Dielectric 1.5

Data Sheet

Description:
Hotblox Dielectric 1.5 is a rigid, low loss, moldable dielectric material that is suitable for numerous RF applications, including dielectric lenses, radomes, and filled waveguide applications. With a dielectric constant of 1.5, this material has the lowest possible dielectric constant for a polymer material having high temperature capabilities. Hotblox Dielectric 1.5 is ideal for continuous use in environments up to 400 °C, and can be used in conditions as high as 600 °C for short duration exposure. Hotblox Dielectric 1.5 has a CTE similar to that of aluminum, enabling design of components using this material in contact with aluminum parts, providing long service life for RF items operating in a variable temperature environment.

Hotblox Dielectric 1.5 samples were exposed to the space environment on the exterior of the International Space Station for 18 months as part of NASA’s MISSE-6 (Materials International Space Station Experiment). Data concerning the effects of solar thermal cycling, ultraviolet, and atomic oxygen exposure on Hotblox Dielectric 1.5 are available upon request.

General:
- Density (ASTM D792): 0.38 g/cm³
- Color: White/off white
- Continuous Use Temperature (Determined by Thermogravimetric Analysis): 400 °C
- Short Duration Use Temperature (No degradation in Room Temperature Properties): 600 °C for 2 min.
- Water Absorption (ASTM D570): Testing in progress

Thermal Properties:
- Thermal Conductivity (Line Source Transient): 0.08 W/m-K
- Coefficient of Thermal Expansion (CTE) (ASTM E831): <30 ppm/°C

Mechanical Properties:
- Flexural Strength (ASTM D790): 5.2 MPa

Electrical Properties:
- Dielectric Constant (Ka-band/X-band): 1.5/1.6
- Loss Tangent (Ka-band): 0.005

Astronaut retrieving Hotblox samples from International Space Station