

# Material Overview KYOCERA Fineceramics Precision GmbH

	StarCeram® S	StarCeram® Si <sup>1)</sup>	StarCeram® AT* 1201/1203 Al <sub>2</sub> TiO <sub>5</sub>	StarCeram® N 7000 Si <sub>3</sub> N <sub>4</sub>	StarCeram® N 3000 Si <sub>3</sub> N <sub>4</sub>	StarCeram® N 8000 Si <sub>3</sub> N <sub>4</sub>
<b>Density</b> [g/cm <sup>3</sup> ]	3.13	3.05	3.35	3.22	3.23	3.23
<b>Fracture strength</b> RT [MPa] ***	375	300	40/25	800	900	1.050
<b>Weibull modulus</b> RT [-]	15	10	40	25	> 15	> 15
<b>Fracture toughness</b> [MPa √m] **	3.0	3.6	3 - 5	6.7	6.5	6.0
<b>Hardness</b> (DPH) [GPa]	25	20	5	15	15	15
<b>Young's modulus</b> (RT) [GPa]	395	380	15/10	300	300	310
<b>Thermal conductivity</b> (RT) [W/mK]	125	200	1.4	20	25	25
<b>CTE</b> (RT- 1000 °C) [x10 <sup>-6</sup> K <sup>-1</sup> ]	4.5	4.0	1.6	3.4	3.4	3.4
<b>Resistivity</b> RT [Ωm]	10 <sup>4</sup>	10 <sup>-2</sup>	10 <sup>14</sup>	10 <sup>11</sup> - 10 <sup>12</sup>	10 <sup>11</sup> - 10 <sup>12</sup>	10 <sup>11</sup> - 10 <sup>12</sup>
<b>Thermal shock coefficient</b> R1 [K]	180	190	1.500/2000	620	670	760
<b>Max. working temperature</b> [°C]	1.600	1.350	1.000	1.000	1.200	1.200
<b>Max. outside diameter</b> [mm] ****	530	680	550	500	275	280
<b>Max. length</b> [mm] ****	1.100	800	1.750	1.500	370	900

<sup>1)</sup> Electrically conductive, wire-cut and ram electrical discharge machinable

\* Porosity <= 10%

\*\* ICL method

\*\*\* 4-point-bending 40/20 mm

\*\*\*\* depending on specific geometry