

## Technical Ceramics – Typical Properties

Composition		Cordierite (C 520)	Steatite (C221)	Silicon Nitride (GPSSN)	Aluminium Nitride	Zirconia Toughened Alumina (ZTA)	Zirconia (Y-TZP)	Tungsten Carbide
	%	50 SiO <sub>2</sub>	60 SiO <sub>2</sub>	90 Si <sub>3</sub> N <sub>4</sub>	95 AlN	80 ZrO <sub>2</sub>	95 ZrO <sub>2</sub>	90 WC
	%	35 Al <sub>2</sub> O <sub>3</sub>	25 MgO	-	-	20 Al <sub>2</sub> O <sub>3</sub>	5 Y <sub>2</sub> O <sub>3</sub>	10 Co
	%	15 MgO	5 Al <sub>2</sub> O <sub>3</sub>	-	-	-	-	-
Property								
Max Use Temperature - in air	°C (°F)	1200 (2200)	1200 (2200)	1200 (2200)	1000 (1800)	100 (200)	100 (200)	800 (1500)
Bulk Density	g/cm <sup>3</sup>	2.0	2.7	3.2	3.3	4.2	6.0	14.5
Open Porosity	%	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Modulus of Rupture (room Temp)	MPa	30	140	700	300	350	900	3000
Modulus of Elasticity	GPa	40	100	300	325	300	200	600
Thermal Conductivity	W/mK	1.5	2.5	20	170	25	3	100
Thermal Expansion (20-1000°C)	x10 <sup>-6</sup> /K	3.0	8.0	3.3	5.5	8.5	10	5.5
KIC Fracture Toughness	MPam <sup>1/2</sup>	-	-	7	-	6	9	12
Hardness	HV 1	-	800	1600	1100	1500	1200	1600
Volume Resistance	Ωcm	>10 <sup>12</sup>	>10 <sup>12</sup>	>10 <sup>14</sup>	>10 <sup>15</sup>	>10 <sup>14</sup>	5 x 10 <sup>8</sup>	Good electrical conductor
Dielectric Constant	-	-	6	7	9	10	29	
Dielectric Strength	kV/mm	-	20	15	15	12	12	

This information is given in good faith but does not constitute a specification or guarantee.