Deranox™ 975 (Mac-A975R)

Description

Fine grain alumina ceramic of **97.5% Al$_2$O$_3$** content. A high quality material, widely used for electrical and mechanical components that require thick film metallizing, as well as for dynamic duties where resistance to abrasion and chemical attack are essential.

Prime Features:

- Can be thick film metallized with noble metal
- High volume resistivity
- High mechanical strength
- Excellent corrosion resistance
- Excellent wear resistance
- Low coefficient of friction
- High thermal stability
- High density, non-porous and vacuum tight

Specifications

- Quality Assurance to ISO 9002

Typical Applications:

- Thick film metallized components, such as those with conductor and/or resistor networks, dielectric layers, solderable interfaces, etc
- High-integrity devices for duties in the defence, aerospace, medical, laser and scientific instrument fields
- Dynamic and static components in pumps and valves that handle corrosive or abrasive media

Production Capabilities

- Complex pressed and machined components
- Ground or polished surface finishes
- Spheres to high tolerance
- Precision thick film metallizing
- Prototype, batch and volume production
- Soldered assemblies

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

Property	Value
Colour	White
Bulk Density (fired)	3.8 Mg/m^3
Grain Size	4 µm
Porosity (apparent)	0% (fully dense) % nominal
Vickers Hardness	15.0 GPa @ Hv 0.5kg
Rockwell hardness (R45N)	85
Compressive Strength	2500 MPa
Flexural strength (ASTM C1161, 3-point)	350 MPa
Young's modulus @20C	340 GPa
Fracture toughness, MPa.m$^{\frac{1}{2}}$	3.6
Thermal Conductivity	24 W/m.K @20C
Thermal Expansion Coefficient (0-800C)	8.1 10^{-6}/C
Thermal Downshock	190 σC
Specific heat	880 J/kg.K
Maximum no-load temperature	1600 C
Dielectric Constant	
@1MHz	9.6
@ 9.4GHz	9.5
Dielectric Loss	
@ 1MHz, tan δ 10.4	1.9
@ 9.4GHz, tan δ 10.4	4.3
Dielectric strength	20@ 2-3mm, kV/mm
Volume Resistivity	
20°C	> 10^{16}
300°C	> 10^{12}
600°C	> 10^8