Kennametal Grade System for Cutting Materials

Grade Selection Table

Type	Grade	Coating	Composition and Application	Standard designation	Area of use: Wear resistance ↔ Toughness (05 10 15 20 25 30 35 40 45)
Uncoated Carbide Grades	**K313**	C3 – C4	**composition:** A hard, low binder content, unalloyed WC/Co fine-grained grade. **application:** 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 M K N S H	
	K68	C3	**composition:** A hard, low binder content, unalloyed grade WC/Co fine-grained grade. **application:** 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 N S H	
PVD-Coated Carbide Grades	**KC5010** NEW! improved	TiAlN C3, C4	**composition:** 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%. **application:** 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 N S H	
	KC5025 NEW! improved	TiAlN C2, C6	**composition:** An advanced PVD TiAlN coated grade with a tough, ultra-fine grain unalloyed substrate. **application:** 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 N S H	
	KC5410	TiB_2 C3 – C4	**composition:** A PVD TiB2 coating over a very deformation-resistant unalloyed substrate. **application:** The KC5410 grade is designed for roughing, semifinishing and finishing of free machining (hypoeutectic <12.2% Si) aluminum, aluminum alloys and magnesium alloys. The TiB2 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 N S H	
	KC5510 NEW!	TiAlN C3 – C4	**composition:** An advanced PVD TiAlN coated fine-grained tungsten carbide grade. **application:** Grade KC5510 is specifically engineered for the productive machining of high-temperature alloys. The fine-grained tungsten carbide 6% cobalt substrate has excellent toughness and deformation resistance while the advanced PVD coating allows for metal cutting speeds double those of conventional PVD-coated cutting tools.	P M K N S H	
	KC5525 NEW!	TiAlN C2 – C6	**composition:** Advanced PVD TiAlN coated fine-grained high cobalt carbide grade. **application:** Grade KC5525 utilizes the same advanced PVD coating as grade KC5510 in conjunction with a fine-grained tungsten carbide 10% cobalt substrate. The higher cobalt provides for added security in interrupted cuts while the fine grained WC maintains hardness-resisting deformation at higher speeds. Designed for medium to heavy interruptions in high-temperature alloys.	P M K N S H	
	KU10T NEW!	TiN TiAlN C3, C4	**composition:** An advanced PVD coating over a highly deformation-resistant carbide substrate. **application:** 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 effective when machining hardened and short-chipping materials.	P M K N S H	

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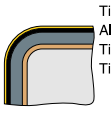
PVD-Coated Carbide Grades	**KU25T** NEW!	 C2, C6	**composition:** An advanced PVD coating over a tough and highly wear resistant carbide substrate. **application:** KU25T is ideal for finishing to general machining of most workpiece materials. With a higher cobalt content than KU10T, this grade provides 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. KU25T can also be effectively applied when machining hardened and short-chipping materials.	P M K N S H	
CVD-Coated Carbide Grades	**KC8050**	 C1 – C3, C5 – C7	**composition:** A newly developed, advanced cobalt-enriched carbide grade with a thick alumina coating. **application:** A versatile performer on a wide range of workpiece materials (steels, stainless steels, and cast irons) for roughing through finishing operations. This highly wear-resistant grade can operate with or without coolant at high speeds, and has exceptional edge strength for interrupted cuts. The micro-finished insert edge resists workpiece build-up and microchipping, and produces excellent surface finishes. For machining steels and cast irons, your first choices are the -RN and -MN geometries. For medium machining applications and finishing cuts, the -MP and -FP geometries with a positive rake are suggested.	P M K N S H	
	KC9040	 C5 – C6	**composition:** An alumina-coated grade with a tough cobalt-enriched substrate. **application:** For heavy roughing applications on all types of steels, stainless steels, and most other materials when tool edge strength is critical. A specially designed coating preparation assures prolonged tool life. Apply with confidence on tough jobs.	P M K N S H	
	KC9110	 C3, C7	**composition:** A specially engineered, patent-pending cobalt-enriched carbide grade with thick K-MTCVD-TiCN coating layer, an Al_2O_3 layer of controlled grain size, and outer layers of TiCN and TiN for maximum wear resistance. **application:** 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 M K N S H	
	KC9125	 C2 – C3, C6 – C7	**composition:** A tough cobalt-enriched carbide grade with a newly designed multi-layer K-MTCVD TiCN-Al_2O_3-TiCN-TiN coating with superior interlayer adhesion. **application:** 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 M K N S H	
	KC9140 NEW!	 C5 – C6	**composition:** A newly engineered, tough carbide grade with an advanced multi-layered TiN-MT-TiCN-Al_2O_3-TiN coating. **application:** For heavy roughing applications of alloy steels where insert edge strength is critical. A specially designed coating ensures excellent interlayer adhesion and long tool life.	P M K N S H	
	KC9225	 C2 – C3	**composition:** A newly engineered, patent-pending, multi-layered K-MTCVD coated cobalt-enriched carbide grade. **application:** KC9225 grade has been specially designed for resisting depth-of-cut notching and minimizing burr formation often observed in the machining of austenitic stainless steels. Cobalt-enrichment provides an optimum combination of toughness and deformation resistance. This new grade's polished edge minimizes build-up and ensures superior workpiece finishes. KC9225 inserts are your first choice for machining stainless steels.	P M K N S H	

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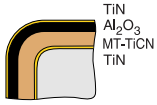
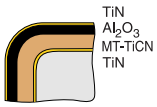
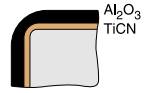
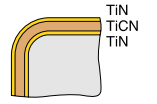
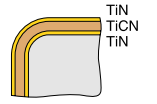
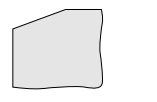
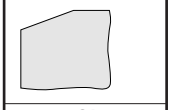
CVD-Coated Carbide Grades	**KC9240** NEW! improved	 C1 – C2	**composition:** A multi-layered CVD coating comprised of TiN-MT-TiCN-Al_2O_3-TiN coating over a tough, non-enriched carbide substrate. **application:** This CVD coated grade is designed for tough applications at moderate speeds and feeds. KC9240 inserts offer an extraordinary combination of toughness, built-up edge resistance, and wear resistance in stainless steel applications. Excellent thermal/mechanical shock resistance makes KC9240 inserts ideally suited for even the most challenging stainless steel applications.	P M K N S H	
	KC9245	 C1 – C2	**composition:** A multi-layered K-MTCVD coating over a super-tough substrate. **application:** This K-MTCVD coated carbide grade is engineered to take on the most brutal cast stainless steel machining applications. Its substrate withstands heavy interruptions, while its polished surface resists build-up, even at slow cutting speeds. Additionally, its wear-resistant coating resists the micro-chipping common when machining austenitic stainless steel. KC9245 grade is also available in insert sizes and geometries appropriate for heavy feeds and large depths of cut.	P M K N S H	
	KC9315 NEW! improved	 C3 – C4	**composition:** A multi-layered CVD coating with very thick K-MTCVD Al_2O_3 TiCN layers, for maximum wear resistance, is applied over a substrate specifically engineered for cutting cast and ductile irons. **application:** The KC9315 grade delivers longer tool life when high-speed machining of ductile and cast irons. The thick K-MTCVD TiCN coating ensures a tremendous tool life advantage, especially when cutting higher tensile strength ductile and cast irons where workpiece size consistency and reliability of tool life are critical. This new Kennametal grade is excellent when used for either straight or lightly interrupted cut applications. Moreover, if you're looking for high productivity performance, the KC9315 grade is an ideal choice.	P M K N S H	
	KC9325	 C2 – C3	**composition:** A TiCN and alumina-coated grade with a strong, reliable substrate. **application:** Grade development for the KC9325 grade focused on a variety of ductile and cast iron operations. The coating and substrate are optimized for flexibility. If you are machining different types of ductile or cast irons where application confidence, flexibility and broad range reliability are your primary requirements, the KC9325 grade is the perfect choice.	P M K N S H	
	KU30T NEW!	 C5 – C6	**composition:** A tough cobalt-enriched substrate with a multilayered CVD coating. **application:** KU30T is a new grade designed specifically for the job shop industry where a wide range of workpiece materials is employed. With its tough cobalt-enriched substrate, KU30T performs very effectively in roughing through finishing operations. The post-coat grinding of the insert permits stable insert seating while the post-coat treatment resists workpiece build-up and microchipping. For machining steels, cast irons, and stainless steels, your first choices are the –RN, -MN, and the –RP geometries. For medium machining and finishing, the –MP and –FP geometries with a positive rake are suggested.	P M K N S H	
PVD-Coated Cermet	**KT315**	 C3, C7	**composition:** A multi-layered, PVD TiN/TiCN/TiN, coated cermet turning grade. **application:** 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 M K N S H	
Ceramics	**KY1310** NEW!	 –	**composition:** An advanced sialon ceramic grade. **application:** Grade KY1310 provides maximum wear resistance. Use it for high-speed continuous turning of gray cast iron, including through scale.	P M K N S H	
	KY1525 NEW!	 C4	**composition:** An advanced silicon carbide whisker reinforced aluminum oxynitride grade. **application:** Excellent combination of wear resistance, edge toughness, and thermal shock resistance for general purpose to finish machining of high-temperature alloys. Proven excellent depth-of-cut notch resistance as compared to whisker reinforced alumina-based ceramics.	P M K N S H	

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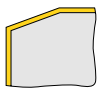
Ceramics	KY1540 NEW!	 C4	**composition:** KY1540 is the latest and most advanced sialon material ever developed. **application:** Combines excellent wear properties, fracture toughness, and thermal shock resistance for general purpose to finish machining of high-temperature alloys. Provides superior depth of cut notch resistance as compared to whisker ceramics.	P M K N S H	
	KY1615	 C4, C8	**composition:** An advanced alumina/TiC ceramic grade (black). **application:** Great combination of toughness and wear resistance; used for machining alloy steels, tool steels and stainless steels to 60 HRC (653 HB). It is also applied in finish turning and boring of cast irons.	P M K N S H	
	KY2100	 C4	**composition:** An advanced sialon grade. **application:** Good mechanical shock resistance combined with edge wear resistance; used for general purpose machining of high-temperature alloys.	P M K N S H	
	KY3400	 C3	**composition:** CVD-coated pure silicon nitride grade. **application:** Excellent combination of toughness and edge wear resistance; used for general purpose machining of gray cast irons and ductile or nodular cast irons.	P M K N S H	
	KY3500	 C2	**composition:** Pure silicon nitride grade. **application:** Maximum toughness; used at high feed rates for rough machining of gray cast iron, including machining through interruptions.	P M K N S H	
	KY4400	 C4, C8	**composition:** A PVD TiN coating over an aluminum oxide and titanium carbonitride ceramic (Al_2O_3/TiCN). **application:** Used for finish turning of hardened steels and irons (greater than 45 HRC). Where possible, use under dry conditions in smooth or varied depth of cuts. Can also be applied in finish turning of nickel alloys, cobalt alloys, and powder metals.	P M K N S H	
PCBN – Polycrystalline Cubic Boron Nitride	KB5625	 C4, C8	**composition:** A PVD TiAlN coating over a low content, PCBN tip brazed onto a carbide insert. **application:** Designed for roughing to finishing of hardened steels (>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 M K N S H	
	KB9610 NEW!	 C4, C8	**composition:** A low content PCBN grade with a TiN/Al_2O_3/TiCN CVD coating for protection against harmful crater wear. **application:** KB9610 is designed for the precision machining of hardened steels (>48 HRC), the harder the steel the better. KB9610 is very effectively applied on bearing steels, hot and cold work tool steels, high-speed steels, die steels, case hardened steels, carburized and nitrided irons, and some hard coatings. Do not use on soft steels. For best results, apply negative rake tools in OD applications and positive tools in ID applications. KB9610 is available in a multi-tip format with a tremendous breadth of edge preps and two styles of wiper geometries.	P M K N S H	
	KB9640 NEW!	 C1	**composition:** A high CBN content, solid PCBN structure having multiple cutting edges and a CVD alumina coating. **application:** KB9640 grade is applied in the roughing to semi-finishing of fully pearlitic gray cast iron, chilled irons, high chrome alloy steels, sintered powdered metals, and heavy cuts in hardened steels (>45 HRC). Also use for finished chilled cast iron and fully pearlitic cast iron. Do not apply on finishing hardened steels. The solid KB9640 also can be effectively applied when roughing hardened steels.	P M K N S H	

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PCBN – Polycrystalline Cubic Boron Nitride	KD120	 C8	**composition:** A high CBN content, PCBN tip brazed onto a carbide insert. **application:** 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 (>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 M K N S H	
PCD - Polycrystalline Diamond	KD100	 C4	**composition:** A polycrystalline diamond tip (PCD) brazed onto a carbide substrate. **application:** 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 M K N S H	
	KD1405 NEW!	 C4	**composition:** A pure CVD deposited diamond sheet tool direct brazed to a carbide substrate. **application:** 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 M K N S H	