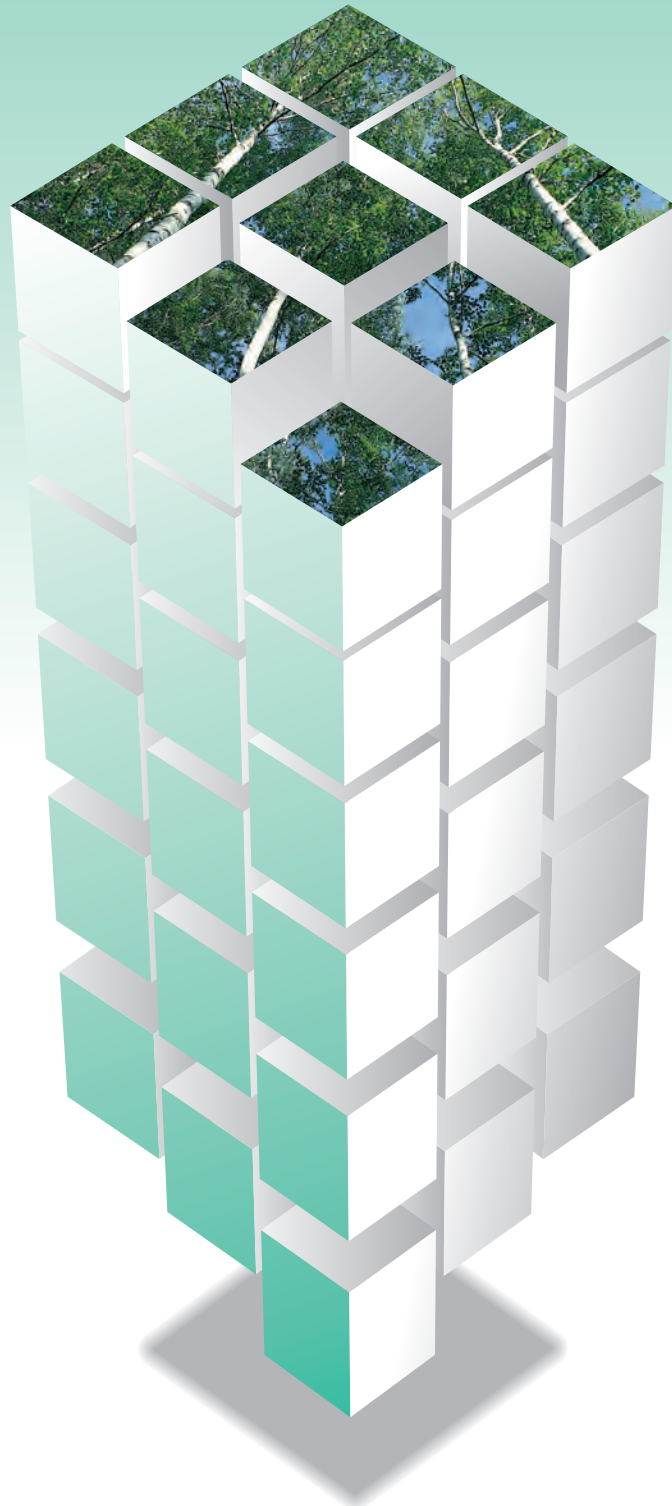


NTK CUTTING TOOLS

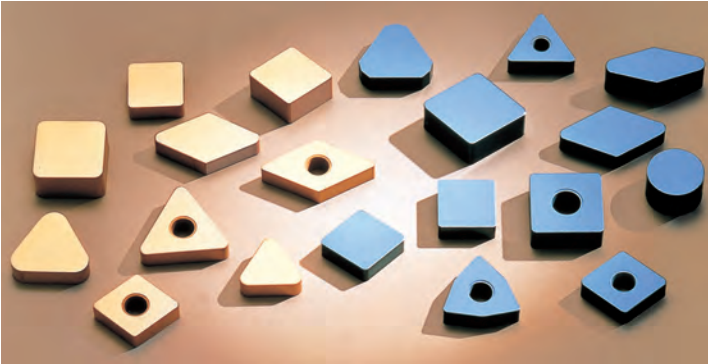
INFORMATION



NGK SPARK PLUG EUROPE GMBH

APPLICATION RANGE OF NTK INSERT

Ceramic Series



SX1, SX2, SX8, SP2, SX9 ^{NEW} Si₃N₄ Type

- Mainly composed of silicon nitride (Si₃N₄), these inserts with excellent toughness and wear resistance are stable during rough turning and milling of cast iron with coolant. Their performance during rough turning is outstanding.

Applications

- Rough turning and milling of gray cast iron
- Rough turning and milling of Heat resistant alloys

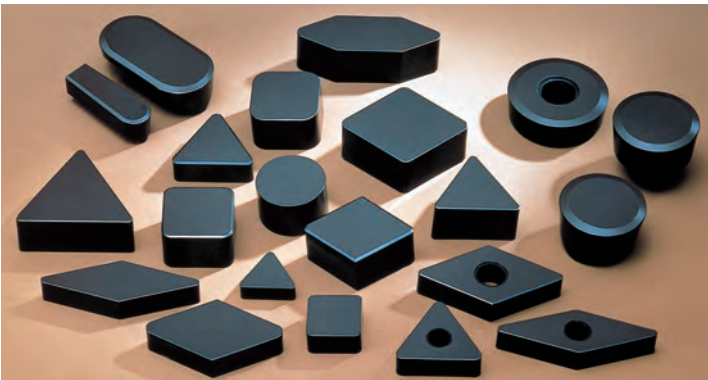


HC1, HW2, HW3 Al₂O₃ Type

- Mainly composed of highly pure alumina (Al₂O₃), these inserts have a very dense fine grain structure and have superior wear resistance and fracture toughness.

Applications

- General turning and boring of gray cast iron
- Tube scarfing



HC2, HC4, HC5, HC7 ^{NEW} Al₂O₃-TiC Type

- Its excellent high temperature hardness and reduced plastic deformation allows a wide range of applications including finish machining of hardened materials. HC7 has superior performance in roll turning.

Applications

- General turning and boring of gray cast iron
- Turning of heat resistant alloys
- Turning of hard materials (under HRC65)



HC6 TiC Type

- TiC ceramics developed for ductile cast iron are superior during high speed cutting over 400m/min that conventional ceramics have never before attained.

Applications

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



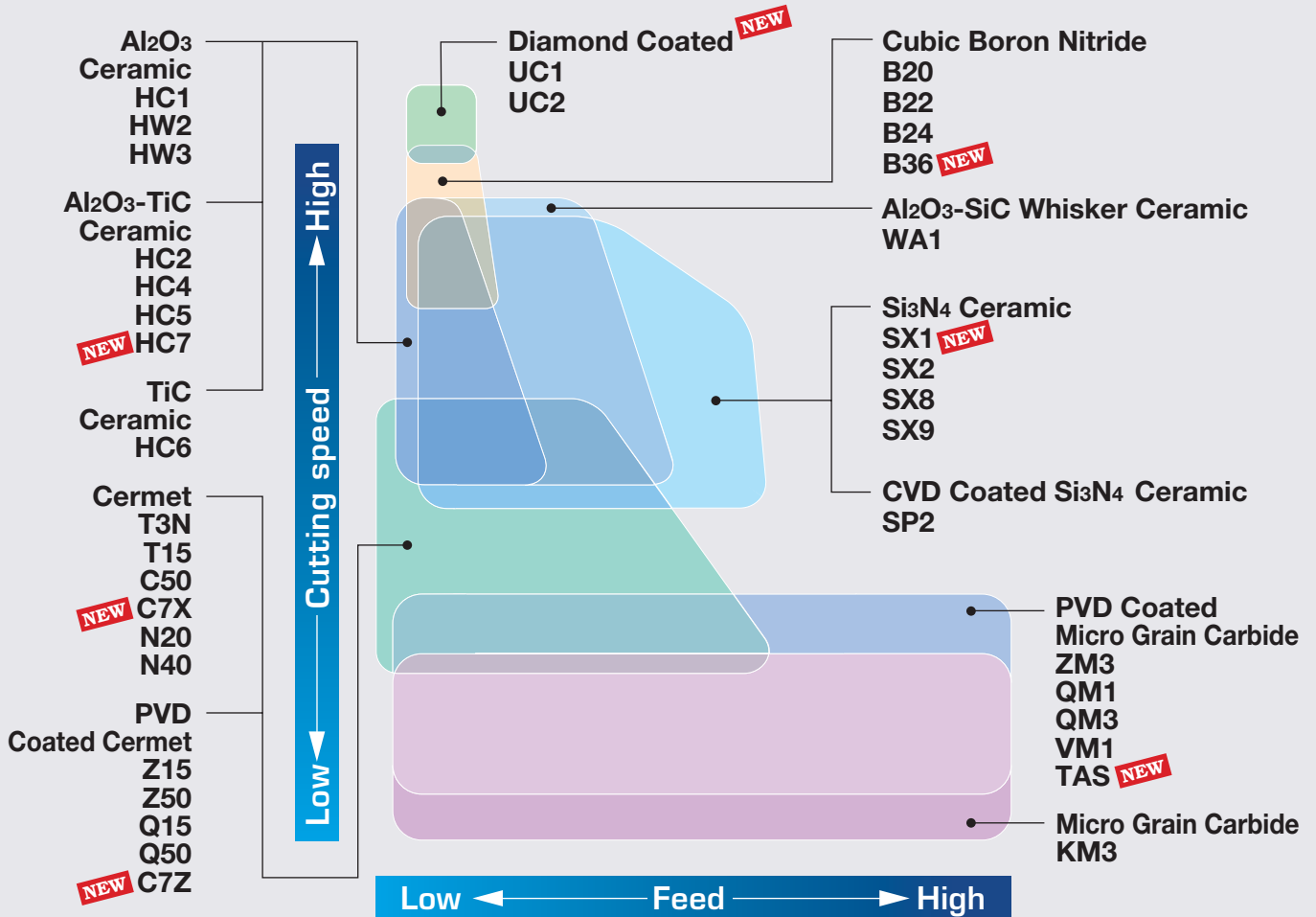
WA1 Al₂O₃-SiC Whisker Type

- WA1 is a whisker reinforced ceramic insert made by adding silicon carbide whiskers to highly pure alumina (Al₂O₃). This provides excellent fracture toughness and thermal shock resistance, resulting in high machining efficiency.

Applications

- Rough and finish turning and milling of gray cast iron
- Turning of heat resistant alloys
- High speed turning of steel
- Turning of chilled cast iron

Application Range of NTK Insert Grade



Cubic Boron Nitride

B20, B22, B24, B36 (NEW)

- These inserts, composed of CBN (Cubic Boron Nitride) and a special ceramic binder, have high hardness at room temperature and high temperatures and less affinity to work piece materials, allowing efficient high speed machining of hardened steels and gray cast iron.

Applications

High speed finish turning of hard materials (over HRC60) and gray cast iron with coolant
 Interrupted cutting of hard materials
 High speed milling of gray cast iron



Diamond Coated (NEW)

UC1, UC2

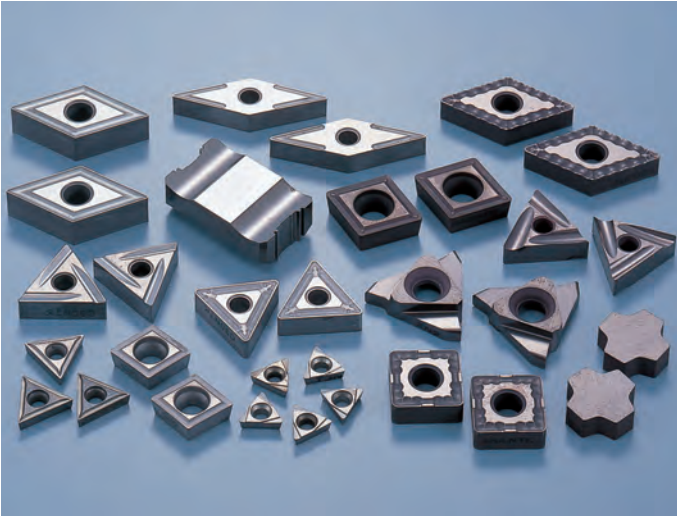
- These inserts, made by coated cemented carbide surface with layers of Diamond using the CVD (Chemical Vapor Deposition) method, provide excellent wear resistance UC1/UC2 develop particularly excellent performance during the machining of high-silicon aluminum alloys, MMC materials, and other cutting-refardant materials.

Applications

Rough and Semi-finish cutting
 Aluminum alloys (high-silicon aluminum alloys) and MMC
 Ceramics, reinforced plastics, and carbon



Cermet Series



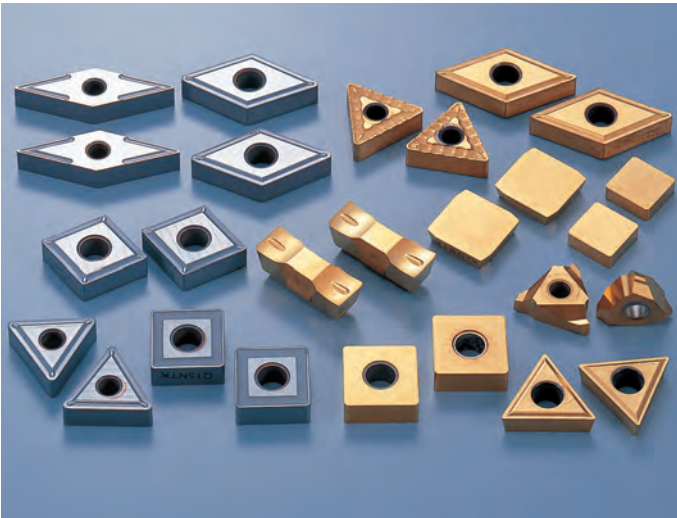
T3N, T15, C50, N20, N40, C7X Cermet

NEW

- NTK cermet series is lined up by TiC-Ti based T3N, T15, C7X, carbide based C50, and TiN based N20, N40. T3N, T15 has great wear resistance. C50 has excellent thermal shock resistance. N20, N40 have great toughness and wear resistance. C7X has excellent thermal shock resistance.

Applications

- Semi-finish and grooving of steel
- Turning of bearing parts and general milling



Z15, Z50, Q15, Q50, C7Z PVD Coated Cermet

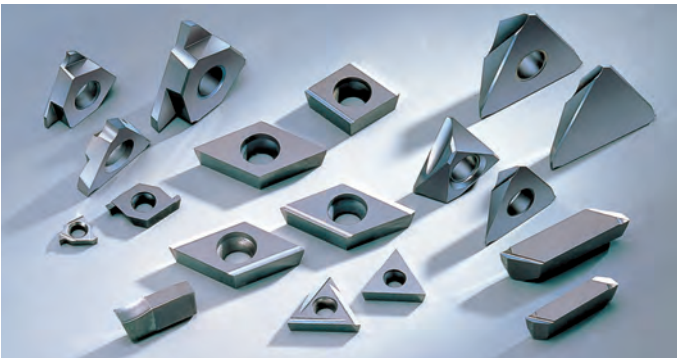
NEW

- These grades are coated by PVD to improve wear resistance.

Applications

- Semi-finish and finishing turning of steel and ductile cast iron.

Micro Grain Carbide Series



KM3 Micro Grain Carbide

- Mainly composed of WC micro-grain, KM3 has excellent durability and can be used in the same conditions as cemented carbide inserts.

Applications

- Low speed machining of steel
- Turning of stainless steel
- Turning of gray cast iron



ZM3, QM1, QM3, VM1, TAS Micro Grain PVD Coated Carbide

NEW

- These grades are PVD coated micro grain carbide by Ti compound or TiC compound or TiAlN compound. Without affecting based carbide, these grades have excellent wear resistance.

Applications

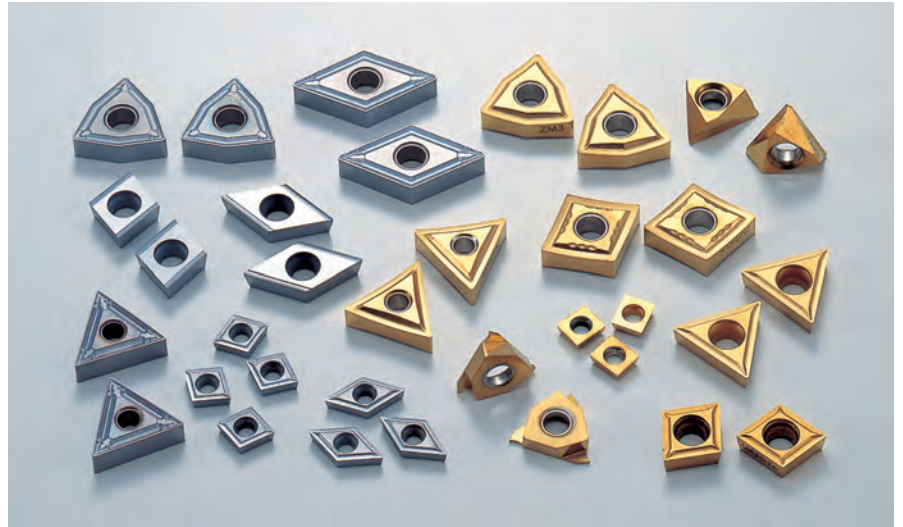
- Milling of steel, grooving, intermittent rough turning, milling of gray cast iron.

NTK **MICRO-GRAIN CARBIDE INSERTS KM3,ZM3,VM1,QM1,QM3,TAS** NEW

Micro-grain carbide inserts have been developed to bridge the gap in the application range between cemented carbide and high speed steel inserts.

Mainly composed of WC micro-grains, these inserts have high hardness and durability.

They come in series, including PVD coated inserts, and can be applied to a wide range of cutting conditions.



■ FEATURES

■ KM3

1. KM3, micro grain carbide grade, has excellent wear resistance and machining accuracy with slow feed and minimal depth of cut on small automatic CNC lathes.
2. Applicable to wide range of work piece including steel, stainless steel, and difficult-to-cut materials.

■ ZM3

1. ZM3, PVD coated micro grain carbide with Ti compound, has improved wear and deposition resistance without losing toughness of base material.
2. Machining with its sharp edge attained by PVD - coating provides excellent and stable surface finish.
3. Compared with KM3, higher cutting speed, up to 150m/min, is applicable.

■ VM1

1. VM1, PVD coated micro grain carbide, is a new grade for small tool series.
2. This grade provides excellent tool life and surface finish in machining of free cutting steel.

■ QM1

1. QM1 has significantly improved wear resistance of QM3.

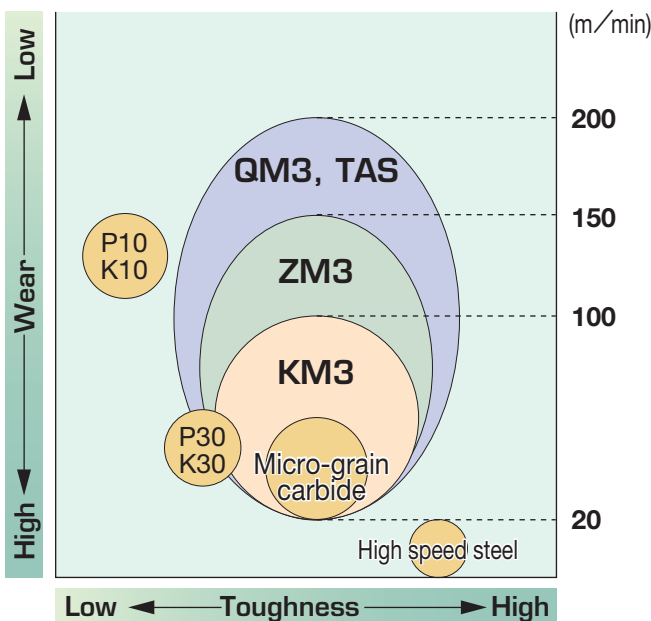
■ QM3

1. QM3, PVD coated with TiC compound, has greatly improved thermal shock resistance as well as wear resistance.
2. High fracture toughness is given due to the remaining compressed stress applied to the coating layer.
3. Its high thermal chipping resistance assures high performance in milling with coolant.

■ TAS

1. TiAlN-based PVD coating provides excellent in wear resistance and in oxidation resistance.
2. High-quality sharp edge by high-adhesion special layer coating stable extension of tool life.

■ Application range of inserts



■ Examples of actual application of inserts

ZM3 / Front-turning, back-turning, cutting-off, internal threading and internal grooving on automatic lathes.

VM1 / Small parts turning, free cutting steel.

QM1 / Milling, grooving of steel, turning of sintered metals, ductile cast irons and heat-resistant alloys.

QM3 / Milling and grooving of steel.

TAS / Stainless steel small parts turning.

■ Usage of inserts

Usage		KM3	ZM3	VM1	QM3	QM1	TAS
Steel	Milling		○			◎	
	Grooving		○			◎	
	Spot facing	○	◎				
	Automatic lathes (front/back turning, small size inserts)	◎	◎	◎			◎
Gray cast iron				◎	○		
Sinterd metals				◎	○		
Ductile iron				○	○		

◎ : First recommendation ○ : Second recommendation

New Silicon Nitride Ceramic

NEW

SX9

■ SX9 New Silicon Nitride Ceramic

SX9 is a new Si_3N_4 ceramic grade, which has improved notch wear resistance of current Si_3N_4 insert. This grade has high Vickers hardness (Hv) and fracture toughness (Kc).

■ Features

1. SX9 performs better notch wear in turning of gray cast iron.
2. SX9 performs well even heavily and lightly interrupted cutting.
3. SX9 provides excellent tool life in Heat Resistant Alloys.



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