

Data Sheet

AL 300™ (Mac-A976W)

Description

A top quality alumina ceramic of **97.6% Al₂O₃** content, widely used for high integrity components where its exceptional electrical and thermal properties are essential to operational stability and reliability.

Prime Features:

- Exceptionally high dielectric strength
- Consistent dielectric constant
- Dense, non-porous and vacuum tight
- Readily accepts moly-manganese metallizing for high temperature brazing of assemblies
- Electrically and dimensionally stable across a wide temperature range
- Resists chemical attack and abrasion
- Good thermal conductivity

Specifications

- Quality Assurance to ISO 9001

Physical Properties

Typical Applications:

- Power distribution equipment
- High power tubes for klystron and x-ray equipment used in defence, medical and communications
- Electro-optical equipment
- Flow measurement devices
- Pressure sensors

Production Capabilities:

- Isostatic and dry pressing of small to large complex components
- CNC grinding and lapping to very tight tolerances
- Prototype, batch and volume production
- Complete documentation and traceability
- Functional coatings, such as Cr₂O₃, MnTiCr...

Colour	White		
Bulk Density (fired)	3.76 g/cm ³	0.136 lb/in ³	
Porosity (apparent)	0 (fully dense) % nominal		
Rockwell Hardness (R45N)	75		
Compressive Strengths	> 1720 MPa	> 250,000 lb/in ²	
Flexural Strength	296 MPa	43,000 lb/in ²	
Thermal Conductivity	26.8 W/m.K	15.5 BTU/ft.hr.°F	
Thermal Expansion Coefficient 10 ⁻⁶ /C [10 ⁻⁶ /°F]	25-200C [77-390°F]	6.9 [3.8]	
	200-400C [390-750°F]	7.8 [4.3]	
	400-600C [750-1110°F]	8.5 [4.7]	
	600-800C [1110-1470°F]	8.8 [4.9]	
	800-1000C [1470-1830°F]	9.0 [5.0]	
Maximum no-load temperature	1650 C	3000°F	
Dielectric Strength *	32.6 dc kV/mm	828 V/mil	
Dielectric Constant K ¹	25C	300C	500C
@10MHz	9.53	9.91	10.14
@1000MHz	9.00	-	-
@8500MHz	9.04	9.32	9.54
Dissipation factor, tanδ			
@10MHz	0.00004	0.00016	0.00052
@1000MHz	0.00030	-	-
@8500MHz	0.00045	0.00040	0.00072
Loss factor, K ¹ .tan δ			
@10MHz	0.00038	0.00158	0.00527
@1000MHz	0.00207	-	-
@8500MHz	0.00407	0.00373	0.00687
Volume resistivity, ohm.cm:	> 10 ¹⁴	1.0x10 ¹²	8.4 x 10 ¹⁰

*ASTM Standard D149-97a¹³