



 **GLISTEN**  
MAKE PERFORMANCE YOURS



***GLISTEN***





We here introduce ourselves as Glisten Cutting Tools. Own and managed by dedicated and experienced professionals.

**We believe in “Supply quality products in best prices”.**

Glisten's focus is always towards the development, designing and marketing of our High performance products range. Our company's satisfaction relies in our customer satisfaction.

Our tools cover aerospace, precision moulding industries, medical equipment and semiconductors. We have a high range in END MILL with excellent quality at great prices. Our Glisten team management is always dedicated towards increasing productivity and enhancing the tools life.

Glisten tools are made in consonance with the European Manufacturing standards of production. Glisten tools are made from high quality German Carbide rods on German and Swiss 6- axis CNC Grinding machines, advanced Swiss Coating Technologies and sophisticated German measuring instruments.

Glisten has made a commitment to deliver the highest quality of tools. Excellence and Innovation describe the reputation, which can only be achieved by the performance. At Glisten we provide the Performance to let the our customers increase their service and product.

Get connected to Glisten and Make The Performance Yours.

## Q MG



## SOLID CARBIDE

Co%	9
WC incl. Doping (%)	89.83
Tungsten Carbide	Ø04.µm
T.R.S. (N / mm <sup>2</sup> )	>4000
Density (g / cm <sup>3</sup> )	14.3
Hardness HRA	93.2
Hardness HV30 (N / mm <sup>2</sup> )	1950

## SMG



Co%	9
WC incl. Doping (%)	89.83
Tungsten Carbide	Ø04.µm
T.R.S. (N / mm <sup>2</sup> )	>4000
Density (g / cm <sup>3</sup> )	14.3
Hardness HRA	93.2
Hardness HV30 (N / mm <sup>2</sup> )	1950

## SMG



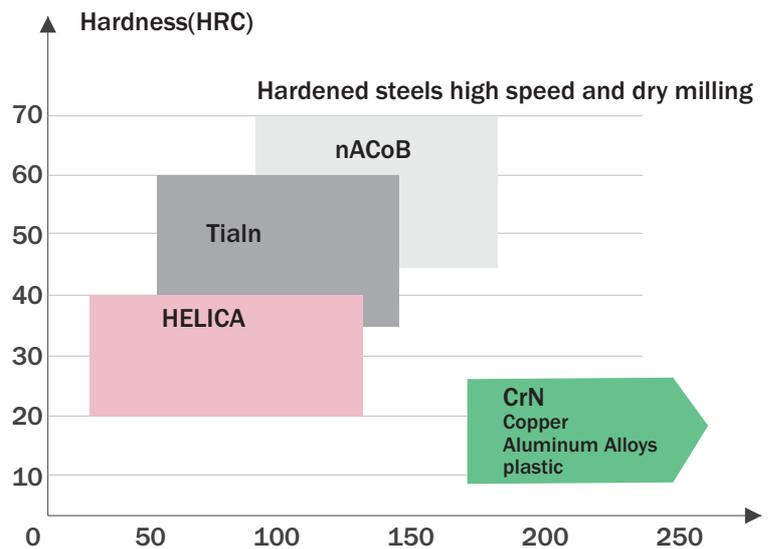
Co%	9
WC incl. Doping (%)	89.83
Tungsten Carbide	Ø04.µm
T.R.S. (N / mm <sup>2</sup> )	>4000
Density (g / cm <sup>3</sup> )	14.3
Hardness HRA	93.2
Hardness HV30 (N / mm <sup>2</sup> )	1950

## HARD COATING PROPERTIES

Coating Type	Symbol Color	Nanohardness (GPa)	Thickness (µm)	Friction Coefficient	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

## COATING APPLICATION

Coolant	Work Material
Air Blow	SKH(H) SKD11(H)
	HPM38(H) SKD 61(H)
Oilmist	NAK80 NAK55
Oil	SCM440 SUS304
Water soluble	S45C S50C





2.3.4... Flutes



Tungsten Carbide x

ø0.6µm ø0.4µm ø0.2µm



Helix Angle



Corner Radius (R)



Work Material Hardness



Coating



Fine Pitch



Point Angle

Chisel Edge Angle



High Speed Cutting



Shank Diamet Tolerance



Cutting Flute Tolerance



Drills Type



Work Type

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14	HBS
15	HBS
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18	HERL

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55	GCDA
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## 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 noise 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 start from 50% cutting data, Then get more.

## 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
8.0	0~-0.025
8.0	0~-0.030
10.0	0~-0.035
12.0	0~-0.040
18.0	0~-0.040
20.0	0~-0.040

Ball Nose End Mills (mm)

Flute Dia.	R Tolerance
R0.5	±0.01
R1	±0.01
R1.5	±0.01
R2	±0.01
R25	±0.01
R3	±0.01
R4	±0.01
R5	±0.01
R6	±0.015
R8	±0.02
R10	±0.02

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. Shank Tolerance

Shank Dia.	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

Shank Dia. Shank Tolerance

Shank Dia.	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

Shank Dia. Shank Tolerance

Shank Dia.	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~-0.011

**RANGE**  
**01**



**MIRACLE**  
**CUTTING SERIES**

## Ball Nose End Mills

Co 9%	Wc 89.83%	Dia 0.2µm
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
HB0104	R0.5	2	50	4
HB0106	R0.5	2	50	6
HB0154	R0.75	3	50	4
HB0156	R0.75	3	50	6
HB 0204	R1	4	50	4
HB 0206	R1	4	50	6
HB 0303	R1.5	6	50	3
HB 0304	R1.5	6	50	4
HB 0306	R1.5	6	50	6
HB 0404	R2	8	50	4
HB 0406	R2	8	50	6
HB 0506	R2.5	10	50	6
HB 0606	R3	12	50	6
HB 0808	R4	16	60	8
HB 1010	R5	20	75	10
HB 1212	R6	24	75	12
HB 1616	R8	32	100	16

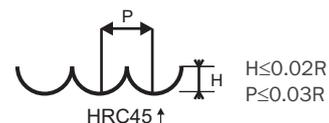
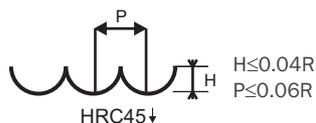
MIRACLE CUTTING SERIES



### Recommended cutting condition for HB

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

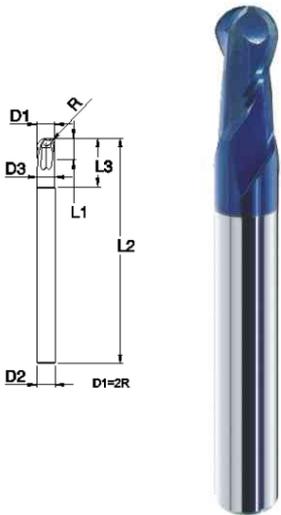
DEPTH OF CUT



## Ball Nose End Mills

Co	Wc	Dia
9%	89.83%	0.2µm

2 Flutes	Q MG	30°	HRC 65	nAcoE
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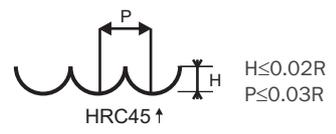
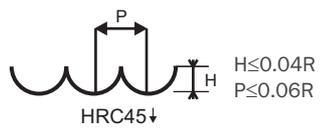
Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
HBN 0104	R0.5	2	50	4
HBN 0106	R0.5	2	50	6
HBN 0154	R0.75	3	50	4
HBN 0156	R0.75	3	50	6
HBN 0204	R1	4	50	4
HBN 0206	R1	4	50	6
HBN 0303	R1.5	6	50	3
HBN 0304	R1.5	6	50	4
HBN 0306	R1.5	6	50	6
HBN 0404	R2	8	50	4
HBN 0406	R2	8	50	6
HBN 0506	R2.5	10	50	6
HBN 0606	R3	12	50	6
HBN 0808	R4	16	60	8
HBN 1010	R5	20	75	10
HBN 1212	R6	24	75	12
HBN 1616	R8	32	100	16



### Recommended cutting condition for HBN

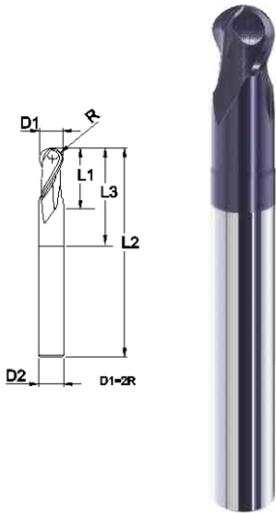
MATERIAL	Carbon Steels - Alloy Steels S45C, RD, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
RADIUS	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	FEED Mm/ min
R1	23000	2000	22000	1800	16000	900
R1.5	16000	2000	15000	1800	11000	900
R2	15000	2400	14000	2000	10000	1300
R3	17000	5500	14000	5000	9000	1500
R4	12000	4000	9000	3000	6200	1400
R5	9000	3500	7000	2800	5200	900
R6	8000	2800	6500	1800	4300	800
R8	7000	2000	5000	1500	3300	700

#### DEPTH OF CUT



MIRACLE CUTTING SERIES

Co 9%	Wc 89.83%	Dia 0.2µm
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Order No.	Radius R	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
HBF 0104	R0.5	1	3	50	4
HBF 0154	R0.75	1	3	50	4
HBF 0204	R1	2	5	50	4
HBF 0306	R1.5	3	8	50	6
HBF 0406	R2	4	10	50	6
HBF 0506	R2.5	5	13	50	6
HBF 0606	R3	6	15	50	6
HBF 0808	R4	8	20	60	8
HBF 1010	R5	10	25	75	10
HBF 1212	R6	12	30	75	12

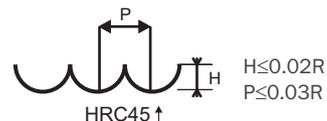
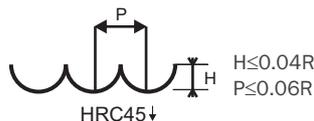
MIRACLE CUTTING SERIES



### Recommended cutting condition for HBF

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

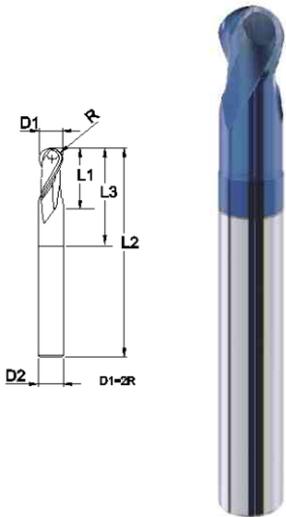
DEPTH OF CUT



## Ball Nose End Mills

Co	Wc	Dia
9%	89.83%	0.2µm

2 Flutes	QMG	30°	HRC 65	nAcoE
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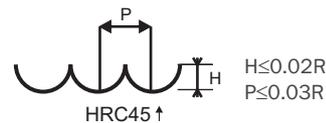
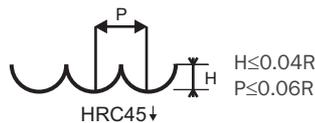
Order No.	Radius R	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
HBFN 0104	R0.5	1	3	50	4
HBFN 0154	R0.75	1	3	50	4
HBFN 0204	R1	2	5	50	4
HBFN 0306	R1.5	3	8	50	6
HBFN 0406	R2	4	10	50	6
HBFN 0506	R2.5	5	13	50	6
HBFN 0606	R3	6	15	50	6
HBFN 0808	R4	8	20	60	8
HBFN 1010	R5	10	25	75	10
HBFN 1212	R6	12	30	75	12



### Recommended cutting condition for HBFN

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

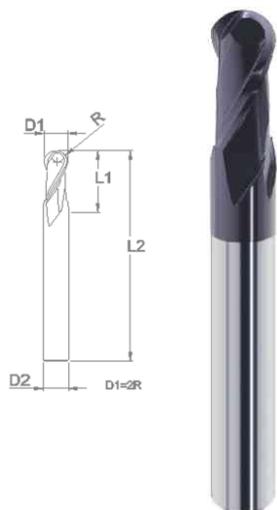
#### DEPTH OF CUT



# HBL.HBLL

## Long Shank Ball Nose End Mills

Co 9%	Wc 89.83%	Dia 0.2µm
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
HBL 0206	R1	4	75	6
HBL 0306	R1.5	6	75	6
HBL 0406	R2	8	75	6
HBL 0506	R2.5	10	75	6
HBL 0606	R3	12	75	6
HBL 0808	R4	16	75	8
HBLL 0606	R3	12	100	6
HBLL 0808	R4	16	100	8
HBLL 1010	R5	20	100	10
HBLL 1212	R6	24	100	12

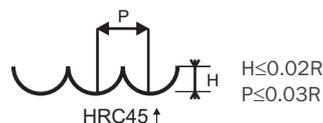
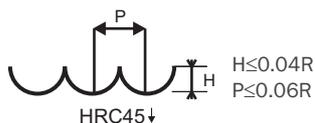
MIRACLE CUTTING SERIES



### Recommended cutting condition for HBL.HBLL

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
RADIUS	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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

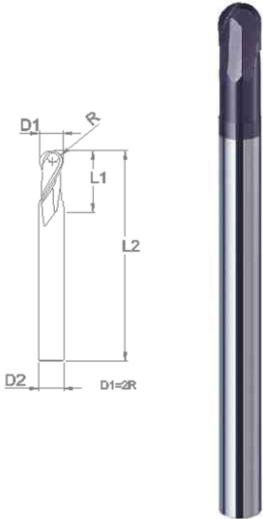
DEPTH OF CUT



## Power Ball Nose End Mills

Co	Wc	Dia
9%	89.83%	0.2µm

2 Flutes	Q MG	30°	HRC 65	ALTiN
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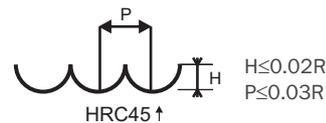
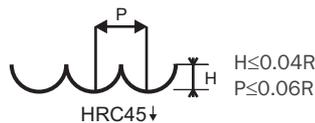
Order No.	Radius R	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
HBP 0104	R0.5	1	3	50	4
HBP 0154	R0.75	2	5	50	4
HBP 0206	R1	3	6	50	6
HBP 0306	R1.5	4	8	50	6
HBP 0306A	R1.5	4	8	75	6
HBP 0406	R2	5	10	50	6
HBP 0406A	R2	5	10	75	6
HBP 0606	R3	6	12	50	6
HBP 0606A	R3	6	16	75	6
HBP 0808	R4	8	16	60	8
HBP 0808A	R4	8	25	100	8
HBP 1010	R5	10	20	75	10
HBP 1010A	R5	10	30	100	10



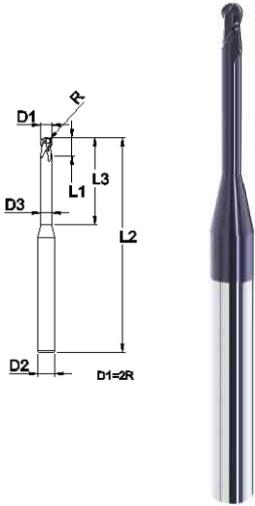
### Recommended cutting condition for HBP

MATERIAL	Alloy Steels - Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Alloy Steels . Tool Steels SKD61		Hardened Steels SKD11	
HARDNESS	~HRC40		~HRC50		~HRC60	
RADIUS	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
R1	45000	2000	18000	1500	12000	1200
R1.5	42000	2000	18000	1500	12000	1200
R2	15000	3000	18000	1500	12000	1200
R3	13000	5000	11000	3500	8000	1700
R4	9000	3000	8000	2000	4000	1400
R5	7500	2500	6500	1800	3500	1300

DEPTH OF CUT



Co 9%	Wc 89.83%	Dia 0.2µm
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Order No.	Radius R	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
HBF 00504	R0.25	1	4	50	4
HBF 00506	R0.25	1	6	50	4
HBF 00604	R0.3	1.2	4	50	4
HBF 00606	R0.3	1.2	6	50	4
HBF 00806	R0.4	1.2	6	50	4
HBF 00808	R0.4	1.2	8	50	4
HBF 01006	R0.5	1.5	6	50	4
HBF 01008	R0.5	1.5	8	50	4
HBF 01010	R0.5	1.5	10	50	4
HBF 01012	R0.5	1.5	12	50	4
HBF 01208	R0.6	2	8	50	4
HBF 01212	R0.6	2	12	50	4
HBF 01508	R0.75	2	8	50	4
HBF 01512	R0.75	2	12	50	4
HBF 01516	R0.75	2	16	50	4
HBF 01520	R0.75	2	20	50	4
HBF 01608	R0.8	2.5	8	50	4
HBF 01612	R0.8	2.5	12	50	4
HBF 01616	R0.8	2.5	16	50	4
HBF 02008	R1.0	3	8	50	4
HBF 02012	R1.0	3	12	50	4
HBF 02016	R1.0	3	16	50	4
HBF 02020	R1.0	3	20	50	4
HBF 03008	R1.5	4	8	50	6
HBF 03010	R1.5	4	10	50	6
HBF 03016	R1.5	4	16	50	6
ABE 03020	R1.5	4	20	75	6
HBF 03025	R1.5	4	25	75	6
HBF 04010	R2.0	5	10	75	6
HBF 04015	R2.0	5	15	75	6
HBF 04020	R2.0	5	20	75	6
HBF 04025	R2.0	5	25	75	6
ABF 04030	R2.0	5	30	75	6

MIRACLE CUTTING SERIES

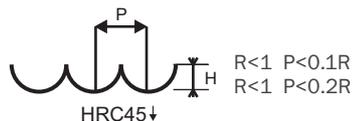


## Recommended cutting condition for HBS

MATERIAL	Alloy Steels . Tool Steels . Hardened Steels 845C, SCM, S50C, SKS, SCr, SNCM1, SKD11, SKD61, NAKBO			
RADIUS	Effective Length	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	Depth Of Cut
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
	6	20000 - 32000	300 - 750	0.04
R0.5	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 - 600	0.06
	16	13000 - 18000	350 - 800	0.05
R1.5	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

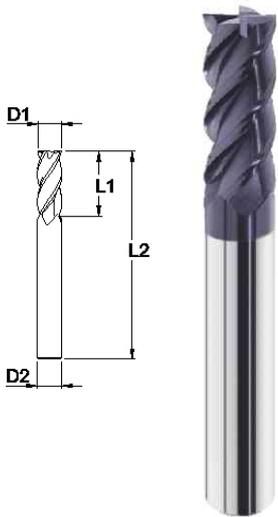
MIRACLE CUTTING SERIES

DEPTH OF CUT



## Square End Mills

Co 9%	Wc 89.83%	Dia 0.2µm
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
HE 0304	3	8	50	4
HE 0404	4	11	50	4
HE 0506	5	13	50	6
HE 0606	6	16	50	6
HE 0808	8	20	60	8
HE 1010	10	25	75	10
HE 1212	12	30	75	12
HE 1616	16	40	100	16
HE 2020	20	45	100	20

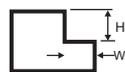
MIRACLE CUTTING SERIES



### Recommended cutting condition for HE

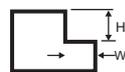
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
3	20000	2000	16000	1000	9000	500
4	19000	2000	12000	1300	6000	550
5	13000	1800	10000	1400	5000	500
6	10000	3000	8000	1500	4600	700
8	8000	3200	5000	1300	3600	600
10	7000	3000	4500	1200	3000	500
12	5000	2000	4000	1100	2000	500
16	4000	1800	3500	1000	1800	450
20	3500	1800	3000	1000	1300	450

SIDE MILLING



D 6mm↓ H=1.5D W=0.2D  
D 6mm↑ H=1.5D W=0.5D

HRC45↓



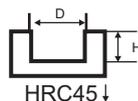
D 6mm↓ H=1.5D W=0.1D  
D 6mm↑ H=1.5D W=0.2D

HRC45↑

GROOVING

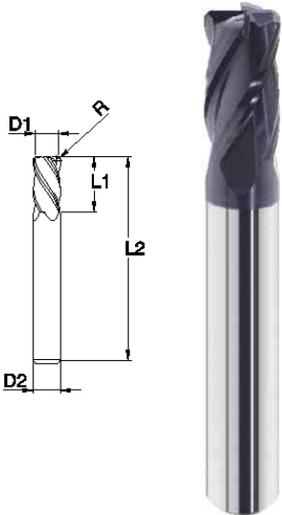
3	2000	2000	20000	1200	16000	1200
4	16000	2000	16000	1200	12000	1300
5	13000	1800	13000	1100	10000	1400
6	10000	3000	10000	2100	8000	1500
8	6000	2900	8000	1800	6000	1400
10	7000	2800	6000	1700	5000	1300
12	5000	2300	5500	1700	4500	1200
16	3500	1800	4500	1800	3500	1200
20	3000	1400	3000	1500	2600	1100

DEPTH OF CUT



## Corner Radius End Mills

Co 9%	Wc 89.83%	Dia 0.2µm
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Order No.	Diameter D1	Corner R R	Flute Length L1	Q.A.L. L2	Shank Dia D2
HER 0102	1	0.2	2	50	4
HER 01502	1.5	0.2	3	50	4
HER 01503	1.5	0.3	3	50	4
HER 0202	2	0.2	4	50	4
HER 0203	2	0.3	4	50	4
HER 0205	2	0.5	4	50	4
HER 0302	3	0.2	6	50	3
HER 0305	3	0.5	6	50	3
HER 0402	4	0.2	8	50	4
HER 0405	4	0.5	8	50	4
HER 0410	4	1.0	8	50	4
HER 0605	6	0.5	12	50	6
HER 0610	6	1.0	12	50	6
HER 0805	8	0.5	16	60	8
HER 0810	8	1.0	16	60	8
HER 1005	10	0.5	20	75	10
HER 1010	10	1.0	20	75	10
HER 1020	10	2.0	20	75	10
HER 1030	10	3.0	20	75	10
HER 1205	12	0.5	24	75	12
HER 1210	12	1.0	24	75	12
HER 1220	12	2.0	24	75	12
HER 1230	12	3.0	24	75	12

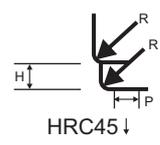
MIRACLE CUTTING SERIES



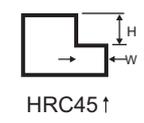
### Recommended cutting condition for HER

MATERIAL	Carbon Steels . Alloy Steels S45C,FC, FCD, SCM , S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
	~HRC30		~HRC50		~HRC60	
HARDNESS						
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
2	26000	1600	16500	1000	7500	300
3	19000	1800	12000	1200	5400	360
4	16000	3200	10000	1900	4800	480
5	14000	3300	8000	2000	3800	500
6	12000	3600	7200	2200	3500	650
8	9600	4000	5600	2200	2700	750
10	7000	3400	4400	1700	2100	650
12	6000	2800	3600	1400	1800	600

DEPTH OF CUT

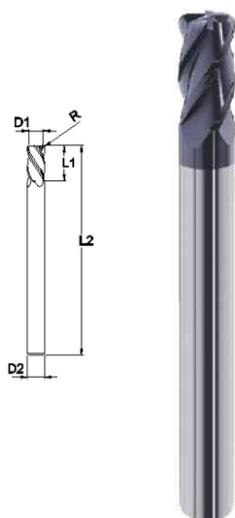


H ≤ 0.02R  
P ≤ 0.02R



H ≤ 0.01D  
W ≤ 0.02D

Co 9%	Wc 89.83%	Dia 0.2µm
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Order No.	Diameter D1	Corner R R	Flute Length L1	Q.A.L. L2	Shank Dia D2
HERL 0605	6.0	05	12	75	6
HERL 0605A	6.0	0.5	12	100	6
HERL 0610	6.0	1.0	12	75	6
HERL 0610A	6.0	1.0	12	100	6
HERL 0805	8.0	0.5	16	100	8
HERL 0810	8.0	1.0	16	100	8
HERL 1003	10.0	0.5	20	100	10
HERL 1010	10.0	1.0	20	100	10
HERL 1020	10.0	2.0	20	100	10
HERL 1210	12.0	1.0	24	100	12
HERL 1220	12.0	2.0	24	100	12

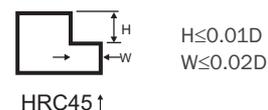
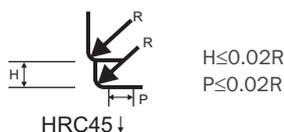
MIRACLE CUTTING SERIES



### Recommended cutting condition for HE

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
2	26000	1600	16500	1000	7500	300
3	19000	1800	12000	1200	5400	360
4	16000	3200	10000	1900	4800	480
5	14000	3300	8000	2000	3800	500
6	12000	3600	7200	2200	3500	650
8	9600	4000	5600	2200	2700	750
10	7000	3400	4400	1700	2100	650
12	6000	2800	3600	1400	1800	600

DEPTH OF CUT



**RANGE**  
**02**

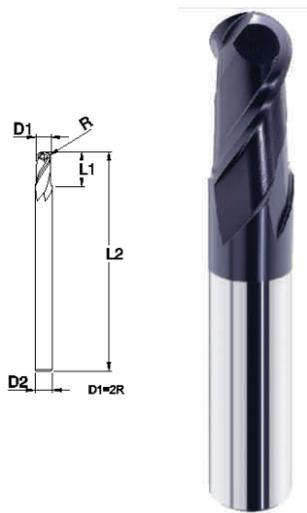


**HIGH SPEED  
& HIGH HARD  
CUTTING**

## Ball Nose End Mills

Co <b>12%</b>	Wc <b>88%</b>	Dia <b>0.4µm</b>
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2 Flutes	<b>S</b> MG	30°	<b>HRC</b> <b>65</b>	<b>ALTiN</b>
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
GB 0104	R0.5	2	50	4
GB 0106	R0.5	2	50	6
GB 0154	R0.75	3	50	4
GB 0156	R0.75	3	50	6
GB 0204	R1	4	50	4
GB 0206	R1	4	50	6
GB 0254	R1.25	5	50	4
GB 0256	R1.25	5	50	6
GB 0303	R1.5	6	50	3
GB 0304	R1.5	6	50	4
GB 0306	R1.5	6	50	6
GB 0404	R2	8	50	4
GB 0406	R2	8	50	6
GB 0506	R2.5	10	50	6
GB 0606	R3	12	50	6
GB 0808	R4	16	60	8
GB 1010	R5	20	75	10
GB 1212	R6	24	75	12
GB 1616	R8	32	100	16

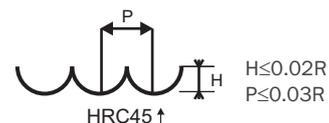
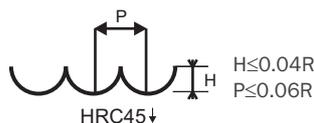
HIGH SPEED &  
HIGH HARD CUTTING



### Recommended cutting condition for GB

MATERIAL	Carbon Steels - Alloy Steels S45C, RD, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
RADIUS	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
R0.5	45000	2000	45000	1800	28000	1000
R1	23000	2000	22000	1800	16000	900
R1.5	16000	2000	15000	1800	11000	900
R2	15000	2400	14000	2000	10000	1300
R3	13000	3200	11000	2000	9000	1500
R4	9000	2300	8000	1500	6200	1400
R5	7500	1900	6500	1200	5200	900
R6	6300	1600	5500	1000	4300	800
R8	4500	1200	3800	800	3300	700

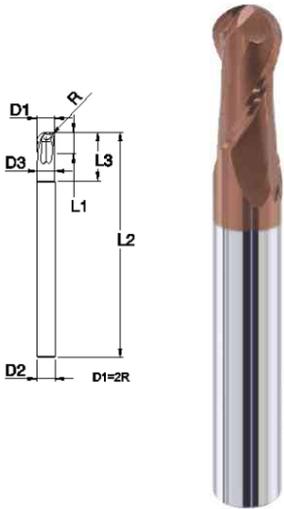
DEPTH OF CUT



## Ball Nose End Mills

Co	Wc	Dia
12%	88%	0.4µm

2 Flutes	S MG	30°	HRC 65	nAcoE
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
GBH 0104	R0.5	2	50	4
GBH 0154	R0.75	3	50	4
GBH 0204	R1	4	50	4
GBH 0306	R1.5	6	50	6
GBH 0406	R2	8	50	6
GBH 0506	R2.5	10	50	6
GBH 0606	R3	12	50	6
GBH 0808	R4	16	60	8
GBH 1010	R5	20	75	10
GBH 1212	R6	24	75	12

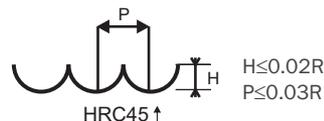
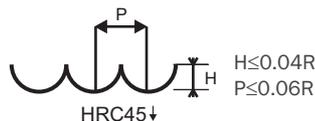


### Recommended cutting condition for GBH

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 <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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

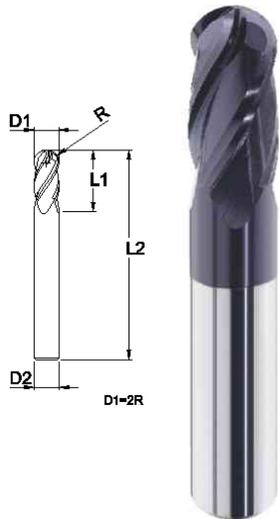
HIGH SPEED &  
HIGH HARD CUTTING

DEPTH OF CUT



Co 12%	Wc 88%	Dia 0.4µm
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2 Flutes	S MG	30°	HRC 65	ALTiN
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
GBD 0104	R0.5	2	50	4
GBD 0154	R0.75	3	50	4
GBD 0204	R1	4	50	4
GBD 0254	R1.25	5	50	4
GBD 0304	R1.5	6	50	4
GBD 0404	R2	8	50	4
GBD 0506	R2.5	10	50	6
GBD 0606	R3	12	50	6
GBD 0808	R4	16	60	8
GBD 1010	R5	20	75	10
GBD 1212	R6	24	75	12
GBD 1616	R8	32	100	16

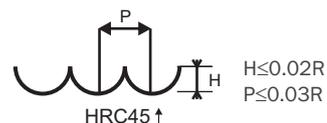
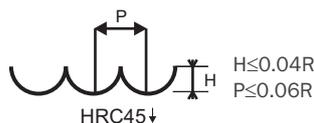


### Recommended cutting condition for GBD

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
RADIUS	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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 & HIGH HARD CUTTING

DEPTH OF CUT

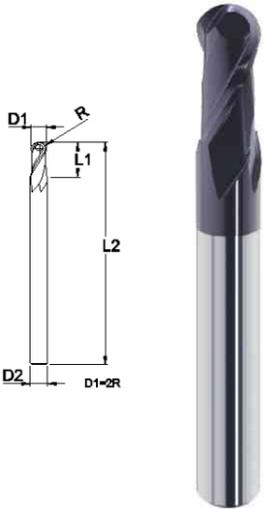


# GBLS.GBLM.GBLL



## Long Shank Ball Nose End Mills

Co <b>12%</b>	Wc <b>88%</b>	Dia <b>0.4µm</b>
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
GBLS 0104	R0.5	2	75	4
GBLS 0106	R0.5	2	75	6
GBLS 0154	R0.75	3	75	4
GBLS 0156	R0.75	3	75	6
GBLS 0206	R1	4	75	6
GBLS 0256	R1.25	5	75	6
GBLS 0303	R1.5	6	75	3
GBLS 0306	R1.5	6	75	6
GBLS 0404	R2	8	75	4
GBLS 0406	R2	8	75	6
GBLS 0506	R2.5	10	75	6
GBLS 0606	R3	12	75	6
GBLM 0206	R1	4	100	6
GBLM 0306	R1.5	6	100	6
GBLM 0406	R2	8	100	6
GBLM 0606	R3	12	100	6
GBLM 0208	R4	16	100	8
GBLM 1010	R5	20	100	10
GBLM 1212	R6	24	100	12
GBLL 0606	R3	12	150	6
GBLL 0808	R4	16	150	8
GBLL 1010	R5	20	150	10
GBLL 1212	R6	24	150	12

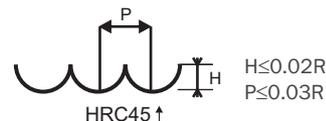
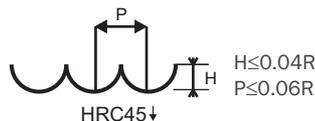
HIGH SPEED &  
HIGH HARD CUTTING



## Recommended cutting condition for GBLS.GBLM.GBLL

MATERIAL	Alloy Steels - Tool Steels SCr, SNCM, SKD11, SKD61, NAK80...		Alloy Steels . Tool Steels SKD61		Hardened Steels SKD11	
HARDNESS	~HRC40		~HRC50		~HRC60	
RADIUS	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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
P2	15000	2400	14000	2000	10000	1300
R3	13000	3200	11000	2000	9000	1500
R4	9000	2300	8000	1500	6200	1400
R5	7500	1900	6500	1200	5200	900
R6	6300	1600	5500	1000	4300	800
R8	4500	1200	3800	800	3300	700

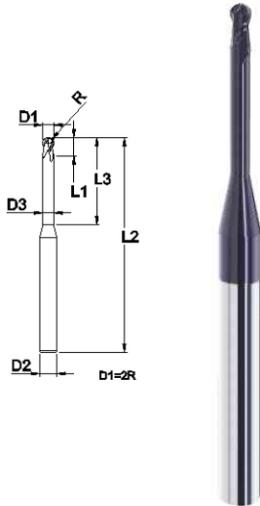
DEPTH OF CUT



# GBLN

## Long Neck Ball Nose End Mills

Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Radius R	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
GBLN 00504	R0.25	1	4	50	4
GBLN 00506	R0.25	1	6	50	4
GBLN 00604	R0.3	1.2	4	50	4
GBLN 00606	R0.3	1.2	6	50	4
GBLN 00806	R0.4	1.2	6	50	4
GBLN 00808	R0.4	1.2	8	50	4
GBLN 01006	R0.5	1.5	6	50	4
GBLN 01008	R0.5	1.5	8	50	4
GBLN 01010	R0.5	1.5	10	50	4
GBLN 01012	R0.5	1.5	12	50	4
GBLN 01208	R0.6	2	8	50	4
GBLN 01212	R0.6	2	12	50	4
GBLN 01508	R0.75	2	8	50	4
GBLN 01512	R0.75	2	12	50	4
GBLN 01516	R0.75	2	16	50	4
GBLN 01520	R0.75	2	20	50	4
GBLN 01608	R0.8	2.5	8	50	4
GBLN 01612	R0.8	2.5	12	50	4
GBLN 01616	R0.8	2.5	16	50	4
GBLN 02008	R1.0	3	8	50	4
GBLN 02012	R1.0	3	12	50	4
GBLN 02016	R1.0	3	16	50	4
GBLN 02020	R1.0	3	20	50	4
GBLN 03008	R1.5	4	8	50	6
GBLN 03010	R1.5	4	10	50	6
GBLN 03016	R1.5	4	16	50	6
GBLN 03020	R1.5	4	20	75	6
GBLN 03025	R1.5	4	25	75	6
GBLN 04010	R2.0	5	10	75	6
GBLN 04015	R2.0	5	15	75	6
GBLN 04020	R2.0	5	20	75	6
GBLN 04025	R2.0	5	25	75	6
GBLN 04030	R2.0	5	30	75	6

HIGH SPEED &  
HIGH HARD CUTTING

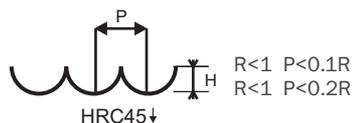


## Recommended cutting condition for GBLN

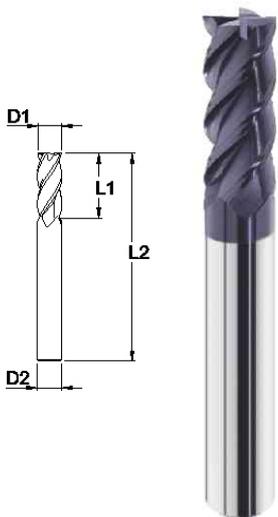
MATERIAL	Alloy Steels . Tool Steels . Hardened Steels 845C, SCM, S50C, SKS, SCr, SNCM1, SKD11, SKD61, NAKBO			
RADIUS	Effective Length	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	Depth Of Cut H(mm)
R0.25	4	30000 - 40000	200 - 650	0.015
	6	30000 - 40000	200 - 650	0.013
R0.3	4	27000 - 40000	180 - 650	0.025
	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 - 600	0.06
	16	13000 - 18000	350 - 800	0.05
R1.5	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

HIGH SPEED &  
HIGH HARD CUTTING

DEPTH OF CUT



Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
GE 0104	1.0	3	50	4
GE 0154	1.5	4	50	4
GE 0204	2.0	6	50	4
GE 0306	3.0	8	50	6
GE 0406	4.0	11	50	6
GE 0506	5.0	13	50	6
GE 0606	6.0	16	50	6
GE 0808	8.0	20	60	8
GE 1010	10.0	25	75	10
GE 1212	12.0	30	75	12
GE 1616	16.0	40	100	16
GE 2020	20.0	45	100	20

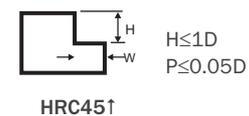
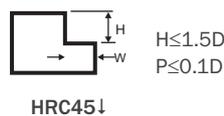


### Recommended cutting condition for GE

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
1	22000	400	18000	200	9000	140
1.5	12000	500	11000	280	5200	150
2	10000	550	10000	280	4800	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 &  
HIGH HARD CUTTING

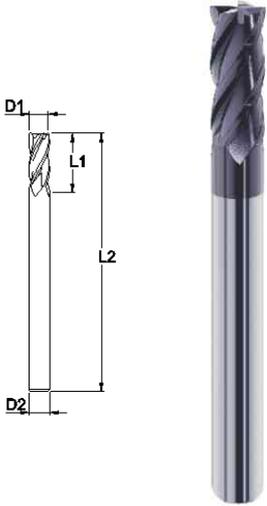
DEPTH OF CUT



## Corner Radius End Mills

Co	Wc	Dia
12%	88%	0.4µm

4 Flutes	S MG	35°	HRC 60	ALTiN
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
GEL 0606	6.0	15	75	6
GEL 0606A	6.0	15	100	6
GEL 0808	8.0	20	100	8
GEL 1010	10.0	25	100	10
GEL 1010A	10.0	25	150	10
GEL 1212	12.0	30	100	12
GEL 1212A	12.0	30	150	12
GEL 1616	16.0	40	150	16

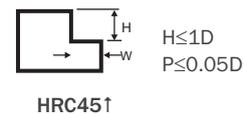
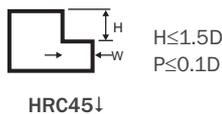


### Recommended cutting condition for GEL

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
	~HRC30		~HRC50		~HRC60	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	FEED Mm/ min
1	22000	400	18000	200	9000	140
1.5	12000	500	11000	280	5200	150
2	10000	550	10000	280	4800	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 &  
HIGH HARD CUTTING

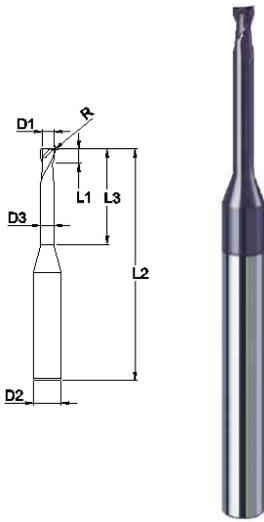
DEPTH OF CUT



# GERLN

## Corner Radius Long Neck End Mills

Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Diameter D1	Corner R R	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
GERLN 01004	1.0	0.1	1.0	4	50	4
GERLN 01006	1.0	0.1	1.0	6	50	4
GERLN 01008	1.0	0.1	1.0	8	50	4
GERLN 01010	1.0	0.1	1.0	10	50	4
GERLN 01504	1.5	0.2	1.5	4	50	4
GERLN 01506	1.5	0.2	1.5	6	50	4
GERLN 01508	1.5	0.2	1.5	8	50	4
GERLN 01510	1.5	0.2	1.5	10	50	4
GERLN 01512	1.5	0.2	1.5	12	50	4
GERLN 02008	2.0	0.2	2.0	8	50	4
GERLN 02010	2.0	0.2	2.0	10	50	4
GERLN 02012	2.0	0.2	2.0	12	50	4
GERLN 02016	2.0	0.2	2.0	16	50	4
GERLN 03008	3.0	0.2	3.0	8	50	6
GERLN 03010	3.0	0.2	3.0	10	50	6
GERLN 03012	3.0	0.2	3.0	12	50	6
GERLN 03016	3.0	0.2	3.0	16	50	6
GERLN 03020	3.0	0.2	3.0	20	50	6

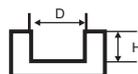


### Recommended cutting condition for GERLN

MATERIAL	Alloy Steels . Tool Steels . Hardened Steels 845C, SCM, S50C, SKS, ScR, SNCM1, SKD11 ,SKD61 ,NAK80			
Diameter	Effective Length	SPEED (mm <sup>-1</sup> )	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	0.30
	16	12000	900	0.30
	20	12000	900	0.30
4	10	9000	850	0.50
	16	9000	850	0.40

HIGH SPEED &  
HIGH HARD CUTTING

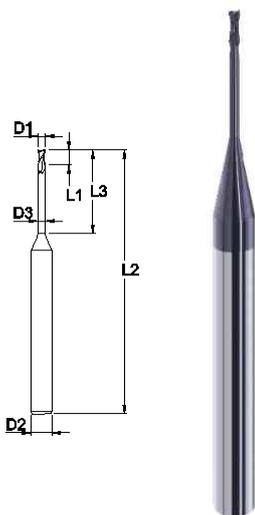
DEPTH OF CUT



## Long Neck Square End Mills

Co	Wc	Dia
12%	88%	0.4µm

2 Flutes	S MG	35°	HRC 60	ALTiN
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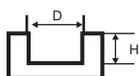
Order No.	Diameter D1	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
GELN 01006	1.0	3	6	50	4
GELN 01008	1.0	3	8	50	4
GELN 01010	1.0	3	10	50	4
GELN 01012	1.0	3	12	50	4
GELN 01508	1.5	4	8	50	4
GELN 01510	1.5	4	10	50	4
GELN 01512	1.5	4	12	50	4
GELN 01516	1.5	4	16	50	4
GELN 02008	2.0	6	8	50	4
GELN 02010	2.0	6	10	50	4
GELN 02012	2.0	6	12	50	4
GELN 02016	2.0	6	16	50	4
GELN 02020	2.0	6	20	50	4
GELN 02510	2.5	8	10	50	4
GELN 02512	2.5	8	12	50	4
GELN 02516	2.5	8	16	50	4
GELN 02520	2.5	8	20	50	4
GELN 03010	3.0	8	10	50	6
GELN 03012	3.0	8	12	50	6
GELN 03016	3.0	8	16	50	6
GELN 03020	3.0	8	20	75	6
GELN 03025	3.0	8	25	75	6



### Recommended cutting condition for GELN

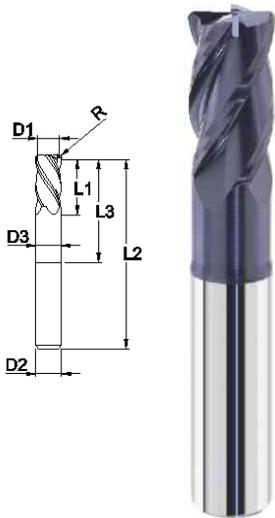
MATERIAL	Alloy Steels . Tool Steels . Hardened Steels 845C, SCM, S50C, SKS, Sc, SNCM1, SKD11 ,SKD61 ,NAK80			
Diameter	Effective Length	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	Depth Of Cut H(mm)
1	4	25000	1500	0.05
	6	25000	1500	0.03
	10	25000	1500	0.01
1.5	4	15000	1200	0.1
	8	15000	1200	0.05
	10	15000	1200	0.025
2	12	15000	1200	0.018
	8	12000	900	0.2
	10	8800	700	0.12
3	12	7500	600	0.05
	16	7000	500	0.02
	8	8000	600	0.5
4	12	8000	600	0.45
	16	5500	450	0.18
	20	4000	300	0.15
4	10	6000	400	0.7
	16	6000	400	0.4

DEPTH OF CUT



HIGH SPEED &  
HIGH HARD CUTTING

Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Diameter D1	Corner R R	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
GER 0402	4.0	0.2	8	12	50	4
GER 0405	4.0	0.5	8	12	50	4
GER 0602	6.0	0.2	12	18	50	6
GER 0605	6.0	0.5	12	18	50	6
GER 0610	6.0	1.0	12	18	50	6
GER 0803	8.0	0.3	16	24	60	8
GER 0805	8.0	0.5	16	24	60	8
GER 0810	8.0	1.0	16	24	60	8
GER 1005	10.0	0.5	20	30	75	10
GER 1010	10.0	1.0	20	30	75	10
GER 1020	10.0	2.0	20	30	75	10
GER 1030	10.0	3.0	20	30	75	10
GER 1205	12.0	0.5	24	36	75	12
GER 1210	12.0	1.0	24	36	75	12
GER 1605	16.0	0.5	30	40	100	16
GER 1610	16.0	1.0	30	40	100	16

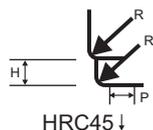


### Recommended cutting condition for GER

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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 & HIGH HARD CUTTING

DEPTH OF CUT



$$H \leq 0.02R$$

$$P \leq 0.02R$$

HRC45 ↓



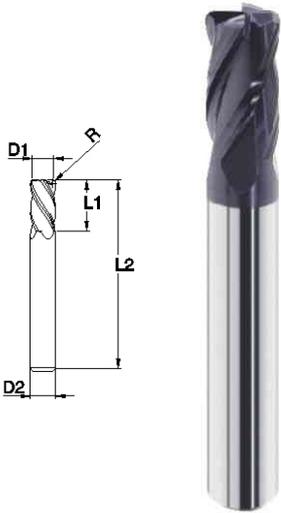
$$H \leq 0.01D$$

$$W \leq 0.02D$$

HRC45 ↑

## Corner Radius End Mills

Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Diameter D1	Corner R R	Flute Length L1	Q.A.L. L2	Shank Dia D2
GRD 0302	3.0	0.2	6	50	3
GRD 0305	3.0	0.5	6	50	3
GRD 0402	4.0	0.2	8	50	4
GRD 0405	4.0	0.5	8	50	4
GRD 0410	4.0	1.0	8	50	4
GRD 0602	6.0	0.2	12	50	6
GRD 0605	6.0	0.5	12	50	6
GRD 0610	6.0	1.0	12	50	6
GRD 0615	6.0	1.5	12	50	6
GRD 0620	6.0	2.0	12	50	6
GRD 0803	8.0	0.3	16	60	8
GRD 0805	8.0	0.5	16	60	8
GRD 0810	8.0	1.0	16	60	8
GRD 0815	8.0	1.5	16	60	8
GRD 0820	8.0	2.0	16	60	8
GRD 1003	10.0	0.3	20	75	10
GRD 1005	10.0	0.5	20	75	10
GRD 1010	10.0	1.0	20	75	10
GRD 1015	10.0	1.5	20	75	10
GRD 1020	10.0	2.0	20	75	10
GRD 1030	10.0	3.0	20	75	10
GRD 1205	12.0	0.5	24	75	12
GRD 1210	12.0	1.0	24	75	12
GRD 1215	12.0	1.5	24	75	12
GRD 1220	12.0	2.0	24	75	12
GRD 1230	12.0	3.0	24	75	12

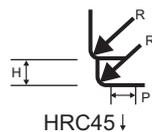
HIGH SPEED &  
HIGH HARD CUTTING



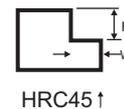
### Recommended cutting condition for GRD

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	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	400

DEPTH OF CUT



H ≤ 0.02R  
P ≤ 0.02R

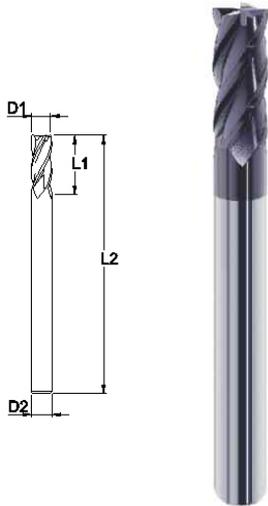


H ≤ 0.01D  
W ≤ 0.02D

# GERF

## Corner Radius End Mills

Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Diameter D1	Corner R R	Flute Length L1	Q.A.L. L2	Shank Dia D2
GERF 0605	6.0	05	12	75	6
GERF 0605A	6.0	0.5	12	100	6
GERF 0610	6.0	1.0	12	75	6
GERF 0610A	6.0	1.0	12	100	6
GERF 0805	8.0	0.5	16	100	8
GERF 0810	8.0	1.0	16	100	8
GERF 1005	10.0	0.5	20	100	10
GERF 1010	10.0	1.0	20	100	10
GERF 1020	10.0	2.0	20	100	10
GERF 1210	12.0	1.0	24	100	12
GERF 1220	12.0	2.0	24	100	12

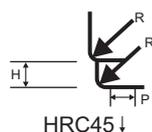


### Recommended cutting condition for GERF

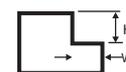
MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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

HIGH SPEED &  
HIGH HARD CUTTING

DEPTH OF CUT



H ≤ 0.02R  
P ≤ 0.02R

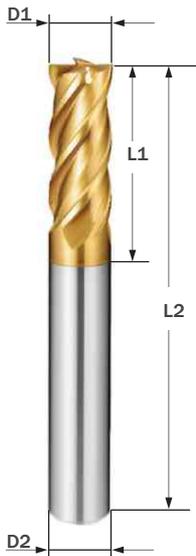


H ≤ 0.01D  
W ≤ 0.02D

## Titanium Alloy/ Square End Mills

Co	Wc	Dia
12%	88%	0.4µm

4Flutes	S MG	Variable	G 300	ALTiN
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
TIE 0306	3.0	8	50	6
TIE 0406	4.0	11	50	6
TIE 0506	5.0	13	50	6
TIE 0606	6.0	16	50	6
TIE 0808	8.0	20	60	8
TIE 1010	10.0	25	75	10
TIE 1212	12.0	30	75	12
TIE 1616	16.0	40	100	16
TIE 2020	20.0	45	100	20



### Recommended cutting condition for TIE

MATERIAL	Stainless Steels		Alloy Steels		Inconel 718	
HARDNESS	H=1D W=0.05D		H=1D W=0.05D		H=1D W=0.05D	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
6	4600	590	4600	590	2600	230
8	3500	560	3500	560	2000	220
10	2700	535	2700	535	1600	200
12	2400	520	2400	520	1400	170
16	1700	450	1700	450	1000	130
20	1400	450	1400	450	800	100

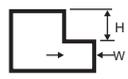
SIDE MILLING

HIGH SPEED & HIGH HARD CUTTING

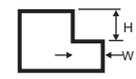
MATERIAL	Stainless Steels		Alloy Steels		Inconel 718	
HARDNESS	H=1D W=0.05D		H=1D W=0.05D		H=1D W=0.05D	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
6	3000	375	2600	335	1200	105
8	2200	360	2000	320	900	90
10	1800	335	1600	310	750	80
12	1500	330	1300	300	600	70
16	1100	290	1000	250	450	50
20	900	290	800	250	360	40

Slotting

DEPTH OF CUT

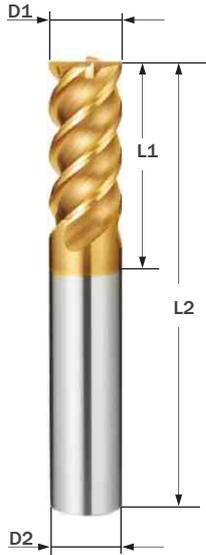


HRC45↓



HRC45↑

Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
SSEF 0306	3.0	8	50	6
SSEF 0406	4.0	11	50	6
SSEF 0506	5.0	13	50	6
SSEF 0606	6.0	16	50	6
SSEF 0808	8.0	20	60	8
SSEF 1010	10.0	25	75	10
SSEF 1212	12.0	30	75	12
SSEF 1616	16.0	40	100	16
SSEF 2020	20.0	45	100	20

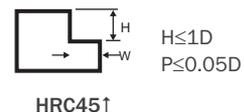
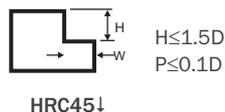


### Recommended cutting condition for SSEF

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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 &  
HIGH HARD CUTTING

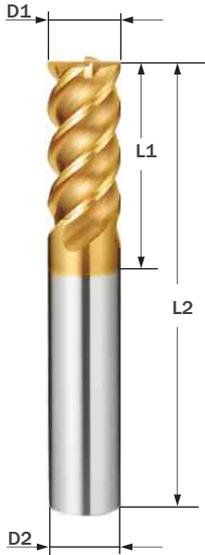
DEPTH OF CUT



## Titanium Alloy/ Square End Mills

Co 12%	Wc 88%	Dia 0.4µm
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4Flutes	S MG	Variable	G 300	ALTiN
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
SSE 0306	3.0	8	50	6
SSE 0406	4.0	11	50	6
SSE 0506	5.0	13	50	6
SSE 0606	6.0	16	50	6
SSE 0808	8.0	20	60	8
SSE 1010	10.0	25	75	10
SSE 1212	12.0	30	75	12
SSE 1616	16.0	40	100	16
SSE 2020	20.0	45	100	20



### Recommended cutting condition for SSE

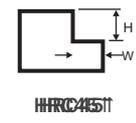
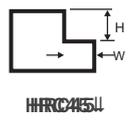
SIDE MILLING

MATERIAL	Stainless Steels		Alloy Steels		Inconel 718	
HARDNESS	H=1D W=0.05D		H=1D W=0.05D		H=1D W=0.05D	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
6	4600	590	4600	590	2600	230
8	3500	560	3500	560	2000	220
10	2700	535	2700	535	1600	200
12	2400	520	2400	520	1400	170
16	1700	450	1700	450	1000	130
20	1400	450	1400	450	800	100

Slotting

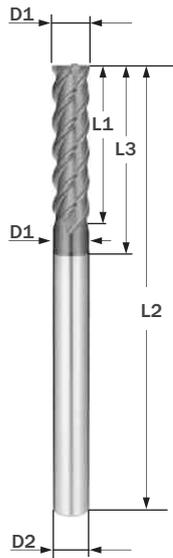
MATERIAL	Stainless Steels		Alloy Steels		Inconel 718	
HARDNESS	H=1D W=0.05D		H=1D W=0.05D		H=1D W=0.05D	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
6	3000	375	2600	335	1200	105
8	2200	360	2000	320	900	90
10	1800	335	1600	310	750	80
12	1500	330	1300	300	600	70
16	1100	290	1000	250	450	50
20	900	290	800	250	360	40

DEPTH OF CUT



HIGH SPEED & HIGH HARD CUTTING

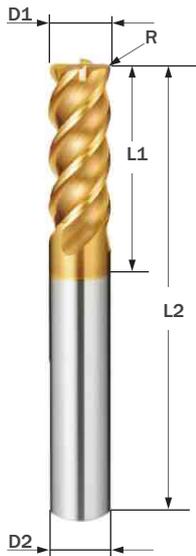
Co	Wc	Dia
12%	88%	0.4µm



Order No.	Diameter D1	Neck Dia D3	Flute Length L1	Effective Length L3	Q.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 &  
HIGH HARD CUTTING

Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Diameter D1	Corner R R	Flute Length L1	Q.A.L. L2	Shank Dia D2
SSER 0305	3.0	0.5	8	50	6
SSER 0405	4.0	0.5	11	50	6
SSER 0605	6.0	0.5	16	50	6
SSER 0610	6.0	1.0	16	50	6
SSER 0805	8.0	0.5	20	60	8
SSER 0810	8.0	1.0	20	60	8
SSER 1005	10.0	0.5	25	75	10
SSER 1010	10.0	1.0	25	75	10
SSER 1205	12.0	0.5	30	75	12
SSER 1210	12.0	1.0	30	75	12



### Recommended cutting condition for SSER

MATERIAL	Stainless Steels		Alloy Steels		Inconel 718	
HARDNESS	H=1D W=0.05D		H=1D W=0.05D		H=1D W=0.05D	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
6	4600	590	4600	590	2600	230
8	3500	560	3500	560	2000	220
10	2700	535	2700	535	1600	200
12	2400	520	2400	520	1400	170
16	1700	450	1700	450	1000	130
20	1400	450	1400	450	800	100

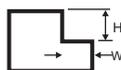
SIDE MILLING

HIGH SPEED &  
HIGH HARD CUTTING

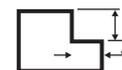
MATERIAL	Stainless Steels		Alloy Steels		Inconel 718	
HARDNESS	H=1D W=0.05D		H=1D W=0.05D		H=1D W=0.05D	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
6	3000	375	2600	335	1200	105
8	2200	360	2000	320	900	90
10	1800	335	1600	310	750	80
12	1500	330	1300	300	600	70
16	1100	290	1000	250	450	50
20	900	290	800	250	360	40

Slotting

DEPTH OF CUT

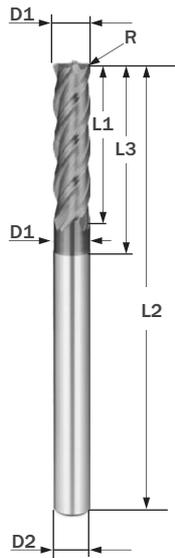


HFRC45L



HFRC45T

Co 12%	Wc 88%	Dia 0.4µm
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Order No.	Diameter D1	Corner R R	Neck Dia D3	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
SORB 0403	4.0	0.3	3.88	20	25	75	4
SORB 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
SORB 0603	6.0	0.3	5.80	25	30	75	6
SORB 0603A	6.0	0.3	5.80	25	30	100	6
SORB 0603B	6.0	0.3	5.80	25	30	150	6
SORB 0605	6.0	0.5	5.80	25	30	75	6
SORB 0605A	6.0	0.5	5.80	25	30	100	6
SORB 0605B	6.0	0.5	5.80	25	30	150	6
SORB 0805	8.0	0.5	7.70	30	40	100	8
SORB 0805B	8.0	0.5	7.70	30	40	150	8
SGRB 1010	10.0	1.0	9.60	30	40	100	10
SORB 1010B	10.0	1.0	9.60	30	40	150	10
SORB 1210	12.0	1.0	11.50	30	40	100	12
SORB 1210B	12.0	1.0	11.50	30	40	150	12

HIGH SPEED &  
HIGH HARD CUTTING

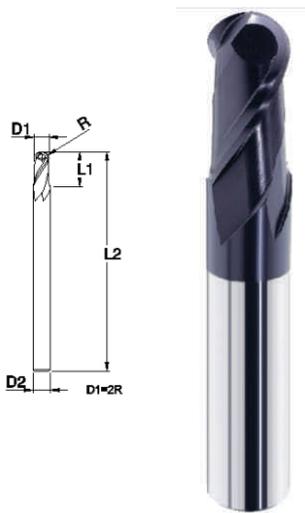
**RANGE**  
**03**



**BALL NOSE**  
**END MILL SERIES**

Co <b>10%</b>	Wc <b>90%</b>	Dia <b>0.6µm</b>
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2 Flutes	<b>MG</b>	30°	<b>HRC 55</b>	<b>AiaLN</b>
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
BN 0104	R0.5	2	50	4
BN 0154	R0.75	3	50	4
BN 0204	R1	4	50	4
BN 0254	R1.25	5	50	4
BN 0304	R1.5	6	50	4
BN 0354	R1.75	7	50	4
BN 0404	R2	8	50	4
BN 0456	R2.25	9	50	6
BN 0506	R2.5	10	50	6
BN 0556	R2.75	11	50	6
BN 0606	R3	12	50	6
BN 0708	R3.5	14	60	8
BN 0808	R4	16	60	8
BN 0910	R4.5	18	75	10
BN 1010	R5	20	75	10
BN 1212	R6	24	75	12
BN 1616	R8	32	100	16
BN 2020	R10	40	100	20

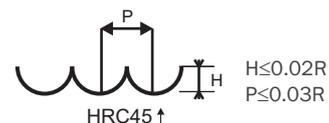
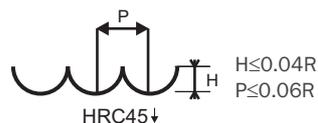
BALL NOSE END MILLSERIES



### Recommended cutting condition for BN

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

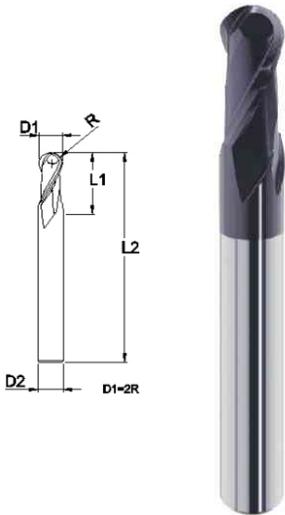
DEPTH OF CUT



## Long Shank Ball Nose End Mills

Co <b>10%</b>	Wc <b>90%</b>	Dia <b>0.6µm</b>
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2 Flutes	MG	30°	HRC 55	AiaLN
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
BNL 0104	R05	2	75	4
BNL 0106	R0.5	2	75	6
BNL 0154	R0.75	3	75	4
BNL 0156	R0.75	3	75	6
BNL 0206	R1	4	75	6
BNL 0256	R1.25	5	75	6
BNL 0306	R1.5	6	75	6
BNL 0406	R2	8	75	6
BNL 0506	R2.5	10	75	6
BNL 0606	R3	12	75	6
BNLL 0206	R1	4	100	6
BNLL 0306	R1.5	6	100	6
BNLL 0406	R2	8	100	6
BNLL 0606	R3	12	100	6
BNLL 0808	R4	16	100	8
BNL 1010	R5	20	100	10
BNL 1212	R6	24	100	12
BNLLL 0606	R3	12	150	6
BNLLL 0808	R4	16	150	8
BNLL 1010	R5	20	150	10
BNLL 1212	R6	24	150	12

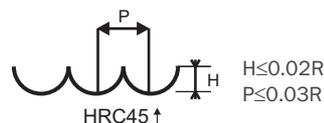
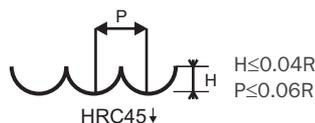


### Recommended cutting condition for BNL.BNLL.BNLLL

MATERIAL	Carbon Steels - Alloy Steels S45C, RD, FCD, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
RADIUS	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
R0.5	45000	800	35000	600	20000	200
R1	23000	800	18000	600	1000	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

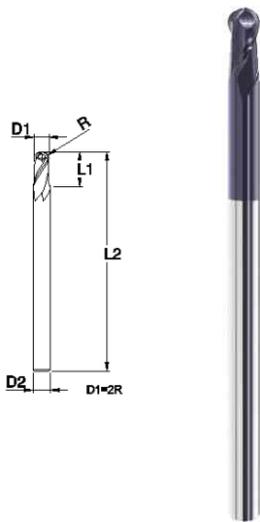
BALL NOSE END MILLSERIES

DEPTH OF CUT



Co 10%	Wc 90%	Dia 0.6µm
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2 Flutes	MG	30°	HRC 55	AiaLN
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Order No.	Radius R	Flute Length L1	Q.A.L. L2	Shank Dia D2
RDS 0103	R0.5	2	50	3
RDS 0153	R0.75	3	50	3
RDS 0203	R1	4	50	3
RDS 0253	R1.25	5	50	3
RDS 0303	R1.5	6	50	3
RDS 0303A	R1.5	6	75	3
RDS 0303B	R1.5	6	100	3
RDS 0404	R2	8	75	4
RDS 0404A	R2	8	100	4

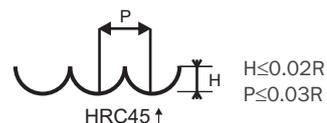
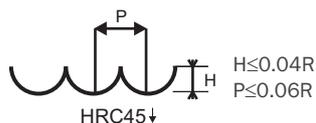
BALL NOSE END MILL SERIES



### Recommended cutting condition for BNS

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

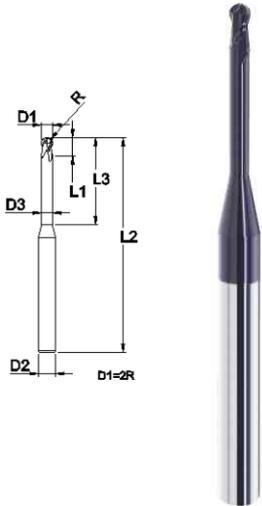
DEPTH OF CUT



## Long Neck Ball Nose End Mills

Co	Wc	Dia
10%	90%	0.6µm

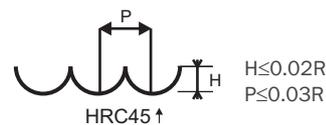
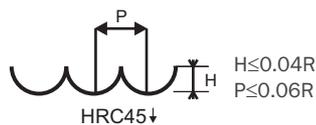
2 Flutes	MG	30°	HRC 55	AiaLN
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Order No.	Radius R	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
BNLN 01006	R0.5	2	6	50	4
BNLN 01008	R0.5	2	8	50	4
BNLN 01010	R0.5	2	10	50	4
BNLN 01012	R0.5	2	12	50	4
BNLN 01508	R0.75	3	8	50	4
BNLN 01510	R0.75	3	10	50	4
BNLN 01512	R0.75	3	12	50	4
BNLN 01516	R0.75	3	16	50	4
BNLN 01520	R0.75	3	20	50	4
BNLN 02008	R1.0	4	8	50	4
BNLN 02010	R1.0	4	10	50	4
BNLN 02012	R1.0	4	12	50	4
BNLN 02016	R1.0	4	16	50	4
BNLN 02020	R1.0	4	20	50	4
BNLN 03008	R1.5	6	8	50	6
BNLN 03010	R1.5	6	10	50	6
BNLN 03012	R1.5	6	12	50	6
BNLN 03016	R1.5	6	16	50	6
BNLN 03020	R1.5	6	20	75	6
BNLN 03025	R1.5	6	25	75	6
BNLN 04012	R2.0	8	12	50	6
BNLN 04016	R2.0	8	16	50	6
BNLN 04020	R2.0	8	20	50	6
BNLN 04025	R2.0	8	25	75	6
BNLN 04030	R2.0	8	30	75	6

BALL NOSE END MILL SERIES

DEPTH OF CUT



Co 10%	Wc 90%	Dia 0.6µm
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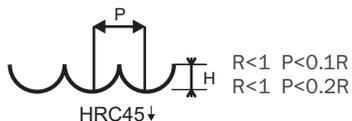
2 Flutes	MG	30°	HRC 55	AiaLN
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### Recommended cutting condition for BNLN

MATERIAL	Alloy Steels . Tool Steels . Hardened Steels 845C, SCM, S50C, SKS, SCr, SNCM1, SKD11 ,SKD61 ,NAK80			
RADIUS	Effective Length	SPEED (mm <sup>-1</sup> )	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 - 600	0.06
	16	13000 - 18000	350 - 800	0.05
R1.5	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

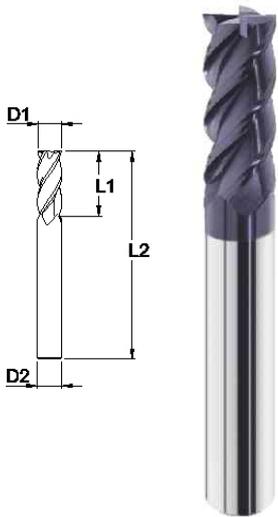


**RANGE**  
**04**



**END MILL  
SERIES**

Co 10%	Wc 90%	Dia 0.5µm
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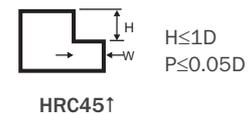
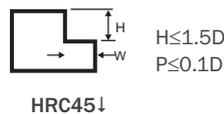
Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
EM 0104	1.0	3	50	4
EM 0154	1.5	4	50	4
EM 0204	2.0	6	50	4
EM 0254	2.5	8	50	4
EM 0304	3.0	8	50	4
EM 0404	4.0	11	50	4
EM 0506	5.0	13	50	6
EM 0606	6.0	16	50	6
EM 0808	8.0	20	60	8
EM 1010	10.0	25	75	10
EM 1212	12.0	30	75	12
EM 1616	16.0	40	100	16
EM 2020	20.0	45	100	20



### Recommended cutting condition for EM

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
1	22000	400	18000	200	9000	140
1.5	12000	500	11000	280	5200	150
2	10000	550	10000	280	4800	170
3	9000	600	5500	310	3500	220
4	6000	600	5000	400	2200	220
5	4800	750	4000	400	1700	240
6	4500	800	3800	420	1600	300
8	3500	820	2800	420	1000	300
10	3000	820	1800	420	900	300
12	2000	820	1600	350	800	300
16	1500	650	1000	300	500	150
20	1200	600	900	300	400	150

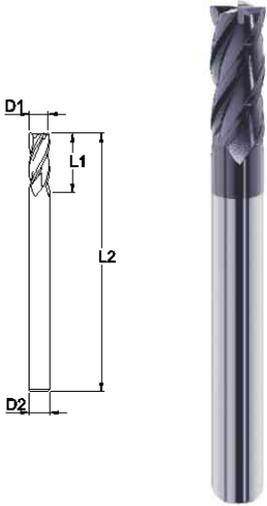
DEPTH OF CUT



## Long Shank Square End Mills

Co <b>10%</b>	Wc <b>90%</b>	Dia <b>0.5µm</b>
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4Flutes	MG	35°	HRC 55	ALTiN
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
EMLS 0606	6.0	15	75	6
EMLS 0606A	6.0	15	100	6
EMLS 0808	8.0	20	100	8
EMLS 1010	10.0	25	100	10
EMLS 1010A	10.0	25	150	10
EMLS 1212	12.0	30	100	12
EMLS 1212A	12.0	30	150	12
EMLS 1616	16.0	40	150	16

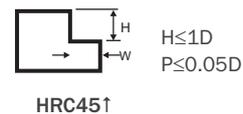
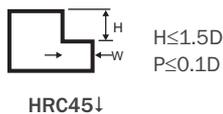


### Recommended cutting condition for EMLS

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	FEED Mm/ min
1	22000	400	18000	200	9000	140
1.5	12000	500	11000	280	5200	150
2	10000	550	10000	280	4800	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

END MILLS SERIES

DEPTH OF CUT

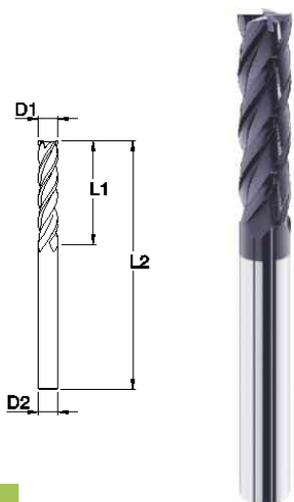


# EMLF

## Square End Mills

Co 10%	Wc 90%	Dia 0.5µm
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4Flutes	MG	35°	HRC 55	AiaLN
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
EMLF 0204	2.0	15	50	4
EMLF 0304	3.0	20	50	4
EMLF 0404	4.0	25	75	4
EMLF 0506	5.0	30	75	6
EMLF 0606	6.0	30	75	6
EMLF 0808	8.0	40	100	8
EMLF 1010	10.0	40	100	10
EMLF 1212	12.0	45	100	12
EMLF 1616	16.0	60	150	16
EMLF 2020	20.0	60	150	20

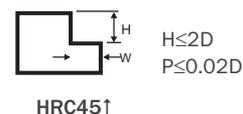
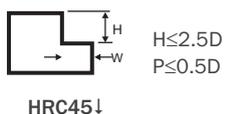


### Recommended cutting condition for EMLF

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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

END MILLS SERIES

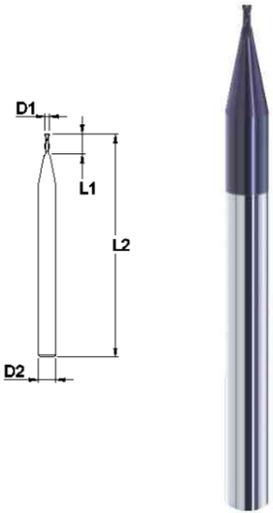
DEPTH OF CUT



## Micro Diameter Square End Mills

Co <b>10%</b>	Wc <b>90%</b>	Dia <b>0.5µm</b>
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2 Flutes	MG	35°	HRC 55	ALTiN
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Order No.	Diameter D1	Flute Length L1	Q.A.L. L2	Shank Dia D2
EMM 0024	0.2	0.4	50	4
EMM 0034	0.3	0.6	50	4
EMM 0044	0.4	0.8	50	4
EMM 0054	0.5	1.0	50	4
EMM 0064	0.6	1.2	50	4
EMM 0074	0.7	1.4	50	4
EMM 0084	0.8	1.6	50	4
EMM 0094	0.9	1.6	50	4
EMM 0124	1.2	3.0	50	4
EMM 0144	1.4	3.0	50	4
EMM 0164	1.6	4.0	50	4
EMM 0184	1.8	5.0	50	4

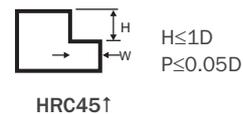
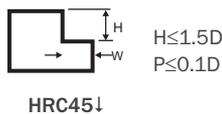


### Recommended cutting condition for EMM

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	FEED Mm/ min	SPEED (mm <sup>-3</sup> )	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

END MILLS SERIES

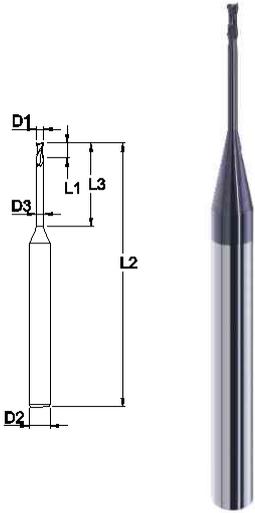
DEPTH OF CUT



# EMLN

## Long Neck Square End Mills

Co 10%	Wc 90%	Dia 0.5µm
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Order No.	Diameter D1	Flute Length L1	Effective Length L3	Q.A.L. L2	Shank Dia D2
EMLN 01006	1.0	3	6	50	4
EMLN 01008	1.0	3	8	50	4
EMLN 01010	1.0	3	10	50	4
EMLN 01012	1.0	3	12	50	4
EMLN 01508	1.5	4	8	50	4
EMLN 01510	1.5	4	10	50	4
EMLN 01512	1.5	4	12	50	4
EMLN 01516	1.5	4	16	50	4
EMLN 02008	2.0	6	8	50	4
EMLN 02010	2.0	6	10	50	4
EMLN 02012	2.0	6	12	50	4
EMLN 02016	2.0	6	16	50	4
EMLN 02020	2.0	6	20	50	4
EMLN 02510	2.5	8	10	50	4
EMLN 02512	2.5	8	12	50	4
EMLN 02516	2.5	8	16	50	4
EMLN 02520	2.5	8	20	50	4
EMLN 03010	3.0	8	10	50	6
EMLN 03012	3.0	8	12	50	6
EMLN 03016	3.0	8	16	50	6
EMLN 03020	3.0	8	20	75	6
EMLN 03025	3.0	8	25	75	6

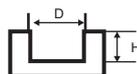
END MILLS SERIES



### Recommended cutting condition for EMLN

MATERIAL	Alloy Steels . Tool Steels . Hardened Steels 845C, SCM, S50C, SKS, ScR, SNCM1, SKD11 ,SKD61 ,NAK80				
	Diameter	Effective Length	SPEED (mm <sup>-1</sup> )	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
2		12	15000	1200	0.018
		8	12000	900	0.2
		10	8800	700	0.12
3		12	7500	600	0.05
		16	7000	500	0.02
		8	8000	600	0.5
4		12	8000	600	0.45
		16	5500	450	0.18
		20	4000	300	0.15
4		10	6000	400	0.7
		16	6000	400	0.4

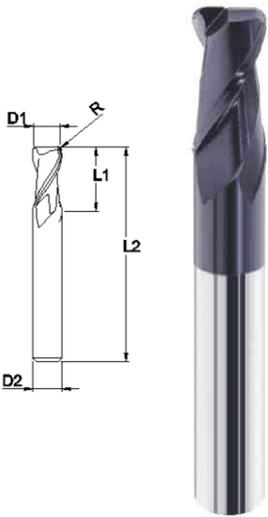
DEPTH OF CUT



## Corner Radius End Mills

Co 10%	Wc 90%	Dia 0.5µm
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2 Flutes	MG	35°	HRC 55	ALTiN
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Order No.	Diameter D1	Corner R R	Flute Length L1	Q.A.L. L2	Shank Dia D2
EMRB 0302	3.0	0.2	6	50	3
EMRB 0305	3.0	0.5	6	50	3
EMRB 0402	4.0	0.2	8	50	4
EMRB 0405	4.0	0.5	8	50	4
EMRB 0410	4.0	1.0	8	50	4
EMRB 0602	6.0	0.2	12	50	6
EMRB 0605	6.0	0.5	12	50	6
EMRB 0610	6.0	1.0	12	50	6
EMRB 0615	6.0	1.5	12	50	6
EMRB 0620	6.0	2.0	12	50	6
EMRB 0803	8.0	0.3	16	60	8
EMRB 0805	8.0	0.5	16	60	8
EMRB 0810	8.0	1.0	16	60	8
EMRB 0815	8.0	1.5	16	60	8
EMRB 0820	8.0	2.0	16	60	8
EMRB 1005	10.0	0.5	20	75	10
EMRB 1010	10.0	1.0	20	75	10
EMRB 1015	10.0	1.5	20	75	10
EMRB 1020	10.0	2.0	20	75	10
EMRB 1030	10.0	3.0	20	75	10
EMRB 1205	12.0	0.5	24	75	12
EMRB 1210	12.0	1.0	24	75	12
EMRB 1215	12.0	1.5	24	75	12
EMRB 1220	12.0	2.0	24	75	12
EMRB 1230	12.0	3.0	24	75	12

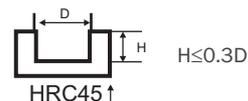
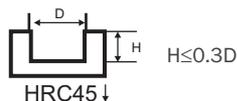
END MILLS SERIES



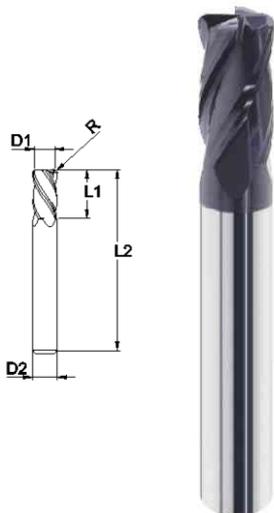
### Recommended cutting condition for EMRB

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	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



Co 10%	Wc 90%	Dia 0.5µm
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Order No.	Diameter D1	Corner R R	Flute Length L1	Q.A.L. L2	Shank Dia D2
EMRD 0302	3.0	0.2	6	50	3
EMRD 0305	3.0	0.5	6	50	3
EMRD 0402	4.0	0.2	8	50	4
EMRD 0405	4.0	0.5	8	50	4
EMRD 0410	4.0	1.0	8	50	4
EMRD 0602	6.0	0.2	12	50	6
EMRD 0605	6.0	0.5	12	50	6
EMRD 0610	6.0	1.0	12	50	6
EMRD 0615	6.0	1.5	12	50	6
EMRD 0620	6.0	2.0	12	50	6
EMRD 0803	8.0	0.3	16	60	8
EMRD 0805	8.0	0.5	16	60	8
EMRD 0810	8.0	1.0	16	60	8
EMRD 0815	8.0	1.5	16	60	8
EMRD 0820	8.0	2.0	16	60	8
EMRD 1005	10.0	0.5	20	75	10
EMRD 1010	10.0	1.0	20	75	10
EMRD 1015	10.0	1.5	20	75	10
EMRD 1020	10.0	2.0	20	75	10
EMRD 1030	10.0	3.0	20	75	10
EMRD 1205	12.0	0.5	24	75	12
EMRD 1210	12.0	1.0	24	75	12
EMRD 1215	12.0	1.5	24	75	12
EMRD 1220	12.0	2.0	24	75	12
EMRD 1230	12.0	3.0	24	75	12

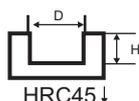
END MILLS SERIES



### Recommended cutting condition for EMRD

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

DEPTH OF CUT

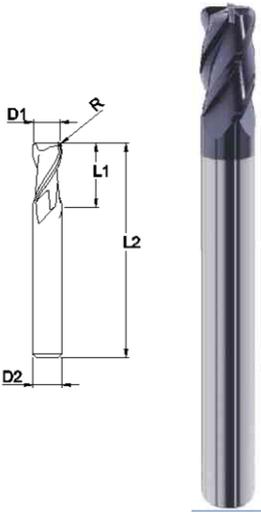


H ≤ 0.1D  
W ≤ 0.02D

## Corner Radius End Mills

Co <b>10%</b>	Wc <b>90%</b>	Dia <b>0.5µm</b>
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4Flutes	MG	35°	HRC 55	ALTiN
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Order No.	Diameter D1	Corner R R	Flute Length L1	Q.A.L. L2	Shank Dia D2
EMRL 0605	6.0	0.5	12	75	6
EMRL 0605A	6.0	0.5	12	100	6
EMRL 0610	6.0	1.0	12	75	6
EMRL 0610A	6.0	1.0	12	100	6
EMRL 0805	8.0	0.5	16	100	8
EMRL 0810	8.0	1.0	16	100	8
EMRL 1005	10.0	0.5	20	100	10
EMRL 1010	10.0	1.0	20	100	10
EMRL 1020	10.0	2.0	20	100	10
EMRL 1210	12.0	1.0	24	100	12
EMRL 1220	12.0	2.0	24	100	12

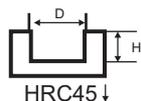
END MILLS SERIES



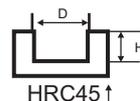
### Recommended cutting condition for EMRB

MATERIAL	Carbon Steels . Alloy Steels S45C, FC, FCO, SCM, S50C, SKS...		Alloy Steels . Tool Steels SCr, SNCM , SKD11 ,SKD61, NAK80...		Hardened Steels SKD11	
HARDNESS	~HRC30		~HRC50		~HRC60	
DIAMETER	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min	SPEED (mm <sup>-1</sup> )	FEED Mm/ min
2	9900	245	6500	155	4400	65
3	7600	270	4800	180	2900	80
4	6500	490	4000	300	2500	100
5	5500	510	3200	320	2000	110
6	4800	560	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
16	1800	320	1100	160	700	90

DEPTH OF CUT



H ≤ 0.3~0.5D  
H ≤ 0.1D



H ≤ 0.05D  
H ≤ 0.1D

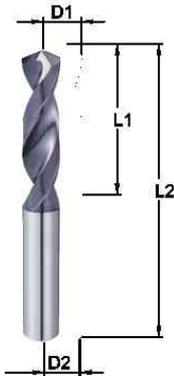


**CARBIDE  
DRILL SERIES**

**RANGE  
05**

Co <b>10%</b>	Wc <b>90%</b>	Dia <b>0.6µm</b>
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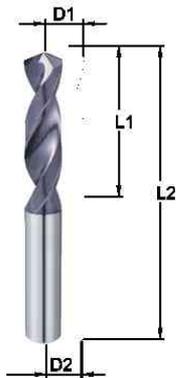
140°	Finishing Semi Finishing	3xD	H7	H6	30°	MG	DIN 6537	ALTiN
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Order No.	Diameter D1	Flute Length L1	Overall Length L1	Shank Dia D2	Order No.	Diameter D1	Flute Length L1	Overall Length L1	Shank Dia D2
GCDA030	3.0	20	62	6.0	GCDA085	8.5	47	89	10.0
GCDA031	3.1	20	62	6.0	GCDA086	8.6	47	89	10.0
GCDA032	3.2	20	62	6.0	GCDA087	8.7	47	89	10.0
GCDA033	3.3	20	62	6.0	GCDA088	8.8	47	89	10.0
GCDA034	3.4	20	62	6.0	GCDA089	8.9	47	89	10.0
GCDA035	3.5	20	62	6.0	GCDA090	9.0	47	89	10.0
GCDA036	3.6	20	62	6.0	GCDA091	9.1	47	89	10.0
GCDA037	3.7	20	62	6.0	GCDA092	9.2	47	89	10.0
GCDA038	3.8	24	66	6.0	GCDA093	9.3	47	89	10.0
GCDA039	3.9	24	66	6.0	GCDA094	9.4	47	89	10.0
GCDA040	4.0	24	66	6.0	GCDA095	9.5	47	89	10.0
GCDA041	4.1	24	66	6.0	GCDA096	9.6	47	89	10.0
GCDA042	4.2	24	66	6.0	GCDA097	9.7	47	89	10.0
GCDA043	4.3	24	66	6.0	GCDA098	9.8	47	89	10.0
GCDA044	4.4	24	66	8.0	GCDA099	9.9	47	89	10.0
GCDA045	4.5	24	66	6.0	GCDA100	10.0	47	89	10.0
GCDA046	4.6	24	66	6.0	GCDA101	10.1	55	102	12.0
GCDA047	4.7	24	66	6.0	GCDA102	10.2	55	102	12.0
GCDA048	4.8	28	66	6.0	GCDA103	10.3	55	102	12.0
GCDA049	4.9	28	66	6.0	GCDA104	10.4	55	102	12.0
GCDA050	5.0	28	66	6.0	GCDA105	10.5	55	102	12.0
GCDA051	5.1	28	66	6.0	GCDA106	10.6	55	102	12.0
GCDA052	5.2	28	66	6.0	GCDA107	10.7	55	102	12.0
GCDA053	5.3	28	66	6.0	GCDA108	10.8	55	102	12.0
GCDA054	5.4	28	66	6.0	GCDA109	10.9	55	102	12.0
GCDA055	5.5	28	66	6.0	GCDA110	11.0	55	102	12.0
GCDA056	5.6	28	66	6.0	GCDA111	11.1	55	102	12.0
GCDA057	5.7	28	66	6.0	GCDA112	11.2	55	102	12.0
GCDA058	5.8	28	66	6.0	GCDA113	11.3	55	102	12.0
GCDA059	5.9	28	66	6.0	GCDA114	11.4	55	102	12.0
GCDA060	6.0	28	66	6.0	GCDA115	11.5	55	102	12.0
GCDA061	6.1	34	79	8.0	GCDA116	11.6	55	102	12.0
GCDA062	6.2	34	79	8.0	GCDA117	11.7	55	102	12.0
GCDA063	6.3	34	79	8.0	GCDA118	11.8	55	102	12.0
GCDA064	6.4	34	79	8.0	GCDA119	11.9	55	102	12.0
GCDA065	6.5	34	79	8.0	GCDA120	12.0	55	102	12.0
GCDA066	6.6	34	79	8.0	GCDA125	12.5	60	107	14.0
GCDA067	6.7	34	79	8.0	GCDA130	13.0	60	107	14.0
GCDA068	6.8	34	79	8.0	GCDA135	13.5	60	107	14.0
GCDA069	6.9	34	79	8.0	GCDA140	14.0	60	107	14.0
GCDA070	7.0	34	79	8.0	GCDA145	14.5	65	115	16.0
GCDA071	7.1	41	79	8.0	GCDA150	15.0	65	115	16.0
GCDA072	7.2	41	79	8.0	GCDA155	15.5	65	115	16.0
GCDA073	7.3	41	79	8.0	GCDA160	16.0	65	115	16.0
GCDA074	7.4	41	79	8.0	GCDA165	16.5	73	123	18.0
GCDA075	7.5	41	79	8.0	GCDA170	17.0	73	123	18.0
GCDA076	7.6	41	79	8.0	GCDA175	17.5	73	123	18.0
GCDA077	7.7	41	79	8.0	GCDA180	18.0	73	123	18.0
GCDA078	7.8	41	79	8.0	GCDA185	18.5	79	131	20.0
GCDA079	7.9	41	79	8.0	GCDA190	19.0	79	131	20.0
GCDA080	8.0	41	79	8.0	GCDA195	19.5	79	131	20.0
GCDA081	8.1	47	89	10.0	GCDA200	20.0	79	131	20.0
GCDA082	8.2	47	89	10.0					
GCDA083	8.3	47	89	10.0					
GCDA084	8.4	47	89	10.0					

Co 10%	Wc 90%	Dia 0.6µm
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140°	Finishing Semi Finishing	3xD	H7	H6	30°	MG	DIN 6539	ALTiN
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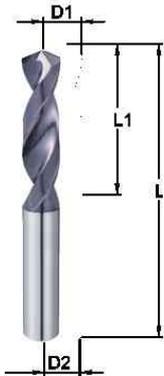


Order No.	Diameter D1	Flute Length L1	Overall Length L2
GCD005	0.5	6	26
GCD006	0.6	6	26
GCD007	0.7	6	26
GCD008	0.8	6	26
GCD009	0.9	6	26
GCD010	1.0	6	26
GCD011	1.1	7	28
GCD012	1.2	8	30
GCD013	1.3	8	30
GCD014	1.4	9	32
GCD015	1.5	9	32
GCD016	1.6	10	34
GCD017	1.7	10	34
GCD018	1.8	11	36
GCD019	1.9	11	36
GCD020	2.0	12	38
GCD021	2.1	12	38
GCD022	2.2	13	40
GCD023	2.3	13	40
GCD024	2.4	14	43
GCD025	2.5	14	43
GCD026	2.6	14	43
GCD027	2.7	16	46
GCD028	2.8	16	46
GCD029	2.9	16	46
GCD030	3.0	16	46
GCD031	3.1	18	49
GCD032	3.2	18	49
GCD033	3.3	18	49
GCD034	3.4	20	52
GCD035	3.5	20	52
GCD036	3.6	20	52
GCD037	3.7	20	52
GCD038	3.8	22	55
GCD039	3.9	22	55
GCD040	4.0	22	55
GCD041	4.1	22	55
GCD042	4.2	22	55
GCD043	4.3	24	58
GCD044	4.4	24	58
GCD045	4.5	24	58
GCD046	4.6	24	58
GCD047	4.7	24	58
GCD048	4.8	26	62
GCD049	4.9	26	62
GCD050	5.0	26	62
GCD051	5.1	26	62
GCD052	5.2	26	62
GCD053	5.3	26	62
GCD054	5.4	28	66
GCD055	5.5	28	66
GCD056	5.6	28	66
GCD057	5.7	28	66
GCD058	5.8	28	66
GCD059	5.9	28	66

Order No.	Diameter D1	Flute Length L1	Overall Length L2
GCD060	6.0	28	66
GCD061	6.1	31	70
GCD062	6.2	31	70
GCD063	6.3	31	70
GCD064	6.4	31	70
GCD065	6.5	31	70
GCD066	6.6	31	70
GCD067	6.7	31	70
GCD068	6.8	34	74
GCD069	6.9	34	74
GCD070	7.0	34	74
GCD071	7.1	34	74
GCD072	7.2	34	74
GCD073	7.3	34	74
GCD074	7.4	34	74
GCD075	7.5	34	74
GCD076	7.6	37	79
GCD077	7.7	37	79
GCD078	7.8	37	79
GCD079	7.9	37	79
GCD080	8.0	37	79
GCD081	8.1	37	79
GCD082	8.2	37	79
GCD083	8.3	37	79
GCD084	8.4	37	79
GCD085	8.5	37	79
GCD086	8.6	40	84
GCD087	8.7	40	84
GCD088	8.8	40	84
GCD089	8.9	40	84
GCD090	9.0	40	84
GCD091	9.1	40	84
GCD092	9.2	40	84
GCD093	9.3	40	84
GCD094	9.4	40	84
GCD095	9.5	40	84
GCD096	9.6	43	89
GCD097	9.7	43	89
GCD098	9.8	43	89
GCD099	9.9	43	89
GCD100	10.0	43	89
GCD102	10.2	43	89
GCD105	10.5	43	89
GCD110	11.0	47	95
GCD115	11.5	47	95
GCD120	12.0	51	102
GCD125	12.5	51	102
GCD130	13.0	51	102

Co 10%	Wc 90%	Dia 0.6µm
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140°	Finishing Semi Finishing	8xD	H7	H6	30°	MG	DIN 6537	ALTiN
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Order No.	Diameter D1	Flute Length L1	Overall Length L2	Shank Dia D2	Order No.	Diameter D1	Flute Length L1	Overall Length L1	Shank Dia D2
GCDC030	3.0	34	72	6.0	GCDC076	7.6	76	114	8.0
GCDC031	3.1	34	72	6.0	GCDC077	7.7	76	114	8.0
GCDC032	3.2	34	72	6.0	GCDC078	7.8	76	114	8.0
GCDC033	3.3	34	72	6.0	GCDC079	7.9	76	114	8.0
GCDC034	3.4	34	72	6.0	GCDC080	8.0	76	114	8.0
GCDC035	3.5	34	72	6.0	GCDC081	8.1	95	142	10.0
GCDC036	3.6	34	72	6.0	GCDC082	8.2	95	142	10.0
GCDC037	3.7	34	72	6.0	GCDC083	8.3	95	142	10.0
GCDC038	3.8	43	72	6.0	GCDC084	8.4	95	142	10.0
GCDC039	3.9	43	81	6.0	GCDC085	8.5	95	142	10.0
GCDC040	4.0	43	81	6.0	GCDC086	8.6	95	142	10.0
GCDC041	4.1	43	81	6.0	GCDC087	8.7	95	142	10.0
GCDC042	4.2	43	81	6.0	GCDC088	8.8	95	142	10.0
GCDC043	4.3	43	81	6.0	GCDC089	8.9	95	142	10.0
GCDC044	4.4	43	81	6.0	GCDC090	9.0	95	142	10.0
GCDC045	4.5	43	81	6.0	GCDC091	9.1	95	142	10.0
GCDC046	4.6	43	81	6.0	GCDC092	9.2	95	142	10.0
GCDC047	4.7	43	81	6.0	GCDC093	9.3	95	142	10.0
GCDC048	4.8	57	81	6.0	GCDC094	9.4	95	142	10.0
GCDC049	4.9	57	95	6.0	GCDC095	9.5	95	142	10.0
GCDC050	5.0	57	95	6.0	GCDC096	9.6	95	142	10.0
GCDC051	5.1	57	95	6.0	GCDC097	9.7	95	142	10.0
GCDC052	5.2	57	95	6.0	GCDC098	9.8	95	142	10.0
GCDC053	5.3	57	95	6.0	GCDC099	9.9	95	142	10.0
GCDC054	6.4	67	95	6.0	GCDC100	10.0	95	142	10.0
GCDC055	5.5	57	95	6.0	GCDC101	10.1	114	162	12.0
GCDC056	5.6	57	95	6.0	GCDC102	10.2	114	162	12.0
GCDC057	5.7	57	95	6.0	GCDC103	10.3	114	162	12.0
GCDC058	5.8	57	95	6.0	GCDC104	10.4	114	162	12.0
GCDC059	5.9	57	95	6.0	GCDC105	10.5	114	162	12.0
GCDC060	6.0	57	95	6.0	GCDC106	10.6	114	162	12.0
GCDC061	6.1	76	114	8.0	GCDC107	10.7	114	162	12.0
GCDC062	6.2	76	114	8.0	GCDC108	10.8	114	162	12.0
GCDC063	8.3	76	114	8.0	GCDC109	10.9	114	162	12.0
GCDC064	6.4	76	114	8.0	GCDC110	11.0	114	162	12.0
GCDC065	6.5	76	114	8.0	GCDC111	11.1	114	162	12.0
GCDC066	6.6	76	114	8.0	GCDC112	11.2	114	162	12.0
GCDC067	6.7	76	114	8.0	GCDC113	11.3	114	162	12.0
GCDC068	6.8	76	114	8.0	GCDC114	11.4	114	162	12.0
GCDC069	6.9	76	114	8.0	GCDC115	11.5	114	162	12.0
GCDC070	7.0	76	114	8.0	GCDC116	11.6	114	162	12.0
GCDC071	7.1	76	114	8.0	GCDC117	11.7	114	162	12.0
GCDC072	7.2	76	114	8.0	GCDC118	11.8	114	162	12.0
GCDC073	7.3	76	114	8.0	GCDC119	11.9	114	162	12.0
GCDC074	7.4	76	114	8.0	GCDC120	12.0	114	162	12.0
GCDC075	7.5	76	114	8.0					

Co 10%	Wc 90%	Dia 0.6µm
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140°	Finishing Semi Finishing	5xD	H7	H6	30°	MG	DIN 6537	ALTiN
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CARBIDE DRILL SERIES

Order No.	Diameter D1	Flute Length L1	Overall Length L1	Shank Dia D2	Order No.	Diameter D1	Flute Length L1	Overall Length L1	Shank Dia D2
GCDB030	3.0	28	66	6.0	GCDB085	8.5	61	103	10.0
GCDB031	3.1	28	66	6.0	GCDB086	8.6	61	103	10.0
GCDB032	3.2	28	66	6.0	GCDB087	8.7	61	103	10.0
GCDB033	3.3	28	66	6.0	GCDB088	8.8	61	103	10.0
GCDB034	3.4	28	66	6.0	GCDB089	8.9	61	103	10.0
GCDB035	3.5	28	66	6.0	GCDB090	9.0	61	103	10.0
GCDB036	3.6	28	66	6.0	GCDB091	9.1	61	103	10.0
GCDB037	3.7	28	66	6.0	GCDB092	9.2	61	103	10.0
GCDB038	3.8	36	74	6.0	GCDB093	9.3	61	103	10.0
GCDB039	3.9	36	74	6.0	GCDB094	9.4	61	103	10.0
GCDB040	4.0	36	74	6.0	GCDB095	9.5	61	103	10.0
GCDB041	4.1	36	74	6.0	GCDB096	9.6	61	103	10.0
GCDB042	4.2	36	74	6.0	GCDB097	9.7	61	103	10.0
GCDB043	4.3	36	74	6.0	GCDB098	9.8	61	103	10.0
GCDB044	4.4	36	74	6.0	GCDB099	9.9	61	103	10.0
GCDB045	4.5	36	74	6.0	GCDB100	10.0	61	103	10.0
GCDB046	4.6	36	74	6.0	GCDB101	10.1	71	118	12.0
GCDB047	4.7	36	74	6.0	GCDB102	10.2	71	118	12.0
GCDB048	4.8	44	82	6.0	GCDB103	10.3	71	118	12.0
GCDB049	4.9	44	82	6.0	GCDB104	10.4	71	118	12.0
GCDB050	5.0	44	82	6.0	GCDB105	10.5	71	118	12.0
GCDB051	5.1	44	82	6.0	GCDB106	10.6	71	118	12.0
GCDB052	5.2	44	82	6.0	GCDB107	10.7	71	118	12.0
GCDB053	5.3	44	82	6.0	GCDB108	10.8	71	118	12.0
GCDB054	5.4	44	82	6.0	GCDB109	10.9	71	118	12.0
GCDB055	5.5	44	82	6.0	GCDB110	11.0	71	118	12.0
GCDB056	5.6	44	82	6.0	GCDB111	11.1	71	118	12.0
GCDB057	5.7	44	82	6.0	GCDB112	11.2	71	118	12.0
GCDB058	5.8	44	82	6.0	GCDB113	11.3	71	118	12.0
GCDB059	5.9	44	82	6.0	GCDB114	11.4	71	118	12.0
GCDB060	6.0	44	82	6.0	GCDB115	11.5	71	118	12.0
GCDB061	6.1	53	91	8.0	GCDB116	11.6	71	118	12.0
GCDB062	6.2	53	91	8.0	GCDB117	11.7	71	118	12.0
GCDB063	6.3	53	91	8.0	GCDB118	11.8	71	118	12.0
GCDB064	6.4	53	91	8.0	GCDB119	11.9	71	118	12.0
GCDB065	6.5	53	91	8.0	GCDB120	12.0	71	118	12.0
GCDB066	6.6	53	91	8.0	GCDB125	12.5	77	124	14.0
GCDB067	6.7	53	91	8.0	GCDB130	13.0	77	124	14.0
GCDB068	6.8	53	91	8.0	GCDB135	13.5	77	124	14.0
GCDB069	6.9	53	91	8.0	GCDB140	14.0	77	124	14.0
GCDB070	7.0	53	91	8.0	GCDB145	14.5	83	133	16.0
GCDB071	7.1	53	91	8.0	GCDB150	15.0	83	133	16.0
GCDB072	7.2	53	91	8.0	GCDB155	15.5	83	133	16.0
GCDB073	7.3	53	91	8.0	GCDB160	16.0	83	133	16.0
GCDB074	7.4	53	91	8.0	GCDB165	16.5	93	143	18.0
GCDB075	7.5	53	91	8.0	GCDB170	17.0	93	143	18.0
GCDB076	7.6	53	91	8.0	GCDB175	17.5	93	143	18.0
GCDB077	7.7	53	91	8.0	GCDB180	18.0	93	143	18.0
GCDB078	7.8	53	91	8.0	GCDB185	18.5	101	153	20.0
GCDB079	7.9	53	91	8.0	GCDB190	19.0	101	163	20.0
GCDB080	8.0	53	91	8.0	GCDB195	19.5	101	153	20.0
GCDB081	8.1	61	103	10.0	GCDB200	20.0	101	153	20.0
GCDB082	8.2	61	103	10.0					
GCDB083	8.3	81	103	10.0					
GCDB084	8.4	61	103	10.0					







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