Data Sheet

Deranox™ 970 (Mac-A970R)

Description

High-quality alumina ceramic of **97.0% Al_2O_3** content.
This material is an excellent electrical insulator that can be metallized to facilitate high-temperature brazing of assemblies.

Prime Features:

- Readily accepts metallizing with moly-manganese
- Very high volume resistivity
- Low loss, constant high dielectric
- High density, non-porous and vacuum tight
- Resists abrasive wear and chemical attack

Specifications

- Quality Assurance to ISO 9001

Typical Applications:

Metallized ceramic components used in high-integrity applications, including:

- High-vacuum systems
- Laser equipment (gas, solid-state and waveguide)
- X-ray tubes and electron microscopes
- Microwave windows
- Insulators in medical and scientific equipment

Production Capabilities

- Complex pressed and machined components
- Grinding, lapping polishing to precise limits
- Moly-manganese metallizing
- Brazed assemblies
- Prototype, 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.

Physical Properties

Colour	White
Bulk Density (fired)	3.74 Mg/m^3
Grain Size	14 μm
Porosity (apparent)	0% (fully dense) % nominal
Vickers Hardness	12.8 GPa @ Hv 0.5kg
Compressive Strength	2000 MPa
Flexural strength (3-point) @20C	280 MPa
Young's modulus @20C	330 GPa
Fracture toughness, $MPa.m^{½}$	3.5
Thermal Conductivity	24 W/m.K @20C
Thermal Expansion Coefficient (0-800C)	8.1 10^{-6}/C
Thermal Downshock	150 σC
Specific heat	880 J/kg.K
Maximum no-load temperature	1550 C
Dielectric Constant	
@1MHz	9.2
@ 9.4GHz	9.1
Dielectric Loss	
@ 1MHz, tan δ	0.00041
@ 9.4GHz, tan δ	0.00101
@ 9.4GHz, tan δ	0.00067
Dielectric strength	30.6 kV/mm
Volume Resistivity	
20ºC	> 10^{15}
300ºC	> 10^{12}
600ºC	> 10^{8}