

# Grade

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# Grade

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Coated Grade / CVD

A002

Coated Grade / PVD

A003

Ceramic

A005

Cermet

A005

CBN

A006

PCD

A007

Cemented Carbide

A007

Grade comparison chart

A008

Chipbreaker comparison chart

A020

# CVD - Coated Grade

Grade	Coating		Application	Feature	Turning	Grooving	Milling	Drilling
	Main composition	Thickness / $\mu\text{m}$						
<b>T9205</b> P01 - P10 K10 - K20	Ti compound +Al <sub>2</sub> O <sub>3</sub>	18	<b>P</b> <b>K</b>	- High wear resistance - Excellent performance in high-speed cutting	█			
<b>T9215</b> P10 - P20 M10 - M20 K10 - K20	Ti compound +Al <sub>2</sub> O <sub>3</sub>	18	<b>P</b> <b>M</b> <b>K</b>	- Well-balanced between wear and chipping resistance - First choice for steel - High versatility for a wide range of applications	█			
<b>T9225</b> P15 - P25 M15 - M25	Ti compound +Al <sub>2</sub> O <sub>3</sub>	18	<b>P</b> <b>M</b>	- First choice for roughing to medium cutting - High fracture resistance	█	█		
<b>T9235</b> P30 - P40	Ti compound +Al <sub>2</sub> O <sub>3</sub>	18	<b>P</b>	- High fracture resistance in heavy interrupted cutting	█			
<b>New</b> <b>T6215</b> P10 - P30 M10 - M30	TiCN-Al <sub>2</sub> O <sub>3</sub>	8	<b>P</b> <b>M</b>	- High wear resistance at medium to high speed machining - First choice CVD grade for stainless steel cutting	█			
<b>New</b> <b>T505</b> K10 - K20	TiCN-Al <sub>2</sub> O <sub>3</sub>	23	<b>K</b>	- High wear resistance in high-speed continuous cutting	█			
<b>T5105</b> K05 - K15	TiCN-Al <sub>2</sub> O <sub>3</sub>	16	<b>K</b>	- High resistance to wear and plastic deformation in high-speed continuous cutting	█			
<b>T515</b> K10 - K20	TiCN-Al <sub>2</sub> O <sub>3</sub>	16	<b>K</b>	- First choice CVD grade for cast iron machining	█	█		
<b>T5115</b> K10 - K20	TiCN-Al <sub>2</sub> O <sub>3</sub>	16	<b>K</b>	- Stable machining in a wide range of applications from continuous to interrupted cutting	█			
<b>T5125</b> K15 - K30	TiCN-Al <sub>2</sub> O <sub>3</sub>	16	<b>K</b>	- Toughness to prevent sudden fracture - Ideal for heavy interrupted cutting	█			
<b>T313V</b> -	TiCN-Al <sub>2</sub> O <sub>3</sub>	3	Threading	- High resistance to plastic deformation	█			
<b>T3225</b> P20 - P35 M20 - M35	TiCN-Al <sub>2</sub> O <sub>3</sub>	10	<b>P</b> <b>M</b>	- High chipping and fracture resistance - Suitable for milling steel and stainless steel			█	
<b>T3130</b> P20 - P40 M20 - M40	TiCN-Al <sub>2</sub> O <sub>3</sub>	6	<b>P</b> <b>M</b>	- Good balance between wear and chipping resistance - Suitable for milling steel and stainless steel			█	
<b>T1215</b> K10 - K25	TiCN-Al <sub>2</sub> O <sub>3</sub>	10	<b>K</b>	- Good balance between wear and chipping resistance - Suitable for milling cast iron			█	
<b>T1115</b> K10 - K25	TiCN-Al <sub>2</sub> O <sub>3</sub>	11	<b>K</b>	- High wear resistance - Suitable for milling cast iron			█	

# PVD - Coated Grade

Grade

A

Grade	Coating		Applica- tion	Feature	Turning	Grooving	Milling	Drilling	Insert
	Main composition	Thick- ness / $\mu\text{m}$							
<b>AH110</b> P05 - P15 M05 - M15 K10 - K25 S05 - S15	(Ti, Al)N	3	<b>P M</b> <b>K S</b>	- High wear resistance - Suitable for finishing steel, cast iron, and difficult-to-cut material					
<b>AH120</b> P15 - P25 M15 - M25 K15 - K30 S10 - S25	(Ti, Al)N	3	<b>P M</b> <b>K S</b>	- Good balance between wear and fracture resistance - Suitable for machining steel, stainless steel, and cast iron under general cutting conditions					
<b>AH130</b> P25 - P40 M25 - M40	(Ti, Al)N	3	<b>P M</b>	- High chipping and fracture resistance - Designed for machining austenitic stainless steel under general cutting conditions					
<b>AH140</b> M30 - M45	(Ti, Al)N	3	<b>M</b>	- High fracture resistance - Suitable for milling stainless steel					
<b>AH170</b> P20 - P35 M20 - M35 K15 - K30	(Ti, Al)N	3	<b>P M</b> <b>K</b>	- High wear resistance - Designed for drilling carbon steel and cast iron					
<b>AH180</b> P20 - P35 M20 - M35 K15 - K30	(Ti, Al)N	3	<b>P M</b> <b>K</b>	- High wear resistance - Designed for drilling carbon steel, cast iron, and stainless steel					
<b>AH3225</b> P20 - P35 M20 - M35	(Ti, Al)SiCrN	5	<b>P M</b>	- Good balance between wear and fracture resistance - Suitable for steel and stainless steel					
<b>AH330</b> P15 - P30	(Ti, Al)N	3	<b>P</b>	- Excellent wear resistance					
<b>AH3135</b> P30 - P40 M30 - M40	(Ti, Al)N	4	<b>P M</b>	- High fracture resistance - Suitable for machining steel and stainless steel under general cutting conditions					
<b>AH3035</b> P20 - P45 H20 - H30	(Ti, Al)N	5	<b>P H</b>	- Good balance between wear and chipping resistance - Suitable for machining high-hardened steel at high feed					
<b>AH4035</b> M30 - M45	(Ti, Al)N	5	<b>M</b>	- Good balance between wear and fracture resistance - Suitable for difficult-to-cut stainless steel					
<b>New</b> <b>AH6225</b> P20 - P30 M15 - M30	(Ti, Al)N	6	<b>P M</b>	- First choice PVD grade for stainless steel machining - A versatile PVD grade for excellent performance in a wide range of stainless steel applications					
<b>AH6030</b> M25 - M35 S15 - S30	(Ti, Al)N	5	<b>M S</b>	- High fracture resistance - Suitable for drilling stainless steel and heat-resistant alloy under general cutting conditions					
<b>New</b> <b>AH6235</b> P30 - P40 M30 - M40	(Ti, Al)N	6	<b>P M</b>	- Provides high reliability in interrupted cutting with large depths of cut					
<b>AH710</b> P05 - P15 K05 - K15 H05 - H15	(Ti, Al)N	3	<b>P K</b> <b>H</b>	- High wear resistance - Suitable for finishing cast iron and high-hardened steel					
<b>AH7025</b> P20 - P30 M20 - M30 S15 - S25	(Ti, Al)N	3.5	<b>P M</b> <b>S</b>	- Excellent wear resistance and high rigidity - First choice for grooving of various materials					
<b>AH725</b> P15 - P30 M15 - M30 K25 - K30 S15 - S25	(Ti, Al)N	2	<b>P M</b> <b>K S</b>	- Good balance between wear and chipping resistance - Suitable for machining steel and stainless steel under general cutting conditions					

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# PVD - Coated Grade

Grade	Coating		Application	Feature	Turning	Grooving	Milling	Drilling
	Main composition	Thickness / $\mu\text{m}$						
<b>AH730</b> P15 - P30	(Ti, Al)N	3	<b>P</b>	- Good balance between wear and fracture resistance				
<b>AH750</b> H15 - H30	(Ti, Al)N	3	<b>H</b>	- High wear resistance - Designed for milling high-hardened material				
<b>AH8005</b> M01 - M10 S01 - S10 H10 - H20	(Al,Ti)N	3.5	<b>M S</b> <b>H</b>	- Good resistance to wear and adhesion - Excellent performance in machining heat-resistant alloy at high speed				
<b>AH905</b> S01 - S10	(Al, Ti)N	1.5	<b>S</b>	- High resistance to wear and built-up edge				
<b>AH8015</b> P10 - P20 M10 - M20 K10 - K25 S10 - S20 H10 - H20	(Al,Ti)N	3.5	<b>P M</b> <b>K S</b> <b>H</b>	- Good balance between wear and fracture resistance - First choice for machining heat-resistant alloy under general cutting conditions - First choice for threading				
<b>AH9130</b> P15 - P35 M25 - M35 K10 - K25 S15 - S30	(Ti, Al)SiCrN	4.5	<b>P M</b> <b>K S</b>	- High wear resistance - Designed for drilling various materials				
<b>AH9030</b> P15 - P35 K10 - K25	(Ti, Al)N	5	<b>P K</b>	- High wear resistance - Suitable for drilling steel and cast iron at high speed				
<b>APH730</b> P20 - P30 M20 - M30 S15 - S25	(Ti, Al)N	4.5	<b>P M</b> <b>S</b>	- Well balanced in wear and fracture resistance				
<b>DS1100</b> N05 - N20	DLC coating	Thin layer	<b>N</b>	- High wear resistance - Suitable for finishing aluminum				
<b>DS1200</b> N10 - N25	DLC coating	Thin layer	<b>N</b>	- Good balance between wear and chipping resistance - Suitable for semi-finishing to finishing of aluminum				
<b>GH110</b> P10 - P20 M10 - M20 K10 - K25 N05 - N15 S10 - S20	Ti(C, N, O)	3	<b>P M</b> <b>K N</b> <b>S</b>	- High wear resistance				
<b>GH130</b> P25 - P40 M25 - M40 K25 - K40	Ti(C, N, O)	3	<b>P M</b> <b>K</b>	- High chipping and fracture resistance - Suitable for steel, stainless steel, and cast iron				
<b>GH330</b> P15 - P30 M15 - M30 K05 - K30	Ti(C, N, O)	3	<b>P M</b> <b>K</b>	- High resistance to wear and fracture - Suitable for continuous to medium interrupted cutting				
<b>GH730</b> P20 - P35 M20 - M35 K20 - K30	Ti(C, N, O)	3	<b>P M</b> <b>K</b>	- High wear resistance - Suitable for turning and grooving at low speed				
<b>J740</b> -	TiN	1	For swiss lathes	- Ultra-fine-grain cemented carbide coated with TiN-based compound				
<b>SH725</b> P20 - P30 M20 - M30	(Ti, Al)N	2	<b>P M</b>	- High wear resistance - Designed for machining steel and stainless steel - First recommendation for swiss part machining				
<b>SH730</b> P20 - P35 M20 - M35 S05 - S15	(Ti, Al)N	1	<b>P M</b> <b>S</b>	- High wear resistance - Designed for machining steel, stainless steel, and difficult-to-cut material				
<b>YH170</b> P20 - P35 M20 - M35	Ti(C, N)	1.5	<b>P M</b>	- High resistance to wear and fracture - Designed for drilling carbon steel and stainless steel				
<b>YH180</b> P20 - P35 M20 - M35	Ti(C, N)	1.5	<b>P M</b>	- High wear resistance - Designed for drilling carbon steel and stainless steel				

# Ceramic

Grade

A

Grade	Hardness (HRA)	Application	Feature	Insert			
				Turning	Grooving	Milling	Drilling
LX10	94.0	<b>H</b>	- Alumina base - Suitable for continuous cutting of high-hardened material	█			
LX11	94.0	<b>H</b>	- Alumina base (TiN coating) - Suitable for continuous cutting of high-hardened material	█			
LX21	94.0	<b>K</b>	- Alumina base - Excellent chipping resistance in continuous cutting of cast iron	█			
FX105	93.0	<b>K</b>	- Silicon nitride base - Suitable for high-speed machining of cast iron	█		█	
FX510	94.0	<b>S K N</b>	- SiAlON base - Suitable for heat-resistant alloy, such as nickel-based alloy			█	
CX710	92.9	<b>K</b>	- Silicon nitride base - Suitable for high-speed machining of cast iron	█			
TZ120	93.0	<b>K</b>	- Ceramic grade with ZrO <sub>2</sub> and Al <sub>2</sub> O <sub>3</sub> - Suitable for machining of centrifugal cast iron	█			
TW43	94.0	<b>S</b>	- Whisker-reinforced Al <sub>2</sub> O <sub>3</sub> ceramic for super alloy machining			█	
TS200	93.1	<b>S</b>	- SiAlON ceramic grade - Suitable for high-speed finishing operation of heat-resistant alloys			█	
TS300	94.3	<b>S</b>	- SiAlON ceramic grade - Suitable for high-speed roughing operation of heat-resistant alloys			█	

Insert

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Ext. Toolholder

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Int. Toolholder

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# Cermet

Grade	Coating		Application	Feature	Milling cutter			
	Main composition	Thickness / μm			Turning	Grooving	Milling	Drilling
NS520	Uncoated	-	<b>P K</b>	- High wear resistance	█			
NS9530	Uncoated	-	<b>P K</b>	- High fracture resistance - Suitable for finishing to medium cutting of steel	█	█		
AT9530	(Ti,Al)N laminated coating	3	<b>P</b>	- High wear resistance - First choice for machining alloy steel	█			
GT9530	Ti(C, N, O)	3	<b>P K</b>	- High wear resistance - Excellent surface quality in finishing	█			
J9530	TiN	1	For Swiss lathes	- Suitable for small-part machining	█	█		
NS740	Uncoated	-	<b>P</b>	- High resistance to fracture and thermal crack - High-rigidity grade for milling			█	
X407	Uncoated	-	<b>P</b>	- High wear resistance in finishing with dry cutting	█		█	
N308	Uncoated	-	<b>P</b>	- High wear resistance			█	

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# CBN

Grade	Hardness (Hv)	T.R.S. (GPa)	Application	Feature	Turning	Grooving	Milling	Drilling
<b>BXA10</b>	3200 ~ 3400	1.00 ~ 1.10	<b>H</b>	- Coated CBN with excellent performance in continuous cutting with middle speed range for hardened steel	■	■		
<b>BXM10</b>	2700 ~ 2900	0.80 ~ 0.90	<b>H</b>	- Coated CBN for excellent performance in high-speed continuous cutting of hardened steel	■			
<b>BX310</b>	2700 ~ 2900	0.80 ~ 0.90	<b>H</b>	- High wear resistance - Designed for high-speed continuous cutting of hardened steel	■			
<b>BXA20</b>	3300 ~ 3500	1.30 ~ 1.50	<b>H</b>	- Coated CBN for excellent performance in machining hardened steel	■			
<b>BXM20</b>	3500 ~ 3700	1.35 ~ 1.50	<b>H</b>	- Coated CBN for machining hardened steel in a wide range of application area	■			
<b>BX360</b>	3200 ~ 3400	1.00 ~ 1.10	<b>H</b>	- Suitable for general machining of hardened steel	■	■		
<b>BX380</b>	3500 ~ 3700	1.15 ~ 1.30	<b>H</b>	- High fracture resistance - Designed for heavy interrupted cutting of hardened steel	■			
<b>New</b> <b>BR35F</b>	3100 ~ 3300	1.40 ~ 1.60	<b>H</b>	- Coated CBN with outstanding fracture resistance in heavy-interrupted machining of hardened steel	■			
<b>BXC50</b>	3500 ~ 3700	1.15 ~ 1.30	<b>H</b>	- Coated CBN with high fracture resistance in continuous to interrupted cutting	■			
<b>BX330</b>	2800 ~ 3000	0.85 ~ 0.95	<b>H</b>	- Excellent sharpness - Designed for finishing hardened steel	■			
<b>BX850</b>	3300 ~ 3500	0.75 ~ 0.85	<b>H</b>	- High fracture resistance - Good performance in high-speed face milling			■	
<b>BXC90</b>	3900 ~ 4100	1.80 ~ 1.90	<b>K</b>	- Coated solid CBN for high-speed machining of cast iron	■		■	
<b>BX910</b>	2600 ~ 2800	0.80 ~ 0.90	<b>K</b>	- Excellent wear resistance in high-speed machining - Designed for centrifugally cast iron	■			
<b>BX930</b>	3000 ~ 3200	0.95 ~ 1.20	<b>K</b>	- Designed for ductile cast iron	■			
<b>BX470</b>	4100 ~ 4300	1.90 ~ 2.10	Sintered metal	- Excellent sharpness - Suitable for ferrous sintered metal	■			
<b>BX480</b>	4100 ~ 4300	1.90 ~ 2.10	Sintered metal <b>K</b>	- Hardest CBN - Ideal for ferrous sintered metal - Suitable for high-speed face milling of cast iron	■		■	
<b>BX815</b>	3000 ~ 3200	1.00 ~ 1.10	<b>S</b>	- High wear resistance and thermo stability - Suitable for high-speed machining of Inconel	■			

# PCD

Grade	Grain size (µm)	Hardness (Hv)	T.R.S. (GPa)	Application	Feature	Turning	Grooving	Milling	Drilling
<b>DX110</b>	< 1	8500	1.8	<b>N</b>	- Excellent sharpness for high surface quality - Suitable for finishing non-ferrous metal and nonmetal	█	█	█	█
<b>DX120</b>	4.5	9000	1.8	<b>N</b>	- Suitable for finishing non-ferrous metal and nonmetal	█	█	█	█
<b>DX140</b>	12.5	10000	1.7	<b>N</b>	- High wear resistance - Designed for machining non-ferrous metal and nonmetal	█	█	█	█
<b>DX160</b>	28	11000	1.6	<b>N</b>	- Designed for machining ceramic, cemented carbide, and nonmetal	█	█	█	█
<b>DX180</b>	45	12000	1.5	<b>N</b>	- Designed for machining ceramic, cemented carbide, and nonmetal	█	█	█	█

# Cemented Carbide

Grade	Hardness (HRA)	T.R.S. (GPa)	Application	Turning	Grooving	Milling	Drilling
<b>TH03</b> P05 M05 K05 N05	93.8	1.9	<b>P M</b> <b>K N</b>	█	█	█	█
<b>KS05F</b> K05 S05 N05	93.0	2.9	<b>K S</b> <b>N</b>	█	█	█	█
<b>TH10</b> P10 M10 K10 N10	92.0	2.4	<b>P M</b> <b>K N</b>	█	█	█	█
<b>KS15F</b> N15	91.5	3.0	<b>N</b>	█	█	█	█
<b>KS20</b> K20 N20 S20	90.8	2.8	<b>K S</b> <b>N</b>	█	█	█	█
<b>UX30</b> P30 M30	91.1	2.3	<b>P M</b>	█	█	█	█
<b>EM10</b> P10 - P25 K10 - K25	91.5	3.4	<b>P K</b>	█	█	█	█

Grade	Hardness (HRA)	T.R.S. (GPa)	Application	Turning	Grooving	Milling	Drilling
<b>UM</b> K10 - K25 N10 - N25	90.9	3.5	<b>K N</b>	█	█	█	█
<b>G1F</b> P10 - P25 K10 - K25	92	2.6	<b>P K</b>	█	█	█	█
<b>MD20</b> P20 - P35 M20 - M35	91.5	3.9	<b>P M</b>	█	█	█	█

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# Grade Comparison Chart

## ●CVD Coated Grades for Turning

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	NTK	Kennametal	Seco Tools	Walter	Iscar	TaeguTec	Ceratizit
Classification	Symbol													
<b>P</b>	P01	<b>T9205</b>	UE6105		GC4305	CA510	HG8010		KCP05B KCP05 KCPK05	TP0501	WPP05S	IC8150 IC9150	TT8105 TT8105B	CTCK110
	P10	<b>T9205</b> <b>T9215</b>	UE6105 UE6110 MC6015 MC6115	AC8015P AC8020P	GC4305 GC4315 GC4415	CA515	HG8010 GM8020	CP7	KCP10B KCP10	TP0501 TP1501	WPP10S WPP10G WPPV10	IC8150 IC9150	TT8115 TT8115B	CTC3110 CTCK120 CTCP115-P
	P20	<b>T9215</b> <b>T9225</b>	MC6015 MC6025 MC6115 MC6125	AC8015P AC8020P AC8025P	GC4315 GC4325 GC4415 GC4425	CA515 CA525 CA025P	HG8025 GM8020 GM25	CP7	KCP25B KCP25	TP1501 TP2501	WPP20S WPP20G WPPV20	IC8150 IC9150 IC8250 IC9250	TT8125 TT8125B TT5100	CTCP115 CTCP115-P CTCP125 CTCP125-P
	P30	<b>T9225</b> <b>T9235</b>	MC6025 MC6035 MC6125	AC8025P AC8035P AC8030M	GC4325 GC4335 GC4425	CA530 CA025P	HG8025 GM8035 GM25		KCP30B KCP30	TP2501 TP3501	WPP30S WPP30G	IC8350 IC9350	TT8125 TT8125B TT5100 TT8135 TT8135B	CTCP125 CTCP125-P CTCP135-P
	P40	<b>T9235</b> <b>T6215</b>	MC6035	AC8035P AC8030M	GC4335	CA530	GM8035 GX30		KCP40B KCP40	TP3501		IC8350 IC9350	TT8135 TT8135B TT7100	
<b>M</b>	M10	<b>T6215</b>	MC7015	AC6020M	GC2015	CA6515			KCM15B KCM15	TM1501		IC9250	TT9215	CTCM120
	M20	<b>T6215</b>	MC7015 MC7025	AC6020M	GC2015 GC2025 GC2220	CA6525	HG8025 GM25		KCM25B KCM25	TM1501 TM2501		IC9350	TT9215 TT9225	CTCM120 CTCM130
	M30	<b>T6215</b>	MC7025 US735	AC6030M	GC2025 GC2035	CA6525	GM8035 GM25 GX30		KCM35B KCM35	TM2501 TM3501		IC9350	TT9225 TT9235	CTCM130
	M40		US735		GC2035		GX30			TM4000			TT9235	
<b>K</b>	K01	<b>T505</b> <b>T5105</b>	MC5005 MC5105 UC5105	AC405K	GC3005 GC3205	CA4505 CA310	HX3505	CP1	KCK05B KCK05	TK0501		IC5005	TT7005	
	K10	<b>T505</b> <b>T515</b> <b>T5105</b> <b>T5115</b>	MC5015 MC5115 MH515 UC5115	AC4010K AC415K	GC3210 GC3215	CA4515 CA315	HX3515 HG8010	CP1	KCK15B KCK15	TK0501	WKK10S WKV10 WAK10	IC9150 IC5005 IC5010	TT7005 TT7015	CTC3110 CTCK110
	K20	<b>T515</b> <b>T5115</b> <b>T5125</b>	MC5015 MC5125 UC5115	AC4015K AC420K	GC3225	CA320	HX3515 GM8020	CP1	KCK20B KCK20	TK1501	WKK20S WKV20 WAK20	IC9150 IC5010	TT7015 TT7025 TT7310	CTCK120 CTCP115
	K30	<b>T5125</b>		AC8025P			HG8025				WAK30	IC4050 IC8150	TT7025	CTCP125

Note: The above table is selected from a publication. We have not obtained approval from each company.

## ●PVD Coated Grade for Turning

ISO Classification	Symbol	Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	NTK	Kennametal	Seco Tools	Walter	Iscar	TaeguTec	Ceratizit
<b>P</b>	P01					PR1705								
	P10	AH8005	VP10RT MS6015	AC1030U AC530U ACZ150	GC1105	PR1705 PR930 PR1725	IP2000	VM1 DT4 DM4	KC5010 KCU10	TS2000 CP200		IC807 IC907 IC808 IC908 IC1007	TT4410 TT7010	CTPX710 CTPX715
		AH120 AH725 SH725 AH730 J740 AH8015 AH6225	VP15TF VP20MF VP10RT VP20RT UP20M MS6015	AC1030U AC530U	GC1125	PR1725 PR930 PR1225 PR1025	IP2000	VM1 DT4 DM4 TM4 QM3	KC5025 KCU25 KCS10 KCU10 KC5010	TS2500 CP200		IC807 IC907 IC808 IC908 IC830 IC1010	TT9030 TT4410	CTPX710 CTPX715 CTPM125
	P30	AH120 AH725 AH7025 SH725 SH730 J740 AH8015 AH6225	VP15TF VP20MF VP20RT UP20M MS7025	AC1030U	GC1125	PR1725 PR1225 PR1535 PR1025	IP3000	QM3 TM4	KC5025 KCU25 KCU25	CP500 CP600		IC928 IC528 IC228 IC830 IC1010 IC1030	TT9030 TT8020 TT8010 TT9080 TT7220	CTPM125
		AH120 AH725 AH6225	MS7025			PR1535	IP3000	QM3		CP500 CP600		IC228 IC528 IC1030	TT8020 TT8010 TT4430 TT9020	CTPM125
<b>M</b>	M01										WSM01	IC806 IC1007		
	M10	AH8005 AH6225	VP10RT	AC5005S ACZ150	GC1105 GC1115	PR930 PR1725	IP100S IP050S	VM1 DT4 DM4 ZM3	KC5010 KCU10 KCS10B KCS10	TS2000 TS2500 CP200	WSM10 WSM10S WSM01	IC807 IC907 IC808 IC908 IC1010	*TT4410 TT5080*	CTPM125 CTPX710 CTPX715
		AH8015 AH120 AH7025 AH725 SH725 SH730 AH6225	VP10RT VP15TF VP20MF VP20RT UP20M MS7025 MS9025	AC5015S	GC1115 GC1125	PR930 PR1225 PR1725 PR1025	IP100S IP050S	VM1 DT4 DM4 ST4 TM4 ZM3 QM3	KC5025 KCU25 KCS10 KCU10 KC5010	TS2500 CP200 CP500 CP600	WSM20S	IC808 IC908 IC830 IC1030	TT9030 TT8010 TT4410 TT5080 TT9080	CTPM125 CWN15
	M30	AH120 AH725 SH725 SH730 J740 AH6235	VP15TF VP20MF VP20RT UP20M MP7035 MS7025 MS9025	AC6040M AC1030U AC5025S AC530U	"GC1125 GC2035"	PR1225 PR1535 PR1725 PR1025	IP100S	DT4 DM4 QM3 ST4 TM4 ZM3	KC5025 KCU25	CP500 CP600	WSM30S	IC528 IC228 IC830 IC1030	TT8020 TT4430 TT8010 TT8080 TT7220	CTPM125
		AH6235	MP7035	AC6040M	GC2035	PR1535		ST4 QM3 TM4		CP600		IC228 IC528	TT8010 TT8020	
<b>K</b>	K01	AH110												
	K10	AH110 GH110 AH110	VP10RT	ACZ150					KC5010 KCU10 KCS10B KCS10	TS2000 CP200		IC807 IC907	TT9030 TT7010 TT6080	CTPX715
		AH120 AH7025 AH8015 AH6225	VP10RT VP20RT VP15TF	AC1030U					KC5025 KCU25	TS2500 CP200 TS2000		IC807 IC907 IC808 IC908 IC1007 IC1010	*TT9030 TT7010 TT6080 TT9080	CTPX715
	K30	AH120 GH130	VP15TF VP20RT						CP500			IC807 IC907 IC808 IC908	TT9030	CTPX715
<b>S</b>	S01	AH8005	VP05RT MP9005	AC5005S AC5015S ACZ150		PR005S	JP9105		KCS10B		WSM10S	IC804 IC806	TT3010	
	S10	AH8005 AH8015 AH6225	VP10RT MP9015	AC5005S AC5015S	GC1105	PR015S PR005S	JP9105 JP9115	QM3 ZM3	KC5025 KCU25 KCS10B KCS10 KC5010 KCU10	TS2000 TS2500 CP200 CP500	WSM10S WSM01 WNN10	IC806 IC1007 IC1010	TT3010 TT3020 TT5080	CTPX710 CTPX715
		AH8015 AH7025 AH6225	MP9015 VP20RT MP9025 MS9025	AC5015S AC5025S	GC1115 GC1125	PR015S PR1535	JP9115		KC5025 KCU25 KCS10B	TS2000 TS2500 CP200 CP500 CP600	WSM20S	IC807 IC907 IC808 IC908 IC806 IC1010	TT3020 TT4430 TT9030 TT9080	CTPX710 CTPX715
	S30	AH7025 AH6235	VP20RT MP9025 MS9025	AC5025S	GC1125	PR1535			CP600	WSM30S	IC830 IC928	TT4430 TT8020 TT9030		

Note: The above table is selected from a publication. We have not obtained approval from each company.

# Grade Comparison Chart

## ●Cermet for Turning

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	NTK	Kennametal	Seco Tools	Walter	Iscar	TaeguTec	Ceratizit
Classification	Symbol													
<b>P</b>	P01	<b>NS520</b>	AP25N VP25N	T1000A		TN610 PV710						IC20N IC520N	PV3010	CTEP10 TCM407
	P10	<b>AT9530</b> <b>GT9530</b> <b>J9530</b>	AP25N VP25N NX2525	T1500Z T1500A	CT5015 GC1525	TN610 TN620 PV710 PV720 CCX			KT315 KTP10	TP1020	WCE10	IC20N IC30N IC520N IC530N	PV3010 CT3000	CTEP10 TCM10 TCM407
	P20	<b>AT9530</b> <b>GT9530</b> <b>NS9530</b> <b>J9530</b>	AP25N VP25N VP45N NX2525 NX3035 MP3025	T1500A T1500Z T2500A T2500Z	GC1525	TN620 PV720	CZ25			TP1020 TP1030	WCE10	IC20N IC30N IC520N IC530N	PV3010 CT3000	TCM10
	P30	<b>NS9530</b>	VP45N NX3035 MP3025	T2500Z T3000Z		PV730	CZ25					IC530N		
<b>M</b>	M10	<b>NS520</b>	AP25N VP25N NX2525	T1000A	GC1525	TN620 TN610 PV720 PV710			KT315 KTP10	TP1030		IC20N IC30N IC520N IC530N	PV3010 CT3000	CTEP10 TCM10 TCM407
	M20	<b>AT9530</b> <b>GT9530</b> <b>NS9530</b> <b>J9530</b>	AP25N VP25N NX2525	T1500A		TN620 PV720 PV730	CZ25					IC30N IC530N	PV3010 CT3000	
	M30	<b>NS9530</b>		T3000Z			CZ25							
<b>K</b>	K01	<b>NS520</b>	AP25N VP25N	T1000A		PV7005							PV3010	CTEP10 TCM10 TCM407
	K10	<b>AT9530</b> <b>GT9530</b> <b>NS9530</b> <b>J9530</b>	AP25N VP25N NX2525		CT5015	TN60 CCX	CZ25		KT315 KTP10				PV3010 CT3000	TCM10
	K20	<b>NS9530</b>	AP25N VP25N NX2525				CZ25						PV3010 CT3000	

Note: The above table is selected from a publication. We have not obtained approval from each company.

## ●Cemented Carbide for Turning

Classification	ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	NTK	Kennametal	Seco Tools	Walter	Iscar	TaeguTec	Ceratizit	
	Symbol															
<b>P</b>	P01															
	P10	<b>TH10</b>			ST10P											S26T
	P20	<b>KS20</b>			ST20E								IC50M	P20		S26T S40T
	P30	<b>KS15F UX30</b>		UTi20T	A30								IC28 IC50M	P30		S40T
	P40			UTi20T									IC28			
<b>M</b>	M10	<b>TH10</b>			EH510					K313 KU10 K68	890		IC20			
	M20	<b>KS20</b>		UTi20T	EH520					K313 KU10 K68	HX 883		IC20			CTW7120 H210T U17T
	M30	<b>UX30</b>		UTi20T	A30								IC28			
	M40												IC28			S40T
<b>K</b>	K01	<b>TH03</b>		HTi05												CTWK601
	K10	<b>TH10</b>		HTi10	G10E	H13A	KW10	WH10		K313 KU10 K68	890		IC20	K10		H210T H10T U17T
	K20	<b>KS15F KS20</b>		UTi20T	G10E	H13A	KW10				890 HX 883		IC20	K20		CTW7120 H210T H10T U17T
	K30			UTi20T		H13A					883					TSM30
	K40															
	K01	<b>TH03</b>		HTi05												
<b>N</b>	N01	<b>KS05F</b>				H10	GW05						IC04			
	N10	<b>TH10</b>		HTi10	H1	H10	GW05 KW10	WH10	KM1	K313 KU10 K68	890 HX KX	WK1	IC20 IC28	K10		H210T H10T U17T
	N20	<b>KS15F</b>			H1	H13A			KM1		890 HX KX 883	WK1	IC20 IC28	K20		CTW7120 H210T H10T U17T
	N30										883					
<b>S</b>	S01			MT9005 RT9005		H10A	SW05						IC20			
	S10	<b>KS05F TH10</b>		MT9015 RT9010	EH510	H10F	SW10 KW10	WH10	KM1	K313 KU10 K68	890 883	WK1 WS10	IC20	K10		H210T H10T
	S20	<b>KS15F KS20</b>		MT9015 RT9010	EH520	H13A H10F	SW25		KM1		890 883	WK1 WS10	IC20 IC28	K20		CTW7120 H210T H10T
	S30										883					
<b>H</b>	H01												IC20			
	H10	<b>TH10</b>				H13A		WH10					IC20	K10		
	H20										890 HX 883					

Note: The above table is selected from a publication. We have not obtained approval from each company.

# Grade Comparison Chart

## ●CBN and PCD for Turning

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratizit
Classification	Symbol																
<b>K</b>	K01	<b>BX930</b> <b>BX910</b> <b>BX870</b>	MB710 MB730 MB5015 MB5015	NCB100 BN500 BNC500	CB50	KBN475 KBN60M			B52		KB1630 KB1345	IB10K		TB7015	WBH10C	WCB80	CTB S10U
	K10	<b>BX470</b> <b>BX480</b>	MB730 MB5015 MB4020	BN7000 BN500	CB7525 CB50	KBN65M KBN65B		JBN795	B23 B30 B52	CBN200 CBN300 CBN400C	KB1640 KB1345	IB05S IB10S	TB730	TB730	WBK40U	WCB80 WCB50	CTB S10U
	K20	<b>BXC90</b> <b>BX90S</b>	MB4020 MB4120 MBS140	BNC8115 BNS8125	CB7925	KBN900 KBN70M			B23 B30 B52	CBN300 CBN500	KB5630	IB90A IB90 IB25KD		TB7020	WBK45U	WCB80	CTB S20C
	K30	<b>BXC90</b> <b>BX90S</b>	MBS140 BC5030	BNS8125		KBN900			B16	CBN500	KB9640	IB90A IB25KD	KB90A	KB90A			
<b>S</b>	S01	<b>BX815</b>	MB730	NCB100 BN7000				JBN795	JP2	CBN170		IB05S IB10S		KB90			CTB S10U
	S10	<b>BX480</b>	MB4020 MB4120	BN7500 BN7115	CB7050	KBN65B KBN65M			B23 B30	CBN200	KB1630	IB05S IB10S		KB90A	WBK45U	WCB80	CTB S20C
<b>H</b>	H01	<b>BXM10</b> <b>BX310</b>	BC8105 BC8110 MBC010 MB810 MB8110	BNC2010 BNC2115 BN1000 BN2000 BNX10 BN1000	CB7105	KBN510 KBN05M KBN10M			B52 B5K	CBN010 CBN100 CBN160C CBN050C	KB1610 KB5610*	IB05H IB10HC	TB610	TB610	WBH10C	WCB30	CTB H15C CTB H15U
	H10	<b>BXA10</b> <b>BXM10</b> <b>BX330</b> <b>BX530</b>	BC8210 MB020 MB8025 MB8110 MB825	BNC2020 BNC2115 BN2000	CB7015 CB7115 CB7025	KBN525 KBN05M KBN10M		JBN245	B36 B52 B6K	CBN150 CBN200 CBN300 CBN060K CBN160C CBN400C	KB9610 KB1610 KB5610	IB50 IB55 IB10H IB10HC IB20H IB25HA		TB2015	WBH10C WBH10P WBH10U	WCB30 WCB50	CTB H15C CTB H15U
	H20	<b>BXM20</b> <b>BXA20</b> <b>BX360</b>	BC8220 MBC020 MB8025 MB8120	BNC200 BNC2020 BNC2125 BNX20	CB7015 CB7125 CB50	KBN525 KBN05M KBN10M KBN25M KBN020		JBN300	B22 B36 B40 B6K	CBN200 CBN300 CBN160C CBN400C CH2540	KB5625 KB1625	IB20H IB20HC IB25HA IB25HC	TB650 TB2030	TB650	WBH25P	WCB50 WCB80	CTB H20C CTB H21U
	H30	<b>BR35F</b> <b>BXC50</b> <b>BX380</b>	BC8130 MB8130 MB835	BNC300 BN350 BNX25		KBN30M KBN35M KBN900		JBN300	B22 B40	CH3515	KB1630 KB9640	IB25HC IB90	TB670	TB670	WBH40C		CTB H40C CTB H40U
<b>N</b>	N01	<b>DX160</b> <b>DX180</b>	MD205	DA90	CD05	KPD230		JDA30 JDA735	PD1		KD1405	ID5					CTD PU20
	N10	<b>DX140</b>	MD205 MD220	DA150	CD10	KPD010 KPD230		JDA715	PD1	PCD05 PCD10	KD100 KD1400 KD1425	ID5	IN90D	TD810	WDN25U	WCD10	CTD PU20
	N20	<b>DX120</b>	MD220 MD230	DA2200 DA1000	CD10	KPD010		JDA715	PD2	PCD05 PCD20	KD1425		IN90D	KP300	WDN25U	WCD10	CTD PD20
	N30	<b>DX110</b>	MD2030 MD230	DA2200 DA1000		PKD001		JDA10		OVD20 PCD30 PCD30M				TD830		WCD10	

Note: The above table is selected from a publication. We have not obtained approval from each company.

## ●Ceramic for Turning

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratizit
Classification	Symbol																
<b>K</b>	K01	<b>TZ120 LX21</b>		NB90S	CC620	KA30 A65 KT66 PT600M			HC1 HW2		KY1310 KY1615	IN110		AW120 AB30	CW2015		CTN3105 CTS3105
	K10	<b>CX710 FX105</b>			CC6190 CC650	A65 KT66 A66N PT600M			HC2 HC5 HC6		KY1310 KY1615	IN23 IS6	IN70N	AB30 AS10	CW2015 CW5025	WSN10	CTN3105 CTM3110 CTI3105 CTN3110 CTS3105
	K20	<b>FX105 CX710</b>			CC6190	KS6000 KS6050			SP9 SX9		KY1320 KY3400 KY3500 KY4300	IS8	IN70N	SC10	CW5025	WSN10	CTM3110 CTN3110
<b>S</b>	S01	<b>TS200</b>							JX1	CS100	KY1525 KY2100	IS25		TC3020			
	S10	<b>TW43 TS300</b>		WX120	CC670 CC6060 CC6065	KS6030 KS6040			WA1 WA5 SX9	CW100 CS300	KY1540 KYS30 KY2100 KY4300	IW7 IS35		TC430 TC3030	CW3020	WWS20	
<b>H</b>	H01	<b>LX10 LX11</b>		NB100C	CC6050 CC650	PT600M			HC2 HC5 HC6		KY4300	IN420 IN22		AB2010	CW2015		CTS3105
	H10				CC6050 CC670 CC6190	A66N PT600M			HC7 WA1		KY4400	IN23		AB2010 AB20 AB30	CW2015		CTS3105

Note: The above table is selected from a publication. We have not obtained approval from each company.

# Grade Comparison Chart

## ●CVD Coated Grade for Milling

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratizit
Classification	Symbol																
<b>P</b>	P01									MP1501		IC9015 IC5400 IC8080 IC9080			TN2510		
	P10		FH7020 MC7020	ACP100 XCU2500 ACP2000	GC4220 GC4330					MP1501	KCPM20	IC9015 IC5400 IC8080 IC9080 IC4100 IC5100			TN2510 TN7525	WKP25	GM226+
	P20	<b>T3225</b>	FH7020 F7030 MC7020	ACP100 XCU2500 ACP2000	GC4330 GC4340		GX2140 GX2160			MP1501 MP2501	KCPM20 KCPK30 KCPM30	IC8080 IC9080 IC4100 IC5100 IC9250 IC520M	IN6530	TT7800	TN7525 TN7535	WKP25 WKP35 WKP35S	GM226+
	P30	<b>T3130</b> <b>T3225</b>	F7030	ACP100 XCU2500 ACP2000	GC4230 GC4340		GX2140 GX2160			MP2501	KCPK30 KCPM30	IC9250 IC520M IC4050 IC635	IN6530	TT7800	TN7525 TN7535	WKP25 WKP35 WKP35S	GM226+ GM246 GM43+
	P40				GC4240 GC4340		GX2160				KCPK30 KCPM30	IC4050 IC635	IN6530	TT7800	TN7535	WKP35 WKP35S	GM246 GM43+
<b>M</b>	M10			ACM200 XCU2500							KCPM20	IC9250 IC520M IC9350			TN7525		
	M20	<b>T3225</b>	F7030 MC7020	ACM200 XCU2500		CA6535	AX2040			T350M	KCPM20 KCPM30	IC9250 IC520M IC9350 IC4050 IC635	IN6530	TT7800	TN7525 TN7535		CTC5235 GM226+
	M30	<b>T3225</b> <b>T3130</b>	F7030	ACM200 XCU2500	GC2040	CA6535	GX2160 AX2040			T350M	KCPM30	IC9350 IC4050 IC635	IN6530	TT7800	TN7525 TN7535		CTC5235 CTC5240 GM226+ GM246 GM43+
	M40				GC2040	CA6535	GX2160			T350M		IC635	IN6530		TN7535		CTC5235 CTC5240 GM246 GM43+
<b>K</b>	K01		MC5020			CA420M		JC605W				IC8080 IC4100 IC5100 IC9150			TN2510 TN5505	WKP15	CTC3215
	K10	<b>T1215</b> <b>T1115</b>	MC5020 MC520	ACK200 XCK200 ACK200	GC3220	CA420M	GX2120	JC605W		MK1500	KCK15	IC8080 IC4100 IC5100 IC9150 IC9080 IC520M		TT6800	TN2510 TN5505 TN5515 TN5520	WKP15 WKP25	CTC3215 SR216 SR226+
	K20	<b>T1215</b>	MC5020	ACK200 XCK2000 XCU2500 ACK2000	GC3220 GC3330 GC3040	CA420M	GX2120 GX2140	JC605W		MK1500	KC915M	IC5100 IC9150 IC9080 IC520M IC4050	IN6515 IN6530	TT6800	TN5515 TN5520	WKP15 WKP25 WKP35 WKP35S	SR216 SR226+
	K30		MC5020		GC3330 GC3040		GX2140			MK1500	KC930M	IC520M IC4050	IN6515 IN6530			WKP25 WKP35 WKP35S	

Note: The above table is selected from a publication. We have not obtained approval from each company.

## ●PVD Coated Grade for Milling

ISO Classification	Symbol	ISO																
		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratizit	
<b>P</b>	P01	AH710 AH110			GC1010		ATH80D JP4105	JC8003			KC505M KC510M KC515M	IC903		TT2510 TT5505	TN2505 TN6505			
	P10	AH120 AH725	MP6120 VP15TF	ACP200 ACU2500	GC1010 GC1025	PR830 PR1225 PR1230 PR1525	ATH80D PN08M ATH10E PN15M JP4105 JP4115 JP4120	JC8003 JC8015 JC5015 JC5118	DM4	F40M	KC505M KC510M KC515M KC610M KC715M	IC903 IC907 IC950 IC908 IC910 IC380 IC900	IN2505	TT2510 TT5505 TT5515 TT7080	TN2505 TN2525 TN6425 TN6505	WHH15 WXM15		
	P20	AH120 AH725 AH3135 AH9030 AH3225	MP6120 VP15TF MP6130 UP20M VP20RT	ACP200 ACP300 ACP3000 ACU2500	GC1025 GC1030 GC2030	PR830 PR1225 PR1230 PR1525	JP4120 JS4045 CY250	JC8015 JC5015 JC5118 JC5040			F40M	KC522M KC525M KC527M KC530M KC537M KC610M KC620M KC635M KC715M KC720M KC730M	IC907 IC950 IC908 IC910 IC380 IC900 IC830 IC928 IC1008	IN2040 IN2505 IN4005 IN4030	TT2510 TT5505 TT5525 TT7080 TT9080	TN2525 TN6425 TN6430 TN6525	WHH15 WXM15	CTP1235 CTP1625
	P30	AH120 AH725 AH3135 AH130 AH6030 AH3225	MP6120 VP15TF MP6130 UP20M VP20RT VP30RT	ACP200 ACP300 ACP3000 ACU2500	GC1025 GC1030 GC2030	PR830 PR1225 PR1230 PR1525	JS4045 CY250 JM4160	JC5118 JC5040 JC8050 JC7560			F40M	KC525M KC527M KC530M KC537M KC610M KC620M KC720M KC725M KC730M KC735M	IC907 IC950 IC908 IC910 IC380 IC900 IC830 IC928 IC1008	IN2040 IN2505 IN2530 IN4005 IN4030	TT5525 TT7080 TT8020 TT8080 TT9030 TT9080	TN6430 TN6525 TN6540	WSP45 WSP46	CTP1235 CTP1625 CTP2235
	P40	AH140	VP30RT	ACP300 ACP3000 ACU2500	GC1030 GC2030		JM4160	JC5118 JC5040 JC8050 JC7560			F40M	KC537M KC720M KC725M KC735M	IC830 IC928 IC1008	IN2040 IN2530 IN4005 IN4030	TT8020	TN6540	WSP45 WSP46	CTP1235 CTP2235
	M01				GC1010		PCS08M		DM4				IC907 IC903					
<b>M</b>	M10	AH725	VP15TF	ACM100 ACK300 ACP300 ACU2500	GC1010 GC1025 GC1030 GC2030	PR830 PR1225 PR1525 PR1535	PCS08M CY150		DM4		KC515M KC610M KC635M KC720M	IC907 IC903	IN2505	TT5525 TT9030 TT9080	TN6425 TN6525	WXM15		
	M20	AH725 AH3135 AH130 AH6030 AH3225	VP15TF MP7130 MP7030 UP20M VP20RT	ACM300 ACP300 ACU2500	GC1025 GC1030 GC1040 GC2030	PR830 PR1225 PR1525 PR1535	CY150 CY250	JC8015 JC5015 JC5118	DM4	F40M	KC522M KC525M KC530M KC537M KC610M KC635M KC720M KC730M	IC380 IC900 IC908 IC928 IC1008	IN2005 IN2505 IN2530 IN4005	TT8020 TT8080	TN6425 TN6525	WXM15 WSM35 WSM36	CTP1235 CTP1625	
	M30	AH3135 AH130	VP15TF MP7130 MP7030 UP20M VP20RT MP7140 VP30RT	ACM300	GC1040 GC2030	PR830 PR1225 PR1525 PR1535	CY250 JM4160	JC8015 JC5015 JC5118 JC8050 JC7560		F40M	KC522M KC525M KC530M KC537M KC725M KC730M KC735M	IC380 IC900 IC908 IC928 IC1008 IC328 IC330	IN2005 IN2505 IN2530 IN4005 IN4030	TT8020 TT8080	TN6540	WSM35 WSM36 WSP45 WSP46	CTP1235 CTP2235	
	M40	AH140	MP7140 VP30RT	ACM300	GC1040	PR1225 PR1525 PR1535	JM4160	JC5015 JC5118 JC8050 JC7560		F40M	KC725M	IC1008 IC328 IC330	IN2005 IN2530 IN4005 IN4030	TT8020	TN6540	WSM35 WSM36 WSP45 WSP46	CTP2235	
	K01	AH110	MP8010		GC1010	PR1510	ATH80D JP4105	JC8003				IC380 IC900		TT6080	TN2505 TN6405 TN6505		AMZ	
	<b>K</b>	K10	AH110 AH120	MP8010 VP15TF	ACK3000 ACU2500	GC1010 GC1020	PR1210 PR1510	ATH80D JP4105 JP4120 CY150	JC8015		MK2050	KC514M KC515M KC520M KC620M	IC380 IC900 IC810 IC910	IN2015 IN2505 IN4015	TT6080	TN2505 TN6405 TN6505 TN6510	WHH15 WXM15 WKK25	AMZ CTP3220 CTP6215
K20		AH120 AH9030	MP8010 VP15TF VP20RT	ACK300 ACK3000 ACU2500	GC1020	PR1210 PR1510	JP4120 CY150	JC8015 JC5015		MK2050	KC514M KC520M KC522M KC524M KC527M KC610M KC620M KC635M	IC810 IC910 IC950 IC350 IC830 IC928	IN2015 IN2505 IN4015 IN4030		TN2525 TN6510 TN6520 TN6525	WHH15 WXM15 WKK25	CTP3220 CTP1625	
K30		AH120	VP15TF VP20RT	ACK300 ACK3000 ACU2500		PR1510	CY250	JC8015 JC5015		MK2050	KC522M KC524M KC527M KC537M KC610M KC620M KC635M	IC830 IC928 IC1008 IC808 IC908	IN2015 IN2505 IN4015 IN4030		TN6430 TN6525 TN6540	WKK25		

Note: The above table is selected from a publication. We have not obtained approval from each company.



# Grade Comparison Chart

## ●PVD Coated Grade for Milling

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratizit
Classification	Symbol																
<b>N</b>	N01										KC410M KC510M KC5410			TT6080	TN6501		AMZ
	N10	<b>DS1100</b>		DL1000 DL2000	GC1025 GC1030		SD5010 HD7010				KC410M KC510M KC5410 KC620M			TT6080 TT8020	TN6501 TN6502	WXN15	AMZ
	N20	<b>DS1200</b>	LC15TF	DL1000 DL2000	GC1025 GC1030		SD5010 HD7010			F15M	KC422M KC620M			TT8020		WXN15	
<b>S</b>	S01	<b>AH110</b> <b>AH710</b>			GC1010	PR905 PR1210 PR1535		JC8003 JC8015			KC510M	IC808 IC907 IC908			TN6405		AMZ
	S10	<b>AH120</b> <b>AH725</b>	MP9120 VP15TF MP9130	ACM100 ACK300 ACP300 ACU2500	S30T GC1010 GC1030 GC2030	PR905 PR1210 PR1535	PTH13S JS1025	JC8003 JC8015 JC5015 JC5118		MS2050	KC510M KC610M	IC808 IC907 IC908 IC903	IN2505 IN2530	TT9030 TT9080 TT8080	TN6405 TN6425		AMZ CTP1625
	S20	<b>AH725</b> <b>AH130</b> <b>AH6030</b>	MP9120 VP15TF MP9130 MP9140	ACM300 ACP300 ACU2500	S30T GC1030 GC1040 GC2030 GC2040	PR905 PR1210 PR1535	PTH13S JS1025	JC8015 JC5015 JC5118 JC8050 JC7560		MS2050 F40M	KC522M KC610M	IC300 IC900 IC830 IC928	IN2505 IN2530	TT8080 TT8020	TN6425	WSM35 WSM36	CTP1235 CTP1625
	S30	<b>AH130</b>	MP9130 MP9140	ACM300	S30T GC1040 GC2040	PR1535		JC5118 JC8050 JC7560		MS2050 F40M	KC522M KC525M KC725M	IC830 IC928	IN2530	TT8020	TN6540	WSM35 WSM36 WSP45 WSP46	CTP1235 CTP2235
<b>H</b>	H01	<b>AH110</b> <b>AH710</b> <b>AH8005</b>	MP8010		GC1010			DH102 JC6102 JC8003 JC8008			KC510M	IC903		TT2510 TT5505	TN2505		
	H10	<b>AH110</b> <b>AH120</b> <b>AH710</b> <b>AH8015</b>	MP8010 VP15TF		GC1010 GC1025 GC1030		PTH08M JP4105	JC6102 JC8003 JC8008 JC8015 JC5118		MH1000 F15M	KC505M KC510M KC635M	IC903 IC808 IC907 IC908		TT5515 TT6080	TN2505 TN2525	WHH15	CTP6215
	H20	<b>AH120</b> <b>AH725</b> <b>AH9030</b>	VP15TF		GC1025 GC1030		JP4105	JC8015 JC5118		F15M	KC635M	IC808 IC907 IC908 IC380 IC900		TT5515 TT6080	TN2525	WHH15	CTP6215
	H30									MP3000 F30M		IC380 IC900 IC1008					

Note: The above table is selected from a publication. We have not obtained approval from each company.

## ●Cermet for Milling

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratzit
Classification	Symbol																
<b>P</b>	P01			T250A	CT530	TN60 TN100M	MZ1000						IN0560	CT3000			TCC410
	P10	<b>NS740</b>	NX2525	T250A T2500A	CT530	TN60 TN100M TC60M	MZ1000 MZ2000 CH550	NIT CX75 CX90		MP1020	KTPK20	IC30N	IN0560 IN60C	CT3000 CT7000	TTI25		TCC410 TCM10
	P20	<b>NS740</b>	NX2525 MX3020	T250A T2500A T4500A		TN60 TN100M TC60M	MZ2000 MZ3000 CH500 CH7030	NIT CX75 CX90 SC30		MP1020	KTPK20	IC30N	IN60C	CT3000 CT7000	TTI25		TCM10
	P30		NX4545 MX3030	T250A T2500A T4500A			MZ3000 CH7035		C7X			IC30N	IN0545	CT7000			
<b>M</b>	M10	<b>NS740</b>	NX2525	T250A T2500A	CT530	TN60 TN100M TC60M	MZ1000 CH550	NIT CX75			KTPK20	IC30N	IN0560	CT3000 CT7000	TTI25		TCC410
	M20	<b>NS740</b>	NX2525 MX3020	T250A T2500A T4500A		TN60 TN100M TC60M	MZ2000 MZ3000 CH500 CH7030	NIT CX75 SC30	C7X	MP1020	KTPK20	IC30N		CT7000	TTI25		TCC410 TCM10
	M30		NX4545 MX3030	T4500A			MZ3000 CH7035	SC30									
<b>K</b>	K01						MZ1000 CH550	NIT									TCC410
	K10	<b>NS740</b>	NX2525				MZ2000 MZ3000 CH500 CH7030	NIT CX75			KTPK20			CT7000			TCC410 TCM10
	K20		NX2525 MX3020 MX3030				MZ2000 MZ3000 CH500 CH7030 CH7035	CX75			KTPK20						

Note: The above table is selected from a publication. We have not obtained approval from each company.

# Grade Comparison Chart

## ●Cemented Carbide for Milling

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratizit	
Classification	Symbol																	
<b>P</b>	P01																	
	P10																	S26T
	P20		UTi20T	A30N			EX35				K125M	IC50M		P30	TTM			S26T
	P30	<b>UX30</b>	UTi20T	A30N	SM30		EX40				K125M	IC50M IC28		P30	TTM TTR			S26T
	P40				SM30							IC28			TTR			
<b>M</b>	M01																	
	M10											IC20 IC07 IC08						S26T
	M20		UTi20T		SM30							IC07 IC08			TTM			S26T
	M30		UTi20T	A30N	SM30							IC28			TTM TTR			S26T
	M40			A30N								IC28			TTR			
<b>K</b>	K01		HTi05T			KW10					K115M K313			K10	THM-F			
	K10	<b>TH10</b>	HTi10	G10E	H13A	KW10 GW25	WH10				K115M K313 K110M	IC20		K10	THM-F THM			CTW4615 H216T
	K20		HTi10 UTi20T	G10E	H13A	KW10 GW25				HX	KMF	IC20	IN10K		THM THR			CTW4615 H216T
	K30		UTi20T								KMF		IN10K		THR			
	K40												IN10K					
<b>N</b>	N01	<b>KS05F</b>	HTi10		H10	KW10					K115M				THM-U	WK10		
	N10	<b>TH10</b>	HTi10 MT2010		H10 H13A H10F	KW10 GW25	WH10			H15	K115M K313 K110M	IC20 IC08		K10 UF10	THM-U THM-F THR-S	WK10		CTW4615 H216T
	N20	<b>KS15F</b>	HTi10 TF15 MT2010	H1 H20	H13A H10F	KW10 GW25				HX H15 H25	KMF K313 K110M	IC20 IC08 IC28		K10 UF10	THM-F THR-S THM	WMG40		CTW4615 H216T
	N30		TF15	H1 H20						H25	KMF	IC28				WMG40		
<b>S</b>	S01					KW10					K313	IC20						
	S10			EH520	H13A	KW10 GW25		FZ15			K313 K110M	IC20 IC07 IC08			THM-F			
	S20	<b>KS20</b>		EH520	H10F H13A	KW10 GW25		FZ15		HX H25	KMF	IC20 IC07 IC08 IC28			THM			
	S30				H10F							IC07 IC08						
<b>H</b>	H01				H1P			FZ05										
	H10				H1P			FZ05 FZ15				IC20			THM-F			
	H20							FZ15										

Note: The above table is selected from a publication. We have not obtained approval from each company.

## ●CBN and PCD for Milling

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratzit
Classification	Symbol															
<b>K</b>	K10	<b>BX480</b>	MB710 MB730	BN7000	CB50	KBN475	JBN795 JBN500	B30 B52	CBN200		IB85	IN80B	KB90	WBK40U	WCB80	TA201
	K20	<b>BXC90</b>	MB4120	BNC8115 BNS8125					CBN300 CBN400C	KB1340						
<b>H</b>	H20	<b>BX850</b>		BN7000			JBN245		CBN100							
	H30				CB50					KB1340		IN80B			WCB80	TA201
<b>N</b>	N10	<b>DX140</b> <b>DX160</b>	MD220	DA1000	CD10	KPD230	JDA30 JDA735	PD1	PCD20 PCD30M	KD1415	ID5	IN90D		WDN25U	WCD10	CTD4205
	N20		MD2030	DA1000		KPD010	JDA10			KD1425	ID8					
	N30	<b>DX110</b>	MD2030	DA1000		KPD001			PCD05	KD1420						

Note: The above table is selected from a publication. We have not obtained approval from each company.

## ●Ceramic for Milling

ISO		Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Sandvik	Kyocera	Moldino	Dijet	NTK	Seco Tools	Kennametal	Iscar	Ingersoll	TaeguTec	Widia	Walter	Ceratzit
Classification	Symbol																
<b>K</b>	K01	<b>LX21</b>		NB90S	CC6190 CC650	KA30 A65 KT66 PT600M			HC1 HW2 HC2		KY1310 KY1615			AW20 AB30 AS10	CW2015		CTN3105 CTS3105
	K10	<b>CX710</b> <b>FX105</b>			CC6190 CC650	A65 KT66 A66N PT600M			HC1 HW2 WA1 WA5		KY1310 KY1320 KY1615 KY3400		IN70N	AB30 AS10	CW2015 CW5025	WSN10	CTN3105 CTM3110 CTI3105 CTN3110 CTS3105
	K20	<b>FX105</b> <b>CX710</b>			CC6190	KS6000			SP9 SX9		KY1320 KY3400 KY3500 KY4300		IN70N	AS10	CW5025	WSN10	CTM3110 CTN3110
<b>S</b>	S01								JX1		KY1525 KY2100						
	S10	<b>TW43</b>		WX120	CC670 CC6060 CC6065	CF1			WA1 WA5 SX3 SX7 SX9		KY1525 KY1540 KY2100 KY4300			AS20 TC430	CW3020		
<b>H</b>	H01	<b>TW43</b>		NB100C	CC6050 CC650	A65 KT66 A66N PT600M			ZC4 ZC7		KY4300			AW20	CW2015		CTS3105
	H10			NB100C	CC6050 CC670 CC6190	A65 KT66 A66N PT600M			HC4 HC7 WA1		KY1615 KY4400			AB2010 AB20 AB30	CW2015		CTS3105

Note: The above table is selected from a publication. We have not obtained approval from each company.

# Chipbreaker Comparison Chart

## ● Negative insert type

ISO Classification	Cutting Mode	Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Kyocera	Sandvik	Moldino	Kennametal	Seco Tools	Iscar	TaeguTec	Walter	Ceratizit	
<b>P</b>	Precision finishing	<b>01 TF</b>	PK FH	FA	GP	PF	FE	FS, LF	FF1	SF, PP, TF	FA			
	Finishing and light cutting	<b>TS, TSF PS, ZF NS AS TQ</b>	FP FY LP SH SA SY	SU FL  SE, SX	XP, PP XQ, HQ, CJ, XS	PF LC MF R/L-K XF	BE, BH  AB, CT  CE	FF, FN	MF2	F3P NF, SF	FG VF, EA FC MC  ML, MP	NF3 NS6	CF, TF	
	Finishing and light cutting (With Wiper)	<b>AFW, FW ASW, SW</b>	SW MW	LUW SEW GUW	WP WQ WF	WL, WF WMX WM, WR			FW MW RW	W-FF2 W-MF1 W-M3 W-M6	WF WG	WS WT	NF NM	TFQ TMQ
	Medium cutting	<b>TM, AM PM, DM ZM, NM All-round, TA</b>	MA MH, MP	GU GE, UX	HS, PT, GT CS, PS	PM, QM XM, XRM	AE, AY, B	AH	MN	MF5 M3	M3P, M3M PP, TF, GN	PC, MT MC, MG	NMT, NM4	TMF, TMM M50
	Medium to heavy cutting	<b>TH THS</b>	RP, GH	MU, ME HG	PH All-round	HM, PR MR	RE	RN, RP MR	M5 MR7	NR MR	RT	MM5, NM6 NM9	TM TRM	
Heavy cutting	<b>TU TRS TUS</b>	HM, HX HL, HR HZ, HV	HG, HP HU, HW HF	PX	PR, MR HR, QR	TE, UE HX, HE H	RM RH	R RR	R3P NM	HT, HD RX, RH HY, HZ	NR6 NRF NRR	TRR, TR R28, R58 R88		
<b>M</b>	Finishing and light cutting	<b>SF SS</b>	GM, LM	EX, EG SU, EF	GU MQ	MF, XF	MP BH, AB	FP, FF	FF1 MF1 MF3	TF, VL	EA, SF, SU FG	NF4 NMS	CF, F30, M34 F32, TF	
	Medium cutting	<b>SM, SA S, TA SDM</b>	MM, MA MS	GU HM	MU	MM, QM XM	PV, SE DE	MP, P	MF4 M3	M3M, PP	EM, ET	NM4	TMF, M42 M30, M52	
	Heavy cutting	<b>SH, TH TU</b>	GH, RM HL	EM, MU	MS TK	MR HM, PR	AH, AE	UP, RP	M5 MR3	MR, MH		NR4 NRT, NRS	TM, M60 TRM, TMR, TRR R80	
<b>K</b>	Finishing	<b>CF</b>	LK, MA	UZ	C	KF, XF	Y, AH	FN, MT		GN	FG		CF	
	Medium cutting	<b>CM All-round</b>	MK GK	GZ	ZS All-round	KM, QM XM, XMR	RE VA	RP, UN	M4 M5		MT MG	NM5	M50	
	Heavy cutting	<b>CH Flat-top</b>	RK Flat-top	Flat-top	GC Flat-top	KR Flat-top	RE, V	MA Flat-top	MR9 Flat-top		RT	Flat-top	TMR, TR R28 R58, R88	
<b>N</b>	Cutting of non-ferrous metals	<b>P 28</b>		AX	AH, A3	MF		MS GR		PP			F32	
<b>S</b>	Finishing	<b>HRF</b>	FJ, LS MJ	EF EX	SQ, SX	SF	VI	FS MS	MF1			NFT NF4		
	Medium cutting	<b>HRM HMM SA, 28 SDM</b>	MS RS, GJ	EG MU EM	SQ, SX	SMR	VI	UP RP	MF4 M1	PP	SM	NMS NM4, NRS, NR4	M34, M52	

Note: Above charts are based on published data and not authorized by each manufacturer.

## ● Positive insert type

ISO Classification	Cutting Mode	Tungaloy	Mitsubishi Carbide	Sumitomo Electric	Kyocera	Sandvik	Moldino	NTK	Kennametal	Seco Tools	Iscar	TaeguTec	Walter	Ceratzit	
<b>P</b>	Precision finishing	01	FV	FC	CF, CK		JQ		GM	FF1 F1	SF		PF2	F32	
	Finishing and light cutting	PSF, PF, SS PS, PSS TS, TSF	FP, FV, SV LP SVX	FP, LU FK, SC SU	GQ GP XP PP, VF WP	R/L-K PF UF WF, WK, WM	JQ JE		11, LF VF, FP FW, MW	MF2	PF SM, 14, 17 19, XL R/L RF, LF	FA FG GF	PF5 PF4 PS5 PF, PM	SF SMF SMW, 25Q	
		TSW, SW W08-20	SW, MW	LUW, SDW											
	Medium cutting	PM TM All-round RS	MP MV No sign	SU, MU SC	All-round HQ, XQ GK	PM UM, PR UR	JE		MP MF	M3 M5	DT, HQ	MT MT	PM5	SM	
High-feed, small depth of cut cutting	61									No sign 14	No sign				
<b>M</b>	Finishing	PSF, SS	FM, SV	FC		R/L-K UF, MF			11, VF	FF1 MF2		FG			
	Finishing to Medium cutting	PSS PS	LM SV	SI, GU LB, SU	MQ	MM UM			LF, FP	M3			PF4	SF, SMF	
	Medium cutting	PM	MM	MU	HQ	MR UR			MF, MP	M5			PM5	F23, F43 SM	
<b>K</b>	Cutting of cast irons	CM Flat-top	MK Flat-top	FC, MU Flat-top	KF KM UM, KR	Flat-top			11, VF, FP MP, MF Flat-top	M5 Flat-top	19	MT Flat-top	PS5, PM5 Flat-top	SF 25P 27, 29	
<b>N</b>	Cutting of non-ferrous metals	AL P Ground	AZ R/L-F R/L	AG AY AW LD, GD	AH	AL			HP, LF	AL	AS	FL	PF2 PM2	23P 25P 27, 29	
<b>S</b>	Finishing	PSF	FJ	FC	MQ	MF, UF, R/L-K			HP	F1				SF	
	Finishing to Medium cutting	PSS PS	LS, MS	SU, GU		MM SM			LF, FP	MF2				F23	
	Medium cutting	All-round		SI		UM, MR, UR						FG	PF2, PF4	SM, 25P, 29	
<b>P</b> <b>M</b> <b>N</b> <b>S</b>	Turning on small lathes	JP, 01 W08, W15, W20 J08	R/L-SR R/L-SN R/L-SS FS-P, F	W, SD FX, FY	CF, SKS R/L-F, R/L-FSF ER/L-U FR/L-U R/L-U FR/L-U, R/L-USF MF, R/F-FSF SK, GF CK, GQ	F, M UM	No sign	AMX AZ7 YL, AM3 U CL	LF		SM F2M	GF, GW SL SA SM SH	PM5		
		JS, JSS	LS-P	LU, FP, FK, SU FC, SI, SC											
		JRP, JSR, JPP J10, TS, JTS TSW SS	SW, MW SRF SMG												

Note: Above charts are based on published data and not authorized by each manufacturer.

# MEMO

