

## SABIC Innovative Plastics ULTEM HU1010 PEI

Category : Polymer , Thermoplastic , Polyetherimide (PEI)

### Material Notes:

Transparent, enhanced flow Polyetherimide (Tg 217C). ECO Conforming. For medical devices and pharmaceutical applications. Healthcare management of change, biocompatible (ISO 10993 or USP Class VI), food contact compliant. EtO and steam sterilizable.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_SABIC-Innovative-Plastics-ULTEM-HU1010-PEI.php](http://www.lookpolymers.com/polymer_SABIC-Innovative-Plastics-ULTEM-HU1010-PEI.php)

| Physical Properties                | Metric                                                 | English                                                | Comments                                |
|------------------------------------|--------------------------------------------------------|--------------------------------------------------------|-----------------------------------------|
| Specific Gravity                   | 1.27 g/cc                                              | 1.27 g/cc                                              | ASTM D792                               |
| Density                            | 1.27 g/cc                                              | 0.0459 lb/in <sup>3</sup>                              | ISO 1183                                |
| Moisture Absorption                | 0.700 %                                                | 0.700 %                                                | 23Â°C / 50% RH; ISO 62                  |
| Moisture Absorption at Equilibrium | 1.25 %                                                 | 1.25 %                                                 | ASTM D570                               |
| Water Absorption at Saturation     | 1.25 %                                                 | 1.25 %                                                 | ISO 62                                  |
| Linear Mold Shrinkage, Flow        | 0.0050 - 0.0070 cm/cm<br>@Thickness 3.20 mm            | 0.0050 - 0.0070 in/in<br>@Thickness 0.126 in           | SABIC Method                            |
| Melt Flow                          | 17.8 g/10 min<br>@Load 6.60 kg,<br>Temperature 337 Â°C | 17.8 g/10 min<br>@Load 14.6 lb,<br>Temperature 639 Â°F | ASTM D1238                              |
| Melt Index of Compound             | 25 g/10 min<br>@Load 5.00 kg,<br>Temperature 360 Â°C   | 25 g/10 min<br>@Load 11.0 lb,<br>Temperature 680 Â°F   | MVR [cm <sup>3</sup> /10 min]; ISO 1133 |

| Mechanical Properties     | Metric  | English   | Comments                    |
|---------------------------|---------|-----------|-----------------------------|
| Hardness, Rockwell M      | 109     | 109       | ASTM D785                   |
| Tensile Strength at Break | 105 MPa | 15200 psi | Type I, 5 mm/min; ASTM D638 |
| Tensile Strength, Yield   | 105 MPa | 15200 psi | 5 mm/min; ISO 527           |
|                           | 110 MPa | 16000 psi | Type I, 5 mm/min; ASTM D638 |
| Elongation at Break       | 60 %    | 60 %      | Type I, 5 mm/min; ASTM D638 |
|                           | 60 %    | 60 %      | 5 mm/min; ISO 527           |
| Elongation at Yield       | 6.0 %   | 6.0 %     | 5 mm/min; ISO 527           |
|                           | 7.0 %   | 7.0 %     | Type I, 5 mm/min; ASTM D638 |

| Tensile Modulus<br>Mechanical Properties | 3.20 GPa<br>Metric       | 464 ksi<br>English       | 1 mm/min; ISO 527<br>Comments      |
|------------------------------------------|--------------------------|--------------------------|------------------------------------|
|                                          | 3.58 GPa                 | 519 ksi                  | 5 mm/min; ASTM D638                |
| Flexural Yield Strength                  | 160 MPa                  | 23200 psi                | 2 mm/min; ISO 178                  |
|                                          | 165 MPa                  | 23900 psi                | 2.6 mm/min, 100 mm span; ASTM D790 |
|                                          | 174 MPa                  | 25200 psi                | 1.3 mm/min, 50 mm span; ASTM D790  |
| Flexural Modulus                         | 3.30 GPa                 | 479 ksi                  | 2 mm/min; ISO 178                  |
|                                          | 3.42 GPa                 | 496 ksi                  | 1.3 mm/min, 50 mm span; ASTM D790  |
|                                          | 3.51 GPa                 | 509 ksi                  | 2.6 mm/min, 100 mm span; ASTM D790 |
| Izod Impact, Notched                     | 0.320 J/cm               | 0.599 ft-lb/in           | ASTM D256                          |
|                                          | 0.350 J/cm               | 0.656 ft-lb/in           | ASTM D256                          |
|                                          | @Temperature -30.0<br>°C | @Temperature -22.0<br>°F | ASTM D256                          |
|                                          | 11.67 J/cm               | 21.86 ft-lb/in           | ASTM D256                          |
|                                          | @Thickness 3.20 mm       | @Thickness 0.126 in      | ASTM D256                          |
| Izod Impact, Unnotched                   | 13.35 J/cm               | 25.01 ft-lb/in           | ASTM D4812                         |
| Izod Impact, Notched (ISO)               | 5.00 kJ/mÂ²              | 2.38 ft-lb/inÂ²          | 80*10*4; ISO 180/1A                |
|                                          | 5.00 kJ/mÂ²              | 2.38 ft-lb/inÂ²          | 80*10*4; ISO 180/1A                |
|                                          | @Temperature -30.0<br>°C | @Temperature -22.0<br>°F | 80*10*4; ISO 180/1A                |
| Charpy Impact, Notched                   | 0.300 J/cmÂ²             | 1.43 ft-lb/inÂ²          | Edgew 80*10*4 sp=62mm; ISO 179/1eA |
| Gardner Impact                           | 33.0 J                   | 24.3 ft-lb               | ASTM D3029                         |
| Dart Drop, Total Energy                  | 33.0 J                   | 24.3 ft-lb               | ASTM D3763                         |
|                                          | @Temperature 23.0<br>°C  | @Temperature 73.4 Â°F    | ASTM D3763                         |
| Taber Abrasion, mg/1000 Cycles           | 10                       | 10                       | CS-17, 1 kg; ASTM D1044            |

| Thermal Properties            | Metric                           | English                         | Comments    |
|-------------------------------|----------------------------------|---------------------------------|-------------|
| CTE, linear, Parallel to Flow | 50.0 Âµm/m-Â°C                   | 27.8 Âµin/in-Â°F                | ISO 11359-2 |
|                               | @Temperature -40.0 -<br>40.0 Â°C | @Temperature -40.0 -<br>104 Â°F | ISO 11359-2 |
|                               | 55.8 Âµm/m-Â°C                   | 31.0 Âµin/in-Â°F                |             |

| Thermal Properties                          | Metric                        | English                       | Comments                         |
|---------------------------------------------|-------------------------------|-------------------------------|----------------------------------|
|                                             | @ Temperature -20.0 - 150 Â°C | @ Temperature -4.00 - 302 Â°F |                                  |
| CTE, linear, Transverse to Flow             | 50.0 Âµm/m-Â°C                | 27.8 Âµin/in-Â°F              | ASTM E 831                       |
|                                             | @Temperature -40.0 - 40.0 Â°C | @Temperature -40.0 - 104 Â°F  |                                  |
|                                             | 50.0 Âµm/m-Â°C                | 27.8 Âµin/in-Â°F              | ISO 11359-2                      |
|                                             | @Temperature -40.0 - 40.0 Â°C | @Temperature -40.0 - 104 Â°F  |                                  |
| Thermal Conductivity                        | 0.220 W/m-K                   | 1.53 BTU-in/hr-ftÂ²-Â°F       | ASTM C177                        |
| Deflection Temperature at 0.46 MPa (66 psi) | 207 Â°C                       | 405 Â°F                       | unannealed; ASTM D648            |
|                                             | @Thickness 6.40 mm            | @Thickness 0.252 in           |                                  |
| Deflection Temperature at 1.8 MPa (264 psi) | 193 Â°C                       | 379 Â°F                       | Flatw 80*10*4 sp=64mm; ISO 75/Af |
|                                             | 198 Â°C                       | 388 Â°F                       |                                  |
|                                             | @Thickness 6.40 mm            | @Thickness 0.252 in           | unannealed; ASTM D648            |
| Vicat Softening Point                       | 211 Â°C                       | 412 Â°F                       | Rate B/50; ISO 306               |
|                                             | 212 Â°C                       | 414 Â°F                       | Rate B/120; ISO 306              |
|                                             | 218 Â°C                       | 424 Â°F                       | Rate B/50; ASTM D1525            |
| Glass Transition Temp, Tg                   | 217 Â°C                       | 423 Â°F                       |                                  |
| UL RTI, Electrical                          | 170 Â°C                       | 338 Â°F                       | UL 746B                          |
| UL RTI, Mechanical with Impact              | 170 Â°C                       | 338 Â°F                       | UL 746B                          |
| UL RTI, Mechanical without Impact           | 170 Â°C                       | 338 Â°F                       | UL 746B                          |
| Flammability, UL94                          | V-2                           | V-2                           | UL 94                            |
|                                             | @Thickness 0.710 mm           | @Thickness 0.0280 in          |                                  |
|                                             | V-0                           | V-0                           | UL 94                            |
|                                             | @Thickness 0.750 mm           | @Thickness 0.0295 in          |                                  |
|                                             | 5VA                           | 5VA                           | UL 94                            |
|                                             | @Thickness 3.00 mm            | @Thickness 0.118 in           |                                  |
| Oxygen Index                                | 44 %                          | 44 %                          | ASTM D2863                       |

| Optical Properties    | Metric | English | Comments                              |
|-----------------------|--------|---------|---------------------------------------|
| Transmission, Visible | 90 %   | 90 %    | transparent; thickness not quantified |

| Optical Properties                   | Metric                | English               | Comments            |
|--------------------------------------|-----------------------|-----------------------|---------------------|
| Electrical Properties                | Metric                | English               | Comments            |
| Volume Resistivity                   | 1.00e+17 ohm-cm       | 1.00e+17 ohm-cm       | ASTM D257           |
| Dielectric Constant                  | 3.15                  | 3.15                  | ASTM D150           |
|                                      | @Frequency 1000 Hz    | @Frequency 1000 Hz    |                     |
| Dielectric Strength                  | 28.0 kV/mm            | 711 kV/in             | in oil; ASTM D149   |
|                                      | @Thickness 1.60 mm    | @Thickness 0.0630 in  |                     |
|                                      | 32.7 kV/mm            | 831 kV/in             | in air; ASTM D149   |
|                                      | @Thickness 1.60 mm    | @Thickness 0.0630 in  |                     |
| Dissipation Factor                   | 0.0013                | 0.0013                | ASTM D150           |
|                                      | @Frequency 1000 Hz    | @Frequency 1000 Hz    |                     |
|                                      | 0.0025                | 0.0025                | ASTM D150           |
|                                      | @Frequency 2.45e+9 Hz | @Frequency 2.45e+9 Hz |                     |
| Arc Resistance                       | 120 - 180 sec         | 120 - 180 sec         | Tungsten; ASTM D495 |
| Comparative Tracking Index           | 100 - 175 V           | 100 - 175 V           | UL 746A             |
| Hot Wire Ignition, HWI               | 60 - 120 sec          | 60 - 120 sec          | UL 746A             |
| High Amp Arc Ignition, HAI           | 15 - 30 arcs          | 15 - 30 arcs          | UL 746A             |
| High Voltage Arc-Tracking Rate, HVTR | 25.4 - 80.0 mm/min    | 1.00 - 3.15 in/min    | UL 746A             |

| Descriptive Properties               | Value | Comments   |
|--------------------------------------|-------|------------|
| NBS Smoke Density, Flaming, Ds 4 min | 2     | ASTM E 662 |

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