

Summary of Insert Grades

Insert Grades

PCD A8

Workpiece Material		Non-ferrous Material (Aluminum / Non-ferrous Metal)				Heat Resistant Material (Titanium Alloy / Ni Alloy)			
Cutting Range		Finishing		Roughing		Finishing		Roughing	
ISO Classification		N01	N10	N20	N30	S01	S10	S20	S30
Turning Milling	PCD	KPD001				KPD001			
		KPD010				KPD010			
		KPD230				KPD230			

CBN A9

Workpiece Material		Hardened Material (Heat treated Steel / Chilled Cast Iron)				Sintered metal				Cast Iron (Gray Cast Iron / Nodular Cast Iron)			
Cutting Range		Finishing		Roughing		Finishing		Roughing		Finishing		Roughing	
ISO Classification		H01	H10	H20	H30	01	10	20	30	K01	K10	K20	K30
Turning	CBN	KBN510											
		KBN525											
		KBN05M											
		KBN10M								KBN60M			
		KBN25M				KBN65M				KBN900			
		KBN30M				KBN70M							
		KBN35M											
		KBN900											

Ceramic A10

Workpiece Material		Hardened Material (Heat treated Steel / Chilled Cast Iron)				Hard-to-machine Material (High temperature alloy / Inconel)				Cast Iron (Gray Cast Iron / Nodular Cast Iron)			
Cutting Range		Finishing		Roughing		Finishing		Roughing		Finishing		Roughing	
ISO Classification		H01	H10	H20	H30	S01	S10	S20	S30	K01	K10	K20	K30
Turning	Ceramic	A65								KA30			
		A66N				CF1				A65			
		PT600M								A66N			
										PT600M			
										KS6000			

Cell Fiber A11

Workpiece Material		Hardened Material (Heat treated Steel / Chilled Cast Iron)				Hard-to-machine Material (High temperature alloy / Inconel)			
Cutting Range		Finishing		Roughing		Finishing		Roughing	
ISO Classification		H01	H10	H20	H30	S01	S10	S20	S30
Turning	Cell Fiber	KBN35M				CF1			

Cermet A12

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)				Stainless Steel (Stainless Steel / Steel Castings)				Cast Iron (Gray Cast Iron / Nodular Cast)					
Cutting Range		Finishing		Roughing		Finishing		Roughing		Finishing		Roughing			
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning Milling	TN Series	TN6010				TN6010				TN60					
		TN60				TN60				TN90					
		TN90				TN90				TN100M					
	TC Series	TC40				TC60				TC40					
		TC60				TC60									
	Super micro-grain	TN6020				TN6020									

PVD Cermet A12

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)				Stainless Steel (Stainless Steel / Steel Castings)				Cast Iron (Gray Cast Iron / Nodular Cast)					
Cutting Range		Finishing		Roughing		Finishing		Roughing		Finishing		Roughing			
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning	PV Series	PV7010				PV7010				PV7005					
		PV7020				PV7020									
		PV60				PV60									
		PV90				PV90									

CVD Coated Carbide Ⓢ A13

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)					Stainless Steel (Stainless Steel / Steel Castings)					Cast Iron (Gray Cast Iron / Nodular Cast)			
Cutting Range		Finishing ↔ Roughing					Finishing ↔ Roughing					Finishing ↔ Roughing			
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning	CA Series	CA5505 CA5515 CA5525 CA5535					CA6515 CA6525					CA4010 CA4115 CA4120			
	CR Series	CR9025					CR9025								

Workpiece Material		Non-ferrous Material (Aluminum / Non-ferrous Metal)				Heat Resistant Material (Titanium Alloy / Ni Alloy)				Hardened Material (Heat treated Steel / Chilled Cast Iron)			
Cutting Range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing			
ISO Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Turning	CA Series					CA6515 CA6525							

PVD Coated Carbide Ⓢ A14, A15

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)					Stainless Steel (Stainless Steel / Steel Castings)					Cast Iron (Gray Cast Iron / Nodular Cast)			
Cutting Range		Finishing ↔ Roughing					Finishing ↔ Roughing					Finishing ↔ Roughing			
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning Milling Drilling	PR Series	PR630 PR660 PR730 PR830 PR1005 PR1025 PR1115 PR1230					PR630 PR660 PR730 PR830 PR1025 PR1125 PR1225					PR905 PR1210			

Workpiece Material		Non-ferrous Material (Aluminum / Non-ferrous Metal)				Heat Resistant Material (Titanium Alloy / Ni Alloy)				Hardened Material (Heat treated Steel / Chilled Cast Iron)			
Cutting Range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing			
ISO Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Turning Milling Drilling	PR Series					PR660 PR915 PR1125				PR1230			

PVD Coated Carbide for High Precision Machining Ⓢ A14, A15

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)					Stainless Steel (Stainless Steel / Steel Castings)					Cast Iron (Gray Cast Iron / Nodular Cast)			
Cutting Range		Finishing ↔ Roughing					Finishing ↔ Roughing					Finishing ↔ Roughing			
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning Milling Drilling	PR Series	PR915 PR930 PR1005 PR1025 PR1115					PR915 PR930 PR1125								

Carbide Ⓢ A15

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)					Stainless Steel (Stainless Steel / Steel Castings)					Cast Iron (Gray Cast Iron / Nodular Cast)			
Cutting Range		Finishing ↔ Roughing					Finishing ↔ Roughing					Finishing ↔ Roughing			
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Turning Milling Drilling	Carbide											KW10 GW15			

Workpiece Material		Non-ferrous Material (Aluminum / Non-ferrous Metal)				Heat Resistant Material (Titanium Alloy / Ni Alloy)				Hardened Material (Heat treated Steel / Chilled Cast Iron)			
Cutting Range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing			
ISO Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Turning Milling Drilling	Carbide	KW10 GW15				KW10							

Summary of Insert Grades

A

Insert Grades

Turning

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)					Stainless Steel (Stainless Steel / Steel Castings)					Cast Iron (Gray Cast Iron / Nodular Cast)			
Cutting Range		Finishing			Roughing		Finishing			Roughing		Finishing		Roughing	
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Cermet	TN Series	TN6010					TN6010					TN60			
		TN60					TN60					TN90			
		TN90					TN90					TC40N			
	TC Series	TC40N					TC60M					TC60M			
Super micro-grain	TN6020					TN6020					PV7005				
PV Series		PV7010					PV7010					PV7020			
		PV7020					PV7020					PV60			
		PV60					PV60					PV90			
		PV90					PV90								
Coated Carbide	CA Series	CA5505				CA6515					CA4010				
		CA5515				CA6515					CA4115				
		CA5525				CA6525					CA4120				
		CA5535				CA6525									
CR Series		CR7015					CR7015					CR7015			
		CR7025					CR9025								
		CR9025					CR9025								
		PR630					PR630								
PR Series		PR660					PR660								
		PR915				PR915									
		PR930				PR930									
		PR1005				PR1025									
	PR1025				PR1125										
	PR1115				PR1125										
Ceramic										A65					
										KT66					
										A66N					
										PT600M					
Carbide										KS6000					
										KW10					
										GW15					
CBN										KBN60M					
										KBN900					

Workpiece Material		Non-ferrous Material (Aluminum / Non-ferrous Metal)				Heat Resistant Material (Titanium Alloy / Ni Alloy)				Hardened Material (Heat treated Steel / Chilled Cast Iron)				Sintered metal			
Cutting Range		Finishing		Roughing		Finishing		Roughing		Finishing		Roughing		Finishing		Roughing	
ISO Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30	01	10	20	30
Coated Carbide	CA Series					CA6515											
						CA6525											
	CR Series					CR7015											
	PR Series					PR1125								PR930			
Cermet														TN6010			
														TN60			
Ceramic						CF1					KT66						
						KW10					A66N						
						KW10					PT600M						
CBN		KW10				KW10				KBN510							
		GW15				KW10				KBN525							
						KW10				KBN05M							
						KW10				KBN10M					KBN65M		
						KW10				KBN25M				KBN70M			
						KW10				KBN30M							
						KW10				KBN35M							
PCD		KPD001				KPD001				KBN900							
		KPD010				KPD010				KBN900							

Milling

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)					Stainless Steel (Stainless Steel / Steel Castings)					Cast Iron (Gray Cast Iron / Nodular Cast)			
Cutting Range		Finishing ← → Roughing					Finishing ← → Roughing					Finishing ← → Roughing			
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Cermet	TN Series	TN60					TN60								
	TC Series	TN100M					TN100M								
Coated Carbide				PR630					PR630						
				PR660					PR660						
				PR730					PR730					PR905	
				CA2325					PR830						
				PR830					PR1025						
Carbide													KW10		
													GW25		

Workpiece Material		Non-ferrous Material (Aluminum / Non-ferrous Metal)				Heat Resistant Material (Titanium Alloy / Ni Alloy)				Hardened Material (Heat treated Steel / Chilled Cast Iron)			
Cutting Range		Finishing ← → Roughing				Finishing ← → Roughing				Finishing ← → Roughing			
ISO Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Coated Carbide								PR660					
Carbide		KW10						KW10					
		CW12						GW25					
		GW25											
CBN									KBN525				
PCD		KPD001				KPD001							
		KPD010				KPD010							
		KPD230				KPD230							

Drilling

Workpiece Material		General Steel (Carbon Steel / Alloy Steel)					Stainless Steel (Stainless Steel / Steel Castings)					Cast Iron (Gray Cast Iron / Nodular Cast)			
Cutting Range		Finishing ← → Roughing					Finishing ← → Roughing					Finishing ← → Roughing			
ISO Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Coated Carbide				CA2325						PR660					
				PR660					PR730					PR905	
				PR730					PR830					PR1210	
				PR830					PR915						
				PR915					PR930						
				PR930					PR1025						
				PR1025					PR1225						
				PR1230											
Carbide													KW10		
													GW15		










Workpiece Material		Non-ferrous Material (Aluminum / Non-ferrous Metal)				Heat Resistant Material (Titanium Alloy / Ni Alloy)				Hardened Material (Heat treated Steel / Chilled Cast Iron)			
Cutting Range		Finishing ← → Roughing				Finishing ← → Roughing				Finishing ← → Roughing			
ISO Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
Coated Carbide	PR Series							PR660				PR1230	
Carbide		KW10						PR905					
		SW11						KW10					
		GW15						GW15					

Summary of Insert Grades

A

Insert Grades

Insert Material Selection Table

Operation	Cutting Range	P	M	K		N	S		H	Sintered Metal	
		Steel	Stainless Steel	Gray Cast Iron	Nodular Cast Iron	Non-ferrous Metal	Heat Resist Steel	Titanium Alloy	Hardened Material		
	Finishing ↑ ↓	TN6010							KT66 A66N A65 PT600M		
		TN60	TN60	KA30	TN60						
		TN6020	PV7020	KS6000	PV7005			CF1			TN6010
		PV7010	CA6515	PV7005	CA5505	KPD001		KW10	KPD001	KBN510	TN60
		PV7020	CA5525	CA5505	CA4115	KPD010	CA6515	KPD010	KBN05M	PR930	
		CA5505	CA5535	CA4010	CA4120	KW10	CA6525	KW10	KBN10M	KBN65M	
		CA5515	CA6525	CR7015			PR1125		KBN25M	KBN70M	
		CA5525	PR1125	KBN60M			PR660		KBN30M		
CA5535	PR660						KBN35M				
								KBN900			
	High speed Cutting speed ↑ ↓ Low speed	TN6010									
		TN60	TN6020								
		TN6020	PV7020							KBN510	TN6010
		PV7010	CA6515	CA4010			KPD001	CA6515	KPD001	KBN525	
		PV7020	CA6525	CA4115	CA4115	KPD010	PR1125	KPD010	KBN05M	TN60	
		CA5515	PR1005	CA4120	CA4120	KW10	PR660	KW10	KBN10M	PR930	
		CA5525	PR930	KW10	KW10				KBN25M	KBN65M	
		PR930	PR1025						KBN30M	KBN70M	
PR1025											
	Large Cutting Dia. ↑ ↓ Small	TN6010									
		TN60	TN60								
		TN6020	PV7020							PT600M	TN6010
		PV7010	CA6515	PV7005	PV7005					KBN510	TN60
		PV7020	CA5525	CA4115	CA4115	KPD001	CA6515	KPD001	KBN05M	PR930	
		CA5515	CA6525	CA4120	CA4120	KPD010	CA6525	KPD010	KBN10M	KBN65M	
		CA5525	PR930	KW10	KW10	KW10	PR1125	KW10	KBN25M	KBN70M	
		CA5535	PR1125	KBN60M			PR660		KBN30M		
PR930	PR1025										
PR1025											
	Large Cutting Dia. ↑ ↓ Small	CR9025	CR9025								
		PR660	PR660	KW10	KW10	KW10	KW10	KW10			
		PR930	PR930					PR660			
		PR915	PR915								
	(Depends on the workpiece material)	PR1025	PR1025	KW10	KW10	KW10	KW10	KW10			
							PR1025				
	Surface finishing ↑ ↓ Stable cutting	TC40N	TC40N								
		TN6020	TN6020								
		TN90	TN90							KBN510	
		TC60M	TC60M	PR905	PR905	KPD001	PR915	KPD001	KBN525	TC40N	
		PR630	PR630	KW10	KW10	KW10	KW10	KW10	PT600M	PR930	
		PR915	PR915	GW15	GW15						
PR930	PR930										
PR1115	PR1115										
	Surface finishing ↑ ↓ Stable cutting	TC60M	TC60M								
		PR630	PR630								
		PR930	PR930	KW10	KW10	KW10	KW10	KW10		PR930	
		PR1115	PR1115	GW15	GW15						
	Good Wear Resistance ↑ ↓ Flexural resistance	PR930									
		PR730	PR730	PR510	PR510			PR660			
		CA2325	PR830	PR905	PR905			PR1025			
		PR830	PR915	PR1210	PR1210	KW10	PR1230	KW10			
		PR915	PR1025	KW10	KW10		KW10				
		PR1025	PR1225								
		PR1230	PR660								
PR660											
	Finishing ↑ ↓ Roughing	TN100M									
		PR630	PR630				PR630	KPD001			
		PR730	PR730	PR905	PR905	KPD010	PR730	KPD010			
		CA2325	PR830	KW10	KW10	CW12	PR830	KW10			
		PR830	PR1025			KW10	PR1025				
		PR1025	PR660			GW25	PR660				
		PR660									

• Colored material is first recommendation.

A6

Material Feature List

A

Insert Grades

Cermet

Symbol	Color	Main Component	Ratio	Base Material Hardness (HV)	Base Material Hardness (GPa)	Fracture Toughness (MPam ^{1/2})	Transverse Strength (MPa)
TN6010	Gray	TiCN	6.5	1,700	16.7	7.0	2,000
TN6020	Gray	TiCN	6.4	1,500	14.7	10.0	2,500
TN60	Gray	TiCN+NbC	6.6	1,600	15.7	9.0	1,760
TN90	Gray	TiCN+NbC	6.4	1,450	14.2	10.0	1,960
TN100M	Gray	TiCN+NbC	6.7	1,520	14.9	10.5	1,860
TC40	Gray	TiC+TiN	6.0	1,650	16.2	9.0	1,570
TC60	Gray	NbC	8.1	1,500	14.7	10.5	1,670

PVD Coated Cermet

Symbol	Color	Coating Composition	Coating Layer	Gravity	Base Material Hardness (HV)	Base Material Hardness (GPa)	Fracture Toughness (MPam ^{1/2})	Transverse Strength (MPa)
PV7005	Blackish red	MEGACOAT	Thin	6.0	1,650	16.2	8.5	1,470
PV7010	Blackish red	MEGACOAT	Thin	6.5	1,700	16.7	7.0	2,000
PV7020	Gold	TiAlN+TiN	Thin	6.4	1,500	14.7	10.0	2,500
PV60	Gold	TiN	Thin	6.6	1,600	15.7	9.0	1,760
PV90	Gold	TiN	Thin	6.4	1,450	14.2	10.0	1,960

CVD Coated Carbide

Symbol	Color	Coating Composition	Coating Layer	Gravity	Base Material Hardness (HV)	Base Material Hardness (GPa)	Fracture Toughness (MPam ^{1/2})	Transverse Strength (MPa)
CA2325	Gold	TiCN+Al ₂ O ₃ +TiN	Thin	13.7	1,450	14.2	12.0	2,250
CA4010	Gold	Columnar TiCN+Al ₂ O ₃ +TiN	Thick	14.8	1,670	16.4	10.0	3,000
CA4115	Gold	Micro columnar TiCN+Al ₂ O ₃ +TiN	Thick	14.7	1,550	15.2	12.0	2,750
CA4120	Gold	Micro columnar TiCN+Al ₂ O ₃ +TiN	Thick	14.7	1,550	15.2	12.0	2,750
CA5505	Gold	Micro columnar TiCN+Al ₂ O ₃ +TiN	Thick	14.7	1,730	17.0	10.0	2,540
CA5515	Gold	Micro columnar TiCN+Al ₂ O ₃ +TiN	Thick	14.7	1,550	15.2	12.0	2,750
CA5525	Gold	Micro columnar TiCN+Al ₂ O ₃ +TiN	Thick	14.5	1,400	13.7	12.0	2,780
CA5535	Gold	Micro columnar TiCN+Al ₂ O ₃ +TiN	Thick	14.1	1,340	13.1	16.5	2,970
CA6515	Gold	Micro columnar TiCN+Al ₂ O ₃ +TiN	Thin	14.7	1,530	15.0	12.0	2,780
CA6525	Gold	Micro columnar TiCN+Al ₂ O ₃ +TiN	Thin	14.7	1,580	13.5	16.0	3,100
CR9025	Gold	Columnar TiCN+TiN	Thick	14.5	1,400	13.7	12.0	2,780

PVD Coated Carbide

Symbol	Color	Coating Composition	Coating Layer	Gravity	Base Material Hardness (HV)	Base Material Hardness (GPa)	Fracture Toughness (MPam ^{1/2})	Transverse Strength (MPa)
PR630	Gold	TiN	Thin	12.5	1,500	14.7	11.0	2,160
PR660	Gold	TiN	Thin	13.7	1,450	14.2	12.0	2,250
PR730	Gold	TiAlN+TiN	Thin	13.7	1,450	14.2	12.0	2,250
PR830	Gold	TiAlN+TiN	Thin	13.7	1,450	14.2	12.0	2,250
PR905	Bluish purple	TiAlN	Thin	14.8	1,670	16.4	10.0	3,000
PR915	Bluish purple	TiAlN	Thin	14.1	1,700	16.7	11.0	4,140
PR930	Reddish gray	TiCN	Thin	14.1	1,700	16.7	11.0	4,140
PR1005	Reddish gray	TiCN	Thin	14.9	1,800	17.6	10.0	3,300
PR1025	Reddish gray	TiCN	Thin	14.5	1,600	15.8	13.0	3,400
PR1115	Purple red	TiAlN	Thin	14.7	1,700	17.2	11.0	3,000
PR1125	Purple red	TiAlN	Thin	14.5	1,600	15.8	13.0	3,400
PR1210	Blackish red	MEGACOAT	Thin	14.8	1,670	16.4	10.0	3,000
PR1225	Blackish red	MEGACOAT	Thin	14.5	1,600	15.8	13.0	3,400
PR1230	Blackish red	MEGACOAT	Thin	13.7	1,450	14.2	12.0	2,250

Carbide

Symbol	Color	Main Component	Gravity	Base Material Hardness (HV)	Base Material Hardness (GPa)	Fracture Toughness (MPam ^{1/2})	Transverse Strength (MPa)
KW10	Gray	WC+Co	15.0	1,650	16.2	10.0	1,470
GW15	Gray	WC+Co	14.7	1,700	17.2	11.0	3,000
GW25	Gray	WC+Co	14.5	1,600	15.8	13.0	3,400