

## Mechanical, thermal and electrical properties of selected ceramic materials

Mechanical	Unit	Al <sub>2</sub> O <sub>3</sub> 94%	Al <sub>2</sub> O <sub>3</sub> 96%	Al <sub>2</sub> O <sub>3</sub> 99,5%	ZrO <sub>2</sub> , Y <sub>2</sub> O <sub>3</sub> partially stabilised
Density	gm/cc	3.69	3.72	3.89	6
Porosity	%	0	0	0	0
Color	—	white	white	ivory	ivory
Flexural Strength	Mpa	330	345	379	900
Elastic Modulus	Gpa	300	300	375	200 - 270
Shear Modulus	Gpa	124	124	152	85
Bulk Modulus	Gpa	165	172	228	—
Poisson's Ratio	—	0.21	0.21	0.22	0.23
Compressive Strength	Mpa	2100	2100	2600	3900
Hardness	Kg/mm <sup>2</sup>	1175	1100	1440	1300
Fracture Toughness K <sub>IC</sub>	Mpa	3.5	3.5	4	13
Maximum Use Temperature	°C	1700	1700	1750	1500
<b>Thermal</b>					
Thermal Conductivity	W/m•°K	18	25	35	2
Coefficient of Thermal Expansion	10 <sup>-6</sup> /°C	8.1	8.2	8.4	10.3
Specific Heat	J/Kg•°K	880	880	880	400
<b>Electrical</b>					
Dielectric Strength	ac-kv/mm	16.7	14.6	16.9	9
Dielectric Constant	@ 1 MHz	9.1	9.0	9.8	29
Dissipation Factor	@ 1 kHz	0.0007	0.0011	0.0002	—
Volume Resistivity in 20 °C	ohm•cm	>10 <sup>14</sup>	>10 <sup>14</sup>	>10 <sup>14</sup>	>10 <sup>10</sup>