

CeramTec MZ 111 Zirconia, ZrO₂-Y₂O₃

Category : Ceramic , Oxide , Zirconium Oxide

Material Notes:

MZ 111 is a yttria-stabilized tetragonal zirconia used in dental applications.

Order this product through the following link:

[http://www.lookpolymers.com/polymer_CeramTec-MZ-111-Zirconia-ZrO₂-Y₂O₃.php](http://www.lookpolymers.com/polymer_CeramTec-MZ-111-Zirconia-ZrO2-Y2O3.php)

Physical Properties	Metric	English	Comments
Density	6.08 g/cc	0.220 lb/in ³	DIN EN 623-2
Water Absorption	0.00 %	0.00 %	Open Porosity; DIN EN 623-2
Particle Size	0.15 - 0.20 µm	0.15 - 0.20 µm	Grain; DIN EN 623-3
Permeability	0.00	0.00	%, Gas
Weibull Modulus	>= 10	>= 10	DINV ENV 843-5

Mechanical Properties	Metric	English	Comments
Vickers Microhardness	1250	1250	HV1; DINV ENV 843-4
	1250	1250	HV 0.5; DIN ENV 843-2
Tensile Modulus	210 GPa	30500 ksi	Young's; DINV ENV 843-2
Flexural Strength	1050 MPa	152000 psi	DIN EN 843-1
	1400 MPa	203000 psi	Bending Strength; 4-Point; without HIP: 1050; DIN ENV 843-1
Compressive Strength	2200 MPa	319000 psi	DIN 51067T1
Poissons Ratio	0.30	0.30	DINV ENV 843-2
Fracture Toughness	6.70 MPa-m ^{1/2}	6.10 ksi-in ^{1/2}	K _{IC} (SEVNB); DIN CEN/TS 14425-1
	7.50 MPa-m ^{1/2}	6.83 ksi-in ^{1/2}	SEVNB; ISO 23 146
Shear Modulus	80.8 GPa	11700 ksi	Calculated

Thermal Properties	Metric	English	Comments
CTE, linear	11.1 µm/m-°C	6.17 µin/in-°F	DIN EN 821-1
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	
	11.2 µm/m-°C	6.22 µin/in-°F	DIN EN 821-1

Thermal Properties	Metric @Temperature 20.0 - 400 °C	English @Temperature 68.0 - 750 °F	Comments
	11.6 µm/m-°C	6.44 µin/in-°F	DIN EN 821-1
	@Temperature 20.0 - 600 °C	@Temperature 68.0 - 1110 °F	
	11.7 µm/m-°C	6.50 µin/in-°F	DIN EN 821-1
	@Temperature 20.0 - 1000 °C	@Temperature 68.0 - 1830 °F	
Specific Heat Capacity	0.400 J/g-°C	0.0956 BTU/lb-°F	DINV ENV 821-3
Thermal Conductivity	2.50 W/m-K	17.4 BTU-in/hr-ft ² -°F	DIN EN 821-2
Maximum Service Temperature, Air	1000 °C	1830 °F	
Maximum Service Temperature, Inert	1000 °C	1830 °F	

Component Elements Properties	Metric	English	Comments
Al2O3	0.10 %	0.10 %	DIN ISO 12677
HfO2	2.0 %	2.0 %	DIN ISO 12677
Y2O3	4.9 %	4.9 %	DIN ISO 12677
ZrO2	93 %	93 %	DIN ISO 12677

Electrical Properties	Metric	English	Comments
Volume Resistivity	1.00e+12 ohm-cm	1.00e+12 ohm-cm	IEC 672-1
	29	29	
Dielectric Constant	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	IEC 672-1
Dielectric Strength	19.0 kV/mm	483 kV/in	IEC 672-1
	0.0020	0.0020	
Dielectric Loss Index	@Frequency 1.00e+9 Hz	@Frequency 1.00e+9 Hz	IEC 672-1

Descriptive Properties	Value	Comments
Color	Ivory	
Monoclinic Content (%)	< 1	DIN ISO 12677
Other Oxides (%)	< 0.1	DIN ISO 12677
Ra = Arithmetic Mean Roughness Value (µm)	<0.06	

Descriptive Properties	Value	Comments
Thermal Shock Resistance R1 (K)	336	calculated; $R1 = [s^2 (1-\mu)] / (a \cdot E)$
Thermal Stress R2 (W/m)	841	

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