



Technical Products, Inc.

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Zirconia (ZrO₂) –TTZ-T Material Specifications

Zirconia (ZrO₂) is a readily available material with reasonable processing cost, possessing excellent mechanical, electrical, and wear properties. Our fabricated Zirconia is used in a wide range of applications not limited to aerospace, automotive, medical and military.

Technical Products processes include cold isotactic pressing of green billets, pre-fired machining, sintering, and post sintered grinding operations.

Physical Properties	Units	ZrO ₂ -TTZ-T
Sintered	-	Magnesium (MgO)
Density	g/cc	5.70
Color	-	Yellow
Water Absorption	%	0
Gas Permeability	%	0
Hardness (Rockwell 45 N)	-	77

Mechanical Properties	Units	ZrO ₂ -TTZ-T
Compressive Strength	MPa / psi x 10 ³	1750 / 254
Tensile Strength	MPa	483
Flexural Strength	MPa	900
Modulus of Elasticity (Young's Mod.)	GPa	200
Fracture Toughness, K(I c)	MPa m ^{1/2}	11
Poisson's Ratio, 20°C	-	0.30

Thermal Properties	Units	ZrO ₂ -TTZ-T
Max. Use Temperature (no-load cond.)	°C	1500
Thermal Shock Resistance Δ Tc	°C	350
Thermal Conductivity, 20°C	W/m-K	2.2
Thermal Expansion Coefficient, 25°C - 1000°C	1 x 10 ⁻⁶ /°C	10.2
Specific Heat, 100°C	J/kg*K	400

Electrical Properties	Units	ZrO ₂ -TTZ-T
Dielectric Strength	ac V/mil	240
Dielectric Constant, 25°C	1 MHz	28.0
Dielectric Loss (tan delta) , 25°C	1 MHz	0.001
Volume Resistivity, 25°C	ohm-cm	>10 ¹³
500°C		2 x 10 ⁶
1000°C		<10 ³

**The information provided in this table is a compilation of publicly available data. This information is provided for comparison purposes only, and is not intended to be warrantable. Further, *Technical Products, Inc.* disclaims any and all liability from errors, in accuracies, or omissions.