Morgan Advanced Materials

DATA SHEET

Hilox™ 961

Alumina

Description

A high quality alumina ceramic of 96% Al_2O_3 content. Excellent mechanical characteristics make this an ideal material for components where resistance to dynamic wear and abrasive action are prime factors.

Prime Features

- Exceptionally hard-wearing
- Excellent abrasion resistance
- High compressive and flexural strengths
- Dense, non-porous and vacuum tight
- Excellent dimensional stability across very wide temperature range
- Resists chemical attack

Typical Applications

- Valve plates for liquid and gas control systems: industrial and domestic duties
- Pneumatic slider valves (>20 million operating cycles can be achieved)
- Wear resistant components for rotary and reciprocating pumps: shafts, bearings, thrust washers, plungers, counterface seats, etc.

MTC Production Capabilities

- Complex components to close tolerances.
- Exacting flatness and surface finishes for low friction valve operation and accurate flow control.
- Flatness tolerance below three helium bands (0.0009mm)
- Flat surface polished finish to 0.08µm Ra.
- Cylindrical surface finish to 0.2µm Ra.
- Prototype, batch and volume production.

Specifications

Quality Assurance to ISO 9002

Physical Properties

Colour	Brown
Density (fired), g/cm^3	3.89
Porosity (apparent), % nominal	0 (fully dense)
Rockwell hardness (R45N)	84
Fracture Toughness, MPa.m^{½}	4.5
Flexural Strength (3-point), MPa @ 20 °C	325
Grain Size, µm	3.5
Young's Modulus E, GPa @ 20 °C	358
Shear Modulus G, GPa @ 20 °C	145
Poisson's Ratio v	0.23

Thermal Properties

Thermal Conductivity, W/m.K @ 20C	20.7
Thermal Expansion Coefficient 10^{-6} @ 20-1000 ºC	9
Thermal Shock Resistance (R_1) ΔT/C	77
Thermal Shock Resistance (R_2) W/m	1390
Specific Heat J/kg.K	890

Electrical Properties

Permittivity, 20C 1MHz	9.9
20C 10 GHz	9.7
Dielectric Loss @ 1MHz, tan δ 10^{-4}	15
@ 10 GHz, tan δ 10^{-4}	4.6
Dielectric Strength, kV/mm	28
Volume Resistivity, ohm.cm @100°C	>10^{14}
300°C	>10^{8}
600°C	>10^{6}

Please note that all values quoted are based on test pieces and may vary according to component design. These values are not guaranteed in anyway whatsoever and should only be treated as indicative and for guidance only. 12.12.2012

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