Data Sheet

ZTA (Mac-ZTA20W)

Description

Alumina-based material with mechanical properties enhanced by the addition of yttria partially-stabilised zirconia.
Typically contains in excess of 80% Al_2O_3 with the remainder comprising mainly ZrO_2 and HfO_2 in combination, plus a small percentage of Y_2O_3.

Prime Features:

- Very fine grain microstructure
- High mechanical strength
- Enhanced fracture toughness and thermal shock resistance
- Resists chemical attack and abrasion
- High dielectric strength

Specifications

- Quality Assurance to ISO 9002

Typical Applications:

- Special ballistic applications
- Pump and valve components for chemical processing duties where toughness and strength are required, together with resistance to wear and corrosion at elevated temperatures

Production Capabilities:

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

Physical Properties

Colour	White
Grain Size	2.0 μm
Thermal Conductivity (Calculated)	20 W/m.K
Porosity (apparent)	0 (fully dense) % nominal
Grain Size	430 μm
	62,000 μm
Thermal Expansion Coefficient	8.3 @RT-400C 10^{-6}/C
Bulk Density (fired)	4.32 Mg/m^3
	0.156 lb/in^3
Young's modulus (ASTM C623 Mod)	350 MPa
	51 $M.lb/in^2$
Shear modulus (ASTM C623 Mod)	145 GPa
	22 $M.lb/in^2$
Poisson's ratio (ASTM C623 Mod)	0.24
Dielectric strength (ASTM D3755 Mod)	85.3 dc kV/mm
	2166 V/mil
Dielectric constant (ASTM D150 & D257 Mod)	12.5 K^1 @ 1kHz
Dissipation factor (ASTM D150 & D257 Mod)	$1x10^{-2}$ tan δ, @ 1kHz
Volume resistivity (ASTM D150 & D257 Mod)	$9x10^{12}$ ohm.cm @ 100C

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We design and manufacture products for demanding applications in a variety of markets using a comprehensive range of advanced ceramic, glass, precious metal, piezoelectric and dielectric materials. We utilise core competences of applications engineering and superior materials technology, together with state of the art fully integrated manufacturing processes to offer precision ceramic components, ceramic-to-metal assemblies and special coatings for use in a variety of applications.