ITEM PAGE STRUCTURE

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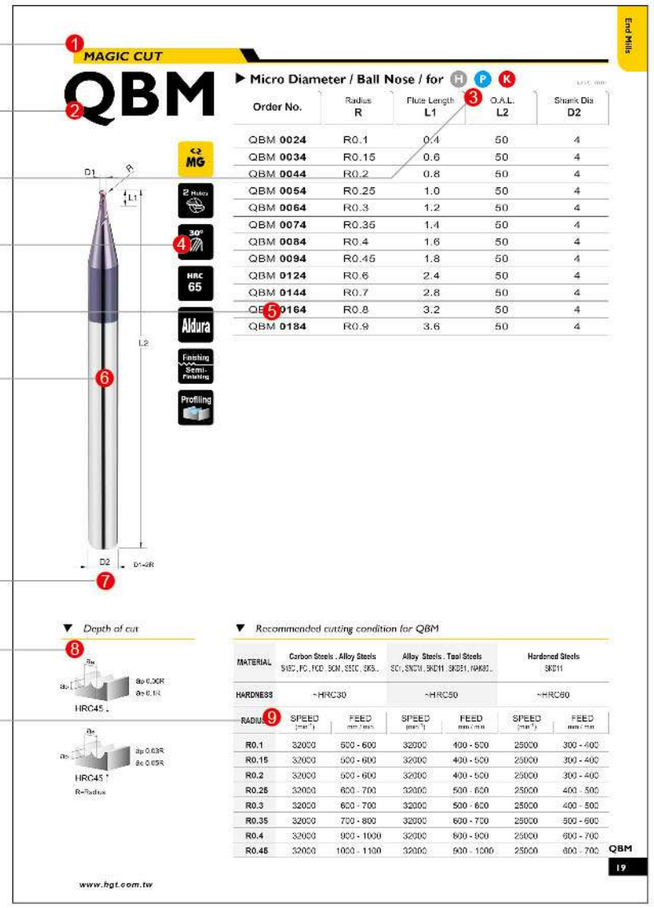

MAGIC CUT

QBM

▶ Micro Diameter / Ball Nose / for H P K

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

MG · 2 Flutes · 30° · HRC 65 · Aldura · Finishing Semi-Finishing · Profiling

▼ Depth of cut

HRC45 ↓

HRC45 ↑

▼ Recommended cutting condition for QBM

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

End Mills

QBM 19

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THE SYSTEM CODE INTRODUCES

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TOLERANCE

Square End Mills (mm)

Flute Dia.	Dia. Tolerance
1.0	0~ -0.015
1.5	0~ -0.015
2.0	0~ -0.015
2.5	0~ -0.015
3.0	0~ -0.015
4.0	0~ -0.015
5.0	0~ -0.015
6.0	0~ -0.015
8.0	0~ -0.020
10.0	0~ -0.020
12.0	0~ -0.020
16.0	0~ -0.020
20.0	0~ -0.020

Ball Nose End Mills (mm)

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

Corner Radius End Mills (mm)

Flute Dia.	R Tolerance
1.0	±0.01
2.0	±0.01
3.0	±0.01
4.0	±0.01
6.0	±0.01
8.0	±0.01
10.0	±0.01
12.0	±0.01
16.0	±0.015

Shank (mm)

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

Recommended Cutting Instructions

1. In order to enhance processing efficiency and extend life of cutters, please use the balanced chucks with high rigidity and high accuracy.
2. Make overhang enough for processing. If it's necessary to extend the milling cutter, please be sure to reduce spindle speed and feed speed.
3. If there's abnormal sound or vibration during processing, please adjust cutting data to prevent cutters from being influenced or broken.
4. Please choose correct cutting oil to maximize efficiency.
5. The result of cutting data depends on working materials, machines, work clips, programming and etc. Cutting data are for reference. You may increase cutting data starting from 50%.

ICONS

Flutes

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

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

Coating

Roughing Pitch

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

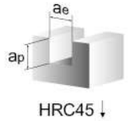
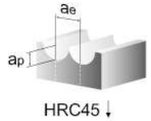
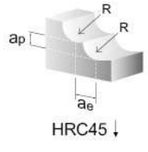
Tip Angle (60° , 90° , 120°)

Applications

Statistics For Drills

Drills Type	Drills Type	Drills Type	DIN Code	DIN Code	Shank Diameter Tolerance	Cutting Flute Tolerance	Helix Angle	Tip Angle

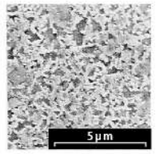
DEPTH OF CUT

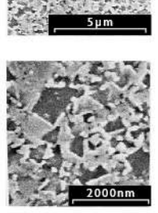
SIDE MILLING	SLOTTING	RADIUS	PROFILING
			
HRC45 ↓	HRC45 ↓	HRC45 ↓	HRC45 ↓
D1 6mm ↓ ap=1.5D ae=0.02D D1 6mm ↑ ap=1.5D ae=0.05D	ap 0.2D ae=D1	ap 0.04R ae 0.06R	ap 0.02R ae 0.02R

SOLID CARBIDE

QMG

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

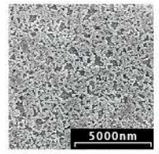


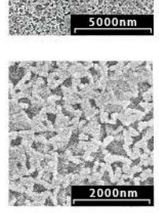


Co %	9
WC incl. Doping (%)	89.83
Tungsten Carbide α	ø0.2µm

SMG

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

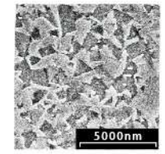


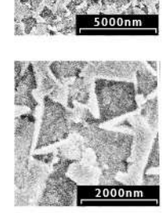


Co %	12
WC incl. Doping (%)	88
Tungsten Carbide α	ø0.4µm

MG

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





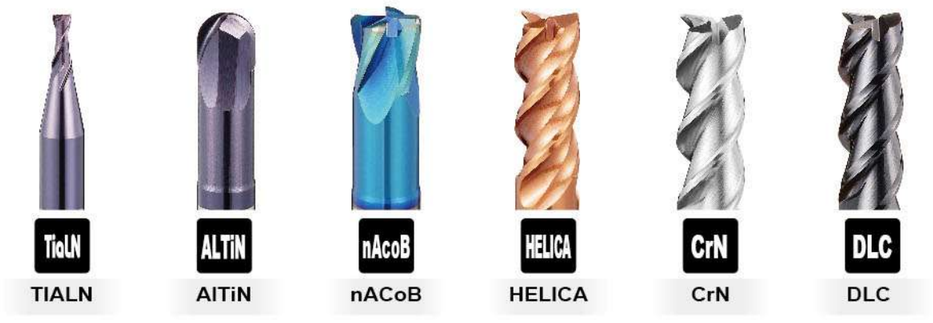
Co %	10
WC incl. Doping (%)	90
Tungsten Carbide α	ø0.6µm

WORK MATERIAL

ISO	H	P	K	M	S	N
MATERIAL	Hardened steel	Low alloy steel High alloy steel, cast steel, tool steel	Cast iron	Stainless steel	High temp. alloys Titanium and Ti alloys	Aluminum alloy Copper alloys Non-metallic

HARD COATIING PROPERTIES

Coating Type	Symbol Color	Nanohard-ness(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	BLUE	45	1 - 4	0.45	1200	400↑
HELICA	COPPER	30	1 - 4	0.25	1000	480↑
CrN	METAL-SILVER	18	1 - 7	0.4	700	200 - 400
DLC	BLACK	20	1 - 3	0.15	400	150 - 250
G100	BURGUNDY-VIOLET	33	1 - 4	0.3	500	
G300	SOFT GOLD	35	1 - 4	0.4	800	
i8	GOLD-BRASS	47	1 - 4	0.45	900	
Aldura	BLACK	32	1 - 4	0.35	1100	
G-plus	WHITE GOLD		1 - 4	0.25	550	
i-plus	COPPER		1 - 3	0.3	1200	



COATING APPLICATIONS

Coating Type	Symbol Color	Introduce coating on different materials
TIALN	BLACK	General steel for wet cutting (HRC35-45)
AlTiN	BLACK	High Hard steel for Dry cutting (HRC45-65)
nACoB	BLUE	High Hard steel for Dry cutting (HRC55-65)
HELICA	COPPER	General steel, Cast iron, with special flute design and work on Stainless steel(EX: SEPS)
CrN	METAL-SILVER	Copper Alloy
DLC	BLACK	Aluminum Alloy
G100	BURGUNDY-VIOLET	General steel for wet cutting (HRC35-45)
G300	SOFT GOLD	Tough material, ex: Titanium Alloy, Nickel Alloy ,Stainless steel and Heat-resistant alloy
i8	GOLD-BRASS	High Hard steel for Dry and wet cutting(HRC55-65)
Aldura	BLACK	High Hard steel for Dry cutting (HRC55-65)
Diamond	BLACK GRAY	Graphite, Zirconium Oxide
G-plus	WHITE GOLD	Tough material, ex: Titanium Alloy, Nickel Alloy ,Stainless steel and Heat-resistant alloy
i-plus	COPPER	High Hard steel for Dry and wet cutting(HRC70)