

# TECHNICAL DATA SHEET

## Ultem® (PEI)

(PolyEtherImide)

Ultem® is a semi-transparent high temperature plastic material with extremely high strength and stiffness. Ultem is resistant to hot water and steam and can withstand repeated cycles in a steam autoclave. Ultem has outstanding electrical properties offer one of the highest dielectric strengths of any commercially available thermoplastic material. Ultem offers excellent chemical resistance, high dielectric strength, natural flame resistance, and extremely low smoke generation. Ultem provides exceptionally high mechanical properties

### GRADES OF ULTEM

#### Ultem® 1000 (unfilled)

Ultem® excels in hot air and water environments.

UUltem® is hydrolytically stable; it retains 100% of tensile strength after 2,000 steam autoclave cycles at 270°F. Ultem® also retains 85% of its tensile strength after 10,000 hour boiling water immersion. It is also UV and gamma radiation resistant.

#### Ultem® 2100 (10% glass filled)

#### Ultem® 2200 (20% glass filled)

#### Ultem® 2300 (30% glass filled)

\*Glass filled Ultem® provides even greater rigidity and dimensional stability while maintaining many of the useful characteristics of basic Ultem®. The glass reinforcement in Ultem® yields exceptional strength-to-weight ratio and increased tensile strength.

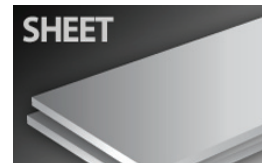
#### Benefits

- Chemical resistance
- Dimensional stability
- High dielectric strength
- Natural flame resistance
- Low smoke generation KPSI
- High strength
- FDA, USDA, USP Class VI & NSF Approved (natural color only)
- Available in glass-reinforced grades 30% (Ultem 2300), 20% (Ultem 2200), 10% (Ultem 2100).

#### Applications

- Medical reusable
- Aircraft components
- Electric/electrical components
- Circuit boards
- Computer circuitry
- Automotive
- Pump and valve parts
- Structural Probes
- Surgical Probes
- High Frequency Insulators used in Microwave Communications
- Pump Housings
- Wafer Processing

#### SHAPES AVAILABLE



### SEE NEXT PAGE FOR ADDITIONAL INFORMATION

ULTEM is a registered trademark of SABIC Innovative Plastics IP BV (formerly GE Plastics).  
 DURATRON is a registered trademark of Quadrant Engineering Plastic Products.

NOTE: The information contained herein are typical values intended for reference and comparison purposes only. They should NOT be used as a basis for design specifications or quality control. Contact us for manufacturers' complete material property datasheets.  
 All values at 73°F (23°C) unless otherwise noted.



**TYPICAL PROPERTIES of ULTEM® PEI POLYETHERIMIDE**

| ASTM or UL test   | Property  | Ultem® 1000 unfilled | Ultem® 2100 10% glass | Ultem® 2200 20% glass | Ultem® 2300 30% glass |
|-------------------|---|----------------------|-----------------------|-----------------------|-----------------------|
| <b>PHYSICAL</b>   |   |                      |                       |                       |                       |
| D792              | Density (lb/in <sup>3</sup> )<br>(g/cm <sup>3</sup> )                                   | 0.046<br>1.28        | 0.048<br>1.34         | 0.051<br>1.42         | 0.055<br>1.51         |
| D570              | Water Absorption, 24 hrs (%)  | 0.25                 | 0.21                  | 0.19                  | 0.18                  |
| D570              | Water Absorption, Saturation (%)  | 1.25                 | 1.20                  | 1.10                  | 0.90                  |
| <b>MECHANICAL</b> |   |                      |                       |                       |                       |
| D638              | Tensile Strength (psi)  | 16,500               | 16,800                | 16,900                | 17,000                |
| D638              | Tensile Modulus (psi)   | 500,000              | 650,000               | 700,000               | 800,000               |
| D638              | Tensile Elongation at Break (%)   | 80                   | 6                     | 3                     | 3                     |
| D790              | Flexural Strength (psi)   | 20,000               | 23,000                | 25,000                | 27,000                |
| D790              | Flexural Modulus (psi)  | 500,000              | -                     | -                     | 850,000               |
| D695              | Compressive Strength (psi)  | 22,000               | 24,000                | 28,000                | 32,000                |
| D695              | Compressive Modulus (psi)   | 480,000              | -                     | -                     | 625,000               |
| D785              | Hardness, Rockwell  | M112 / R125          | M114 / R127           | M114 / R127           | M114 / R127           |
| D256              | IZOD Notched Impact (ft-lb/in)  | 0.5                  | 0.6                   | 0.8                   | 1.0                   |
| <b>THERMAL</b>    |   |                      |                       |                       |                       |
| D696              | Coefficient of Linear Thermal Expansion (x 10 <sup>-5</sup> in./in./°F)                 | 3.1                  | 1.8                   | 1.4                   | 1.1                   |
| D648              | Heat Deflection Temp (°F / °C) at 264 psi   | 400 / 204            | 405 / 207             | 408 / 208             | 410 / 210             |
| D3418             | Glass Transition Temp (°F / °C)   | 410 / 210            | 410 / 210             | 410 / 210             | 410 / 210             |
| -                 | Max Operating Temp (°F / °C)  | 340 / 171            | 340 / 171             | 340 / 171             | 340 / 171             |
| C177              | Thermal Conductivity (BTU-in/ft <sup>2</sup> -hr-°F) (x 10 <sup>-4</sup> cal/cm-sec-°C) | 0.85<br>2.93         | 1.22<br>4.20          | 1.43<br>4.93          | 1.56<br>5.37          |
| UL94              | Flammability Rating   | V-0                  | V-0                   | V-0                   | V-0                   |
| <b>ELECTRICAL</b> |   |                      |                       |                       |                       |
| D149              | Dielectric Strength (V/mil) short time, 1/8" thick                                      | 830                  | -                     | -                     | 770                   |
| D150              | Dielectric Constant at 1 KHz  | 3.15                 | 3.5                   | 3.5                   | 3.7                   |
| D150              | Dissipation Factor at 1 KHz   | 0.0013               | 0.0014                | 0.0015                | 0.0015                |
| EOS/ESD           | Surface Resistivity   | > 10 <sup>13</sup>   | > 10 <sup>13</sup>    | > 10 <sup>13</sup>    | > 10 <sup>13</sup>    |

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