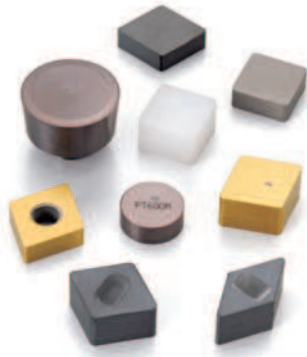


# Insert Grades

A

## Ceramic



### Ceramic

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

### Features

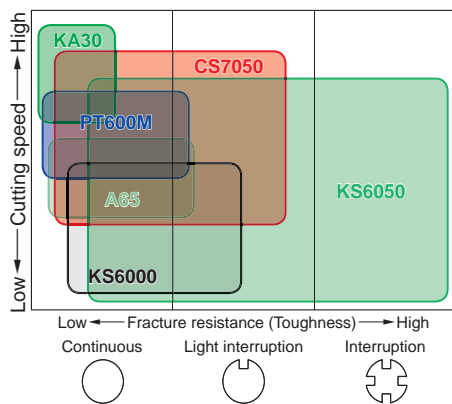
- Excellent wear resistance enables high cutting speeds
- Ceramic maintains good surface finishes due to the low affinity to workpiece materials
- Silicon nitride ceramic has improved thermal shock resistance allowing cast iron cutting using coolants

### Features of Ceramic

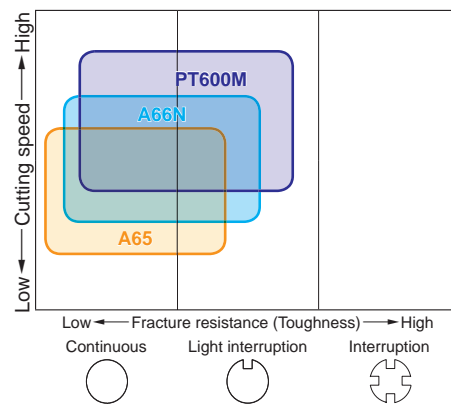
Workpiece Material	Symbol	Color	Main Component	Hardness of Coated Layer (GPa)	Hardness of Substrate (GPa)	Fracture Toughness (MPa·m <sup>1/2</sup> )	Transverse Strength (MPa)	Advantages
<b>K</b> Cast Iron	KA30	White	Al <sub>2</sub> O <sub>3</sub>	-	17.5	4.0	750	<ul style="list-style-type: none"> <li>• Aluminum Oxide ceramic (Al<sub>2</sub>O<sub>3</sub>)</li> <li>• Application: Finishing of cast iron at high cutting speeds without coolant</li> </ul>
	KS6000	Gray	Si <sub>3</sub> N <sub>4</sub>	-	15.7	6.5	1230	<ul style="list-style-type: none"> <li>• Silicon nitride ceramic (Si<sub>3</sub>N<sub>4</sub>)</li> <li>• Application: High feed and interrupted cutting of cast iron (with or without coolant)</li> </ul>
	KS6050	Gray	Si <sub>3</sub> N <sub>4</sub>	-	15.6	7.8	1200	<ul style="list-style-type: none"> <li>• Silicon nitride ceramic (Si<sub>3</sub>N<sub>4</sub>)</li> <li>• Application: Roughing and interrupted cutting of cast iron. Focusing on stability. Wet processing is possible.</li> </ul>
	CS7050	Grayish white	Si <sub>3</sub> N <sub>4</sub> (Special Al <sub>2</sub> O <sub>3</sub> COAT)	Thin coating	15.6	7.8	1200	<ul style="list-style-type: none"> <li>• Silicon nitride ceramic (Si<sub>3</sub>N<sub>4</sub>) + CVD Coated Carbide (Special Al<sub>2</sub>O<sub>3</sub> COAT)</li> <li>• Application: Finishing and continuous cutting, and high speed and high efficient cutting. Wet processing is possible.</li> </ul>
<b>K</b> Cast Iron <b>H</b> Hardened Materials	A65	Black	Al <sub>2</sub> O <sub>3</sub> +TiC	-	20.6	4.5	780	<ul style="list-style-type: none"> <li>• Aluminum Oxide and Titanium Carbide ceramic (Al<sub>2</sub>O<sub>3</sub>+TiC)</li> <li>• Application: Semi-roughing to finishing of cast iron, and hardened materials.</li> </ul>
	A66N (TiN coat)	Gold	Al <sub>2</sub> O <sub>3</sub> +TiC	20	20.1	4.1	980	<ul style="list-style-type: none"> <li>• TiN PVD coated Aluminum Oxide and Titanium Carbide ceramic (TiN coated Al<sub>2</sub>O<sub>3</sub>+TiC)</li> <li>• Application: Semi-roughing to finishing of hardened materials</li> </ul>
	PT600M (MEGACOAT)	Blackish red	Al <sub>2</sub> O <sub>3</sub> +TiC	30	20.1	4.1	980	<ul style="list-style-type: none"> <li>• Heat-resistant MEGACOAT on Aluminum Oxide and Titanium Carbide ceramic (MEGACOAT Al<sub>2</sub>O<sub>3</sub>+TiC)</li> <li>• Application: Semi-roughing to finishing of cast iron, hardened materials and roll materials</li> </ul>

### Application Maps

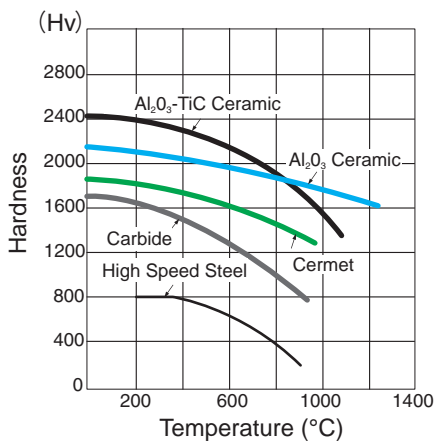
#### Cast Iron



#### Hardened Materials



### High-Temperature Hardness



### Properties of PVD Coating

