PROTOLABS
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PEI ULTEM 1000

ULTEM is an amorphous thermoplastic polyetherimide (PEI) material that combines exceptional mechanical, thermal, and electrical properties. Natural ULTEM is a translucent amber color. Key attributes include excellent mechanical strength, the ability to retain strength at elevated temperatures, high heat resistance, and high stress resistance.

Applications

PEI ULTEM 1000 is used in the medical, pharmaceutical, and biotechnology markets as it can withstand repeated autoclaving cycles. It is also used in parts that require consistent dielectric properties over an extensive range of frequencies and that are exposed to extreme conditions, making it desirable in the automotive and aerospace industries. Furthermore, electronics and semiconductor technology are other common applications of PEI ULTEM 1000.

Key Product Benefits

- High Strength and Stiffness
- Flame Retardant
- Stress Resistance
- Heat Resistance
- Chemical Resistance
- Dielectric Strength

Properties

Property	Test Method	Value
Density	ASTM D792	1.27 g/cm3
Water Absorption @ 24 hours	ASTM D570	0.25%
Water Absorption @ Saturation	ASTM D570	1.25%
Tensile Strength @ Yield	ASTM D638	16,700-17,000 psi
Tensile Strength @ Break	ASTM D638	17,000-17,500 psi
Tensile Modulus	ASTM D638	430,000-500,000 psi
Elongation @ Yield	ASTM D638	6.9-7%
Elongation @ Break	ASTM D638	32-80%
Flexural Strength	ASTM D790	20,000-23,000 psi
Flexural Modulus	ASTM D790	480,000-500,000 psi
Compressive Strength	ASTM D695	21,000-22,000 psi
Rockwell Hardness (M Scale)	ASTM D785	110-114

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Property (Continued)	Test Method (Continued)	Value (Continued)
Rockwell Hardness (R Scale)	ASTM D785	123-126
Izod Impact, Notched	ASTM D256	0.5-0.6 ft-lb/in
Thermal Conductivity	ASTM D2214	1-1.5 BTU-in/hr-ft2-°F
Coefficient of Linear Thermal Expansion	ASTM D696/ASTM E831	3.1 x 10-5 in/in/°F
Continuous Service Temperature, Air		338-340°F
Heat Deflection Temperature @ 264 psi	ASTM D648	394-400°F
Heat Deflection Temperature @ 66 psi	ASTM D648	405-410°F
Dielectric Constant @ 1 MHz	ASTM D150	3.15-3.2
Flammability	UL 94	V-0

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