



MATERIALS PROPERTIES

Properties	Unit	Alumina 97,6%	Alumina 99,5%	Aluminium Nitride	Zirconia MgO-PSZ	Zirconia Y-TZP	Silicon Carbide (sintered)	Silicon Nitride (sintered)	Macor®	Quartz Standard Optical Grade
Density	g/cm ³	3,76	3,86	3,32	5,65	6,05	>3,10	>3,24	2,52	2,2
Porosity	%water absorption	0	0	0	0	0	0	0	0	0
Flexural Strength	MPa	296	310	300	545	1000	400	700	94	67
Compressive Strength	MPa	>1720	>2070	2000	1700	2000	2200	>2500	345	1150
Young's Modulus	GPa	>320	>370	310	205	205	410	300	67	70
Fracture Toughness	MPa.m ^{1/2}	-	-	3,35	6	10	4	7	-	-
Hardness	-	HR 45N 75	HR 45N 81	-	HV 0,3 1120	HV 0,3 1300	HV 0,5 2600	HV 0,5 1450	-	-
Thermal Conductivity	W/m K	26,8	29,3	180	2,5	2	125	25	1,5	1,38
Linear Thermal Expansion Coefficient	10 ⁻⁶ /C	25 - 1000°C 9	25 - 1000°C 9,4	25 - 1000°C 5,6	25 - 1000°C 10	25 - 1000°C 10	25 - 1000°C 5,2	25 - 1000°C 4	25 - 800°C 12,6	25 - 900°C 0,48
Max. Working Temperature	°C	1650	1725	-	1000	1000	1450 (air)	-	800	1150
Dielectric Strength	kV/mm	43.3	31,5	20	-	-	-	-	40	40
Volume Resistivity	Ohm.cm	> 10 ¹⁴	> 10 ¹⁴	5.0 · 10 ¹²	>10 ¹⁰	>10 ⁰⁹	1 · 10 ⁰⁶	1 · 10 ¹¹	1 · 10 ¹⁶	1 · 10 ¹⁶
Dielectric Constant (K')	-	10MHz 9,53	10MHz 9,58	1MHz 8,6	-	-	-	-	1kHz 6,03	1MHz 3,7
Dissipation Factor (tan d)	-	10MHz 0,00004	10MHz 0,00003	1MHz 0,005	-	-	-	-	1kHz 0,0047	1kHz 0,0005

Please note that all values quoted are for information only and are based upon test pieces. These values may vary according to component design. They should be used for guidance only. Microcertec do not guarantee that the materials offered will entirely meet these specifications. Further materials are available and data can be supplied upon request.

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