

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