

Data Sheet

AL 500™ (Mac-A940W)

Description

Alumina ceramic of 94% Al₂O₃ content.

Its excellent combination of mechanical, thermal, electrical and chemical properties are well suited to applications across industry.

Prime Features:

- Dense, non-porous and vacuum tight
- High mechanical strength and hardness
- Low thermal expansion
- High volume resistivity
- Resists abrasion
- Consistent dielectric constant
- Readily accepts moly-manganese metalizing for high temperature brazing of assemblies

Typical Applications:

- Pressure sensors for fluid flow measurement
- Wear and barrier coatings for sputtering targets
- Electron tube components

Production Capabilities:

- Isostatic and dry pressing, green machining
- CNC grinding and lapping to very tight tolerances
- Metallising of components
- High temperature brazing of assemblies
- Prototype, batch and volume production

Specifications

- Quality Assurance to ISO 9001

Physical Properties

| Colour | White | | | |
|--|------------------------------------|-----------------------------|----------------------|---------------------|
| Bulk Density (fired) | 3.67 g/cm ³ | 0.132 lb/in ³ | | |
| Porosity (apparent) | 0 (fully dense) % nominal | | | |
| Rockwell Hardness (R45N) | 78 | | | |
| Compressive Strengths | >2070 MPa | >300,000 lb/in ² | | |
| Flexural Strength | 345 MPa | 50,000 lb/in ² | | |
| Thermal Conductivity | 20.5 W/m.K | 11.9 BTU/ft.hr.°F | | |
| Thermal Expansion Coefficient 10 ⁻⁶ /°C [10 ⁻⁶ /°F] | 25-200°C [77-390°F] | 6.3 [3.5] | | |
| | 200-400°C [390-750°F] | 7.5 [4.2] | | |
| | 400-600°C [750-1110°F] | 8.0 [4.4] | | |
| | 600-800°C [1110-1470°F] | 8.6 [4.8] | | |
| | 800-1000°C [1470-1830°F] | 9.1 [5.1] | | |
| Maximum no-load temperature | 1600°C | 2910 °F | | |
| Dielectric Strength | 25.6 DC kV/mm | 650 V/mil | | |
| Dielectric Constant K ¹ | 25°C | 300°C | 500°C | |
| | @10MHz | 9.07 | 9.53 | 9.91 |
| | @1000MHz | 9.04 | - | - |
| | @8500MHz | 8.98 | 9.26 | 9.40 |
| Dissipation factor, tanδ | @10MHz | 0.00026 | 0.00028 | 0.00341 |
| | @1000MHz | 0.00062 | - | - |
| | @8500MHz | 0.00078 | 0.00155 | 0.00155 |
| | Loss factor, K ¹ .tan δ | @10MHz | 0.00236 | 0.00267 |
| @1000MHz | | 0.00560 | - | - |
| @8500MHz | | 0.00700 | 0.01165 | 0.01457 |
| Volume resistivity, ohm.cm: | | > 10 ¹⁴ | 2.0x10 ¹² | 8.9x10 ⁹ |