

ULTEMTM RESIN 1000

REGION AMERICAS

DESCRIPTION

ULTEM 1000 resin is an amorphous, transparent polyetherimide (PEI) plastic offering a glass transition temperature (T_g) of 217°C. This inherently flame retardant resin has UL94 V0, V2 and 5VA ratings and is RoHS compliant. ULTEM 1000 resin is an unreinforced general purpose grade offering high heat resistance, high strength and modulus and broad chemical resistance up to high temperatures.

| INDUSTRY | SUB INDUSTRY |
|----------------------------|--|
| Automotive | Heavy Truck, Automotive Interiors, Bus, Automotive Under the Hood |
| Building and Construction | Outdoor, Lawn and Landscape |
| Consumer | Ophthalmics, Sport/Leisure, Personal Accessory, Home Appliances, Personal Recreation, Commercial Appliance, Recreational Vehicle |
| Electrical and Electronics | Electrical Devices and Displays, Lighting, Electrical Components and Infrastructure |
| Hydrocarbon and Energy | Fossil, Electric Vehicle, Wind Energy, Energy Storage |
| Industrial | Defense, Semiconductors, Textile, Servomotor, Electronic Material Handling, Industrial Material Handling, Composite |
| Mass Transportation | Aircraft Interiors, Specialty Vehicles, Rail |
| Packaging | Rigid Packaging, Consumer Packaging |

TYPICAL PROPERTY VALUES

Revision 20200108

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|----------------|-----------|--------------|
| MECHANICAL | | | |
| Tensile Stress, yld, Type I, 5 mm/min | 110 | MPa | ASTM D 638 |
| Tensile Strain, yld, Type I, 5 mm/min | 7 | % | ASTM D 638 |
| Tensile Strain, brk, Type I, 5 mm/min | 60 | % | ASTM D 638 |
| Tensile Modulus, 5 mm/min | 3580 | MPa | ASTM D 638 |
| Flexural Stress, yld, 2.6 mm/min, 100 mm span | 165 | MPa | ASTM D 790 |
| Flexural Modulus, 2.6 mm/min, 100 mm span | 3510 | MPa | ASTM D 790 |
| Hardness, Rockwell M | 109 | - | ASTM D 785 |
| Taber Abrasion, CS-17, 1 kg | 10 | mg/1000cy | ASTM D 1044 |
| IMPACT | | | |
| Izod Impact, unnotched, 23°C | 1335 | J/m | ASTM D 4812 |
| Izod Impact, notched, 23°C | 53 | J/m | ASTM D 256 |
| Izod Impact, Reverse Notched, 3.2 mm | 1335 | J/m | ASTM D 256 |
| Gardner, 23°C | 36 | J | ASTM D 3029 |
| THERMAL | | | |
| Vicat Softening Temp, Rate B/50 | 218 | °C | ASTM D 1525 |
| HDT, 0.45 MPa, 6.4 mm, unannealed | 210 | °C | ASTM D 648 |
| HDT, 1.82 MPa, 6.4 mm, unannealed | 201 | °C | ASTM D 648 |
| CTE, -20°C to 150°C, flow | 5.58E-05 | 1/°C | ASTM E 831 |
| CTE, -20°C to 150°C, xflow | 5.4E-05 | 1/°C | ASTM E 831 |
| Thermal Conductivity | 0.22 | W/m·°C | ASTM C177 |
| Relative Temp Index, Elec ⁽¹⁾ | 170 | °C | UL 746B |

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|-----------------------------------|----------|--------------|
| Relative Temp Index, Mech w/impact ⁽¹⁾ | 170 | °C | UL 746B |
| Relative Temp Index, Mech w/o impact ⁽¹⁾ | 170 | °C | UL 746B |
| PHYSICAL | | | |
| Specific Gravity | 1.27 | - | ASTM D 792 |
| Water Absorption, 24 hours | 0.25 | % | ASTM D 570 |
| Water Absorption, equilibrium, 23C | 1.25 | % | ASTM D 570 |
| Mold Shrinkage, flow, 3.2 mm | 0.5 – 0.7 | % | SABIC method |
| Melt Flow Rate, 337°C/6.6 kgf | 9 | g/10 min | ASTM D 1238 |
| Poisson's Ratio | 0.36 | - | ASTM E 132 |
| ELECTRICAL | | | |
| Volume Resistivity | 1.E+17 | Ohm-cm | ASTM D 257 |
| Dielectric Strength, in air, 1.6 mm | 32.7 | kV/mm | ASTM D 149 |
| Dielectric Strength, in oil, 1.6 mm | 28.0 | kV/mm | ASTM D 149 |
| Dielectric Strength, in oil, 3.2 mm | 19.7 | kV/mm | ASTM D 149 |
| Relative Permittivity, 100 Hz | 3.15 | - | ASTM D 150 |
| Relative Permittivity, 1 kHz | 3.15 | - | ASTM D 150 |
| Dissipation Factor, 100 Hz | 0.0015 | - | ASTM D 150 |
| Dissipation Factor, 1 kHz | 0.0012 | - | ASTM D 150 |
| Dissipation Factor, 2450 MHz | 0.0025 | - | ASTM D 150 |
| Comparative Tracking Index (UL) {PLC} | 4 | PLC Code | UL 746A |
| Hot-Wire Ignition (HWI), PLC 1 | ≥3 | mm | UL 746A |
| Hot-Wire Ignition (HWI), PLC 2 | ≥0.75 | mm | UL 746A |
| High Amp Arc Ignition (HAI), PLC 3 | ≥3 | mm | UL 746A |
| High Amp Arc Ignition (HAI), PLC 4 | ≥0.75 | mm | UL 746A |
| High Voltage Arc Track Rate {PLC} | 2 | PLC Code | UL 746A |
| Arc Resistance, Tungsten {PLC} | 5 | PLC Code | ASTM D 495 |
| FLAME CHARACTERISTICS ⁽¹⁾ | | | |
| UL Yellow Card Link | E121562-101048254 | - | - |
| UL Recognized, 94-5VA Flame Class Rating | ≥3 | mm | UL 94 |
| UL Recognized, 94V-0 Flame Class Rating | ≥0.75 | mm | UL 94 |
| UL Recognized, 94V-2 Flame Class Rating | ≥0.4 | mm | UL 94 |
| UV-light, water exposure/immersion | F2 | - | UL 746C |
| Oxygen Index (LOI) | 47 | % | ASTM D 2863 |
| NBS Smoke Density, Flaming, Ds 4 min | 0.7 | - | ASTM E 662 |
| INJECTION MOLDING | | | |
| Drying Temperature | 150 | °C | |
| Drying Time | 4 – 6 | hrs | |
| Drying Time (Cumulative) | 24 | hrs | |
| Maximum Moisture Content | 0.02 | % | |
| Melt Temperature | 350 – 400 | °C | |
| Nozzle Temperature | 345 – 400 | °C | |
| Front - Zone 3 Temperature | 345 – 400 | °C | |
| Middle - Zone 2 Temperature | 340 – 400 | °C | |
| Rear - Zone 1 Temperature | 330 – 400 | °C | |
| Mold Temperature | 135 – 165 | °C | |

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|------------------------------------|----------------|-------|--------------|
| Back Pressure | 0.3 – 0.7 | MPa | |
| Screw Speed | 40 – 70 | rpm | |
| Shot to Cylinder Size | 40 – 60 | % | |
| Vent Depth | 0.025 – 0.076 | mm | |
| EXTRUSION BLOW MOLDING | | | |
| Drying Temperature | 140 – 150 | °C | |
| Drying Time | 4 – 6 | hrs | |
| Drying Time (Cumulative) | 24 | hrs | |
| Maximum Moisture Content | 0.01 – 0.02 | % | |
| Melt Temperature (Parison) | 320 – 355 | °C | |
| Barrel - Zone 1 Temperature | 325 – 350 | °C | |
| Barrel - Zone 2 Temperature | 330 – 355 | °C | |
| Barrel - Zone 3 Temperature | 330 – 355 | °C | |
| Barrel - Zone 4 Temperature | 330 – 355 | °C | |
| Adapter - Zone 5 Temperature | 330 – 355 | °C | |
| Head - Zone 6 - Top Temperature | 330 – 355 | °C | |
| Head - Zone 7 - Bottom Temperature | 330 – 355 | °C | |
| Screw Speed | 10 – 70 | rpm | |
| Mold Temperature | 65 – 175 | °C | |
| Die Temperature | 325 – 355 | °C | |

(1) UL Ratings shown on the technical datasheet might not cover the full range of thicknesses and colors. For details, please see the UL Yellow Card.

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