

# Grade System for Grooving and Cut-Off Applications



## Grade Selection Table

Type	Grade	Coating	Composition and Application	Area of use													
				Standard designation	Wear resistance ↔ Toughness												
				05	10	15	20	25	30	35	40	45					
Uncoated Carbide Grades	K313	C-Class	<b>composition:</b> A hard, low binder content, unalloyed WC/Co fine-grained grade. <b>application:</b> Exceptional edge wear resistance combined with very high strength for machining titanium, cast irons, austenitic stainless steels, non-ferrous metals, nonmetals, and most high-temperature alloys. Superior thermal deformation and depth of cut notch resistance. The grain structure is well controlled for minimal pits and flaws which contributes to long, reliable service.	P													
		C3 - C4		M													
				K													
Uncoated Carbide Grades	K68	C3	<b>composition:</b> A hard, low binder content, unalloyed grade WC/Co fine-grained grade. <b>application:</b> The K68 grade has excellent abrasion resistance for machining cast irons, austenitic stainless steels, non-ferrous metals, nonmetals and as an alternative to the K313 grade on most high-temperature alloys. Use as a general purpose grade for non-ferrous materials.	P													
				M													
				K													
Uncoated Carbide Grades	K1025 (KMF)	C2, C6	<b>composition:</b> It's a medium in hardness and binder content unalloyed WC, Co fine grained grade. <b>application:</b> For machining high-temp alloys, titanium and non-ferrous workpiece materials under unfavorable conditions.	P													
				M													
				K													
PVD Coated Carbide Grades	KC5010 <b>NEW!</b> improved	TiAlN C3, C4	<b>composition:</b> An advanced PVD TiAlN coating over a very deformation-resistant unalloyed carbide substrate. KC5010's new and improved coating allows for speeds to be increased by 50 to 100%. <b>application:</b> The KC5010 grade is ideal for finishing to general machining of most workpiece materials at higher speeds. Excellent for machining most steels, stainless steels, cast irons, non-ferrous materials and super alloys under stable conditions. It also performs well machining hardened and short chipping materials.	P													
				M													
				K													
PVD Coated Carbide Grades	KC5025 <b>NEW!</b> improved	TiAlN C2, C6	<b>composition:</b> An advanced PVD TiAlN coated grade with a tough, ultra-fine grain unalloyed substrate. <b>application:</b> For general purpose machining of most steels, stainless steels, high-temperature alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium, and will handle interruptions and high feed rates.	P													
				M													
				K													
PVD Coated Carbide Grades	KC5410	TiB <sub>2</sub> C3 - C4	<b>composition:</b> A PVD TiB <sub>2</sub> coating over a very deformation-resistant unalloyed substrate. <b>application:</b> The KC5410 grade is designed for roughing, semifinishing and finishing of free machining (hypoeutectic <12.2% Si) aluminum, aluminum alloys and magnesium alloys. The TiB <sub>2</sub> coating is harder than TiN and TiAlN coatings and has an extremely smooth surface, resulting in reduced surface friction, speedy chip flow and outstanding wear resistance. In addition, built-up edge is prevented because this coating has a very low affinity for aluminum. The substrate is unalloyed and fine grained and offers sharp edges, smooth surfaces, and excellent thermal deformation resistance and edge integrity. Inserts with a ground periphery are polished before coating and have a sharp edge. Molded inserts have a light hone.	P													
				M													
				K													
PVD Coated Carbide Grades	KU10T <b>NEW!</b>	TiN TiAlN C3, C4	<b>composition:</b> An advanced PVD coating over a highly deformation-resistant carbide substrate. <b>application:</b> KU10T is an ideal general machining grade designed for medium to finishing operations. KU10T is excellent when machining most steels, stainless steels, cast irons, non-ferrous materials, and superalloys under stable conditions. KU10T is also effectively applied when machining hardened and short-chipping materials.	P													
				M													
				K													
PVD Coated Carbide Grades	KU25T <b>NEW!</b>	TiN TiAlN C2, C6	<b>composition:</b> An advanced PVD coating over a tough and highly wear resistant carbide substrate. <b>application:</b> KU25T is ideal for finishing to general machining of most workpiece materials. With a higher cobalt content than KU10T, this grade provides the toughness needed to handle the demands of grooving, threading and cut-off operations. KU25T performs extremely well when machining most steels, stainless steels, cast irons, non-ferrous materials, and superalloys under stable conditions.	P													
				M													
				K													



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					05	10	15	20	25	30	35	40	45					
CVD Coated Carbide Grades	KC9110	C-Class	<p><b>composition:</b> A specially engineered, patent-pending cobalt-enriched carbide grade with thick K-MTCVD-TiCN coating layer, an Al<sub>2</sub>O<sub>3</sub> layer of controlled grain size, and outer layers of TiCN and TiN for maximum wear resistance.</p> <p><b>application:</b> An excellent finishing to medium machining grade for a variety of workpiece materials including most steels, ferritic and martensitic stainless steels, and cast irons. The specially engineered, cobalt-enriched substrate offers a balanced combination of deformation resistance and edge toughness, while the thick coating layers offer outstanding abrasion resistance and crater wear resistance for high-speed machining. The smooth coating provides good resistance to edge build-up and microchipping and produces excellent surface finishes. For rougher cutting, use the KC9125 grade.</p>	P														
				C3, C7	M													
					K													
CVD Coated Carbide Grades	KC9125		<p><b>composition:</b> A tough cobalt-enriched carbide grade with a newly designed multi-layer K-MTCVD TiCN-Al<sub>2</sub>O<sub>3</sub>-TiCN-TiN coating with superior interlayer adhesion.</p> <p><b>application:</b> This is the industry's best general-purpose turning grade for most steels, and ferritic and martensitic stainless steels. The substrate design, with cobalt-enrichment, assures adequate deformation resistance along with excellent bulk toughness and insert edge strength. The coating layers offer good wear resistance over a wide range of machining conditions. The smoothness of the coating leads to reduced frictional heat, minimizes microchipping, and improves workpiece surface finishes. The KC9125 grade performs well in moderately heavy roughing to semi-finishing cuts. Use the KC9110 grade for finishing cuts.</p>	P														
				C2 - C3, C6 - C7	M													
					K													
Cermet	KT315		<p><b>composition:</b> A multi-layered, PVD TiN/TiCN/TiN, coated cermet turning grade.</p> <p><b>application:</b> Ideal for high-speed finishing to medium machining of most carbon and alloy steels and stainless steels. Performs very well in cast and ductile iron applications too. Provides long and consistent tool life and will produce excellent workpiece finishes.</p>	P														
				C3, C7	M													
					K													
PCBN - Polycrystalline Cubic Boron Nitride	KD081		<p><b>composition:</b> A low content, PCBN tip brazed onto a carbide insert.</p> <p><b>application:</b> Designed for roughing to finishing of hardened steels (&gt;45 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case hardened steels, carburized and nitrided irons, and some hard coatings.</p>	P														
				C4, C8	M													
					K													
PCBN - Polycrystalline Cubic Boron Nitride	KD120		<p><b>composition:</b> A high CBN content, PCBN tip brazed onto a carbide insert.</p> <p><b>application:</b> The primary application area for high CBN content grades is in roughing to finishing of fully pearlitic gray cast iron, chilled irons, high chrome alloys steels, sintered powdered metals, and heavy cuts in hardened steels (&gt;45 HRC). Also use for finishing chilled cast iron and fully pearlitic cast iron. Do not apply on finishing cuts in hardened steels. Available in regular size tips.</p>	P														
				C8	M													
					K													
PCD - Polycrystalline Diamond	KD100		<p><b>composition:</b> A polycrystalline diamond tip (PCD) brazed onto a carbide substrate.</p> <p><b>application:</b> The KD100 grade is for general purpose turning. The cutting tool material contains a binder in addition to diamond particles. This makes the KD100 grade suitable for roughing to finishing all types of highly abrasive workpieces, including non-ferrous metals and non-metallics. Use as your first choice on high content silicon aluminum alloys (hypereutectic). Will generally produce good surface finishes. Provides the best mechanical shock resistance of the diamond tool materials. The cutting edge is sharp. This grade operates at very high speeds.</p>	P														
				C4	M													
					K													
PCD - Polycrystalline Diamond	KD1405		<p><b>composition:</b> A pure CVD deposited diamond sheet tool direct brazed to a carbide substrate.</p> <p><b>application:</b> KD1405 is Kennametal's and the industry's most abrasion resistant tool material for non-ferrous and non-metallic materials. KD1405 is best applied when abrasion resistance is the desired benefit. KD1405 is not as tough as KD100, but can withstand moderate interruptions when turning and traditional face milling operations.</p>	P														
				C4	M													
					K													

TOP NOTCH

A4

A3

GROOVING & CUT-OFF TOOLS

A2