

METALLIZED CERAMICS

Introductions

Specializing in **Metallized Ceramic Components** used in various industrial, based materials as below;

94%,96%,99%,99.6% Alumina Ceramic Components;

AlN Ceramic Substrate;

BeO Ceramic Substrate;



Metallized Ceramics

Metallizing on alumina ceramic components surface is a very important technique for brazing with metal parts. Mo/Mn and W paste developed by Innovacera is used for the metallization.

Applications

- Feed-through insulators
- Headers
- High-power receptacles
- Insulating discs
- Insulating rings and cylinders
- Precipitator products
- Power Switches
- Vacuum Interrupters
- SCR Housing
- Windows
- X-Ray tubes

Available Ceramic Composition

- 94%,96%,99%,99.6% Alumina Ceramic Components;
- AlN Ceramic Substrate;
- BeO Ceramic Substrate;

Specification

- Metallization thickness: $\pm 10\mu\text{m}$
- Nickel thickness: $2\sim 10\mu\text{m}$
- Pin full strength: $4200\text{kg}/\text{cm}^2$ avg.
(at $\Phi 5.0\text{mm}$ pin)

Our processing is available in a wide range of size and shapes as customer request.



Material Specification and Properties

| Properties | | Unit | Test Method | Material | | |
|------------|---|------------------------|---------------|-------------------|-------------------|-------------------|
| | | | | IN94 | IN96 | IN99 |
| Mechanical | Color | - | - | White | White | Ivory |
| | Alumina Content | % | - | 94 | 96 | 99 |
| | Bulk Density | g/cm ³ | ASTM C-20-83 | 3.70 | 3.80 | 3.90 |
| | Surface Roughness | Um | Profilometer | - | Max 0.6 | - |
| | Water Absorption | % | ASTM C373-72 | 0.0 | 0.0 | 0.0 |
| | Average Crystalline Size | Um | ASTM E112-88 | 4 | 3 | 4 |
| | Flexural Strength (20°C) | MPa | ASTM F417-78 | 350 | 370 | 370 |
| | Elastic Modulus | Gpa | ASTM C773-82 | 290 | 310 | 340 |
| | Poisson's Ratio | - | ASTM C773-82 | 0.22 | 0.22 | 0.22 |
| | Compressive Strength | Mpa | ASTM C773-82 | 2100 | - | 2500 |
| | Hardness | - | Knoop 1KG | 12 | - | 14 |
| | Fracture Toughness | Mpa.m ^{1/2} | NOCHED BEAM | 3.4 | - | 4.5 |
| Thermal | Thermal Conductivity (20°C) | W/m.K | ASTM C408-82 | 21 | 24 | 28 |
| | Coefficient of Thermal Expansion(20~1000°C) | × 10 ⁻⁶ /°C | ASTM C372-81 | 8.0 | 7.8 | 8.1 |
| | Specific Heat | Cal/g°C | ASTM C351-82 | 0.2 | 0.2 | 0.2 |
| | Thermal Shock Resistance | °C | Customer | 200 | 200 | 200 |
| | Max. Use Temperature | °C | - | 1600 | 1600 | 1650 |
| Electrical | Dielectric Strength | KV/mm | ASTM D116-76 | ≥12 | ≥15 | ≥17 |
| | Dielectric Constance (1MHz.25°C) | - | ASTM D150-81 | 9.2 | 9.6 | 9.7 |
| | Dielectric Loss (tan delta, 1MHz.25°C) | - | ASTM D150-81 | 0.0004 | 0.0003 | 0.0002 |
| | Volume Resistivity (25°C) | Ω cm2/cm | ASTM D1829-68 | ≥10 ¹⁴ | ≥10 ¹⁴ | ≥10 ¹⁴ |

The general characteristics of this material described above were derived from laboratory test performed by Innocera from time on sample quantities. Actual characteristics of production lots may vary.

INNOV◀CERA

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