

*Create a world-famous cutting tool brand and
become a prestigious enterprise.*



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A Turning

General turning

Parting and grooving

Threading

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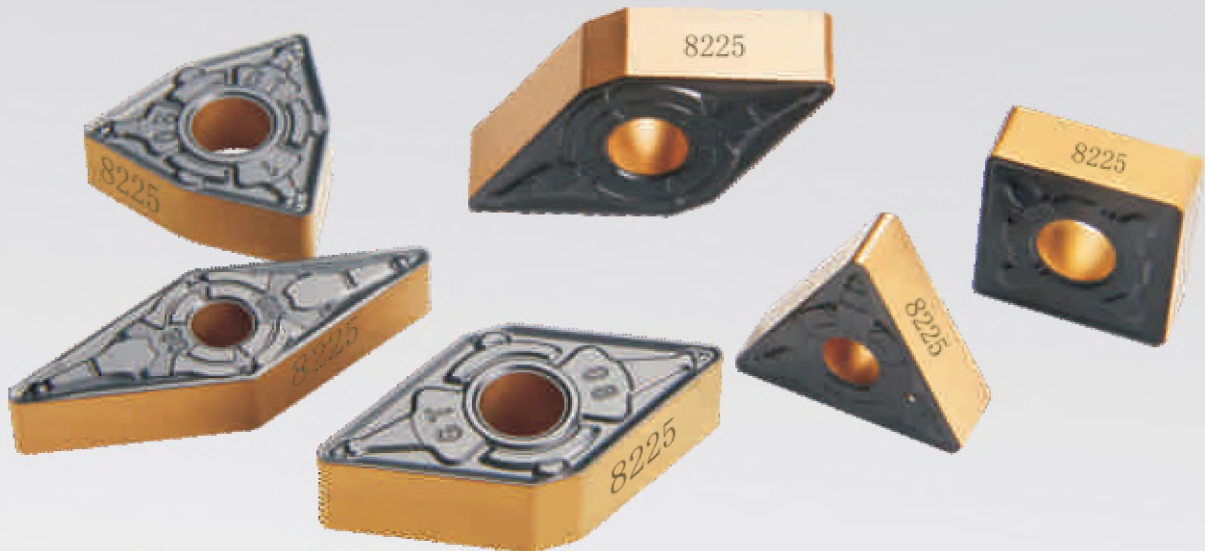
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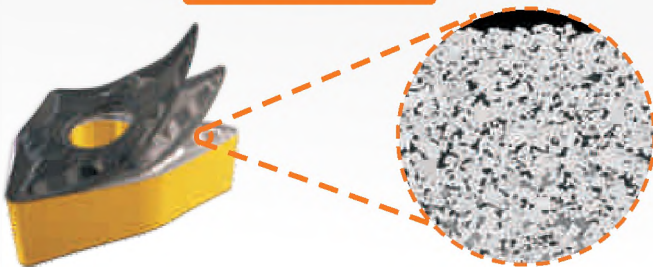
Steel turning

We offer a series of durable and efficient steel turning products, all of which can deliver good machining quality.



New grade **HR8225**

New substrate



- Brand-new carbide substrate with high strength, outstanding wear resistance and reliable toughness;
- The strengthened bonding phase can effectively protect the substrate from high temperature plastic deformation;
- The functional gradient layer with high bonding phase ensure good anti-cracking performance;
- Well-distributed refined hard phase particles show both toughness and good wear resistance;
- The improved precision molding technique further improves the size accuracy.

New coating



- High-strength directionally grown alumina is deposited on columnar fine-grained titanium carbonitride, forming a brand-new composite multilayer CVD coating;
- The smooth coating surface effectively reduces chip adhesion.



GF chipbreaker: Supported by a large rake angle design plus a cutting edge inclination, low cutting force and strong chip control ability, it is suitable for small cutting depth and finish machining.



GM chipbreaker: Advanced balance of sharpness and high-strength creates applicability for multiple purposes, and provides efficient cutting and long service life.



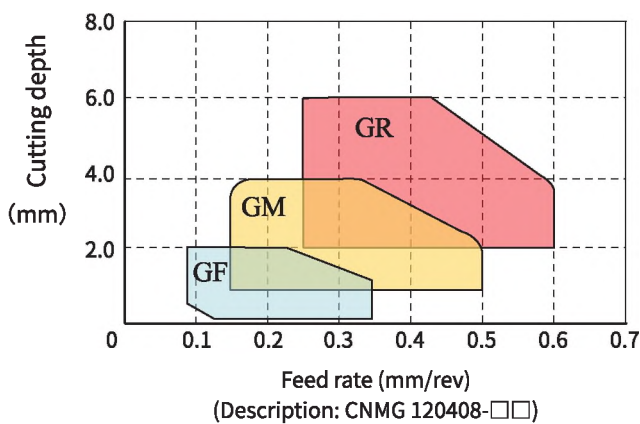
GR chipbreaker: With a wide chamfer and high-strength insert, it can achieve good chip control ability, reduce rake face damage and extend the service life.



HR8115



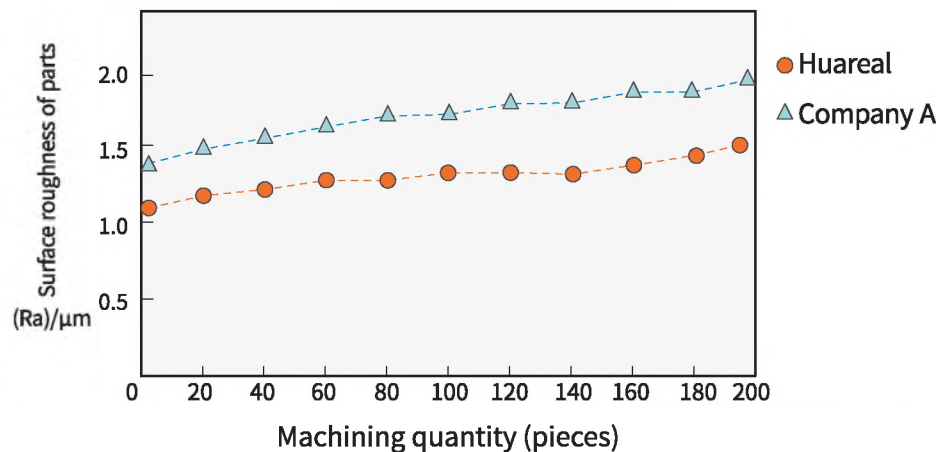
HR8225



Cutting data

Chipbreaker	Grade	Cutting speed(v_c) (mm/min)	Feed rate(f_n) (mm/r)	Cutting depth(a_p) (mm)
GF	HR8115	240-450	0.08-0.35	0.30-2.00
	HR8225	240-420		
GM	HR8115	200-420	0.15-0.50	1.00-4.00
	HR8225	200-400		
GR	HR8225	180-300	0.25-0.60	2.00-6.00

Workpiece name: Shaft parts
 Workpiece material: 45# steel
 Machining method: Wet external turning
 Insert: DNMG150408-GF
 HR8115
 Machining parameters: $v_c=338\text{m/min}$,
 $f_r=0.2\text{mm/r}$
 $a_p=0.4\text{mm}$



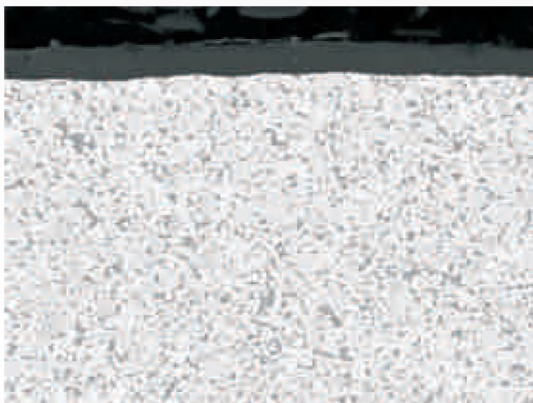
Stainless steel turning

BF, BM, BR and other grooves can meet the requirements of stainless steel turning from finish machining to rough machining.



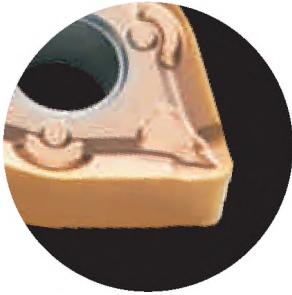
New grade for stainless steel turning

HR7225



Structure of HR7225

- The brand-new nano-gradient composite structure "**H²-Flex**" coating, strengthened by non-metal modified components, has ultra-high nano-hardness, good cohesion failure resistance and film-substrate adhesion.
- The well-distributed refined submicron hard phases and optimized bonding phase composition together improve the wear resistance and toughness of the substrate.



BF

With low cutting force and strong chip control ability, the edge is a good solution for small cutting depth and finish machining.



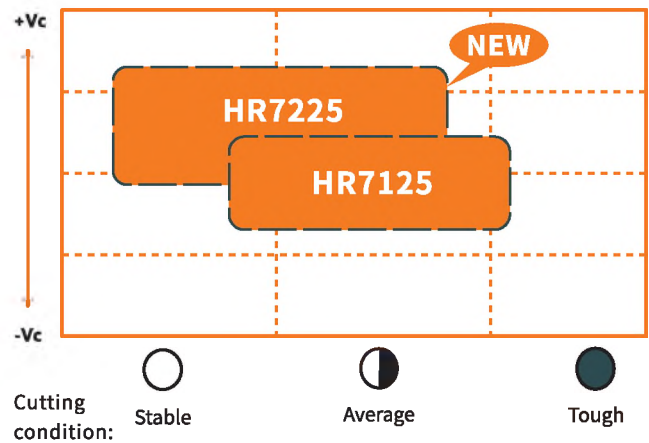
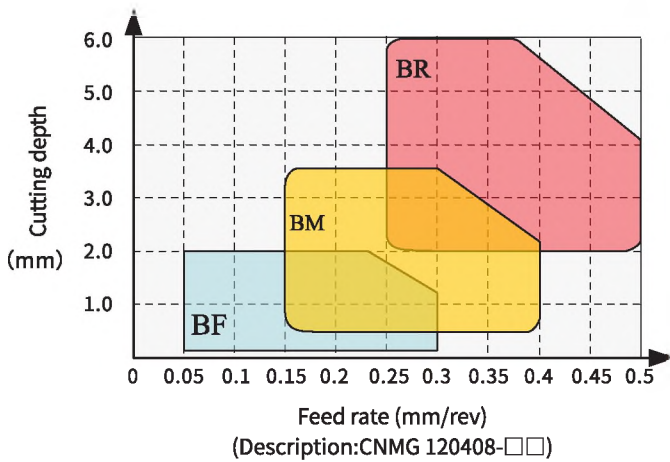
BM

The edge micro-machining technology guarantees both sharpness and high strength, and thus meet the machining requirements of high efficiency and long service life of stainless steel.



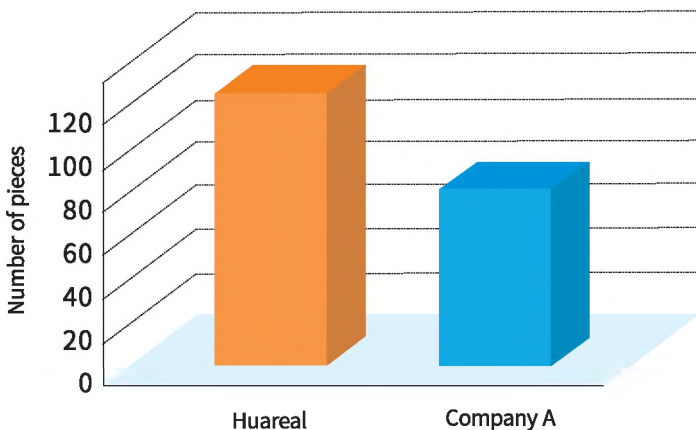
BR

Thanks to the optimized design of chip breaking convex plate with high strength insert, it is suitable for intermittent machining of stainless steel and light-load rough machining.



Workpiece material: SUS304
 Machining method: wet external semi-finish turning
 Insert: VNMG160408-BM HR7225
 Machining parameters: $v_c=170\text{m/min}$,
 $f_n=0.2\text{mm/r}$, $a_p=1.2\text{mm}$

Cutting data (HR7225)



Chipbreaker	Cutting speed (m/min)	Feed rate (mm/r)	Cutting depth (mm)
BF	200	0.05	0.20
	320	0.30	2.00
BM	150	0.15	0.50
	240	0.40	3.50
BR	140	0.25	2.00
	200	0.50	6.00

Cast iron turning



All-round chipbreaker: top choice for cast iron turning



Flat chipbreaker: applicable to cast iron turning under unstable working conditions



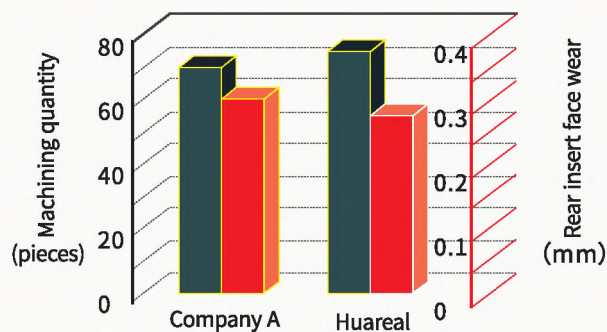
Structure of HR6115

Cutting data (HT300)

Chipbreaker Grade	All-round chipbreaker HR6115	All-round chipbreaker Flat chipbreaker HR6115	All-round chipbreaker Flat chipbreaker HR6115
Cutting speed (m/min)	250 --- 600	230 --- 550	200 --- 500
Feed rate (mm/r)	0.05 --- 0.20	0.10 --- 0.35	0.30 --- 0.50
Cutting depth (mm)	0.20 --- 1.50	1.00 --- 3.00	2.50 --- 5.00
Machining type	Finishing	Semi-finishing	Finishing

Cases of cast iron Material machining

Material of workpiece: ht250
 Machining method: external turning
 Insert: WNMG080412
 All-round chipbreaker
 Machining parameters:
 $vc=415\text{m/min}$,
 $fn=0.25\text{mm/r}$,
 $ap=1.2\text{mm}$

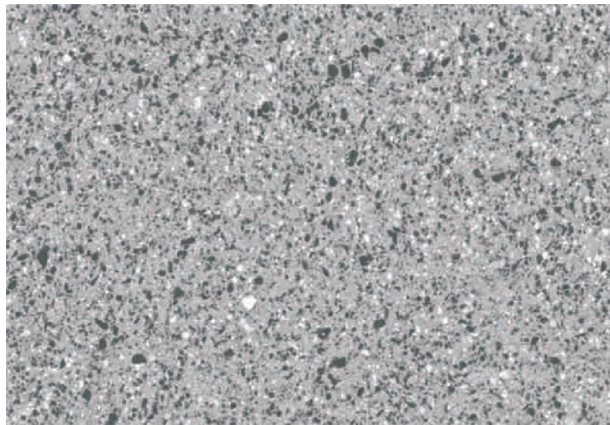


Cermet insert

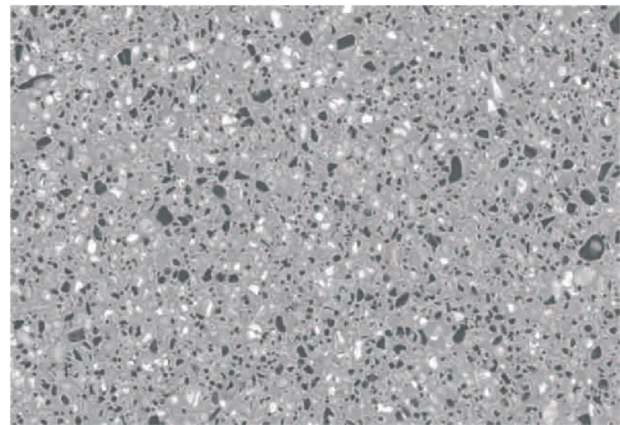


HRC10: It has excellent wear resistance, good chemical stability and solid adhesion resistance. Therefore, it is an appropriate solution for continuous high-speed turning of carbon steel, alloy steel, ductile iron, etc., with both high quality and high efficiency of finishing.

HRC20: With wide versatility, good wear resistance and collapse resistance, it is suitable for continuous and intermittent finishing and semi-finishing of carbon steel, alloy steel and ductile iron, providing both high surface quality and high machining efficiency.



Structure of HRC10



Structure of HRC20

Cutting data for cermet insert				
Grade	HRC10		HRC20	
	< 250HB	> 250HB	< 250HB	> 250HB
Material hardness	< 250HB	> 250HB	< 250HB	> 250HB
Cutting speed (m/min)	150 --- 300	150 --- 220	100 --- 250	100 --- 200
Feed rate (mm/r)	0.10 --- 0.30	0.05 --- 0.25	0.15 --- 0.35	0.10 --- 0.25
Cutting depth (mm)	0.20 --- 1.00	0.20 --- 0.80	0.40 --- 2.50	0.40 --- 2.00
	Machining range		Finishing	
			Semi-finishing	

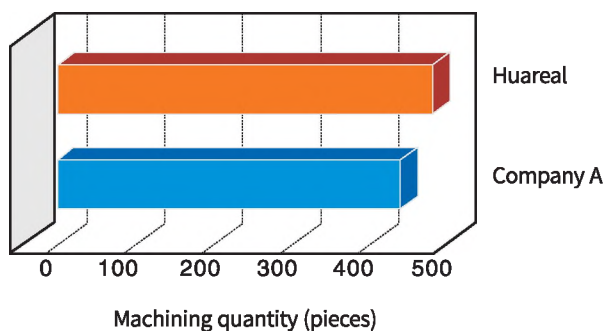
Machining case of cermet insert

Workpiece material: Gear shaft, 20MnTiB, 280-300HB

Machining method: Wet external and end face finish turning

Insert: WNMG080404HQ, HRC20

Machining parameters: $v_c=240\text{m/min}$, $f_r=0.15\text{-}0.25\text{mm/r}$, external circle $a_p=0.4\text{mm}$, end face $a_p=0.25\text{mm}$



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Grade code key



① Grade code

② Classification codes

Number	5	6	7	8	9
Classification of materials	General	Cast iron	Stainless steel	Steel	High-temp alloy

③ Number of grades in the same group

- 1— 1st Gen
- 2— 2nd Gen
- 3— 3rd Gen

④ ISO material classification number

05	10
15	20
25	30
35	40

Overview of general turning grades

Type	Material	ISO	CVD coating					PVD coating				Cemented carbide		Cermet		ISO	
			HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10		HRC20
	Non-alloyed steel/Alloy steel	P01														P01	
		P05															P05
		P10	HR8115												HRC10		P10
		P15		HR8125	HR8225												P15
		P20															P20
		P25		HR8125	HR8225												P25
		P30															P30
		P35															P35
		P40															P40
		P45															P45
		P50															P50
	Stainless steel	M05														M05	
		M10														M10	
		M15						HR7115								M15	
		M20							HR7125	HR7225						M20	
		M25									HR5125	HR5225				M25	
		M30														M30	
		M35														M35	
		M40														M40	
		M45														M45	
	Cast iron	K01													K01		
		K05													K05		
		K10													K10		
		K15													K15		
		K20						HR6115							K20		
		K25													K25		
		K30													K30		
		K35													K35		
		K40													K40		
		K45													K45		
		K50													K50		
	Aluminum/Aluminum alloy	S01													S01		
		S05													S05		
		S10													S10		
		S15													S15		
		S20													S20		
		S25													S25		
		S30													S30		
		S40													S40		
	High-temp alloy	N01													N01		
		N05													N05		
		N10						HR9105							N10		
		N15							HR7115						N15		
		N20								HR7125	HR7225				N20		
		N25													N25		
		N30													N30		

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- Short hole drills
- Solid carbide drills

General turning inserts code key

Shape code			Chipbreaker and clamping form							
			B	Yes	N/A		N	N/A	N/A	
			H	Yes	Single-sided		R	N/A	Single-sided	
			C	Yes	N/A		F	N/A	Double-sided	
			J	Yes	Double-sided		A	Yes	N/A	
			W	Yes	N/A		M	Yes	Single-sided	
		Others	T	Yes	Single-sided		G	Yes	Double-sided	
			Q	Yes	N/A		X	---	---	special
			U	Yes	Double-sided					
			Code	Hole	Chipbreaker	Insert section	Code	Hole	Chipbreaker	Insert section

C **N** **M** **G**

Major clearance angle			
Code	Clearance angle	Code	Clearance angle
A		B	
C		D	
E		F	
G		N	
P		O	Others

Tolerance (mm)										
Class	Corner height (m)	Inscribed circle (ΦD)	Thickness (S)	◆ Tolerance requirements M-class (Distinguished by shape and inscribed circle size) ◆ Corner height (m) tolerance						
				Inscribed circle	Regular triangle	Square	80° rhombus	55° rhombus	35° rhombus	Circular
A	±0.005	±0.025	±0.025	6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
F	±0.005	±0.013	±0.025	9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
C	±0.013	±0.025	±0.025	12.7	±0.13	±0.13	±0.13	±0.15	---	---
H	±0.013	±0.013	±0.025	15.875	±0.15	±0.15	±0.15	±0.18	---	---
E	±0.025	±0.025	±0.025	19.05	±0.15	±0.15	±0.15	±0.18	---	---
G	±0.025	±0.025	±0.13	25.4	---	±0.18	---	---	---	---
J	±0.005	±0.05-±0.13	±0.025	◆ Inscribed circle (ΦD) tolerance						
K	±0.013	±0.05-±0.13	±0.025	Inscribed circle	Regular triangle	Square	80° rhombus	55° rhombus	35° rhombus	Circular
L	±0.025	±0.05-±0.13	±0.025	6.35	±0.05	±0.05	±0.05	±0.05	±0.05	---
M	±0.08-±0.18	±0.05-±0.13	±0.13	9.525	±0.05	±0.05	±0.05	±0.05	±0.05	±0.05
N	±0.08-±0.18	±0.05-±0.13	±0.025	12.7	±0.08	±0.08	±0.08	±0.08	---	±0.08
U	±0.13-±0.38	±0.08-±0.25	±0.13	15.875	±0.10	±0.10	±0.10	±0.10	---	±0.10
				19.05	±0.10	±0.10	±0.10	±0.10	---	±0.10
				25.4	---	±0.13	---	---	---	±0.13

32.00			32					
31.75			31					
25.40			25	25				
25.00	25	25	25					
20.00			20					
19.05	19		19	19	33			
16.00		19	16					
15.875	16		15	15	27			
12.70	12	15	12	12	22	22	08	
12.00			12					
10.00			10					
9.525	09	11	09	09	16	16	06	16
8.00			08					
6.35	06	07			11	11		
6.00			06					
5.56					09			
5.50			05					
3.97					06			
Inscribed circle diameter (mm)								
	C	D	R	S	T	V	W	K
Insert shape								
Cutting edge length								

12	12.70
10	11.11
T9	9.72
09	9.52
07	7.94
T6	6.75
06	6.35
T5	5.95
05	5.56
T4	4.96
04	4.76
T3	3.97
03	3.18
T2	2.58
02	2.38
T1	1.98
01	1.59
T0	0.99
00	0.79
Code	Thickness (mm)
Insert thickness	

12 04 08 - GM (ISO)

4 3 2 (inch)

Inscribed circle	
Code	Inscribed circle diameter (mm)
2	6.35
3	9.525
4	12.7
5	15.875
6	19.05
8	25.4

Thickness	
Code	Thickness (mm)
2	3.18
3	4.76
4	6.35
5	7.94
6	9.52

Corner radius	
Code	Corner radius (mm)
0	0.2
1	0.4
2	0.8
3	1.2
4	1.6
5	2.0
6	2.4

Corner radius code	
Code	Corner radius (mm)
00	No fillet
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others
Insert diameter Mo (Metric)	Round insert

Chipbreaker code		
GF	GM	GR
BF	BM	BR
All-round chipbreaker	Flat chipbreaker	GZ

- A
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- Short hole drills
- Solid carbide drills

Overview of general turning inserts

Usage	Tolerance	Chipbreaker	Features	Chipbreaker diagram	Sectional view of chipbreaker
For finishing	M	GF	<p>Recommended chipbreaker for finishing of P-type material</p> <ul style="list-style-type: none"> ◆ Extra-large positive rake angle, less cutting resistance. ◆ Positive cutting inclination angle can well control chip flow direction. ◆ The two-stage chip breaking table ensures good chip breaking even at small cutting depth. 		
		BF	<p>Recommended chipbreaker for finishing of M-type material</p> <ul style="list-style-type: none"> ◆ Sharp cutting edge, less cutting resistance. ◆ Good chip disposal performance even at small cutting depth. 		
For semi-finishing	M	GM	<p>Recommended chipbreaker for semi-finishing of P-type material</p> <ul style="list-style-type: none"> ◆ Special edge design, ensuring both sharpness and strength. ◆ The curved front face with variable cutting edge width and rake angle ensures the smooth flow and good control of chips. ◆ With high versatility and wide cutting range, efficient and consistent machining is achieved. 		
		GQ	<p>Semi-finishing of P-type material</p> <ul style="list-style-type: none"> ◆ It is suitable for finishing to semi-finishing of P-type material. ◆ Good chip removal performance with high versatility. 		

A

General turning

Parting and grooving

Threading

B





















Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

	80° C-type	55° D-type	90° S-type	60° T-type	35° V-type	80° W-type
						
	A19	A23	A26	A29	A32	A33
						
	A19	A23	A26	A29	A32	A34
						
	A19	A23	A26	A29	A32	A34
						
				A29		A34

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Solid carbide drills

Overview of general turning inserts

Usage	Tolerance	Chipbreaker	Features	Chipbreaker diagram	Sectional view of chipbreaker
For semi-finishing	M	BM	<p>Recommended chipbreaker for semi-finishing of stainless steel</p> <ul style="list-style-type: none"> ◆ Sharp cutting edge, less cutting resistance, good chip disposal performance even at small cutting depth. ◆ The micro-passivated cutting edge reduces the formation of build-up edge. 		
		All-round	<p>General machining chipbreaker</p> <ul style="list-style-type: none"> ◆ Double-sided chipbreaker, especially suitable for K-type material machining. ◆ Recommended cutting parameters 		
		Flat	<p>Machining grooves for brittle materials and H-type materials</p> <ul style="list-style-type: none"> ◆ With high structural strength and good fit to the cutter bar, it is more suitable for unstable cutting of cast iron. 		
		SM	<p>Semi-finish machining grooves for S-type material and titanium alloys</p> <ul style="list-style-type: none"> ◆ Light and fast in cutting, the influence of work hardening and build-up edge on insert is effectively reduced. 		

A

General turning

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Threading

B






















Indexable milling

Solid carbide end mills

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Short hole drills

Solid carbide drills

	80° C-type	55° D-type	90° S-type	60° T-type	35° V-type	80° W-type
	 A19	 A24	 A26	 A29	 A32	 A34
	 A20	 A24	 A27	 A30	 A32	 A35
	 A20	 A25	 A27	 A30	 A33	 A35
	 A21	 A25				 A35

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Solid carbide drills

Overview of general turning inserts

Usage	Tolerance	Chipbreaker	Features	Chipbreaker diagram	Sectional view of chipbreaker
For rough machining	M	GR	<p>Recommended chipbreaker for roughing of P-type material</p> <ul style="list-style-type: none"> Chipbreaking table with raised corner can effectively control the chip flow direction at small cutting depth; With a large rake angle and wide chamfer, both insert strength and sharpness are ensured; Double-sided groove is more cost-effective with good chip removal performance and enhanced versatility; It is suitable for roughing and semi-finishing of light-load cutting. 		
		BR	<p>Recommended chipbreaker for roughing of M-type material</p> <ul style="list-style-type: none"> Even edge passivation; Optimized chipbreaker convex plate; With firm cutting chamfer and land, it is capable of intermittent and heavy finishing; Large chip space enable it to achieve roughing and high feed finishing. 		
For heavy machining	M	GZ	<p>Heavy machining chipbreaker for P-type material</p> <ul style="list-style-type: none"> The unique chipbreaker convex plate design on the rake face reduces the chip contact area at large cutting depth and provides excellent chip control. The sharp cutting edge can effectively reduce the cutting force. 		
		GX	<p>Heavy machining chipbreaker for P-type material</p> <ul style="list-style-type: none"> The variable chamfer design and special chipbreaker provide excellent chip control. The strong cutting edge can bear great impact. 		

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Indexable milling

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Short hole drills

Solid carbide drills

	80° C-type	55° D-type	90° S-type	60° T-type	35° V-type	80° W-type
	 A21	 A25	 A27	 A30		 A35
	 A21		 A28	 A31		 A35
	 A21		 A28			
	 A22		 A28			

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Overview of general turning inserts

Usage	Tolerance	Chipbreaker	Features	Chipbreaker diagram	Sectional view of chipbreaker
For semi-finish machining	M	TM	<p>General chipbreaker for semi-finishing</p> <ul style="list-style-type: none"> It is suitable for internal or external semi-finishing of steel, stainless steel and cast iron. 		
			<p>Aluminum alloy machining chipbreaker</p> <ul style="list-style-type: none"> With a large rake angle and clearance angle, the cutting edge of the insert becomes sharper and therefore, cutting can be done in a faster and lighter pattern with effective chip breaking. 		
Aluminum alloy machining	G	AK	<p>Aluminum alloy machining chipbreaker</p> <ul style="list-style-type: none"> With a large rake angle and clearance angle, the cutting edge of the insert becomes sharper and therefore, cutting can be done in a faster and lighter pattern with effective chip breaking. 		
Usage	Tolerance	Chipbreaker	Features	Chipbreaker diagram	Sectional view of chipbreaker
Profiling insert	M	All-round chipbreaker	<ul style="list-style-type: none"> With high strength, the cutting edge secures high safety and is the first choice for rough profiling. It is suitable for train wheel turning. 		
		MR	<ul style="list-style-type: none"> Large chip-breaking space prevents chip blockage during large cutting depth machining. The small pit group improves the chip machining performance during small cutting depth machining. It is suitable for train wheel turning. 		
Usage	Tolerance	Chipbreaker	90° S-type	Chipbreaker	90° S-type
Planer milling machining	M	HAF		HSF	
			A36		A36

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Indexable milling

Solid carbide end mills

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Short hole drills

Solid carbide drills

	80° C-type	55° D-type	90° S-type	60° T-type	35° V-type	80° W-type
						
	A38	A39	A40	A41	A42	
						
	A38	A39		A41	A42	
R-type						
						
			A43			
						
			A43			
	Usage	Tolerance	Chipbreaker	120° H-type		90° S-type
Pipe-stripping machining	U		BG			
				A37		A37

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A

80° CN □ □

General turning

Parting and grooving

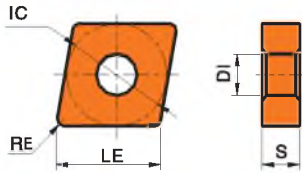
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition													
	●	●	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel										●	●			
K Cast iron										●	●			
N Non-ferrous metal													●	●
S Heat-resistant alloy Titanium alloy										●	●			

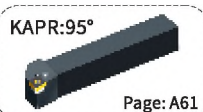
Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide		Cermets					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
Finishing		CNMG120404-GF	12.9	12.7	4.76	5.16	0.4	★	☆	★													
		CNMG120408-GF	12.9	12.7	4.76	5.16	0.8	★	☆	★													
Finishing		CNMG120404-BF	12.9	12.7	4.76	5.16	0.4																
		CNMG120408-BF	12.9	12.7	4.76	5.16	0.8																
Semi-finishing		CNMG120404-GM	12.9	12.7	4.76	5.16	0.4	★	☆	★													
		CNMG120408-GM	12.9	12.7	4.76	5.16	0.8	★	☆	★													
		CNMG120412-GM	12.9	12.7	4.76	5.16	1.2	★	☆	★													
		CNMG160608-GM	16.1	15.875	6.35	6.35	0.8	★	☆	★													
		CNMG160612-GM	16.1	15.875	6.35	6.35	1.2	★	☆	★													
Semi-finishing		CNMG160616-GM	16.1	15.875	6.35	6.35	1.6	★	☆	★													
		CNMG120404-BM	12.9	12.7	4.76	5.16	0.4																
		CNMG120408-BM	12.9	12.7	4.76	5.16	0.8																
Semi-finishing		CNMG120412-BM	12.9	12.7	4.76	5.16	1.2																

★ Recommended grade ☆ Available grade

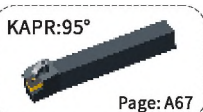
Applicable tools



PCBNR/L

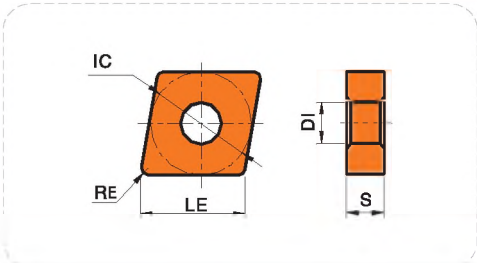


PCLNR/L



MCLNR/L

80° CN □ □



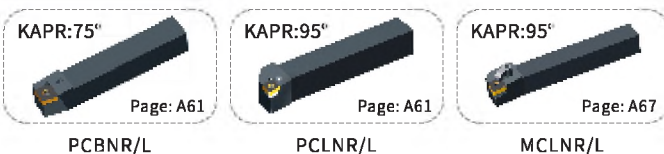
Working condition: ● Stable ● Average ‡ Tough

Workpiece material	Working condition												
	●	●	●	●	●	●	●	●	●	●	●	●	
P Steel	●	●	●	‡								●	●
M Stainless steel									●	●			
K Cast iron			●	●									
N Non-ferrous metal												●	●
S Heat-resistant alloy Titanium alloy									●	●			

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide		Cermet					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
Cast iron machining		CNMG120404	12.9	12.7	4.76	5.16	0.4				★												
		CNMG120408	12.9	12.7	4.76	5.16	0.8				★												
		CNMG120412	12.9	12.7	4.76	5.16	1.2				★												
		CNMG120416	12.9	12.7	4.76	5.16	1.6				★												
		CNMG160608	16.1	15.875	6.35	6.35	0.8				★												
		CNMG160612	16.1	15.875	6.35	6.35	1.2				★												
		CNMG160616	16.1	15.875	6.35	6.35	1.6				★												
		CNMG190612	19.3	19.05	6.35	7.94	1.2				★												
Cast iron machining		CNMA120404	12.9	12.7	4.76	5.16	0.4				★												
		CNMA120408	12.9	12.7	4.76	5.16	0.8				★												
		CNMA120412	12.9	12.7	4.76	5.16	1.2				★												
		CNMA120416	12.9	12.7	4.76	5.16	1.6				★												
		CNMA160608	16.1	15.875	6.35	6.35	0.8				★												
		CNMA160612	16.1	15.875	6.35	6.35	1.2				★												
		CNMA160616	16.1	15.875	6.35	6.35	1.6				★												
		CNMA190612	19.3	19.05	6.35	7.94	1.2				★												
CNMA190616	19.3	19.05	6.35	7.94	1.6				★														

★ Recommended grade ☆ Available grade

Applicable tools



Page: A61 Page: A61 Page: A67

- A General turning
- Parting and grooving
- Threading
- B Indexable milling
- Solid carbide end mills
- C Short hole drills
- Solid carbide drills

Turning / General turning

A

80° CN□□

General turning

Parting and grooving

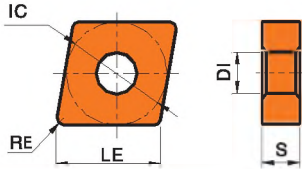
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



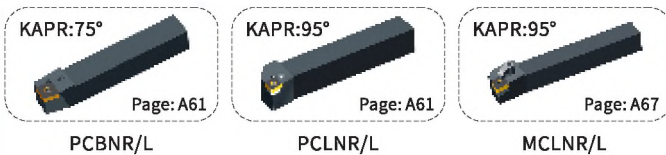
Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P	● ● ● ✱				
M		● ●			
K			● ●		
N				● ●	
S					● ●

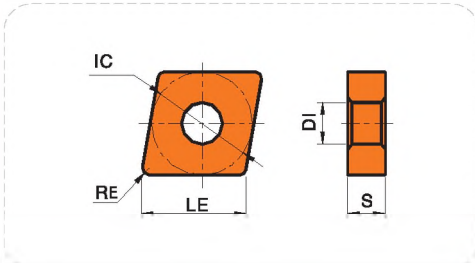
Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide	Cermet							
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Semi-finishing		CNMG120404-SM	12.9	12.7	4.76	5.16	0.4					☆	★									
		CNMG120408-SM	12.9	12.7	4.76	5.16	0.8					☆	★									
		CNMG120412-SM	12.9	12.7	4.76	5.16	1.2					☆	★									
Rough machining		CNMG120408-GR	12.9	12.7	4.76	5.16	0.8	☆	☆	★												
		CNMG120412-GR	12.9	12.7	4.76	5.16	1.2	☆	☆	★												
		CNMG190608-GR	19.3	19.05	6.35	7.94	0.8	☆	☆	★												
		CNMG190612-GR	19.3	19.05	6.35	7.94	1.2	☆	☆	★												
Rough machining		CNMG120408-BR	12.9	12.7	4.76	5.16	0.8						☆	★								
		CNMG120412-BR	12.9	12.7	4.76	5.16	1.2						☆	★								
		CNMG190616-BR	19.3	19.05	6.35	7.94	1.6						☆	★								
Heavy machining		CNMM190608-GZ	19.3	19.05	6.35	7.94	0.8	★	★													
		CNMM190612-GZ	19.3	19.05	6.35	7.94	1.2	★	★													
		CNMM190616-GZ	19.3	19.05	6.35	7.94	1.6	★	★													
		CNMM190624-GZ	19.3	19.05	6.35	7.94	2.4	★	★													
		CNMM250924-GZ	25.19	25.4	9.525	9.12	2.4	★	★													
		CNMM250932-GZ	25.19	25.4	9.525	9.12	3.2	★	★													

★ Recommended grade ☆ Available grade

Applicable tools



80° CN □ □



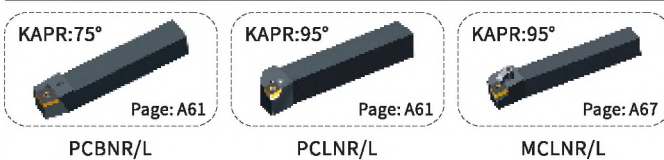
Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P	● ● ● ✱				
M		● ●			
K			● ●		
N				● ●	
S					● ●

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide	Cermet							
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20			
Heavy machining		CNMM190608-GX	19.3	19.05	6.35	7.94	0.8	★	★															
		CNMM190612-GX	19.3	19.05	6.35	7.94	1.2	★	★															
		CNMM190616-GX	19.3	19.05	6.35	7.94	1.6	★	★															
		CNMM190624-GX	19.3	19.05	6.35	7.94	2.4	★	★															
		CNMM250716-GX	25.19	25.4	7.94	9.12	1.6	★	★															
		CNMM250724-GX	25.19	25.4	7.94	9.12	2.4	★	★															
		CNMM250732-GX	25.19	25.4	7.94	9.12	3.2	★	★															
		CNMM250916-GX	25.19	25.4	9.525	9.12	1.6	★	★															
		CNMM250924-GX	25.19	25.4	9.525	9.12	2.4	★	★															
		CNMM250932-GX	25.19	25.4	9.525	9.12	3.2	★	★															

★ Recommended grade ☆ Available grade

Applicable tools



- A General turning
- Parting and grooving
- Threading
- B Indexable milling
- Solid carbide end mills
- C Short hole drills
- Solid carbide drills

A

55°DN □ □

General turning

Parting and grooving

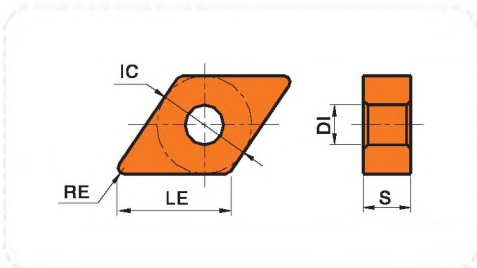
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



Working condition: ● Stable ● Average ✚ Tough

Workpiece material	Working condition												
	●	●	●	●	●	●	●	●	●	●	●	●	
P Steel	●	●	●	✚								●	●
M Stainless steel										●	●		
K Cast iron			●	●									
N Non-ferrous metal												●	●
S Heat-resistant alloy Titanium alloy									●	●			

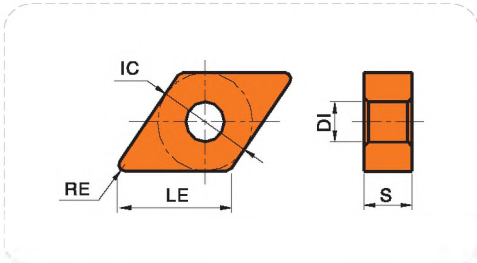
Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide	Cermet					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Finishing		DNMG150404-GF	15.5	12.7	4.76	5.16	0.4	★	☆	★												
		DNMG150408-GF	15.5	12.7	4.76	5.16	0.8	★	☆	★												
		DNMG150604-GF	15.5	12.7	6.35	5.16	0.4	★	☆	★												
		DNMG150608-GF	15.5	12.7	6.35	5.16	0.8	★	☆	★												
Finishing		DNMG150404-BF	15.5	12.7	4.76	5.16	0.4															
		DNMG150408-BF	15.5	12.7	4.76	5.16	0.8								☆	★						
		DNMG150604-BF	15.5	12.7	6.35	5.16	0.4								☆	★						
		DNMG150608-BF	15.5	12.7	6.35	5.16	0.8								☆	★						
Semi-finishing		DNMG150404-GM	15.5	12.7	4.76	5.16	0.4	★	☆	★												
		DNMG150408-GM	15.5	12.7	4.76	5.16	0.8	★	☆	★												
		DNMG150412-GM	15.5	12.7	4.76	5.16	1.2	★	☆	★												
		DNMG150604-GM	15.5	12.7	6.35	5.16	0.4	★	☆	★												
		DNMG150608-GM	15.5	12.7	6.35	5.16	0.8	★	☆	★												
		DNMG150612-GM	15.5	12.7	6.35	5.16	1.2	★	☆	★												

★ Recommended grade ☆ Available grade

Applicable tools



55° DN □ □



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P Steel	● ● ● ✱				● ●
M Stainless steel		● ●			
K Cast iron			● ●		
N Non-ferrous metal				● ●	
S Heat-resistant alloy Titanium alloy					● ●

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide		Cermet				
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Semi-finishing		DNMG150404-BM	15.5	12.7	4.76	5.16	0.4						☆	★								
		DNMG150408-BM	15.5	12.7	4.76	5.16	0.8						☆	★								
		DNMG150412-BM	15.5	12.7	4.76	5.16	1.2						☆	★								
		DNMG150604-BM	15.5	12.7	6.35	5.16	0.4						☆	★								
		DNMG150608-BM	15.5	12.7	6.35	5.16	0.8						☆	★								
		DNMG150612-BM	15.5	12.7	6.35	5.16	1.2						☆	★								
Cast iron machining		DNMG150404	15.5	12.7	4.76	5.16	0.4			★												
		DNMG150408	15.5	12.7	4.76	5.16	0.8			★												
		DNMG150412	15.5	12.7	4.76	5.16	1.2			★												
		DNMG150604	15.5	12.7	6.35	5.16	0.4			★												
		DNMG150608	15.5	12.7	6.35	5.16	0.8			★												
		DNMG150612	15.5	12.7	6.35	5.16	1.2			★												

★ Recommended grade ☆ Available grade

Applicable tools



A
General turning
Parting and grooving
Threading
B
Indexable milling
Solid carbide end mills
C
Short hole drills
Solid carbide drills

A

55° DN □ □

General turning

Parting and grooving

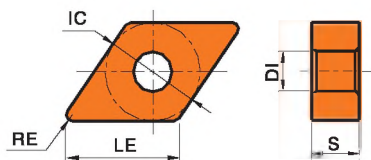
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



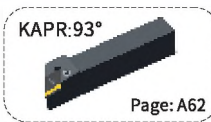
Working condition: ● Stable ● Average ⚡ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P	● ● ● ⚡				
M		● ● ● ●			
K			● ●		
N				● ●	
S					● ●

Machining type	Insert shape	Type	Basic dimension (mm)					CVD			PVD		Cemented carbide	Cermet						
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
Cast iron machining		DNMA150404	15.5	12.7	4.76	5.16	0.4				★									
		DNMA150408	15.5	12.7	4.76	5.16	0.8				★									
		DNMA150412	15.5	12.7	4.76	5.16	1.2				★									
		DNMA150604	15.5	12.7	6.35	5.16	0.4				★									
		DNMA150608	15.5	12.7	6.35	5.16	0.8				★									
		DNMA150612	15.5	12.7	6.35	5.16	1.2				★									
Semi-finishing		DNMG150404-SM	15.5	12.7	6.35	5.16	0.4				☆	★								
		DNMG150608-SM	15.5	12.7	6.35	5.16	0.8				☆	★								
		DNMG150612-SM	15.5	12.7	6.35	5.16	1.2				☆	★								
Rough machining		DNMG150608-GR	15.5	12.7	6.35	5.16	0.8	☆	☆	★										
		DNMG150612-GR	15.5	12.7	6.35	5.16	1.2	☆	☆	★										

★ Recommended grade ☆ Available grade

Applicable tools



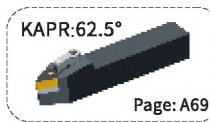
PDJNR/L



PDNN

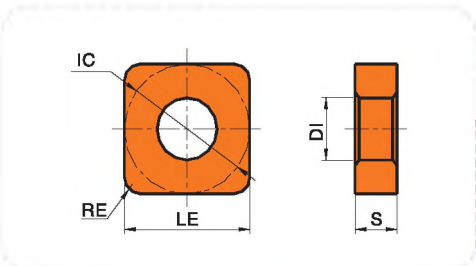


MDJNR/L



MDPNN

90°SN □ □



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P	● ● ● ✱				
M		● ●			
K			● ●		
N				● ●	
S					● ●

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide	Cermet					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Finishing		SNMG120404-GF	12.7	12.7	4.76	5.16	0.4	★	☆	★												
		SNMG120408-GF	12.7	12.7	4.76	5.16	0.8	★	☆	★												
Finishing		SNMG120404-BF	12.7	12.7	4.76	5.16	0.4						☆	★								
		SNMG120408-BF	12.7	12.7	4.76	5.16	0.8						☆	★								
Semi-finishing		SNMG120404-GM	12.7	12.7	4.76	5.16	0.4	★	☆	★												
		SNMG120408-GM	12.7	12.7	4.76	5.16	0.8	★	☆	★												
		SNMG120412-GM	12.7	12.7	4.76	5.16	1.2	★	☆	★												
Semi-finishing		SNMG120404-BM	12.7	12.7	4.76	5.16	0.4						☆	★								
		SNMG120408-BM	12.7	12.7	4.76	5.16	0.8						☆	★								
		SNMG120412-BM	12.7	12.7	4.76	5.16	1.2						☆	★								

★ Recommended grade ☆ Available grade

Applicable tools



A
General turning
Parting and grooving
Threading
B
Indexable milling
Solid carbide end mills
C
Short hole drills
Solid carbide drills

A

General turning

Parting and grooving

Threading

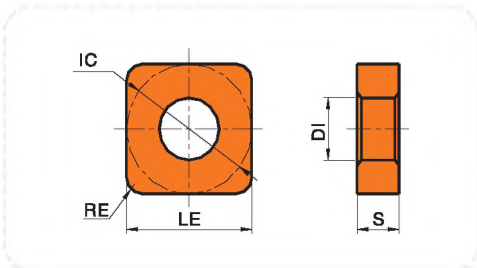
Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

90°SN □ □



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition											
	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel					●	●						
K Cast iron					●	●						
N Non-ferrous metal										●	●	
S Heat-resistant alloy Titanium alloy									●	●		

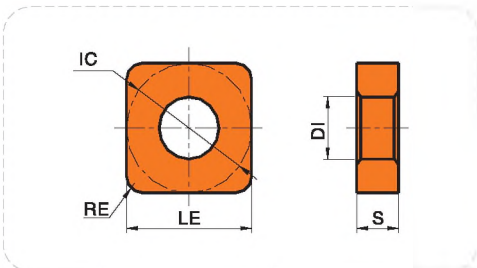
Machining type	Insert shape	Type	Basic dimension (mm)					CVD			PVD			Cemented carbide	Cermet							
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Cast iron machining		SNMG120404	12.7	12.7	4.76	5.16	0.4				★											
		SNMG120408	12.7	12.7	4.76	5.16	0.8				★											
		SNMG120412	12.7	12.7	4.76	5.16	1.2				★											
		SNMG150608	15.875	15.875	6.35	6.35	0.8				★											
		SNMG150612	15.875	15.875	6.35	6.35	1.2				★											
		SNMG150616	15.875	15.875	6.35	6.35	1.6				★											
		SNMG190612	19.05	19.05	6.35	7.94	1.2				★											
Cast iron machining		SNMA120404	12.7	12.7	4.76	5.16	0.4				★											
		SNMA120408	12.7	12.7	4.76	5.16	0.8				★											
		SNMA120412	12.7	12.7	4.76	5.16	1.2				★											
		SNMA150608	15.875	15.875	6.35	6.35	0.8				★											
		SNMA150612	15.875	15.875	6.35	6.35	1.2				★											
		SNMA150616	15.875	15.875	6.35	6.35	1.6				★											
		SNMA190612	19.05	19.05	6.35	7.94	1.2				★											
Rough machining		SNMG120408-GR	12.7	12.7	4.76	5.16	0.8	☆	☆	★												
		SNMG120412-GR	12.7	12.7	4.76	5.16	1.2	☆	☆	★												
		SNMG190608-GR	19.05	19.05	6.35	7.94	0.8	☆	☆	★												
		SNMG190612-GR	19.05	19.05	6.35	7.94	1.2	☆	☆	★												
		SNMG190616-GR	19.05	19.05	6.35	7.94	1.6	☆	☆	★												

★ Recommended grade ☆ Available grade

Applicable tools

Page: A63	Page: A63	Page: A64	Page: A70	Page: A71	Page: A71
PSBNR/L	PSDNN	PSKNR/L	MSBNR/L	MSKNR/L	MSDNN

90°SN□□



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition: ● Stable ● Average ✱ Tough																			
	P	M	K	N	S	HR8.115	HR8.125	HR8.225	HR6.115	HR9.105	HR7.115	HR7.125	HR7.225	HR5.125	HR5.225	HRK10	HRK20	HRC10	HRC20	
P Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel												●	●							
K Cast iron												●	●							
N Non-ferrous metal																	●	●		
S Heat-resistant alloy Titanium alloy												●	●							

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide		Cermets			
			LE	IC	S	DI	RE	HR8.115	HR8.125	HR8.225	HR6.115	HR9.105	HR7.115	HR7.125	HR7.225	HR5.125	HR5.225	HRK10	HRK20	HRC10	HRC20
Rough machining		SNMG120408-BR	12.7	12.7	4.76	5.16	0.8														
		SNMG120412-BR	12.7	12.7	4.76	5.16	1.2														
Heavy machining		SNMM190608-GZ	19.05	19.05	6.35	7.94	0.8	★	★												
		SNMM190612-GZ	19.05	19.05	6.35	7.94	1.2	★	★												
		SNMM190616-GZ	19.05	19.05	6.35	7.94	1.6	★	★												
		SNMM190624-GZ	19.05	19.05	6.35	7.94	2.4	★	★												
		SNMM250924-GZ	25.4	25.4	9.525	9.12	2.4	★	★												
		SNMM250932-GZ	25.4	25.4	9.525	9.12	3.2	★	★												
Heavy machining		SNMM190608-GX	19.05	19.05	6.35	7.94	0.8	★	★												
		SNMM190612-GX	19.05	19.05	6.35	7.94	1.2	★	★												
		SNMM190616-GX	19.05	19.05	6.35	7.94	1.6	★	★												
		SNMM190624-GX	19.05	19.05	6.35	7.94	2.4	★	★												
		SNMM250716-GX	25.4	25.4	7.94	9.12	1.6	★	★												
		SNMM250724-GX	25.4	25.4	7.94	9.12	2.4	★	★												
		SNMM250732-GX	25.4	25.4	7.94	9.12	3.2	★	★												
		SNMM250916-GX	25.4	25.4	9.525	9.12	1.6	★	★												
		SNMM250924-GX	25.4	25.4	9.525	9.12	2.4	★	★												
		SNMM250932-GX	25.4	25.4	9.525	9.12	3.2	★	★												

★ Recommended grade ☆ Available grade

Applicable tools

 Page: A63 PSBNR/L	 Page: A63 PSDNN	 Page: A64 PSKNR/L	 Page: A70 MSBNR/L	 Page: A71 MSKNR/L	 Page: A71 MSDNN
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- A General turning
- Parting and grooving
- Threading
- B Indexable milling
- Solid carbide end mills
- C Short hole drills
- Solid carbide drills

A

60°TN □ □

General turning

Parting and grooving

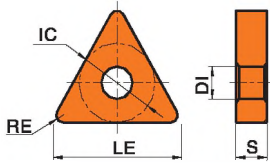
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition											
	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel									●	●		
K Cast iron				●	●							
N Non-ferrous metal											●	●
S Heat-resistant alloy Titanium alloy									●	●		

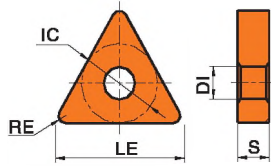
Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide	Cermet						
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
			Finishing		TNMG160404-GF	16.5	9.525	4.76	3.81	0.4	★	☆	★								
		TNMG160408-GF	16.5	9.525	4.76	3.81	0.8	★	☆	★											
Finishing		TNMG160404-BF	16.5	9.525	4.76	3.81	0.4					☆	★								
		TNMG160408-BF	16.5	9.525	4.76	3.81	0.8					☆	★								
Semi-finishing		TNMG160404-GM	16.5	9.525	4.76	3.81	0.4	★	☆	★											
		TNMG160408-GM	16.5	9.525	4.76	3.81	0.8	★	☆	★											
		TNMG160412-GM	16.5	9.525	4.76	3.81	1.2	★	☆	★											
		TNMG220412-GM	22	12.7	4.76	5.16	1.2	★	☆	★											
Semi-finishing		TNMG160404-BM	16.5	9.525	4.76	3.81	0.4						☆	★							
		TNMG160408-BM	16.5	9.525	4.76	3.81	0.8						☆	★							
		TNMG160412-BM	16.5	9.525	4.76	3.81	1.2						☆	★							
Semi-finishing		TNMG160404-GQ	16.5	9.525	4.76	3.81	0.4	★		★											
		TNMG160408-GQ	16.5	9.525	4.76	3.81	0.8	★		★											
		TNMG160412-GQ	16.5	9.525	4.76	3.81	1.2	★		★											

★ Recommended grade ☆ Available grade

Applicable tools

Page: A65	Page: A65	Page: A66	Page: A72	Page: A72	Page: A73
PTFNR/L	PTTNR/L	PTGNR/L	MTGNR/L	MTJNR/L	MTFNR/L

60°TN□□



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P	● ● ● ✱				● ●
M		● ●			
K			● ●		
N				● ●	
S					● ●

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide	Cermet					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Cast iron machining		TNMG160404	16.5	9.525	4.76	3.81	0.4				★											
		TNMG160408	16.5	9.525	4.76	3.81	0.8				★											
		TNMG160212	16.5	9.525	4.76	3.81	1.2				★											
		TNMG220408	22	12.7	4.76	5.16	0.8				★											
		TNMG220412	22	12.7	4.76	5.16	1.2				★											
		TNMG220416	22	12.7	4.76	5.16	1.6				★											
Cast iron machining		TNMA160404	16.5	9.525	4.76	3.81	0.4				★											
		TNMA160408	16.5	9.525	4.76	3.81	0.8				★											
		TNMA160412	16.5	9.525	4.76	3.81	1.2				★											
		TNMA220408	22	12.7	4.76	5.16	0.8				★											
		TNMA220412	22	12.7	4.76	5.16	1.2				★											
		TNMA220416	22	12.7	4.76	5.16	1.6				★											
Rough machining		TNMG160408-GR	16.5	9.525	4.76	3.81	0.8	☆	☆	★												
		TNMG160412-GR	16.5	9.525	4.76	3.81	1.2	☆	☆	★												

★ Recommended grade ☆ Available grade

Applicable tools



- A General turning
- Parting and grooving
- Threading
- B Indexable milling
- Solid carbide end mills
- C Short hole drills
- Solid carbide drills

Turning / General turning

A

60°TN □ □

General turning

Parting and grooving

Threading

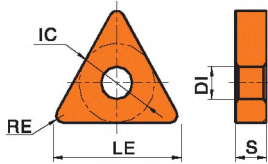
Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

Working condition: ● Stable ● Average ✱ Tough



Workpiece material

P Steel	● ● ● ● ● ● ● ●
M Stainless steel	● ● ● ● ● ● ● ●
K Cast iron	● ● ● ● ● ● ● ●
N Non-ferrous metal	● ● ● ● ● ● ● ●
S Heat-resistant alloy Titanium alloy	● ● ● ● ● ● ● ●

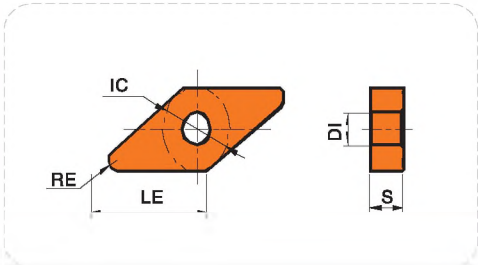
Machining type	Insert shape	Type	Basic dimension (mm)					CVD		PVD		Cemented carbide	Cermet										
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
Rough machining		TNMG160408-BR	16.5	9.525	4.76	3.81	0.8																
		TNMG160412-BR	16.5	9.525	4.76	3.81	1.2																

★ Recommended grade ☆ Available grade

Applicable tools

Page: A65	Page: A65	Page: A66	Page: A72	Page: A72	Page: A73
PTFNR/L	PTTNR/L	PTGNR/L	MTGNR/L	MTJNR/L	MTFNR/L

35°VN □ □



Working condition: ● Stable ● Average ✚ Tough

Workpiece material	Working condition											
	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel									●	●		
K Cast iron								●	●			
N Non-ferrous metal											●	●
S Heat-resistant alloy Titanium alloy									●	●		

Machining type	Insert shape	Type	Basic dimension (mm)					CVD			PVD			Cemented carbide		Cermets				
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10
Finishing		VNMG160404-GF	16.6	9.525	4.76	3.81	0.4	★	☆	★										
		VNMG160408-GF	16.6	9.525	4.76	3.81	0.8	★	☆	★										
Finishing		VNMG160404-BF	16.6	9.525	4.76	3.81	0.4							☆	★					
		VNMG160408-BF	16.6	9.525	4.76	3.81	0.8							☆	★					
Semi-finishing		VNMG160404-GM	16.6	9.525	4.76	3.81	0.4	★	☆	★										
		VNMG160408-GM	16.6	9.525	4.76	3.81	0.8	★	☆	★										
		VNMG160412-GM	16.6	9.525	4.76	3.81	1.2	★	☆	★										
Semi-finishing		VNMG160404-BM	16.6	9.525	4.76	3.81	0.4							☆	★					
		VNMG160408-BM	16.6	9.525	4.76	3.81	0.8							☆	★					
		VNMG160412-BM	16.6	9.525	4.76	3.81	1.2							☆	★					
Cast iron machining		VNMG160404	16.6	9.525	4.76	3.81	0.4						★							
		VNMG160408	16.6	9.525	4.76	3.81	0.8						★							

★ Recommended grade ☆ Available grade

Applicable tools



MVNN



MVJNR/L

- A**
- General turning
- Parting and grooving
- Threading
- B**
- Indexable milling
- Solid carbide end mills
- C**
- Short hole drills
- Solid carbide drills

A

General turning

Parting and grooving

Threading

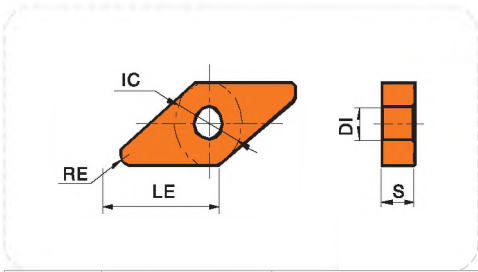
Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

35°VN □□



Working condition: ● Stable ● Average ✱ Tough

Machining type	Insert shape	Type	Basic dimension (mm)					CVD					PVD		Cemented carbide	Cermet					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
			Cast iron machining		VNMA160404	16.6	9.525	4.76	3.81	0.4				★							
		VNMA160408	16.6	9.525	4.76	3.81	0.8				★										

★ Recommended grade ☆ Available grade

Applicable tools

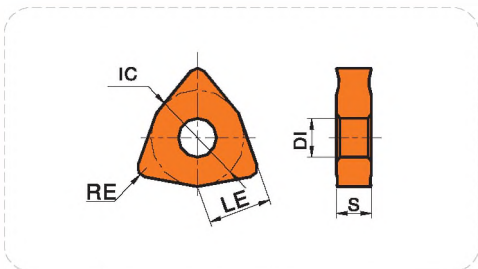


MVVNN



MVJNR/L

80°WN □□

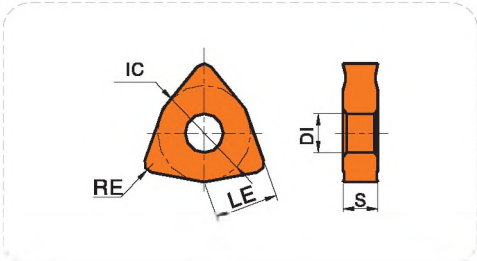


Working condition: ● Stable ● Average ✱ Tough

Machining type	Insert shape	Type	Basic dimension (mm)					CVD					PVD		Cemented carbide	Cermet					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
			Finishing		WNMG080404-GF	8.7	12.7	4.76	5.16	0.4	★	☆	★								
		WNMG080408-GF	8.7	12.7	4.76	5.16	0.8	★	☆	★											

★ Recommended grade ☆ Available grade

80°WN □ □



Working condition: ● Stable ● Average ‡ Tough

Workpiece material	Working condition													
	●	●	‡	●	●	‡	●	●	‡	●	●	‡	●	●
P Steel	●	●	‡											●
M Stainless steel										●	●			
K Cast iron				●	●									
N Non-ferrous metal													●	●
S Heat-resistant alloy Titanium alloy									●	●				

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide		Cermets				
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Finishing		WNMG080402-BF	8.7	12.7	4.76	5.16	0.2															
		WNMG080404-BF	8.7	12.7	4.76	5.16	0.4								☆	★						
		WNMG080408-BF	8.7	12.7	4.76	5.16	0.8								☆	★						
Semi-finishing		WNMG080404-GM	8.7	12.7	4.76	5.16	0.4	★	☆	★												
		WNMG080408-GM	8.7	12.7	4.76	5.16	0.8	★	☆	★												
		WNMG080412-GM	8.7	12.7	4.76	5.16	1.2	★	☆	★												
Semi-finishing		WNMG080404-GQ	8.7	12.7	4.76	5.16	0.4	★		★												
		WNMG080408-GQ	8.7	12.7	4.76	5.16	0.8	★		★												
		WNMG080412-GQ	8.7	12.7	4.76	5.16	1.2	★		★												
Semi-finishing		WNMG06T312-BM	6.6	9.525	3.97	3.81	0.8															
		WNMG060412-BM	6.6	9.525	4.76	3.81	1.2															
		WNMG080404-BM	8.7	12.7	4.76	5.16	0.4															
		WNMG080408-BM	8.7	12.7	4.76	5.16	0.8															
		WNMG080412-BM	8.7	12.7	4.76	5.16	1.2															

★ Recommended grade ☆ Available grade

Applicable tools



- A General turning
- Parting and grooving
- Threading
- B Indexable milling
- Solid carbide end mills
- C Short hole drills
- Solid carbide drills

A

80°WN □ □

General turning

Parting and grooving

Threading

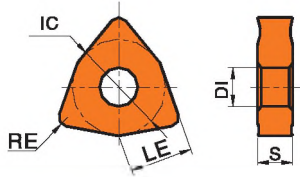
Indexable milling

Solid carbide end mills

Short hole drills

Short hole drills

Solid carbide drills



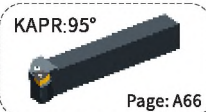
Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition											
	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	●	●	●	●	●	●	●	●	●
M Stainless steel										●	●	●
K Cast iron									●	●		
N Non-ferrous metal											●	●
S Heat-resistant alloy Titanium alloy									●	●		

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide		Cermets				
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
			Cast iron machining		WNMG080404	8.7	12.7	4.76	5.16	0.4				★								
		WNMG080408	8.7	12.7	4.76	5.16	0.8				★											
		WNMG080412	8.7	12.7	4.76	5.16	1.2				★											
Cast iron machining		WNMA060404	6.6	9.525	4.76	3.81	0.4				★											
		WNMA060408	6.6	9.525	4.76	3.81	0.8				★											
		WNMA080404	8.7	12.7	4.76	5.16	0.4				★											
		WNMA080408	8.7	12.7	4.76	5.16	0.8				★											
		WNMA080412	8.7	12.7	4.76	5.16	1.2				★											
		WNMA080416	8.7	12.7	4.76	5.16	1.6				★											
Semi-finishing		WNMG080404-SM	8.7	12.7	4.76	5.16	0.4							☆	★							
		WNMG080408-SM	8.7	12.7	4.76	5.16	0.8							☆	★							
		WNMG080412-SM	8.7	12.7	4.76	5.16	1.2							☆	★							
Rough machining		WNMG080408-GR	8.7	12.7	4.76	5.16	0.8			☆	☆	★										
		WNMG080412-GR	8.7	12.7	4.76	5.16	1.2			☆	☆	★										
Rough machining		WNMG080408-BR	8.7	12.7	4.76	5.16	0.8									☆	★					
		WNMG080412-BR	8.7	12.7	4.76	5.16	1.2									☆	★					

★ Recommended grade ☆ Available grade

Applicable tools

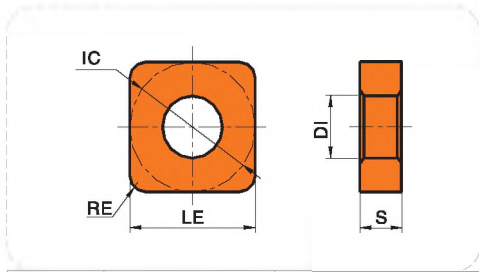


PWNLR/L



MWLNR/L

Planer insert



Working condition: ● Stable ● Average ✚ Tough

Workpiece material	Working condition												
	Stable	Average	Tough	Stable	Average	Tough	Stable	Average	Tough	Stable	Average	Tough	
P Steel	●	●	✚									●	●
M Stainless steel					●	●							
K Cast iron			●	●									
N Non-ferrous metal												●	●
S Heat-resistant alloy Titanium alloy					●	●							

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD				Cemented carbide	Cermet					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Planer machining		SNMG120404-HAF	12.7	12.7	4.76	5.16	0.4															
Planer machining		SNMG120404-HSF	12.7	12.7	4.76	5.16	0.4							☆	☆							

★ Recommended grade ☆ Available grade

Applicable tools



A
General turning

Parting and grooving

Threading

B
Indexable milling

Solid carbide end mills

C
Short hole drills

Solid carbide drills

A

Pipe-stripping insert

General turning

Parting and grooving

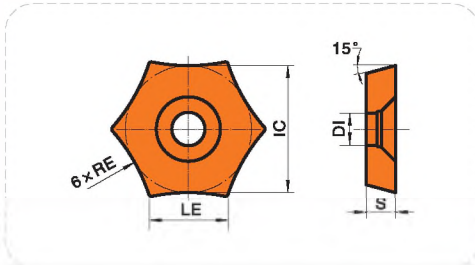
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

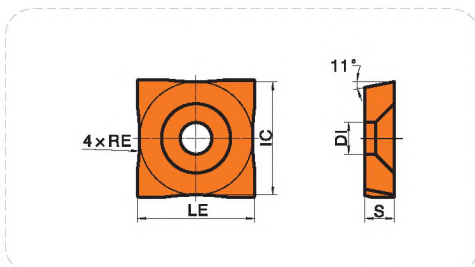


Working condition: ● Stable ● Average # Tough

Workpiece material	Working condition: ● Stable ● Average # Tough																		
	P	M	K	N	S	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
P Steel	●	●	#															●	●
M Stainless steel											●	●							
K Cast iron									●										
N Non-ferrous metal																		●	●
S Heat-resistant alloy Titanium alloy										●	●								

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide	Cermet									
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20			
Pipe-stripping machining		HDUB250414-BG	12.663	20.58	4.76	5.16	14	★	☆	★														
		HDUB250417-BG	12.663	20.58	4.76	5.16	17	★	☆	★														
		HDUB250422-BG	12.663	20.58	4.76	5.16	22	★	☆	★														
		HDUB250430-BG	12.663	20.58	4.76	5.16	30	★	☆	★														
		HDUB250440-BG	12.663	20.58	4.76	5.16	40	★	☆	★														
		HDUB250450-BG	12.663	20.58	4.76	5.16	50	★	☆	★														

★ Recommended grade ☆ Available grade



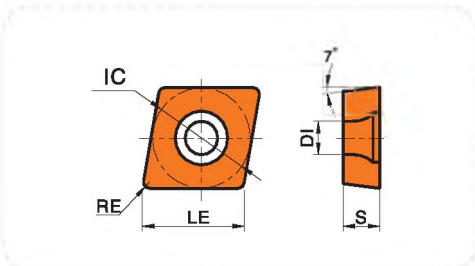
Working condition: ● Stable ● Average # Tough

Workpiece material	Working condition: ● Stable ● Average # Tough																					
	P	M	K	N	S	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20			
P Steel	●	●	#																●	●		
M Stainless steel												●	●									
K Cast iron										●												
N Non-ferrous metal																			●	●		
S Heat-resistant alloy Titanium alloy											●	●										

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide	Cermet								
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
Pipe-stripping machining		SPUB190409-BG	19.05	19.05	4.76	5.16	9.5	★	☆	★													
		SPUB190412-BG	19.05	19.05	4.76	5.16	12	★	☆	★													
		SPUB190415-BG	19.05	19.05	4.76	5.16	15	★	☆	★													
		SPUB190420-BG	19.05	19.05	4.76	5.16	20	★	☆	★													
		SPUB190425-BG	19.05	19.05	4.76	5.16	25	★	☆	★													
		SPUB190432-BG	19.05	19.05	4.76	5.16	32	★	☆	★													

★ Recommended grade ☆ Available grade

80°CC □ □



Working condition: ● Stable ● Average ✦ Tough

Workpiece material	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat-resistant alloy Titanium alloy
P Steel	● ● ● ✦ ● ●				
M Stainless steel		● ● ● ● ● ●			
K Cast iron			● ● ● ● ● ●		
N Non-ferrous metal				● ● ● ● ● ●	
S Heat-resistant alloy Titanium alloy					● ● ● ● ● ●

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide	Cermet								
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
Finishing		CCGT060202-AK	6.4	6.35	2.38	2.8	0.2											★ ☆					
		CCGT060204-AK	6.4	6.35	2.38	2.8	0.4											★ ☆					
		CCGT09T302-AK	9.7	9.525	3.97	4.4	0.2												★ ☆				
		CCGT09T304-AK	9.7	9.525	3.97	4.4	0.4												★ ☆				
		CCGT120404-AK	12.9	12.7	4.76	5.56	0.4												★ ☆				
		CCGT120408-AK	12.9	12.7	4.76	5.56	0.8												★ ☆				
Semi-finishing		CCMT060204-TM	6.4	6.35	2.38	2.8	0.4	★ ☆ ★					☆ ★										
		CCMT060208-TM	6.4	6.35	2.38	2.8	0.8	★ ☆ ★					☆ ★										
		CCMT09T304-TM	9.7	9.525	3.97	4.4	0.4	★ ☆ ★					☆ ★										
		CCMT09T308-TM	9.7	9.525	3.97	4.4	0.8	★ ☆ ★					☆ ★										
		CCMT120404-TM	12.9	12.7	4.76	5.56	0.4	★ ☆ ★					☆ ★										
		CCMT120408-TM	12.9	12.7	4.76	5.56	0.8	★ ☆ ★					☆ ★										
		CCMT120412-TM	12.9	12.7	4.76	5.56	1.2	★ ☆ ★					☆ ★										

★ Recommended grade ☆ Available grade

- A
- General turning
- Parting and grooving
- Threading
- B
- Indexable milling
- Solid carbide end mills
- Short hole drills
- Solid carbide drills

Applicable tools



S□□-SCLCR/L

A

55°DC□□

General turning

Parting and grooving

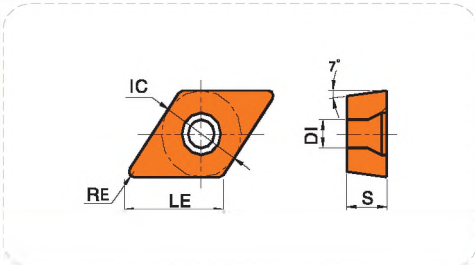
Threading

Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition												
	●	●	●	●	●	●	●	●	●	●	●	●	
P Steel	●	●	●	✱								●	●
M Stainless steel					●	●							
K Cast iron		●	●										
N Non-ferrous metal											●	●	
S Heat-resistant alloy Titanium alloy		●	●										

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide	Cermet						
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
			Finishing		DCGT070202-AK	7.8	6.35	2.38	2.8	0.2											★
DCGT070204-AK	7.8	6.35			2.38	2.8	0.4											★	☆		
DCGT11T302-AK	11.6	9.525			3.97	4.4	0.2											★	☆		
DCGT11T304-AK	11.6	9.525			3.97	4.4	0.4											★	☆		
Semi-finishing		DCMT070204-TM	7.8	6.35	2.38	2.8	0.4	★	☆	★				☆	★						
		DCMT070208-TM	7.8	6.35	2.38	2.8	0.8	★	☆	★				☆	★						
		DCMT11T304-TM	11.6	9.525	3.97	4.4	0.4	★	☆	★				☆	★						
		DCMT11T308-TM	11.6	9.525	3.97	4.4	0.8	★	☆	★				☆	★						
		DCMT11T312-TM	11.6	9.525	3.97	4.4	1.2	★	☆	★				☆	★						

★ Recommended grade ☆ Available grade

Applicable tools

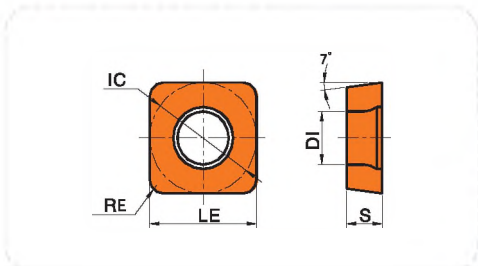


S□□-SDQCR/L



S□□-SDUCR/L

90°SC□□



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition													
	●	●	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●	✱										●
M Stainless steel									●	●				
K Cast iron				●	●									
N Non-ferrous metal													●	●
S Heat-resistant alloy Titanium alloy								●	●					

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide		Cermet					
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
Semi-finishing		SCMT09T304-TM	9.525	9.525	3.97	4.4	0.4	★	☆	★				☆	★						
		SCMT09T308-TM	9.525	9.525	3.97	4.4	0.8	★	☆	★				☆	★						
		SCMT120404-TM	12.7	12.7	4.76	5.56	0.4	★	☆	★				☆	★						
		SCMT120408-TM	12.7	12.7	4.76	5.56	0.8	★	☆	★				☆	★						
		SCMT120412-TM	12.7	12.7	4.76	5.56	1.2	★	☆	★				☆	★						

★ Recommended grade ☆ Available grade

Applicable tools



Page: A77
S□□-SSKCR/L

- A** General turning
- Parting and grooving
- Threading
- B** Indexable milling
- Solid carbide end mills
- C** Short hole drills
- Solid carbide drills

Turning / General turning

A

60°TC□□

General turning

Parting and grooving

Threading

B

Indexable milling

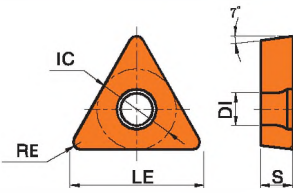
Solid carbide end mills

C

Short hole drills

Solid carbide drills

Working condition: ● Stable ● Average ✖ Tough



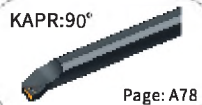
Workpiece material

P Steel	● ● ● ✖ ● ●
M Stainless steel	● ● ● ●
K Cast iron	● ●
N Non-ferrous metal	● ●
S Heat-resistant alloy Titanium alloy	● ●

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide	Cermet						
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
Finishing		TCGT090204-AK	9.7	5.56	2.38	2.8	0.4											★	☆		
		TCGT110204-AK	11.0	6.35	2.38	2.8	0.4											★	☆		
		TCGT16T304-AK	16.5	9.525	3.97	4.4	0.4											★	☆		
Semi-finishing		TCMT110204-TM	11.0	6.35	2.38	2.8	0.4	★	☆	★			☆	★							
		TCMT110208-TM	11.0	6.35	2.38	2.8	0.8	★	☆	★			☆	★							
		TCMT16T304-TM	16.5	9.525	3.97	4.4	0.4	★	☆	★			☆	★							
		TCMT16T308-TM	16.5	9.525	3.97	4.4	0.8	★	☆	★			☆	★							
		TCMT16T312-TM	16.5	9.525	3.97	4.4	1.2	★	☆	★			☆	★							

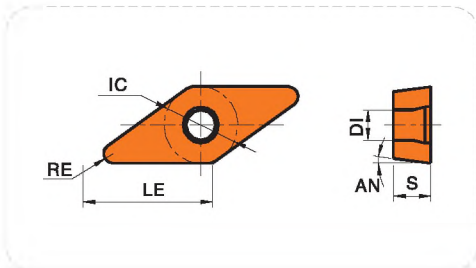
★ Recommended grade ☆ Available grade

Applicable tools



S□□-STFCR/L

35°VB&VC □□



Working condition: ● Stable ● Average ✦ Tough

Workpiece material	Working condition														
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
P Steel	●	●	●											●	●
M Stainless steel										●	●				
K Cast iron						●	●								
N Non-ferrous metal														●	●
S Heat-resistant alloy Titanium alloy									●	●					

Machining type	Insert shape	Type	Basic dimension (mm)						CVD				PVD		Cemented carbide	Cermet						
			LE	IC	S	DI	RE	AN	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
Finishing		VBGT160402-AK	16.5	9.525	4.76	4.4	0.2	5.0											★	☆		
		VBGT160404-AK	16.5	9.525	4.76	4.4	0.4	5.0											★	☆		
		VBGT160408-AK	16.5	9.525	4.76	4.4	0.8	5.0											★	☆		
		VCGT110302-AK	11.0	6.35	3.18	2.8	0.2	7.0											★	☆		
		VCGT110304-AK	11.0	6.35	3.18	2.8	0.4	7.0											★	☆		
		VCGT160402-AK	16.5	9.525	4.76	4.4	0.2	7.0											★	☆		
		VCGT160404-AK	16.5	9.525	4.76	4.4	0.4	7.0											★	☆		
		VCGT160408-AK	16.5	9.525	4.76	4.4	0.8	7.0											★	☆		
Semi-finishing		VBMT110304-TM	11.0	6.35	3.18	2.8	0.4	5.0	★	☆	★				☆	★						
		VBMT110308-TM	11.0	6.35	3.18	2.8	0.8	5.0	★	☆	★				☆	★						
		VBMT160404-TM	16.5	9.525	4.76	4.4	0.4	5.0	★	☆	★				☆	★						
		VBMT160408-TM	16.5	9.525	4.76	4.4	0.8	5.0	★	☆	★				☆	★						
		VBMT160412-TM	16.5	9.525	4.76	4.4	1.2	5.0	★	☆	★				☆	★						
		VCMT110304-TM	11.0	6.35	3.18	2.8	0.4	7.0	★	☆	★				☆	★						
		VCMT110308-TM	11.0	6.35	3.18	2.8	0.8	7.0	★	☆	★				☆	★						
		VCMT160404-TM	16.5	9.525	4.76	4.4	0.4	7.0	★	☆	★				☆	★						
		VCMT160408-TM	16.5	9.525	4.76	4.4	0.8	7.0	★	☆	★				☆	★						
		VCMT160412-TM	16.5	9.525	4.76	4.4	1.2	7.0	★	☆	★				☆	★						

★ Recommended grade ☆ Available grade

Applicable tools



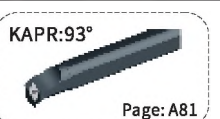
S□□-SVQCR/L



S□□-SVUCR/L



S□□-SVQBR/L



S□□-SVUBR/L

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

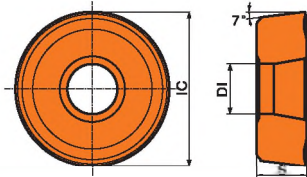
C

Short hole drills

Solid carbide drills

A

Profile turning insert



Working condition: ● Stable ● Average ✱ Tough

Workpiece material	Working condition: ● Stable ● Average ✱ Tough															
	P	M	K	N	S											
P Steel	●	●	✱												●	●
M Stainless steel									●	●						
K Cast iron						●	●									
N Non-ferrous metal															●	●
S Heat-resistant alloy Titanium alloy									●	●						

Machining type	Insert shape	Type	Basic dimension (mm)			CVD				PVD		Cemented carbide	Cermet						
			IC	S	DI	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
Profiling		RCMX1003MO	10	3.18	3.6	★	☆	★											
		RCMX1204MO	12	4.76	4.4	★	☆	★											
		RCMX1606MO	16	6.35	5.5	★	☆	★											
		RCMX2006MO	20	6.35	6.5	★	☆	★											
		RCMX2507MO	25	7.94	7.2	★	☆	★											
		RCMX3209MO	32	9.525	9.5	★	☆	★											
Profiling		RCMX1606MO-MR	16	6.35	5.5	★	☆	★											
		RCMX2006MO-MR	20	6.35	6.5	★	☆	★											
		RCMX2507MO-MR	25	7.94	7.2	★	☆	★											

★ Recommended grade ☆ Available grade

General turning

Parting and grooving

Threading

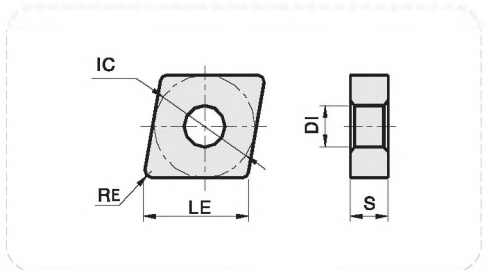
Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

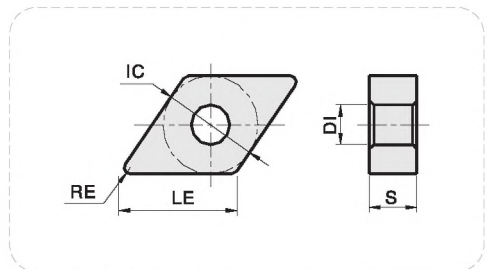
Cermet insert



Working condition: ● Stable ● Average ✚ Tough

Machining type	Insert shape	Type	Basic dimension (mm)					CVD		PVD		Cemented carbide	Cermet										
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
			Finishing and semi-machining		CNMG120404HQ	12.9	12.7	4.76	5.16	0.4													
CNMG120408HQ	12.9	12.7			4.76	5.16	0.8																★

★ Recommended grade ☆ Available grade



Working condition: ● Stable ● Average ✚ Tough

Machining type	Insert shape	Type	Basic dimension (mm)					CVD		PVD		Cemented carbide	Cermet											
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20			
			Finishing and semi-machining		DNMG150404HQ	15.5	12.7	4.76	5.16	0.4														
DNMG150408HQ	15.5	12.7			4.76	5.16	0.8																	★

★ Recommended grade ☆ Available grade

A
General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

A

Cermet insert

General turning

Parting and grooving

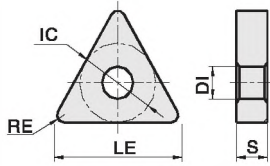
Threading

Indexable milling


Solid carbide end mills

Short hole drills

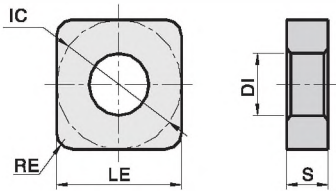
Solid carbide drills




Working condition: ● Stable ● Average ⚡ Tough

Machining type	Insert shape	Type	Basic dimension (mm)					CVD		PVD		Cemented carbide	Cermet										
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
			Finishing and semi-machining		TNMG160404HQ	16.5	9.525	4.76	3.81	0.4													
TNMG160408HQ	16.5	9.525			4.76	3.81	0.8																★

★ Recommended grade ☆ Available grade



Working condition: ● Stable ● Average ⚡ Tough

Machining type	Insert shape	Type	Basic dimension (mm)					CVD		PVD		Cemented carbide	Cermet											
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20			
			Finishing and semi-machining		SNMG120404HQ	12.7	12.7	4.76	5.16	0.4														

★ Recommended grade ☆ Available grade

A

General turning

Parting and grooving

Threading

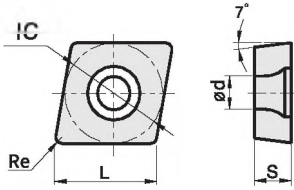
Indexable milling

Solid carbide end mills

Short hole drills

Solid carbide drills

Cermet insert



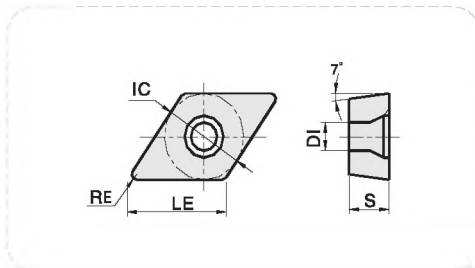
Working condition: ● Stable ● Average ✚ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P	● ● ● ✚ ● ●				
M		● ●			
K			● ●		
N				● ●	
S					● ●

Machining type	Insert shape	Type	Basic dimension (mm)					CVD				PVD		Cemented carbide		Cermet						
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Finishing and semi-machining		CCMT060204HQ	6.4	6.35	2.38	2.8	0.4														★	★
		CCMT09T304HQ	9.7	9.525	3.97	4.4	0.4														★	★
		CCMT09T308HQ	9.7	9.525	3.97	4.4	0.8														★	★
		CPMH090308HQ	9.7	9.525	3.18	4.4	0.8														★	★

★ Recommended grade ☆ Available grade

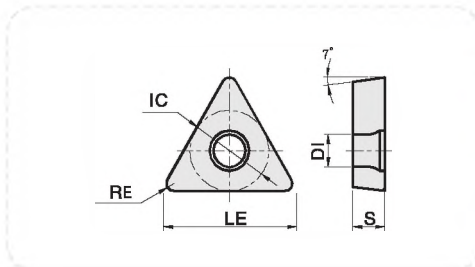
Cermet insert



Workpiece material	Working condition: ● Stable ● Average ✎ Tough																		
	P	M	K	N	S	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
P Steel	●	●	✎															●	●
M Stainless steel										●	●								
K Cast iron						●	●												
N Non-ferrous metal																●	●		
S Heat-resistant alloy Titanium alloy									●	●									

Machining type	Insert shape	Type	Basic dimension (mm)					CVD		PVD		Cemented carbide	Cermet										
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20		
Finishing and semi-machining		DCMT070202HQ	7.8	6.35	2.38	2.8	0.2														★	★	
		DCMT070204HQ	7.8	6.35	2.38	2.8	0.4															★	★
		DCMT070208HQ	7.8	6.35	2.38	2.8	0.8															★	★
		DCMT11T302HQ	11.6	9.525	3.97	4.4	0.2															★	★
		DCMT11T304HQ	11.6	9.525	3.97	4.4	0.4															★	★
		DCMT11T308HQ	11.6	9.525	3.97	4.4	0.8															★	★

★ Recommended grade ☆ Available grade



Workpiece material	Working condition: ● Stable ● Average ✎ Tough																		
	P	M	K	N	S	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
P Steel	●	●	✎															●	●
M Stainless steel										●	●								
K Cast iron						●	●												
N Non-ferrous metal																●	●		
S Heat-resistant alloy Titanium alloy									●	●									

Machining type	Insert shape	Type	Basic dimension (mm)					CVD		PVD		Cemented carbide	Cermet									
			LE	IC	S	DI	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Finishing and semi-machining		TCMT110204-PS	11.0	6.35	2.38	2.8	0.4														★	★

★ Recommended grade ☆ Available grade

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

Application - P-type material turning

Flange plate

- Workpieces materials 40Cr, quenching and tempering
- Machining method Finishing of end face
- Insert DNMG150408-GF HR8115
- Machining parameters $V_c=338.5\text{m/min}$, $f_n=0.14\sim 0.32\text{mm/r}$, $ap=0.2\text{mm}$
- Cooling method Water cooling

After machining 200 workpieces, Huareal products have less wear extent on rear insert face and better surface quality.



Company A



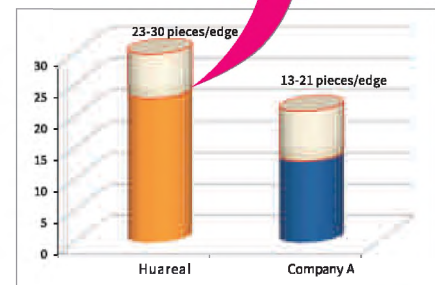
GF

Hub unit

- Workpieces materials 65Mn
- Machining method Semi-finishing of end face
- Insert WNMG080408-GF HR8115
- Machining parameters $V_c=330\text{m/min}$, $f_n=0.3\text{mm/r}$, $ap=0.8\text{mm}$
- Cooling method Water cooling



Its service life is extended by about 50%

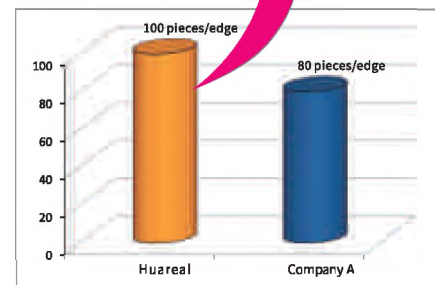


Flange plate

- Workpieces materials 65Mn
- Machining method Rough turning of end face
- Insert WNMG080412-GM HR8225
- Machining parameters $V_c=260\text{m/min}$, $f_n=0.32\text{mm/r}$, $ap=1.0\text{mm}$
- Cooling method Water cooling



Its service life is extended by about 20%



A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

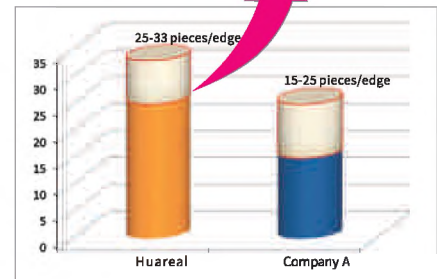
Application - P-type material turning

Flange machining

- Workpieces materials 45# steel
- Machining method Strong intermittent rough turning of end face
- Insert WNMG080408-GM HR8225
- Machining parameters $V_c=180\sim 358\text{m/min}$, $f_n=0.275\text{mm/r}$, $a_p=1.3\sim 3\text{mm}$
- Cooling method Water cooling



Its service life is extended by 45%

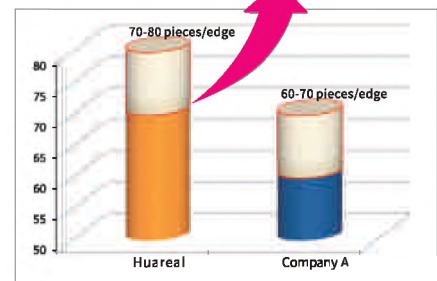


Flange plate

- Workpieces materials 55# steel
- Machining method External and end face turning
- Insert WNMG080408-GM HR8225
- Machining parameters $V_c=285.7\text{m/min}$, $f_n=0.27\text{mm/r}$, $a_p=0.6\text{mm}$
- Cooling method Water cooling



Its service life is extended by more than 15%

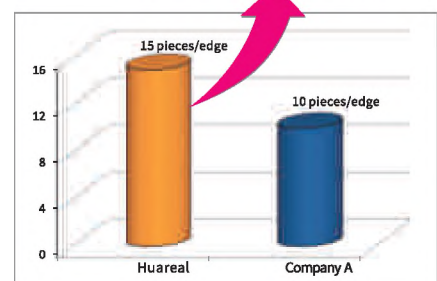


Tropid housing

- Workpieces materials CF53
- Machining method Rough turning of axle neck and small axle
- Insert WNMG080412-GR HR8225
- Machining parameters $V_c=351\text{m/min}$, $f_n=0.45\text{mm/r}$, $a_p=2.0\text{mm}$
- Cooling method Water cooling



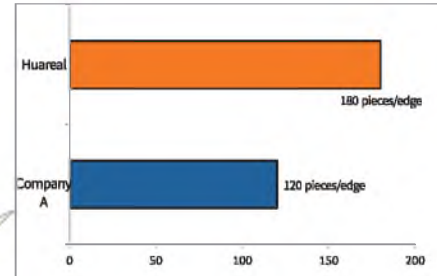
Its service life is extended by 50%



Machining case - stainless steel turning

Flange plate

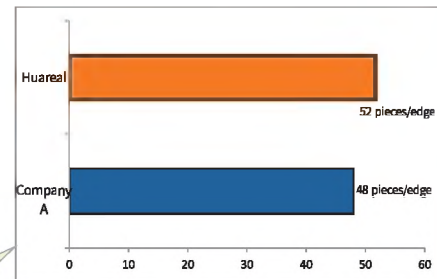
- Workpieces materials SUS304
- Machining method External and end face turning
- Insert VNMG160408-BF HR7225
- Machining parameters $V_c=171\sim 180\text{m/min}$, $f_n=0.08\text{mm/r}$, $a_p=0.30\text{mm}$
- Cooling method Water cooling



With good machined surface quality, Huareal products' service life is extended by about 50%

Flange plate

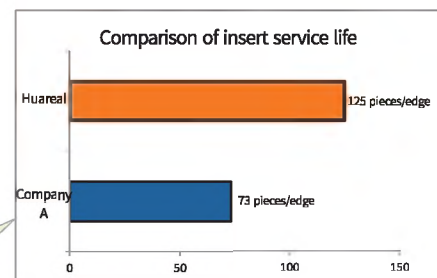
- Workpieces materials SUS304
- Machining method Continuous external and end face finishing
- Insert WNMG080408-BF HR7225
- Machining parameters $V_c=259\text{m/min}$, $f_n=0.15\text{mm/r}$, $a_p=0.50\text{mm}$
- Cooling method Water cooling



With good machined surface quality, Huareal products' service life is extended by about 50%

Flange plate

- Workpieces materials SUS304
- Machining method Semi-finishing of cone and end faces
- Insert WNMG080408-BM HR7225
- Machining parameters $V_c=150\sim 243\text{m/min}$, $f_n=0.2\text{mm/r}$, $a_p=1.2\text{mm}$
- Cooling method Water cooling



With less groove wear, Huareal products' service life is extended by about 70%

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

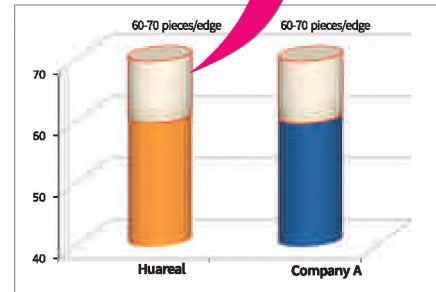
Machining case - cast iron turning

Compressor cylinder

- Workpieces materials HT250
- Machining method External and end face rough turning
- Insert WNMG080412 HR6115
- Machining parameters $V_c=415\text{m/min}$, $f_n=0.15\text{mm/r}$, $a_p=0.4\text{mm}$
- Cooling method Water cooling



It has the equivalent performance with the world-class brand.

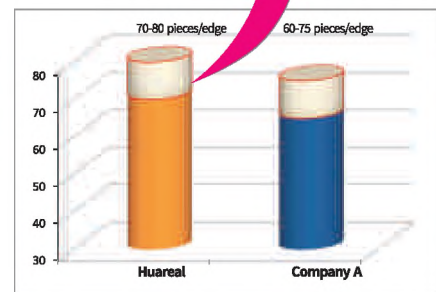


Compressor flange

- Workpieces materials HT250
- Machining method External and end face rough turning
- Insert WNMG080408 HR6115
- Machining parameters $V_c=563\text{m/min}$, $f_n=0.25\text{mm/r}$, $a_p=1\text{mm}$
- Cooling method Water cooling



Its service life is extended by more than 10%-15%

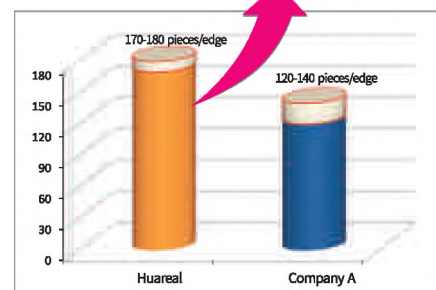


Tripod housing

- Workpieces materials QT500
- Machining method External turning
- Insert WNMG080408 HR6115
- Machining parameters $V_c=190\text{m/min}$, $f_n=0.4\text{mm/r}$, $a_p=1\text{mm}$
- Cooling method Water cooling



Its service life is extended by about 30%



Comparison table of chipbreaker grooves of general turning

Material to be cut	Usage	Huareal	Sandvik	Kennametal	Iscar	Mitsubishi	Hitachi	Tungaloy	Kyocera	Sumitomo Electric	Taegutec	ZCC.CT
P	Finishing	GF	LC XF MF	PMFN CT	--- NF	SA SY SH	BE CE B BH	NM TS TSF	PP XQ CQ HQ	LU FE SU	FG FC	DF PF SF
	Semi-finishing	GM GQ	XM、QM PMC、PM SM、KM HM	P、MG MN MP1	GN RF、LF	MA MV MH MP	AH AE AY	TM TQ DM AM	HS、PS PQ、GS PT、PG	GU(UG) GE UX	ML MP MC PC MT	DM PM
	Roughing	GR	PR、XMR KR	RP RN	M3P、NR ---	RP GH MAS MT	RE AR ---	TH S CH	HT GT PH ---	MU ME MX	RT ---	DR LR
	Heavy machining	GZ GX	QR HR、SR --- MR	RM、MR RH --- ---	NM TNM --- R3P	HZ、HX HL、HH HXD HR HV HCS	TE、UE --- H HX、HE	THS TRS 65 --- TUS	PX All-round --- --- ---	HG HP HU HW HF	RX RH HT HD HY HZ	HDR HPR
	Positive style	TM	UM、PM MX、PR	MF MP	---	MV MP	JE	PM	HQ XQ GK	MU	MT PC	HM
M	Finishing	BF	MF	FP、FS LF	---	LM SH	SE、MP	SS	MQ GU	SU EF	EA SF	EF
	Semi-finishing	BM	MM、MMC SMR	MP	M3M、PP	MM	DE	SM	---	GU	ET	EM
	Roughing	BR	--- MR、MRR	UP ---	--- MR	ES、1M 2M、HL RM、GH HM	--- ---	S SH	--- TK	HM EM MU	VF SU	ER
	Positive style	TM	MM	MP	---	MW	---	PM	HQ GK	MU	---	EM
K	Semi-finishing	All-round	KF	UN	GN	LK MA MK	V、VA	CM CF	All-round C	UZ	MT	All-round
	Roughing	Flat Plate	KM、KR KRR	---	---	GK RK GH	Y、RE	Ch 33 All-round	ZS、GC	GZ(UX)	RT	---
N	Metals for non-ferrous metal machining	AK	---	MS	---	---	---	P	AH	AX	---	Flat
S	Finishing	---	SF、SGF	---	---	LS FJ	---	HRF	---	EF	---	NF NGF
	Semi-finishing	SM	SM、SMC	---	---	MS MJ	VI	HMM SA HRM	---	EG、EX	---	NM
H	Finishing	---	---	---	---	---	---	HP*	---	FV*	---	Flat
	Semi-finishing	---	---	---	---	---	---	---	---	GH	---	Flat

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

Recommended cutting parameters for general external turning

Machined workpiece materials				Product grade																			
ISO	Classification of materials		Hardness of Brinell (HB)	Tensile strength (N/mm ²)	HR8115		HR8125		HR8225		HR7125		HR7225		HR6115			HRK10		HRK20			
					Feed rate /(mm/r)																		
					0.1	0.4	0.6	0.1	0.4	0.6	0.1	0.4	0.6	0.1	0.4	0.6	0.1	0.3	0.5	0.1	0.4	0.6	0.1
Cutting speed /(m/min)																							
P	Non-alloyed steel	C ≤ 0.25%	Annealing	125	428	500	360	280	450	330	260	430	340	260									
		0.25 < C ≤ 0.55%	Annealing	190	639	460	320	260	420	310	240	420	310	240									
		0.25 < C ≤ 0.55%	Quenching and tempering	210	708	420	280	220	380	270	220	380	280	200									
		C > 0.55%	Annealing	190	639	420	280	220	380	270	220	380	280	200									
		C > 0.55%	Quenching and tempering	300	1013	420	280	220	380	270	220	380	280	200									
	Short chip steel	Annealing	220	745	360	280	210	320	290	275	360	270	210										
	Low-alloyed steel	Annealing		175	591	420	350	300	400	330	280	400	330	280									
		Quenching and tempering		300	1013	280	220	180	260	200	160	260	200	160									
		Quenching and tempering		380	1282	200	150	140	100	85	65	180	150	120									
		Quenching and tempering		430	430	140	130		65	55		120	100										
	High alloy steel and high alloy tool steel	Annealing		200	675	260	200	180	270	240	220	260	200	180									
		Quenching and tempering		300	1013	200	180	160	170	140	120	200	180	160									
Quenching and tempering		400	1361	130	120		65	55		130	120												
M	Stainless steel	Ferrite/martensite, annealing	200	675							250	220	210	190	170	150							
		Martensite, quenching and tempering	330	1114							130	110	100	90	80	60							
	Stainless steel	Austenite, quenching	200	675							200	160	130	210	170	150							
		Austenite, precipitation hardening stainless steel (PH stainless steel)	300	1013							160	130	70	170	150	90							
		Austenite- ferrite, duplex stainless steel	230	778							180	140	110	180	170	120							
K	Malleable cast iron	Ferrite	200	400										400	300	200							
		Pearlite	260	700											300	250	180						
	Grey cast iron	Low tensile strength	180	200											550	400	250						
		High tensile strength/austenite	245	350											240	180	120						
	Ductile iron	Ferrite	155	400											320	240	150						
		Pearlite	265	700											320	240	150						
	Compacted graphite iron GGV (CGI)		230	400											300	220	130						

Recommended cutting parameters for general external turning

Machined workpiece materials				Product grade																			
ISO	Classification of materials		Hardness of Brinell (HB)	Tensile strength (N/mm ²)	HR8115		HR8125		HR8225		HR7125		HR7225		HR6115		HRK10		HRK20				
					Feed rate /(mm/r)																		
					0.1	0.4	0.6	0.1	0.4	0.6	0.1	0.4	0.6	0.1	0.4	0.6	0.1	0.4	0.6	0.1	0.4	0.6	0.1
Cutting speed /(m/min)																							
N	Wrought aluminum alloy	Non-aging	30	—																			
		Ageable and aged	100	340													650	600	300				
	Foundry aluminum alloy	≤ 12% silicon, non-aging	75	260													700	450	300				
		≤ 12% silicon, ageable and aged	90	310													500	300	200				
		> 12% silicon, non-aging	130	450																			
	Magnesium alloy		70	250																			
	Copper and copper alloys (bronzes/brass)	Non-alloyed, electrolytic copper		100	340												500	400	270				
		Brass, bronze, red brass		90	310												400	300	250				
Copper alloy, short chip		110	380												280	200	130						
Ampco alloy of high strength		300	1010																				
S	Iron-based alloy	Iron-based	Annealing	200	680														90	70			
			Aged	280	940															70	60		
		Nickel-based or cobalt-based	Annealing	250	840															70	60		
			Aged	350	1180															60	50		
	Cobalt-based alloy	Pure titanium		200	680																		
		α and β phase alloys, aged		375	1260															70	50	40	
β phase alloy		410	1400															40	35	30			
Nickel-based alloy	1177		300	1010																			
Titanium alloy	1262		300	1010																			
H	Hardened steel	Quenching and tempering		50HRC																			
		Quenching and tempering		55HRC																			
		Quenching and tempering		60HRC																			
	Hardened cast steel	Quenching and tempering		50HRC																			

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

Recommended cutting parameters for internal turning

(Positive style: standard machining diameter > φ10)

[Cutting depth: radius value (radial cutting depth)]

ISO classification	Material to be cut	Hardness	Cutting field	Machining form	Recommended material	Corner (RE)	Lower limit - recommended value -upper limit		
							Speed Vc (m/min)	Cutting depth ap (mm)	Feed fn (mm/rev)
P	Low carbon steel Low carbon alloy Steel	HB ≤ 300	Precision finishing	Continuous Intermittent	HR8115 HR8225	0.4	250-300-350 120-170-220	0.05-0.3-0.5 0.05-0.3-0.5	0.03- 0.1- 0.15 0.03- 0.1- 0.15
			Finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	200-250-300 150-200-250	0.2-0.5-1.0 0.2-0.5-1.0	0.05- 0.1- 0.2 0.05- 0.1- 0.2
			Finishing - semi-finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	150-200-250 100-150-200	0.5-1.0-2.0 0.5-1.0-1.5	0.1- 0.15- 0.25 0.1- 0.15- 0.2
			Semi-finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	100-150-200 80-120-150	1.0-1.5-2.5 1.0-1.5-2.0	0.1- 0.15- 0.3 0.1- 0.15- 0.2
	Medium carbon steel Medium carbon alloy	HB ≤ 300	Precision finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	150-200-250 120-140-170	0.05-0.3-0.5 0.05-0.3-0.5	0.03- 0.1- 0.15 0.03- 0.1- 0.15
			Finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	150-200-250 120-180-200	0.2-0.5-1.0 0.2-0.5-1.0	0.05- 0.1- 0.2 0.05- 0.1- 0.2
			Finishing - semi-finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	120-180-220 100-150-200	0.5-1.0-2.0 0.5-1.0-1.5	0.1- 0.15- 0.25 0.1- 0.15- 0.2
			Semi-finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	100-150-200 80-120-150	1.0-1.5-2.5 1.0-1.5-2.0	0.1- 0.15- 0.3 0.1- 0.15- 0.2
	High carbon Alloy steel	HB ≤ 280	Precision finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	120-150-180 110-130-160	0.05-0.3-0.5 0.05-0.3-0.5	0.03- 0.1- 0.15 0.03- 0.1- 0.15
			Finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	120-150-180 100-120-150	0.2-0.5-1.0 0.2-0.5-1.0	0.05- 0.1- 0.2 0.05- 0.1- 0.2
			Finishing - semi-finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	120-150-180 100-120-150	0.5-1.0-2.0 0.5-1.0-1.5	0.1- 0.15- 0.25 0.1- 0.15- 0.2
			Semi-finishing	Continuous Intermittent	HR8115 HR8225	0.4 0.8	100-120-150 80-100-120	1.0-1.5-2.5 1.0-1.5-2.0	0.1- 0.15- 0.3 0.1- 0.15- 0.2
M	Stainless steel (austenite)	HB ≤ 220	Finishing	Continuous Intermittent	HR7125 HR7225	0.4 0.8	120-150-180 100-120-150	0.2-0.5-0.8 0.2-0.5-0.8	0.05- 0.08- 0.1 0.05- 0.08- 0.1
			Semi-finishing	Continuous Intermittent	HR7125 HR7225	0.4 0.8	120-150-180 100-120-150	0.5-1.0-1.5 0.5-1.0-1.5	0.05- 0.1- 0.2 0.05- 0.1- 0.2
	Stainless steel (precipitation and hardening)	HB ≤ 300	Finishing	Continuous Intermittent	HR7125 HR7225	0.4 0.8	80-100-120 60-80-100	0.2-0.7-1.0 0.2-0.7-1.0	0.05- 0.1- 0.15 0.05- 0.1- 0.15
			Semi-finishing	Continuous Intermittent	HR7125 HR7225	0.4 0.8	80-100-120 60-80-100	0.5-1.0-1.5 0.5-1.0-1.5	0.05- 0.1- 0.2 0.05- 0.1- 0.2
K	Grey cast iron	HB ≤ 250	High speed finishing	Continuous Intermittent	HR6115	0.4 0.8	400-500-600 200-250-350	0.05-0.2-0.5 0.2-0.5-1.0	0.05- 0.1- 0.15 0.05- 0.1- 0.15
			Finishing (with high luster)	Continuous Intermittent	HR6115	0.4 0.8	200-250-300 120-180-230	0.2-0.5-1.0 0.2-0.5-1.0	0.05- 0.1- 0.2 0.05- 0.1- 0.2
			Finishing	Continuous Intermittent	HR6115	0.4 0.8	150-180-200 100-150-180	0.2-0.5-1.0 0.2-0.5-1.0	0.05- 0.1- 0.2 0.05- 0.1- 0.2
			Semi-finishing	Continuous Intermittent	HR6115	0.4 0.8	100-150-200 80-120-150	0.5-1.0-2.0 0.5-1.0-2.0	0.1- 0.15- 0.2 0.05- 0.1- 0.15
	Ductile iron	HB ≤ 270	High speed finishing	Continuous Intermittent	HR6115	0.4 0.8	200-300-400 150-200-250	0.05-0.2-0.5 0.2-0.5-1.0	0.03- 0.05- 0.1 0.05- 0.1- 0.15
			Finishing (with high luster)	Continuous Intermittent	HR6115	0.4 0.8	150-200-250 120-150-200	0.2-0.5-1.0 0.2-0.5-1.0	0.05- 0.1- 0.2 0.05- 0.1- 0.2
			Finishing	Continuous Intermittent	HR6115	0.4 0.8	120-150-180 100-120-150	0.2-0.5-1.0 0.2-0.5-1.0	0.05- 0.1- 0.2 0.05- 0.1- 0.2
			Semi-finishing	Continuous Intermittent	HR6115	0.4 0.8	100-120-150 80-100-120	0.5-1.0-2.0 0.5-1.0-2.0	0.05- 0.1- 0.2 0.05- 0.1- 0.15
N	Non-ferrous metal Copper - copper alloy Aluminum/ aluminum alloy (Si < 10%), etc.	HB ≤ 100	High speed finishing (iridescence surface luster)	Continuous	HRK10 HRK20	0.4 0.8	200-400-1000	0.05-0.1-0.3	0.05-0.1-0.15
			Finishing	Continuous Intermittent	HRK10 HRK20	0.4 0.8	100-200-400 100-200-400	0.05-0.5-1.0 0.05-0.5-1.0	0.03- 0.1- 0.2 0.03- 0.1- 0.2
S	Titanium alloy	HB ≤ 400	Precision finishing (iridescence surface luster)	Continuous Intermittent	HR9105 HR7115	0.4 0.8	100-120-150 70-100-120	0.05-0.1-0.3 0.05-0.1-0.3	0.03- 0.07- 0.1 0.03- 0.07- 0.1
			Finishing	Continuous Intermittent	HR9105 HR7115	0.4 0.8	30-50-70 30-50-70	0.05-0.5-1.0 0.05-0.5-1.0	0.03- 0.1- 0.2 0.03- 0.1- 0.2
	Heat-resistant alloy	HB ≤ 350	Finishing	Continuous Intermittent	HR9105 HR7115	0.4 0.8	10-30-50 10-30-50	0.05-0.5-1.0 0.05-0.5-1.0	0.03- 0.1- 0.2 0.03- 0.1- 0.2
			Finishing	Continuous Intermittent	HR9105 HR7115	0.4 0.8	40-60-80 40-60-80	0.1-0.3-0.5 0.1-0.3-0.5	0.03- 0.05- 0.1 0.03- 0.05- 0.1
H	Quenched steel High hardness material	40-50 HRC	Finishing	Continuous Intermittent	HRK10	0.4 0.8	60-80-100 30-50-70	0.05-0.3-0.5 0.05-0.3-0.5	0.05- 0.08- 0.1 0.05- 0.08- 0.1
		45-68 HRC	Finishing	Continuous Intermittent	HRK10	0.4 0.8	100-140-180 90-120-160	0.1-0.2-0.3 0.1-0.2-0.3	0.02- 0.07- 0.1 0.02- 0.07- 0.1
			Semi-finishing	Continuous	HRK10	0.4 0.8	60-80-100	0.3-0.7-1.0	0.03-0.1-0.15

Recommended cutting parameters for cermet brand

	Material name	Low carbon steel/ low carbon alloy steel	Middle carbon steel/ middle carbon alloy steel	High carbon alloy steel
	Hardness	< 150HB	< 250HB	< 350HB
HRC10	Vc/ (m/min)	150-200-300		150-170-220
	fn/ (mm/rev)	0.10~0.30		0.05~0.25
HRC20	Vc/ (m/min)	100-150-250		100-130-200
	fn/ (mm/rev)	0.15~0.35		0.10~0.25

Correction table of cutting parameters for S-type internal turning

Workpiece material	Hardness	Machining form	L/D≤3		L/D=4		L/D=5		L/D=6	
			Feed (mm/rev)	Cutting depth (mm)	Feed (mm/rev)	Cutting depth (mm)	Feed (mm/rev)	Cutting depth (mm)	Feed (mm/rev)	Cutting depth (mm)
P Carbon steel, alloy steel 45#、 42CrMo	HB 180-280	Finishing	0.05-0.1-0.15	<0.2	0.05-0.1-0.15	<0.2				
		semi-finishing	0.15-0.25-0.35	<3.0	0.1-0.15-0.2	<1.5				
M Stainless steel 1Cr18Ni9Ti 0Cr18Ni9	≤ HB220	Finishing	0.05-0.1-0.15	<0.2	0.05-0.1-0.15	<0.2				
		semi-finishing	0.15-0.2-0.25	<2.0	0.1-0.15-0.2	<1.0				
N Aluminum alloy	—	Finishing	0.05-0.1-0.15	<0.2	0.05-0.1-0.15	<0.2	0.05-0.1-0.15	-0.15	0.05-0.1-0.15	<0.1
		semi-finishing	0.05-0.1-0.15	<2.0	0.05-0.1-0.15	<1.5	0.05-0.1-0.15	-1.0	0.05-0.1-0.15	<1.0

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

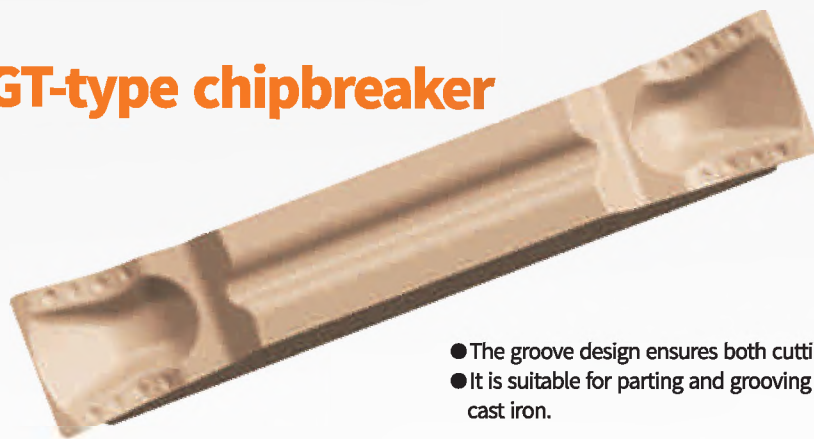
Solid carbide drills

CT-type chipbreaker



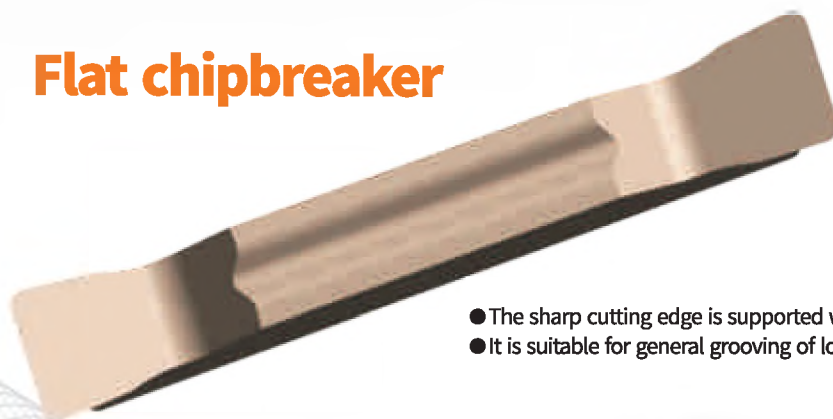
- The unique groove design ensures good chip control.
- It is suitable for external, internal and end face grooving as well as plunge turning.

GT-type chipbreaker



- The groove design ensures both cutting edge strength and sharpness;
- It is suitable for parting and grooving of carbon steel, alloy steel and cast iron.

Flat chipbreaker

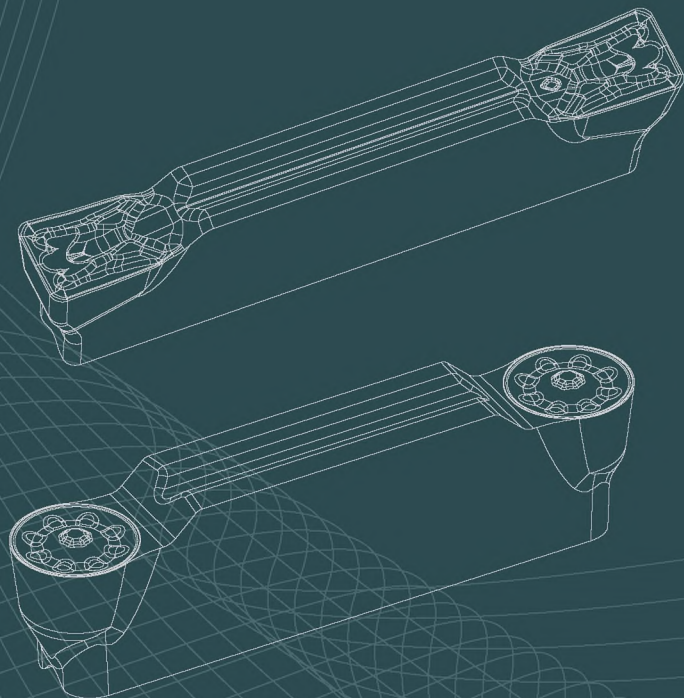


- The sharp cutting edge is supported with lower cutting resistance.
- It is suitable for general grooving of low hardness materials.

A Turning

Parting and grooving

- ◆ Code key of parting and grooving inserts A91
- ◆ Overview of parting and grooving tools A92
- ◆ Parting and grooving inserts A93-A94
- ◆ Parting and grooving tools A95-A98
- ◆ Technical information for parting and grooving A99-A102



Code key of grooving inserts



① Insert type	
Code	Type
QD	Parting insert
QC	Grooving insert
QP	Profile insert

② Tolerance class	
Code	Standard
M	M— class tolerance
K	K— class tolerance
E	E— class tolerance

③ Cutting edge count	
Code	Number of cutting edges
A	Single insert
B	Double inserts
C	Triple inserts

④ Cutting edge width	
Code	Insert width (mm)
25	2.50
30	3.00
40	4.00
50	5.00
60	6.00
124	12.40

⑤ Corner radius	
Code	Corner radius (mm)
00	0.00
02	0.20
03	0.30
04	0.40
08	0.80

⑥ Chipbreaker groove	
Default	Flat
CT	CT-type groove
GT	GT-type groove
RM	RM-type groove
AK	AK-type groove

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

Overview of parting and grooving tools

Machining form	Diagram	Applicable tools	Applicable inserts	Features
External grooving and plunge turning		HREH□□	QCMB□□ QCKB□□ QPMB□□ QPEB□□	<ul style="list-style-type: none"> The multi-purpose cutting tool is compatible with different inserts such as grooving, profile and parting inserts. The insert can produce either pressing groove or grinding groove, which meet different machining requirements. The maximum groove depth is 20mm. With a profiling insert, it can be used to machines a variety of materials.
Parting		HREH□□	QCMB□□ QCKB□□	<ul style="list-style-type: none"> With our parting inserts, it can be used to cut and process various materials. Maximum parting diameter: 60mm.
End face grooving and plunge turning		HRFH**	QCMB□□ QCKB□□	<ul style="list-style-type: none"> The multi-purpose cutting tool is compatible with different inserts such as grooving, profiling and parting inserts. Groove depth: 10-20mm.
Internal grooving and turning		HRIV□□	QCMB□□ QCKB□□ QPMB□□	<ul style="list-style-type: none"> The multi-purpose cutting tool is compatible with different inserts such as grooving, profile and parting inserts. Minimum inscribed circle diameter for machining: 25mm. Maximum groove depth: 6mm.
Relief groove machining		HREU□□	QCMB□□ QCKB□□ QPMB□□	<ul style="list-style-type: none"> The 45°cutting tool structure shall complete a variety of forms of relief groove machining. Maximum vertical depth of the relief groove: 3.3mm.

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

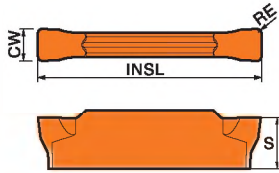
C

Short hole drills

Solid carbide drills

A

Parting and grooving insert



Working condition: ● Stable ● Average ⚡ Tough

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat-resistant alloy Titanium alloy
P	● ● ● ⚡				● ●
M		● ●			
K			● ●		
N				● ●	
S					● ●

Machining type	Insert shape	Type	Basic dimension (mm)				CVD				PVD				Cemented carbide		Cermets				
			INSL	CW	S	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20	
Parting and grooving		QCMB1502-GT	16.0	1.5	3.50	0.2	★	★	★			★	☆								
		QCMB2002-GT	16.0	2.0	3.55	0.2	★	★	★			★	☆								
		QCMB3002-GT	21.0	3.0	4.86	0.2	★	★	★			★	☆								
		QCMB4002-GT	21.0	4.0	4.86	0.2	★	★	★			★	☆								
		QCMB5003-GT	26.0	5.0	5.80	0.3	★	★	★			★	☆								
		QCMB6003-GT	26.0	6.0	5.90	0.3	★	★	★			★	☆								
Grooving		QCKB2002	16.0	2.0	3.55	0.2						★	☆								
		QCKB3004	21.0	3.0	4.86	0.4						★	☆								
		QCKB4004	21.0	4.0	4.86	0.4						★	☆								
		QCKB5008	26.0	5.0	5.80	0.8						★	☆								
Grooving and plunge turning		QCMB2002-CT	16.0	2.0	3.55	0.2	★	★	★			★	☆								
		QCMB2502-CT	18.5	2.5	3.90	0.2	★	★	★			★	☆								
		QCMB3004-CT	21.0	3.0	4.86	0.4	★	★	★			★	☆								
		QCMB4004-CT	21.0	4.0	4.86	0.4	★	★	★			★	☆								
		QCMB5008-CT	26.0	5.0	5.80	0.8	★	★	★			★	☆								

★ Recommended grade ☆ Available grade

General turning

Parting and grooving

Threading

B

Indexable milling

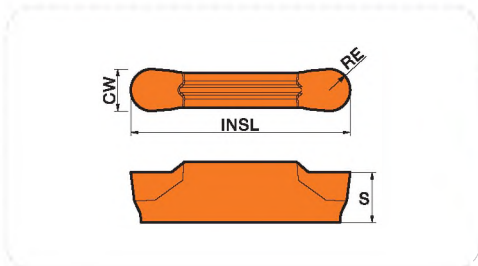
Solid carbide end mills

C

Short hole drills

Solid carbide drills

Profile groove insert



Working condition: ● Stable ● Average ✚ Tough

Workpiece material	Working condition														
	●	●	✚	●	●	✚	●	●	✚	●	●	✚	●	●	
P Steel	●	●	✚											●	●
M Stainless steel									●	●					
K Cast iron				●	●										
N Non-ferrous metal													●	●	
S Heat-resistant alloy Titanium alloy								●	●						

Machining type	Insert shape	Type	Basic dimension (mm)				CVD				PVD		Cemented carbide		Cermets					
			INSL	CW	S	RE	HR8115	HR8125	HR8225	HR6115	HR9105	HR7115	HR7125	HR7225	HR5125	HR5225	HRK10	HRK20	HRC10	HRC20
Profile		QPMB2010-RM	16.0	2.0	3.5	1.0	★	★	★			★	☆							
		QPMB3015-RM	21.0	3.0	4.8	1.5	★	★	★			★	☆							
		QPMB4020-RM	21.0	4.0	4.8	2.0	★	★	★			★	☆							
		QPMB5025-RM	26.0	5.0	5.8	2.5	★	★	★			★	☆							
		QPMB6030-RM	26.0	6.0	5.9	3.0	★	★	★			★	☆							
Aluminum hub groove insert		QPEB8040-AK	30.0	8.0	8.365	4.0										★	★			

★ Recommended grade ☆ Available grade

A

General turning

Parting and grooving

Threading

B

Indexable milling

Solid carbide end mills

C

Short hole drills

Solid carbide drills

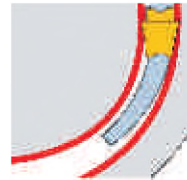
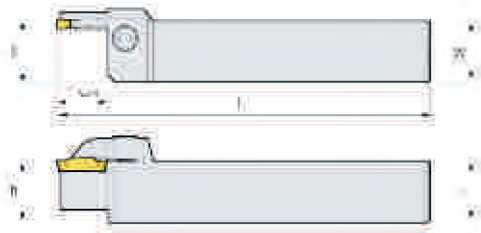
External grooving, parting and turning tools



Type		Basic dimension (mm)							Screw	Wrench	Applicable inserts
		Inventory	H=h	W	L	S	H1	T-MAX			
HREHR/L	1212-2-T08	△	12	12	100	12.2	/	8	HHA0512	WR40L	QCMB□□ QCKB□□ QPMB□□ QPEB□□
	1616-2-T08	△	16	16	100	16.2	/	8			
	2020-2-T08	▲	20	20	125	20.2	/	8			
	2525-2-T08	▲	25	25	150	25.2	/	8			
	1616-2-T12	△	16	16	100	16.2	/	12			
	2020-2-T12	△	20	20	125	20.2	/	12			
	2525-2-T12	▲	25	25	150	25.2	/	12			
	1616-2.5-T17	△	16	16	100	16.3	/	17			
	2020-2.5-T17	△	20	20	125	20.3	/	17			
	2525-2.5-T17	△	25	25	150	25.3	/	17			
	1616-3-T10	△	16	16	100	16.4	/	10			
	2020-3-T10	▲	20	20	125	20.4	/	10			
	2525-3-T10	▲	25	25	150	25.4	/	10			
	1616-3-T13	△	16	16	100	16.4	/	13			
	2020-3-T13	▲	20	20	125	20.4	/	13			
	2525-3-T13	▲	25	25	150	25.4	/	13			
	1616-3-T20	△	16	16	100	16.4	/	20			
	2020-3-T20	△	20	20	125	20.4	/	20			
	2525-3-T20	△	25	25	150	25.4	/	20			
	2020-4-T10	▲	20	20	125	20.4	/	10	HHA0616	WR50L	
2525-4-T10	▲	25	25	150	25.4	/	10				
3232-4-T10	△	32	32	150	32.4	/	10				
2020-4-T15	△	20	20	125	20.4	/	15				
2525-4-T15	△	25	25	150	25.4	/	15				
2020-4-T20	△	20	20	125	20.4	/	20				
2525-4-T20	△	25	25	150	25.4	/	20				
3232-4-T20	△	32	32	170	32.4	/	20				

▲Running stock △Make-to-order

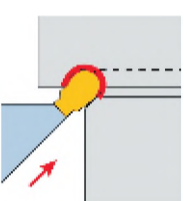
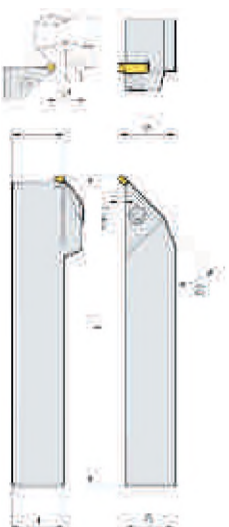
90° end face grooving tool



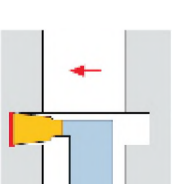
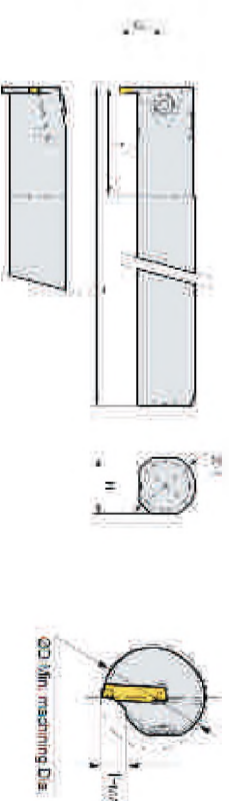
Type		Basic dimension (mm)						ΦD		Screw	Wrench	Applicable inserts	
		Inventory	H=h	W	L	S	T-MAX	Min	Max				
HRFHR/L	325-34/50-T10	△	25	25	150	25.5	10	34	50	HHA0512	WR40L	QCMB□□ QCKB□□	
	325-44/70-T15	▲	25	25	150	25.5	15	44	70				
	325-64/100-T15	△	25	25	150	25.5	15	64	100				
		425-40/60-T10	△	25	25	150	25.6	10	40	60	HHA0616		WR50L
		425-44/70-T20	▲	25	25	150	25.6	20	44	70			
		425-84/92-T20	△	25	25	150	25.6	20	84	92			
		425-60/120-T20	▲	25	25	150	25.6	20	60	120			
		425-112/200-T20	△	25	25	150	25.6	20	112	200			
		525-190/220-T10	▲	25	25	150	25.6	10	190	200			
		625-170/190-T10	△	25	25	150	25.6	10	170	190			
	625-190/220-T10	△	25	25	150	25.6	10	190	200				

▲Running stock △Make-to-order

Relief groove tool



Internal grooving and turning tools



Type	Basic dimension (mm)							Screw	Wrench	Applicable inserts
	Inventory	H=h	W	L	S	φD Max	T-MAX			
HREUR/L	2020-3	△	20	20	125	23	40	2.8	HHA0512	WR40L
	2525-3	▲	25	25	150	28	40	2.8		
	3232-3	△	32	32	170	35	40	2.8	QCMB□□ QCKB□□ QPMB□□	
	2020-4	▲	20	20	125	23	40	2.8		
	2525-4	▲	25	25	150	28	40	2.8		
	3232-4	△	32	32	170	35	40	2.8		
2020-5	▲	20	20	125	23.5	50	3.3	HHA0616	WR50L	
3232-5	△	32	32	170	35.5	50	3.3			
2020-6	▲	20	20	125	23.5	50	3.3			
2525-6	▲	25	25	150	28.5	50	3.3			

▲Running stock △Make-to-order

Type	Basic dimension (mm)										Screw	Wrench	Applicable inserts
	Inventory	φD	φd	L	ℓ	T-MAX	H	S					
HRVR/L	2516-2	△	25	16	125	35	6.5	15	14	HHB0410	WR30L	QCMB□□ QCKB□□ QPMB□□	
	2520-2	△	25	20	150	45	6.5	18	15.5				
	3225-2	△	32	25	200	45	7	23	19	HHA0512	WR40L		
	2516-2.5	△	25	16	125	35	6.5	15	14				
	2520-2.5	▲	25	20	150	45	6.5	18	15.5	HHB0410	WR30L		
	3225-2.5	△	32	25	200	45	7	23	19				
	2520-3	▲	25	20	150	45	6.5	18	15.5	HHB0410	WR30L		
	3225-3	△	32	25	200	45	7	23	19				
	4032-3	△	40	32	250	55	7.5	30	22.5	HHA0512	WR40L		
	2520-4	▲	25	20	150	45	6.5	18	15.5				
	3225-4	△	32	25	200	45	7	23	19	HHB0410	WR30L		
	4032-4	△	40	32	250	55	7.5	30	22.5				
	3225-5	△	32	25	200	45	7.5	23	19.5	HHA0512	WR40L		
	4032-5	△	40	32	250	55	8.5	30	23.5				
	3225-6	▲	32	25	200	45	7.5	23	19.5	HHA0512	WR40L		
	4032-6	△	40	32	250	55	8.5	30	23.5				

▲Running stock △Make-to-order

Cutting speed recommendations for parting and grooving

ISO	Classification of materials		Hardness of Brinell (HB)	Tensile strength (N/mm ²)	Cutting Speed Recommendations (m/min)												
					HR8225			HR7125			HR7225			HR6115			
					Feed (mm/rev)												
		0.1	0.3	0.5	0.1	0.3	0.5	0.1	0.3	0.5	0.1	0.3	0.5				
P	Non-alloyed steel	C ≤ 0.25% Annealing	125	428	280	200	130	260	180	120	260	180	120				
		0.25 < C ≤ 0.55% Annealing	190	639	240	160	115	220	150	105	200	140	105				
		0.25 < C ≤ 0.55% Quenching and tempering	210	708	130	115	100	120	110	100	120	110	100				
		C > 0.55% Annealing	190	639	145	130	115	130	120	110	130	120	110				
		C > 0.55% Quenching and tempering	300	1013	115	100	80	110	95	70	110	95	70				
		Short chip steel Annealing	220	745	130	115	100	120	105	90	120	105	90				
	Low-alloyed steel	Annealing		175	591	280	200	130	170	135	120	170	135	120			
		Quenching and tempering		300	1013	115	100	80	105	90	70	105	90	70			
		Quenching and tempering		380	1282	170	90	70	160	80	60	160	80	60			
		Quenching and tempering		430	430												
	High-alloyed steel and high alloy tool steel	Annealing		200	675												
		Quenching and tempering		300	1013												
		Quenching and tempering		400	1361												
M	Stainless steel	Ferrite/martensite, annealing	200	675				200	150	105	200	150	105				
		Martensite, quenching and tempering	330	1114				150	115	70	150	115	70				
	Stainless steel	Austenite, quenching	200	675				165	135	105	185	155	125				
		Austenite, precipitation hardening stainless steel (PH stainless steel)	300	1013				155	120	80	165	135	95				
		Austenite- ferrite, duplex stainless steel	230	778				135	110	85	145	110	85				
K	Malleable cast iron	Ferrite	200	400										220	160	80	
		Pearlite	260	700										115	90	65	
	Grey cast iron	Low tensile strength	180	200										200	150	95	
		High tensile strength/austenite	245	350										185	140	95	
	Ductile iron	Ferrite	155	400										160	130	80	
		Pearlite	265	700										145	110	80	
	Compacted graphite iron GGV (CGI)		230	400										150	120	90	

Notes: 1. Cutting parameters are suitable for wet cutting.

2. For internal and section machining, it is recommended to reduce the cutting speed by 30%-50% Precautions for Parting and Grooving:

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Precautions for parting and grooving:

Parting

- When the insert gets close to the center of the workpiece, the feed rate should be reduced by 30% for longer tool service life and good surface quality.
- If allowed, the overhang should be minimized to ensure good stability.

External grooving and turning, profile turning

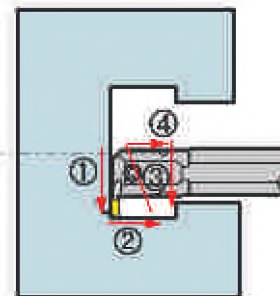
- Pass sequence: When cutting depth > 0.5mm, radial feed (the maximum cutting depth can reach 0.75 x insert width S) → radial return about 0.1mm → axial pass → oblique return → axial pass → radial machining to the required depth.

End face grooving and turning

- Finish machining (multi-groove cutting)
Cutting inwards from the largest diameter, and the insert is slightly offset towards the central insert when returning the insert.
- Recess turning
Axial turning depth: $\leq 0.75 \times S$ (insert width)
If the groove width is greater than the depth, recess turning is recommended.
If the groove depth is greater than the width, multi-recess cutting is recommended.
- Finish machining
Machine the bottom and outer diameter edge in a finished way, and then the inner diameter to the required size.

Internal grooving and turning

- Please follow the machining sequence as shown.
In order to facilitate cutting outflow, please always feed outward from the far end face side.


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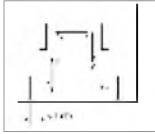
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C

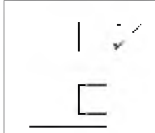
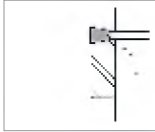
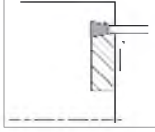
Short hole drills

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Precautions for external parting, grooving and turning

S/N	Machining subjects	Precautions	Diagram
1	Grooving first and then transverse turning	When roughing (groove depth > 0.5mm), please do not adopt transverse feed machining immediately after grooving. Instead, return the insert about 0.1mm before starting transverse feed machining.	
		When finishing (groove depth < 0.5mm), the corner is subjected to small force, and transverse feed machining can be carried out immediately after grooving.	
2	Groove width expanding machining	Please stagger them into step shape for machining.	
	Finishing	(1) When machining towards the center side without using a center fixing, please lower the feeding speed. (2) A cutting depth more than 0.5mm on one side can effectively improve chip disposal.	

Precautions for end face grooving turning

S/N	Machining subjects	Precautions	Diagram
1	Precautions for cutter bar selection	(1) Choose the model that fits the groove width of the cut material. (2) Check the groove depth. (3) It is recommended to mount the cutter bar facing downwards (reversed).	
		Perform transverse feed machining from the outer section to the inner end face with good chip discharge.	
2	End face turning	When roughing (groove depth > 0.5mm), please do not feed transversely immediately after grooving. Instead, return the insert about 0.1mm before starting transverse feed machining.	
		When finishing (groove depth < 0.5mm), the corner is subjected to small force, and transverse feed machining can be carried out immediately after grooving. (No need to stop the knife)	

Precautions for end face grooving turning

S/N	Machining subjects	Precautions	Diagram
3	End face groove expansion machining	During rough machining, please stagger them into step shape for machining.	
		Finish machining: When the cutting depth is set to 0.5mm or above on one side, the chip disposal performs well.	

FAQs of parting and grooving

Condition	Countermeasures
There is white turbidity at the bottom of the end face	<p>(1) Increase the cutting speed only in the finish machining.</p> <p>(2) When method 1 does not work, please readjust the parallelism of the insert and the corner.</p> <p>Correction method: Adjust the cutter bar to within $\pm 5^\circ$ tolerance of the perpendicularity between the cut-in angle and the material to be cut.</p>
When grooving, the tool gets entangled with chips.	<p>(1) Install the cutter bar facing downwards (reversed). Please spray the coolant from the rear side of the insert to the corner.</p> <p>(2) When expanding the groove, please process it shallowly and extensively as a whole. (Deep recess machining cannot be done at the same time)</p>
The insert collapses during the transverse feed machining.	Please replace the outside-inside machining by the inside-outside machining.
The recesses cannot be accessed vertically.	Please correct the parallelism of the corner Reduce the feeding speed.

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Non-alloyed steel										
	S235JR G2	1.0038	4360 40 C	-	1311	A570.36	E 24-2 Ne	-	-	STKM 12A;C
	S235J2 G3	1.0116	4360 40 B	-	1312	A573-81 65	E 24-U	Fe37-3	-	-
	C15	1.0401	080M15	-	1350	1015	CC12	C15C16	F.111	-
	C22	1.0402	050A20	2C/2D	1450	1020	CC20	C20C21	F.112	-
	C15E	1.1141	080M15	32C	1370	1015	XC12	C16	C15K	S15C
	C25E	1.1158	-	-	-	1025	-	-	-	S25C
	S380N	1.89	4360 55 E	-	2145	A572-60	-	FeE390KG	-	-
	17MnV7	1.087	4360 55 E	-	2142	A572-60	NFA 35-501 E 36	-	-	-
	55Si7	1.0904	250A53	45	2085	9255	55S7	55Si8	56Si7	-
	-	-	-	-	2090	9255	55S7	-	-	-
	C35	1.0501	060A35	-	1550	1035	CC35	C35	F.113	-
	C45	1.0503	080M46	-	1650	1045	CC45	C45	F.114	-
	40Mn4	1.1157	150M36	15	-	1039	35M5	-	-	-
	36Mn5	1.1167	-	-	2120	1335	40M5	-	36Mn5	SMn438(H)
	28Mn6	1.117	150M28	14A	-	1330	20M5	C28Mn	-	SCMn1
	C35G	1.1183	060A35	-	1572	1035	XC38TS	C36	-	S35C
	C45E	1.1191	080M46	-	1672	1045	XC42	C45	C45K	S45C
	C53G	1.1213	060A52	-	1674	1050	XC48TS	C53	-	S50C
	C55	1.0535	070M55	-	1655	1055	-	C55	-	-
	C55E	1.1203	070M55	-	-	1055	XC55	C50	C55K	S55C
	S275J2G3	1.0144	4360 43C	-	1412	A573-81	E 28-3	-	-	SM 400A;B;C
	S355J2G3+C2	1.057	4360 50B	-	2132	-	E36-3	Fe52BFN/Fe52CFN	-	SM490A;B;C;YA;YB
	S355J2G3	1.0841	150 M 19	-	2172	5120	20 MC 5	Fe52	F-431	-
	C60E	1.0601	080A62	43D	-	1060	CC55	C60	-	-
	C60E	1.1221	080A62	43D	1678	1060	XC60	C60	-	S58C
	C101E	1.1274	060 A 96	-	1870	1095	XC 100	-	F-5117	-
	C101u	1.1545	BW 1A	-	1880	W 1	Y105	C36KU	F-5118	SK 3
	C105W1	-	BW2	-	2900	W210	Y120	C120KU	F.515	SUP4
	S340 MGC	1.0961	-	-	-	9262	60SC7	60SiCr8	60SiCr8	-
	11SMn30	1.0715	230M07	-	1912	1213	S250	CF9SMn28	11SMn28	SUM22
	11SMnPb30	1.0718	-	-	1914	12L13	S250Pb	CF9SMnPb28	11SMnPb28	SUM22L
	10SPb20	1.0722	-	-	-	-	10PbF2	CF10SPb20	10SPb20	-
	11SMn37	1.0736	240M07	1B	-	1215	S 300	CF9SMn36	12SMn35	-
	11SMnPb37	1.0737	-	-	1926	12L14	S300Pb	CF9SMnPb36	12SMnP35	-
	35S20	1.0726	212M36	8M	1957	1140	35MF4	-	F210G	-
	GC16E	1.1142	030A04	1A	1325	1115	-	-	-	-
Low-alloyed steel										
	16Mo3	1.5415	1501-240	-	2912	A204GrA	15D3	16Mo3KW	16Mo3	-
	14Ni6	1.5622	-	-	-	A350LF5	16N6	14Ni6	15Ni6	-
	21NiCrMo2	1.6523	805M20	362	2506	8620	20NCD2	20NiCrMo2	20NiCrMo2	SNCM220(H)
	17CrNiMo6	1.6587	820A16	-	-	-	18NCD6	-	14NiCrMo13	-
	15Cr3	1.7015	523M15	-	-	5015	12C3	-	-	SCR415(H)
	55Cr3	1.7176	527A60	48	-	5155	55C3	-	-	SUP9(A)
	15CrMo5	1.7262	-	-	2216	-	12CD4	-	12CrMo4	SCM415(H)

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Low-alloyed steel											
	13CrMo4-5		1.7335	1501-620Gr27	-	-	A182 F11;F12	15CD3.5	14CrMo4 5	14CrMo45	-
								15CD4.5			
	10CrMo9 10		1.738	1501-622 Gr.31;45	-	2218	A182 F.22	12CD9, 10	12CrMo9, 10	TU.H	-
	14MoV6 3		1.7715	1503 660-440	-	-	-	-	-	13MoCrV6	-
	50CoMo4		1.7228	823M30	33	2512	-	-	653M31	-	-
	14NiCr10		1.5732	-	-	-	3415	14NC11	16NiCr11	15NiCr11	SNC415(H)
	14NiCr14		1.6582	655M13; A12	36A	-	3415;3310	12NC15	-	-	SNC815(H)
	16MnCr5		1.7131	(527M20)	-	2511	5115	16MC5	16MnCr5	16MnCr5	-
	34CrMo4		1.722	708A37	19B	2234	4137;4135	35CD4	35CrMo4	34CrMo4	SCM432;SCCRM3
	41CrMo4		1.7223	708M40	19A	2244	4140;4142	42CD4TS	41CrMo4	42CrMo4	SCM 440
	42CrMo4		1.7225	708M40	19A	2244	4140	42CD4	42CrMo4	42CrMo4	SCM440(H)
	14NiCrMo134		1.6657	832M13	36C	-	-	-	15NiCrMo13	14NiCrMo131	-
	31CrMo12		1.8515	722 M 24	-	2240	-	30 CD 12	30CrMo12	F-1712	-
	39CrMoV13 9		1.8523	897M39	40C	-	-	-	36CrMoV12	-	-
	41CrS4		1.7039	524A14	-	2092	L1	-	105WCR 5	-	-
	50NiCr13		1.2721	-	-	2550	L6	55NCV6	-	F-528	-
	45WCrV7		1.2542	BS1	-	2710	S1	-	45WCrV8KU	45WCrSi8	-
	36CrNiMo4		1.6511	816M40	110	-	9840	40NCD3	38NiCrMo4(KB)	35NiCrMo4	-
	34CrNiMo6		1.3505	817M40	24	2541	4340	35NCD6	35NiCrMo6(KB)	-	-
	34Cr4		1.7033	530A32	18B	-	5132	32C4	34Cr4(KB)	35Cr4	SCR430(H)
	41Cr4		1.7035	530A40	18	-	5140	42C4	41Cr4	42Cr4	SCR440(H)
	32CrMo12		1.7361	722M24	40B	2240	-	30CD12	32CrMo12	F.124.A	-
	51CrV4		1.8159	735A50	47	2230	6150	50CV4	50CrV4	51CrV4	SUP10
	41CrAlMo7		1.8509	905M39	41B	2940	-	40CAD6, 12	41CrAlMo7	41CrAlMo7	-
	100Cr6		1.5752	534A99	31	2258	52100	100C6	100Cr6	F.131	SUJ2
	105WCr6		1.2419	-	-	2140	-	105WC13	10WCr6	105WCr5	SKS31
	-		-	-	-	-	-	-	107WCr5KU	-	SKS2, SKS3
	-		1.2714	-	-	-	L6	55NCDV7	-	F.520.S	SKT4
	100Cr6		1.2067	BL3	-	-	L3	Y100C6	-	100Cr6	-
	16MnCr5		1.7139	-	-	2127	-	-	-	-	-
	16Mo5		1.5423	1503-245-420	-	-	4520	-	16Mo5	16Mo5	-
	40NiCrMo8-4		1.6562	311-Type 7	-	-	8740	-	40NiCrMo2(KB)	40NiCrMo2	SNCM240
	42Cr4		1.7045	-	-	2245	5140	-	-	42Cr4	SCR440
	31NiCrMo14		1.5755	830 M 31	-	2534	-	-	-	F-1270	-
	36NiCr6		1.571	640A35	111A	-	3135	35NC6	-	-	SNC236
	22Mo4		1.5419	605A32	-	2108	8620	-	-	F520.S	-
	25CrMo4		1.7218	1717CDS110	-	2225	4130	25CD4	25CrMo4(KB)	AM26CrMo4	SCM420;SCM430
	-		-	-	-	2223	-	-	-	-	-
High-alloyed steel											
	X210Cr12		1.208	BD3	-	-	D3	Z200C12	X210Cr13KU	X210Cr12	SKD1
									X250Cr12KU		
	X43Cr13		1.2083	-	-	2314	-	-	-	-	-
	X40CrMoV5 1		1.2344	BH13	-	2242	H13	Z40CDV5	X35CrMoV05KU	X40CrMoV5	SKD61

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Low-alloyed steel										
								X40CrMoV511KU		
	X100CrMoV5 1	1.2363	BA2	-	2260	A2	Z100CDV5	X100CrMoV51KU	X100CrMoV5	SKD12
	X210CrW12	1.2436	-	-	2312	-	-	X215CrW12 1KU	X210CrW12	SKD2
	X30WCrV9 3	1.2581	BH21	-	-	H21	Z30WCV9	X28W09KU	X30WCrV9	SKD5
								X30WCrV9 3KU		
	X165CrMoV 12	1.2601	-	-	2310	-	-	X165CrMoW12KU	X160CrMoV12	-
	X155CrMoV12-1	1.2379	-	-	2736	HNV3	-	-	-	-
	X8Ni9	1.5662	1501-509;510	-	-	ASTM A353	-	X10Ni9	XBNI09	-
	12Ni19	1.5668	-	-	-	2515	Z18N5	-	-	-
	S6-5-2	1.3343	4959BA2	-	2715	D3	Z40CSD10	15NiCrMo13	-	SUH3
	-	-	BM 2	-	2722	M 2	Z85WDCV	HS 6-5-2-2	F-5603	SKH 51
	HS 6-5-2-5	1.3243	BM 35	-	2723	M 35	6-5-2-5	HS 6-5-2-5	F-5613	SKH 55
	HS 2-9-2	1.3348	-	-	2782	M 7	-	HS 2-9-2	F-5607	-
	G-X120Mn12	1.3401	Z120M12	-	2183	L3	Z120M12	XG120Mn12	X120Mn12	SCMnH/1
Ferrite/martensite stainless steel										
	X10CrAl13	1.4724	403S17	-	-	405	Z10C13	X10CrAl12	F.311	SUS405
	X10CrAl18	1.4742	430S15	60	-	430	Z10CAS18	X8Cr17	F.3113	SUS430
	X10CrAl2-4	1.4762	-	-	2322	446	Z10CAS24	X16Cr26	-	SUH446
	X1CrMoTi18-2	1.4521	-	-	2326	S44400	-	-	-	-
	X6Cr13	1.4	403S17	-	2301	403	Z6C13	X6Cr13	F.3110	SUS403
	X7Cr14	1.4001	-	-	-	-	-	-	F.8401	-
	X10Cr13	1.4006	410S21	56A	2302	410	Z10C14	X12Cr13	F.3401	SUS410
	X6Cr17	1.4016	430S15	960	2320	430	Z8C17	X8Cr17	F.3113	SUS430
	X6CrAl13	1.4002	405S17	-	-	405	Z8CA12	X6CrAl13	-	-
	X20Cr13	1.4021	420S37	-	2303	420	Z20C13	X20Cr13	-	-
	X6CrMo17-1	1.4113	434S17	-	2325	434	Z8CD17.01	X8CrMo17	-	SUS434
	X45CrS9-3-1	1.4718	401S45	52	-	HW3	Z45CS9	X45GrSi8	F.322	SUH1
	X85CrMoV18-2	1.4748	443S65	59	-	HNV6	Z80CSN20.02	X80CrSiNi20	F.320B	SUH4
	X20CrMoV12-1	1.4922	-	-	2317	-	-	X20CrMoNi 12 01	-	-
	X12CrS13	1.4005	416 S 21	-	2380	416	Z11CF1	X12 CrS 13	F-3411	SUS 416
	X46Cr13	1.4034	420S45	56D	2304	-	Z40CM	X40Cr14	F.3405	SUS420J2
	X19CrNi17-2	1.4057	431S29	57	2321	431	Z15CNi6.02	X16CrNi16	F.3427	SUS431
	X5CrNiCuNb16-4 X4	1.4542 1.4548	-	-	-	630	Z7CNU17-04	-	-	-
	CrNiMo16-5	1.4418	-	-	2387	-	Z6CND16-04-01	-	-	-
	X14CrMoS17	1.4104	-	-	2383	430F	Z10CF17	X10CrS17	F.3117	SUS430F

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M	Austenite stainless steel										
	X3CrNiMo13-4		1.4313	425C11	-	2385	CA6-NM	Z4CND13.4M	(G)X6CrNi304	-	SCS5
								Z38C13M			
	X53CrMnNiN21-9		1.4871	349S54	-	-	EV8	Z52CMN21.09	X53CrMnNiN21 9	-	SUH35, SUH36
	X2CrNiN18-10		1.4311	304S62	-	2371	304LN	Z2CN18.10	-	-	SUS304LN
	X2CrNiMoN17-13-3		1.4429	-	-	2375	316LN	Z2CND17.13	-	-	SUS316LN
	X2CrNiMo17-12-2		1.4435	316S13	-	2348	316L	Z2CND17-12	X2CrNiMo1712	-	-
	X2CrNiMo18-14-3		1.4404	316S13	-	2353	316L	Z2CND17.12	X2CrNiMo17 12	-	SCS16, SUS316L
	X3CrNiMo17-3-3		1.4436	316S33	-	2343 2347	316	Z6CND18-12-03	X8CrNiMo1713	-	-
	X2CrNiMo18-15-4		1.4438	317S12	-	2367	317L	Z2CND19.15	X2CrNiMo18 16	-	SUS317L
	X6CrNiNb18-10		1.455	347S17	58F	2338	347	Z6CNNb18.10	X6CrNiNb18 11	F.3552 F.3524	SUS347
	X6CrNiMoTi17-12-2		1.4571	320S17	58J	2350	316Ti	Z6NDT17.12	X6CrNiMoTi17 12	F.3535	-
	X10CrNiMoNb 18-12		1.4583	-	-	-	318	Z6CNDNb17 13B	X6CrNiMoNb17 13	-	-
	X15CrNiSi20-12		1.4828	309S24	-	-	309	Z15CNS20.12	-	-	SUS303
	X2CrNiMoN17-11-2		1.4406	301S21	58C	2370	308	Z1NCDU25.20	-	F.8414	SCS17
	X1CrNiMoCuN20-18-7		1.4547	-	-	2378	S31254	Z1CNDU20-18-06AZ	-	-	-
	X9CrNi18-8		1.431	-	-	2331	301	Z12CN17.07	X12CrNi17 07	F.3517	SUS301
	X7CrNiAl17-7	1.4568	1.4504	316S111	-	-	17-7PH	Z8CNA17-07	X2CrNiMo1712	-	-
	X2CrNi19-11		1.4306	304S11	-	2352	304L	Z2CN18-10	X2CrNi18 11	-	-
				304S12							
	-	-	-	304S31	58E	2332 2333	304	Z6CN18.09	X5CrNi18 10	F.3504 F.3541	SUS304
	X5CrNi18-10		1.4301	304S15	58E	2332	304	Z6CN18.09	X5CrNi18 10	F.3551	SUS304
	X5CrNiMo17-2-2		1.4401	316S16	58J	2347	316	Z6CND17.11	X5CrNiMo17 12	F.3543	SUS316
	X6CrNiTi18-10		1.4541	321S12	58B	2337	321	Z6CNT18.10	X10CrNiS 18.09	F.3553 F.3523	SUS321
	X8CrNiS18-9		1.4305	303S21	58M	2346	303	Z10CNF 18.09	X6CrNiTi18 11	F.3508	SUS303
	High quality austenite (Ni>20%) stainless steel										
	G-X40NiCrSi36-18		1.4865	330C11	-	-	-	-	XG50NiCr39 19	-	SCH15
	X1NiCrMoCu25-20-5		1.4539	-	-	2562	UNS V 0890A	Z2 NCDU25-20	-	-	-
X8CrNi25-21		1.4845	310S24	-	2361	310S	Z12CN25 20	X6CrNi25 20	F.331	SUH310	
X12NiCrSi36 16		1.4864	-	-	-	330	Z12NCS35.16	F-3313	-	SUH330	
X1NiCrMoCu31-27-4		1.4563	-	-	2584	NO8028	Z1NCDU31-27-03	-	-	-	
Duplex (austenite/ferrite) stainless steel											
X2CrNiN23-4		1.4362	-	-	2376	S31500	-	-	-	-	
X8CrNiMo27-5		-	-	-	2324	S32900	-	-	-	-	
X2CrNiN23-4		-	-	-	2327	S32304	Z2CN23-04AZ	-	-	-	
-	-	-	-	-	2328	-	-	-	-	-	
X2CrNiMoN22-53		-	-	-	2377	S31803	Z2CND22-05-03	-	-	-	

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 Short hole drills
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Comparison table of PVD turning grades

Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEC	ZCC.CT	
	IOS classification	Groups of materials											
PVD turning	P	P10	HR5225 HR7225	GC1025 GC1125	KCS10 KCU10 KC5010	IC807	VP10MF MS6015	AH710	PR930 PR1005 PR1025 PR1115 PR1215 PR1425 PR1225	AC1030U ACZ150 AC5025S AC520U		YBG102	
		P20	HR5125 HR5225 HR7125 HR7225	GC1025 GC1125	KCS10 KCU10 KCU25 KC5010 KC5025	IC807 IC808 IC810	VP10RT VP20RT VP15TF VP20MF	AH120 AH725 AH730 SH725 SH730 J740	PR930 PR1025 PR1115 PR1215 PR1225 PR1625	AC1030U AC5025S AC520U AC530U	TT9020 TT9030	YBG202	
		P30	HR5125 HR5225 HR7125 HR7225	GC1025 GC1125	KCU25 KC5025	IC328 IC330 IC830 IC928	VP10RT VP20RT VP15TF VP20MF	AH725 AH7025 AH730 SH725 SH730 GH730 GH330 J740	PR1025 PR1225 PR1535	AC1030U AC530U	TT8020 TT8080 TT9030	YBG202	
		P40	HR5125 HR7125	GC1025		IC830		AH120 AH725 AH645		AC1030U	TT8020 TT8080 TT9080		
		M10	HR9105 HR7115	GC1115 GC1125	KCS10 KCU10 KC5010	IC807 IC808 IC907 IC908	VP10MF MS6015	AH8005 AH630	PR1025 PR1215 PR1225	AC515S AC5025S AC510U AC520U ACZ150	TT5080	YBG202 YBG205	
	M20	HR5125 HR5225 HR7115 HR7125 HR7225	GC1115 GC1125 GC2035	KCS10 KCU10 KCU25 KC5010 KC5025	IC330 IC806 IC808 IC830 IC908 IC330 IC806 IC808 IC830 IC908 IC928	VP10RT VP20RT VP15TF VP20MF	AH8015 AH630 AH120 AH7025 AH725 SH725 SH730	PR930 PR1025 PR1125 PR1215 PR1425 PR1225 PR1515	AC5015S AC5025S AC1030U AC520U	TT5080 TT9080	YBG202 YBG205		
	M30	HR5125 HR5225 HR7125 HR7225	GC1125 GC2035	KCU25 KC5025	IC328 IC330 IC830 IC840 IC882	VP10RT VP20RT VP15TF VP20MF MP7035	AH645 AH120 AH725 SH725 SH730 J740	PR1125 PR1535	AC5025S AC6040M AC1030U AC520U AC530U	TT8020 TT8080 TT9020 TT9080			
		HR5125 HR7125	GC2035		IC830 IC928	MP7035	AH645		AC6040M AC1030U AC530U	TT8020 TT8080 TT9020 TT9080			

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F Short hole drills
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Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEC	ZCC.CT	
	IOS classification	Groups of materials											
PVD turning	K	K10		GC3330 GC3220 K20W K20D K20M K15W	KCS10 KCU10 KC5010	IC810		GH110 AH110	PR905 PR1215	AC1030U AC510U ACZ150			
		K20		GC3330 GC3220 GC3040 K20W K20D GC4230 K20M K15W	KCS10 KCU10 KCU25 KC5010 KC5025		VP10RT VP20RT VP15TF	AH120 AH725 AH730 SH725 SH730 J740	PR905 PR1215	AC1030U AC5025S AC520U AC530U			
		K30		GC3330 GC3040 K20W GC4240 GC4230		IC830 IC908 IC910 IC928	VP10RT VP20RT VP15TF	AH725 AH7025 AH730 SH725 SH730 GH730 GH330 J740		AC1030U AC530U			
	S	S01					IC804 IC806	MP9005 VP05RT	AH8005 AH905			PR005S	YBG102
		S10	HR9105 HR7115	GC1105 GC1005 GC1025	KC5010 KC5510 KCU10 KCS10	IC807 IC808 IC907 IC908	MP9005 MP9015 VP10RT	AH8015 AH905 SH730 AH110	PR005S PR015S	AC510U AC5015S	TT9080 TT9030		YBG102 YBG105 YBG202 YBG103
		S20	HR7115	GC1025 GC1125	KC5025 KC5525 KCU25	IC806 IC808 IC908	MP9015 MT9015 VP20RT MP9025	AH8015 AH120 AH725	PR015S PR1535	AC510U AC520U AC5025S	TT8080 TT8020		YBG212 YBG105 YBS103
		S30	HR7225	GC1125			IC3028	MP9025	AH725	PR1535	AC520U		YBG212

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General turning

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Short hole drills

Solid carbide drills

Comparison table of CVD turning grades

Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEK	ZCC.CT
	IOS classification	Groups of materials										
CVD turning	P	P01	HR8115	GC4305 GC4315	KCP05B KCPK05 KCK05B KCK15B	IC8005 IC8150 IC428	UE6105	T9205 T9105	CA510 CA5505	AC8015P AC810P	TT8105	
		P10	HR8115	GC4305 GC4415 GC4325	KCP05B KCPK05 KCP10B KCK15B KCK20B	IC5100 IC8150 IC8250 IC9015	UE6105 MC6015 UE6110 MY5015	T9205 T9105 T9215 T9115	CA510 CA515 CA5505 CA5515	AC8015P AC810P	TT8105 TT8115	YBC151 YBC152
		P20	HR8125 HR8225	GC4225 GC4325 GC4425	KCP10B KCP25B KCM15B	IC8150 IC8250 IC8350 IC9015	MC6015 UE6110 MC6025 UE6020 MY5015	T9215 T9115 T9225 T9125	CA025P CA525 CA5515 CA5525 CR9025	AC8025P AC820P	TT5100 TT8125	YBC251 YBC252
		P30	HR8225	GC4315 GC4325 GC4335 GC2025	KCP25B KCP30B KCM15B	IC8350 IC8025	MC6025 UE6020 MC6035 UE6035 UH6400	T9225 T9125 T9235 T9135 T6130	CA025P CA525 CA5525 CA530 CA5535 CA9025	AC8035P AC830P AC6030M AC630M	TT8125 T5100	YBC252 YBC351 YBC352
		P40		GC4325 GC4335	KCP30B KCP40B KCM25B KCM35B	IC8350 IC8025	MC6035 UE6035 UH6400		CA530 CA5535	AC8035P AC830P AC6030M AC630M	TT8135 TT7100	YBC351 YBC352
	M	M10		GC2015 GC1515	KCM15B	IC6015 IC8025 IC8150 IC8250 IC5820	MC7015 US7020	T9235 T9135 T6130	CA6515	AC6020M AC610M	TT9215	
		M20		GC2015 GC2025 GC2020	KCP30B KCP40B KCM15B KCM25B	IC6015 IC6025 IC8320	MC7015 US7020 MC7025	T9215 T9115	CA6525	AC6020M AC6030M AC610M AC630M	TT9225	YBM151 YBM153
		M30		GC2025 GC2020	KCP40B KCM25B KCM35B	IC6025	MC7025 US735	T6120 T9215 T9115		AC6030M AC630M AC8035P AC830P	TT9235	YBM151 YBM251
		M40			KCM35B KCM35		US735	T6130		AC6030M AC630M	TT9235	YB253

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F Short hole drills
G Solid carbide drills

Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEC	ZCC.CT
	IOS classification	Groups of materials										
CVD turning	K	K01		GC3210	KCK05B KCK05	IC5005	MC5005 UC5105	T5105	CA310 CA4010 CA4505 CA5505	AC4010K AC405K	TT7005	YBD052
		K10		GC3210	KCK05B KCK05 KCK15B KCK15	IC5005 IC5010 IC5100	MC5015 UC5115 MY5015	T5105 T515 T5115 T9215	CA310 CA315 CA4010 CA4115 CA4505 CA4515 CA5505	AC4010K AC4015K AC405K AC415K	TT7015	YBD102
		K20	HR6115	GC3210 GC3225	KCK15B KCK15 KCK20B KCK20	IC5010 IC8150	MC5015 UC5115 UE6110 MY5115	T515 T5115 T5125 T9215	CA315 CA320 CA4115 CA4120 CA4515	AC4015K AC415K AC420K AC425K AC8025P	TT7015 TT7025	YBD152 YBD252
		K30	HR6115	GC3225	KCP05B KCPK05 KCP10B KCP25B KCK20B		UE6110	T5125	CA320			

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Solid carbide end mills

C

Short hole drills

Solid carbide drills

Comparison table of CVD turning grades

Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEK	ZCC.CT	
	IOS classification	Groups of materials											
CVD milling	P	P10		GC4220 GC4230 GC3040	KC930M KC935P	IC4100 IC520M IC4050 DT7150 IC5400				ACP2000 ACP100	TT7515		
		P20		GC4220 GC4230 GC3040	SC6525 SP6519		F7030 MC7020	T3225		ACP2000 ACP100	TT7515	YBC301 YBC251	
		P30	HR8140	GC4230 GC3040 GC2040 M30B	MP91M SC6525 KCPK30 X500		F7030 MC7020	T3130 T3225		ACP2000 ACP100	TT7800	YBM351	
		P40	HR8140	GC4240 GC4230 GC3040 GC2040 M30B	KCPK30 X500						TT7800	YBC302	
	M	M10								ACM200			
		M20		GC2040 GC4230	SC6525		F7030 MC7020	T3225	CA6535	ACM200		YBM251 YBM253	
		M30		GC2040 GC4230 GC4240 M30B S40T	SC6525 X500	IC5820	F7030 MC7020	T3225 T3130		ACM200	TT7800	YBM302	
		M40		GC2040 M30B S40T GC4240	X500					ACM200	TT7800		
	K	K10			SC3025 KCK15	IC5100	MC5020	T1215 T1115		ACK2000 ACK100 ACK200	TT7515	YBD151	
		K20		GC3220 K20W	KCK15 SC3025 MP91M	IC5100 DT7150 IC4010 IC4050 IC4100	MC5020	T1215	CA420M	ACK200 ACK200	TT7515	YBD252	
		K30	HR8140	GC3040	MP91M KCPK30 SC6525							YBD252	

Comparison table of cermet grades

Type	Classification codes		HUAREAL	SANDVIK	KENNAMETAL	ISCAR	MITSUBISHI	TUNGALOY	KYOCERA	SUMITOMO	TEAGUTEC	ZCC.CT
	IOS classification	Groups of materials										
Cermet	P	P10			KT1120	IC20N	NX1010	NS520	TN610	T110A T1000A		
		P20	HRC20	CT5015	KT1120 KT175	IC20N IC75T	NX2525	NS520 NS9530	TN610 TN60	T1200A T1500A	CT3000	YNG151 YNG151C
		P30	HRC20	CT5015	KT125	IC20N IC75T IC30N	NX2525 NX3035	NS9530 NS530 NS730	TN620 TN90	T1200A T1500A	CT3000	
		P40				IC75T IC30N	NX3035 NX4545	NS740		T250A		

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General turning

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Solid carbide end mills

C

Short hole drills

Solid carbide drills

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