

## GE Plastics Ultem® 1000 PEI, Polyetherimide, unfilled, extruded

### Material Notes:

Ultem\* 1000 polyetherimide is an amorphous, high-performance polymer with exceptional flame and heat resistance. It performs continuously to 340°F (171°C), making it ideal for high strength/high heat applications, and those requiring consistent dielectric properties over a wide frequency range. It is hydrolysis resistant, highly resistant to acidic solutions and capable of withstanding multiple autoclaving cycles.

Ultem 100 is FDA and USP Class VI compliant. FDA compliant colors of Ultem are also available on a custom basis. Ultem commonly is machined into parts for reusable medical devices, analytical instrumentation, electrical/electronic insulators and a variety of structural components requiring high strength and rigidity at elevated temperatures.

Data provided by Quadrant Engineering Plastic Products from tests on stock shapes and parts produced by Quadrant EPP.

Physical Properties	Metric	English	Comments
Specific Gravity	1.28 g/cc	0.0462 lb/in <sup>3</sup>	ASTM D792
Water Absorption	0.25 %	0.25 %	Immersion, 24hr; ASTM D570(2)
Water Absorption at Saturation	1.25 %	1.25 %	Immersion; ASTM D570(2)
<b>Mechanical Properties</b>			
Hardness, Rockwell M	112	112	ASTM D785
Hardness, Rockwell R	125	125	ASTM D785
Hardness, Shore D	86	86	ASTM D2240
Tensile Strength, Ultimate	114 MPa	16500 psi	ASTM D638
Elongation at Break	80 %	80 %	ASTM D638
Tensile Modulus	3.45 GPa	500 ksi	ASTM D638
Flexural Modulus	3.45 GPa	500 ksi	ASTM D790
Flexural Yield Strength	138 MPa	20000 psi	ASTM D790
Compressive Strength	152 MPa	22000 psi	10% Def.; ASTM D695
Compressive Modulus	3.31 GPa	480 ksi	ASTM D695
Shear Strength	103 MPa	15000 psi	ASTM D732
Coefficient of Friction	0.42	0.42	Dry vs. Steel; QTM55007
K (wear) Factor	5840 x 10 <sup>-8</sup> mm <sup>3</sup> /N-M	2900 x 10 <sup>-10</sup> in <sup>3</sup> -min/ft-lb-hr	QTM 55010
Limiting Pressure Velocity	0.0657 MPa-m/sec	1875 psi-ft/min	4:1 safety factor; QTM 55007
Izod Impact, Notched	0.267 J/cm	0.5 ft-lb/in	ASTM D256 Type A
<b>Electrical Properties</b>			
Surface Resistivity per Square	Min 1e+013 ohm	Min 1e+013 ohm	EOS/ESD

			S11.11
Dielectric Constant	3.15	3.15	1MHz; ASTM D150
Dielectric Strength	32.7 kV/mm	830 V/mil	Short Term; ASTM D149
Dissipation Factor	0.0013	0.0013	1MHz; ASTM D150

### Thermal Properties

CTE, linear 68°F	55.8 $\mu\text{m}/\text{m}\cdot\text{°C}$	31 $\mu\text{in}/\text{in}\cdot\text{°F}$	(-40°F to 300°F); ASTM E831
Thermal Conductivity	0.122 W/m-K	0.85 BTU-in/hr-ft <sup>2</sup> -°F	ASTM F433
Maximum Service Temperature, Air	171 °C	340 °F	Long Term
Deflection Temperature at 1.8 MPa (264 psi)	204 °C	400 °F	ASTM D648
Glass Temperature	210 °C	410 °F	ASTM D3418
Flammability, UL94*	V-0	V-0	1/8 inch

### Qualitative Processing Properties

Compliance - FDA	Compliant	
Machinability	3	1-10, 1=Easier to Machine
Service in Alcohols	Acceptable	
Service in Aliphatic Hydrocarbons	Limited	
Service in Aromatic Hydrocarbons	Unacceptable	
Service in Chlorinated Solvents	Unacceptable	
Service in Ethers	Acceptable	
Service in Ketones	Unacceptable	
Service in Strong Acids	Unacceptable	
Service in Strong Alkalies	Unacceptable	
Service in Sunlight	Acceptable	
Service in Weak Acids	Acceptable	
Service in Weak Alkalies	Acceptable	

All statements, technical information and recommendations contained in this database are presented in good faith, based upon tests believed to be reliable and practical field experience. The reader is cautioned, however, that Quadrant EPP and Automation Creations, Inc. cannot guarantee the accuracy or completeness of this information, and it is the customer's responsibility to determine the suitability of Quadrant EPP's products in any given application.

\* This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.