NTK

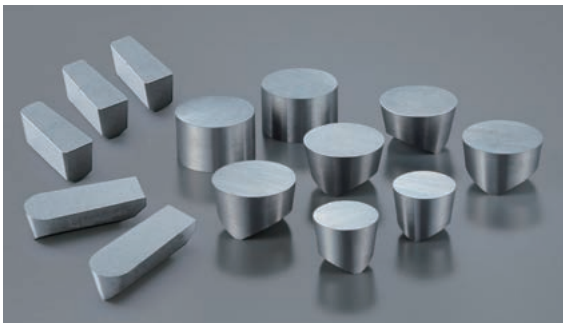
CUTTING TOOLS

PRODUCT GUIDE 8000

Insert Grade Information

BIDEMICS SERIES

JX1 / JX3 NEW

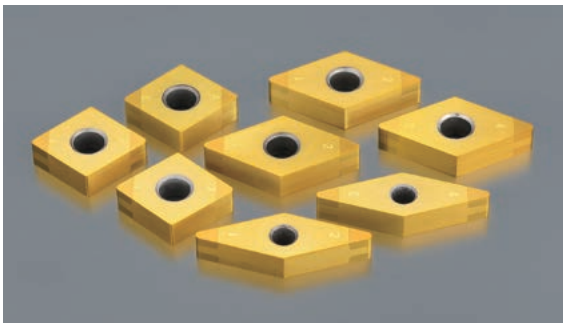


JX1/JX3 are made of an advanced composite cutting tool material developed for machining Heat Resistant Super Alloys. JX1/JX3 are capable of running at speeds 2x greater than whisker ceramics.JX1/JX3 excel in notching resistance and wear resistance leading to significantly longer tool life. Also, JX1/JX3 produce superior surface finishes vs. whisker ceramics. JX3 grade brings a new level of toughness to the BIDEMICS family.

Applications

Semi-finish & finish turning of HRSA materials
Roughing (No scale) of HRSA materials

JP2



JP2 is an advanced composite cutting tool material developed for machining Heat Resistant Super Alloys. JP2 is brazed onto carbide for maximum strength. JP2 is designed for finishing at speeds up to 1700 SFM. This translates into 10-15 times faster cutting speeds than typical coated carbide in finishing applications. JP2 excels in notching resistance and wear resistance vs. carbide or CBN. As an added benefit, JP2 produces superior surface finishes vs. carbide or CBN.

Applications

Finish turning of HRSA materials

CERAMIC-SILICON NITRIDE SERIES

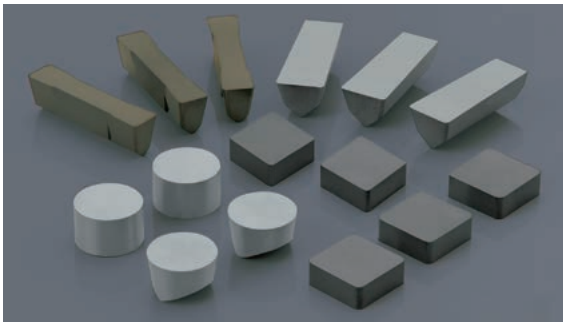
SX6, SP9 Si_3N_4 Type

SX6 & SP9 make high-speed machining productive and profitable. SX6 has the highest silicon nitride content on the market. SX6 excels in rough turning or milling of gray cast iron. CVD coated SP9 has a unique combination of wear resistance and toughness which enables the use of smaller T-lands. Sharper edges reduce tool pressure. This feature makes SP9 the best choice for finishing gray cast iron and rough turning and milling of ductile cast irons.

Applications

Rough and finish turning / milling of gray cast iron (SX6)
Rough and finish turning / milling of ductile cast iron (SP9)

SX3 NEW, SX5, SX7, SX9 SiAlON Type



SX3, SX5, SX7 & SX9 are SiAlON ceramics used for high-speed machining of nickel-based alloys. SiAlON ceramics offer better notching resistance and are tougher than whisker based ceramics. SX5 is the toughest grade for machining through scale or interruptions. SX9 has added wear resistance needed for turning or milling of HNBA. SX7 offers better flank wear resistance compared to other SiAlON's. SX3 has the best combination of wear resistance and toughness to apply wide range of HRSA applications.

Applications

Rough and finish turning HRSA materials
Grooving HRSA materials
Milling of HRSA materials

CERAMIC-ALUMINA SERIES

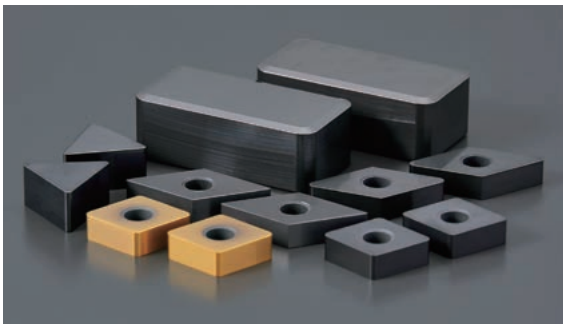
HC1, HW2 Al_2O_3 Type

HC1 is a pure (Al_2O_3) alumina white ceramic. It's highly dense and fine grain structure improves wear resistance, tool life and toughness. HW2 is similar to HC1, but much tougher. Both grades are best suited for high cutting speeds with no coolant.

Applications

Finish turning and boring of gray cast iron (～3000 SFM)
Semi-rough and finished cylinder liner materials
Tube scarfing

HC2, HC5, HC7, ZC4, ZC7 Al_2O_3+TiC Type

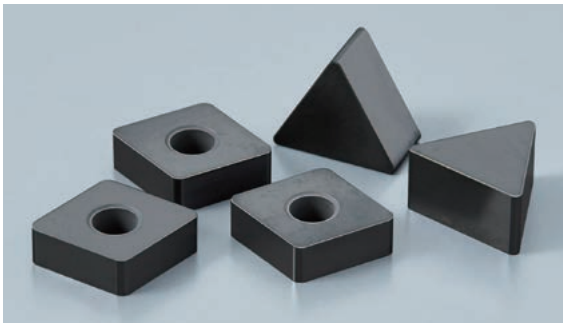


These grades of ceramic consist of properly proportioned aluminum oxide and titanium carbide (Al_2O_3+TiC) sintered under pressure. The resulting products are stable over a vast range of machining conditions. HC2 is a general purpose ceramic. HC7 (ZC7-TiN coated version) is a premium grade for hard turning in steel rolls. (TiN) coated ZC4 has the finest grain structure which is best suited for hard turning steel applications. (HRC 50-65) vs CBN.

Applications

Finish turning and boring of gray cast iron
Turning of hard materials (HRC 40-65)

HC6 TiC+Al_2O_3

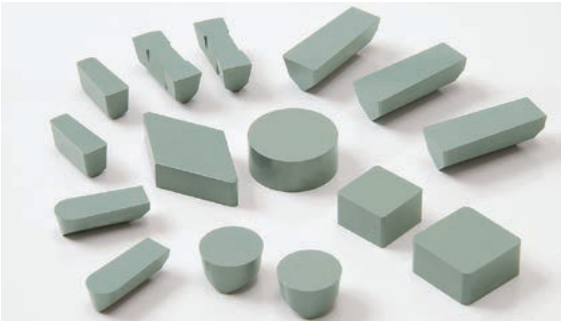


HC6 is a unique (TiC) ceramic composite material. This grade is specifically designed to machine ductile cast iron. HC6 demonstrates superior wear resistance at high speeds. As an added benefit, this ceramic produces excellent surface finishes. HC6 toughness and thermal shock resistance surpass (Al_2O_3+TiC) ceramics. HC6 can be run with or without coolant.

Applications

Semi-finish and finish turning of ductile cast iron
High speed cutting of gray cast iron

WA1 Al_2O_3+SiC Type



WA1 is a whisker-reinforced ceramic material with Silicon-Carbide (SiC) whiskers added to alumina. WA1 machines HRSA at high cutting speeds and hardened steels with interruptions. WA1 has a higher (SiC) content than other competitor's whisker-reinforced ceramics. The resulting material, WA1, shows increased productivity and extended reliability in applications where both toughness and notching resistance are needed.

Applications

Rough and finish turning HRSA
Milling of HRSA
Turning of hard materials with interruptions
Milling of hard steels (HRC 50-62)

CBN SERIES

CBN

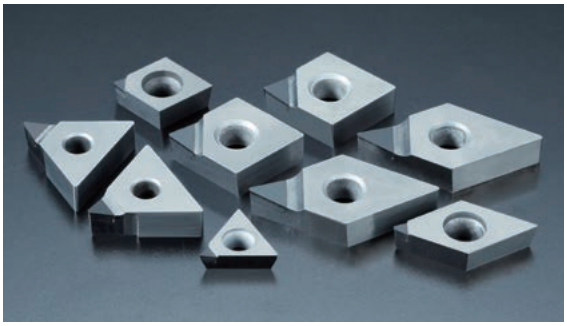
B23, B30, B36, B40, B52 grades are composite CBN (Cubic Boron Nitride) materials. They exhibit high hardness characteristics, the same as ceramics, allowing high speed cutting with maximum efficiency. These five CBN grades cover a variety of applications from turning hardened steels to high speed machining of cast irons. Many geometries have multiple cutting edges.
B5K, B6K grades are composite CBN materials with a TiCN coating. This coating makes edge wear easily detectable.
B99 grade is a solid CBN material. Ideal for harder mill roll machining.

Applications

Turning of steels (HRC60), Turning of gray cast iron
Finish milling of gray cast iron, Rough turning of steel mill rolls

PCD SERIES

PD1, PD2

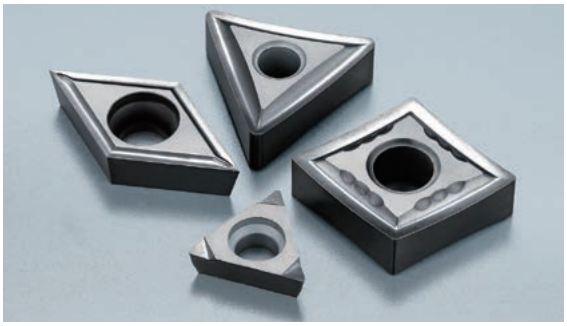


PD1 is a fine grain (10 μm) PCD (Polycrystalline Diamond) grade designed for turning and milling of aluminum and nonferrous materials. PD1 enables high precision and stable machining by controlling built-up edge. PD1 photo not shown.
PD2 is a super fine grain (1 μm) PCD grade designed with sharp cutting edges and increased chipping resistance.
PD2 has ground in chipbreakers that provide excellent chip control on aluminum and nonferrous materials.

Applications

Turning and milling of aluminum, Turning and milling of nonferrous material
Various Swiss Tooling geometries

UC1 NEW Diamond coating



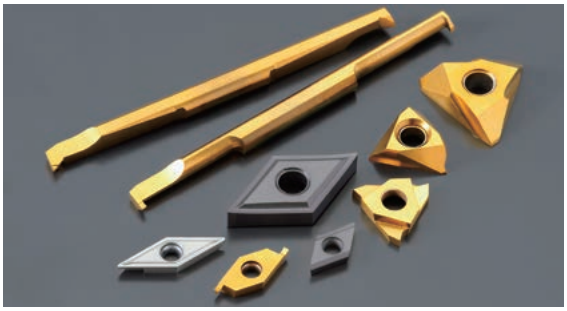
UC1 is an ultra fine diamond grain (<0.1 μm) coated grade designed for turning of aluminum, copper, and carbon materials. The purity and hardness of the fine particle coating provides better wear resistance to past PCD tooling. A good coating adherence provides stable cutting and long tool life.

Applications

Rough to Finish turning of aluminum, nonferrous material, copper, and carbon
Various Swiss Tooling geometries

MICRO-GRAIN CARBIDE SERIES

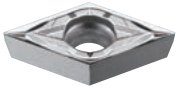
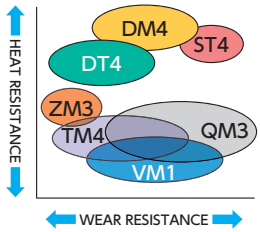
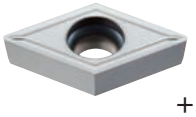
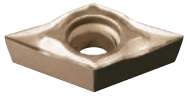
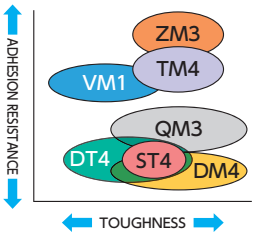
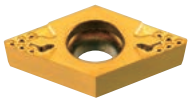
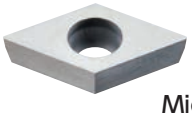
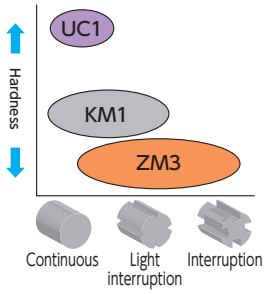
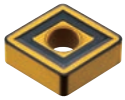
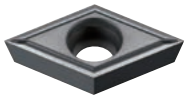
MICRO-GRAIN CARBIDE



NTK's micrograin carbide has been developed by reducing the size of WC hard grains, to about 1 μm.
This process results in a tougher and harder carbide with sharp cutting edges. Various compositions and coatings have been developed to handle all the demanding small part applications on Swiss lathes.

Applications

Rough and finish turning, cut-off, grooving, threading,
boring and milling of all materials.

Grade name / Coating type	Recommended applications	Applications map
ST4 NEW  Micro-grain carbide + Thick CrAlN coat	●Excellent adhesion and wear resistance. ●For stainless steel especially 304 SS.	■Correlation chart 1 
QM3  Micro-grain carbide + Thick TiCN coat	●Excellent toughness and wear resistance. ●For stainless, steel, high-nickel alloys and abrasive materials. Demanding applications (such as grooving and interrupted cuts). ●1st recommendation for most Swiss machining applications.	
DT4  Micro-grain carbide + Thin TiN-TiCN-TiAlN coat	●Excellent oxidation and heat resistance with sharp cutting edges. ●For high-speed turning of titanium alloys, stainless, steel, high-nickel alloys and hardened materials	
DM4  Micro-grain carbide + Thick TiN-TiCN-TiAlN coat	●Best oxidation and heat resistance combined with toughness. ●For high-speed turning of stainless steels, high-nickel alloys and hardened materials.	■Correlation chart 2 
TM4  Micro-grain carbide +Thin TiN-TiCN-TiN coat	●Exceptionally smooth coating surface to minimize adhesion. Well-balanced combination of wear resistance, toughness and sharp cutting edges. ●For titanium, nonferrous materials (including plastic), stainless and steel.	
VM1  Micro-grain carbide + Thin TiCN coat	●Excellent wear resistance and sharp cutting edges. ●For titanium, nonferrous materials (including plastic), stainless, steel, rare metals (including platinum) and small parts applications.	
ZM3  Micro-grain carbide + Thick TiN coat	●Best selling PVD TiN coated grade with exceptional versatility and smooth coating layer.	
KM1  Micro-grain carbide	●Precision ground and polished to mirror-finish with extremely sharp cutting edge. ●For aluminum and nonferrous materials.	■Aluminum / Brass 
CP1  Carbide + Thick film Al_2O_3-TiCN coat	●Good balance of wear resistance and toughness for cast iron machining.	
AC3 NEW  Micro-grain carbide + Thin TiACrN-TiAlN coat	●Developed for solid carbide endmill.	
UC1 NEW  Micro-grain carbide + Diamond coat	●Pure and hard diamond coating.	