



Ultem* Resin 1000EF

Asia Pacific: COMMERCIAL

Transparent, enhanced flow Polyetherimide (Tg 217C) with internal mold release. ECO Conforming, U.S. FDA and EU Food Contact compliant.

| TYPICAL PROPERTIES ¹ | TYPICAL VALUE | UNIT | STANDARD |
|--|---------------|---------------------|-------------|
| MECHANICAL | | | |
| Tensile Stress, yld, Type I, 5 mm/min | 1120 | kgf/cm ² | ASTM D 638 |
| Tensile Stress, brk, Type I, 5 mm/min | 860 | kgf/cm ² | 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 | 36600 | kgf/cm ² | ASTM D 638 |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 1680 | kgf/cm ² | ASTM D 790 |
| Flexural Modulus, 1.3 mm/min, 50 mm span | 35800 | kgf/cm ² | ASTM D 790 |
| Tensile Stress, yield, 5 mm/min | 105 | MPa | ISO 527 |
| Tensile Stress, break, 5 mm/min | 85 | MPa | ISO 527 |
| Tensile Strain, yield, 5 mm/min | 6 | % | ISO 527 |
| Tensile Strain, break, 5 mm/min | 60 | % | ISO 527 |
| Tensile Modulus, 1 mm/min | 3200 | MPa | ISO 527 |
| Flexural Stress, yield, 2 mm/min | 160 | MPa | ISO 178 |
| Flexural Modulus, 2 mm/min | 3300 | MPa | ISO 178 |
| IMPACT | | | |
| Izod Impact, unnotched, 23°C | 136 | cm-kgf/cm | ASTM D 4812 |
| Izod Impact, notched, 23°C | 5 | cm-kgf/cm | ASTM D 256 |
| Izod Impact, Reverse Notched, 3.2 mm | 136 | cm-kgf/cm | ASTM D 256 |
| Instrumented Impact Total Energy, 23°C | 387 | cm-kgf | ASTM D 3763 |
| Izod Impact, unnotched 80*10*4 +23°C | NB | kJ/m ² | ISO 180/1U |
| Izod Impact, unnotched 80*10*4 -30°C | NB | kJ/m ² | ISO 180/1U |
| Izod Impact, notched 80*10*4 +23°C | 6 | kJ/m ² | ISO 180/1A |
| Izod Impact, notched 80*10*4 -30°C | 6 | kJ/m ² | ISO 180/1A |

1) Typical values only. Variations within normal tolerances are possible for various colours. All values are measured at least after 48 hours storage at 23°C/50% relative humidity.
All properties, except the melt volume rate are measured on injection moulded samples.
All samples are prepared according to ISO 294.

2) Only typical data for material selection purpose. Not to be used for part or tool design.
3) This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.
4) Own measurement according to UL.

Source, GMD, Last Update: 11/05/2003

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| TYPICAL PROPERTIES ¹ | TYPICAL VALUE | UNIT | STANDARD |
|---|---------------|-------------------------|----------------|
| IMPACT | | | |
| Izod Impact, notched 80*10*4 -30°C | 6 | kJ/m ² | ISO 180/1A |
| Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm | 4 | kJ/m ² | ISO 179/1eA |
| Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm | 4 | kJ/m ² | ISO 179/1eA |
| Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm | NB | kJ/m ² | ISO 179/1eU |
| Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm | NB | kJ/m ² | ISO 179/1eU |
| THERMAL | | | |
| Vicat Softening Temp, Rate B/50 | 219 | °C | ASTM D 1525 |
| HDT, 0.45 MPa, 3.2 mm, unannealed | 207 | °C | ASTM D 648 |
| HDT, 1.82 MPa, 3.2mm, unannealed | 199 | °C | ASTM D 648 |
| 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, -40°C to 150°C, flow | 5.5E-05 | 1/°C | ASTM E 831 |
| CTE, -40°C to 150°C, xflow | 5.5E-05 | 1/°C | ASTM E 831 |
| Thermal Conductivity | 0.22 | W/m-°C | ASTM C 177 |
| Thermal Conductivity | 0.24 | W/m-°C | ISO 8302 |
| CTE, 23°C to 150°C, flow | 5.5E-05 | 1/°C | ISO 11359-2 |
| CTE, 23°C to 150°C, xflow | 5.5E-05 | 1/°C | ISO 11359-2 |
| Ball Pressure Test, 125°C +/- 2°C | Passes | - | IEC 60695-10-2 |
| Vicat Softening Temp, Rate A/50 | 215 | °C | ISO 306 |
| Vicat Softening Temp, Rate B/50 | 211 | °C | ISO 306 |
| Vicat Softening Temp, Rate B/120 | 212 | °C | ISO 306 |
| HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm | 200 | °C | ISO 75/Be |
| HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm | 190 | °C | ISO 75/Ae |
| HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm | 198 | °C | ISO 75/Bf |
| HDT/af, 1.8 MPa Flatw 80*10*4 sp=64mm | 188 | °C | ISO 75/af |
| 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 on Tensile Bar, flow (2) | 0.5 - 0.7 | % | GE Method |
| Mold Shrinkage, flow, 3.2 mm | 0.5 - 0.7 | % | GE Method |
| Mold Shrinkage, xflow, 3.2 mm | 0.5 - 0.7 | % | GE Method |
| Melt Flow Rate, 337°C/6.6 kgf | 12 | g/10 min | ASTM D 1238 |
| Density | 1.27 | g/cm ³ | ISO 1183 |
| Water Absorption, (23°C/sat) | 1.25 | % | ISO 62 |
| Moisture Absorption (23°C / 50% RH) | 0.7 | % | ISO 62 |
| Melt Volume Rate, MVR at 360°C/5.0 kgf | 17 | cm ³ /10 min | ISO 1133 |

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| THERMAL | | | |
| HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm | 188 | °C | ISO 75/Af |
| PHYSICAL | | | |
| Specific Gravity | 1.27 | - | ASTM D 792 |
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| PROCESSING PARAMETERS | TYPICAL VALUE | UNIT |
|-----------------------------|---------------|------|
| 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 |
| 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 |

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