



Thin metallized ceramic rings for ceramic-to-metal joining

Brazing Ceramic Components

Product ID / SKU: FWM/MET-BRAZE-001

Material: Metallized Ceramic Family

Product type: Metallized Ceramics Component

Metallized ceramic rings, tubes and bodies prepared for drawing-based ceramic-to-metal brazing assemblies.

Alumina Typical Material Properties

Property	95% Al ₂ O ₃	99% Al ₂ O ₃	99.5% Al ₂ O ₃	99.8% Al ₂ O ₃	Condition / basis
Density (g/cm ³)	3.65	3.85	3.90	3.92	-
Fracture toughness (MPa·m ^{1/2})	3-4	3-4	4	4	-
Young's modulus (GPa)	320	340	370	390	-
Flexural strength (MPa)	300	330	375	390	25°C
Compressive strength (MPa)	2200	2350	2450	2500	25°C
Thermal conductivity (W/(m·K))	18-22	27	29	32	25°C
Linear thermal expansion coefficient (10 ⁻⁶ /K)	8	8	8	8	25-1000°C
Dielectric strength (kV/mm)	16	20	22	22	-
Volume resistivity (Ω·cm)	10 ¹⁴	10 ¹⁴	10 ¹⁴	10 ¹⁴	25°C
Relative permittivity	9	9.7	9.7	9.8	1MHz, 25°C
Dielectric loss	0.0004	0.0002	0.0002	0.0001	1MHz, 25°C
Vickers hardness (HV)	>1300	1700	1750	1800	-
Material thermal-shock temperature difference, ΔT (°C)	220	180-200	180-200	180-200	-

Property	95% Al ₂ O ₃	99% Al ₂ O ₃	99.5% Al ₂ O ₃	99.8% Al ₂ O ₃	Condition / basis
Typical maximum material temperature (°C)	1500	1650	1700	1700	-

AlN (AN216A) Typical Properties

Property	AN216A typical value	Condition / method
Density	3.4 g/cm ³	JIS R 1634
Water absorption	0 %	JIS C 2141
Vickers hardness	10.4 GPa	HV9.807N (9.807 N load); JIS R 1610
Three-point flexural strength	310 MPa	Three-point bending; JIS R 1601
Young's modulus	320 GPa	JIS R 1602
Poisson's ratio	0.24	JIS R 1602
Fracture toughness (SEPB)	3.2 MPa·m ^{1/2}	SEPB; JIS R 1607
Linear thermal expansion, 40-400°C	4.6 × 10 ⁻⁶ /K	40-400°C; JIS R 1618
Linear thermal expansion, 40-800°C	5.3 × 10 ⁻⁶ /K	40-800°C; JIS R 1618
Thermal conductivity	150 W/(m·K)	20°C; JIS R 1611
Specific heat capacity	0.71 J/(g·K)	JIS R 1611
Material thermal-shock temperature difference	250 °C	Water immersion; relative method; JIS R 1648
Dielectric strength	14 kV/mm	JIS C 2141
Volume resistivity, 20°C	>10 ¹⁴ Ω·cm	20°C; JIS C 2141
Volume resistivity, 300°C	10 ¹⁰ Ω·cm	300°C; JIS C 2141
Volume resistivity, 500°C	10 ⁸ Ω·cm	500°C; JIS C 2141
Relative permittivity	8.6	1 MHz; JIS C 2141
Dielectric loss tangent	0.0003	1 MHz; JIS C 2141

Product Geometry & Configuration

Product parameter	Configuration	Basis
Material system	Metallized Ceramic Family	Material family; grade selected for the application
Component forms	Metallized rings; Metallized tubes and sleeves; Custom brazing bodies	Drawing-defined configurations
Geometry and dimensions	Custom sizes available	Part drawing and mating interfaces
Functional surfaces	Contact, locating, joining or insulating surfaces as applicable	Surface finish and acceptance criteria on the drawing