



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

- High 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 | Nano HIP |
|------------|------------------------------------|----------------------|-------------------|
| General | Composition | - | Yttria Stabilized |
| | Color | - | Grey |
| Mechanical | Compressive Strength | MPa | 2100 |
| | Density | g/cm ³ | 6.07 |
| | Flexural Strength @25°C | MPa | 1400 |
| | Fracture Toughness K _{Ic} | MPa m ^{1/2} | 8 |
| | Hardness | GPa | 14.5 |
| | Young's Modulus | GPa | 200 |
| | Poisson's Ratio | - | 0.30 |
| Thermal | Thermal Conductivity @ 25°C | W/mK | 2 |
| | CTE @ 25°C – 400°C | 10 ⁻⁶ /K | 10 |
| | Maximum Temperature (Air) | °C | 800 |
| | Maximum Temperature (Inert) | °C | 1000 |
| | 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.

