DATA SHEET

TG12

Alumina

Description
A 99.5% purity, fully dense alumina typically used in ceramic injection moulding and extrusion forming for applications requiring good electrical properties and resistance to thermal and chemical fatigue.

Prime Features
- Non-porous and vacuum tight
- High volume resistivity
- Good thermal conductivity
- Resistant to chemical attack

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

Specifications
- Quality Assurance to ISO 9002

Physical Properties
- Colour: Ivory white
- Density (fired), g/cm³: 3.91
- Porosity (apparent), % nominal: 0 (fully dense)
- Rockwell hardness (R45N): 82
- Fracture Toughness, MPa.m¹/₂: 4.0
- Flexural Strength (3-point), MPa @ 20 °C: 330
- Grain Size, µm: 10
- Young’s Modulus E, GPa @ 20 °C: 370
- Shear Modulus G, GPa @ 20 °C: 149
- Poisson’s Ratio ν: 0.24

Thermal Properties
- Thermal Conductivity, W/m.K @ 20°C: 26
- Thermal Expansion Coefficient 10⁻⁶ @ 20-1000 °C: 9.0
- Thermal Shock Resistance (R₁) ΔT/C: 66
- Thermal Shock Resistance (R₂) W/m: 1921
- Specific Heat J/kg.K: 940

Electrical Properties
- Permittivity, 20°C 1MHz: 9.5
- 10 GHz: ----
- Dielectric Loss @ 1MHz, tan δ 10⁻⁴: 4.6
- @ 10 GHz, tan δ 10⁻⁴: 2.7
- Dielectric Strength, kV/mm: 20-25
- Volume Resistivity, ohm.cm @100°C: >10¹⁵
- 300°C: >10¹⁻⁷
- 600°C: >10¹⁻⁷

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. 12.12.2012