Insert Grades

Ceramic



Ceramic

Ceramics inserts are capable of running at high speeds, thus reducing expensive machining time. Hard turning of 38HRC to 64HRC hardened steels, or rough to finished turning of cast irons are recommended applications for ceramic inserts. KYOCERA's ceramic grades are designed to resist oxidation and maintain hardness at elevated temperatures.

Features

- · Excellent wear resistance enables high cutting speeds
- · Ceramic maintains good surface finishes due to the low affinity to workpiece materials
- · Silicon nitride ceramic (KS6000) has improved thermal shock resistance allowing cast iron machining using coolants

Features of Ceramic

Workpiece Material	Symbol	Color	Main Component	Hardness of Coated Layer (GPa)	Hardness of Substrate (GPa)	Fracture Toughness (MPa¶m ^{1/2})	Transverse Strength (MPa)	Advantages
K Cast Iron	KA30	White	Al ₂ O ₃	-	17.5	4.0	750	 Aluminum Oxide ceramic (Al₂O₃) Application: Finishing of cast iron at high cutting speeds without coolant
	KS6000	Gray	Si ₃ N ₄	-	15.7	6.5	1230	 Silicon nitride ceramic (SiN₄) Application: High feed and interrupted machining of cast iron (with or without coolant)
K	A65	Black	Al ₂ O ₃ +TiC	-	20.6	4.5	780	 Aluminum Oxide and Titanium Carbide ceramic (Al₂O₃+TiC) Application: Semi-roughing to finishing of cast iron, and hardened materials.
Cast Iron	A66N (TiN coat)	Gold	Al₂O₃+TiC	20	20.1	4.1	980	 TiN PVD coated Aluminum Oxide and Titanium Carbide ceramic (TiN coated Al₂O₃+TiC) Application: Semi-roughing to finishing of hard materials
	PT600M (MEGACOAT)	Blackish red	Al ₂ O ₃ +TiC	30	20.1	4.1	980	 Heat-resistant MEGACOAT on Aluminum Oxide and Titanium Carbide ceramic (MEGACOAT Al₂O₃+TiC) Application: Semi-roughing to finishing of cast iron, hard materials and roll materials

Application Maps

Temperature (°C)

Cast Iron Machining Hard Materials Machining **KA30** Low - Cutting speed - High Low - Cutting speed - High **PT600M PT600M** 66N **A66N** KS6000 A65 -Fracture resistance (Toughness)-Low -I ow -Light Interruption Light Interruption Continuous Interruption Continuous Interruption **Properties of PVD Coating High-Temperature Hardness** MEGACOAT (GPa) (Hv)40 2800 MEGACOAT TiC 🔘 Al₂0₃-TiC Ceramic TICN 30 2400 Hardness C Al₂0[']₃ Ceramic Hardness 2000 Al₂O 20 TiN TIAIN (Reference: Ceramic 1600 Ó Carbide (Reference: Carbide) 10 1200 Cermet High Speed Steel 800 0 200 400 600 800 1000 1200 1400 400 Oxidation temperature (°C) 0 200 600 1000 1400

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kyocera@kyocera-tools.ru www.kyocera-tools.ru