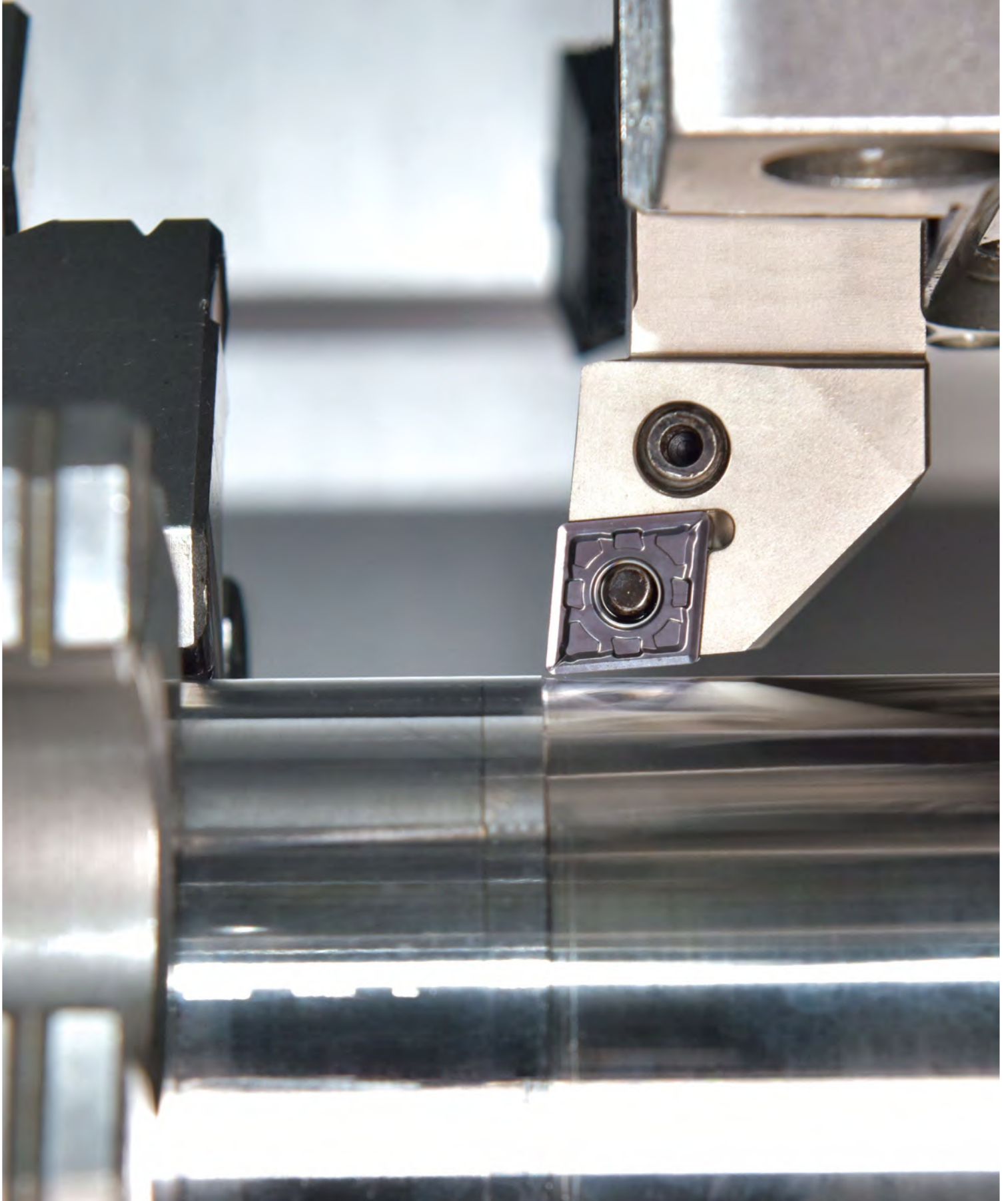


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CUTTING TOOL CATALOGUE

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Positive 35° V Shape Insert	90
Positive 80° W Shape Insert	95
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ISO Turning Insert Denomination System

ISO Turning Inserts

C 1	N 2	M 3	G 4
---------------	---------------	---------------	---------------

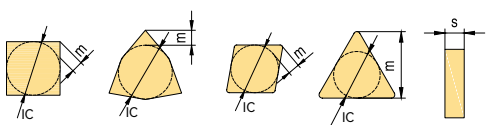
1- Shape/Code

A	B	C	D	E
H	K	L	M	O
P	R	S	T	V
W	Z	Others		

2- Clearance Angle

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

3- Tolerance



Class	Unit	In.Circle dimension IC	Nose height m	Thickness s
A	mm	± 0,025	± 0,005	± 0,025
C	mm	± 0,025	± 0,013	± 0,025
E	mm	± 0,025	± 0,025	± 0,025
F	mm	± 0,013	± 0,005	± 0,025
G	mm	± 0,025	± 0,025	± 0,130
H	mm	± 0,013	± 0,013	± 0,025
J	mm	*	± 0,005	± 0,025
K	mm	*	± 0,013	± 0,025
L	mm	*	± 0,025	± 0,025
M	mm	*	*	± 0,127
U	mm	*	*	± 0,127
N	mm	*	*	± 0,025

* For details refer to right and below tables

IC	Shape: C, E, H, M, O, P, S, T, R, W			
	IC		m	
	J,K,L,M,N	U	M, N	U
4.76	± 0,05	± 0,08	± 0,08	± 0,13
5.56	± 0,05	± 0,08	± 0,08	± 0,13
6.00	± 0,05	± 0,08	± 0,08	± 0,13
6.35	± 0,05	± 0,08	± 0,08	± 0,13
7.94	± 0,05	± 0,08	± 0,08	± 0,13
8.00	± 0,05	± 0,08	± 0,08	± 0,13
9.525	± 0,05	± 0,08	± 0,08	± 0,13
10.00	± 0,05	± 0,08	± 0,08	± 0,13
12.00	± 0,08	± 0,13	± 0,13	± 0,20
12.70	± 0,08	± 0,13	± 0,13	± 0,20
15.875	± 0,10	± 0,18	± 0,15	± 0,27
16.00	± 0,10	± 0,18	± 0,15	± 0,27
19.05	± 0,10	± 0,18	± 0,15	± 0,27
20.00	± 0,10	± 0,18	± 0,15	± 0,27
25.00	± 0,13	± 0,25	± 0,18	± 0,38
25.40	± 0,13	± 0,25	± 0,18	± 0,38
31.75	± 0,15	± 0,25	± 0,20	± 0,38
32.00	± 0,15	± 0,25	± 0,20	± 0,38

M&N class	D shape		V shape	
	IC	ic	ic	m
5.56	± 0,05	± 0,11		
6.35	± 0,05	± 0,11	± 0,05	± 0,16
7.94	± 0,05	± 0,11	± 0,05	± 0,16
9.525	± 0,05	± 0,11	± 0,05	± 0,16
12.70	± 0,08	± 0,15	± 0,08	± 0,20
15.875	± 0,10	± 0,18	± 0,10	± 0,27
19.05	± 0,10	± 0,18	± 0,10	± 0,27

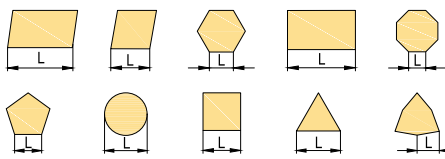
4- Type of Insert



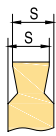
A	B	C	F	G
H	J	M	N	Q
R	T	U	W	Z
				Special

12
5

04
6

5- Cutting Edge Length	
In.Circle Dimension (mm)	Insert shape
	C D R S T V W K
3.97	06 02
5.00	05
5.56	09
6.00	06
6.35	06 07 11 11 04
8.00	08
9.525	09 11 09 09 16 16 06 16
10.00	10
12.00	12
12.70	12 15 12 12 22 22 08
15.875	16 15 15 27
16.00	16
19.05	19 19 19 33
20.00	20
25.00	25
25.40	25 25 25
31.75	31
32.00	32



6- Thickness	
Round down plus zero or T	
A, B, C, N, O, W	 <p>Example: 01 = 1.59 T1 = 1.98 02 = 2.38</p>
H, M, R, T	 <p>03 = 3.18 T3 = 3.97 04 = 4.76 05 = 5.56 06 = 6.35 07 = 7.94</p>
F, G, J, U	 <p>09 = 9.525 11 = 11.11 12 = 12.70 14 = 14.29 15 = 15.88</p>

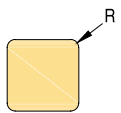
08
7


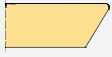


E
8

-
-

KC4
9

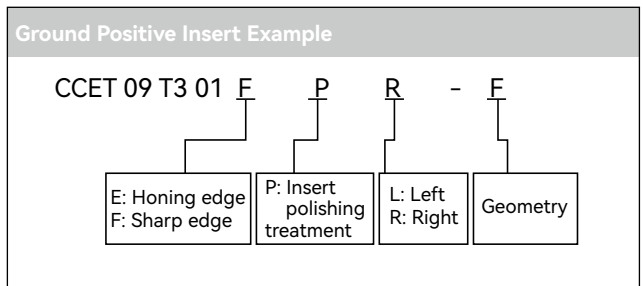
7- Nose Radius	
Corner radius	
Example:	
M0 = Round insert (metric)	
00 = Sharp	20 = 2.00
003 = 0.03	24 = 2.40
005 = 0.05	28 = 2.80
01 = 0.10	32 = 3.20
02 = 0.20	40 = 4.00
04 = 0.40	48 = 4.80
08 = 0.80	56 = 5.60
12 = 1.20	64 = 6.40
16 = 1.60	X = Others



8- Edge Preparation		
Code	Edge shape	Description
F		Sharp cutting edge
E		Honed cutting edge
T		T-land
S		T-land+Honed cutting edge

9- Chip Breaker Description

Refer to page: P28-43



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
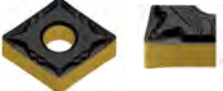
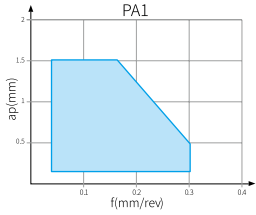


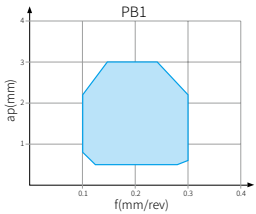
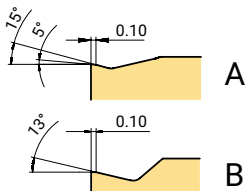

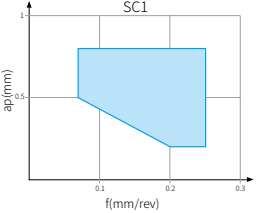
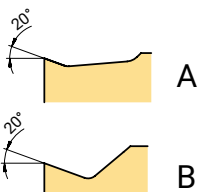

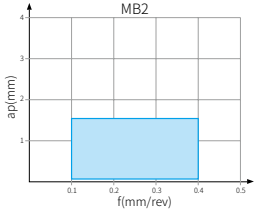
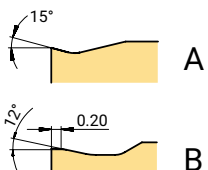
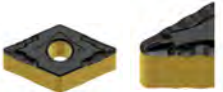
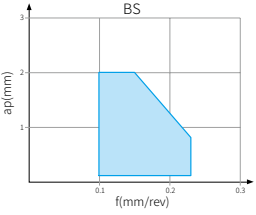
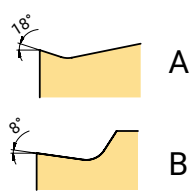

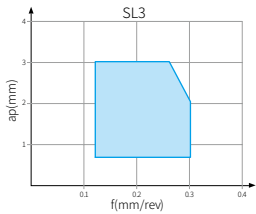
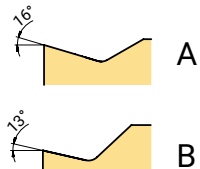
Turning Inserts













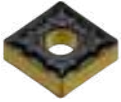
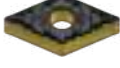




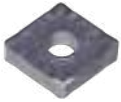
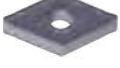

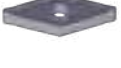







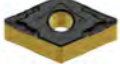







Turning and Grooving Grade Application Guide


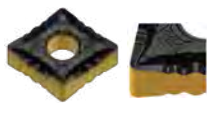
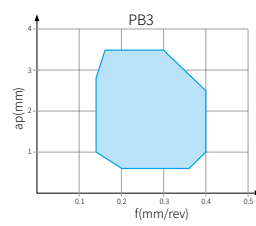
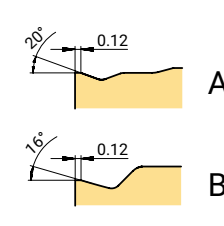
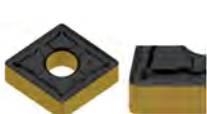
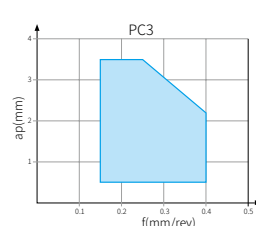
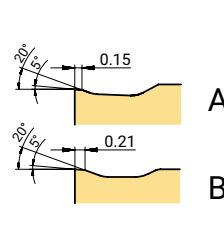

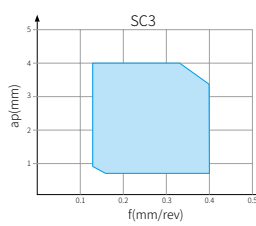
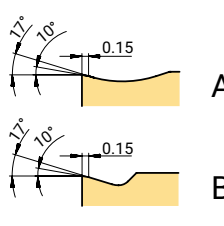

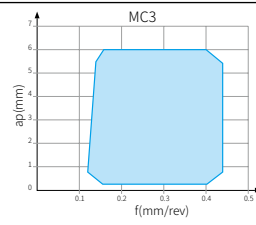
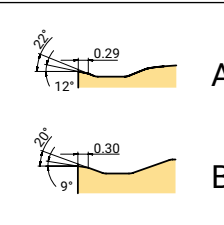

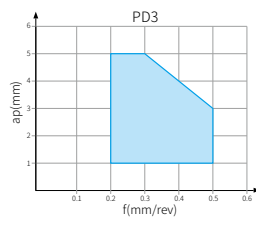
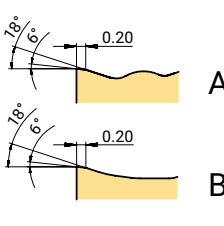

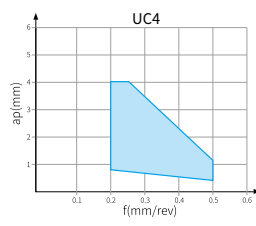
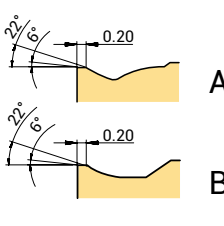
Material Group	ISO	Turning							Grooving/Parting off			ISO			
		Coated				Cermet	Uncoated	PCBN	PCD	Coated			Uncoated		
		CVD		PVD						CVD	PVD				
P Non-alloy steels/ Alloyed steels	P01	AC052P											P01		
	P10	AC152P										AC230P		P10	
	P20		AC252P									AP301U		P20	
	P30		AC350P										AP330M	P30	
	P40			AC200M											P40
	P50														P50
M Stainless steels	M01	AC100M												M01	
	M10		AC200M											M10	
	M20				AP010S								AP301U	AP130S	M20
	M30				AP200U	AP301M								AP330M	M30
	M40														M40
	M50														M50
K Cast iron	K01	AC100K												K01	
	K10	AC102K	AC202K											K10	
	K20													K20	
	K30													K30	
	K40													K40	
	K50													K50	
N Aluminum/ Aluminum alloys	N01													N01	
	N10													N10	
	N20													N20	
	N30													N30	
S Heat resistant alloys	S01	AC100M			AP010S									S01	
	S10		AC200M		AP100S								AP130S	S10	
	S20				AP301M									S20	
	S30													S30	
	S40													S40	
H Hardened steels/ Chilled cast iron	H01													H01	
	H10													H10	
	H20													H20	
	H30													H30	








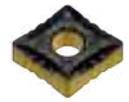
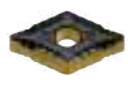



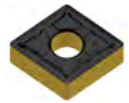
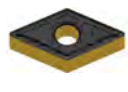










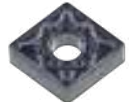





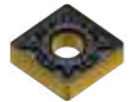
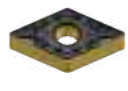


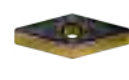

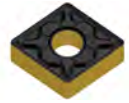
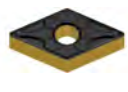


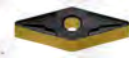

Overview of Turning Insert Geometries


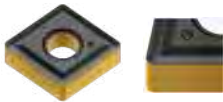
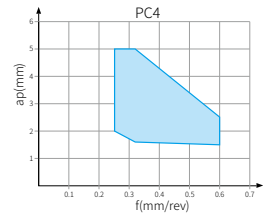
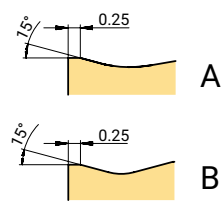

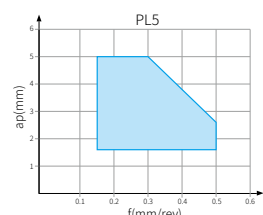
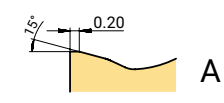
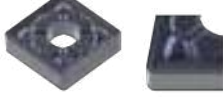
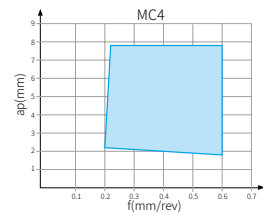
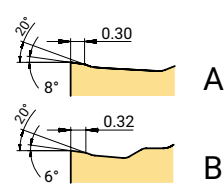
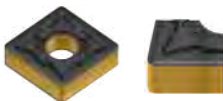
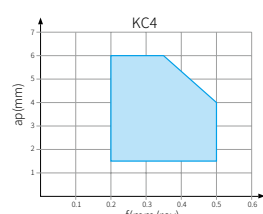
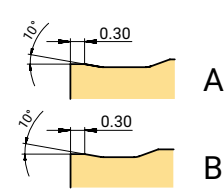
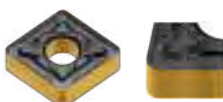
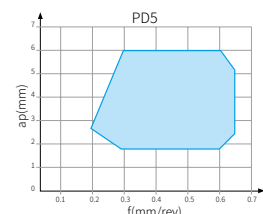
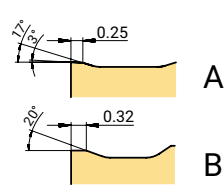
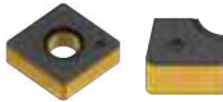
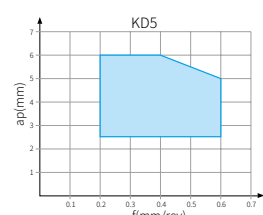

Negative Inserts








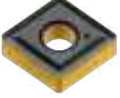
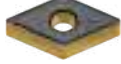




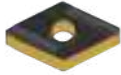


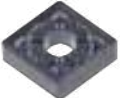




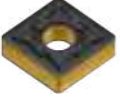
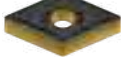





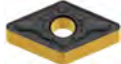



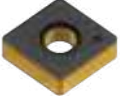
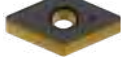



Application	Chip breaker	Features	Chip breaking range	Cross section geometry 
Finishing	PA1 	Steel finishing machining chip breaker Chip breaker structure design to break chips at varied depths of cut, featuring good sharpness and smooth edge inclination design, which can effectively improve the chip flow and reduce cutting force.		
	PB1 	1st choice for steel finish to semi-finishing turning Light cutting chip breaker, low cutting force, suitable for slender shaft, thin walled and poorly clamped parts. Overall good cutting performance.		
	SC1 	1st choice for heat resistant alloy finish turning Excellent performance at low depth of cut.		
	MB2 	1st choice for stainless steel finish turning High positive rake angle reduced cutting force and built-up edge, can obtain much better surface quality. Very good chip breaking at low feed and cutting depth.		
Profiling	BS 	Recommended for profile turning Suitable for profiling with changing depth of cut. Smooth chip evacuation		
Light cutting	SL3 	Recommended for heat resistant alloy light turning. Suitable for heat resistant alloy, Ti-alloy. Sharp and wavy cutting edge can get good surface finish and good chip breaking results.		



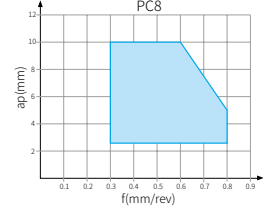
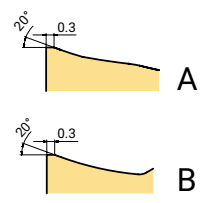

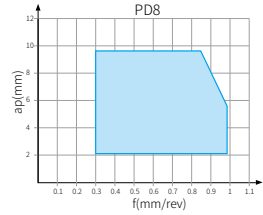
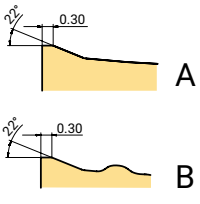

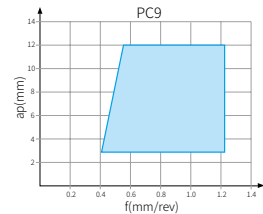
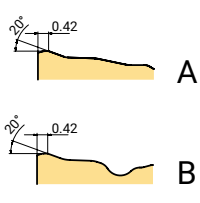
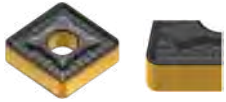
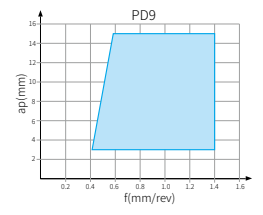
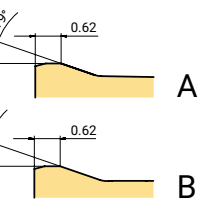
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	<p>CNMG-PB1</p>  <p>P54</p>	<p>DNMG-PB1</p>  <p>P58</p>	<p>SNMG-PB1</p>  <p>P62</p>	<p>TNMG-PB1</p>  <p>P66</p>	<p>VNMG-PB1</p>  <p>P70</p>	<p>WNMG-PB1</p>  <p>P72</p>	
	<p>CNMG-SC1</p>  <p>P54</p>	<p>DNMG-SC1</p>  <p>P58</p>		<p>TNMG-SC1</p>  <p>P66</p>	<p>VNMG-SC1</p>  <p>P70</p>	<p>WNMG-SC1</p>  <p>P72</p>	
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		<p>DNMG-BS</p>  <p>P58</p>			<p>VNMG-BS</p>  <p>P70</p>		
	<p>CNMG-SL3</p>  <p>P54</p>	<p>DNMG-SL3</p>  <p>P58</p>	<p>SNMG-SL3</p>  <p>P62</p>	<p>TNMG-SL3</p>  <p>P66</p>	<p>VNMG-SL3</p>  <p>P70</p>	<p>WNMG-SL3</p>  <p>P73</p>	








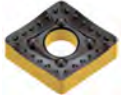
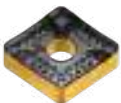




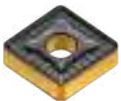

Application	Chip breaker	Features	Chip breaking range	Cross section geometry 
Semi-finishing	PB3 	1st choice for steel semi finish turning The positive rake angle combined with small land guaranteed edge strength and sharpness, reduced the cutting force. The wavy side edge design has a good chip breaking result in small leading angle turning on the shoulder, and in profile turning at different cutting depths.		
	PC3 	Alternative chipbreaker for steel semi-finish turning Unique geometry design offers wider chip breaking range. Double rake angle makes the cutting smoothly. Enhanced insert tip reduced crater wear.		
	SC3 	1st choice for heat resistant alloy medium turning Used in heat resistant alloy and titanium alloy medium turning. Large rake angle + small land width design, easy cutting, is also suitable for soft steel turning.		
	MC3 	1st choice for stainless steel medium turning Sharp cutting edge, low cutting force, wide chip breaking range and good chip removal ability.		
Medium	PD3 	1st choice for steel medium turning It has a strong chip control ability at low feed and cutting depth, and reduces crater wear. The chip breaking is also very good at high feed and cutting depth due to the geometry design. Double rake angle design makes sharp cutting edge and reduces cutting force.		
	UC4 	1st choice for carbon steel & alloyed steel (medium-cutting conditions) Alternative chip breaker for cast iron finishing & light-duty machining Wide applicability across P, M, K-class workpiece materials for general-purpose medium-duty machining. Positive land angle geometry for reduced cutting forces and enhanced process stability. Features an optimized edge preparation technique to balance cutting-edge sharpness and strength.		

	80° Rhombus 	55° Rhombus 	90° Square 	60° Triangle 	35° Rhombus 	80° Trigon 	Round 
	<p>CNMG-PB3</p>  <p>P54</p>	<p>DNMG-PB3</p>  <p>P59</p>		<p>TNMG-PB3</p>  <p>P67</p>	<p>VNMG PB3</p>  <p>P70</p>	<p>WNMG-PB3</p>  <p>P73</p>	
	<p>CNMG-PC3</p>  <p>P54</p>	<p>DNMG-PC3</p>  <p>P59</p>	<p>SNMG-PC3</p>  <p>P62</p>	<p>TNMG-PC3</p>  <p>P67</p>	<p>VNMG-PC3</p>  <p>P70</p>	<p>WNMG-PC3</p>  <p>P73</p>	
	<p>CNMG-SC3</p>  <p>P55</p>	<p>DNMG-SC3</p>  <p>P59</p>	<p>SNMG-SC3</p>  <p>P62</p>	<p>TNMG-SC3</p>  <p>P67</p>	<p>VNMG-SC3</p>  <p>P70</p>	<p>WNMG-SC3</p>  <p>P73</p>	
	<p>CNMG-MC3</p>  <p>P55</p>	<p>DNMG-MC3</p>  <p>P59</p>	<p>SNMG-MC3</p>  <p>P62</p>	<p>TNMG-MC3</p>  <p>P67</p>	<p>VNMG-MC3</p>  <p>P70</p>	<p>WNMG-MC3</p>  <p>P73</p>	
	<p>CNMG-PD3</p>  <p>P55</p>	<p>DNMG-PD3</p>  <p>P60</p>	<p>SNMG-PD3</p>  <p>P63</p>	<p>TNMG-PD3</p>  <p>P67</p>	<p>VNMG-PD3</p>  <p>P71</p>	<p>WNMG-PD3</p>  <p>P73</p>	
	<p>CNMG-UC4</p>  <p>P55</p>	<p>DNMG-UC4</p>  <p>P60</p>	<p>SNMG-UC4</p>  <p>P62</p>	<p>TNMG-UC4</p>  <p>P67</p>	<p>VNMG-UC4</p>  <p>P71</p>	<p>WNMG-UC4</p>  <p>P73</p>	



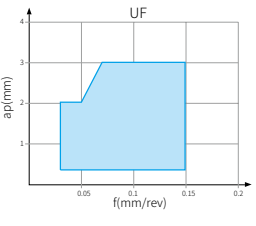
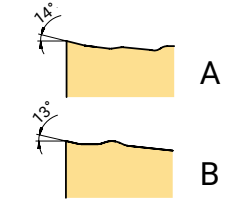

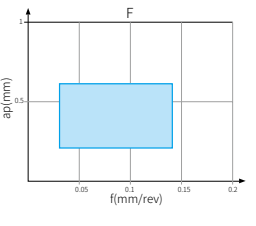


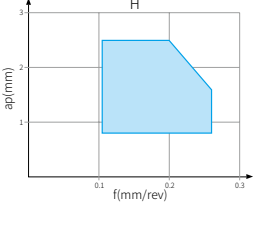
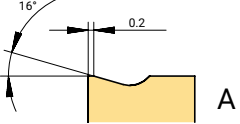
Application	Chip breaker	Features	Chip breaking range	Cross section geometry 
Medium	PC4 	1st choice for cast iron medium turning Alternative chipbreaker for carbon steel and alloy steel medium turning Flat T-land guarantee the strength of cutting edge. This multi-purpose geometry can be used in universal applications.		
	PL5 	1st choice for steel slender bar turning Open chip breaker leads to smooth cutting with low cutting force, which is suitable for slender shaft turning.		
Roughing	MC4 	Alternative chipbreaker for stainless steel and heat resistant alloy rough turning Large chip breaker design, smooth chip evacuation, good chip breaking, with high metal removal rate.		
	KC4 	1st choice for cast iron turning It has strong cutting edge, reliable and stable performance.		
	PD5 	Alternative chipbreaker for steel rough turning A strong cutting edge. Double rake angle design effectively reduces the cutting force, can still have good chip breaking at small cutting depth.		
	KD5 	1st choice for cast iron rough turning High cutting edge strength, suitable for interrupt cutting and unstable cutting.		














	80° Rhombus 	55° Rhombus 	90° Square 	60° Triangle 	35° Rhombus 	80° Trigon 	Round 
	<p>CNMG-PC4</p>  <p>P55</p>	<p>DNMG-PC4</p>  <p>P60</p>	<p>SNMG-PC4</p>  <p>P63</p>	<p>TNMG-PC4</p>  <p>P67</p>	<p>VNMG-PC4</p>  <p>P71</p>	<p>WNMG-PC4</p>  <p>P74</p>	
		<p>DNMG-PL5</p>  <p>P60</p>		<p>TNMG-PL5</p>  <p>P67</p>		<p>WNMG-PL5</p>  <p>P74</p>	
	<p>CNMG-MC4</p>  <p>P56</p>	<p>DNMG-MC4</p>  <p>P61</p>	<p>SNMG-MC4</p>  <p>P63</p>	<p>TNMG-MC4</p>  <p>P68</p>		<p>WNMG-MC4</p>  <p>P74</p>	
	<p>CNMG-KC4</p>  <p>P56</p>	<p>DNMG-KC4</p>  <p>P61</p>	<p>SNMG-KC4</p>  <p>P64</p>	<p>TNMG-KC4</p>  <p>P68</p>	<p>VNMG-KC4</p>  <p>P71</p>	<p>WNMG-KC4</p>  <p>P74</p>	
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Application	Chip breaker	Features	Chip breaking range	Cross section geometry 
Heavy roughing	PC8 	Light cutting geometry for heavy turning Positive rake angle and curved cutting edge design, low cutting force.		
	PD8 	Heavy turning geometry for soft steel and stainless steel The geometry design ensures low cutting force. Suitable for low power machine tools. Applied in steel, stainless steel and cast iron heavy turning.		
	PC9 	1st choice for steel heavy rough turning Wavy geometry is good for chip breaking. The geometry has a big space for chips, which is suitable for high metal removal rate.		
	PD9 	Alternative chipbreaker for steel heavy rough turning High edge strength is suitable for large cutting depth and high feed turning. High machining reliability.		

	80° Rhombus 	55° Rhombus 	90° Square 	60° Triangle 	35° Rhombus 	80° Trigon 	Round 
	CNMM-PC8  P57						
	CNMM-PD8  P57		SNMM-PD8  P65	TNMM-PD8  P69			
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	CNMM-PD9  P57		SNMM-PD9  P65				



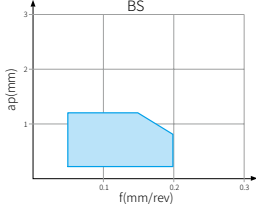
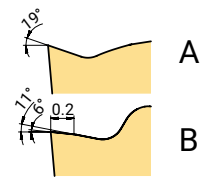
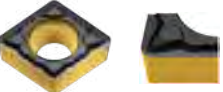
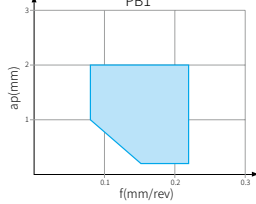
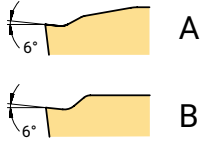
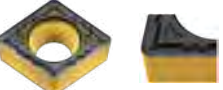
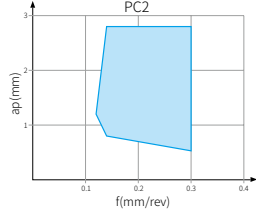
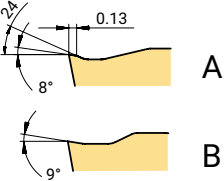
Negative Ground Insert









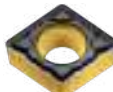




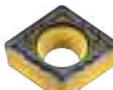




Application	Chip breaker	Features	Chip breaking range	Cross section geometry 
Finishing	<p>UF</p> 	<p>Suitable for precision turning</p> <p>Low cutting forces, good chip breaking, suitable for finish turning.</p>		
	<p>F</p> 	<p>Finish turning</p> <p>Low cutting force, good chip control. The sharp edge produces a good surface finish.</p>		
Semi-finishing-Rough machining	<p>H</p> 	<p>Light turning</p> <p>Excellent chip control at low to medium feed rates. Strong edge strength.</p>		


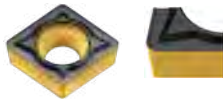
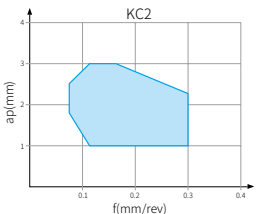
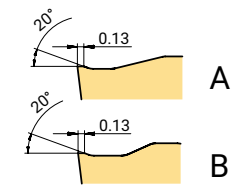
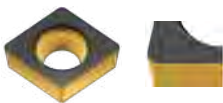
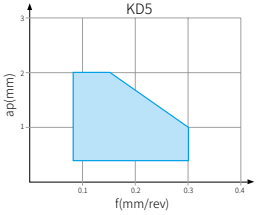


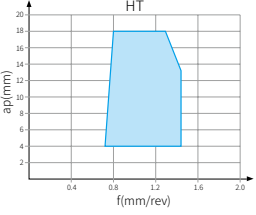
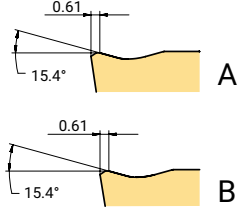
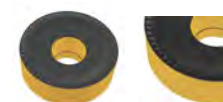
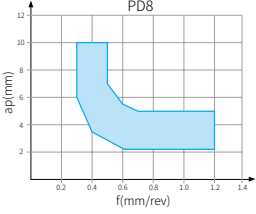
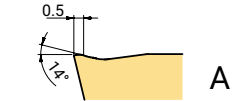

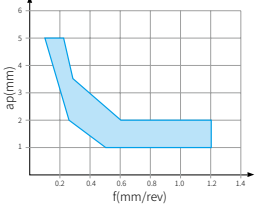
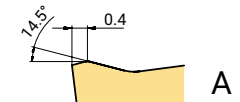
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	<p>CNGG-UF</p>  <p>P54</p>	<p>DNGG-UF</p>  <p>P58</p>		<p>TNGG-UF</p>  <p>P66</p>	<p>VNGG-UF</p>  <p>P70</p>		
				<p>TNGG-F</p>  <p>P69</p>			
				<p>TNGG-H</p>  <p>P69</p>			








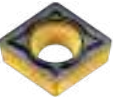
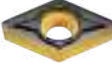



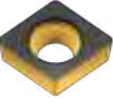
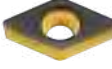





Overview of Turing Insert Geometry

Positive Pressed Insert



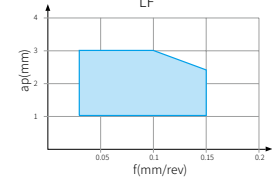
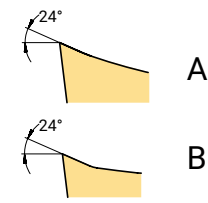

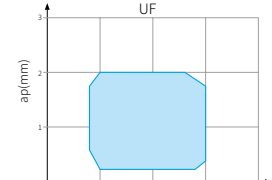
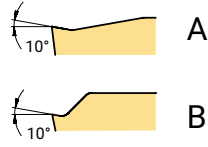

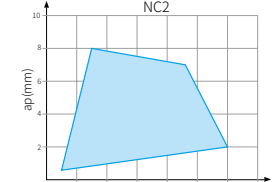
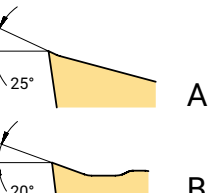

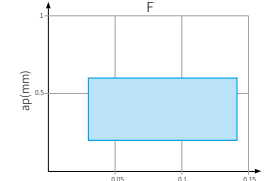


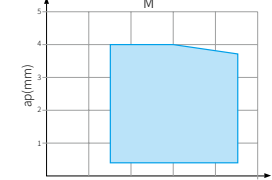


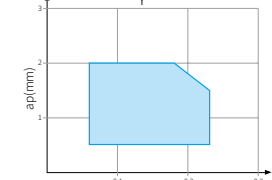
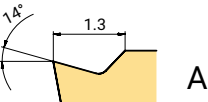
Application	Chip breaker	Features	Chip breaking range	Cross section geometry 
Profiling	<p>BS</p> 	<p>Finish turning</p> <p>Profile turning or turning with changing depth of cut, smooth chip evacuation.</p>		
Finishing	<p>PB1</p> 	<p>1st choice for steel finish turning</p> <p>Positive rake angle reduces cutting force and built-up edge, and obtains better surface finish and longer tool life. Also can be used in stainless steel turning.</p>		
Semi-finishing	<p>PC2</p> 	<p>1st choice for steel and stainless steel semi-finish turning</p> <p>Sharp geometry design ensures low cutting force, less built-up edge and excellent chip control.</p>		

	80° Rhombus 	55° Rhombus 	90° Square 	60° Triangle 	35° Rhombus 	80° Trigon 	Round 
					VBMT-BS  P90		
	CCMT-PB1 CPMT-PB1  P77、80	DCMT-PB1  P82	SCMT-PB1  P84	TCMT-PB1 TPMT-PB1  P86、88	VBMT-PB1 VCMT-PB1  P90、93		
	CCMT-PC2 CPMT-PC2  P77、80	DCMT-PC2  P82	SCMT-PC2  P84	TCMT-PC2 TPMT-PC2  P86、88	VBMT-PC2 VCMT-PC2  P91、93		
































Application	Chip breaker	Features	Chip breaking range	Cross section geometry 
Medium	KC2 	General purpose geometry for steel, stainless steel and cast iron turning Suitable for medium and rough turning. Simple and durable chip breaker design, very good versatility and wide application range.		
Roughing	KD5 	Geometry for cast iron rough turning Suitable for unstable machining due to its strong cutting edge. Reduced chipping.		
	HT 	Geometry for steel turning with large cutting depth Open chip breaker is suitable for large cutting depth with smooth chip evacuation. Good cost efficiency.		
Semi-finishing	PD8 	Geometry for carbon steel and alloy steel semi-finishing turning A wide chipbreaker avoid chip jam at large cutting depth. Chip control can be also good at small cutting depth.		
Medium	No code 	Alternative chipbreaker for cast iron and alloy steel medium turning Negative land and large rake angle design ensure cutting edge strength and sharpness.		

	80° Rhombus 	55° Rhombus 	90° Square 	60° Triangle 	35° Rhombus 	80° Trigon 	Round 
	<p>CCMT-KC2</p>  <p>P78</p>	<p>DCMT-KC2</p>  <p>P82</p>	<p>SCMT-KC2</p>  <p>P84</p>	<p>TCMT-KC2</p>  <p>P87</p>	<p>VBMT-KC2</p>  <p>P91</p>		
	<p>CCMW-KD5</p>  <p>P78</p>	<p>DCMW-KD5</p>  <p>P82</p>	<p>SCMW-KD5</p>  <p>P84</p>	<p>TCMW-KD5</p>  <p>P87</p>			
			<p>SCMT-HT</p>  <p>P84</p>				
							<p>RCMX-PD8</p>  <p>P96</p>
							<p>RCMX</p>  <p>P96</p>

正型磨制 Inserts

Application	Chip breaker	Features	Chip breaking range	Cross section geometry 
Finishing	<p>LF</p> 	<p>Finish turning</p> <p>Sharp cutting edge, low cutting force, suitable for Swiss-type automatic lathe with 2 direction machining.</p>		
	<p>UF</p> 	<p>1st choice for heat resistant alloy turning</p> <p>Peripheral ground finish turning inserts. High repeatability on insert positioning. Sharp cutting edge can achieve good machining tolerance.</p>		
Semi-finishing	<p>NC2</p> 	<p>Choice for aluminium alloy turning</p> <p>Very positive rake angle is designed for non-ferrous metal finish and semi-finish turning. It reduces the cutting force and make smooth chip evacuation. The polished rake surface, with reduced friction and built-up edge.</p>		
Finishing	<p>F</p> 	<p>Choice for finish turning</p> <p>Excellent chip control at low feed rate. Very low cutting force.</p>		
Low feed	<p>M</p> 	<p>Suitable for medium turning in automatic lathes</p> <p>Excellent chip control at low to medium feed rate. Reliable machining. large rake angle avoid work hardening.</p>		
Semi-finishing	<p>Y</p> 	<p>Choice for semi-finish to rough turning in automatic lathe</p> <p>The strong edge can be used in rough turning. Good chip control for low to medium feed rate</p>		

ISO Turning Inserts

	80° Rhombus 	55° Rhombus 	90° Square 	60° Triangle 	35° Rhombus 	80° Trigon 	Round 
	CCGT-LF  P76	DCGT-LF  P81		TCGT-LF  P85	VBGT-LF VCGT-LF VPGT-LF  P90、93、94		
	CCGT-UF  P76	DCGT-UF  P81		TCGT-UF  P85、86	VBGT-UF VCGT-UF VPGT-UF  P90、93、94		
	CCGT-NC2  P76	DCGT-NC2  P81	SCGT-NC2  P84	TCGT-NC2  P86	VCGT-NC2 VPGT-NC2  P93、94		RCGT-NC2  P96
	CCET-F  P78	DCET-F  P82、83		TBET-F TCET-F TPEH-F  P85、87、89	VBET-F VCET-F VPET-F  P91、93、94	WBET-F  P95	
	CCET-M  P79	DCET-M  P83		TCET-M  P87	VBET-M VPET-M  P92、94		
					VBET-Y  P92		

Turning Grade Description

Basic Grades for Turning

P

Steel, cast steel, ferrite/martensite stainless steel and malleable cast iron

Basic grade

AC052P P05(P01-P15)

CVD coated grade, has good crater resistance and chipping resistance, which is recommended for high productivity medium and rough turning in stable condition, can keep edge reliability in dry or wet machining with high temperature.

AC152P P15(P05-P25)

CVD coated grade, can be used in finish to rough turning on steel and cast steel, and is recommended in continuous and light interrupted cutting where it can keep high metal removal rate.

AC252P P25(P15-P35)

CVD coated grade, 1st choice for steel turning, used in finish to rough turning on steel and cast steel. It's recommended for continuous and interrupted machining.

AC350P P35(P30-P45)

CVD coated grade, can be used in rough turning on steel and cast steel under poor conditions. Reliable cutting edge made this grade good for interrupted machining with high metal removal rate.

AT210A P15(P10-P20)

Coated cermet grade, the combination of ultra-fine crystalline hard phase and composite bonding phase to realize the balance of wear resistance and chipping resistance; suitable for continuous medium to fine turning processing of steel materials, and offer high-quality machining surface.

AT202 P15(P10-P20)

Uncoated cermet grade. It has excellent built-up edge resistance and chipping resistance which can be used in finish turning with good surface quality or low cutting force requests.

Supplemental grade

AP200U P25(P15-P35)

PVD coated grade, recommended for finish turning on low carbon steel with low cutting speed or low feed.

M

Austenitic stainless steel, cast steel, manganese steel, alloyed cast iron, malleable cast iron and free cutting iron

Basic grade

AC100M M15(M05-M20)

CVD coated grade. It's recommended for finish machining and light rough machining. It's suitable for machining at medium to high cutting speed due to its heat resistance feature of wear resistant coating.

AC200M M25(M15-M30)

CVD coated grade, optimised for semi-finish to rough turning, can be used in interrupted machining in which it can keep edge reliability due to good thermal shock stability and mechanical shock resistance.

AP301M M25(M15-M35)

PVD coated grade. Mainly used in machining steel and stainless steel small parts. It has excellent built-up edge resistance, good machining stability, can obtain good surface quality, and achieve longer tool life.

Supplemental grade

AP010S (M01-M15)

PVD coated grade, recommended for finish turning due to its high hardness and resistance to plastic deformation.

AP200U M25(M15-M35)

PVD coated grade, used in complementary stainless steel applications at low to medium cutting speeds and also in interrupted turning due to excellent thermal stability, outstanding performance in machining when sharp edge and edge toughness or good surface quality are requested.



Cast iron, chilled cast iron and short chip malleable cast iron

Basic grade

AC100K K05(K01-K15)

CVD coated grade, has thick and smooth wear resistant coating and very hard substrate, recommended for grey cast iron high speed turning.

AC102K K10(K05-K20)

CVD coated grade, has thick and smooth wear resistant coating and hard substrate, recommended for nodular cast iron high speed turning.

AC202K K15(K10-K30)

1st choice for cast iron turning. It can deal with interrupted cutting due to its high wear-resistant CVD coating, used in finish to rough turning on cast iron at low to medium cutting speed.

Supplemental grade

PB90 K10(K01-K20)

CBN grade. Suitable for grey cast iron and chilled cast iron interrupted finish turning due to its good edge strength and wear resistance.

AT210A K15(K10-K20)

Coated cermet grade. The combination of ultra-fine crystalline hard phase and composite bonding phase to provide a balance of abrasion resistance and chipping resistance; suitable for continuous and medium turning of cast iron materials; offer high-quality machining surfaces.

AT202 K15(K10-K20)

Uncoated cermet grade. It has excellent built-up edge resistance and good plastic deformation resistance. It can be used in nodular cast iron finish turning when surface quality, small tolerance or low cutting force are requested.



Non-ferrous metals

Basic grade

AW100K N15(N05-N25)

Uncoated grade. It has both excellent wear resistance and sharp edge. Used in Al alloy rough to finish machining.

PD20 N10 (N01-N20)

PCD grade, used in non-ferrous material and non-metal material machining which can have longer tool life, completely clean cutting and good surface quality.



Heat resistant alloys

Basic grade

AP010S S05(S01-S15)

With extremely high hardness, structural and chemical stability, it can not only meet the needs of high cutting speed finishing stable working conditions, but also suitable for high toughness of medium or semi-finishing and other general working conditions.

AP100S S10(S05-S20)

1st choice for heat resistant alloy. PVD coated grade has high hardness and plastic deformation resistance, can keep high performance and good wear resistance.

AP301M S25(S15-S35)

PVD coated grade. Used in low cutting speed or light interrupted cutting. Suitable for semi-roughing or continuous machining for a short time due to its good notch wear resistance and anti-heat shock capability.

Supplemental grade

AC100M S15(S05-S20)

CVD coated grade, suitable for heat resistant alloy continuous high speed machining.

AC200M S25(S15-S35)

CVD coated grade, suitable for heat resistant alloy general machining.



Hardened materials

Basic grade

PB30 H10(H05-H15)

CBN grade with low CBN content, is used in hardened steel continuous machining at high speed and light interrupted machining.

PB60 H15(H10-H25)

1st choice of CBN grade medium CBN content for hardened steel interrupted machining and continuous machining at medium speed.

Cutting Data Recommendation--Negative Insert

Materials												
ISO	Workpiece Materials				Brinell Hardness (HB)	Tensile strength (N/mm ²)	AT202			AT210A		
							f (mm/rev)			f (mm/rev)		
							0.10	0.30	0.50	0.10	0.30	0.50
P	Unalloyed steel	C ≤ 0.25%	Annealed	125	428	200	100	70	310	200	160	
		0.25 < C ≤ 0.55%	Annealed	190	639	200	100	70	310	200	160	
		0.25 < C ≤ 0.55%	Heat-treated	210	708	200	80	50	310	180	140	
		C > 0.55%	Annealed	190	639	200	80	50	310	180	140	
		C > 0.55%	Heat-treated	300	1013	200	80	50	310	180	140	
		Free cutting steel(short chip)	Annealed	220	745	200	80	50	310	180	140	
	Low-alloyed steel	Annealed			175	591	180	80	50	290	180	140
		Heat-treated			300	1013	180	80	50	290	180	140
		Heat-treated			380	1282	180	80	50	290	180	140
		Heat-treated			430	1477	180	80	50	290	180	140
	High-alloyed steel and high-alloyed tool steel	Annealed			200	675	160	80	50	270	180	140
		Hardened and tempered			300	1013	160	80	50	270	180	140
		Hardened and tempered			400	1361	150	80	50	270	180	140
Stainless steel	Ferritic/Martensite, Annealed			200	675							
	Martensite, Heat-treated			330	1114							
M	Stainless steel	Austenitic,hardened		200	675							
		Austenitic,precipitation hardened stainless steel(PH stainless steel)		300	1013							
		Austenitic, ferritic, duplex		230	778							
K	Malleable cast iron	Ferritic		200	400							
		Pearlitic		260	700							
	Grey cast iron	Low tensile strength		180	200							
		High tensile strength/Austenitic		245	350							
	Nodular cast iron	Ferritic		155	400							
		Pearlitic		265	700							
GGV(CGI)			230	400								
N	Wrought aluminum alloy	Non-aging alloy		30	-							
		Aged alloy		100	340							
	Cast aluminum alloy	≤ 12% Si, non-aging alloy		75	260							
		≤ 12% Si, aged alloy		90	310							
		> 12% Si, non-aging alloy		130	450							
	Magnesium alloy			70	250							
	Copper and copper alloy (bronze/brass)	Unalloyed, electrolytic copper			100	340						
		Brass, bronze, red brass			90	310						
Cu alloy, short chip			110	380								
High tensile, Ampco alloy			300	1010								
S	Heat-resistant alloy	Fe-based	Annealed	200	680							
			Aged	280	940							
		Ni or Co based	Annealed	250	840							
			Aged	350	1180							
			Cast	320	1080							
	Titanium alloy	Pure Titanium			200	680						
		α and β alloy, aged			375	1260						
		β alloy			410	1400						
	Tungsten alloy			300	1010							
	Molybdenum alloy			300	1010							
H	Hardened steel	Hardened and tempered		50HRC								
		Hardened and tempered		55HRC								
		Hardened and tempered		60HRC								
	Chilled cast iron		Hardened and tempered		55HRC							

* The recommended cutting data always refer to general cutting conditions. The actual selection should be adjusted according to the factors such as machine rigidity, tool body, workpiece conditions and coolant (f should be adjust according to insert radius)

Cutting Data Recommendation--Negative Insert

Materials												
ISO	Workpiece Materials				Brinell Hardness (HB)	Tensile strength (N/mm ²)	AP200U			AP301M		
							f (mm/rev)			f (mm/rev)		
							0.10	0.30	0.50	0.10	0.30	0.50
P	Unalloyed steel	C ≤ 0.25%	Annealed	125	428	220	210					
		0.25 < C ≤ 0.55%	Annealed	190	639	170	150					
		0.25 < C ≤ 0.55%	Heat-treated	210	708	140	120					
		C > 0.55%	Annealed	190	639	130	120					
		C > 0.55%	Heat-treated	300	1013							
	Free cutting steel(short chip)	Annealed	220	745	190	170						
	Low-alloyed steel	Annealed		175	591	130	110					
		Heat-treated		300	1013							
		Heat-treated		380	1282							
		Heat-treated		430	1477							
	High-alloyed steel and high-alloyed tool steel	Annealed		200	675	120	80					
		Hardened and tempered		300	1013							
		Hardened and tempered		400	1361							
Stainless steel	Ferritic/Martensite, Annealed		200	675	145	130	90					
	Martensite, Heat-treated		330	1114	105	80	70					
M	Stainless steel	Austenitic,hardened		200	675	180	120	80	180	120	80	
		Austenitic,precipitation hardened stainless steel(PH stainless steel)		300	1013	110	90		110	90		
		Austenitic, ferritic, duplex		230	778	120	100	70	120	100	70	
K	Malleable cast iron	Ferritic		200	400							
		Pearlitic		260	700							
	Grey cast iron	Low tensile strength		180	200							
		High tensile strength/Austenitic		245	350							
	Nodular cast iron	Ferritic		155	400							
		Pearlitic		265	700							
GGV(CGI)			230	400								
N	Wrought aluminum alloy	Non-aging alloy		30	-							
		Aged alloy		100	340							
	Cast aluminum alloy	≤ 12% Si, non-aging alloy		75	260							
		≤ 12% Si, aged alloy		90	310							
		> 12% Si, non-aging alloy		130	450							
	Magnesium alloy			70	250							
	Copper and copper alloy (bronze/brass)	Unalloyed, electrolytic copper		100	340							
		Brass, bronze, red brass		90	310							
Cu alloy, short chip		110	380									
High tensile, Ampco alloy		300	1010									
S	Heat-resistant alloy	Fe-based	Annealed	200	680				40	25		
			Aged	280	940				30	20		
		Ni or Co based	Annealed	250	840				30	25		
			Aged	350	1180				30	20		
	Titanium alloy	Pure Titanium		200	680							
		α and β alloy, aged		375	1260							
	β alloy		410	1400								
	Tungsten alloy			300	1010							
Molybdenum alloy			300	1010								
H	Hardened steel	Hardened and tempered		50HRC								
		Hardened and tempered		55HRC								
		Hardened and tempered		60HRC								
	Chilled cast iron		Hardened and tempered		55HRC							

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Cutting Data Recommendation--Positive Insert

Materials												
ISO	Workpiece Materials				Brinell Hardness (HB)	Tensile strength (N/mm ²)	AT202			AT210A		
							f (mm/rev)			f (mm/rev)		
							0.10	0.30	0.50	0.10	0.30	0.50
P	Unalloyed steel	C ≤ 0.25%	Annealed	125	428	200	100	70	310	200	160	
		0.25 < C ≤ 0.55%	Annealed	190	639	200	100	70	310	200	160	
		0.25 < C ≤ 0.55%	Heat-treated	210	708	200	80	50	310	180	140	
		C > 0.55%	Annealed	190	639	200	80	50	310	180	140	
		C > 0.55%	Heat-treated	300	1013	200	80	50	310	180	140	
		Free cutting steel(short chip)	Annealed	220	745	200	80	50	310	180	140	
	Low-alloyed steel	Annealed			175	591	180	80	50	290	180	140
		Heat-treated			300	1013	180	80	50	290	180	140
		Heat-treated			380	1282	180	80	50	290	180	140
		Heat-treated			430	1477	180	80	50	290	180	140
	High-alloyed steel and high-alloyed tool steel	Annealed			200	675	160	80	50	270	180	140
		Hardened and tempered			300	1013	160	80	50	270	180	140
Hardened and tempered			400	1361	150	80	50	270	180	140		
Stainless steel	Ferritic/Martensite, Annealed			200	675							
	Martensite, Heat-treated			330	1114							
M	Stainless steel	Austenitic,hardened		200	675							
		Austenitic,precipitation hardened stainless steel(PH stainless steel)		300	1013							
		Austenitic, ferritic, duplex		230	778							
K	Malleable cast iron	Ferritic		200	400							
		Pearlitic		260	700							
	Grey cast iron	Low tensile strength		180	200							
		High tensile strength/Austenitic		245	350							
	Nodular cast iron	Ferritic		155	400							
		Pearlitic		265	700							
GGV(CGI)			230	400								
N	Wrought aluminum alloy	Non-aging alloy		30	-							
		Aged alloy		100	340							
	Cast aluminum alloy	≤ 12% Si, non-aging alloy		75	260							
		≤ 12% Si, aged alloy		90	310							
		> 12% Si, non-aging alloy		130	450							
	Magnesium alloy			70	250							
	Copper and copper alloy (bronze/brass)	Unalloyed, electrolytic copper			100	340						
		Brass, bronze, red brass			90	310						
Cu alloy, short chip			110	380								
High tensile, Ampco alloy			300	1010								
S	Heat-resistant alloy	Fe-based	Annealed	200	680							
			Aged	280	940							
		Ni or Co based	Annealed	250	840							
			Aged	350	1180							
	Titanium alloy	Pure Titanium			200	680						
		α and β alloy, aged			375	1260						
		β alloy			410	1400						
	Tungsten alloy			300	1010							
Molybdenum alloy			300	1010								
H	Hardened steel	Hardened and tempered		50HRC								
		Hardened and tempered		55HRC								
		Hardened and tempered		60HRC								
	Chilled cast iron		Hardened and tempered		55HRC							

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Cutting Data Recommendation--Positive Insert

Materials												
ISO	Workpiece Materials				Brinell Hardness (HB)	Tensile strength (N/mm ²)	AP200U			AP301M		
							f (mm/rev)			f (mm/rev)		
							0.10	0.30	0.50	0.10	0.30	0.50
P	Unalloyed steel	C ≤ 0.25%	Annealed	125	428	210	200					
		0.25 < C ≤ 0.55%	Annealed	190	639	160	140					
		0.25 < C ≤ 0.55%	Heat-treated	210	708	140	120					
		C > 0.55%	Annealed	190	639	130	120					
		C > 0.55%	Heat-treated	300	1013							
	Free cutting steel(short chip)	Annealed	220	745	190	170						
	Low-alloyed steel	Annealed			175	591	130	110				
		Heat-treated			300	1013						
		Heat-treated			380	1282						
		Heat-treated			430	1477						
	High-alloyed steel and high-alloyed tool steel	Annealed			200	675	120	80				
		Hardened and tempered			300	1013						
		Hardened and tempered			400	1361						
Stainless steel	Ferritic/Martensite, Annealed			200	675	135	120	90				
	Martensite, Heat-treated			330	1114	105	80	70				
M	Stainless steel	Austenitic,hardened		200	675	170	110	80	170	110	80	
		Austenitic,precipitation hardened stainless steel(PH stainless steel)		300	1013	110	80		110	80		
		Austenitic, ferritic, duplex		230	778	110	90	70	110	90	70	
K	Malleable cast iron	Ferritic		200	400							
		Pearlitic		260	700							
	Grey cast iron	Low tensile strength		180	200							
		High tensile strength/Austenitic		245	350							
	Nodular cast iron	Ferritic		155	400							
		Pearlitic		265	700							
GGV(CGI)				230	400							
N	Wrought aluminum alloy	Non-aging alloy		30	-							
		Aged alloy		100	340							
	Cast aluminum alloy	≤ 12% Si, non-aging alloy		75	260							
		≤ 12% Si, aged alloy		90	310							
		> 12% Si, non-aging alloy		130	450							
	Magnesium alloy				70	250						
	Copper and copper alloy (bronze/brass)	Unalloyed, electrolytic copper			100	340						
		Brass, bronze, red brass			90	310						
Cu alloy, short chip			110	380								
High tensile, Ampco alloy			300	1010								
S	Heat-resistant alloy	Fe-based	Annealed	200	680				40	25		
			Aged	280	940				30	20		
		Ni or Co based	Annealed	250	840				30	25		
			Aged	350	1180				30	20		
	Titanium alloy	Pure Titanium			200	680						
		α and β alloy, aged			375	1260				65	45	35
		β alloy			410	1400				35	35	30
	Tungsten alloy				300	1010						
Molybdenum alloy				300	1010							
H	Hardened steel	Hardened and tempered		50HRC								
		Hardened and tempered		55HRC								
		Hardened and tempered		60HRC								
	Chilled cast iron		Hardened and tempered		55HRC							

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