

# ULTEM™ 1010F resin

Polyether Imide

SABIC Innovative Plastics

## Message:

ULTEM 1010F resin is an amorphous, transparent polyetherimide (PEI) plastic offering a glass transition temperature (Tg) of 217°C. This inherently flame retardant resin has UL94 V0, V2 and 5VA ratings and is RoHS compliant. ULTEM 1010F resin is an unreinforced general purpose grade offering high heat resistance, high strength and modulus and broad chemical resistance up to high temperatures with easy flow. This grade is US FDA and EU Food Contact compliant. ULTEM 1010F resin is not supported with biocompatibility information. For medical applications which require biocompatibility we offer ULTEM HU1010 resin.

| General Information                        |                                  |                        |                 |
|--------------------------------------------|----------------------------------|------------------------|-----------------|
| Features                                   | High strength                    |                        |                 |
|                                            | Good liquidity                   |                        |                 |
|                                            | Good chemical resistance         |                        |                 |
|                                            | Heat resistance, high            |                        |                 |
|                                            | Compliance of Food Exposure      |                        |                 |
|                                            | General                          |                        |                 |
|                                            | amorphous                        |                        |                 |
| Flame retardancy                           |                                  |                        |                 |
|                                            |                                  |                        |                 |
|                                            |                                  |                        |                 |
|                                            |                                  |                        |                 |
|                                            |                                  |                        |                 |
|                                            |                                  |                        |                 |
|                                            |                                  |                        |                 |
| Uses                                       | General                          |                        |                 |
| Agency Ratings                             | FDA Food Exposure, Not Rated     |                        |                 |
|                                            | European food contact, not rated |                        |                 |
| RoHS Compliance                            | RoHS compliance                  |                        |                 |
| Appearance                                 | Clear/transparent                |                        |                 |
| Processing Method                          | Injection molding                |                        |                 |
| Physical                                   | Nominal Value                    | Unit                   | Test Method     |
| Density                                    | 1.27                             | g/cm <sup>3</sup>      | ISO 1183        |
| Melt Volume-Flow Rate (MVR) (340°C/5.0 kg) | 13.0                             | cm <sup>3</sup> /10min | ISO 1133        |
| Molding Shrinkage - Flow <sup>1</sup>      | 0.50 - 0.70                      | %                      | Internal method |
| Water Absorption                           |                                  |                        | ISO 62          |
| Saturated, 23°C                            | 1.3                              | %                      | ISO 62          |
| Equilibrium, 23°C, 50% RH                  | 0.70                             | %                      | ISO 62          |
| Hardness                                   | Nominal Value                    | Unit                   | Test Method     |
| Ball Indentation Hardness (H 358/30)       | 140                              | MPa                    | ISO 2039-1      |
| Mechanical                                 | Nominal Value                    | Unit                   | Test Method     |
| Tensile Modulus                            | 3200                             | MPa                    | ISO 527-2/1     |
| Tensile Stress                             |                                  |                        | ISO 527-2/50    |
| Yield                                      | 105                              | MPa                    | ISO 527-2/50    |
| Fracture                                   | 85.0                             | MPa                    | ISO 527-2/50    |

|                                                              |               |                   |                 |
|--------------------------------------------------------------|---------------|-------------------|-----------------|
| Tensile Strain                                               |               |                   | ISO 527-2/50    |
| Yield                                                        | 6.0           | %                 | ISO 527-2/50    |
| Fracture                                                     | 60            | %                 | ISO 527-2/50    |
| Flexural Modulus <sup>2</sup>                                | 3300          | MPa               | ISO 178         |
| Flexural Stress                                              | 160           | MPa               | ISO 178         |
| Taber Abrasion Resistance (1000 Cycles, 1000 g, CS-17 Wheel) | 10.0          | mg                | Internal method |
| Impact                                                       | Nominal Value | Unit              | Test Method     |
| Notched Izod Impact <sup>3</sup>                             |               |                   | ISO 180/1A      |
| -30°C                                                        | 5.0           | kJ/m <sup>2</sup> | ISO 180/1A      |
| 23°C                                                         | 5.0           | kJ/m <sup>2</sup> | ISO 180/1A      |
| Unnotched Izod Impact Strength <sup>4</sup>                  |               |                   | ISO 180/1U      |
| -30°C                                                        | No Break      |                   | ISO 180/1U      |
| 23°C                                                         | No Break      |                   | ISO 180/1U      |
| Thermal                                                      | Nominal Value | Unit              | Test Method     |
| Heat Deflection Temperature <sup>5</sup>                     |               |                   |                 |
| 0.45 MPa, unannealed, 100 mm span                            | 195           | °C                | ISO 75-2/Be     |
| 1.8 MPa, unannealed, 100 mm span                             | 190           | °C                | ISO 75-2/Ae     |
| Vicat Softening Temperature                                  |               |                   |                 |
| --                                                           | 215           | °C                | ISO 306/A50     |
| --                                                           | 211           | °C                | ISO 306/B50     |
| --                                                           | 212           | °C                | ISO 306/B120    |
| Ball Pressure Test (125°C)                                   | Pass          |                   | IEC 60695-10-2  |
| Linear thermal expansion coefficient                         |               |                   | ISO 11359-2     |
| Flow: 23 to 150°C                                            | 5.0E-5        | cm/cm/°C          | ISO 11359-2     |
| Horizontal: 23 to 150°C                                      | 5.0E-5        | cm/cm/°C          | ISO 11359-2     |
| Thermal Conductivity                                         | 0.21          | W/m/K             | ISO 8302        |
| RTI Elec                                                     | 170           | °C                | UL 746          |
| RTI Imp                                                      | 170           | °C                | UL 746          |
| RTI                                                          | 170           | °C                | UL 746          |
| Electrical                                                   | Nominal Value | Unit              | Test Method     |
| Surface Resistivity                                          | > 1.0E+15     | ohms              | IEC 60093       |
| Volume Resistivity                                           | 1.0E+15       | ohms · cm         | IEC 60093       |
| Dielectric Strength (1.60 mm, in Oil)                        | 28            | kV/mm             | IEC 60243-1     |
| Relative Permittivity                                        |               |                   | IEC 60250       |
| 50 Hz                                                        | 2.90          |                   | IEC 60250       |
| 60 Hz                                                        | 2.90          |                   | IEC 60250       |
| 1 MHz                                                        | 2.90          |                   | IEC 60250       |
| Dissipation Factor                                           |               |                   | IEC 60250       |
| 50 Hz                                                        | 5.0E-4        |                   | IEC 60250       |
| 60 Hz                                                        | 5.0E-4        |                   | IEC 60250       |
| 1 MHz                                                        | 6.0E-3        |                   | IEC 60250       |

| 2.45 GHz                               | 2.5E-3        |      | IEC 60250      |
|----------------------------------------|---------------|------|----------------|
| Comparative Tracking Index             |               |      | IEC 60112      |
| --                                     | 150           | V    | IEC 60112      |
| Solution B                             | 100           | V    | IEC 60112      |
| Flammability                           | Nominal Value | Unit | Test Method    |
| Flame Rating                           |               |      | UL 94          |
| 0.750 mm                               | V-0           |      | UL 94          |
| 3.00 mm                                | 5VA           |      | UL 94          |
| Glow Wire Flammability Index (3.20 mm) | 960           | °C   | IEC 60695-2-12 |
| Oxygen Index                           | 47            | %    | ISO 4589-2     |
| Injection                              | Nominal Value | Unit |                |
| Drying Temperature                     | 150           | °C   |                |
| Drying Time                            | 4.0 - 6.0     | hr   |                |
| Suggested Max Moisture                 | 0.020         | %    |                |
| Hopper Temperature                     | 80.0 - 120    | °C   |                |
| Rear Temperature                       | 350 - 400     | °C   |                |
| Middle Temperature                     | 360 - 410     | °C   |                |
| Front Temperature                      | 370 - 420     | °C   |                |
| Nozzle Temperature                     | 360 - 410     | °C   |                |
| Processing (Melt) Temp                 | 370 - 410     | °C   |                |
| Mold Temperature                       | 140 - 180     | °C   |                |
| NOTE                                   |               |      |                |
| 1.                                     | Tensile Bar   |      |                |
| 2.                                     | 2.0 mm/min    |      |                |
| 3.                                     | 80*10*4       |      |                |
| 4.                                     | 80*10*4       |      |                |
| 5.                                     | 120*10*4 mm   |      |                |

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