

## Data Sheet

# M120F (Mac-AS970W)

### Description

Aluminium silicate ceramic based on natural lava.

It is typically a composite of 41.9%  $Al_2O_3$  and 54.8%  $SiO_2$  with 2.3%  $TiO_2$ , 0.75%  $Fe_2O_3$  plus traces of  $MgO$  and  $CaO$ .

By changing process conditions, this highly versatile material can be tailored to provide a range of hardness values to suit customer requirements, whilst maintaining its thermal and electrical properties. (See Rockwell hardness values to R15T, quoted alongside.)

### Prime Features:

- Excellent high temperature capability
- Exceptional thermal shock resistance
- Low and very stable thermal expansion
- Hard and durable, with excellent resistance to abrasion and chemical attack
- Can be precision formed into complex shapes that are not easily achieved with other materials
- No special tooling required for forming
- Good electrical properties

### Typical Applications:

- Thermally insulative components
- Dicing support plates for wafer slicing
- Furnace fixtures for glass sealing
- Welding nozzles

### Production Capabilities:

- Precision machining in green state
- Firing at precise temperatures to produce very close dimensional tolerances
- Prototype, batch and volume production

### Specifications

- Quality Assurance to ISO 9002

### Physical Properties

Colour	Tan to Pink	
Bulk Density (fired)	2.3 Mg/m <sup>3</sup>	0.082 lb/in <sup>3</sup>
Porosity (apparent)	2 - 3 (can be made impervious to water) % nominal	
Rockwell hardness (R15T)	95 nominal maximum	
Tailorable range	50-95	
Compressive strength	275 MPa	40,000 lb/in <sup>2</sup>
Tensile strength	17.6 MPa	2500 lb/in <sup>2</sup>
Flexural strength	64 MPa	900 lb/in <sup>2</sup>
Young's modulus	55.4 GPa	8.0 lb/in <sup>2</sup>
Impact resistance (Charpy D256-56)	83.8 mm	3.3 in
Thermal conductivity	1.26 @300°C W/m.K	0.73 @575°F BTU/ft.hr.°F
Thermal expansion coefficient 10 <sup>-6</sup> /C, 10 <sup>-6</sup> /F	2.9 @24-260C	1.6 @75-500°F
	3.2 @24-675C	1.8 @75-1250°F
	3.2 @24-900C	1.8 @75-1650°F
Maximum no-load temperature	1150 °C	2100 °F
Softening point of material	1760C	3200 °F
Dielectric strength	3.9 dc kV/mm	100 V/mil
Dielectric constant, K'	5.3 1MHz @ 24C [75°F]	5.2 100MHz @ 24C [75°F]
Dissipation factor, tan δ	0.010 1MHz @ 24C [75°F]	0.007 100MHz @ 24C [75°F]
Loss factor, K'.tan δ	0.053 1MHz @ 24C [75°F]	0.036 100MHz @ 24C [75°F]
Te value	595C	1100°F
Volume resistivity	@ 24C [75°F]	> 10 <sup>14</sup> ohm.cm
	@ 93C [200°F]	6.0x10 <sup>11</sup>
	@ 260C [500°F]	2.0x10 <sup>9</sup>
	@ 480C [900°F]	5.0x10 <sup>6</sup>
	@ 675C [1250°F]	3.5x10 <sup>5</sup>
	@ 900C [1650°F]	5.0x10 <sup>4</sup>