

## DATA SHEET

# CIM Zirconia

### Yttria stabilised zirconia for Ceramic Injection Moulding applications

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#### Description

A very high purity zirconia-based material, partially stabilised with yttria. Contains 99.9 % ZrO<sub>2</sub>, Y<sub>2</sub>O<sub>3</sub> and HfO<sub>2</sub> in combination.

#### Prime Features

- Clinical use since 1990
- Highest levels of QA and traceability
- Very high mechanical strength
- Ultra fine grain
- Very dense and non-porous
- Excellent wear resistance
- Excellent corrosion resistance
- High impact resistance and toughness.

#### Typical Applications

Components for a range of medical, analytical and industrial applications

#### MTC Production Capabilities

- Ceramic injection moulding of highly complex geometries
- High precision, very thin wall extrusions
- Volume capability; prototype, batch through to very high (millions of components)
- A range of secondary processing to meet surface finish and flatness requirements

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.  
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#### Specifications

- Quality Assurance to ISO 9002

#### Physical Properties

Colour	White
Density, g/cm <sup>3</sup>	> 6.0
Porosity (apparent), % nominal	0 (fully dense)
Rockwell Hardness (R45N)	87
Fracture Toughness, MPa.m <sup>½</sup>	10
Flexural Strength (4-point), MPa @ 20C	> 800
Grain Size, µm	0.2
Young's Modulus E, GPa @ 20 °C	220
Shear Modulus G, GPa @ 20 °C	---
Poisson's Ratio ν	---

#### Thermal Properties

Thermal Conductivity, W/m.K @ 20C	2.9
Thermal Expansion coefficient 10 <sup>-6</sup> @ 20-1000 °C	9.0
Thermal Shock Resistance (R <sub>1</sub> ) ΔT/C	400
Thermal Shock Resistance (R <sub>2</sub> ) W/m	891
Specific Heat J/kg.K	610

#### Electrical Properties

Permittivity, 20C 1MHz	---
20C 10 GHz	33
Dielectric Loss @ 1MHz, tan δ 10 <sup>-4</sup>	---
@ 10 GHz, tan δ 10 <sup>-4</sup>	---
Dielectric Strength, kV/mm	---
Volume Resistivity, ohm.cm @ 100 °C	>10 <sup>10</sup>
300 °C	---
600 °C	---