Technical Products, Inc.
P: 262-335-3635 | F: 262-335-3606
E: tpi@technicalproductsinc.com
www.technicalproductsinc.com

Zirconia (ZrO2) 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	ZrO2-YTZP	ZrO2-TTZ-C	ZrO2-TTZ-T	ZTA
Sintered	-	Yttria	Magnesium (MgO)	Magnesium (MgO)	85% Al_2O_3 15% ZrO_2
Density	g/cc	6.04	5.72	5.70	4.1
Color	-	White	White/Ivory	Yellow	White
Water Absorption	%	0	0	0	0
Gas Permeability	%	0	0	0	0
Hardness (Rockwell 45 N)	-	81	77	77	-

Mechanical Properties	Units	ZrO2-YTZP	ZrO2-TTZ-C	ZrO2-TTZ-T	ZTA
Compressive Strength	MPa / psi x 10^3	2500 / 363	1750 / 254	1750 / 254	-
Tensile Strength	MPa	500	483	483	-
Flexural Strength	MPa	1240	900	505	760
Modulus of Elasticity (Young's Mod.)	GPa	210	200	200	310
Fracture Toughness, K(I c)	MPa $m^{1/2}$	13	11	11	6
Poisson's Ratio, 20ºC	-	0.23	0.28	0.30	-

Thermal Properties	Units	ZrO2-YTZP	ZrO2-TTZ-C	ZrO2-TTZ-T	ZTA
Max. Use Temperature (no-load cond.)	ºC	500	1500	1500	1650
Thermal Shock Resistance Δ Tc	ºC	350	350	350	-
Thermal Conductivity, 20ºC	W/m-K	2.2	2.2	2.2	-
Thermal Expansion Coefficient, 25ºC - 1000°C	1 x 10^{-6}/ºC	10.3	10.2	10.2	8.1
Specific Heat, 100ºC	J/kg*K	400	400	400	-

Electrical Properties	Units	ZrO2-YTZP	ZrO2-TTZ-C	ZrO2-TTZ-T	ZTA
Dielectric Strength	ac V/mil	228	240	240	-
Dielectric Constant, 25ºC	1 MHz	29.0	28.0	28.0	-
Dielectric Loss (tan delta) , 25ºC	1 MHz	0.001	0.001	0.001	-
Volume Resistivity, 25ºC 500ºC 1000ºC	ohm-cm	$>10^{13}$ 2 x 10^4 $<10^3$	$>10^{13}$ 2 x 10^6 $<10^3$	$>10^{13}$ 2 x 10^6 $<10^3$	-

**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.