

ULTEM® (Polyetherimide)

ULTEM is an amorphous thermoplastic polyetherimide (PEI) material that combines exceptional mechanical, thermal, and electrical properties. Natural ULTEM® 1000 (unreinforced) is a translucent amber material. The addition of glass fiber reinforcement to the basic ULTEM® provides it with both greater tensile strength and rigidity while at the same time improving dimensional stability.

- Excellent mechanical strength
ULTEM® exhibits high tensile strength at room temperature and retains a significant portion of this strength at elevated temperatures. Glass fibers further increase high-temperature strength.
- Outstanding heat resistance
ULTEM® retains its physical properties at elevated temperatures.
- Exceptional resistance to environmental forces
Environmental characteristics of ULTEM® include its stress resistance
- Inherent flame resistance with low smoke evolution
- High mechanical strength
- High dielectric strength and stability
The high dielectric strength and constant values of ULTEM® make it an excellent electrical insulator UL94 VO
- Low dissipation factor over a wide range of frequencies
- Excellent machinability and finishing characteristics
ULTEM® can be easily machined with conventional metalworking tools, painted, hot stamped, printed, or metallized.
- Natural Grade is FDS, NSF, and USP Class VI compliant

ULTEM® has many applications in medical, electronic/electrical, microwave, automotive, and aircraft industries.

| PROPERTIES | ASTM Test Method | Units | ULTEM® | ULTEM® 10% Glass Reinforced | ULTEM® 20% Glass Reinforced | ULTEM® 30% Glass Reinforced |
|--|------------------|-------------------------------|------------------------|-----------------------------|-----------------------------|-----------------------------|
| Physical | | | | | | |
| Specific Gravity | D792 | - | 1.27 | 1.34 | 1.42 | 1.51 |
| Water Absorption, @24 hours, 73°F (23C) | D570 | % | 0.25 | 0.21 | 0.19 | 0.16 |
| @Equilibrium, 73°F (23C) | D570 | % | 1.25 | 1.20 | 1.10 | 0.90 |
| Mechanical | | | | | | |
| Tensile Strength, Break, 73°F | D638 | psi | 15,200 | 16,600 | 20,100 | 24,500 |
| Tensile Modulus, 73°F | D638 | psi | 430,000 | 650,000 | 1,000,000 | 1,300,000 |
| Elongation, Break, 73°F | D638 | % | 60 | 6 | 3 | 13 |
| Elongation, Yield, 73°F | D638 | % | 7-8 | 5 | N/A | N/A |
| Flexural Strength, 73°F | D790 | psi | 22,000 | 28,000 | 30,000 | 33,000 |
| Flexural Modulus, 73°F | D790 | psi | 480,000 | 650,000 | 900,000 | 1,300,000 |
| Izod Impact Strength, Notched, 73°F | D256 | ft-lbs/in | 1.0 | 1.1 | 1.6 | 1.6 |
| Rockwell Hardness | D785 | "M" Scale | 109 | 114 | 114 | 114 |
| Compressive Strength | D695 | psi | 21,900 | 22,000 | 28,700 | 30,700 |
| Compressive Modulus | D695 | psi | 480,000 | 541,000 | 809,000 | 938,000 |
| Shear Strength, Ultimate | - | psi | 15,000 | 13,000 | 13,500 | 14,000 |
| Thermal | | | | | | |
| Deflection Temperature @ 66 psi, 1/4" | D648 | °F | 410 | 410 | 410 | 414 |
| @264 psi, 1/4" | D648 | °F | 392 | 405 | 408 | 410 |
| Coefficient of Thermal Expansion | D696 | in/in-°F | 3.1 x 10 ⁻⁵ | 1.8 x 10 ⁻⁵ | 1.4 x 10 ⁻⁵ | 1.1 x 10 ⁻⁵ |
| Melting Point | - | °F | 426 | - | - | - |
| Thermal Conductivity | D2214 | BTU-in/hr-ft ² -°F | 0.85 | 1.22 | 1.43 | 1.56 |
| Flammability | UL94 | - | V-0 | V-0 | V-0 | V-0 |
| Electrical | | | | | | |
| Dielectric Strength, In Oil | D149 | V/mil | 710 | 700 | 670 | 630 |
| In Air | D149 | V/mil | 830 | - | - | 770 |
| Dielectric Constant, 1kHz, 50% RH | D150 | - | 3.15 | 3.5 | 3.5 | 3.7 |
| Dissipation Factor 1kHz, 50% RH, 73°F (23°C) | D150 | - | 0.0013 | 0.0014 | 0.0015 | 0.0015 |
| Volume Resistivity, 1/16" | D257 | ohm-cm | 1.0 x 10 ¹⁷ | 1.0 x 10 ¹⁷ | 7.0 x 10 ¹⁶ | 3.0 x 10 ¹⁶ |

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.



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