



**ULTEM™ Resin 1010**  
**Americas: COMMERCIAL**

ULTEM™ 1010 resin is an amorphous, transparent polyetherimide (PEI) plastic offering enhanced flow and a glass transition temperature (Tg) of 217°C. This inherently flame retardant resin has UL94 V0 and 5VA ratings. ULTEM™ 1010 resin is an unreinforced general purpose grade offering high heat resistance, high strength and modulus and broad chemical resistance up to high temperatures.

| TYPICAL PROPERTIES <sup>1</sup>               | TYPICAL VALUE | Unit                | Standard    |
|-----------------------------------------------|---------------|---------------------|-------------|
| <b>MECHANICAL</b>                             |               |                     |             |
| Tensile Stress, yld, Type I, 5 mm/min         | 1120          | kgf/cm <sup>2</sup> | 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                     | 36500         | kgf/cm <sup>2</sup> | ASTM D 638  |
| Flexural Stress, yld, 2.6 mm/min, 100 mm span | 1680          | kgf/cm <sup>2</sup> | ASTM D 790  |
| Flexural Modulus, 2.6 mm/min, 100 mm span     | 35800         | kgf/cm <sup>2</sup> | ASTM D 790  |
| Hardness, Rockwell M                          | 109           | -                   | ASTM D 785  |
| Taber Abrasion, CS-17, 1 kg                   | 10            | mg/1000cy           | ASTM D 1044 |
| <b>IMPACT</b>                                 |               |                     |             |
| Izod Impact, unnotched, 23°C                  | 136           | cm-kgf/cm           | ASTM D 4812 |
| Izod Impact, notched, 23°C                    | 3             | cm-kgf/cm           | ASTM D 256  |
| Izod Impact, Reverse Notched, 3.2 mm          | 119           | cm-kgf/cm           | ASTM D 256  |
| Gardner, 23°C                                 | 345           | cm-kgf              | ASTM D 3029 |
| <b>THERMAL</b>                                |               |                     |             |
| Vicat Softening Temp, Rate B/50               | 218           | °C                  | ASTM D 1525 |
| HDT, 0.45 MPa, 6.4 mm, unannealed             | 207           | °C                  | ASTM D 648  |
| HDT, 1.82 MPa, 6.4 mm, unannealed             | 198           | °C                  | ASTM D 648  |
| CTE, -20°C to 150°C, flow                     | 5.58E-05      | 1/°C                | ASTM E 831  |
| Thermal Conductivity                          | 0.22          | W/m-°C              | ASTM C 177  |
| Relative Temp Index, Elec                     | 170           | °C                  | UL 746B     |
| Relative Temp Index, Mech w/impact            | 170           | °C                  | UL 746B     |
| Relative Temp Index, Mech w/o impact          | 170           | °C                  | UL 746B     |
| <b>PHYSICAL</b>                               |               |                     |             |
| Specific Gravity                              | 1.27          | -                   | ASTM D 792  |

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(2) Only typical data for selection purposes. 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) Internal measurements according to UL standards.

(5) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.

(6) Needs hard coat to consistently pass 60 sec Vertical Burn.

Source GMD, last updated:  
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|---------------------------------------------|---------------|----------|--------------|
| <b>PHYSICAL</b>                             |               |          |              |
| Water Absorption, 24 hours                  | 0.25          | %        | ASTM D 570   |
| Water Absorption, equilibrium, 23C          | 1.25          | %        | ASTM D 570   |
| Mold Shrinkage, flow, 3.2 mm (5)            | 0.5 - 0.7     | %        | SABIC Method |
| Melt Flow Rate, 337°C/6.6 kgf               | 17.8          | g/10 min | ASTM D 1238  |
| <b>ELECTRICAL</b>                           |               |          |              |
| Volume Resistivity                          | 1.E+17        | Ohm-cm   | ASTM D 257   |
| Dielectric Strength, in air, 1.6 mm         | 32.6          | kV/mm    | ASTM D 149   |
| Dielectric Strength, in oil, 1.6 mm         | 27.9          | kV/mm    | ASTM D 149   |
| Relative Permittivity, 1 kHz                | 3.15          | -        | ASTM D 150   |
| Dissipation Factor, 1 kHz                   | 0.0013        | -        | ASTM D 150   |
| Dissipation Factor, 2450 MHz                | 0.0025        | -        | ASTM D 150   |
| Arc Resistance, Tungsten {PLC}              | 5             | PLC Code | ASTM D 495   |
| Hot Wire Ignition {PLC}                     | 1             | PLC Code | UL 746A      |
| High Voltage Arc Track Rate {PLC}           | 2             | PLC Code | UL 746A      |
| High Ampere Arc Ign, surface {PLC}          | 3             | PLC Code | UL 746A      |
| Comparative Tracking Index (UL) {PLC}       | 4             | PLC Code | UL 746A      |
| <b>FLAME CHARACTERISTICS</b>                |               |          |              |
| UL Recognized, 94V-0 Flame Class Rating (3) | 0.75          | mm       | UL 94        |
| UL Recognized, 94-5VA Rating (3)            | 3             | mm       | UL 94        |
| Oxygen Index (LOI)                          | 44            | %        | ASTM D 2863  |
| NBS Smoke Density, Flaming, Ds 4 min        | 2             | -        | ASTM E 662   |

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| PROCESSING PARAMETERS       | TYPICAL VALUE | Unit |
|-----------------------------|---------------|------|
| <b>Injection Molding</b>    |               |      |
| 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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