

## Data Sheet

# Nilcra<sup>®</sup> Zirconia TS Grade

### Description

- Magnesia-Partially Stabilised Zirconia (Mg-PSZ) with exceptional transformation toughening properties.
- Comprising 3.5 wt% MgO in ZrO<sub>2</sub>.
- Designed for applications requiring high thermal shock resistance.

### Prime Features:

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

### Typical Applications:

- Excellent for combating wear and corrosion in applications requiring thermal shock resistance.
- Successfully used for a wide variety of tooling used in metal forming, such as, dies for hot copper and brass extrusion, guide rollers for welded tube production and for zinc coating steel sheet.

### Physical Properties

<b>Colour</b>		White
<b>Density g/cm<sup>3</sup></b>	20°C	5.74
<b>Flexural Strength MPa</b>	20°C	650
	820°C	360
<b>Tensile Strength MPa</b>	20°C	390
<b>Weibull Modulus</b>	20°C	>30
<b>Compressive Strength MPa</b>	20°C	1800
	800°C	1750
<b>Modulus of Elasticity GPa</b>	20°C	205
<b>Poisson's Ratio</b>	20°C	0.31
<b>Hardness HV<sub>0.3</sub> kg/mm<sup>2</sup></b>	20°C	1020
<b>Fracture Toughness MPa√m</b>	20°C	>12
<b>Average Grain Size μm</b>		45
<b>Maximum Use Temperature °C</b>		800
<b>Thermal Shock Resistance, ΔT °C</b>		500
	20°C	>10 <sup>11</sup>
<b>Electrical Resistivity ohm-cm</b>	500°C	1.9 x 10 <sup>5</sup>
	600°C	2.7 x 10 <sup>4</sup>
	900°C	8000
<b>Thermal Conductivity W/m-K</b>	20°C	3.05
	400°C	2.47
	800°C	2.32
<b>Thermal Expansion Coefficient x10<sup>-6</sup> mm/mm/°C</b>	25-400°C	9.9
	25-800°C	9.7
<b>Specific Heat J/g-K</b>	20°C	0.47

### Production Capabilities

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

### Specifications

- Quality Assurance to ISO 9001

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.