBM 0064	R0.3	1.2	50	4
QBM 0074	R0.35	1.4	50	4
QBM 0084	R0.4	1.6	50	4
QBM 0094	R0.45	1.8	50	4
QBM 0124	R0.6	2.4	50	4
QBM 0144	R0.7	2.8	50	4
QBM 0164	R0.8	3.2	50	4
QBM 0184	R0.9	3.6	50	4

2 Flutes
MG
30°
HRC 65
Aldura
Finishing Semi-Finishing
Profiling
Co 9%
Wc 89.83%
Dia 0.2μm
HSC

DEPTH OF CUT



R=Radius

Recommended cutting condition for QBM

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QBF

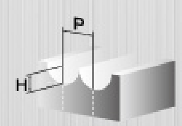
Long Neck / Ball Nose End Mills

unit: mm

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QBF 00504	R0.25	0.46	0.5	4	50	4
QBF 00506	R0.25	0.46	0.5	6	50	4
QBF 00604	R0.3	0.56	0.6	4	50	4
QBF 00606	R0.3	0.56	0.6	6	50	4
QBF 00806	R0.4	0.76	0.8	6	50	4
QBF 00808	R0.4	0.76	0.8	8	50	4
QBF 01006	R0.5	0.95	1.5	6	50	4
QBF 01008	R0.5	0.95	1.5	8	50	4
QBF 01010	R0.5	0.95	1.5	10	50	4
QBF 01012	R0.5	0.95	1.5	12	50	4
QBF 01208	R0.6	1.15	2	8	50	4
QBF 01212	R0.6	1.15	2	12	50	4
QBF 01508	R0.75	1.45	2	8	50	4
QBF 01512	R0.75	1.45	2	12	50	4
QBF 01516	R0.75	1.45	2	16	50	4
QBF 01520	R0.75	1.45	2	20	50	4
QBF 01608	R0.8	1.54	2.5	8	50	4
QBF 01612	R0.8	1.54	2.5	12	50	4
QBF 01616	R0.8	1.54	2.5	16	50	4
QBF 02008	R1	1.92	3	8	50	4
QBF 02012	R1	1.92	3	12	50	4
QBF 02016	R1	1.92	3	16	50	4
QBF 02020	R1	1.92	3	20	50	4
QBF 03008	R1.5	2.90	4	8	50	6
QBF 03010	R1.5	2.90	4	10	50	6
QBF 03016	R1.5	2.90	4	16	50	6
QBF 03020	R1.5	2.90	4	20	75	6
QBF 03025	R1.5	2.90	4	25	75	6
QBF 04010	R2	3.88	5	10	75	6
QBF 04015	R2	3.88	5	15	75	6
QBF 04020	R2	3.88	5	20	75	6
QBF 04025	R2	3.88	5	25	75	6
QBF 04030	R2	3.88	5	30	75	6

2 Flutes
MG
30°
HRC 65
ALTiN
Finishing Semi-Finishing
Profiling
Co 9%
Wc 89.83%
Dia 0.2μm
HHC
HSC
HPC

DEPTH OF CUT



R<1 P<0.1R
R>1 P<0.2R
R=Radius

Recommended cutting condition for QBF

MATERIAL	Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80			
RADIUS	EFFECTIVE LENGTH	SPEED (mm^{-1})	FEED mm / min	DEPTH OF CUT H (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

MAGIC CUTTING SERIES

QEB

▶ Square End Mills

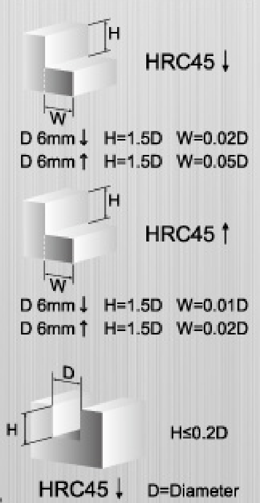
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
QEB 0304	3.0	8	50	4
QEB 0404	4.0	11	50	4
QEB 0506	5.0	13	50	6
QEB 0606	6.0	16	50	6
QEB 0808	8.0	20	60	8
QEB 1010	10.0	25	75	10
QEB 1212	12.0	30	75	12
QEB 1616	16.0	40	100	16
QEB 2020	20.0	45	100	20

Recommended cutting condition for QEB

MATERIAL		Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS		~HRC30		~HRC50		~HRC60	
DIAMETER		SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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



MAGIC CUTTING SERIES

QEBG

▶ Square End Mills

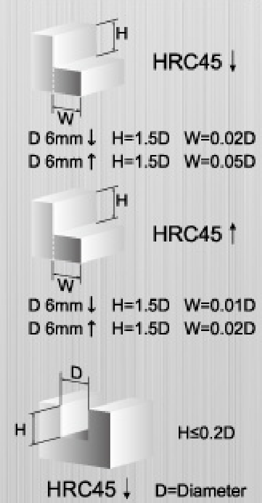
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
QEBG 0404	4.0	11	50	4
QEBG 0606	6.0	16	50	6
QEBG 0808	8.0	20	60	8
QEBG 1010	10.0	25	75	10
QEBG 1212	12.0	30	75	12

Recommended cutting condition for QEBG

MATERIAL		Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS		~HRC30		~HRC50		~HRC60	
DIAMETER		SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
Side Milling	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
Grooving	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

▶ DEPTH OF CUT



MAGIC CUTTING SERIES

QEBN

NEW

4 Flutes · MG · 45° · HRC 65 · nAcoB · Finishing Semi-Finishing · Side · Co 9% · Wc 89.83% · Dia 0.2μm · HHC · HSC

▶ Square End Mills

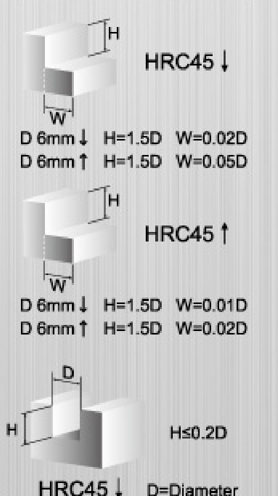
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
QEBN 0304	3.0	8	50	4
QEBN 0404	4.0	11	50	4
QEBN 0506	5.0	13	50	6
QEBN 0606	6.0	16	50	6
QEBN 0808	8.0	20	60	8
QEBN 1010	10.0	25	75	10
QEBN 1212	12.0	30	75	12
QEBN 1616	16.0	40	100	16
QEBN 2020	20.0	45	100	20

Recommended cutting condition for 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	
	DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

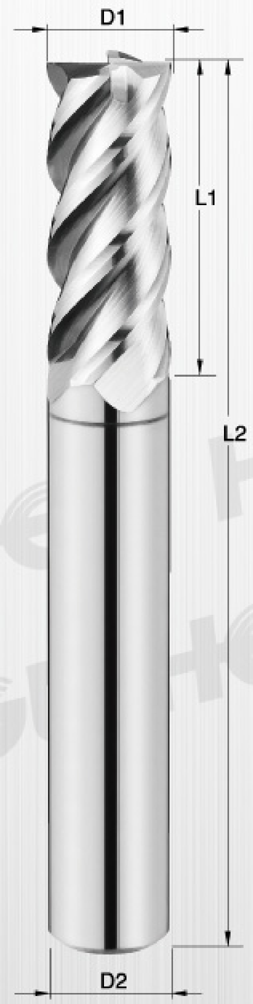
▶ DEPTH OF CUT



MAGIC CUTTING SERIES

QEBV

NEW



4 Flutes · MG · 45° · HRC 65 · G200 · Finishing Semi-Finishing · Side · Co 9% · Wc 89.83% · Dia 0.2μm · HHC · HSC

▶ Square End Mills

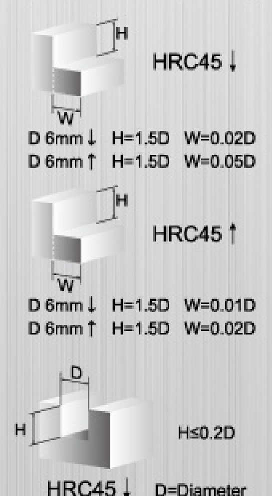
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
QEBV 0304	3.0	8	50	4
QEBV 0404	4.0	11	50	4
QEBV 0506	5.0	13	50	6
QEBV 0606	6.0	16	50	6
QEBV 0808	8.0	20	60	8
QEBV 1010	10.0	25	75	10
QEBV 1212	12.0	30	75	12
QEBV 1616	16.0	40	100	16
QEBV 2020	20.0	45	100	20

Recommended cutting condition for QEBV

	MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
	HARDNESS	~HRC30		~HRC50		~HRC60	
	DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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



MAGIC CUTTING SERIES

QEX

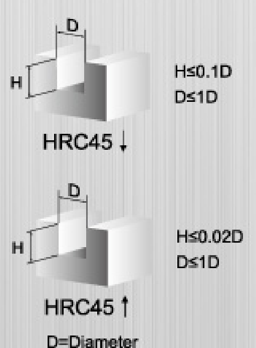
NEW

Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
QEX **0304**	3.0	8	50	4
QEX **0404**	4.0	11	50	4
QEX **0506**	5.0	13	50	6
QEX **0606**	6.0	16	50	6
QEX **0808**	8.0	20	60	8
QEX **1010**	10.0	25	75	10
QEX **1212**	12.0	30	75	12
QEX **1616**	16.0	40	100	16
QEX **2020**	20.0	45	100	20

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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

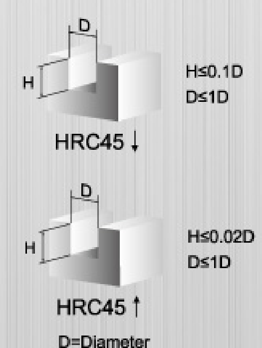
QEM

Micro Diameter / Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
QEM **0024**	0.2	0.4	50	4
QEM **0034**	0.3	0.6	50	4
QEM **0044**	0.4	0.8	50	4
QEM **0054**	0.5	1.0	50	4
QEM **0064**	0.6	1.2	50	4
QEM **0074**	0.7	1.4	50	4
QEM **0084**	0.8	1.6	50	4
QEM **0094**	0.9	1.8	50	4
QEM **0124**	1.2	3.0	50	4
QEM **0144**	1.4	3.0	50	4
QEM **0164**	1.6	4.0	50	4
QEM **0184**	1.8	5.0	50	4

DEPTH OF CUT



Recommended cutting condition for QEM

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

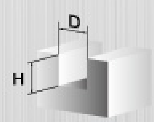
QRFA

Corner Radius Long Neck / End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QRFA 01004	1.0	0.1	0.95	1.0	4	50	4
QRFA 01006	1.0	0.1	0.95	1.0	6	50	4
QRFA 01008	1.0	0.1	0.95	1.0	8	50	4
QRFA 01010	1.0	0.1	0.95	1.0	10	50	4
QRFA 01504	1.5	0.2	1.45	1.5	4	50	4
QRFA 01506	1.5	0.2	1.45	1.5	6	50	4
QRFA 01508	1.5	0.2	1.45	1.5	8	50	4
QRFA 01510	1.5	0.2	1.45	1.5	10	50	4
QRFA 01512	1.5	0.2	1.45	1.5	12	50	4
QRFA 02008	2.0	0.2	1.92	2.0	8	50	4
QRFA 02010	2.0	0.2	1.92	2.0	10	50	4
QRFA 02012	2.0	0.2	1.92	2.0	12	50	4
QRFA 02016	2.0	0.2	1.92	2.0	16	50	4
QRFA 03008	3.0	0.2	2.90	3.0	8	50	6
QRFA 03010	3.0	0.2	2.90	3.0	10	50	6
QRFA 03012	3.0	0.2	2.90	3.0	12	50	6
QRFA 03016	3.0	0.2	2.90	3.0	16	50	6
QRFA 03020	3.0	0.2	2.90	3.0	20	50	6

▶ DEPTH OF CUT



D=Diameter

Recommended cutting condition for QRFA

MATERIAL		Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80		
DIAMETER	EFFECTIVE LENGTH	SPEED (mm⁻¹)	FEED mm / min	DEPTH OF CUT H (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

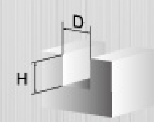
QRFB

Corner Radius Long Neck / End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QRFB 01004	1.0	0.1	0.95	1.0	4	50	4
QRFB 01006	1.0	0.1	0.95	1.0	6	50	4
QRFB 01008	1.0	0.1	0.95	1.0	8	50	4
QRFB 01010	1.0	0.1	0.95	1.0	10	50	4
QRFB 01504	1.5	0.2	1.45	1.5	4	50	4
QRFB 01506	1.5	0.2	1.45	1.5	6	50	4
QRFB 01508	1.5	0.2	1.45	1.5	8	50	4
QRFB 01510	1.5	0.2	1.45	1.5	10	50	4
QRFB 01512	1.5	0.2	1.45	1.5	12	50	4
QRFB 02008	2.0	0.2	1.92	2.0	8	50	4
QRFB 02010	2.0	0.2	1.92	2.0	10	50	4
QRFB 02012	2.0	0.2	1.92	2.0	12	50	4
QRFB 02016	2.0	0.2	1.92	2.0	16	50	4
QRFB 03008	3.0	0.2	2.90	3.0	8	50	6
QRFB 03010	3.0	0.2	2.90	3.0	10	50	6
QRFB 03012	3.0	0.2	2.90	3.0	12	50	6
QRFB 03016	3.0	0.2	2.90	3.0	16	50	6
QRFB 03020	3.0	0.2	2.90	3.0	20	50	6

▶ DEPTH OF CUT



D=Diameter

MAGIC CUTTING SERIES

QEFA

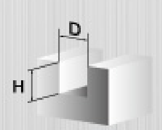
2 Flutes · MG · 35° · HRC 65 · Aldura · Finishing Semi-Finishing · Slotting · Co 9% · Wc 89.83% · Dia 0.2μm · HSC

Long Neck / Square End Mills

unit: mm

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QEFA 00504	0.5	0.46	1	4	50	4
QEFA 00506	0.5	0.46	1	6	50	4
QEFA 00604	0.6	0.56	1.2	4	50	4
QEFA 00606	0.6	0.56	1.2	6	50	4
QEFA 00804	0.8	0.76	1.2	4	50	4
QEFA 00806	0.8	0.76	1.2	6	50	4
QEFA 00808	0.8	0.76	1.2	8	50	4
QEFA 01006	1.0	0.95	1.5	6	50	4
QEFA 01008	1.0	0.95	1.5	8	50	4
QEFA 01010	1.0	0.95	1.5	10	50	4
QEFA 01012	1.0	0.95	1.5	12	50	4
QEFA 01208	1.2	1.15	2	8	50	4
QEFA 01212	1.2	1.15	2	12	50	4
QEFA 01508	1.5	1.45	2	8	50	4
QEFA 01510	1.5	1.45	2	10	50	4
QEFA 01512	1.5	1.45	2	12	50	4
QEFA 01516	1.5	1.45	2	16	50	4
QEFA 01608	1.6	1.54	2.5	8	50	4
QEFA 01612	1.6	1.54	2.5	12	50	4
QEFA 01616	1.6	1.54	2.5	16	50	4
QEFA 02008	2.0	1.92	3	8	50	4
QEFA 02010	2.0	1.92	3	10	50	4
QEFA 02012	2.0	1.92	3	12	50	4
QEFA 02016	2.0	1.92	3	16	50	4
QEFA 02020	2.0	1.92	3	20	50	4
QEFA 02510	2.5	2.40	3	10	50	4
QEFA 02512	2.5	2.40	3	12	50	4
QEFA 02516	2.5	2.40	3	16	50	4
QEFA 02520	2.5	2.40	3	20	50	4
QEFA 03010	3.0	2.90	4	10	50	6
QEFA 03012	3.0	2.90	4	12	50	6
QEFA 03016	3.0	2.90	4	16	50	6
QEFA 03020	3.0	2.90	4	20	75	6
QEFA 03025	3.0	2.90	4	25	75	6

DEPTH OF CUT



D=Diameter

Recommended cutting condition for QEFA

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

MAGIC CUTTING SERIES

QRD

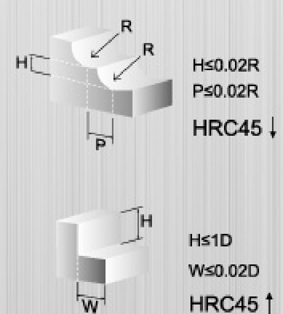
4 Flutes · MG · 35° · R · HRC 65 · ALTiN · Finishing Semi-Finishing · Profiling · Co 9% · Wc 89.83% · Dia 0.2μm · HHC · HSC

Corner Radius End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
QRD 0102	1.0	0.2	2	50	4
QRD 01502	1.5	0.2	3	50	4
QRD 01503	1.5	0.3	3	50	4
QRD 0202	2.0	0.2	4	50	4
QRD 0203	2.0	0.3	4	50	4
QRD 0205	2.0	0.5	4	50	4
QRD 0302	3.0	0.2	6	50	3
QRD 0305	3.0	0.5	6	50	3
QRD 0402	4.0	0.2	8	50	4
QRD 0405	4.0	0.5	8	50	4
QRD 0410	4.0	1.0	8	50	4
QRD 0605	6.0	0.5	12	50	6
QRD 0610	6.0	1.0	12	50	6
QRD 0805	8.0	0.5	16	60	8
QRD 0810	8.0	1.0	16	60	8
QRD 1005	10.0	0.5	20	75	10
QRD 1010	10.0	1.0	20	75	10
QRD 1020	10.0	2.0	20	75	10
QRD 1030	10.0	3.0	20	75	10
QRD 1205	12.0	0.5	24	75	12
QRD 1210	12.0	1.0	24	75	12
QRD 1220	12.0	2.0	24	75	12
QRD 1230	12.0	3.0	24	75	12

DEPTH OF CUT

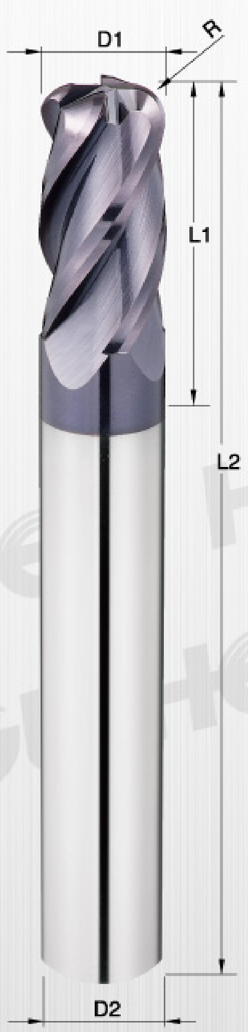


D=Diameter
R=Corner R

Recommended cutting condition for QRD

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

QRDG

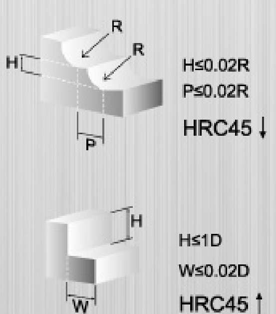


Corner Radius End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
QRDG **0405**	4.0	0.5	8	50	4
QRDG **0605**	6.0	0.5	12	50	6
QRDG **0610**	6.0	1.0	12	50	6
QRDG **0805**	8.0	0.5	16	60	8
QRDG **0810**	8.0	1.0	16	60	8
QRDG **1005**	10.0	0.5	20	75	10
QRDG **1010**	10.0	1.0	20	75	10
QRDG **1205**	12.0	0.5	24	75	12
QRDG **1210**	12.0	1.0	24	75	12

DEPTH OF CUT

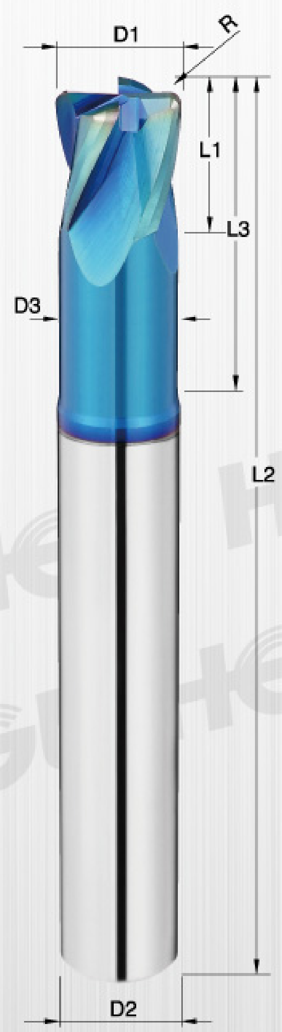


D=Diameter
R=Corner R

Recommended cutting condition for QRDG

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
4	16000	3200	10000	1900	4800	480
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

QRHN

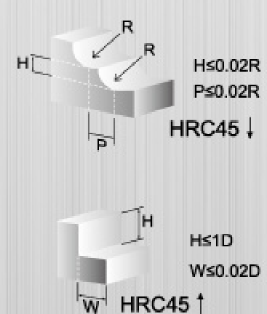


Corner Radius End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QRHN **0305**	3.0	0.5	2.90	3	9	50	6
QRHN **0405**	4.0	0.5	3.88	4	12	50	6
QRHN **0605**	6.0	0.5	5.80	6	15	50	6
QRHN **0610**	6.0	1.0	5.80	6	15	50	6
QRHN **0805**	8.0	0.5	7.70	8	20	60	8
QRHN **0810**	8.0	1.0	7.70	8	20	60	8
QRHN **1010**	10.0	1.0	9.60	10	25	75	10
QRHN **1020**	10.0	2.0	9.60	10	25	75	10
QRHN **1030**	10.0	3.0	9.60	10	25	75	10
QRHN **1210**	12.0	1.0	11.50	12	30	75	12
QRHN **1220**	12.0	2.0	11.50	12	30	75	12

DEPTH OF CUT



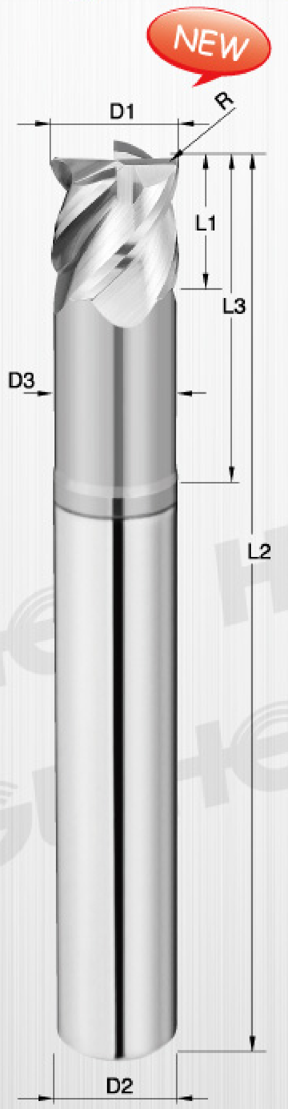
D=Diameter
R=Corner R

Recommended cutting condition for QRHN

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QRHV



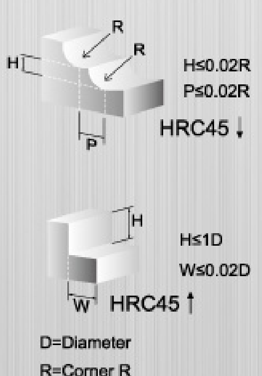
4 Flutes
MG
45°
R
HRC 65
G200
Finishing
Semi-Finishing
Profiling
Co 9%
Wc 89.83%
Dia 0.2μm
HHC
HSC

▶ Corner Radius End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QRHV 0305	3.0	0.5	2.90	3	9	50	6
QRHV 0405	4.0	0.5	3.88	4	12	50	6
QRHV 0605	6.0	0.5	5.80	6	15	50	6
QRHV 0610	6.0	1.0	5.80	6	15	50	6
QRHV 0805	8.0	0.5	7.70	8	20	60	8
QRHV 0810	8.0	1.0	7.70	8	20	60	8
QRHV 1010	10.0	1.0	9.60	10	25	75	10
QRHV 1020	10.0	2.0	9.60	10	25	75	10
QRHV 1030	10.0	3.0	9.60	10	25	75	10
QRHV 1210	12.0	1.0	11.50	12	30	75	12
QRHV 1220	12.0	2.0	11.50	12	30	75	12

▶ DEPTH OF CUT

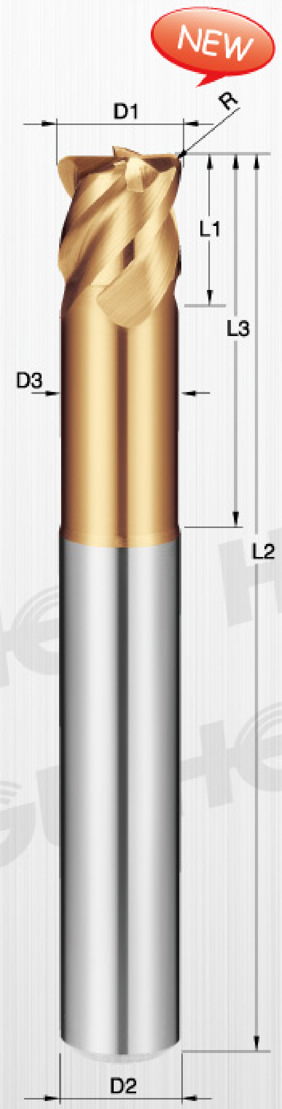


Recommended cutting condition for QRHV

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

QRHX



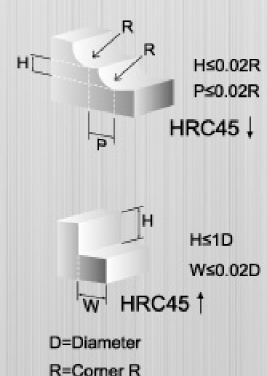
4 Flutes
MG
35°
R
HRC 65
i8
Finishing
Semi-Finishing
Profiling
Co 9%
Wc 89.83%
Dia 0.2μm
HHC
HSC

▶ Corner Radius End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QRHX 0305	3.0	0.5	2.90	3	9	50	6
QRHX 0405	4.0	0.5	3.88	4	12	50	6
QRHX 0605	6.0	0.5	5.80	6	18	50	6
QRHX 0610	6.0	1.0	5.80	6	18	50	6
QRHX 0805	8.0	0.5	7.70	8	24	60	8
QRHX 0810	8.0	1.0	7.70	8	24	60	8
QRHX 1010	10.0	1.0	9.60	10	30	75	10
QRHX 1020	10.0	2.0	9.60	10	30	75	10
QRHX 1030	10.0	3.0	9.60	10	30	75	10
QRHX 1210	12.0	1.0	11.50	12	36	75	12
QRHX 1220	12.0	2.0	11.50	12	36	75	12

▶ DEPTH OF CUT



Recommended cutting condition for QRHX

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

MAGIC CUTTING SERIES

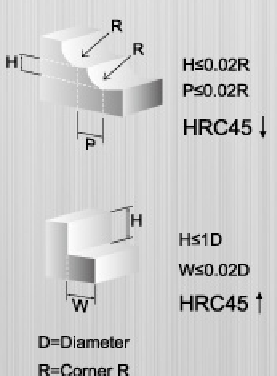
QERC

Long Shank / Corner Radius End Mills

unit: mm

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

DEPTH OF CUT



Recommended cutting condition for QERC

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
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

MAGIC CUTTING SERIES

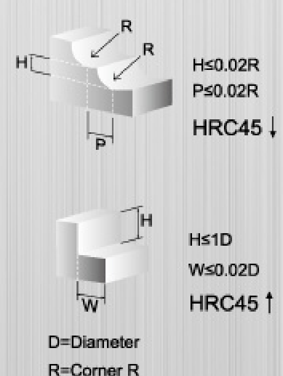
QRHLX

Long Shank / Corner Radius End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
QRHLX 0605	6.0	0.5	6	18	75	6
QRHLX 0610	6.0	1.0	6	18	75	6
QRHLX 0805	8.0	0.5	8	24	100	8
QRHLX 0810	8.0	1.0	8	24	100	8
QRHLX 1005	10.0	0.5	10	30	100	10
QRHLX 1010	10.0	1.0	10	30	100	10
QRHLX 1020	10.0	2.0	10	30	100	10
QRHLX 1205	12.0	0.5	12	36	100	12
QRHLX 1210	12.0	1.0	12	36	100	12
QRHLX 1220	12.0	2.0	12	36	100	12

DEPTH OF CUT



Recommended cutting condition for 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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
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

S HIGH SPEED CUTTING & HIGH HARD CUTTING SERIES

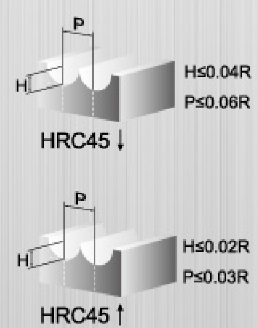
SB

▶ Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
SB 0104	R0.5	2	50	4
SB 0106	R0.5	2	50	6
SB 0154	R0.75	3	50	4
SB 0156	R0.75	3	50	6
SB 0204	R1	4	50	4
SB 0206	R1	4	50	6
SB 0254	R1.25	5	50	4
SB 0256	R1.25	5	50	6
SB 0303	R1.5	6	50	3
SB 0304	R1.5	6	50	4
SB 0306	R1.5	6	50	6
SB 0404	R2	8	50	4
SB 0406	R2	8	50	6
SB 0506	R2.5	10	50	6
SB 0606	R3	12	50	6
SB 0808	R4	16	60	8
SB 1010	R5	20	75	10
SB 1212	R6	24	75	12
SB 1616	R8	32	100	16

▶ DEPTH OF CUT



R=Radius

Recommended cutting condition for SB

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

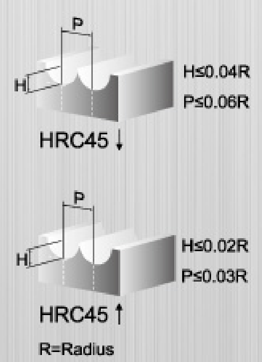
SBH

Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
SBH **0104**	R0.5	2	50	4
SBH **0154**	R0.75	3	50	4
SBH **0204**	R1	4	50	4
SBH **0306**	R1.5	6	50	6
SBH **0406**	R2	8	50	6
SBH **0506**	R2.5	10	50	6
SBH **0606**	R3	12	50	6
SBH **0808**	R4	16	60	8
SBH **1010**	R5	20	75	10
SBH **1212**	R6	24	75	12

DEPTH OF CUT

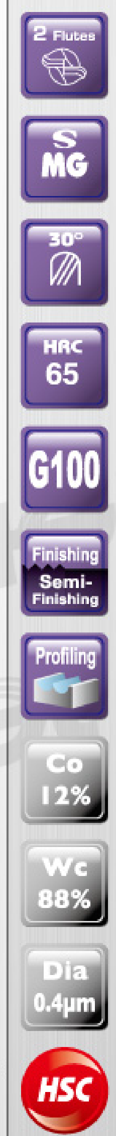


Recommended cutting condition for SBH

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SBK

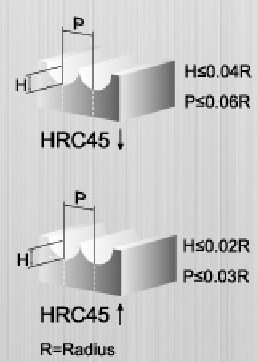


Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
SBK **0104**	R0.5	2	50	4
SBK **0106**	R0.5	2	50	6
SBK **0154**	R0.75	3	50	4
SBK **0156**	R0.75	3	50	6
SBK **0204**	R1	4	50	4
SBK **0206**	R1	4	50	6
SBK **0254**	R1.25	5	50	4
SBK **0256**	R1.25	5	50	6
SBK **0303**	R1.5	6	50	3
SBK **0304**	R1.5	6	50	4
SBK **0306**	R1.5	6	50	6
SBK **0404**	R2	8	50	4
SBK **0406**	R2	8	50	6
SBK **0506**	R2.5	10	50	6
SBK **0606**	R3	12	50	6
SBK **0808**	R4	16	60	8
SBK **1010**	R5	20	75	10
SBK **1212**	R6	24	75	12
SBK **1616**	R8	32	100	16

DEPTH OF CUT



Recommended cutting condition for SBK

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

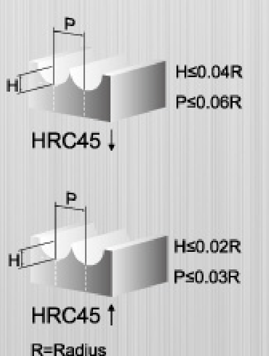
SBX

Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
SBX 0104	R0.5	2	50	4
SBX 0154	R0.75	3	50	4
SBX 0204	R1	4	50	4
SBX 0306	R1.5	6	50	6
SBX 0406	R2	8	50	6
SBX 0506	R2.5	10	50	6
SBX 0606	R3	12	50	6
SBX 0808	R4	16	60	8
SBX 1010	R5	20	75	10
SBX 1212	R6	24	75	12
SBX 1616	R8	32	100	16

DEPTH OF CUT



Recommended cutting condition for SBX

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

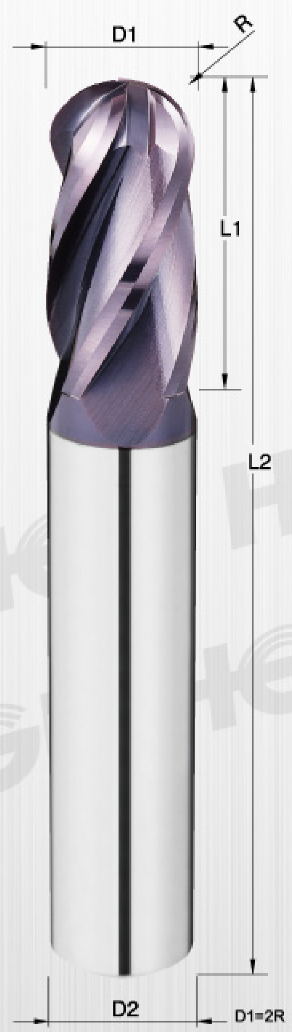
HIGH SPEED CUTTING & HIGH HARD CUTTING

SBB

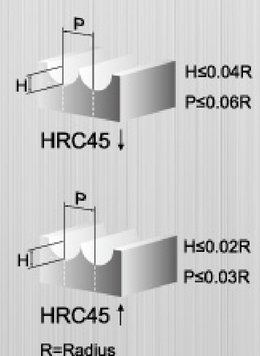
Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
SBB0104	R0.5	2	50	4
SBB0154	R0.75	3	50	4
SBB0204	R1	4	50	4
SBB0254	R1.25	5	50	4
SBB0304	R1.5	6	50	4
SBB0404	R2	8	50	4
SBB0506	R2.5	10	50	6
SBB0606	R3	12	50	6
SBB0808	R4	16	60	8
SBB1010	R5	20	75	10
SBB1212	R6	24	75	12
SBB1616	R8	32	100	16



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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

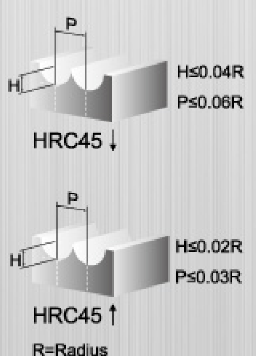
SBLS SBLM SBLL

Long Shank / Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L L2	Shank Dia D2
SBLS0104	R0.5	2	75	4
SBLS0106	R0.5	2	75	6
SBLS0154	R0.75	3	75	4
SBLS0156	R0.75	3	75	6
SBLS0206	R1	4	75	6
SBLS0256	R1.25	5	75	6
SBLS0303	R1.5	6	75	3
SBLS0306	R1.5	6	75	6
SBLS0404	R2	8	75	4
SBLS0406	R2	8	75	6
SBLS0506	R2.5	10	75	6
SBLS0606	R3	12	75	6
SBLM0206	R1	4	100	6
SBLM0306	R1.5	6	100	6
SBLM0406	R2	8	100	6
SBLM0606	R3	12	100	6
SBLM0808	R4	16	100	8
SBLM1010	R5	20	100	10
SBLM1212	R6	24	100	12
SBLL0606	R3	12	150	6
SBLL0808	R4	16	150	8
SBLL1010	R5	20	150	10
SBLL1212	R6	24	150	12

DEPTH OF CUT



Recommended cutting condition for SBLS . SBLM . SBLL

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

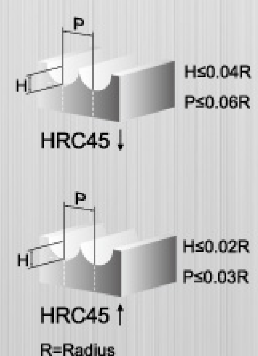
SBLSX SBLMX SBLLX

Long Shank / Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L L2	Shank Dia D2
SBLSX 0206	R1	4	75	6
SBLSX 0306	R1.5	6	75	6
SBLSX 0406	R2	8	75	6
SBLSX 0506	R2.5	10	75	6
SBLSX 0606	R3	12	75	6
SBLMX 0406	R2	8	100	6
SBLMX 0606	R3	12	100	6
SBLMX 0808	R4	16	100	8
SBLMX 1010	R5	20	100	10
SBLMX 1212	R6	24	100	12
SBLLX 0606	R3	12	150	6
SBLLX 0808	R4	16	150	8
SBLLX 1010	R5	20	150	10
SBLLX 1212	R6	24	150	12

DEPTH OF CUT



Recommended cutting condition for SBLSX . SBLMX . SBLLX

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

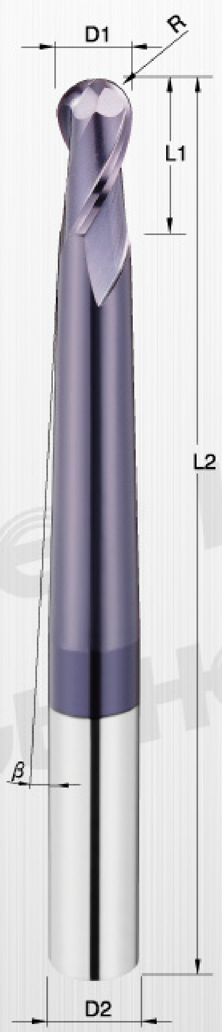
HIGH SPEED CUTTING & HIGH HARD CUTTING

SBC

Taper Neck / Ball Nose End Mills

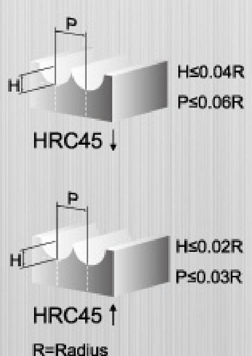
unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2	Taper Angle ß
SBC 0206	R1	4	75	6	3°
SBC 0206A	R1	4	75	6	5°
SBC 0306	R1.5	6	100	6	1.5°
SBC 0306A	R1.5	6	75	6	3°
SBC 0306B	R1.5	6	75	6	5°
SBC 0406	R2	8	100	6	1.5°
SBC 0406A	R2	8	100	6	3°
SBC 0406B	R2	8	75	6	5°
SBC 0608	R3	12	100	8	1.5°
SBC 0608A	R3	12	75	8	3°
SBC 0608B	R3	12	100	8	5°



2 Flutes
MG
30°
HRC 65
ALTiN
Finishing
Semi-Finishing
Profiling
Co 12%
Wc 88%
Dia 0.4μm
HSC

DEPTH OF CUT



Recommended cutting condition for SBC

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

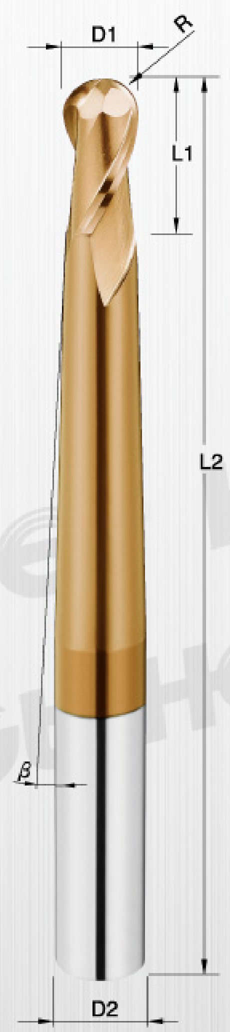
HIGH SPEED CUTTING & HIGH HARD CUTTING

SBCX

Taper Neck / Ball Nose End Mills

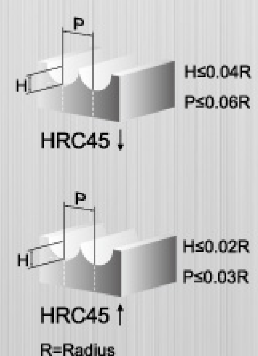
unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2	Taper Angle ß
SBCX 0206	R1	4	75	6	3°
SBCX 0206A	R1	4	75	6	5°
SBCX 0306	R1.5	6	100	6	1.5°
SBCX 0306A	R1.5	6	75	6	3°
SBCX 0306B	R1.5	6	75	6	5°
SBCX 0406	R2	8	100	6	1.5°
SBCX 0406A	R2	8	100	6	3°
SBCX 0406B	R2	8	75	6	5°
SBCX 0608	R3	12	100	8	1.5°
SBCX 0608A	R3	12	75	8	3°
SBCX 0608B	R3	12	100	8	5°



2 Flutes
MG
30°
HRC 65
i8
Finishing
Semi-Finishing
Profiling
Co 12%
Wc 88%
Dia 0.4μm
HSC

DEPTH OF CUT



Recommended cutting condition for 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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

SBM

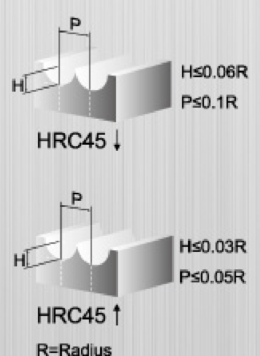
Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
SBM 0024	R0.1	0.4	50	4
SBM 0034	R0.15	0.6	50	4
SBM 0044	R0.2	0.8	50	4
SBM 0054	R0.25	1.0	50	4
SBM 0064	R0.3	1.2	50	4
SBM 0074	R0.35	1.4	50	4
SBM 0084	R0.4	1.6	50	4
SBM 0094	R0.45	1.8	50	4
SBM 0124	R0.6	2.4	50	4
SBM 0144	R0.7	2.8	50	4
SBM 0164	R0.8	3.2	50	4
SBM 0184	R0.9	3.6	50	4

2 Flutes
MG
30°
HRC 65
ALTiN
Finishing Semi-Finishing
Profiling
Co 12%
Wc 88%
Dia 0.4μm
HSC

DEPTH OF CUT



Recommended cutting condition for SBM

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

SBMX

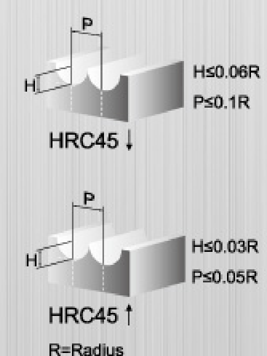
Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
SBMX 0024	R0.1	0.4	50	4
SBMX 0034	R0.15	0.6	50	4
SBMX 0044	R0.2	0.8	50	4
SBMX 0054	R0.25	1.0	50	4
SBMX 0064	R0.3	1.2	50	4
SBMX 0074	R0.35	1.4	50	4
SBMX 0084	R0.4	1.6	50	4
SBMX 0094	R0.45	1.8	50	4
SBMX 0124	R0.6	2.4	50	4
SBMX 0144	R0.7	2.8	50	4
SBMX 0164	R0.8	3.2	50	4
SBMX 0184	R0.9	3.6	50	4

2 Flutes
MG
30°
HRC 65
i8
Finishing Semi-Finishing
Profiling
Co 12%
Wc 88%
Dia 0.4μm
HSC

DEPTH OF CUT



Recommended cutting condition for SBMX

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SBF

Long Neck / Ball Nose End Mills

unit: mm

2 Flutes | S MG | 30° | HRC 65 | ALTiN | Finishing Semi-Finishing | Profiling | Co 12% | Wc 88% | Dia 0.4μm | HSC

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SBF 00504	R0.25	0.46	0.5	4	50	4
SBF 00506	R0.25	0.46	0.5	6	50	4
SBF 00604	R0.3	0.56	0.6	4	50	4
SBF 00606	R0.3	0.56	0.6	6	50	4
SBF 00806	R0.4	0.76	0.8	6	50	4
SBF 00808	R0.4	0.76	0.8	8	50	4
SBF 01006	R0.5	0.95	1.5	6	50	4
SBF 01008	R0.5	0.95	1.5	8	50	4
SBF 01010	R0.5	0.95	1.5	10	50	4
SBF 01012	R0.5	0.95	1.5	12	50	4
SBF 01208	R0.6	1.15	2	8	50	4
SBF 01212	R0.6	1.15	2	12	50	4
SBF 01508	R0.75	1.45	2	8	50	4
SBF 01512	R0.75	1.45	2	12	50	4
SBF 01516	R0.75	1.45	2	16	50	4
SBF 01520	R0.75	1.45	2	20	50	4
SBF 01608	R0.8	1.54	2.5	8	50	4
SBF 01612	R0.8	1.54	2.5	12	50	4
SBF 01616	R0.8	1.54	2.5	16	50	4
SBF 02008	R1.0	1.92	3	8	50	4
SBF 02012	R1.0	1.92	3	12	50	4
SBF 02016	R1.0	1.92	3	16	50	4
SBF 02020	R1.0	1.92	3	20	50	4
SBF 03008	R1.5	2.90	4	8	50	6
SBF 03010	R1.5	2.90	4	10	50	6
SBF 03016	R1.5	2.90	4	16	50	6
SBF 03020	R1.5	2.90	4	20	75	6
SBF 03025	R1.5	2.90	4	25	75	6
SBF 04010	R2.0	3.88	5	10	75	6
SBF 04015	R2.0	3.88	5	15	75	6
SBF 04020	R2.0	3.88	5	20	75	6
SBF 04025	R2.0	3.88	5	25	75	6
SBF 04030	R2.0	3.88	5	30	75	6

Recommended cutting condition for SBF

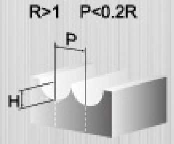
MATERIAL: Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80

RADIUS	EFFECTIVE LENGTH	SPEED (mm^{-1})	FEED mm / min	DEPTH OF CUT H (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

R<1 P<0.1R

R>1 P<0.2R



R=Radius

HIGH SPEED CUTTING & HIGH HARD CUTTING

SBFX

Long Neck / Ball Nose End Mills

unit: mm

2 Flutes | S MG | 30° | HRC 65 | i8 | Finishing Semi-Finishing | Profiling | Co 12% | Wc 88% | Dia 0.4μm | HSC

Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SBFX 00504	R0.25	0.46	0.5	4	50	4
SBFX 00506	R0.25	0.46	0.5	6	50	4
SBFX 00604	R0.3	0.56	0.6	4	50	4
SBFX 00606	R0.3	0.56	0.6	6	50	4
SBFX 00806	R0.4	0.76	0.8	6	50	4
SBFX 00808	R0.4	0.76	0.8	8	50	4
SBFX 01006	R0.5	0.95	1.5	6	50	4
SBFX 01008	R0.5	0.95	1.5	8	50	4
SBFX 01010	R0.5	0.95	1.5	10	50	4
SBFX 01012	R0.5	0.95	1.5	12	50	4
SBFX 01208	R0.6	1.15	2	8	50	4
SBFX 01212	R0.6	1.15	2	12	50	4
SBFX 01508	R0.75	1.45	2	8	50	4
SBFX 01512	R0.75	1.45	2	12	50	4
SBFX 01516	R0.75	1.45	2	16	50	4
SBFX 01520	R0.75	1.45	2	20	50	4
SBFX 01608	R0.8	1.54	2.5	8	50	4
SBFX 01612	R0.8	1.54	2.5	12	50	4
SBFX 01616	R0.8	1.54	2.5	16	50	4
SBFX 02008	R1.0	1.92	3	8	50	4
SBFX 02012	R1.0	1.92	3	12	50	4
SBFX 02016	R1.0	1.92	3	16	50	4
SBFX 02020	R1.0	1.92	3	20	50	4
SBFX 03008	R1.5	2.90	4	8	50	6
SBFX 03010	R1.5	2.90	4	10	50	6
SBFX 03016	R1.5	2.90	4	16	50	6
SBFX 03020	R1.5	2.90	4	20	75	6
SBFX 03025	R1.5	2.90	4	25	75	6
SBFX 04010	R2.0	3.88	5	10	75	6
SBFX 04015	R2.0	3.88	5	15	75	6
SBFX 04020	R2.0	3.88	5	20	75	6
SBFX 04025	R2.0	3.88	5	25	75	6
SBFX 04030	R2.0	3.88	5	30	75	6

Recommended cutting condition for SBFX

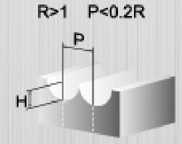
MATERIAL: Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80

RADIUS	EFFECTIVE LENGTH	SPEED (mm^{-1})	FEED mm / min	DEPTH OF CUT H (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

R<1 P<0.1R

R>1 P<0.2R

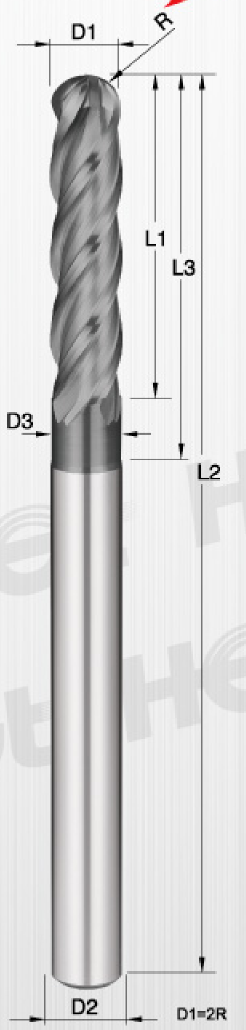


R=Radius

SGBF

Long Neck / Ball Nose End Mills

unit: mm



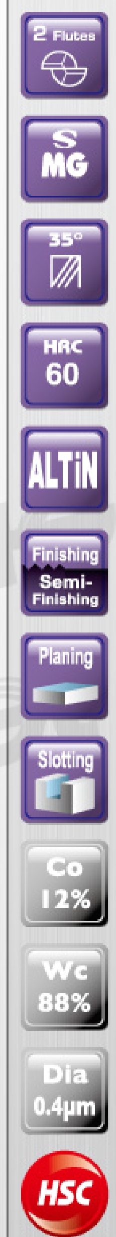
Order No.	Radius R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SGBF **0404**	R2	3.88	20	25	75	4
SGBF **0404A**	R2	3.88	20	25	100	4
SGBF **0606**	R3	5.80	25	30	75	6
SGBF **0606A**	R3	5.80	25	30	100	6
SGBF **0606B**	R3	5.80	25	30	150	6
SGBF **0808**	R4	7.70	30	40	100	8
SGBF **0808B**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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEA

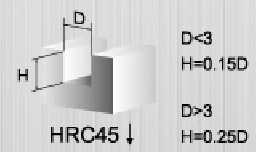
Square End Mills

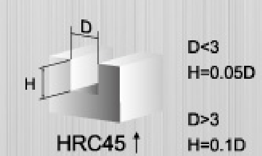
unit: mm



Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEA **0104**	1.0	3	50	4
SEA **0154**	1.5	4	50	4
SEA **0204**	2.0	6	50	4
SEA **0306**	3.0	8	50	6
SEA **0406**	4.0	11	50	6
SEA **0506**	5.0	13	50	6
SEA **0606**	6.0	16	50	6
SEA **0808**	8.0	20	60	8
SEA **1010**	10.0	25	75	10
SEA **1212**	12.0	30	75	12
SEA **1616**	16.0	40	100	16
SEA **2020**	20.0	45	100	20

DEPTH OF CUT





D=Diameter

Recommended cutting condition for SEA

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

SEB

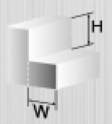
Square End Mills

unit: mm

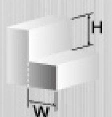
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEB 0104	1.0	3	50	4
SEB 0154	1.5	4	50	4
SEB 0204	2.0	6	50	4
SEB 0306	3.0	8	50	6
SEB 0406	4.0	11	50	6
SEB 0506	5.0	13	50	6
SEB 0606	6.0	16	50	6
SEB 0808	8.0	20	60	8
SEB 1010	10.0	25	75	10
SEB 1212	12.0	30	75	12
SEB 1616	16.0	40	100	16
SEB 2020	20.0	45	100	20

4 Flutes
MG
35°
HRC 60
ALTiN
Finishing
Semi-Finishing
Planing
Side
Co 12%
Wc 88%
Dia 0.4µm
HSC

DEPTH OF CUT



H≤1.5D
W≤0.1D
HRC45↓



H≤1D
W≤0.05D
HRC45↑

D=Diameter

Recommended cutting condition for SEB

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

SEK

Square End Mills

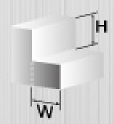
unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEK 0104	1.0	3	50	4
SEK 0154	1.5	4	50	4
SEK 0204	2.0	6	50	4
SEK 0306	3.0	8	50	6
SEK 0406	4.0	11	50	6
SEK 0506	5.0	13	50	6
SEK 0606	6.0	16	50	6
SEK 0808	8.0	20	60	8
SEK 1010	10.0	25	75	10
SEK 1212	12.0	30	75	12
SEK 1616	16.0	40	100	16
SEK 2020	20.0	45	100	20

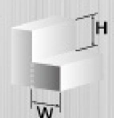
NEW

4 Flutes
MG
45°
HRC 60
G100
Finishing
Semi-Finishing
Planing
Side
Co 12%
Wc 88%
Dia 0.4µm
HSC

DEPTH OF CUT



H≤1.5D
W≤0.1D
HRC45↓



H≤1D
W≤0.05D
HRC45↑

D=Diameter

Recommended cutting condition for SEK

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEX

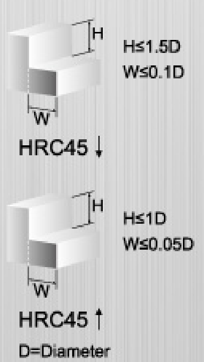
NEW

Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEX 0304	3.0	8	50	4
SEX 0404	4.0	11	50	4
SEX 0506	5.0	13	50	6
SEX 0606	6.0	16	50	6
SEX 0808	8.0	20	60	8
SEX 1010	10.0	25	75	10
SEX 1212	12.0	30	75	12
SEX 1616	16.0	40	100	16
SEX 2020	20.0	45	100	20

DEPTH OF CUT



Recommended cutting condition for SEX

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEQ

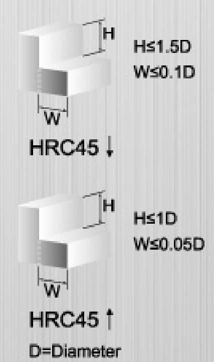
NEW

Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEQ 0104	1.0	3	50	4
SEQ 0154	1.5	4	50	4
SEQ 0204	2.0	6	50	4
SEQ 0306	3.0	8	50	6
SEQ 0406	4.0	11	50	6
SEQ 0506	5.0	13	50	6
SEQ 0606	6.0	16	50	6
SEQ 0808	8.0	20	60	8
SEQ 1010	10.0	25	75	10
SEQ 1212	12.0	30	75	12
SEQ 1616	16.0	40	100	16
SEQ 2020	20.0	45	100	20

DEPTH OF CUT



Recommended cutting condition for SEQ

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEZ

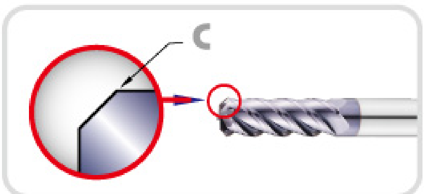
NEW

4 Flutes / S MG / 45° / C / HRC 65 / ALTiN / Finishing Semi-Finishing / Side / Slotting / Co 12% / Wc 88% / Dia 0.4μm / HSC

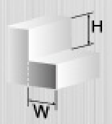
Square End Mills

unit: mm

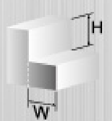
Order No.	Diameter D1	Chamfer C	Flute Length L1	O.A.L. L2	Shank Dia D2
SEZ 0405	4.0	0.5	11	50	6
SEZ 0410	4.0	1.0	11	50	6
SEZ 0605	6.0	0.5	16	50	6
SEZ 0610	6.0	1.0	16	50	6
SEZ 0805	8.0	0.5	20	60	8
SEZ 0810	8.0	1.0	20	60	8
SEZ 1005	10.0	0.5	25	75	10
SEZ 1010	10.0	1.0	25	75	10
SEZ 1020	10.0	2.0	25	75	10
SEZ 1205	12.0	0.5	30	75	12
SEZ 1210	12.0	1.0	30	75	12
SEZ 1220	12.0	2.0	30	75	12



DEPTH OF CUT



H≤1.5D
W≤0.1D
HRC45↓



H≤1D
W≤0.05D
HRC45↑
D=Diameter

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	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEP

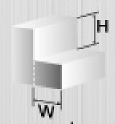
4 Flutes / S MG / 45° / HRC 60 / HELICA / Roughing / Planing / Side / Slotting / Co 12% / Wc 88% / Dia 0.4μm / HSC

Power / Square End Mills

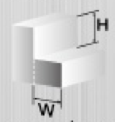
unit: mm

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

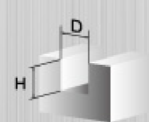
DEPTH OF CUT



HRC45↓
D 6mm↓ H=1.5D W=0.02D
D 6mm↑ H=1.5D W=0.05D



HRC45↑
D 6mm↓ H=1.5D W=0.01D
D 6mm↑ H=1.5D W=0.02D



H≤0.2D
HRC45↓ D=Diameter

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	
	DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

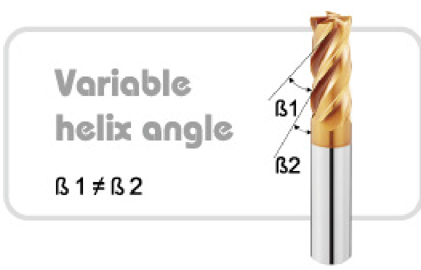
SEW

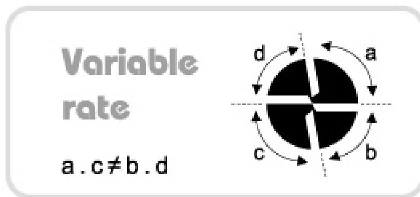
NEW

▶ Square End Mills

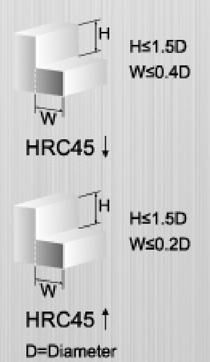
unit: mm

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





▶ DEPTH OF CUT



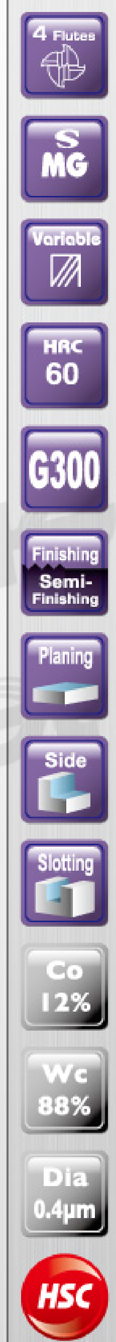
Recommended cutting condition for SEW

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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SIA

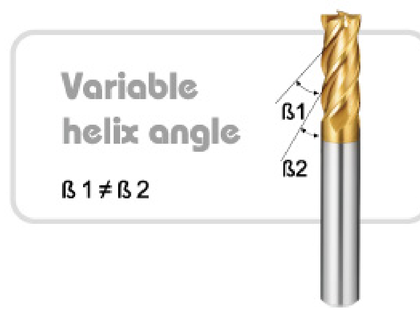
NEW

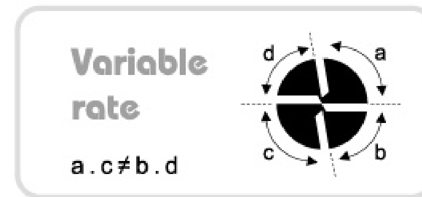


▶ Square End Mills

unit: mm

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





SEI

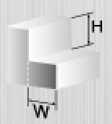
NEW

▶ Square End Mills

unit: mm

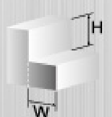
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEI **0306**	3.0	8	50	6
SEI **0406**	4.0	11	50	6
SEI **0506**	5.0	13	50	6
SEI **0606**	6.0	16	50	6
SEI **0808**	8.0	20	60	8
SEI **1010**	10.0	25	75	10
SEI **1212**	12.0	30	75	12
SEI **1616**	16.0	40	100	16
SEI **2020**	20.0	45	100	20

▶ DEPTH OF CUT



H≤1.5D
W≤0.1D

HRC45↓



H≤1D
W≤0.05D

HRC45↑

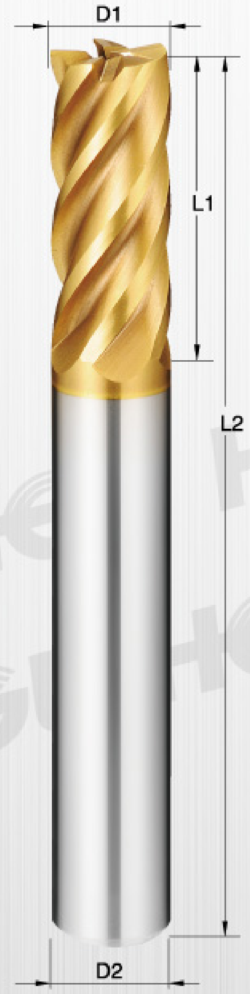
D=Diameter

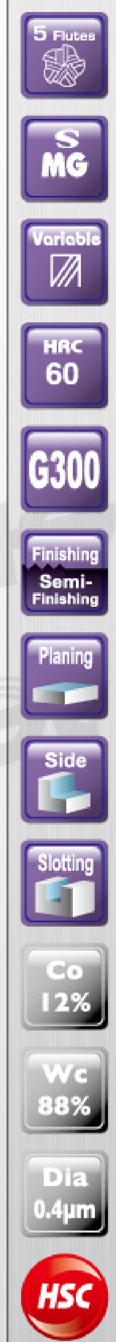
Recommended cutting condition for SEI

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

SIB

NEW





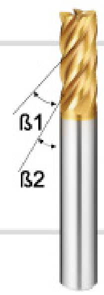
▶ Square End Mills

unit: mm

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

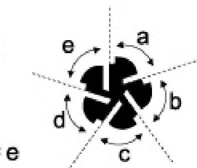
Variable helix angle

ß1≠ß2



Variable rate

a≠b≠c≠d≠e



HIGH SPEED CUTTING & HIGH HARD CUTTING

SEPS

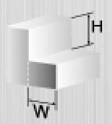
NEW

Square End Mills

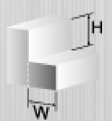
unit: mm

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

DEPTH OF CUT



H≤1.5D
W≤0.1D
HRC45 ↓



H≤1D
W≤0.05D
HRC45 ↑
D=Diameter

Recommended cutting condition for SEPS

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEPI

NEW

Square End Mills

unit: mm

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

End Mills

HIGH SPEED CUTTING & HIGH HARD CUTTING

SGEB

NEW

4 Flutes
MG
45°
Diamond
Finishing
Semi-Finishing
Planing
Side
Co 12%
Wc 88%
Dia 0.4μm

Square End Mills

unit: mm

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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SELA

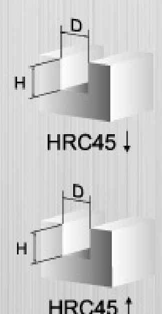
2 Flutes
MG
35°
HRC 60
ALTiN
Finishing
Semi-Finishing
Planing
Slotting
Co 12%
Wc 88%
Dia 0.2μm
HSC

Long Shank / Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SELA 0606	6.0	15	75	6
SELA 0606A	6.0	15	100	6
SELA 0808	8.0	20	100	8
SELA 1010	10.0	25	100	10
SELA 1010A	10.0	25	150	10
SELA 1212	12.0	30	100	12
SELA 1212A	12.0	30	150	12

DEPTH OF CUT



HRC45 ↓: D<3 H=0.15D; D>3 H=0.25D

HRC45 ↑: D<3 H=0.05D; D>3 H=0.1D

D=Diameter

Recommended cutting condition for 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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SELB

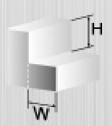
▶ Long Shank / Square End Mills

unit: mm

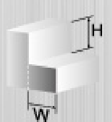
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SELB 0606	6.0	15	75	6
SELB 0606A	6.0	15	100	6
SELB 0808	8.0	20	100	8
SELB 1010	10.0	25	100	10
SELB 1010A	10.0	25	150	10
SELB 1212	12.0	30	100	12
SELB 1212A	12.0	30	150	12
SELB 1616	16.0	40	150	16

4 Flutes
S MG
35°
HRC 60
ALTiN
Finishing Semi-Finishing
Planing
Side
Co 12%
Wc 88%
Dia 0.4μm
HSC

▶ DEPTH OF CUT



H≤1.5D
W≤0.1D
HRC45 ↓



H≤1D
W≤0.05D
HRC45 ↑
D=Diameter

Recommended cutting condition for 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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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
16	1500	650	1000	300	500	150

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEM

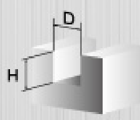
▶ Micro Diameter / Square End Mills

unit: mm

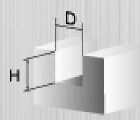
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEM 0024	0.2	0.4	50	4
SEM 0034	0.3	0.6	50	4
SEM 0044	0.4	0.8	50	4
SEM 0054	0.5	1.0	50	4
SEM 0064	0.6	1.2	50	4
SEM 0074	0.7	1.4	50	4
SEM 0084	0.8	1.6	50	4
SEM 0094	0.9	1.8	50	4
SEM 0124	1.2	3.0	50	4
SEM 0144	1.4	3.0	50	4
SEM 0164	1.6	4.0	50	4
SEM 0184	1.8	5.0	50	4

2 Flutes
S MG
35°
HRC 60
ALTiN
Finishing Semi-Finishing
Slotting
Side
Co 12%
Wc 88%
Dia 0.4μm
HSC

▶ DEPTH OF CUT



H≤0.1D
D≤1D
HRC45 ↓



H≤0.02D
D≤1D
HRC45 ↑
D=Diameter

Recommended cutting condition for SEM

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

SEMX

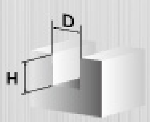
Micro Diameter / Square End Mills

unit: mm

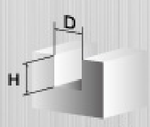
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
SEMX **0024**	0.2	0.4	50	4
SEMX **0034**	0.3	0.6	50	4
SEMX **0044**	0.4	0.8	50	4
SEMX **0054**	0.5	1.0	50	4
SEMX **0064**	0.6	1.2	50	4
SEMX **0074**	0.7	1.4	50	4
SEMX **0084**	0.8	1.6	50	4
SEMX **0094**	0.9	1.8	50	4
SEMX **0124**	1.2	3.0	50	4
SEMX **0144**	1.4	3.0	50	4
SEMX **0164**	1.6	4.0	50	4
SEMX **0184**	1.8	5.0	50	4

2 Flutes · MG · 35° · HRC 60 · i8 · Finishing / Semi-Finishing · Slotting · Side · Co 12% · Wc 88% · Dia 0.4μm · HSC

DEPTH OF CUT



H≤0.1D
D≤1D
HRC45↓



H≤0.02D
D≤1D
HRC45↑
D=Diameter

Recommended cutting condition for SEMX

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

SEF

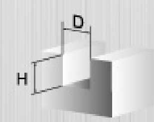
Corner Radius Long Neck / End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SEF **01004**	1.0	0.1	0.95	1.0	4	50	4
SEF **01006**	1.0	0.1	0.95	1.0	6	50	4
SEF **01008**	1.0	0.1	0.95	1.0	8	50	4
SEF **01010**	1.0	0.1	0.95	1.0	10	50	4
SEF **01504**	1.5	0.2	1.45	1.5	4	50	4
SEF **01506**	1.5	0.2	1.45	1.5	6	50	4
SEF **01508**	1.5	0.2	1.45	1.5	8	50	4
SEF **01510**	1.5	0.2	1.45	1.5	10	50	4
SEF **01512**	1.5	0.2	1.45	1.5	12	50	4
SEF **02008**	2.0	0.2	1.92	2.0	8	50	4
SEF **02010**	2.0	0.2	1.92	2.0	10	50	4
SEF **02012**	2.0	0.2	1.92	2.0	12	50	4
SEF **02016**	2.0	0.2	1.92	2.0	16	50	4
SEF **03008**	3.0	0.2	2.90	3.0	8	50	6
SEF **03010**	3.0	0.2	2.90	3.0	10	50	6
SEF **03012**	3.0	0.2	2.90	3.0	12	50	6
SEF **03016**	3.0	0.2	2.90	3.0	16	50	6
SEF **03020**	3.0	0.2	2.90	3.0	20	50	6

2 Flutes · MG · 35° · R · HRC 65 · ALTiN · Finishing / Semi-Finishing · Slotting · Profiling · Co 12% · Wc 88% · Dia 0.4μm · HSC

DEPTH OF CUT



D=Diameter

Recommended cutting condition for SEF

MATERIAL		Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80		
DIAMETER	EFFECTIVE LENGTH	SPEED (mm^{-1})	FEED mm / min	DEPTH OF CUT H (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

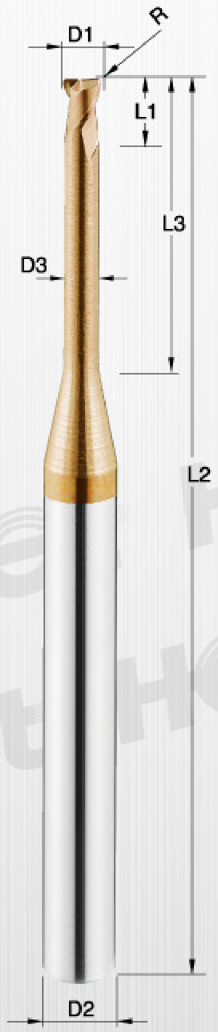
HIGH SPEED CUTTING & HIGH HARD CUTTING

SEFX

Corner Radius Long Neck / End Mills

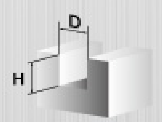
unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SEFX 01004	1.0	0.1	0.95	1.0	4	50	4
SEFX 01006	1.0	0.1	0.95	1.0	6	50	4
SEFX 01008	1.0	0.1	0.95	1.0	8	50	4
SEFX 01010	1.0	0.1	0.95	1.0	10	50	4
SEFX 01504	1.5	0.2	1.45	1.5	4	50	4
SEFX 01506	1.5	0.2	1.45	1.5	6	50	4
SEFX 01508	1.5	0.2	1.45	1.5	8	50	4
SEFX 01510	1.5	0.2	1.45	1.5	10	50	4
SEFX 01512	1.5	0.2	1.45	1.5	12	50	4
SEFX 02008	2.0	0.2	1.92	2.0	8	50	4
SEFX 02010	2.0	0.2	1.92	2.0	10	50	4
SEFX 02012	2.0	0.2	1.92	2.0	12	50	4
SEFX 02016	2.0	0.2	1.92	2.0	16	50	4
SEFX 03008	3.0	0.2	2.90	3.0	8	50	6
SEFX 03010	3.0	0.2	2.90	3.0	10	50	6
SEFX 03012	3.0	0.2	2.90	3.0	12	50	6
SEFX 03016	3.0	0.2	2.90	3.0	16	50	6
SEFX 03020	3.0	0.2	2.90	3.0	20	50	6



2 Flutes · S MG · 35° · R · HRC 60 · i8 · Finishing Semi-Finishing · Slotting · Profiling · Co 12% · WC 88% · Dia 0.4μm · HSC

DEPTH OF CUT



D=Diameter

Recommended cutting condition for SEFX

MATERIAL		Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80		
DIAMETER	EFFECTIVE LENGTH	SPEED (mm^{-1})	FEED mm / min	DEPTH OF CUT H (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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEFA

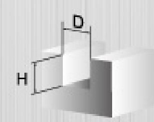
Long Neck / Square End Mills

unit: mm

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

2 Flutes · S MG · 35° · HRC 60 · ALTiN · Finishing Semi-Finishing · Slotting · Co 12% · WC 88% · Dia 0.4μm · HSC

DEPTH OF CUT



D=Diameter

Recommended cutting condition for SEFA

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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEFAX

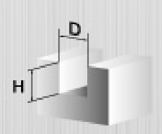
Long Neck / Square End Mills

unit: mm

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

2 Flutes · MG · 35° · HRC 60 · i8 · Finishing Semi-Finishing · Slotting · Co 12% · Wc 88% · Dia 0.4μm · HSC

▶ DEPTH OF CUT



D=Diameter

Recommended cutting condition for SEFAX

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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SRA

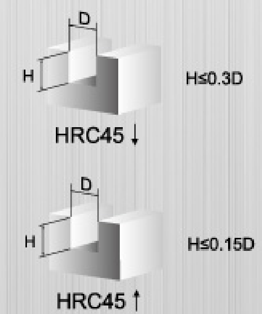
Corner Radius / End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SRA 0402	4.0	0.2	3.88	8	12	50	4
SRA 0405	4.0	0.5	3.88	8	12	50	4
SRA 0602	6.0	0.2	5.80	12	18	50	6
SRA 0605	6.0	0.5	5.80	12	18	50	6
SRA 0610	6.0	1.0	5.80	12	18	50	6
SRA 0803	8.0	0.3	7.70	16	24	60	8
SRA 0805	8.0	0.5	7.70	16	24	60	8
SRA 0810	8.0	1.0	7.70	16	24	60	8
SRA 1003	10.0	0.3	9.60	20	30	75	10
SRA 1005	10.0	0.5	9.60	20	30	75	10
SRA 1010	10.0	1.0	9.60	20	30	75	10
SRA 1020	10.0	2.0	9.60	20	30	75	10
SRA 1210	12.0	1.0	11.50	24	36	75	12
SRA 1220	12.0	2.0	11.50	24	36	75	12
SRA 1605	16.0	0.5	15.40	30	40	100	16
SRA 1610	16.0	1.0	15.40	30	40	100	16

2 Flutes · MG · 35° · R · HRC 65 · ALTiN · Finishing Semi-Finishing · Slotting · Profiling · Co 12% · Wc 88% · Dia 0.4μm · HSC

▶ DEPTH OF CUT



D=Diameter

Recommended cutting condition for SRA

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

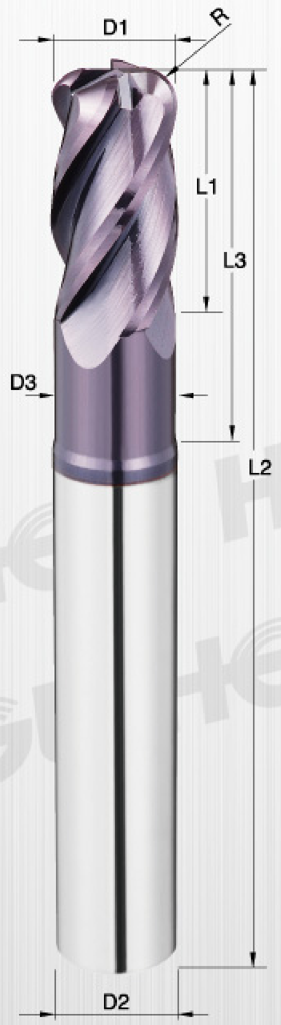
HIGH SPEED CUTTING & HIGH HARD CUTTING

SRB

Corner Radius / End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SRB 0402	4.0	0.2	3.88	8	12	50	4
SRB 0405	4.0	0.5	3.88	8	12	50	4
SRB 0602	6.0	0.2	5.80	12	18	50	6
SRB 0605	6.0	0.5	5.80	12	18	50	6
SRB 0610	6.0	1.0	5.80	12	18	50	6
SRB 0803	8.0	0.3	7.70	16	24	60	8
SRB 0805	8.0	0.5	7.70	16	24	60	8
SRB 0810	8.0	1.0	7.70	16	24	60	8
SRB 1005	10.0	0.5	9.60	20	30	75	10
SRB 1010	10.0	1.0	9.60	20	30	75	10
SRB 1020	10.0	2.0	9.60	20	30	75	10
SRB 1030	10.0	3.0	9.60	20	30	75	10
SRB 1205	12.0	0.5	11.50	24	36	75	12
SRB 1210	12.0	1.0	11.50	24	36	75	12
SRB 1605	16.0	0.5	15.40	30	40	100	16
SRB 1610	16.0	1.0	15.40	30	40	100	16

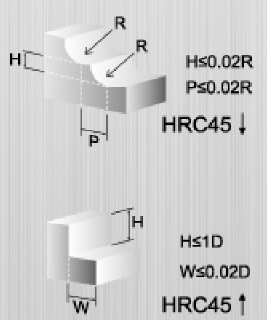


4 Flutes
MG
35°
HRC 65
ALTiN
Finishing
Semi-Finishing
Side
Profiling
Co 12%
Wc 88%
Dia 0.4μm
HSC

Recommended cutting condition for SRB

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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
16	4500	2000	2800	1000	1400	450

DEPTH OF CUT



D=Diameter
R=Corner R

HIGH SPEED CUTTING & HIGH HARD CUTTING

SRC

Corner Radius / End Mills

unit: mm

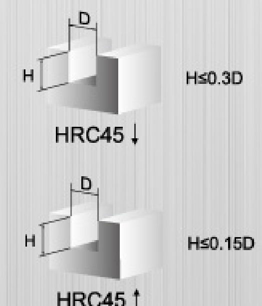
Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
SRC 0302	3.0	0.2	6	50	3
SRC 0305	3.0	0.5	6	50	3
SRC 0402	4.0	0.2	8	50	4
SRC 0405	4.0	0.5	8	50	4
SRC 0410	4.0	1.0	8	50	4
SRC 0602	6.0	0.2	12	50	6
SRC 0605	6.0	0.5	12	50	6
SRC 0610	6.0	1.0	12	50	6
SRC 0615	6.0	1.5	12	50	6
SRC 0620	6.0	2.0	12	50	6
SRC 0803	8.0	0.3	16	60	8
SRC 0805	8.0	0.5	16	60	8
SRC 0810	8.0	1.0	16	60	8
SRC 0815	8.0	1.5	16	60	8
SRC 0820	8.0	2.0	16	60	8
SRC 1003	10.0	0.3	20	75	10
SRC 1005	10.0	0.5	20	75	10
SRC 1010	10.0	1.0	20	75	10
SRC 1015	10.0	1.5	20	75	10
SRC 1020	10.0	2.0	20	75	10
SRC 1030	10.0	3.0	20	75	10
SRC 1205	12.0	0.5	24	75	12
SRC 1210	12.0	1.0	24	75	12
SRC 1215	12.0	1.5	24	75	12
SRC 1220	12.0	2.0	24	75	12
SRC 1230	12.0	3.0	24	75	12

2 Flutes
MG
35°
HRC 65
ALTiN
Finishing
Semi-Finishing
Slotting
Profiling
Co 12%
Wc 88%
Dia 0.4μm
HSC

Recommended cutting condition for SRC

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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



D=Diameter

HIGH SPEED CUTTING & HIGH HARD CUTTING

SRCX

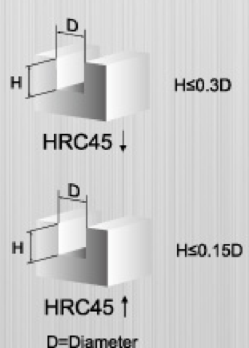
Corner Radius / End Mills

unit: mm

2 Flutes
MG
35°
R
HRC 60
i8
Finishing
Semi-Finishing
Slotting
Profiling
Co 12%
Wc 88%
Dia 0.4μm
HSC

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
SRC 0302	3.0	0.2	6	50	3
SRC 0305	3.0	0.5	6	50	3
SRC 0402	4.0	0.2	8	50	4
SRC 0405	4.0	0.5	8	50	4
SRC 0605	6.0	0.5	12	50	6
SRC 0610	6.0	1.0	12	50	6
SRC 0805	8.0	0.5	16	60	8
SRC 0810	8.0	1.0	16	60	8
SRC 1005	10.0	0.5	20	75	10
SRC 1010	10.0	1.0	20	75	10
SRC 1020	10.0	2.0	20	75	10
SRC 1030	10.0	3.0	20	75	10
SRC 1205	12.0	0.5	24	75	12
SRC 1210	12.0	1.0	24	75	12
SRC 1220	12.0	2.0	24	75	12
SRC 1230	12.0	3.0	24	75	12

DEPTH OF CUT



Recommended cutting condition for SRCX

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SRD

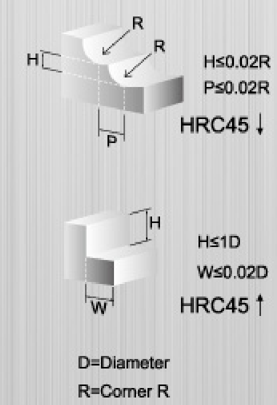
Corner Radius / End Mills

unit: mm

4 Flutes
MG
35°
R
HRC 65
ALTiN
Finishing
Semi-Finishing
Side
Profiling
Co 12%
Wc 88%
Dia 0.4μm
HSC

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
SRD 0302	3.0	0.2	6	50	3
SRD 0305	3.0	0.5	6	50	3
SRD 0402	4.0	0.2	8	50	4
SRD 0405	4.0	0.5	8	50	4
SRD 0410	4.0	1.0	8	50	4
SRD 0602	6.0	0.2	12	50	6
SRD 0605	6.0	0.5	12	50	6
SRD 0610	6.0	1.0	12	50	6
SRD 0615	6.0	1.5	12	50	6
SRD 0620	6.0	2.0	12	50	6
SRD 0803	8.0	0.3	16	60	8
SRD 0805	8.0	0.5	16	60	8
SRD 0810	8.0	1.0	16	60	8
SRD 0815	8.0	1.5	16	60	8
SRD 0820	8.0	2.0	16	60	8
SRD 1003	10.0	0.3	20	75	10
SRD 1005	10.0	0.5	20	75	10
SRD 1010	10.0	1.0	20	75	10
SRD 1015	10.0	1.5	20	75	10
SRD 1020	10.0	2.0	20	75	10
SRD 1030	10.0	3.0	20	75	10
SRD 1205	12.0	0.5	24	75	12
SRD 1210	12.0	1.0	24	75	12
SRD 1215	12.0	1.5	24	75	12
SRD 1220	12.0	2.0	24	75	12
SRD 1230	12.0	3.0	24	75	12

DEPTH OF CUT



Recommended cutting condition for SRD

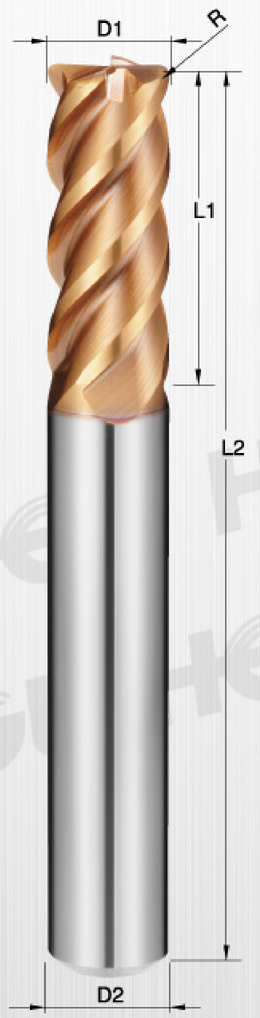
MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
2	26000	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
16	4500	2000	2800	1000	1400	450

HIGH SPEED CUTTING & HIGH HARD CUTTING

SRDX

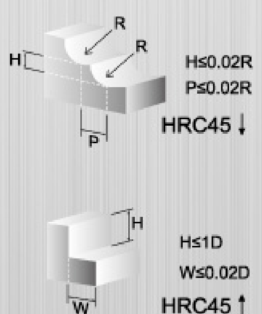
Corner Radius / End Mills

unit: mm



Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
SRDX 0302	3.0	0.2	6	50	3
SRDX 0305	3.0	0.5	6	50	3
SRDX 0402	4.0	0.2	8	50	4
SRDX 0405	4.0	0.5	8	50	4
SRDX 0605	6.0	0.5	12	50	6
SRDX 0610	6.0	1.0	12	50	6
SRDX 0805	8.0	0.5	16	60	8
SRDX 0810	8.0	1.0	16	60	8
SRDX 1005	10.0	0.5	20	75	10
SRDX 1010	10.0	1.0	20	75	10
SRDX 1020	10.0	2.0	20	75	10
SRDX 1030	10.0	3.0	20	75	10
SRDX 1205	12.0	0.5	24	75	12
SRDX 1210	12.0	1.0	24	75	12
SRDX 1220	12.0	2.0	24	75	12
SRDX 1230	12.0	3.0	24	75	12

DEPTH OF CUT



D=Diameter
R=Corner R

Recommended cutting condition for SRDX

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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
16	4500	2000	2800	1000	1400	450

HIGH SPEED CUTTING & HIGH HARD CUTTING

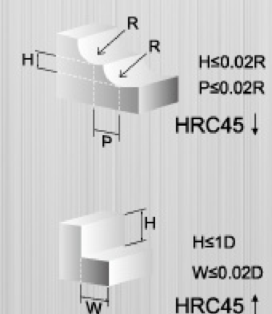
SRK

Corner Radius / End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
SRK 0302	3.0	0.2	8	50	3
SRK 0305	3.0	0.5	8	50	3
SRK 0402	4.0	0.2	11	50	4
SRK 0405	4.0	0.5	11	50	4
SRK 0410	4.0	1.0	11	50	4
SRK 0602	6.0	0.2	16	50	6
SRK 0605	6.0	0.5	16	50	6
SRK 0610	6.0	1.0	16	50	6
SRK 0615	6.0	1.5	16	50	6
SRK 0620	6.0	2.0	16	50	6
SRK 0803	8.0	0.3	20	60	8
SRK 0805	8.0	0.5	20	60	8
SRK 0810	8.0	1.0	20	60	8
SRK 0815	8.0	1.5	20	60	8
SRK 0820	8.0	2.0	20	60	8
SRK 1003	10.0	0.3	25	75	10
SRK 1005	10.0	0.5	25	75	10
SRK 1010	10.0	1.0	25	75	10
SRK 1015	10.0	1.5	25	75	10
SRK 1020	10.0	2.0	25	75	10
SRK 1030	10.0	3.0	25	75	10
SRK 1205	12.0	0.5	30	75	12
SRK 1210	12.0	1.0	30	75	12
SRK 1215	12.0	1.5	30	75	12
SRK 1220	12.0	2.0	30	75	12
SRK 1230	12.0	3.0	30	75	12

DEPTH OF CUT



D=Diameter
R=Corner R

Recommended cutting condition for SRK

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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
16	4500	2000	2800	1000	1400	450

HIGH SPEED CUTTING & HIGH HARD CUTTING

SRIP

NEW

Corner Radius / End Mills

unit: mm

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

HIGH SPEED CUTTING & HIGH HARD CUTTING

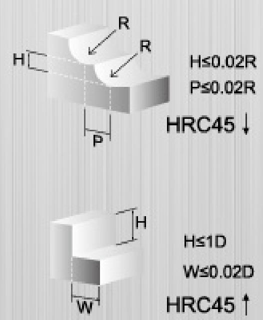
SERC

Long Shank Corner Radius / End Mills

unit: mm

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

DEPTH OF CUT



D=Diameter
R=Corner R

Recommended cutting condition for SERC

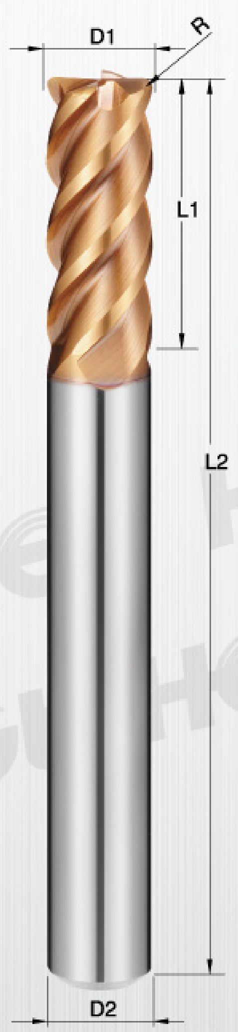
MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
6	12000	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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SERCX

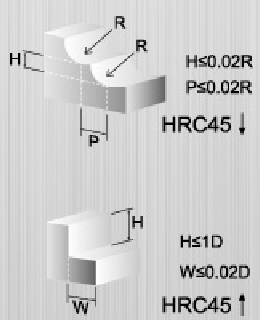
Long Shank Corner Radius / End Mills

unit: mm



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

DEPTH OF CUT



D=Diameter
R=Corner R

Recommended cutting condition for SERCX

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
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

HIGH SPEED CUTTING & HIGH HARD CUTTING

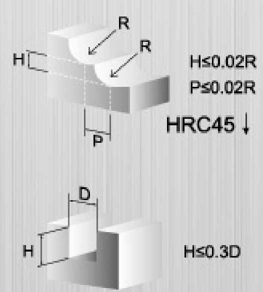
SRP

Power Corner Radius / End Mills

unit: mm

Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SRP **0615**	6.0	1.5	3	18	50	6
SRP **0615A**	6.0	1.5	3	18	75	6
SRP **0820**	8.0	2.0	4	24	60	8
SRP **0820A**	8.0	2.0	4	24	100	8
SRP **1020**	10.0	2.0	5	30	75	10
SRP **1020A**	10.0	2.0	5	30	100	10
SRP **1230**	12.0	3.0	6	36	75	12
SRP **1230A**	12.0	3.0	6	36	100	12

DEPTH OF CUT



D=Diameter
R=Corner R

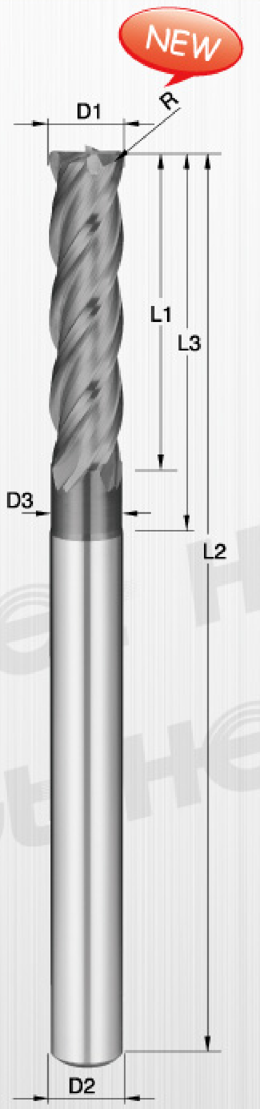
Recommended cutting condition for SRP

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
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

HIGH SPEED CUTTING & HIGH HARD CUTTING

SGRB

NEW



Corner Radius / End Mills

unit: mm

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

HIGH SPEED CUTTING & HIGH HARD CUTTING

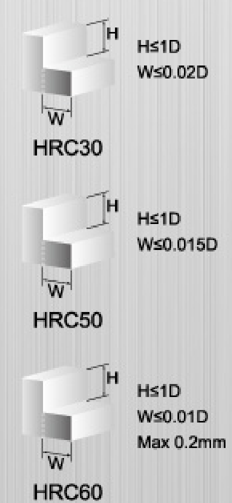
SHA

High Hardness / End Mills

unit: mm

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

DEPTH OF CUT



D=Diameter

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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

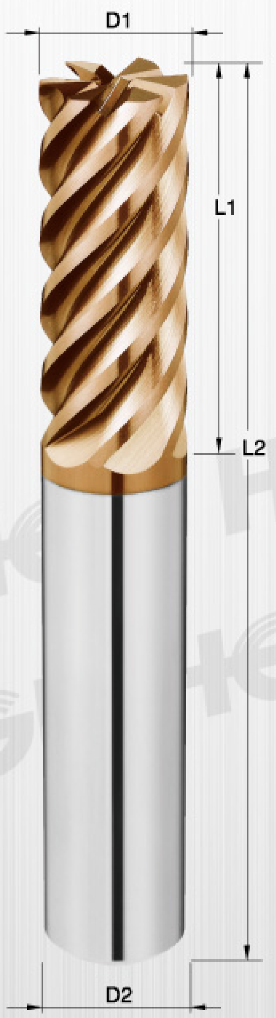
HIGH SPEED CUTTING & HIGH HARD CUTTING

SHAI

High Hardness / End Mills

unit: mm

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



6 Flutes
S MG
45°
HRC 60
G300
Finishing
Side
Co 12%
Wc 88%
Dia 0.4μm
HSC

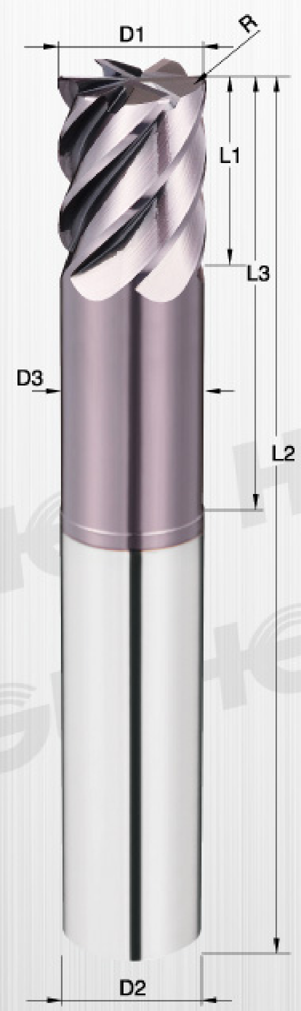
HIGH SPEED CUTTING & HIGH HARD CUTTING

SHB

High Hardness / End Mills

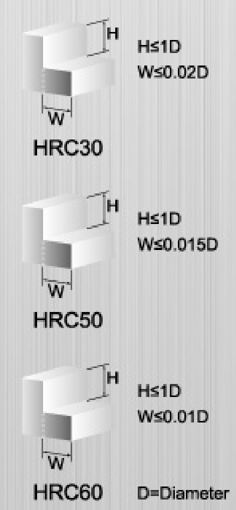
unit: mm

Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	O.A.L. L2	Shank Dia D2
SHB **0603**	6.0	0.3	5.80	8	20	50	6
SHB **0803**	8.0	0.3	7.70	10	25	60	8
SHB **1005**	10.0	0.5	9.60	12	30	75	10
SHB **1205**	12.0	0.5	11.50	15	36	75	12
SHB **1610**	16.0	1.0	15.40	24	40	100	16



6 Flutes
S MG
45°
R
HRC 65
Finishing
Profiling
Side
Co 12%
Wc 88%
Dia 0.4μm
HSC

DEPTH OF CUT



Recommended cutting condition for SHB

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
6	15000	4000	9500	2500	6800	1800
8	11000	3000	8000	2300	4400	1500
10	8500	2500	6000	2000	3600	1100
12	7200	2800	5200	2000	2900	1200
16	5500	2500	3000	1200	2000	900

HIGH SPEED CUTTING & HIGH HARD CUTTING

SEGI

Roughing / Square End Mills

unit: mm

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

ECONOMICAL CLASS BALL NOSE END MILLS SERIES

B

ECONOMICAL CLASS BALL NOSE END MILLS SERIES

ECONOMICAL CLASS BALL NOSE END MILLS SERIES

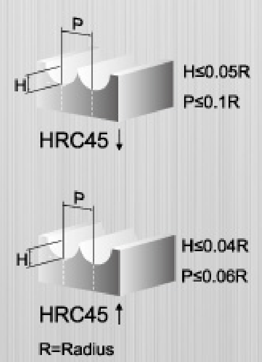
BA

Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
BA 0104	R0.5	2	50	4
BA 0154	R0.75	3	50	4
BA 0204	R1	4	50	4
BA 0254	R1.25	5	50	4
BA 0304	R1.5	6	50	4
BA 0354	R1.75	7	50	4
BA 0404	R2	8	50	4
BA 0456	R2.25	9	50	6
BA 0506	R2.5	10	50	6
BA 0556	R2.75	11	50	6
BA 0606	R3	12	50	6
BA 0708	R3.5	14	60	8
BA 0808	R4	16	60	8
BA 0910	R4.5	18	75	10
BA 1010	R5	20	75	10
BA 1212	R6	24	75	12
BA 1616	R8	32	100	16
BA 2020	R10	40	100	20

DEPTH OF CUT



Recommended cutting condition for BA

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ECONOMICAL CLASS BALL NOSE END MILLS SERIES

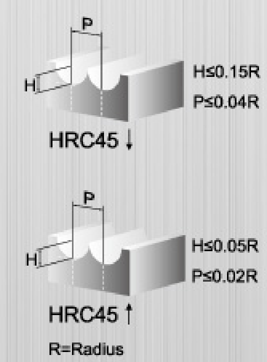
BB

Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
BB 0104	R0.5	2	50	4
BB 0154	R0.75	3	50	4
BB 0204	R1	4	50	4
BB 0254	R1.25	5	50	4
BB 0304	R1.5	6	50	4
BB 0404	R2	8	50	4
BB 0506	R2.5	10	50	6
BB 0606	R3	12	50	6
BB 0808	R4	16	60	8
BB 1010	R5	20	75	10
BB 1212	R 6	24	75	12

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ECONOMICAL CLASS BALL NOSE END MILLS SERIES

BLS.BLM.BLL

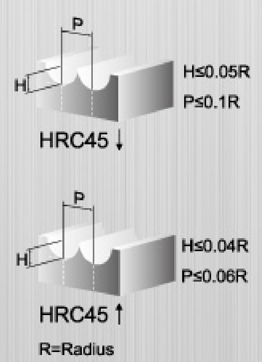
Long Shank / Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
BLS 0104	R0.5	2	75	4
BLS 0106	R0.5	2	75	6
BLS 0154	R0.75	3	75	4
BLS 0156	R0.75	3	75	6
BLS 0206	R1	4	75	6
BLS 0256	R1.25	5	75	6
BLS 0306	R1.5	6	75	6
BLS 0406	R2	8	75	6
BLS 0506	R2.5	10	75	6
BLS 0606	R3	12	75	6
BLM 0206	R1	4	100	6
BLM 0306	R1.5	6	100	6
BLM 0406	R2	8	100	6
BLM 0606	R3	12	100	6
BLM 0808	R4	16	100	8
BLM 1010	R5	20	100	10
BLM 1212	R6	24	100	12
BLL 0606	R3	12	150	6
BLL 0808	R4	16	150	8
BLL 1010	R5	20	150	10
BLL 1212	R6	24	150	12

2 Flutes
MG
30°
HRC 55
TiAlN
Finishing Semi-Finishing
Profiling
Co 10%
Wc 90%
Dia 0.6μm

DEPTH OF CUT



Recommended cutting condition for 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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ECONOMICAL CLASS BALL NOSE END MILLS SERIES

BM

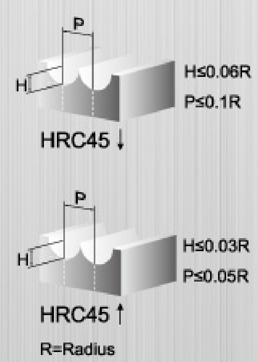
Micro Diamter / Ball Nose End Mills

unit: mm

Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
BM 0044	R0.2	0.8	50	4
BM 0054	R0.25	1.0	50	4
BM 0064	R0.3	1.2	50	4
BM 0074	R0.35	1.4	50	4
BM 0084	R0.4	1.6	50	4
BM 0094	R0.45	1.8	50	4
BM 0124	R0.6	2.4	50	4
BM 0144	R0.7	2.8	50	4
BM 0164	R0.8	3.2	50	4
BM 0184	R0.9	3.6	50	4

2 Flutes
MG
30°
HRC 55
TiAlN
Finishing Semi-Finishing
Profiling
Co 10%
Wc 90%
Dia 0.6μm

DEPTH OF CUT



Recommended cutting condition for BM

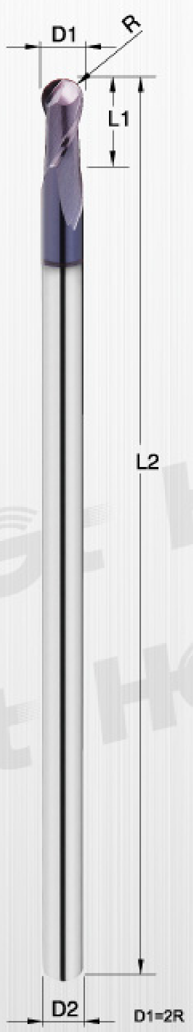
MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
RADIUS	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
R0.1	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

BS

Small Shank / Ball Nose End Mills

unit: mm

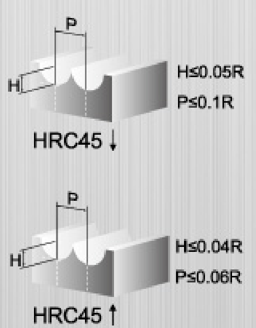
Order No.	Radius R	Flute Length L1	O.A.L. L2	Shank Dia D2
BS 0103	R0.5	2	50	3
BS 0153	R0.75	3	50	3
BS 0203	R1	4	50	3
BS 0253	R1.25	5	50	3
BS 0303	R1.5	6	50	3
BS 0303A	R1.5	6	75	3
BS 0303B	R1.5	6	100	3
BS 0404	R2	8	75	4
BS 0404A	R2	8	100	4



Recommended cutting condition for BS

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	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

▶ DEPTH OF CUT

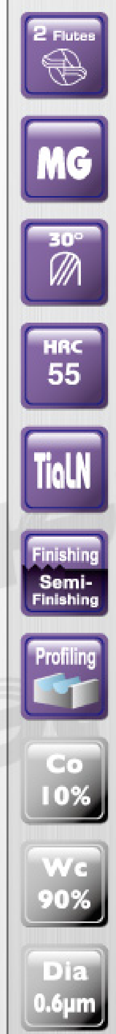


BF

Long Neck / Ball Nose End Mills

unit: mm

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



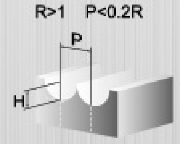
Recommended cutting condition for BF

MATERIAL: Alloy Steels . Tool Steels . Hardened Steels S45C , SCM , S50C , SKS , SCr , SNCM , SKD11 , SKD61 , NAK80

RADIUS	EFFECTIVE LENGTH	SPEED (mm^{-1})	FEED mm / min	DEPTH OF CUT H (mm)
R0.5	6	20000 - 32000	300 - 750	0.04
	8	20000 - 32000	300 - 750	0.03
	10	20000 - 32000	300 - 750	0.025
	12	20000 - 32000	300 - 750	0.015
R0.75	8	18000 - 20000	350 - 550	0.07
	12	18000 - 20000	350 - 550	0.04
	16	18000 - 20000	350 - 550	0.03
	20	18000 - 20000	350 - 550	0.02
R1.0	8	12000 - 17000	500 - 900	0.1
	12	12000 - 17000	500 - 900	0.1
	16	12000 - 17000	500 - 900	0.07
	20	12000 - 17000	500 - 900	0.04
R1.5	8	8000 - 11000	500 - 700	0.17
	10	8000 - 11000	500 - 700	0.15
	16	8000 - 11000	500 - 700	0.14
	20	8000 - 11000	500 - 700	0.12
	25	8000 - 11000	500 - 700	0.1
R2.0	10	5000 - 8000	400 - 600	0.18
	15	5000 - 8000	400 - 600	0.17
	20	5000 - 8000	400 - 600	0.16
	25	5000 - 8000	400 - 600	0.15
	30	5000 - 8000	400 - 600	0.14

▶ DEPTH OF CUT

R<1 P<0.1R
R>1 P<0.2R



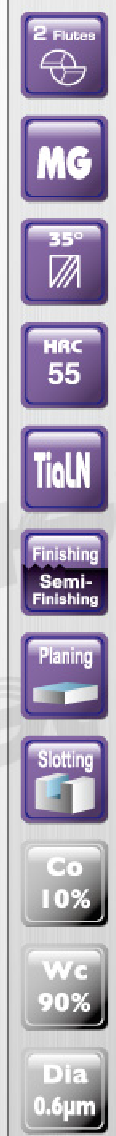
R=Radius

ECONOMICAL CLASS SQUARE END MILLS SERIES

E

ECONOMICAL CLASS SQUARE END MILLS SERIES

EA

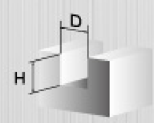


▶ Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EA **0104**	1.0	3	50	4
EA **0154**	1.5	4	50	4
EA **0204**	2.0	6	50	4
EA **0254**	2.5	8	50	4
EA **0304**	3.0	8	50	4
EA **0404**	4.0	11	50	4
EA **0506**	5.0	13	50	6
EA **0606**	6.0	16	50	6
EA **0808**	8.0	20	60	8
EA **1010**	10.0	25	75	10
EA **1212**	12.0	30	75	12
EA **1616**	16.0	40	100	16
EA **2020**	20.0	45	100	20

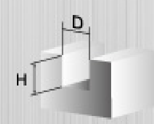
▶ DEPTH OF CUT



HRC45 ↓

D<3 H=0.15D

D>3 H=0.25D



HRC45 ↑

D<3 H=0.05D

D>3 H=0.1D

D=Diameter

Recommended cutting condition for EA

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

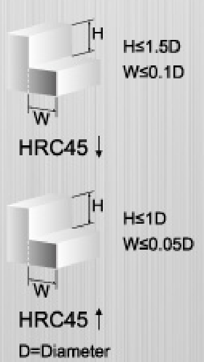
EB

Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EB 0104	1.0	3	50	4
EB 0154	1.5	4	50	4
EB 0204	2.0	6	50	4
EB 0254	2.5	8	50	4
EB 0304	3.0	8	50	4
EB 0404	4.0	11	50	4
EB 0506	5.0	13	50	6
EB 0606	6.0	16	50	6
EB 0808	8.0	20	60	8
EB 1010	10.0	25	75	10
EB 1212	12.0	30	75	12
EB 1616	16.0	40	100	16
EB 2020	20.0	45	100	20

DEPTH OF CUT



Recommended cutting condition for EB

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ECONOMICAL CLASS SQUARE END MILLS SERIES

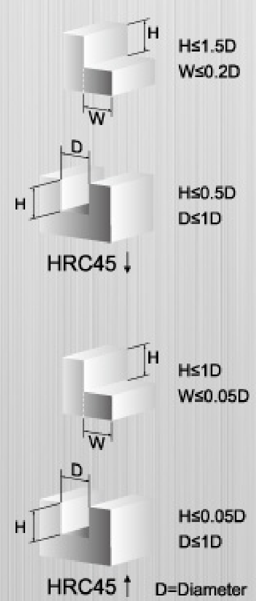
EC

Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EC 0304	3.0	8	50	4
EC 0404	4.0	11	50	4
EC 0506	5.0	13	50	6
EC 0606	6.0	16	50	6
EC 0808	8.0	20	60	8
EC 1010	10.0	25	75	10
EC 1212	12.0	30	75	12
EC 1616	16.0	40	100	16

DEPTH OF CUT



Recommended cutting condition for EC

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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)

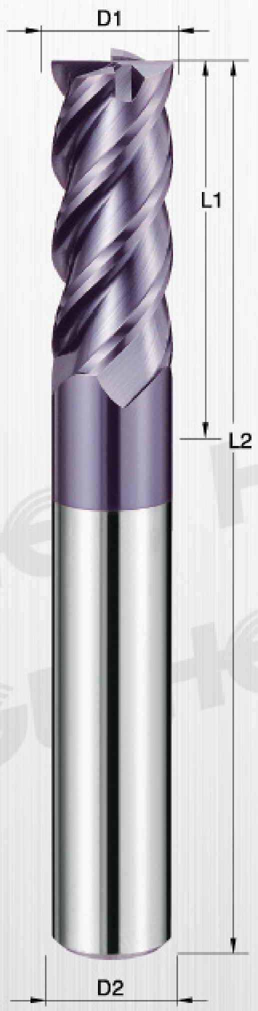
( ):Grooving

ED

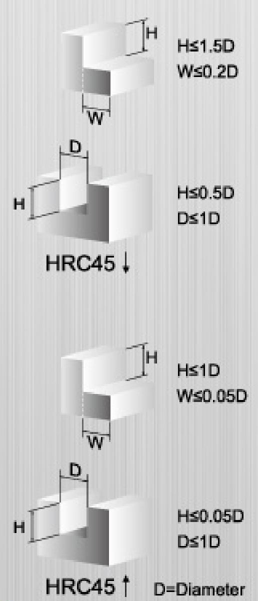
Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ED 0304	3.0	8	50	4
ED 0404	4.0	11	50	4
ED 0506	5.0	13	50	6
ED 0606	6.0	16	50	6
ED 0808	8.0	20	60	8
ED 1010	10.0	25	75	10
ED 1212	12.0	30	75	12
ED 1616	16.0	40	100	16



DEPTH OF CUT



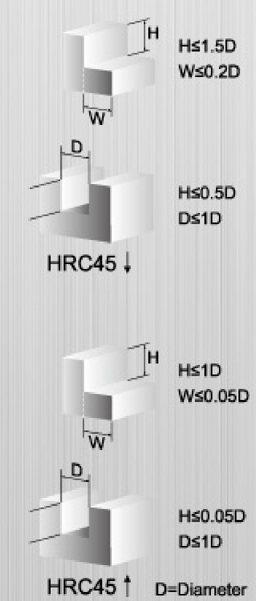
EP

Power / Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EP 0306	3.0	3	50	6
EP 0406	4.0	4	50	6
EP 0506	5.0	5	50	6
EP 0608	6.0	6	60	8
EP 0810	8.0	8	75	10
EP 1012	10.0	10	75	12

DEPTH OF CUT



Recommended cutting condition for EP

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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)

( ):Grooving

ECONOMICAL CLASS SQUARE END MILLS SERIES

ELA

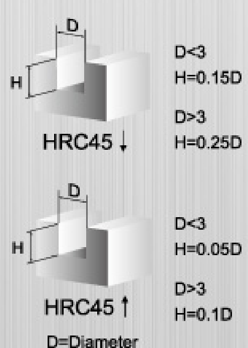
▶ Long Shank / Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ELA 0606	6.0	15	75	6
ELA 0606A	6.0	15	100	6
ELA 0808	8.0	20	100	8
ELA 1010	10.0	25	100	10
ELA 1010A	10.0	25	150	10
ELA 1212	12.0	30	100	12
ELA 1212A	12.0	30	150	12

2 Flutes
MG
35°
HRC 55
TiAlN
Finishing Semi-Finishing
Planing
Slotting
Co 10%
Wc 90%
Dia 0.6µm

▶ DEPTH OF CUT



Recommended cutting condition for 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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
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

ECONOMICAL CLASS SQUARE END MILLS SERIES

ELB

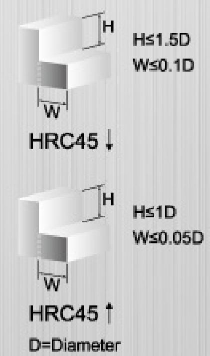
▶ Long Shank / Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ELB 0606	6.0	15	75	6
ELB 0606A	6.0	15	100	6
ELB 0808	8.0	20	100	8
ELB 1010	10.0	25	100	10
ELB 1010A	10.0	25	150	10
ELB 1212	12.0	30	100	12
ELB 1212A	12.0	30	150	12
ELB 1616	16.0	40	150	16

4 Flutes
MG
35°
HRC 55
TiAlN
Finishing Semi-Finishing
Planing
Side
Co 10%
Wc 90%
Dia 0.6µm

▶ DEPTH OF CUT



Recommended cutting condition for 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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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
16	1500	650	1000	300	500	150
20	1200	600	900	300	400	150

ECONOMICAL CLASS SQUARE END MILLS SERIES

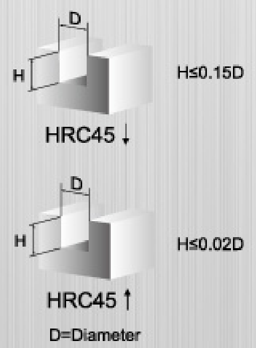
ELC

Long Flute / Square End Mills

unit: mm

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

DEPTH OF CUT



Recommended cutting condition for ELC

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

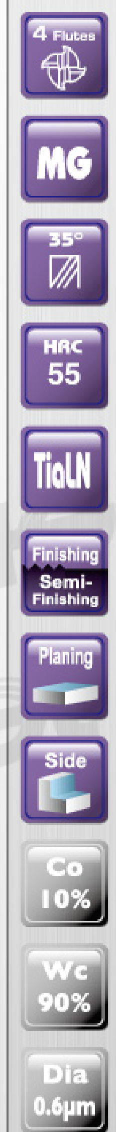
ECONOMICAL CLASS SQUARE END MILLS SERIES

ELD

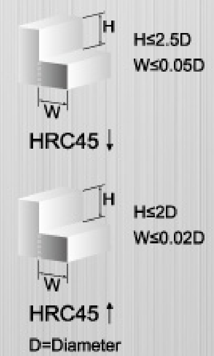
Long Flute / Square End Mills

unit: mm

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



DEPTH OF CUT



Recommended cutting condition for ELD

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

ECONOMICAL CLASS SQUARE END MILLS SERIES

EM

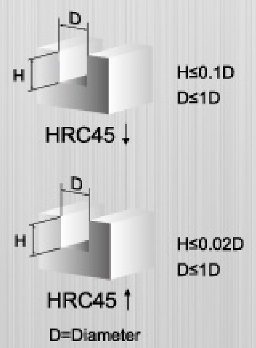
Micro Diameter / Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EM 0044	0.4	0.8	50	4
EM 0054	0.5	1.0	50	4
EM 0064	0.6	1.2	50	4
EM 0074	0.7	1.4	50	4
EM 0084	0.8	1.6	50	4
EM 0094	0.9	1.8	50	4
EM 0124	1.2	3.0	50	4
EM 0144	1.4	3.0	50	4
EM 0164	1.6	4.0	50	4
EM 0184	1.8	5.0	50	4

2 Flutes
MG
35°
HRC 55
TiAlN
Finishing
Semi-Finishing
Slotting
Co 10%
Wc 90%
Dia 0.6µm

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	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ECONOMICAL CLASS SQUARE END MILLS SERIES

ES

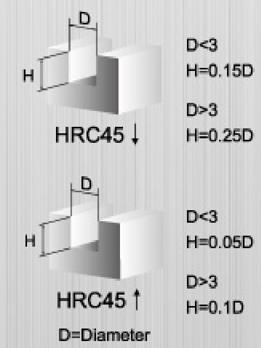
Small Shank / Square End Mills

unit: mm

Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
ES 0103	1.0	3	50	3
ES 0153	1.5	4	50	3
ES 0203	2.0	6	50	3
ES 0253	2.5	8	50	3
ES 0303	3.0	8	50	3
ES 0303A	3.0	8	75	3
ES 0303B	3.0	8	100	3
ES 0404	4.0	11	75	4
ES 0404A	4.0	11	100	4

2 Flutes
MG
35°
HRC 55
TiAlN
Finishing
Semi-Finishing
Planing
Slotting
Co 10%
Wc 90%
Dia 0.6µm

DEPTH OF CUT



Recommended cutting condition for ES

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ECONOMICAL CLASS SQUARE END MILLS SERIES

EFA

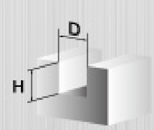
Long Neck / Square End Mills

unit: mm

2 Flutes
MG
35°
HRC 55
TiAlN
Finishing
Semi-Finishing
Slotting
Co 10%
Wc 90%
Dia 0.6μm

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

DEPTH OF CUT



D=Diameter

Recommended cutting condition for EFA

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

ECONOMICAL CLASS SQUARE END MILLS SERIES

ERA

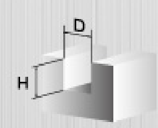
Corner Radius / End Mills

unit: mm

2 Flutes
MG
35°
R
HRC 55
TiAlN
Finishing
Semi-Finishing
Slotting
Profiling
Co 10%
Wc 90%
Dia 0.6μm

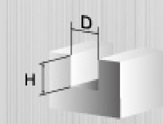
Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
ERA 0302	3.0	0.2	6	50	3
ERA 0305	3.0	0.5	6	50	3
ERA 0402	4.0	0.2	8	50	4
ERA 0405	4.0	0.5	8	50	4
ERA 0410	4.0	1.0	8	50	4
ERA 0602	6.0	0.2	12	50	6
ERA 0605	6.0	0.5	12	50	6
ERA 0610	6.0	1.0	12	50	6
ERA 0615	6.0	1.5	12	50	6
ERA 0620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

DEPTH OF CUT



H≤0.3D

HRC45 ↓



H≤0.15D

HRC45 ↑

D=Diameter

Recommended cutting condition for ERA

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ECONOMICAL CLASS SQUARE END MILLS SERIES

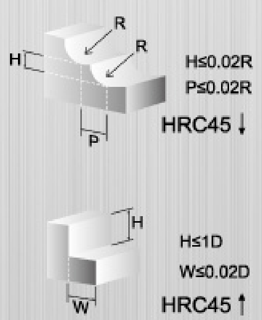
ERB

Corner Radius / End Mills

unit: mm

Order No.	Diameter D1	Corner R R	Flute Length L1	O.A.L. L2	Shank Dia D2
ERB0302	3.0	0.2	6	50	3
ERB0305	3.0	0.5	6	50	3
ERB0402	4.0	0.2	8	50	4
ERB0405	4.0	0.5	8	50	4
ERB0410	4.0	1.0	8	50	4
ERB0602	6.0	0.2	12	50	6
ERB0605	6.0	0.5	12	50	6
ERB0610	6.0	1.0	12	50	6
ERB0615	6.0	1.5	12	50	6
ERB0620	6.0	2.0	12	50	6
ERB0803	8.0	0.3	16	60	8
ERB0805	8.0	0.5	16	60	8
ERB0810	8.0	1.0	16	60	8
ERB0815	8.0	1.5	16	60	8
ERB0820	8.0	2.0	16	60	8
ERB1005	10.0	0.5	20	75	10
ERB1010	10.0	1.0	20	75	10
ERB1015	10.0	1.5	20	75	10
ERB1020	10.0	2.0	20	75	10
ERB1030	10.0	3.0	20	75	10
ERB1205	12.0	0.5	24	75	12
ERB1210	12.0	1.0	24	75	12
ERB1215	12.0	1.5	24	75	12
ERB1220	12.0	2.0	24	75	12
ERB1230	12.0	3.0	24	75	12

DEPTH OF CUT



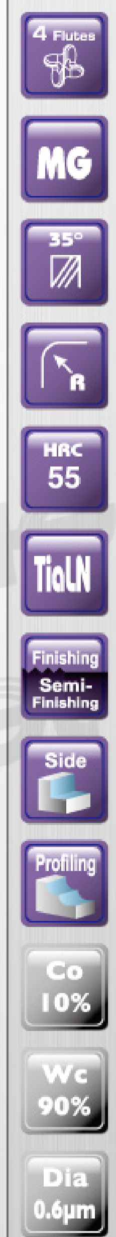
D=Diameter
R=Corner R

Recommended cutting condition for ERB

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ECONOMICAL CLASS SQUARE END MILLS SERIES

ERC

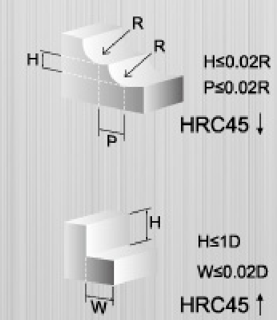


Long Shank Corner Radius / End Mills

unit: mm

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

DEPTH OF CUT



D=Diameter
R=Corner R

Recommended cutting condition for ERC

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

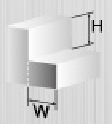
EH

Square End Mills

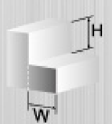
unit: mm

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

DEPTH OF CUT



H≤1.5D
W≤0.1D
HRC45↓



H≤1D
W≤0.05D
HRC45↑

D=Diameter

Recommended cutting condition for EH

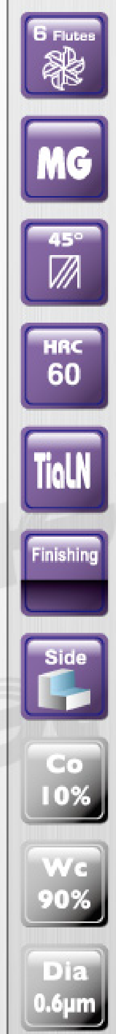
MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
6	5500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

EHL

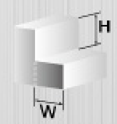
Long Flute / Square End Mills

unit: mm

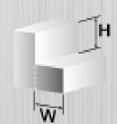
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EHL **0606**	6.0	24	75	6
EHL **0808**	8.0	32	75	8
EHL **1010**	10.0	40	100	10
EHL **1212**	12.0	45	100	12
EHL **1616**	16.0	64	150	16
EHL **2020**	20.0	75	150	20



DEPTH OF CUT



H≤3D
W≤0.01D
HRC45↓



H≤3D
W≤0.005D
HRC45↑

D=Diameter

Recommended cutting condition for EHL

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

ECONOMICAL CLASS SQUARE END MILLS SERIES

EG

3 Flutes | MG | Fine | 45° | HRC 55 | TiAlN | Roughing | Slotting | Side | Co 10% | Wc 90% | Dia 0.6μm

Roughing / Square End Mills

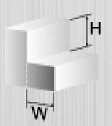
unit: mm

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

DEPTH OF CUT

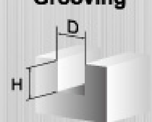
Side Milling

H≤1.5D
W≤0.3D
HRC45 ↓

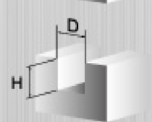


H≤1D
W≤0.05D
HRC45 ↑

Grooving



H≤0.6D
HRC45 ↓



H≤0.2D
HRC45 ↑

D=Diameter

Recommended cutting condition for EG

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

ECONOMICAL CLASS SQUARE END MILLS SERIES

EGA

4 Flutes | MG | Fine | 35° | HRC 55 | TiAlN | Roughing | Slotting | Side | Co 10% | Wc 90% | Dia 0.6μm

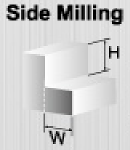
Roughing / Square End Mills

unit: mm

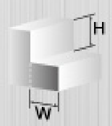
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EGA **0606**	6.0	16	50	6
EGA **0808**	8.0	20	60	8
EGA **1010**	10.0	25	75	10
EGA **1212**	12.0	30	75	12
EGA **1616**	16.0	40	100	16
EGA **2020**	20.0	45	100	20

DEPTH OF CUT

Side Milling



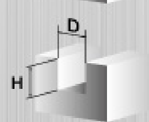
H≤1.5D
W≤0.3D
HRC45 ↓



H≤1D
W≤0.05D
HRC45 ↑

Grooving

H≤0.6D
HRC45 ↓



H≤0.2D
HRC45 ↑

D=Diameter

Recommended cutting condition for EGA

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

ECONOMICAL CLASS SQUARE END MILLS SERIES

EE

Engraving Blanks / End Mills

unit: mm

MG
HRC 40
Finishing
Slotting
Co 10%
Wc 90%
Dia 0.6μm

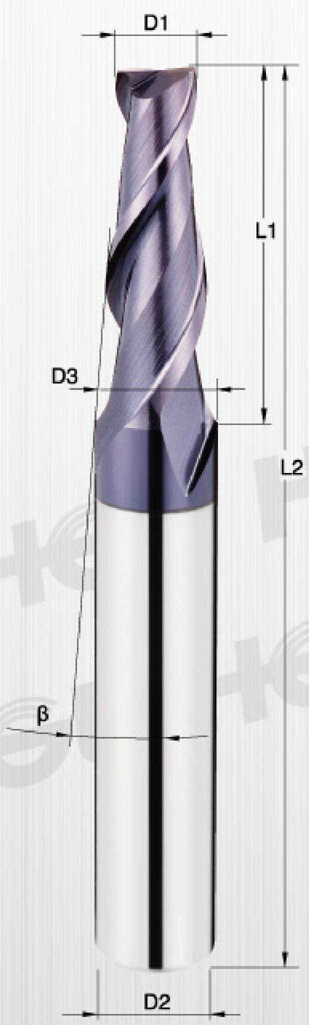
Order No.	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2
EE **0303**	3.0	5	50	3
EE **0404**	4.0	6	50	4
EE **0606**	6.0	9	50	6
EE **0808**	8.0	12	60	8
EE **1010**	10.0	15	75	10
EE **1212**	12.0	18	75	12

ECONOMICAL CLASS SQUARE END MILLS SERIES

ETL

Long Flute . Taper / End Mills

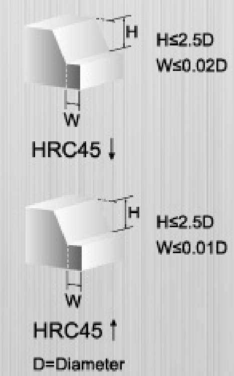
unit: mm



2 Flutes
MG
35°
HRC 55
TiAlN
Finishing Semi-Finishing
Side
Co 10%
Wc 90%
Dia 0.6μm

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

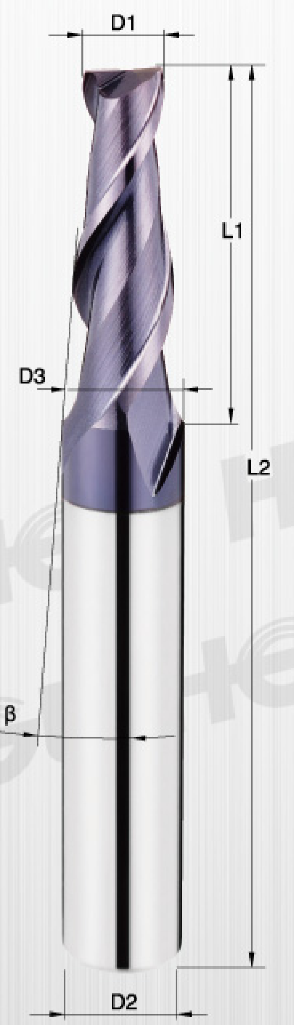
DEPTH OF CUT



Recommended cutting condition for ETL

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

ET

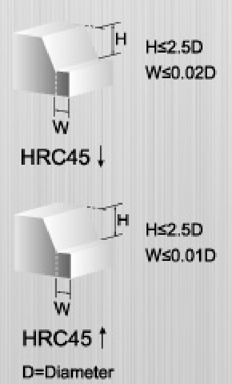


Taper / End Mills

unit: mm

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

▶ DEPTH OF CUT



D=Diameter

Taper / End Mills

unit: mm

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

Recommended cutting condition for ET

MATERIAL	Carbon Steels . Alloy Steels S45C , FC , FCD , SCM , S50C , SKS...		Alloy Steels . Tool Steels SCr , SNCM , SKD11 , SKD61 , NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-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

THREAD MILLING SERIES

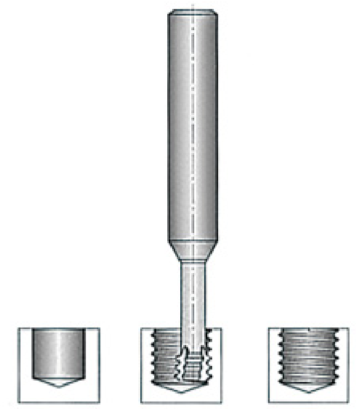
T THREAD MILLING SERIES

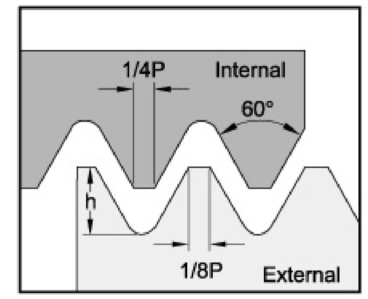
EMT

▶ Thread Milling / End Mills

unit: mm

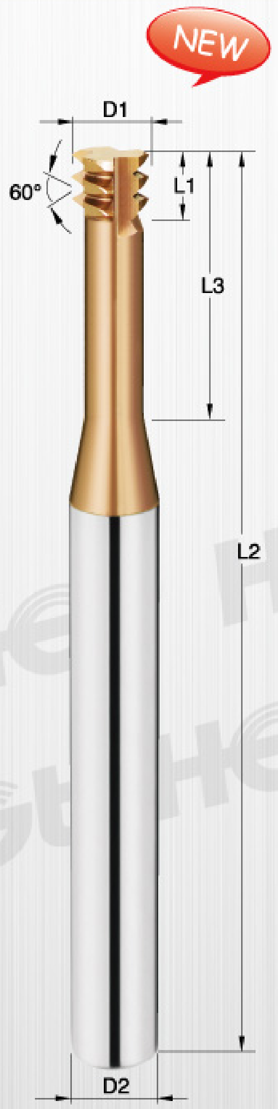
Order No.	Thread SIZE	Diameter D1	Flute Length L1	O.A.L. L2	Shank Dia D2	Flute
EMT **03P050**	M3x0.5	2.2	5.3	50	6	3
EMT **04P070**	M4x0.7	3.1	7.4	50	6	3
EMT **05P080**	M5x0.8	3.6	9.2	50	6	3
EMT **06P100**	M6x1.0	4.0	10.5	50	6	3
EMT **08P125**	M8x1.25	5.0	14.4	50	6	3
EMT **10P150**	M10x1.5	7.0	17.3	60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





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

EMTS



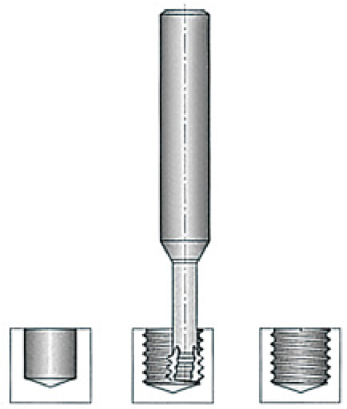
S MG | HRC 60 | i8 | Finishing Semi-Finishing | Co 12% | Wc 88% | Dia 0.4µm

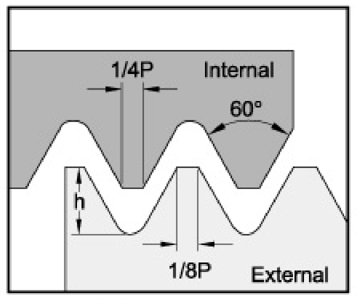
Thread Milling / End Mills

unit: mm

Order No.	Thread SIZE	Diameter D1	Effective Length L3	O.A.L. L2	Shank Dia D2	Flute
EMTS **03P050**	M3x0.5	3.5	10	50	6	3
EMTS **04P070**	M4x0.7	3.1	13	50	6	3
EMTS **05P080**	M5x0.8	3.8	16	50	6	3
EMTS **06P100**	M6x1.0	4.65	20	75	6	3
EMTS **08P125**	M8x1.25	5.95	24	75	6	3

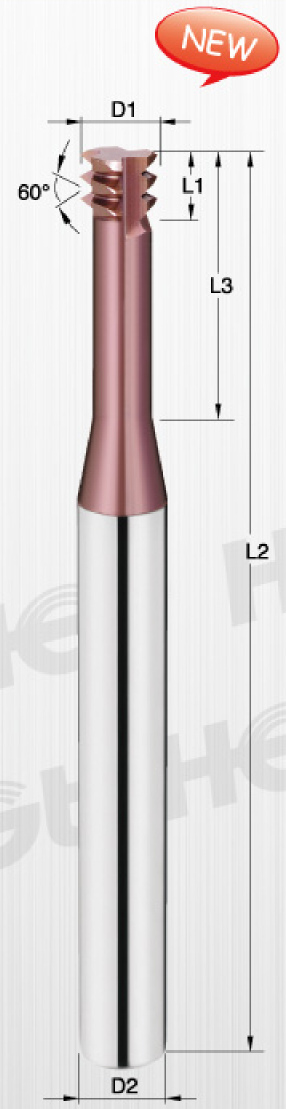
Flute Length (**L1**) = Pitch x 3





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

EMTF



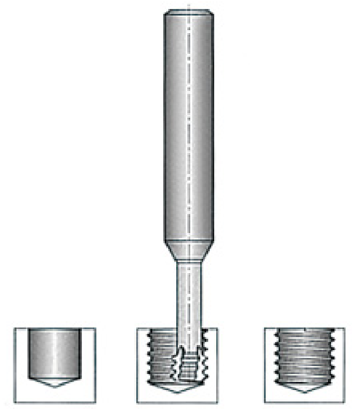
MG | HRC 55 | G100 | Finishing Semi-Finishing | Co 10% | Wc 90% | Dia 0.6µm

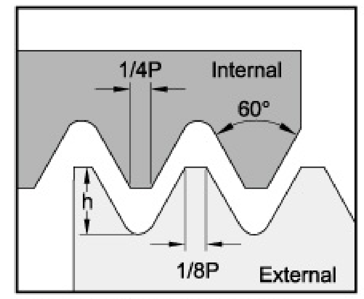
Thread Milling / End Mills

unit: mm

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

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





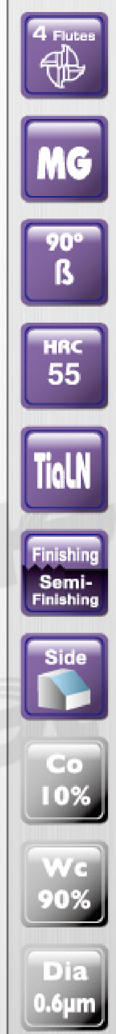
Denfined by: R262 (DIN 13)
Tolerance class: 6H

CHAMFERING SERIES

C CHAMFERING SERIES

CHAMFERING SERIES

ECM



▶ Chamfering / End Mills

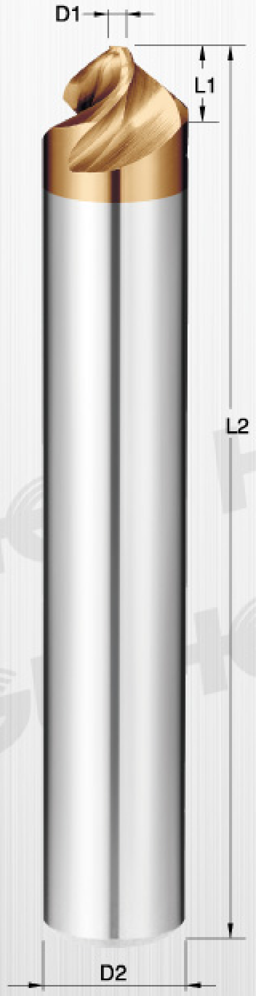
unit: mm

Order No.	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

CHAMFERING SERIES

ECMS

NEW



3 Flutes
MG
90° ß
HRC 55
i8
Finishing Semi-Finishing
Side
Co 10%
Wc 90%
Dia 0.6μm

Chamfering / End Mills

unit: mm

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

CHAMFERING SERIES

ECR

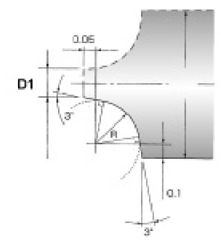
NEW

2 Flutes
MG
HRC 55
Finishing Semi-Finishing
Side
Side
Co 10%
Wc 90%
Dia 0.6μm

Corner Rounding / End Mills

unit: mm

Order No.	Radius R	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



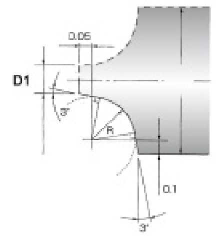
CHAMFERING SERIES

EMCR

Micro Diameter Corner Rounding / End Mills

unit: mm

Order No.	Radius R	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



ALUMINUM & COPPER CUTTING SERIES

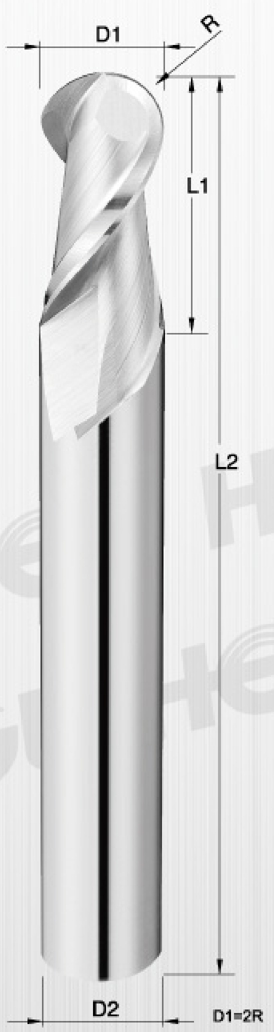
D ALUMINUM & COPPER CUTTING SERIES

ALUMINUM & COPPER CUTTING SERIES

DB

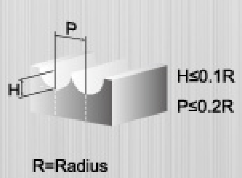
Ball Nose End Mills

unit: mm



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

DEPTH OF CUT



Recommended cutting condition for DB

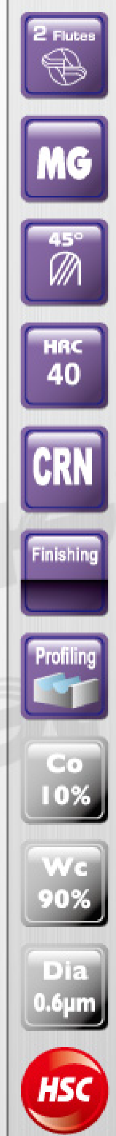
MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
RADIUS	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
R0.5	50000	2300	37000	2000	50000	1400
R0.75	50000	3000	28000	2000	50000	1800
R1	44000	4000	18500	2000	44000	2500
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

ALUMINUM & COPPER CUTTING SERIES

DBX

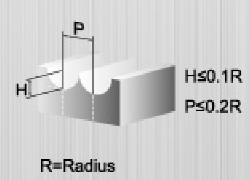
Ball Nose End Mills

unit: mm



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

DEPTH OF CUT



Recommended cutting condition for DBX

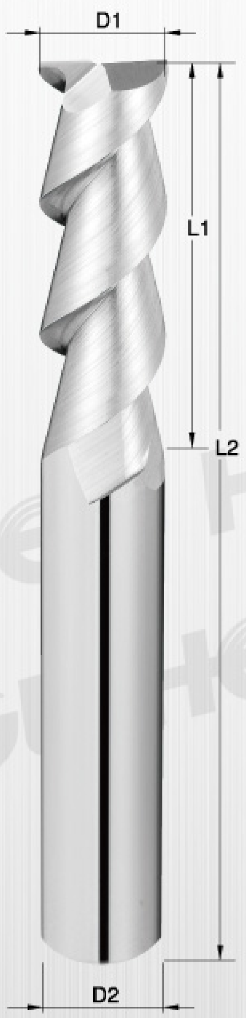
MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
RADIUS	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
R0.5	50000	2300	37000	2000	50000	1400
R0.75	50000	3000	28000	2000	50000	1800
R1	44000	4000	18500	2000	44000	2500
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

DEA

Square End Mills

unit: mm

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

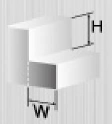


Recommended cutting condition for DEA

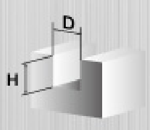
MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
2	37000	2000(800)	16000	850(350)	20000	1100(450)
3	35000	2000(900)	14000	850(450)	18000	1100(550)
4	26000	2000(1100)	11000	850(550)	13000	1100(660)
5	21000	2000(1100)	9000	850(550)	10000	1100(660)
6	17000	2000(1100)	7000	850(550)	9000	1100(660)
8	13000	2000(1100)	5500	850(650)	7000	1100(800)
10	11000	2000(1300)	7000	850(650)	5500	1100(800)
12	8800	2000(1300)	3600	850(800)	4500	1100(800)
16	6500	2000(1100)	3000	850(550)	3500	1100(900)
20	5300	2000(1100)	2200	850(550)	2500	1100(650)

( ):Grooving

DEPTH OF CUT



H≤1.5D
W≤0.1D



H≤0.1D

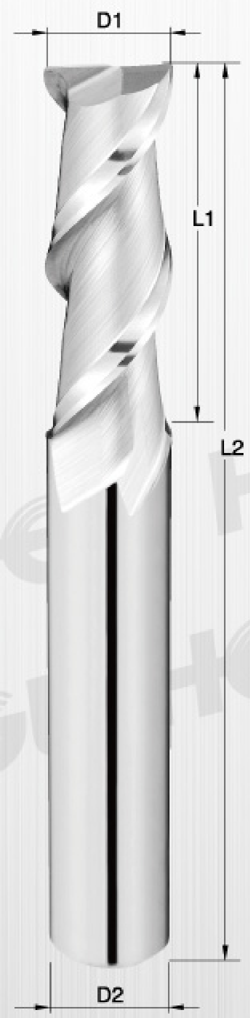
D=Diameter

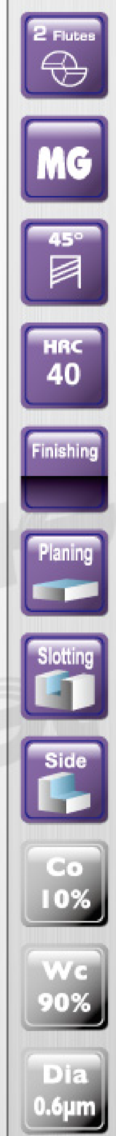
DEB

Square End Mills

unit: mm

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



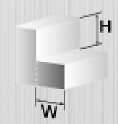


Recommended cutting condition for DEB

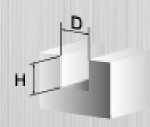
MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
2	37000	2000(800)	16000	850(350)	20000	1100(450)
3	35000	2000(900)	14000	850(450)	18000	1100(550)
4	26000	2000(1100)	11000	850(550)	13000	1100(660)
5	21000	2000(1100)	9000	850(550)	10000	1100(660)
6	17000	2000(1100)	7000	850(550)	9000	1100(660)
8	13000	2000(1100)	5500	850(650)	7000	1100(800)
10	11000	2000(1300)	7000	850(650)	5500	1100(800)
12	8800	2000(1300)	3600	850(800)	4500	1100(800)
16	6500	2000(1100)	3000	850(550)	3500	1100(900)
20	5300	2000(1100)	2200	850(550)	2500	1100(650)

( ):Grooving

DEPTH OF CUT



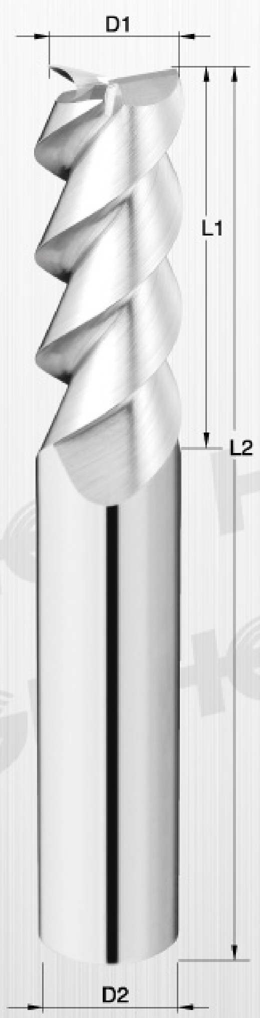
H≤1.5D
W≤0.1D



H≤0.1D

D=Diameter

DEC

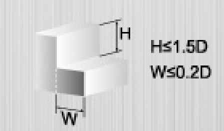


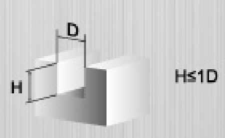
Square End Mills

unit: mm

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

DEPTH OF CUT





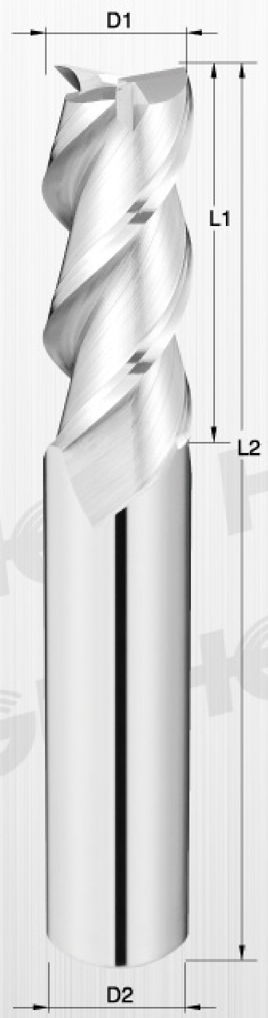
D=Diameter

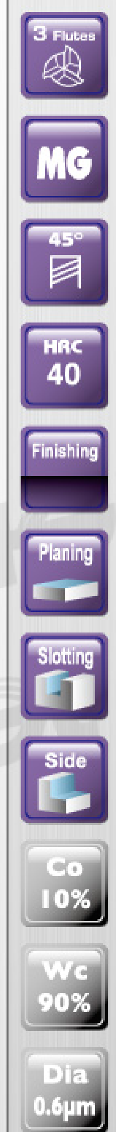
Recommended cutting condition for DEC

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

( ):Grooving

DED



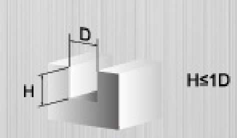


Square End Mills

unit: mm

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

DEPTH OF CUT



D=Diameter

Recommended cutting condition for DED

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

( ):Grooving

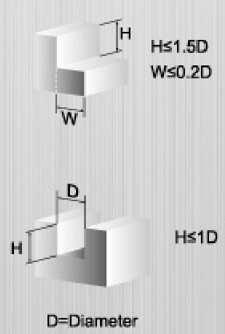
DEDX

▶ Square End Mills

unit: mm

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

▶ DEPTH OF CUT



Recommended cutting condition for DEDX

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

( ):Grooving

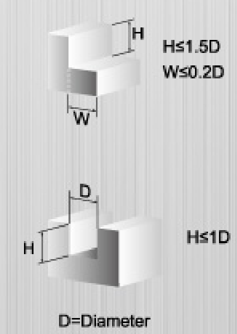
DEDP

▶ Square End Mills

unit: mm

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

▶ DEPTH OF CUT



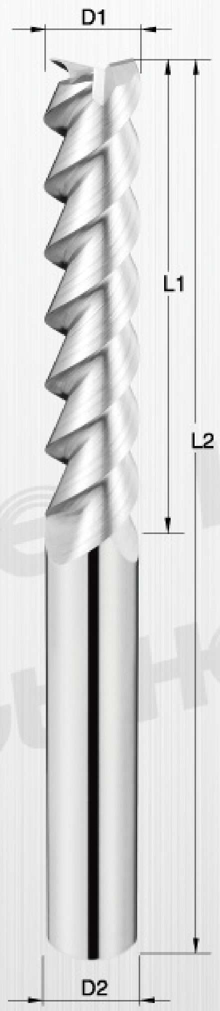
Recommended cutting condition for DEDP

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

( ):Grooving

ALUMINUM & COPPER CUTTING SERIES

DEL

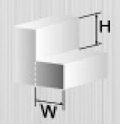


▶ Long Flute / Square End Mills

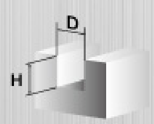
unit: mm

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

▶ DEPTH OF CUT



H≤2.5D
W≤0.15D



H≤0.6D

D=Diameter

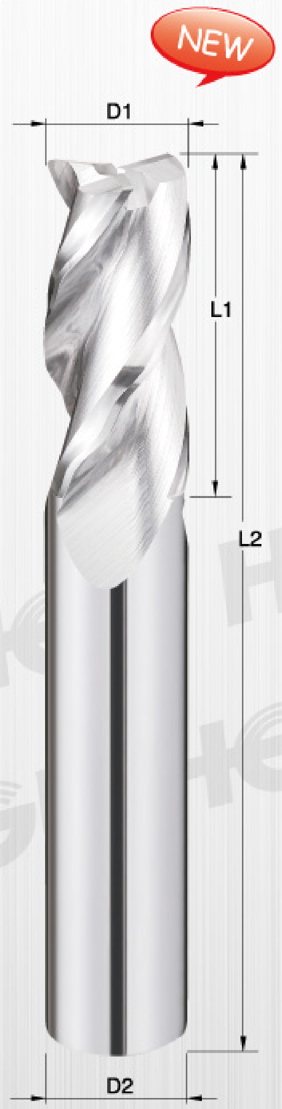
Recommended cutting condition for DEL

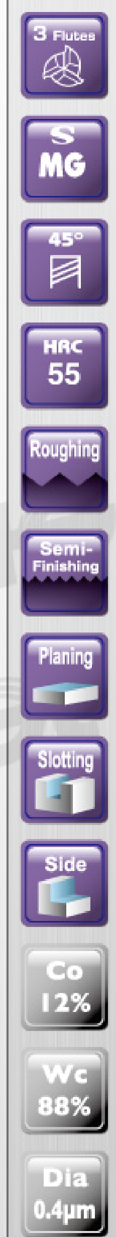
MATERIAL	Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
2	30000	600(500)	15000	250(250)	18000	300(300)
3	26000	600(500)	11000	250(250)	13500	300(350)
4	20000	600(550)	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

ALUMINUM & COPPER CUTTING SERIES

DFR



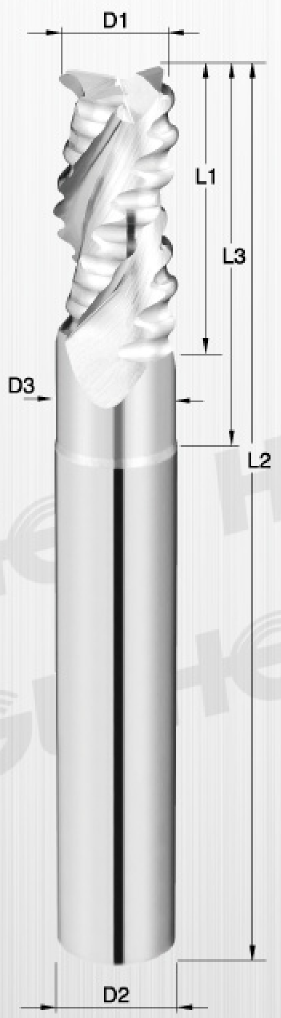


▶ Square End Mills

unit: mm

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

DEG

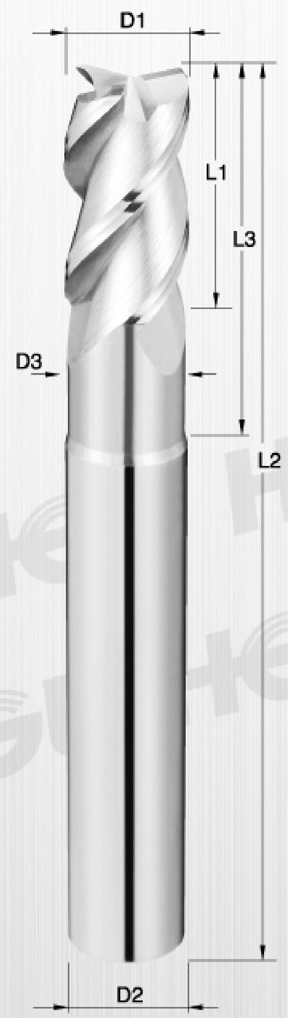


Roughing / Square End Mills

unit: mm

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

DRC



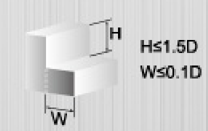
Corner Radius End Mills

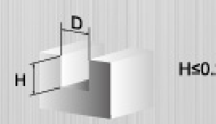
unit: mm

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

Recommended cutting condition for DRC

DEPTH OF CUT





D=Diameter

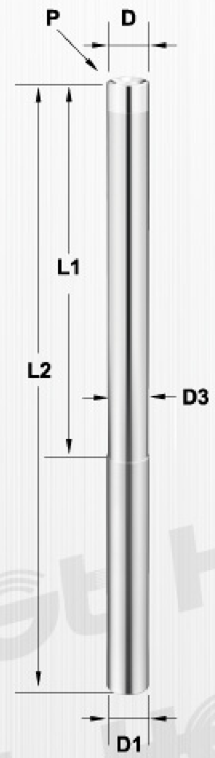
MATERIAL		Aluminum 1070		Aluminum alloy 2014 / 4032 / 5052 / 6061 / 7075		Aluminum alloy AC85	
	DIAMETER	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min	SPEED (mm^{-1})	FEED mm / min
Side Milling	3	25000	1000	25000	1000	9000	350
	4	18000	1200	18000	1200	7000	400
	5	15000	1300	15000	1300	6000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

MAGIC SHANK SERIES

EX MAGIC SHANK SERIES

MAGIC SHANK SERIES

EXCS



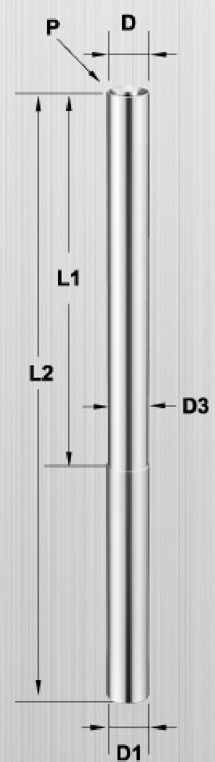
▶ Carbide Shank

unit: mm

Order No.	Neck Dia D	Shank Dia D1	Neck Dia D3	Effective Length L1	Pitch P	O.A.L. L2
EXCS **10150**	9.6	10.0	9.6	90	M5.5	150
EXCS **12150**	11.5	12.0	11.5	90	M6	150
EXCS **12200**	11.5	12.0	11.5	110	M6	200
EXCS **16150**	15.2	16.0	15.2	90	M8	150
EXCS **16200**	15.2	16.0	15.2	110	M8	200
EXCS **20150**	18.3	20.0	18.3	90	M10	150
EXCS **20200**	18.3	20.0	18.3	110	M10	200
EXCS **20250**	18.3	20.0	18.3	150	M10	250

MAGIC SHANK SERIES

EXSS



▶ Steel Shank

unit: mm

Order No.	Neck Dia D	Shank Dia D1	Neck Dia D3	Effective Length L1	Pitch P	O.A.L. L2
EXSS **16150**	15.2	16.0	15.2	90	M8	150
EXSS **16200**	15.2	16.0	15.2	110	M8	200
EXSS **20150**	18.3	20.0	18.3	90	M10	150
EXSS **20200**	18.3	20.0	18.3	110	M10	200
EXSS **20250**	18.3	20.0	18.3	150	M10	250

MAGIC SHANK SERIES

EXSB

Ex Ball Nose

2 Flutes | MG | 30° | HRC 65 | ALTiN | Finishing Semi-Finishing | Profiling

unit: mm

Co 12% | Wc 88% | Dia 0.4μm

Order No.	Radius R	Flute Length L1	Pitch P	O.A.L. L2
EXSB **1010**	R5	8	M5.5	28
EXSB **1212**	R6	10	M6	32
EXSB **1616**	R8	12	M8	38
EXSB **2020**	R10	16	M10	48

MAGIC SHANK SERIES

EXSRD

Ex Corner Radius

4 Flutes | MG | 45° | HRC 65 | R | ALTiN | Finishing Semi-Finishing | Profiling | Side

unit: mm

Co 12% | Wc 88% | Dia 0.4μm

Order No.	Diameter D1	Corner R R	Flute Length L1	Pitch P	O.A.L. L2
EXSRD **1005**	10.0	0.5	8	M5.5	28
EXSRD **1010**	10.0	1.0	8	M5.5	28
EXSRD **1205**	12.0	0.5	10	M6	32
EXSRD **1210**	12.0	1.0	10	M6	32
EXSRD **1605**	16.0	0.5	12	M8	38
EXSRD **1610**	16.0	1.0	12	M8	38
EXSRD **2010**	20.0	1.0	16	M10	48
EXSRD **2020**	20.0	2.0	16	M10	48

MAGIC SHANK SERIES

EXSEB

Ex Square

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

unit: mm

Co 12% | Wc 88% | Dia 0.4μm

Order No.	Diameter D1	Flute Length L1	Pitch P	O.A.L. L2
EXSEB **1010**	10.0	8	M5.5	28
EXSEB **1212**	12.0	10	M6	32
EXSEB **1616**	16.0	12	M8	38
EXSEB **2020**	20.0	16	M10	48

Magic Shank

MAGIC SHANK SERIES

EXESD

Ex Spot Drills

2 Flutes | MG | 90° ß | HRC 60 | ALTiN | Finishing Semi-Finishing

unit: mm

Co 12% | Wc 88% | Dia 0.4μm

Order No.	Diameter D1	Flute Length L1	Pitch P	O.A.L. L2
EXESD **1010**	10.0	8	M5.5	28
EXESD **1212**	12.0	10	M6	32
EXESD **1616**	16.0	12	M8	38
EXESD **2020**	20.0	16	M10	48

MAGIC SHANK SERIES

EXECR

Ex Corner Rounding

3 Flutes | 4 Flutes | MG | HRC 60 | ALTiN | Finishing Semi-Finishing

unit: mm

Co 12% | Wc 88% | Dia 0.4μm

Order No.	Radius R	Diameter D1	Pitch P	O.A.L. L2	Flutes
EXECR **02010**	R1	6	M5.5	28	3
EXECR **03012**	R1.5	6	M6	32	3
EXECR **04016**	R2	8	M8	38	4
EXECR **05020**	R2.5	10	M10	48	4
EXECR **06020**	R3	8	M10	48	4

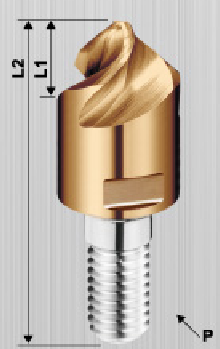
MAGIC SHANK SERIES

EXECMS

Ex Chamfering

3 Flutes | MG | 90° ß | HRC 55 | i8 | Finishing Semi-Finishing | Side

unit: mm



Co 12% | Wc 88% | Dia 0.4μm

Order No.	Diameter D1	Flute Length L1	Pitch P	O.A.L. L2
EXECMS **1010**	10	8	M5.5	28
EXECMS **1212**	12	10	M6	32
EXECMS **1616**	16	12	M8	38
EXECMS **2020**	20	16	M10	48

MAGIC SHANK SERIES

EXCCD

Ex Center Drills

2 Flutes | MG | 60° | HRC 55 | Finishing / Semi-Finishing

unit: mm

Co 12% | Wc 88% | Dia 0.4μm

Order No.	Diameter D1	Flute Length L1	Pitch P	O.A.L. L2
EXCCD **0400**	4.0	5.0	M5.5	28
EXCCD **0500**	5.0	6.3	M6	32

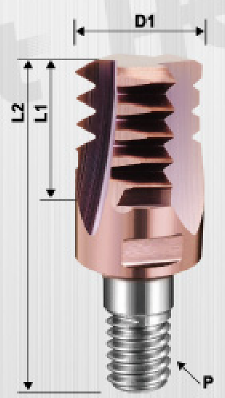
MAGIC SHANK SERIES

EXEMT

Ex Thread Milling

3 Flutes | MG | HRC 55 | G100 | Finishing / Semi-Finishing

unit: mm



Co 12% | Wc 88% | Dia 0.4μm

Order No.	Pitch MM	Diameter D1	Pitch P	O.A.L. L2
EXEMT **P10010**	1.0	10	M5.5	28
EXEMT **P15010**	1.5	10	M5.5	28
EXEMT **P15012**	1.5	12	M6	32
EXEMT **P20012**	2.0	12	M6	32

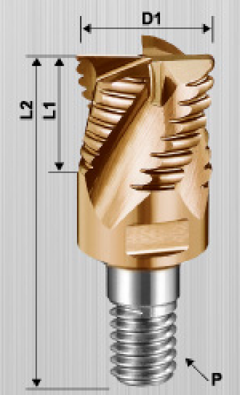
MAGIC SHANK SERIES

EXEGA

Ex Roughing Square

4 Flutes | MG | 45° | HRC 60 | i8 | Roughing | Planing | Slotting | Side

unit: mm



Co 12% | Wc 88% | Dia 0.4μm

Order No.	Diameter D1	Flute Length L1	Pitch P	O.A.L. L2
EXEGA **1010**	10	8	M5.5	28
EXEGA **1212**	12	10	M6	32
EXEGA **1616**	16	12	M8	38
EXEGA **2020**	20	16	M10	48

MAGIC SHANK SERIES

TSSB

Ts Ball Nose

2 Flutes | MG | 30° | HRC 65 | ALTiN | Finishing / Semi-Finishing | Profiling

unit: mm

Co 12% | Wc 88% | Dia 0.4μm

Order No.	Radius R	Flute Length L1	Shank Length L3	Shank Dia D2	O.A.L. L2
TSSB **1010**	R5	8	18	6	28
TSSB **1212**	R6	10	18	6	32
TSSB **1616**	R8	12	18	8	38
TSSB **2020**	R10	16	20	10	48

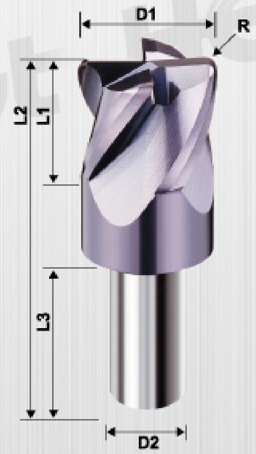
MAGIC SHANK SERIES

TSSRD

Ts Corner Radius

unit: mm

4 Flutes | MG | 45° | R | HRC 65 | ALTiN | Finishing / Semi-Finishing | Profiling | Side



Co 12% | Wc 88% | Dia 0.4μm

Order No.	Diameter D1	Corner R	Flute Length L1	Shank Length L3	Shank Dia D1	O.A.L. L2
TSSRD **1005**	10.0	0.5	8	18	6	28
TSSRD **1010**	10.0	1.0	8	18	6	28
TSSRD **1205**	12.0	0.5	10	18	6	32
TSSRD **1210**	12.0	1.0	10	18	6	32
TSSRD **1605**	16.0	0.5	12	18	8	38
TSSRD **1610**	16.0	1.0	12	18	8	38
TSSRD **2010**	20.0	1.0	16	20	10	48
TSSRD **2020**	20.0	2.0	16	20	10	48

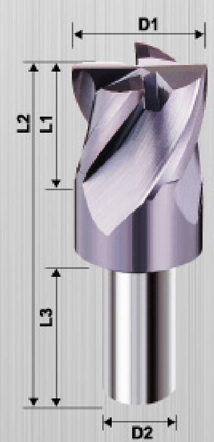
MAGIC SHANK SERIES

TSSEB

Ts Square

4 Flutes | MG | 45° | HRC 60 | ALTiN | Finishing / Semi-Finishing | Planing | Side

unit: mm



Co 12% | Wc 88% | Dia 0.4μm

Order No.	Diameter D1	Flute Length L1	Shank Length L3	Shank Dia D1	O.A.L. L2
TSSEB **1010**	10.0	8	18	6	28
TSSEB **1212**	12.0	10	18	6	34
TSSEB **1616**	16.0	12	18	8	38
TSSEB **2020**	20.0	16	20	10	38

MAGIC SHANK SERIES

TSESD

Ts Spot Drills

2 Flutes | S MG | 90° ß | HRC 60 | ALTiN | Finishing Semi-Finishing

Co 12%
Wc 88%
Dia 0.4μm

unit: mm

Order No.	Diameter D1	Flute Length L1	Shank Length L3	Shank Dia D2	O.A.L. L2
TSESD **1010**	10.0	8	18	6	28
TSESD **1212**	12.0	10	18	6	32
TSESD **1616**	16.0	12	18	8	38
TSESD **2020**	20.0	16	20	10	48

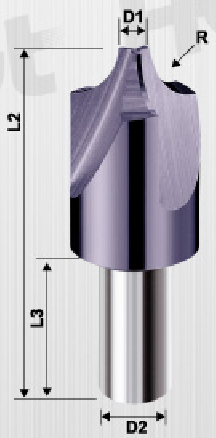
MAGIC SHANK SERIES

TSECR

Ts Corner Rounding

3 Flutes | 4 Flutes | S MG | HRC 60 | ALTiN | Finishing Semi-Finishing

Co 12%
Wc 88%
Dia 0.4μm



unit: mm

Order No.	Radius R	Diameter D1	Shank Length L3	Shank Dia D2	O.A.L. L2	Flutes
TSECR **02010**	R1	6	18	6	28	3
TSECR **03012**	R1.5	6	18	6	32	3
TSECR **04016**	R2	8	18	8	38	4
TSECR **05020**	R2.5	10	20	10	48	4
TSECR **06020**	R3	8	20	10	48	4

CARBIDE DRILLS SERIES

CD CARBIDE DRILLS SERIES

ESD.ESDC.ESDA

ESD ▶ Spot Drills

MG | 90° ß | HRC 40 | Finishing Semi-Finishing | Co 10% | Wc 90% | Dia 0.6μm

unit: mm

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

ESDC ▶ Spot Drills

MG | 90° ß | HRC 40 | TiAlN | Finishing Semi-Finishing | Co 10% | Wc 90% | Dia 0.6μm

unit: mm

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

ESDA ▶ Spot Drills

MG | 120° ß | HRC 40 | TiAlN | Finishing Semi-Finishing | Co 10% | Wc 90% | Dia 0.6μm

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

ESDS.ESDL

ESDS ▶ Long Shank Spot Drills

unit: mm

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

MG | 90° ß | HRC 40 | TiAlN | Finishing Semi-Finishing | Co 10% | Wc 90% | Dia 0.6μm

ESDL ▶ Long Shank Spot Drills

unit: mm

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

MG | 120° ß | HRC 40 | TiAlN | Finishing Semi-Finishing | Co 10% | Wc 90% | Dia 0.6μm

CARBIDE DRILLS SERIES

CCD.CCDA

CCD ▶ Center Drills

unit: mm

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

CCDA ▶ Center Drills

unit: mm

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

CARBIDE DRILLS SERIES

CD

▶ Carbide Drills

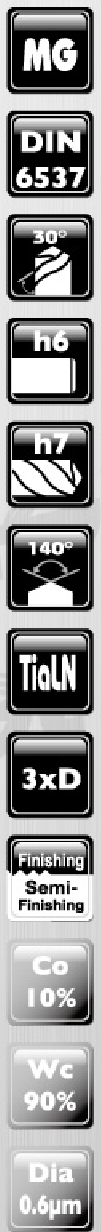
unit: mm

Order No.	Dia D1	Flute Length L1	O.A.L. L2
CD **005**	0.5	6	26
CD **006**	0.6	6	26
CD **007**	0.7	6	26
CD **008**	0.8	6	26
CD **009**	0.9	6	26
CD **010**	1.0	6	26
CD **011**	1.1	7	28
CD **012**	1.2	8	30
CD **013**	1.3	8	30
CD **014**	1.4	9	32
CD **015**	1.5	9	32
CD **016**	1.6	10	34
CD **017**	1.7	10	34
CD **018**	1.8	11	36
CD **019**	1.9	11	36
CD **020**	2.0	12	38
CD **021**	2.1	12	38
CD **022**	2.2	13	40
CD **023**	2.3	13	40
CD **024**	2.4	14	43
CD **025**	2.5	14	43
CD **026**	2.6	14	43
CD **027**	2.7	16	46
CD **028**	2.8	16	46
CD **029**	2.9	16	46
CD **030**	3.0	16	46
CD **031**	3.1	18	49
CD **032**	3.2	18	49
CD **033**	3.3	18	49
CD **034**	3.4	20	52
CD **035**	3.5	20	52
CD **036**	3.6	20	52
CD **037**	3.7	20	52
CD **038**	3.8	22	55
CD **039**	3.9	22	55
CD **040**	4.0	22	55
CD **041**	4.1	22	55
CD **042**	4.2	22	55
CD **043**	4.3	24	58
CD **044**	4.4	24	58
CD **045**	4.5	24	58
CD **046**	4.6	24	58
CD **047**	4.7	24	58
CD **048**	4.8	26	62
CD **049**	4.9	26	62
CD **050**	5.0	26	62
CD **051**	5.1	26	62
CD **052**	5.2	26	62
CD **053**	5.3	26	62
CD **054**	5.4	28	66
CD **055**	5.5	28	66
CD **056**	5.6	28	66
CD **057**	5.7	28	66
CD **058**	5.8	28	66
CD **059**	5.9	28	66

Order No.	Dia D1	Flute Length L1	O.A.L. L2
CD **060**	6.0	28	66
CD **061**	6.1	31	70
CD **062**	6.2	31	70
CD **063**	6.3	31	70
CD **064**	6.4	31	70
CD **065**	6.5	31	70
CD **066**	6.6	31	70
CD **067**	6.7	31	70
CD **068**	6.8	34	74
CD **069**	6.9	34	74
CD **070**	7.0	34	74
CD **071**	7.1	34	74
CD **072**	7.2	34	74
CD **073**	7.3	34	74
CD **074**	7.4	34	74
CD **075**	7.5	34	74
CD **076**	7.6	37	79
CD **077**	7.7	37	79
CD **078**	7.8	37	79
CD **079**	7.9	37	79
CD **080**	8.0	37	79
CD **081**	8.1	37	79
CD **082**	8.2	37	79
CD **083**	8.3	37	79
CD **084**	8.4	37	79
CD **085**	8.5	37	79
CD **086**	8.6	40	84
CD **087**	8.7	40	84
CD **088**	8.8	40	84
CD **089**	8.9	40	84
CD **090**	9.0	40	84
CD **091**	9.1	40	84
CD **092**	9.2	40	84
CD **093**	9.3	40	84
CD **094**	9.4	40	84
CD **095**	9.5	40	84
CD **096**	9.6	43	89
CD **097**	9.7	43	89
CD **098**	9.8	43	89
CD **099**	9.9	43	89
CD **100**	10.0	43	89
CD **102**	10.2	43	89
CD **105**	10.5	43	89
CD **110**	11.0	47	95
CD **115**	11.5	47	95
CD **120**	12.0	51	102
CD **125**	12.5	51	102
CD **130**	13.0	51	102

CARBIDE DRILLS SERIES

CDA



Carbide Drills

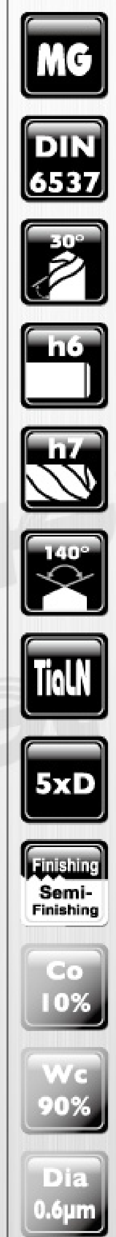
unit: mm

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

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

CARBIDE DRILLS SERIES

CDB



Carbide Drills

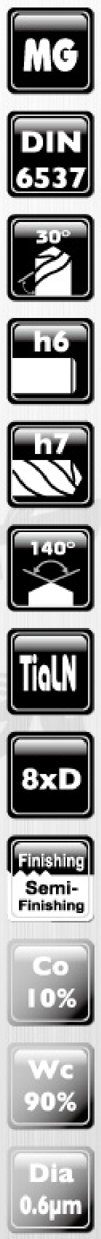
unit: mm

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

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

CARBIDE DRILLS SERIES

CDC



Carbide Drills

unit: mm

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

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

CARBIDE DRILLS SERIES

CDAC

Carbide Drills

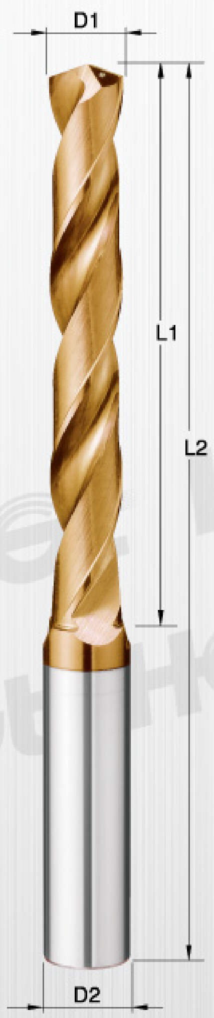
unit: mm

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

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

CARBIDE DRILLS SERIES

CDBC



MG
DIN 6537
30°
h6
h7
140°
i8
5xD
Finishing
Semi-Finishing
Co 10%
Wc 90%
Dia 0.6μm

Carbide Drills

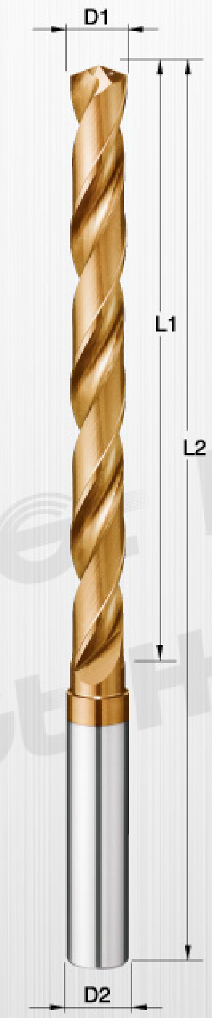
unit: mm

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

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

CARBIDE DRILLS SERIES

CDCC



MG
DIN 6537
30°
h6
h7
140°
i8
8xD
Finishing
Semi-Finishing
Co 10%
Wc 90%
Dia 0.6μm

Carbide Drills

unit: mm

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

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

CARBIDE REAMERS SERIES

CR CARBIDE REAMERS SERIES

CRA

▶ Carbide Reamers

unit: mm

Order No.	Dia D1	Flute Length L1	Overall Length L2	Flutes
CRA010	1.0	6	34	4
CRA011	1.1	7	36	4
CRA012	1.2	7	38	4
CRA013	1.3	7	38	4
CRA014	1.4	8	40	4
CRA015	1.5	8	40	4
CRA016	1.6	9	43	4
CRA017	1.7	9	43	4
CRA018	1.8	10	46	4
CRA019	1.9	10	46	4
CRA020	2.0	11	49	4
CRA021	2.1	11	49	4
CRA022	2.2	12	53	4
CRA023	2.3	12	53	4
CRA024	2.4	14	57	4
CRA025	2.5	14	57	4
CRA026	2.6	14	57	4
CRA027	2.7	15	61	4
CRA028	2.8	15	61	4
CRA029	2.9	15	61	4
CRA030	3.0	15	61	4
CRA031	3.1	16	65	4
CRA032	3.2	16	65	4
CRA033	3.3	16	65	4
CRA034	3.4	18	70	4
CRA035	3.5	18	70	4
CRA036	3.6	18	70	4
CRA037	3.7	18	70	4
CRA038	3.8	19	75	4
CRA039	3.9	19	75	4
CRA040	4.0	19	75	4
CRA041	4.1	19	75	4
CRA042	4.2	19	75	4
CRA043	4.3	21	80	4
CRA044	4.4	21	80	4
CRA045	4.5	21	80	4
CRA046	4.6	21	80	6
CRA047	4.7	21	80	6
CRA048	4.8	23	86	6
CRA049	4.9	23	86	6
CRA050	5.0	23	86	6
CRA051	5.1	23	86	6
CRA052	5.2	23	86	6
CRA053	5.3	23	86	6
CRA054	5.4	26	93	6
CRA055	5.5	26	93	6
CRA056	5.6	26	93	6
CRA057	5.7	26	93	6
CRA058	5.8	26	93	6
CRA059	5.9	26	93	6
CRA060	6.0	26	93	6
CRA061	6.1	28	101	6
CRA062	6.2	28	101	6
CRA063	6.3	28	101	6
CRA064	6.4	28	101	6
CRA065	6.5	28	101	6

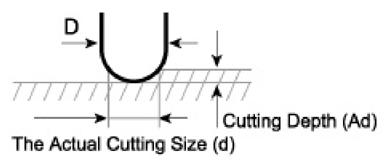
Order No.	Dia D1	Flute Length L1	Overall Length L2	Flutes
CRA066	6.6	28	101	6
CRA067	6.7	31	101	6
CRA068	6.8	31	109	6
CRA069	6.9	31	109	6
CRA070	7.0	31	109	6
CRA071	7.1	31	109	6
CRA072	7.2	31	109	6
CRA073	7.3	31	109	6
CRA074	7.4	31	109	6
CRA075	7.5	31	109	6
CRA076	7.6	33	117	6
CRA077	7.7	33	117	6
CRA078	7.8	33	117	6
CRA079	7.9	33	117	6
CRA080	8.0	33	117	6
CRA081	8.1	33	117	6
CRA082	8.2	33	117	6
CRA083	8.3	33	117	6
CRA084	8.4	33	117	6
CRA085	8.5	33	117	6
CRA086	8.6	36	125	6
CRA087	8.7	36	125	6
CRA088	8.8	36	125	6
CRA089	8.9	36	125	6
CRA090	9.0	36	125	6
CRA091	9.1	36	125	6
CRA092	9.2	36	125	6
CRA093	9.3	36	125	6
CRA094	9.4	36	125	6
CRA095	9.5	36	125	6
CRA096	9.6	38	133	6
CRA097	9.7	38	133	6
CRA098	9.8	38	133	6
CRA099	9.9	38	133	6
CRA100	10.0	38	133	6
CRA101	10.1	38	133	6
CRA102	10.2	38	133	6
CRA103	10.3	38	133	6
CRA104	10.4	38	133	6
CRA105	10.5	38	133	6
CRA106	10.6	38	133	6
CRA107	10.7	41	142	6
CRA108	10.8	41	142	6
CRA109	10.9	41	142	6
CRA110	11.0	41	142	6
CRA111	11.1	41	142	6
CRA112	11.2	41	142	6
CRA113	11.3	41	142	6
CRA114	11.4	41	142	6
CRA115	11.5	41	142	6
CRA116	11.6	41	142	6
CRA117	11.7	41	142	6
CRA118	11.8	41	142	6
CRA119	11.9	44	151	6
CRA120	12.0	44	151	6

Ball Nose End Milling Real Diameter

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

Calculation of Real Dia.

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



Spindle Speed Table

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

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

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

V	Cutting Speed (m/min)
π	Circular constant (3.14)
D	Diameter (mm)
N	RPM (min-1)
Z	Number of Flutes
f	Feed per Tooth (mm/Tooth)
F	Feed (mm/min)

Calculation for Cutting Speed, Spindle Speed and Feed

Cutting Speed (Vc) = $\dfrac{\pi \times D \times n}{1{,}000}$

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

Feed (Vf) = $n \times fz \times Z$

Feed per Tooth (fz) = $\dfrac{Vf}{n \times Z}$

Vc = Cutting Speed (m/min)
π = 3.14 The circular Constant
D = Diameter (mm)
n = Spindle Speed (min^{-1})
Vf = Feed (mm/min)
fz = Feed per Tooh (mm/tooth)
Z = Number of Flutes
ap = Axial Depth of Cut (mm)
ae = Radial Depth of Cut (mm)

Selection of Number of Flute

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

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

Cutting Speed (Vc)

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

Work Materials	*Cutting Speed (m/min)* Carbide	Coated Carbide
Carbon Steels (S50C)	20~40	40~80
Alloy Steels (SCM.SKD)	20~35	35~60
Prehardened Steels (NAK.HPM)	15~30	30~50
Stainless Steels (SOS304)	5~20	10~30
Hardened Steels (SKD61.HRC60)	-	20~40

Feed per Tooth (fz)

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

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

Comparison Table of Hardness

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

Factors for End Mill Operation

Factor	Instruction and Advice
Rigidity of Machine	1.Use a right machine. 2.Adjust cutting conditions according to the rigidity of machine.
Collet Chuck and Run out of End Mill	1.Use a right and precise collet chuck. 2.Minimize the run out of end mill.
Work Clamp	1.Work piece must be firmly clamped. 2.In case work piece cannot be firmly clamped, relieve cutting condition.
Cutting Fluid and Chips	1.Give a sufficient cutting fluid. 2.Recommend water-base cutting fluid for heavy cutting. 3.Some end mills apply dry cutting only. 4.Use air blow for dry cutting. 5.Remove chips from working area.
Selection of End Mill	1.Select most suitable end mills according to work material and dimension. 2.Refer to the index table on front page.
Cutting Conditions	1.Refer to recommend 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 ·Built up edge ·Excessive cooling	·Reduce depth of cut ·Reduce feed ·Clamped work piece firmly ·Reduce spindle speed ·Adjust effective length and overhang as short as possible ·Use new end mill or regrind ·Choose appropriate coating ·Use air blow or oil mist
Abnormal wear	·Excessive spindle speed ·Tool low feed	·Reduce spindle speed ·Increase feed
Clogging and Depositing	·Chips are not well disposed ·Excessive feed ·Excessive depth of cut ·Inappropriate number of flute ·Wear of cutting edge progressed	·Adjust coolant nozzle to right direction to dispose chips ·Reduce feed ·Reduce depth of cut ·Use fewer flutes end mill ·Use new end mill or regrind
Deflection of end mill	·Excessive feed ·Excessive depth of cut ·Excessive long of effective length or overhang of end mill ·Large helix angle of flutes	·Reduce feed ·Reduce depth of cut ·Adjust effective length and overhang as short as possible ·Use smaller helix angle
Burr on finished surface	·Wear of cutting edge progressed ·Small helix angle of flutes ·Excessive depth of cut	·Use new end mill or regrind ·Use smaller helix angle ·Reduce depth of cut
Poor surface roughness	·Wear of cutting edge progressed ·Chips bite ·Excessive feed ·Excessive long of effective length or overhang of end mill ·Too low spindle speed ·Stock removals vary for finishing ·Excessive chucking runout	·Use new end mill or regrind ·Use coolant to remove chips ·Reduce feed ·Adjust effective length and overhang as short as possible ·Increase spindle speed ·Improve semi-finishing process ·Adjust chucking runout
Poor machining accuracy	·Inconsistent thermal extension of spindle ·Stock removals vary for finishing ·Excessive feed ·Excessive chucking runout	·Warm up spindle by idling before starting operation ·Improve semi-finishing process ·Reduce feed ·Adjust chucking runout