Data Sheet

Nilcra® Zirconia MS Grade

Description

- Magnesia–Partially Stabilised Zirconia (Mg-PSZ) with exceptional transformation toughening properties
- Comprising 3.5 wt% MgO in ZrO_2
- Designed for applications requiring maximum strength

Prime Features:

- Very high mechanical strength
- Excellent wear and abrasion resistance
- Excellent corrosion resistance
- High impact resistance and toughness
- Very low thermal conductivity

Specifications

- Quality Assurance to ISO 9001

Physical Properties

Colour		White
Density g/cm³	20°C	5.74
Flexural Strength MPa	20°C	820
Tensile Strength MPa	20°C	430
Weibull Modulus	20°C	>30
Compressive Strength MPa	20°C	1990
Modulus of Elasticity GPa	20°C	205
Poisson's Ratio	20°C	0.31
Hardness $HV_{0.3}$ kg/mm²	20°C	1120
Hardness Rockwell 45N	20°C	82
Fracture Toughness MPa√m	20°C	12
Average Grain Size µm		40
Maximum Use Temperature ˚C		800
Thermal Shock Resistance, ΔT °C		375
Electrical Resistivity ohm-cm	20°C	$>10^{11}$
	500°C	3.3×10^{4}
	600°C	5000
	900°C	100
Thermal Conductivity W/m-K	20°C	3.08
	400°C	2.44
	800°C	2.26
Thermal Expansion Coefficient $x10^{-6}$ mm/mm/˚C		
	25-400°C	10.2
	25-800°C	10.2
Specific Heat J/g-K	20°C	0.47

Typical Applications:

- Excellent for combating wear and corrosion in valves, pumps and liners used in chemical processing and refining environments
- Successfully used for a wide variety of tooling used in metal forming and dry cell battery production

Production Capabilities

- Sintered components
- Precision ground components
- Ceramic / Metal assemblies
- Ceramic design assistance
- Prototyping, batch and volume production

Please note that all values quoted are based on test pieces and may vary according to component design. These values are not guaranteed in anyway whatsoever and should only be treated as indicative and for guidance only.