TAR-G
Artykuły techniczne

KATALOG
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PROFESJONALNE NARZĘDZIA SKRAWAJĄCE

FREZY PEŁNOWĘGLIKOWE
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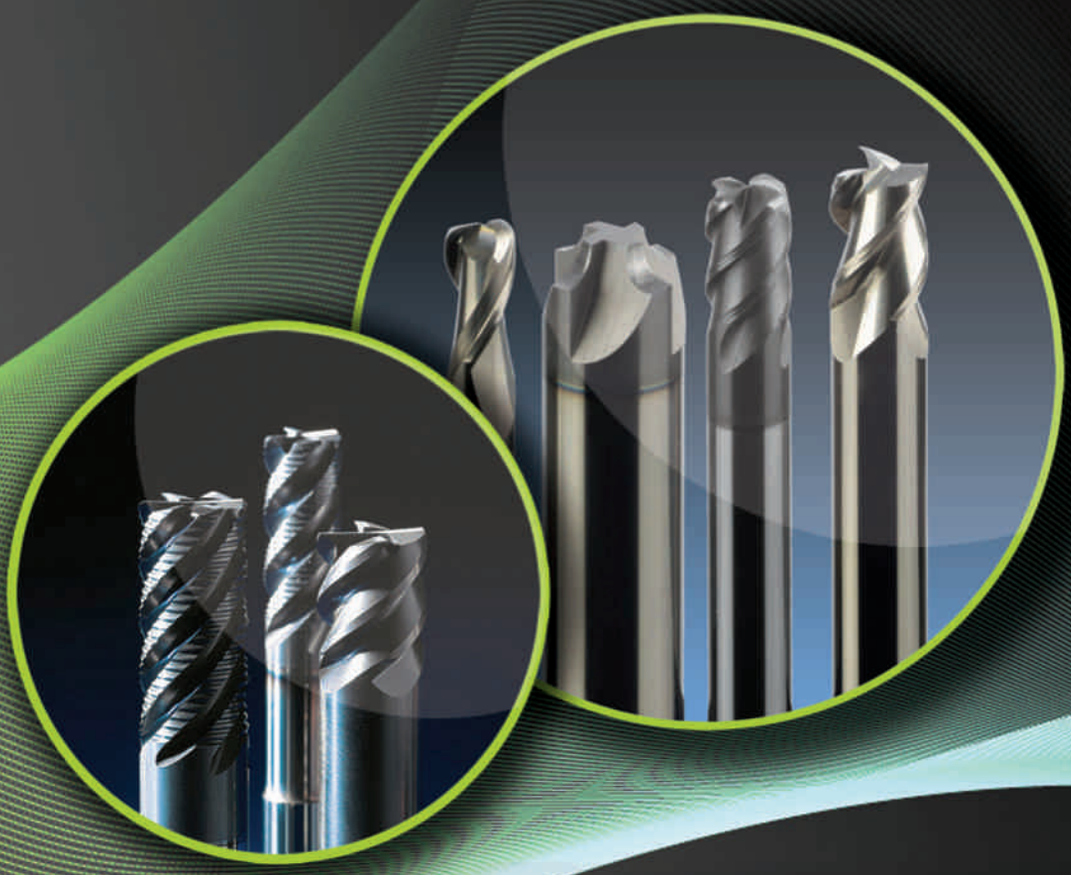

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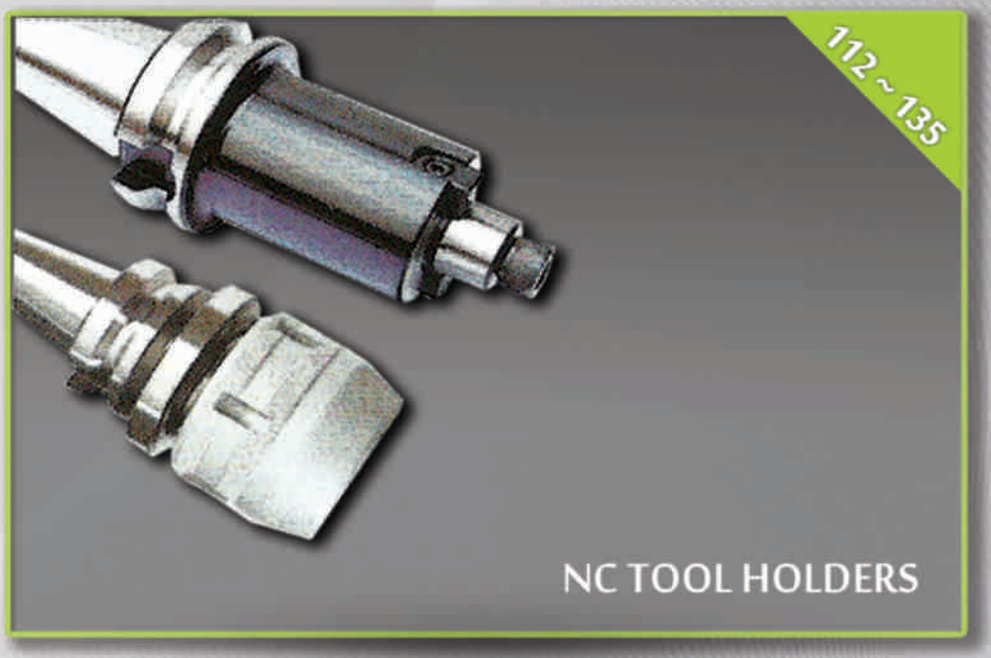
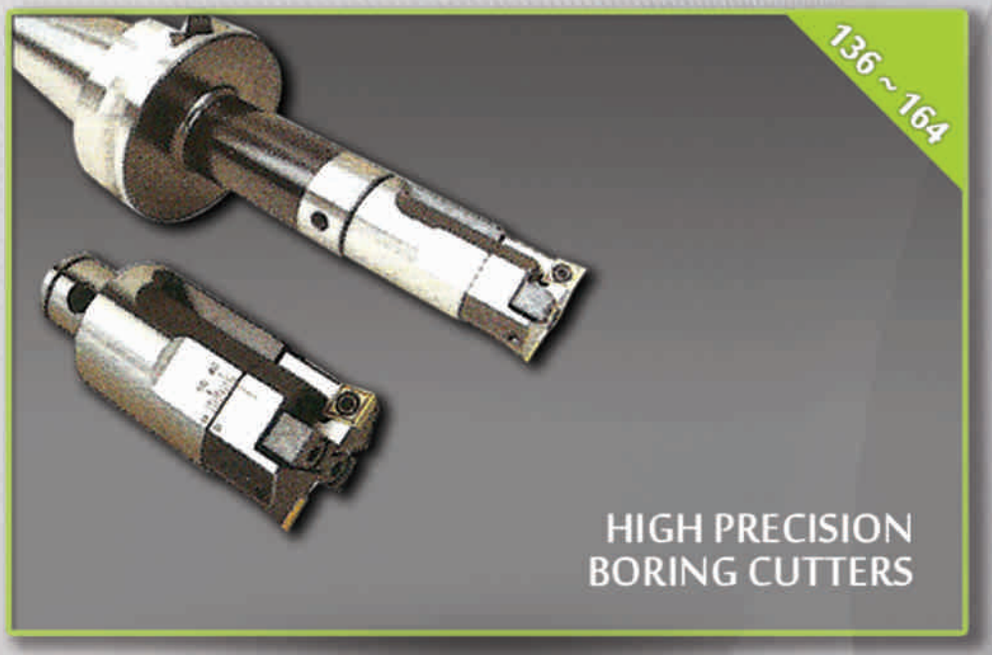
COMPLETE LIST

4 ~ 75
CARBIDE END MILLS

76 ~ 111
NC MILLING CUTTERS
& CUTTER HEADS


112 ~ 135
NC TOOL HOLDERS

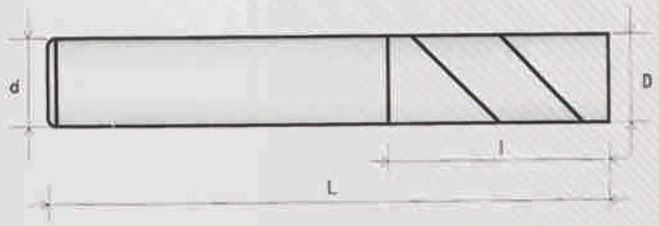

136 ~ 164
HIGH PRECISION
BORING CUTTERS

45 2/4 Flutes Roughing end mill

MG | 35° | HRC ≤45° | CO 10% | ALTIN

55 2/4 Flutes Roughing end mill

MG | 35° | HRC ≤55° | CO 10.2% | ALTIN



1. Suitable for Copper, Cast Iron, Carbon steel, Mould steel, Stainless steel, Titanium Alloy, Tool steel, and Heat-treated steel processing.

2. Main features: Grain size carbon tungsten, high toughness, ALTIN coating, high wear-resistance, special use for high speed cutting of CNC milling machine. Also can increase the smoothness, reduce the ubbing coefficient, and improve the lathe efficiency, save more production time.

Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
1.0	4	3	50
1.5	4	4	50
2.0	4	6	50
2.5	4	8	50
3.0	3	8	50
3.0	4	8	50
3.5	4	11	50
4.0	4	11	50
1.0	6	3	50
1.5	6	4	50
2.0	6	6	50
2.5	6	8	50
3.0	6	8	50
3.5	6	11	50
4.0	6	11	50
4.5	6	13	50
5.0	5	13	50
5.0	6	13	50
6.0	6	15	50
7.0	8	20	60
8.0	8	20	60
9.0	10	25	75
10.0	10	25	75
12.0	12	30	75
14.0	14	45	100
16.0	16	45	100
18.0	18	45	100
20.0	20	45	100

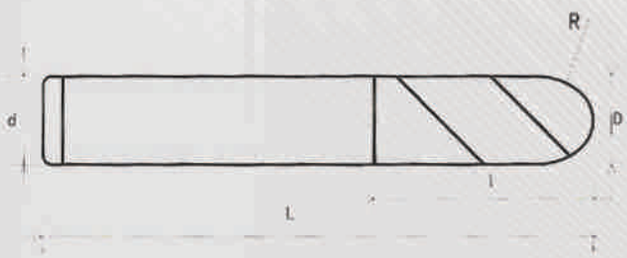
Extra Lenght Type			
Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
4.0	4	3	50
4.0	4	4	50
5.0	4	6	50
6.0	4	8	50
6.0	3	8	50
6.0	4	8	50
8.0	4	11	50
8.0	4	11	50
8.0	6	3	50
10.0	6	4	50
10.0	6	6	50
12.0	6	8	50
12.0	6	8	50
14.0	6	11	50
16.0	6	11	50
18.0	6	13	50
20.0	5	13	50

45 2/4 Flutes Ball nose end mill

MG | ≤35° | HRC ≤45° | CO 10% | ALTIN

55 2/4 Flutes Ball nose end mill

MG | ≤35° | HRC ≤55° | CO 10.2% | ALTIN



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Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
R0.5	4	2	50
R0.75	4	3	50
R1	4	4	50
R1.25	4	5	50
R1.5	3	6	50
R1.5	4	6	50
R2	4	8	50
R0.5	6	2	50
R0.75	6	3	50
R1	6	4	50
R1.25	6	5	50
R1.5	6	6	50
R2	6	8	50
R2.5	5	10	50
R2.5	6	10	50
R3	6	12	50
R4	8	16	60
R5	10	20	75
R6	12	25	75
R8	16	30	100
R10	20	30	100

Extra Lenght Type			
Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
R2	4	8	75
R2	4	8	100
R2.5	6	10	75
R3	6	12	75
R3	6	12	100
R3	6	30	150
R4	8	16	75
R4	8	16	100
R4	8	30	150
R5	10	20	100
R5	10	40	150
R6	12	25	100
R6	12	40	150
R7	14	40	150
R8	16	40	150
R9	18	40	150
R10	20	40	150

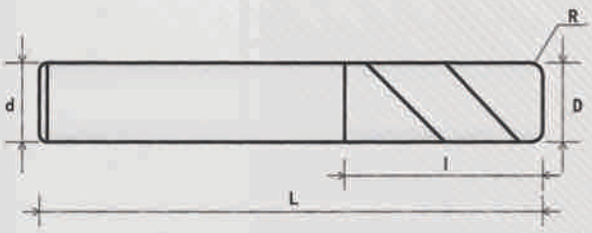
Outside Diameter (D)	Radius (R)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
2.0	R0.5	4	4	50
3.0	R0.5	4	5	50
4.0	R0.5	4	8	50
4.0	R1	4	8	50
6.0	R0.5	6	12	50
6.0	R1	6	12	50
8.0	R0.5	8	16	60
8.0	R1	8	16	60
8.0	R1.5	8	16	60
10.0	R0.5	10	20	75
10.0	R1	10	20	75
10.0	R1.5	10	20	75
12.0	R0.5	12	24	75
12.0	R1	12	24	75
12.0	R1.5	12	24	75
12.0	R2	12	24	75

45 2/4 Flutes Corner Radius end mill

MG | ≤35° | HRC ≤45° | CO 10% | ALTIN | Non-standard sizes custom accepted

55 2/4 Flutes COrner radius end mill

MG | ≤35° | HRC ≤55° | CO 10.2% | ALTIN | Non-standard sizes custom accepted



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Extra Lenght Type				
Outside Diameter (D)	Radius (R)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
2.0	R0.5	4	4	75
3.0	R0.5	4	5	75
4.0	R0.5	4	8	75
4.0	R1	4	8	75
4.0	R0.5	4	8	100
4.0	R1	4	8	100
6.0	R0.5	6	12	75
6.0	R1	6	12	75
6.0	R0.5	6	12	100
6.0	R1	6	12	100
8.0	R0.5	8	16	75
8.0	R1	8	16	75
8.0	R1.5	8	16	75
10.0	R0.5	10	20	100
10.0	R1	10	20	100
10.0	R1.5	10	20	100
12.0	R0.5	12	24	100
12.0	R1	12	24	100
12.0	R1.5	12	24	100
12.0	R2	12	24	100

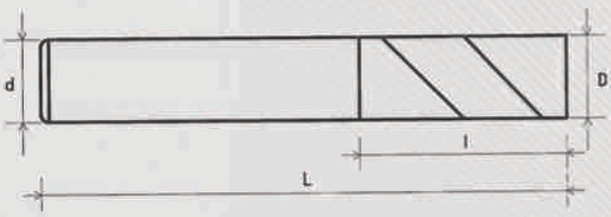
Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
1.0	4	3	50
1.5	4	4	50
2.0	4	6	50
2.5	4	8	50
3.0	4	8	50
4.0	4	11	50
5.0	6	13	50
6.0	6	15	50
8.0	8	20	60
10.0	10	25	75
12.0	12	30	75
14.0	14	45	100
16.0	16	45	100
18.0	18	45	100
20.0	20	45	100

50 2/3 Flutes Aluminium processing end mill 45° 55°

MG | 45° | 55° | HRC ≤50° | CO 10%

60 2/3 Flutes Aluminium processing end mill 45° 55°

MG | 45° | 55° | HRC ≤60° | CO 10.2%



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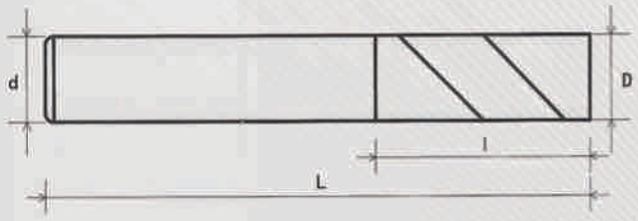
Extra Lenght Type			
Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
3.0	4	11	75
4.0	4	11	75
4.0	4	11	100
5.0	6	13	75
6.0	6	15	75
6.0	6	15	100
6.0	6	15	150
8.0	8	40	75
8.0	8	20	100
8.0	8	40	150
10.0	10	25	100
10.0	10	50	150
12.0	12	30	100
12.0	12	50	150
14.0	14	50	150
16.0	16	50	150
18.0	18	50	150
20.0	20	50	150

45 6 Flutes Finishing end mill

MG | 45° | HRC ≤55° | CO 10.2% | ALTIN



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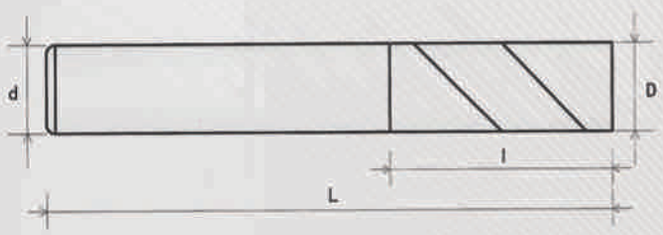
Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
6.0	6	15	50
8.0	8	20	60
10.0	10	25	75
12.0	12	30	75
16.0	16	40	100
20.0	20	40	100
25.0	25	40	100

Extra Lenght Type			
Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
6.0	6	25	75
6.0	6	30	100
8.0	8	35	75
8.0	8	35	100
10.0	10	40	100
10.0	10	40	150
12.0	12	45	100
12.0	25	45	150
16.0	16	60	150
16.0	16	100	200
18.0	20	80	150
20.0	20	100	200

Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
6.0	6	15	50
8.0	8	20	60
10.0	10	25	75
12.0	12	30	75
14.0	14	45	100
16.0	16	45	100
18.0	18	45	100
20.0	20	45	100

45 3/4 Flutes Roughing end mill

MG | ≤35° | HRC ≤55° | CO 10% | ALTIN



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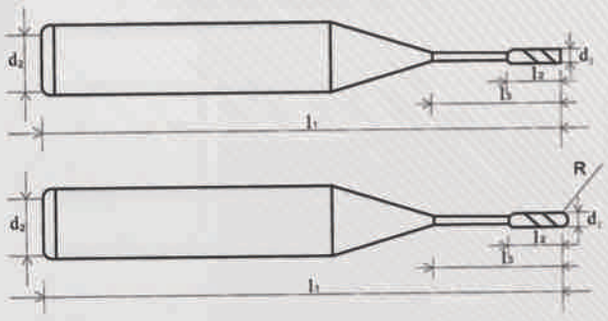
Extra Lenght Type			
Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
6.0	6	15	75
6.0	6	15	100
6.0	6	15	150
8.0	8	20	75
8.0	8	20	100
8.0	8	20	150
10.0	10	25	100
10.0	10	25	150
12.0	12	30	100
12.0	12	30	150
14.0	14	45	150
16.0	16	50	150
18.0	18	55	150
20.0	20	60	150

45 Long neck short flute end mill

MG | 35 | HRC ≤55° | CO 10% | ALTIN

55 Long neck short flute end mill

MG | 35 | HRC ≤55° | CO 10% | ALTIN



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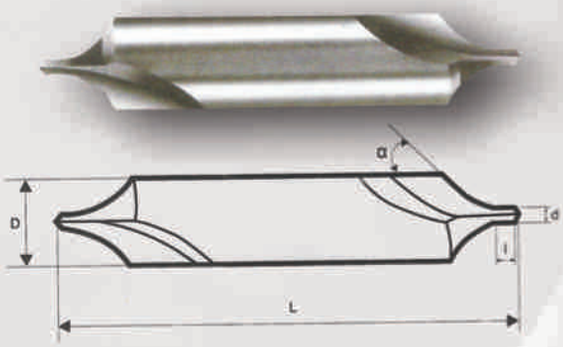
d_1	l_2	l_2	l_1	d_2
0.4	0.6	2	50	4
0.4	0.6	4	50	4
0.5	0.8	2	50	4
0.5	0.8	4	50	4
0.5	0.8	6	50	4
0.6	1.0	2	50	4
0.6	1.0	4	50	4
0.6	1.0	6	50	4
0.6	1.0	8	50	4
0.8	1.2	3	50	4
0.8	1.2	4	50	4
0.8	1.2	6	50	4
0.8	1.2	8	50	4
0.8	1.2	10	50	4
1.0	1.2	4	50	4
1.0	1.2	6	50	4
1.0	1.2	8	50	4
1.0	1.2	10	50	4
1.0	1.2	12	50	4
1.5	1.7	4	50	4
1.5	1.7	6	50	4
1.5	1.7	8	50	4
1.5	1.7	10	50	4
1.5	1.7	12	50	4
2.0	2.2	6	50	4
2.0	2.2	8	50	4
2.0	2.2	10	50	4
2.0	2.2	12	50	4
2.0	2.2	14	50	4
2.0	2.2	16	50	4
3.0	3.2	8	50	4
3.0	3.2	10	50	4
3.0	3.2	12	50	4
3.0	3.2	14	50	4
3.0	3.2	16	75	4
3.0	3.2	20	75	6
4.0	4.2	12	75	6
4.0	4.2	14	75	6
4.0	4.2	16	75	6
4.0	4.2	20	75	6
4.0	4.2	25	75	6

Rd_1	l_2	l_2	l_1	d_2
R 0.4	0.6	2	50	4
R 0.4	0.6	4	50	4
R 0.5	0.8	2	50	4
R 0.5	0.8	4	50	4
R 0.5	0.8	6	50	4
R 0.6	1.0	2	50	4
R 0.6	1.0	4	50	4
R 0.6	1.0	6	50	4
R 0.6	1.0	8	50	4
R 0.8	1.2	3	50	4
R 0.8	1.2	4	50	4
R 0.8	1.2	6	50	4
R 0.8	1.2	8	50	4
R 0.8	1.2	10	50	4
R 1.0	1.2	4	50	4
R 1.0	1.2	6	50	4
R 1.0	1.2	8	50	4
R 1.0	1.2	10	50	4
R 1.0	1.2	12	50	4
R 1.5	1.7	4	50	4
R 1.5	1.7	6	50	4
R 1.5	1.7	8	50	4
R 1.5	1.7	10	50	4
R 1.5	1.7	12	50	4
R 2.0	2.2	6	50	4
R 2.0	2.2	8	50	4
R 2.0	2.2	10	50	4
R 2.0	2.2	12	50	4
R 2.0	2.2	14	50	4
R 2.0	2.2	16	50	4
R 3.0	3.2	8	50	4
R 3.0	3.2	10	50	4
R 3.0	3.2	12	50	4
R 3.0	3.2	14	50	4
R 3.0	3.2	16	75	4
R 3.0	3.2	20	75	6
R 4.0	4.2	12	75	6
R 4.0	4.2	14	75	6
R 4.0	4.2	16	75	6
R 4.0	4.2	20	75	6
R 4.0	4.2	25	75	6



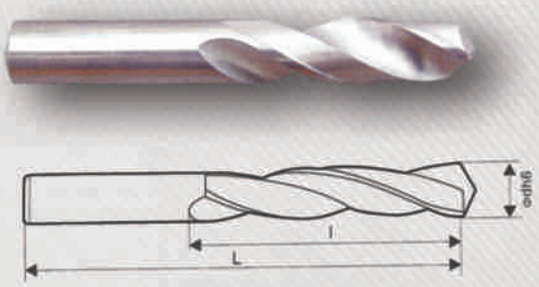
Center Drill

Non-standard sizes custom accepted

MG | HRC ≤45° | HRC ≤55° | HRC ≤65° | CO 10%

Suitable for Mould steel, Cast iron, Titanium alloy, Copper, and Aluminium processing. Mainly for the processing of center location hole of the workpieces.

Outside Diameter (d)	Angle (α)	Shank Diameter (D)	Overal Lenght (L)	Flute Lenght (l)
1.0	60	4	34	1.0
1.5	60	5	40	1.5
2.0	60	6	45	2.0
2.5	60	7	50	2.5
3.0	60	8	50	3.0
4.0	60	10	60	4.5
5.0	60	11	70	5.5



Twist Drill

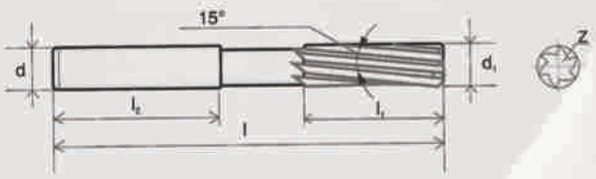
Non-standard sizes custom accepted

MG | 30° | HRC ≤45° | HRC ≤55° | HRC ≤65° | CO 10%

Suitable fpr Mould steel, cast iron, Titanium alloy, Copper, and Aluminium processing. Mainly for the procesing of through hole, threaded hole, and location hole of the workspaces.

- No note for tolerance means the tolerance is 0 - 0.01
- Helix angle 30°, Drill point 118°

Outside Diameter (D)	Overall Lenght (L)	Flute Lenght (l)
0.5 ~ 0.7	30	6
0.8 ~ 0.9	30	8
1.0 ~ 1.7	30	10
1.2 ~ 1.4	35	12
1.5 ~ 1.7	35	14
1.8 ~ 1.9	40	16
2.0 ~ 2.4	40	18
2.5 ~ 3.0	40	20
3.1 ~ 3.9	50	25
4.0 ~ 5.0	50	28
5.1 ~ 6.0	60	30
6.1 ~ 7.0	60	32
7.1 ~ 11.0	70	38
11.1 ~ 12.0	70	38
12.1 ~ 14.0	80	40
16.0	90	45

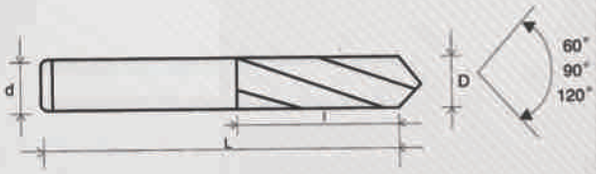


Reamer

MG | HRC ≤45° | CO 10% | ALTIN | Non-standard sizes custom accepted

Suitable for Mould steel, Cast iron, Aluminium alloy, Copper, and Alloy steel processing. Mainly used in the precision-procesing of the holes of engines and precision parts.

Z	d1(h7)	d(h7)	l	l_1	l_2
4	4.0	4	75	20	30
4	4.5	5	75	20	30
6	5.0	5	100	30	40
6	5.5	6	100	30	40
6	6.0	6	100	30	40
6	6.5	8	100	30	40
6	7.0	8	100	30	40
6	8.0	8	100	30	40
6	9.0	10	100	30	40
6	10.0	10	100	30	40
6	11.0	12	150	50	50
6	12.0	12	150	50	50
6	13.0	14	150	50	50
8	14.0	14	150	50	50
8	15.0	16	150	50	50
8	16.0	16	150	50	50
8	17.0	18	150	50	50
8	18.0	18	200	60	60
8	19.0	20	200	60	60
8	20.0	20	200	60	60

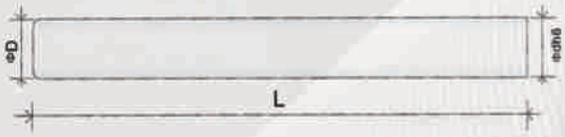


Fixed-point drill

MG | HRC ≤55° | CO 10% | ALTIN | Non-standard sizes custom accepted

Suitable for Mould steel, Aluminium alloy, Copper, and Alloy steel processing. Mainly for fixing point and chamfering before drilling the hole for the workpieces.

Outside Diameter (D)	Shank Diameter (d)	Flute Lenght (l)	Overal Lenght (L)
2	2	4	50
3	3	6	50
4	4	8	50
5	5	10	50
6	6	12	50
8	8	16	60
10	10	20	75
12	12	20	75
16	16	25	100
20	20	25	100
4	4	8	100
5	5	10	100
6	6	12	100
8	8	16	100
10	10	20	100
12	12	20	100



Carbide Rod

MG | HRC ≤45° | HRC ≤55° | HRC ≤60° | Non-standard sizes custom accepted

Suitable for Stainless steel, Cast iron, Mould steel, Aluminium alloy and Copper processing.
Mainly used the graver and wear-resistant parts.

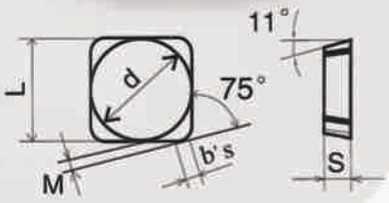
Shank Diameter (d)	Overal Lenght (L)	Overal Lenght (L)	Overal Lenght (L)
1	100	150	300
1.5	100	150	300
2	100	150	300
2.5	100	150	300
3	100	150	300
3.5	100	150	300
4	100	150	300
4.5	100	150	300
5	100	150	300
6	100	150	300
7	100	150	300
8	100	150	300
10	100	150	300
12	100	150	300
14	100	150	300
16	100	150	300
18	100	150	300
20	100	150	300

1/8	100	150	300
3/16	100	150	300
1/4	100	150	300
5/16	100	150	300
3/8	100	150	300
1/2	100	150	300

Face milling insert

MG HRC ≤45° HRC ≤55°

Non-standard sizes custom accepted

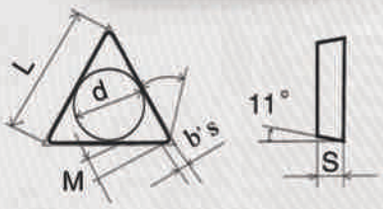


Model		Size			
		L - d	S	M	b' s
SPCN1203ED	R/L	12.7	3.175	0.9	1.4
SPCN1504ED	R/L	15.875	4.76	1.25	1.4
SPCN1905ED	R/L	19.05	5.56	1.48	2.0

Triagle milling insert

MG HRC ≤45° HRC ≤55°

Non-standard sizes custom accepted

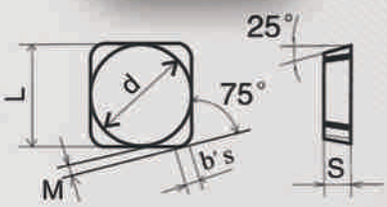


Model		Size				
		L	d	s	M	b' s
TPCN2204PO	R/L	22	12.7	4.76	3.55	1.4
TPCN1603PO	R/L	16.5	9.525	3.175	2.45	1.3
TPCN1103PO	R/L	11	6.35	3.175	1.63	0.7

Face milling insert

MG HRC ≤45° HRC ≤55°

Non-standard sizes custom accepted



Model		Size			
		d	S	M	b' s
SFCN1203ED	R/L	12.7	3.175	1.8	0.8
SfCN1504ED	R/L	15.875	4.76	1.45	1.0

Suitable for Stainless steel, Cast iron, Mould steel, Aluminium alloy, Copper and Acrylic processing. Mainly for the processing of watches and glasses, also for the workspace's slot processing aand parting.

Milling-side in the issue and countermeasures

Problems	Reason	Countermeasures
1. Cutter blade smallrapid collapse occurredt	1. Improper Installation tool	1. Suspended the installation of a minimum amount of stretching 2. Spring chech wheter Bush or Chuck aging wear, precision is not good, bad clip, Wheter there is a glitch. The replacement of normal goods.
	2. Workpiece methods or tools to install anti - seismic measures are not taken into fullmproper installation tool	1. Enhance the work of the installation of rigid (the use of top oil, block, gaskets and so on, so that the workpiece or cutting under non-slip) 2. Sliding table to adjust the gap (to confirm wheter the good side fixed block). 3. Check up and down the main shaft, the drive platform in the fixide-cuting in the reliability. 4. Survey of the machine tools used to avoid gear, shaft vibration system to produce the type of speed, appropriate adjustments to speed.
2. Breakdown of the cutting edge severe damage	1. With the same edge of collapse small impact on larger, more superficial	1. Lower feed, but also improve the speed will be better.
	2. Compatative load (to cut deep into x) he cutter is too long	1. Increase the diameter of the cutter (by hanging under the stretch)
	3. Workpiece or tool to install unstable.	1. Is hanging tool to install the smallest stretch. 2. Workpiece and the machine to install high - accuracy rigid as far as possible.
	4. Naked eye can hardly see the ground when the crack.	1. With sharp resin binders diamondgrinding wheel with not too high speed (1500m/min below) wet grinding, with more than 10 times the microscope of scrutiny.
	5. Has not carbide cutter - side experience, have a primary error.	1. Downtime in the fifficult conditions, to stop feeding, and then stop rotating (or lack of power tools as a result of load trip, should stop feeding). 2. Forget to check tightening screws and pressed Lease block. 3. Cutting edge wear too serious before replacement. 4. Special attention to fast - forward, can not go wrong. 5. Please note that folder machine tool rotary direction is correct. 6. Do not single - handendly arrested several at the same time, with the knife blade between the collision can not be prudent not to fall at the end of the loading and unloading.
3. Cutting in a serious impairment	1. Workpiece cut, cut out, feel of a sudden change in direction, and so on, caused by the impact of changes in the load.	1. Lower feed (to local) 2. To reduce the installation time suspended the amount of stretch. 3. Necessary, to reduce the maximum lenght Duanren. 4. Bushing on. The holding chuck of the inspection.
	2. Cutting load is too large.	1. To prevent the occurrence of excessive wear, the tool change in a timely manner. 2. To the cost of each and every blade into the volume. 3. To enter the same amount, to increase speed. 4. Reduce the depth of cut. 5. To raise or reduce speed to avoid a number of cutting - edge plug and eating crumbs. 6. Without cutting edge chamfering, comer of the neck to avoid cutting tools to reduce stress concentration. 7. To reduce the installation of hanging stretch, to avoid bad set of gripping chuck. 8. Increase the cutting fluid cluster of compressed air to enhance the ability chip. 9. Milling into the inverse cis - milling.
	3. Fatigue damage	1. Cutter cutting force cause the whole side of the bending stress, when more than 90kg/mm, welding - end steel cutter body stress over 50kg/mm occasion of the recutting, after a total of 10 (2000 to x 83 hours) over the use of the possibility of a fatigue failure, should be the replacement of the previous blade.
4. Poor surface	1. Cutter cutting force changes in the flexibility to restore or change is intermittent and the edge of the state of stress differences.	1. Lover feed. 2. Reduce the depth of cut. 3. Shun the milling try to reverse. 4. Helix angle increased. 5. Increase the number edge. 6. Reduce the long edge. 7. Enhance the cutting edge of precision beat. 8. Edge in sharp decline over time prior to the ATC.
	2. Have a flutter.	1. Lower speed (speed). But there are also some increase inspeed will be good. 2. Enhance the feed but 0.04mm/blade to be lowered more than try. 3. Workpiece increase in the installation of rigid. 4. Tool to improove the installation of rigid (reducing stretch suspended, firmly clamp). 5. Ranging from sub-tool use.
5. Machining accuracy bad	1. Radial cutting volume settings, took place to eat edge.	1. Allowance reduced. 2. Inverse change for the milling - shun. 3. Speed increases to improve the sharp edge of reality. 4. Tool to improve the installation of rigid (reducing stretch suspended, firmly clamp). 5. Ranging from sub - tool use.
	2. Cutter - side tilt, the vertica surface difference. Let occurred knife.	1. Allowance reduced. 2. Speed to raise. 3. Reduce feed. 4. Blade increase in the number. 5. Tool to improove the installation of rigid (reducing stretch suspended, firmly champing) 6. Edge in sharp decline over time prior to the Attached. 7. Was for the actual processing side of the inclined to choose the appropriate amount of the cone back, on the peripheral edge tool for grinding.

Tool Material

UFM ultra-fine particles
Ultra-fine particles
88.3 percent cobalt tungsten steel 10.2% other 1.5%
Hardnes of 93.0+0.5
Bending strenght>4200MPa
Grain size of 0.5μm

SMG ultra-fine particles
Ultrafine particles
90% of the cobalt-tungsten steel 10%
Hardness of 92.0+0.5
Bending strenght>3800MPa
Grain size of 0.8μm

Processing materials

<35HRC cast steel
Ordinary steel
S45C, S50C
55C, 55400, SCM

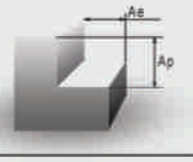
<45HRC pre-hard steel
Ordinary steel
S45C, S50C
55C, 55400, SCM

<52HRC hardening steel
Pre-hardende steel
NAK hardening steel SKD, SKS
SKH51, Dc53

ALU aluminium alloy | C/B Copper | GG(G) cast iron | SUS300 stainless steel | SUS400 stainless steel | Titanium alloy | Plastic hard plastic

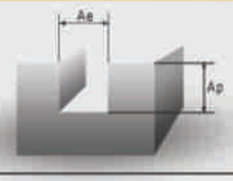
Cutting Data Specification

Side Milling-Extra Lenght Type 2/4 Flutes

Shape of cut		Ae ≤ 0.1D (D ≤ Φ3) Ae ≤ 0.2D (D > Φ3) Ae ≤ 1.5D	Ae ≤ 0.05D Ap ≤ 1.00
Work material	Carbon steel. Castiron AISI1049, SCM, FC250 (~30HRC)	Alloy steel, Die steel, Pre-hardened steel AISIH13, NAK (<45HRC)	Hardened steel AISIH13 (<52HRC)

ΦD (mm)	Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)	
		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes
1	1500	300	450	10000	200	300	7500	60	90
2	750	300	450	5000	200	300	4000	60	90
3	5000	300	450	3500	200	300	2500	60	90
4	3750	300	450	2600	200	300	2000	60	90
5	3000	300	450	2100	200	300	1600	60	90
6	2500	300	450	1750	200	300	1350	60	90
8	2000	260	390	1400	175	260	1000	55	80
10	1600	225	340	1100	150	225	800	50	70
12	1350	205	310	950	135	205	650	50	60
16	1000	180	275	700	115	175	500	65	85
20	800	160	245	550	110	170	400	55	70

Slot Milling Extra Lenght Type 2/4 Flutes

Shape of cut		Ae = D (D ≤ Φ3) Ap ≤ 0.1D (D > Φ2) Ap ≤ 0.2D (D ≥ Φ2)	Ae = D Ap ≤ 0.05D (Φ0.5 ≤ D ≤ Φ2) Ap ≤ 0.10D (D > Φ2)
Work material	Carbon steel. Castiron AISI1049, SCM, FC250 (~30HRC)	Alloy steel, Die steel, Pre-hardened steel AISIH13, NAK (<45HRC)	Hardened steel AISIH13 (<52HRC)

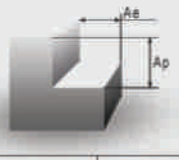
ΦD (mm)	Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)	
		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes
1	1500	240	360	10000	160	240	7500	48	72
2	750	240	360	5000	160	240	4000	48	72
3	5000	240	360	3500	160	240	2500	48	72
4	3750	240	360	2600	160	240	2000	48	72
5	3000	240	360	2100	160	240	1600	48	72
6	2500	240	360	1750	160	240	1350	48	72
8	2000	208	312	1400	140	208	1000	44	64
10	1600	180	272	1100	120	180	800	40	56
12	1350	164	248	950	108	164	650	40	48
16	1000	144	220	700	92	140	500	52	68
20	800	128	196	550	88	136	400	44	56

Matters need attention in usage

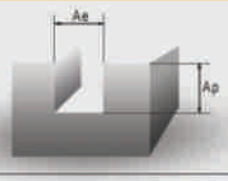
1. If no good rigidity of the work piece, or noise happens when operating, please reduce the rotation rate or feed rate moderately.
2. If processing with sudden feed way, please reduce the feed rate to 1/3.
3. Please take the wet-type processing when cutting stainless steel. E.g. when cutting stainless steel of Austenite, the most efficient way is to use non-water-soluble cutting fluid.

Cutting Data Specification

Side Milling - Estra Lenght Type 2/4 Flutes

Shape of cut												
	Ae ≤ 0.1D (D ≤ Φ3) Ae ≤ 0.2D (D > Φ3) Ap ≤ 1.5D											
Work material	Aluminium Alloy, cuprum			Carbon steel. Castiron AISI1049, SCM, FC250 (~30HRC)			Alloy steel. Die steel (<35HRC)			Stainless steel AISI1304, aisi1316		
ΦD (mm)	Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)	
		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes
1	19000	50	300	10000	60	120	6000	35	70	5000	30	60
2	11000	220	400	5500	90	135	3600	55	85	3000	45	70
3	8500	240	435	4250	100	150	2650	65	100	2200	55	85
4	7000	365	550	3600	180	270	2200	110	165	1850	90	135
5	6000	430	650	3000	190	185	1800	115	175	1500	95	145
6	5500	495	750	2650	210	315	1600	120	180	1350	105	160
8	4000	500	750	2000	225	340	1200	120	180	1000	110	165
10	3200	450	675	1600	195	295	950	95	145	800	95	145
12	2560	370	550	1350	165	250	800	80	120	650	75	115
16	2000	280	420	1000	120	180	600	60	90	500	60	90
20	1600	225	340	800	100	150	500	50	75	400	48	70

Slot Milling - Extra Lenght Type 2/4 Flutes

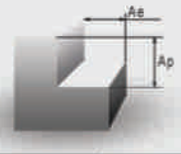
Shape of cut									
	Ae = D (D ≤ Φ3) Ap ≤ 0.1D (D > Φ2) Ap ≤ 0.2D (D ≥ Φ2)						Ae = D Ap ≤ 0.05D (Φ0.5 ≤ D ≤ Φ2) Ap ≤ 0.10D (D > Φ2)		
Work material	Carbon steel. Castiron AISI1049, SCM, FC250 (~30HRC)			Alloy steel, Die steel, Pre-hardened steel AISIH13, NAK (<45HRC)			Hardened steel AISIH13 (<52HRC)		
ΦD (mm)	Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)	
		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes
1	24000	384	576	16000	256	384	12000	77	72
2	12000	384	576	8000	256	384	6400	77	72
3	8000	384	576	5600	256	384	4000	77	72
4	6000	384	576	4160	256	384	3200	77	72
5	4800	384	576	3360	256	384	2560	77	72
6	4000	384	576	2800	256	384	2160	77	72
8	3200	333	500	2240	224	333	1600	71	64
10	2560	288	436	1760	192	288	1280	64	56
12	2160	363	397	1520	173	263	1040	64	48
16	1600	231	352	1120	148	224	800	84	68
20	1280	205	314	880	141	218	640	71	56

Matters need attention in usage

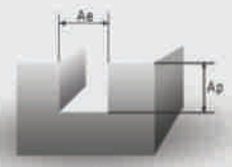
1. If no good rigidity of the work piece, or noise happens when operating, please reduce the rotation rate or feed rate moderately.
2. If processing with sudden feed way, please reduce the feed rate to 1/3.
3. Please take the wet-type processing when cutting stainless steel. E.g. when cutting stainless steel of Austenite, the most efficient way is to use non-water-soluble cutting fluid.

Cutting Data Specification

Side Milling - Estra Lenght Type 2/4 Flutes

Shape of cut												
	Ae ≤ 0.1D (D ≤ Φ3) Ae ≤ 0.2D (D > Φ3) Ap ≤ 1.5D											
Work material	Aluminium Alloy, cuprum			Carbon steel. Castiron AISI1049, SCM, FC250 (~30HRC)			Alloy steel. Die steel (<35HRC)			Stainless steel AISI1304, aisi1316		
ΦD (mm)	Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)	
		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes
1	19000	50	300	10000	60	120	6000	35	70	5000	30	60
2	11000	220	400	5500	90	135	3600	55	85	3000	45	70
3	8500	240	435	4250	100	150	2650	65	100	2200	55	85
4	7000	365	550	3600	180	270	2200	110	165	1850	90	135
5	6000	430	650	3000	190	185	1800	115	175	1500	95	145
6	5500	495	750	2650	210	315	1600	120	180	1350	105	160
8	4000	500	750	2000	225	340	1200	120	180	1000	110	165
10	3200	450	675	1600	195	295	950	95	145	800	95	145
12	2560	370	550	1350	165	250	800	80	120	650	75	115
16	2000	280	420	1000	120	180	600	60	90	500	60	90
20	1600	225	340	800	100	150	500	50	75	400	48	70

Slot Milling - Extra Lenght Type 2/4 Flutes

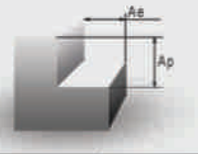
Shape of cut												
	Ae = D Ap ≤ 0.1D (D < 2) Ap ≤ 0.3D (Φ2 ≤ D ≤ Φ3) Ap ≤ 0.5D (D > Φ3)						AE = D Ap ≤ 0.3D (D ≤ Φ3) Ap ≤ 0.5D (D > Φ3)					
Work material	Aluminium Alloy, cuprum			Carbon steel. Castiron AISI1049, SCM, FC250 (~30HRC)			Alloy steel. Die steel (<35HRC)			Stainless steel AISI1304, aisi1316		
ΦD (mm)	Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)	
		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes
1	19000	150	240	10000	60	96	6000	35	56	5000	30	48
2	11000	220	320	5500	90	108	3600	55	68	3000	45	56
3	8500	240	350	4250	100	120	2650	65	80	2200	55	68
4	7000	290	440	3600	145	216	2200	90	132	1500	90	108
5	6000	345	520	3000	150	228	1800	90	140	1200	95	116
6	5500	395	600	2650	170	252	1600	95	144	1100	105	128
8	4000	400	600	2000	180	272	1200	95	144	800	110	132
10	3200	360	540	1600	155	236	950	75	116	650	95	116
12	2560	295	440	1350	130	200	800	65	96	500	75	92
16	2000	225	336	1000	95	144	600	50	72	400	60	72
20	1600	180	272	800	80	120	500	40	60	320	48	56

Matters need attention in usage

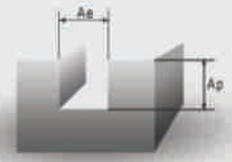
1. If no good rigidity of the work piece, or noise happens when operating, please reduce the rotation rate or feed rate moderately.
2. If processing with sudden feed way, please reduce the feed rate to 1/3.
3. Please take the wet-type processing when cutting stainless steel. E.g. when cutting stainless steel of Austenite, the most efficient way is to use non-water-soluble cutting fluid.

Cutting Data Specification

Side Milling - Standard Type 2/4 Flutes

Shape of cut												
	Ae ≤ 0.1D (D ≤ Φ3) Ae ≤ 0.2D (D > Φ3) Ap ≤ 1.5D											
Work material	Aluminium Alloy, cuprum			Carbon steel. Castiron AISI1049, SCM, FC250 (~30HRC)			Alloy steel. Die steel (<35HRC)			Stainless steel AISI1304, aisi1316		
ΦD (mm)	Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)	
		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes
1	30400	240	480	16000	96	192	9600	56	90	8000	48	77
2	17600	352	640	8800	144	216	5760	88	109	4800	72	90
3	13600	384	696	6800	160	240	4240	104	128	3520	88	109
4	11200	584	880	5760	288	432	3520	176	212	2400	88	173
5	9600	688	1040	4800	304	456	2880	184	224	1920	88	186
6	8800	792	1200	4240	336	504	2560	192	231	1760	104	205
8	6400	800	1200	3200	360	544	1920	192	231	1280	104	212
10	5120	720	1080	2560	312	472	1520	152	186	1040	88	186
12	4240	592	880	2160	264	400	1280	128	154	800	72	148
16	3200	448	672	1600	192	288	960	96	116	640	56	116
20	2560	360	544	1280	160	240	800	80	96	512	48	90

Slot Milling - Standard Type 2/4 Flutes

Shape of cut												
	Ae = D Ap ≤ 0.1D (D < 2) Ap ≤ 0.3D (Φ2 ≤ D ≤ Φ3) Ap ≤ 0.5D (D > Φ3)						AE = D Ap ≤ 0.3D (D ≤ Φ3) Ap ≤ 0.5D (D > Φ3)					
Work material	Aluminium Alloy, cuprum			Carbon steel. Castiron AISI1049, SCM, FC250 (~30HRC)			Alloy steel. Die steel (<35HRC)			Stainless steel AISI1304, aisi1316		
ΦD (mm)	Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)		Rev(min⁻¹)	Cutting speed (mm/min)	
		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes		2 Flutes	4 Flutes
1	30400	240	384	16000	96	154	9600	56	90	8000	48	77
2	17600	352	512	8800	144	173	5760	88	109	4800	72	90
3	13600	384	560	6800	160	192	4240	104	128	3520	88	109
4	11200	464	704	5760	232	346	3520	144	212	2400	88	173
5	9600	552	832	4800	240	365	2880	144	224	1920	88	186
6	8800	632	960	4240	272	404	2560	152	231	1760	104	205
8	6400	640	960	3200	288	436	1920	152	231	1280	104	212
10	5120	576	864	2560	248	378	1520	120	186	1040	88	186
12	3200	472	704	2160	208	320	1280	104	154	800	72	148
16	2560	360	538	1600	152	231	960	80	116	640	56	116
20	2000	288	736	1280	128	192	800	64	96	512	48	90

Matters need attention in usage

1. If no good rigidity of the work piece, or noise happens when operating, please reduce the rotation rate or feed rate moderately.
2. If processing with sudden feed way, please reduce the feed rate to 1/3.
3. Please take the wet-type processing when cutting stainless steel. E.g. when cutting stainless steel of Austenite, the most efficient way is to use non-water-soluble cutting fluid.

Non - standard tool

Non - standard tool

CARBIDE AND MILLS

micro diameter 2 flutes square and mills

004

2 flutes square end mills

005

Long shank 2 flutes square end mills

006

Long flute 2 flutes square end mills

007

For stainless steel processing 3 flutes square and mills

008

3 flutes square and mills

009

4 flutes square end mills

010

For stainless steel processing 4 flutes square end mills

011

Long shank 4 flutes square and mills

012

Long flute 4 flutes square and mills

013

High helix angle 2 flutes square end mills

014

High helix angle 4 flutes square end mills

015

6 flutes square end mills

016

Long flute 6 flutes square end mills

017

micro diameter 2 flutes ball nose end mills

018

2 flutes ball nose end mills

019

Long 2 flutes ball nose end mills

020

4 flutes ball nose end mills

021

Long shank 4 flutes ball nose end mills

022

2 flutes corner radius end mills

023

Long shank 2 flutes corner radius end mills

024

4 flutes corner radius end mills

025

Long shank 4 flutes corner radius end mills

026

6 flutes corner radius end mills

027

2 flutes corner radius end mills

028

3 flutes corner radius end mills

029

4 flutes corner radius end mills

030

For aluminium alloy processing 2 flutes square end mills

031

For aluminium alloy processing 3 flutes tsquare end mills

032

For aluminium alloy processing long flute 2 flutes square end mills

033

For aluminium alloy processing long flute 3 flutes square end mills

034

For aluminium alloy processing 2 flutes ball nose end mills

035

Aluminium 3 Blade Ball special cutter

036

3 flutes roughing end mills

037

4 flutes roughing end mills

038

2 flutes slot cutters

039

Long Neck short 2 flutes square end mills

040

Long neck short flute 2 flutes ball nose end mills

041

Long neck short flute 2 flutes corner radius end mills

042

Taper flute 2 flutes squa end mills

043

Taper flute 4 lutes square end mills

045

Taper flute 2 flutes ball nose and mills

046

2 blade cutter drill

047

45° / 60° L-groove cutters

048

60° / 90° / 120° V-groove cutters

049

60° center drills

050

2 / 3 / 4 flutes corner rounding cutters

051

60° / 90° / 120° 2 NC spotting drills

052

Precision Machine Reamer

053

Micro-diameter drill tungsten steel standard 2 flutes

054

Standard 2 blade high-speed drill

055

High-speed tungsten steel drill Duanren type within the cold 2 flutes (3xd)

056

High-speed tungsten steel drill Duanren type within the cold 2 flutes (5xd)

057

Tungsten steel rod (burin)

058

Solid Carbide Saw Mills

059

Welding type standard 4 flutes tungsten steel finishing mills

060

Welding standard 2 flutes tungsten steel finishing mills

061

Welding thick steel cutter blade-type tungsten

062

Tungsten welding steel T-blate cutter (tooth level)

063

Tungsten welding steel T-bade cutter (the wrong tooth)

064

Tungsten steel blade welding sets roughing cutter

065

Tungsten welding steel blade cutter sleeve

066

NC TOOL HOLDERS

077

078

079

080

081

082

083

084

085

086

087

088

089

090

091

092

093

094

095

096

097

098

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NC MILLING CUTTERS & CUTTER HEADS

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HIGH PRECISION BORING CUTTERS

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NOTES

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