

Zirconia (ZrO₂) – CeramaZirc™ Ultra Tough







Material webpage



Overview

Known as “ceramic steel”, Zirconia (ZrO₂) ceramic presents an exceptional blend of high strength, outstanding wear resistance, and corrosion resistance, with the highest fracture toughness values among ceramic materials.

Primary Advantages

-  Exceptional Fracture Toughness
-  Chemical Inertness
-  Low Thermal Conductivity
-  Wear Resistance

Applications

- High Pressure Equipment
- Pumping Elements
- Metal Forming Rollers
- Flow Control Devices
- Metal Extrusion Dies
- Down-Hole Valves & Seats

	Properties	Units	Ultra Tough
General	Composition	-	Ceria Stabilized
	Color	-	Grey
Mechanical	Compressive Strength	MPa	2000
	Density	g/cm ³	5.7
	Flexural Strength @25°C	MPa	1000
	Fracture Toughness K _{Ic}	MPa m ^{1/2}	17
	Hardness	GPa	13
	Young's Modulus	GPa	200
	Poisson's Ratio	-	0.30
Thermal	Thermal Conductivity @ 25°C	W/mK	3
	CTE @ 25°C - 400°C	10 ⁻⁶ /K	10
	Maximum Temperature (Air)	°C	800
	Maximum Temperature (Inert)	°C	1500
	Thermal Shock Resistance ΔT	°C	250
Electrical	Dielectric Constant @ 1MHz	-	29
	Dielectric Strength (DC)	kV/mm	18
	Volume Resistivity @ 25°C	ohm-cm	10 ¹²

Disclaimer: The values presented are mean and typical of those resulted from test samples. They are provided as an indication only to serve as guidance in the design of ceramic components and are not guaranteed in any way. The actual values can vary according to the shape and size of the envisioned component.



PRECISION CERAMICS UK
uk@precision-ceramics.com
+44 121 687 5858

PRECISION CERAMICS USA
info@precision-ceramics.com
+1 727 388 5060

PRECISION CERAMICS EU
eu@precision-ceramics.com
+353 51 550 480