

# ULTEM™ RESIN 2300F

## DESCRIPTION

ULTEM 2300F resin is a standard flow, 30% glass fiber reinforced polyetherimide resin. The material has global food contact approvals (FDA, CN, EC) and for selected colors it has NSF-51 certification. The material is RoHS compliant and is intrinsically flame retardant without the use of FR modifiers. It offers UL94 V0 and 5VA ratings. The material can also offer excellent dimension stability, strength, stiffness and creep resistance up to high temperature due to its high glass transition temperature of 217°C. The material is opaque and can be custom colored.

ISCC+ certified renewable bio-based solutions are available for this grade via differentiated color nomenclature.

### GENERAL INFORMATION

|                       |                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Features              | Flame Retardant, Chemical Resistance, Hydrolytic Stability, Low Warpage, Low Smoke and Toxicity, Amorphous, Low Shrinkage, IR Transparent, UV-C resistant, Sustainable (bio-based offerings), Food contact, Non halogenated flame retardant, Electroplatable, Creep resistant, Dimensional stability, High stiffness/Strength, High temperature resistance, No PFAS intentionally added |
| Fillers               | Glass Fiber                                                                                                                                                                                                                                                                                                                                                                             |
| Polymer Types         | Polyetherimide (PEI)                                                                                                                                                                                                                                                                                                                                                                    |
| Processing Techniques | Sheet extrusion, Injection Molding, Profile Extrusion, Extrusion, Compression molding                                                                                                                                                                                                                                                                                                   |
| Regional Availability | Europe, Asia, Americas                                                                                                                                                                                                                                                                                                                                                                  |

### INDUSTRY

### SUB INDUSTRY

|                            |                                                                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Automotive                 | Heavy Truck, Automotive Under the Hood, Aerospace, Motorcycle, Recreational/Specialty Vehicles                                                                        |
| Building and Construction  | Building Component, Water Management                                                                                                                                  |
| Consumer                   | Consumer Goods, Sport/Leisure, Personal Accessory, Home Appliances, Commercial Appliance, Furniture                                                                   |
| Electrical and Electronics | Energy Management, Drone Solutions, Mobile Phone - Computer - Tablets, Circuit Boards/Additives, Lighting, Printer Copier, Speaker - Earphone, Wireless Communication |
| Hygiene and Healthcare     | Personal and Professional Hygiene, Pharmaceutical Packaging and Drug Delivery, Surgical devices, General Healthcare, Patient Testing                                  |
| Industrial                 | Electrical, Material Handling, Textile, Eyewear                                                                                                                       |
| Mass Transportation        | Rail                                                                                                                                                                  |
| Packaging                  | Industrial Packaging                                                                                                                                                  |

## TYPICAL PROPERTY VALUES

Revision 20230725

| PROPERTIES                            | TYPICAL VALUES | UNITS     | TEST METHODS |
|---------------------------------------|----------------|-----------|--------------|
| MECHANICAL <sup>(1)</sup>             |                |           |              |
| Tensile Stress, break, 5 mm/min       | 175            | MPa       | ISO 527      |
| Tensile Strain, break, 5 mm/min       | 2.4            | %         | ISO 527      |
| Tensile Modulus, 1 mm/min             | 10500          | MPa       | ISO 527      |
| Flexural Stress, break, 2 mm/min      | 240            | MPa       | ISO 178      |
| Flexural Modulus, 2 mm/min            | 9600           | MPa       | ISO 178      |
| Ball Indentation Hardness, H358/30    | 165            | MPa       | ISO 2039-1   |
| Hardness, Rockwell M                  | 110            | -         | ISO 2039-2   |
| Taber Abrasion, CS-17, 1 kg           | 20             | mg/1000cy | SABIC method |
| Tensile Stress, brk, Type I, 5 mm/min | 175            | MPa       | ASTM D638    |
| Tensile Strain, brk, Type I, 5 mm/min | 2.5            | %         | ASTM D638    |
| Tensile Modulus, 5 mm/min             | 10400          | MPa       | ASTM D638    |

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| PROPERTIES                                          | TYPICAL VALUES | UNITS                   | TEST METHODS   |
|-----------------------------------------------------|----------------|-------------------------|----------------|
| Flexural Stress, brk, 2.6 mm/min, 100 mm span       | 230            | MPa                     | ASTM D790      |
| Flexural Modulus, 2.6 mm/min, 100 mm span           | 9400           | MPa                     | ASTM D790      |
| Flexural Stress, brk, 1.3 mm/min, 50 mm span        | 250            | MPa                     | ASTM D790      |
| Flexural Modulus, 1.3 mm/min, 50 mm span            | 9700           | MPa                     | ASTM D790      |
| Hardness, Rockwell M                                | 114            | -                       | ASTM D785      |
| <b>IMPACT <sup>(1)</sup></b>                        |                |                         |                |
| Izod Impact, notched 80*10*4 +23°C                  | 10             | kJ/m <sup>2</sup>       | ISO 180/1A     |
| Izod Impact, notched 80*10*4 -30°C                  | 10             | kJ/m <sup>2</sup>       | ISO 180/1A     |
| Izod Impact, unnotched 80*10*4 +23°C                | 40             | kJ/m <sup>2</sup>       | ISO 180/1U     |
| Izod Impact, unnotched 80*10*4 -30°C                | 40             | kJ/m <sup>2</sup>       | ISO 180/1U     |
| Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm          | 10             | kJ/m <sup>2</sup>       | ISO 179/1eA    |
| Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm         | 10             | kJ/m <sup>2</sup>       | ISO 179/1eA    |
| Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm          | 40             | kJ/m <sup>2</sup>       | ISO 179/1eU    |
| Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm         | 40             | kJ/m <sup>2</sup>       | ISO 179/1eU    |
| Izod Impact, notched, 23°C                          | 90             | J/m                     | ASTM D256      |
| Izod Impact, notched, -30°C                         | 80             | J/m                     | ASTM D256      |
| Izod Impact, Reverse Notched, 3.2 mm                | 470            | J/m                     | ASTM D256      |
| Izod Impact, unnotched, 23°C                        | 600            | J/m                     | ASTM D4812     |
| Izod Impact, unnotched, -30°C                       | 600            | J/m                     | ASTM D4812     |
| <b>THERMAL <sup>(1)</sup></b>                       |                |                         |                |
| HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm              | 215            | °C                      | ISO 75/Bf      |
| HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm               | 210            | °C                      | ISO 75/Af      |
| Vicat Softening Temp, Rate A/50                     | 225            | °C                      | ISO 306        |
| Vicat Softening Temp, Rate B/120                    | 220            | °C                      | ISO 306        |
| Vicat Softening Temp, Rate B/50                     | 213            | °C                      | ISO 306        |
| CTE, -40°C to 150°C, flow                           | 1.8E-05        | 1/°C                    | ISO 11359-2    |
| CTE, -40°C to 150°C, xflow                          | 4.8E-05        | 1/°C                    | ISO 11359-2    |
| Thermal Conductivity                                | 0.31           | W/m·°C                  | ISO 8302       |
| Ball Pressure Test, 125°C +/- 2°C                   | PASS           | -                       | IEC 60695-10-2 |
| HDT, 0.45 MPa, 3.2 mm, unannealed                   | 215            | °C                      | ASTM D648      |
| HDT, 0.45 MPa, 6.4 mm, unannealed                   | 212            | °C                      | ASTM D648      |
| HDT, 1.82 MPa, 3.2mm, unannealed                    | 211            | °C                      | ASTM D648      |
| HDT, 1.82 MPa, 6.4 mm, unannealed                   | 210            | °C                      | ASTM D648      |
| CTE, -20°C to 150°C, flow                           | 1.8E-05        | 1/°C                    | ASTM E831      |
| CTE, -20°C to 150°C, xflow                          | 4.80E-05       | 1/°C                    | ASTM E831      |
| Relative Temp Index, Elec <sup>(2)</sup>            | 180            | °C                      | UL 746B        |
| Relative Temp Index, Mech w/impact <sup>(2)</sup>   | 170            | °C                      | UL 746B        |
| Relative Temp Index, Mech w/o impact <sup>(2)</sup> | 180            | °C                      | UL 746B        |
| <b>PHYSICAL <sup>(1)</sup></b>                      |                |                         |                |
| Density                                             | 1.51           | g/cm <sup>3</sup>       | ISO 1183       |
| Moisture Absorption, (23°C/50% RH/24hrs)            | 0.1            | %                       | ISO 62-4       |
| Moisture Absorption, (23°C/50% RH/Equilibrium)      | 0.6            | %                       | ISO 62-4       |
| Water Absorption, (23°C/24hrs)                      | 0.16           | %                       | ISO 62-1       |
| Water Absorption, (23°C/saturated)                  | 0.9            | %                       | ISO 62-1       |
| Melt Volume Rate, MVR at 360°C/5.0 kg               | 6              | cm <sup>3</sup> /10 min | ISO 1133       |

| PROPERTIES                                           | TYPICAL VALUES                 | UNITS    | TEST METHODS   |
|------------------------------------------------------|--------------------------------|----------|----------------|
| Specific Gravity                                     | 1.51                           | -        | ASTM D792      |
| Water Absorption, (23°C/24hrs)                       | 0.16                           | %        | ASTM D570      |
| Water Absorption, (23°C/Saturated)                   | 0.9                            | %        | ASTM D570      |
| Melt Flow Rate, 337°C/6.6 kgf                        | 5                              | g/10 min | ASTM D1238     |
| Mold Shrinkage, flow, 3.2 mm <sup>(3)</sup>          | 0.2 – 0.4                      | %        | SABIC method   |
| <b>ELECTRICAL <sup>(1)</sup></b>                     |                                |          |                |
| Volume Resistivity                                   | 1E+15                          | Ω.cm     | IEC 60093      |
| Surface Resistivity, ROA                             | >1E+15                         | Ω        | IEC 60093      |
| Dielectric Strength, in oil, 0.8 mm                  | 35                             | kV/mm    | IEC 60243-1    |
| Dielectric Strength, in oil, 1.6 mm                  | 26                             | kV/mm    | IEC 60243-1    |
| Dielectric Strength, in oil, 3.2 mm                  | 15                             | kV/mm    | IEC 60243-1    |
| Relative Permittivity, 50/60 Hz                      | 3.3                            | -        | IEC 60250      |
| Relative Permittivity, 1 MHz                         | 3.4                            | -        | IEC 60250      |
| Dissipation Factor, 50/60 Hz                         | 0.0016                         | -        | IEC 60250      |
| Dissipation Factor, 1 MHz                            | 0.0023                         | -        | IEC 60250      |
| Dielectric Constant <sup>(4)</sup>                   |                                |          |                |
| at 1.1 GHz                                           | 3.15                           | -        | -              |
| at 5 GHz                                             | 3.59                           | -        | -              |
| at 10 GHz                                            | 3.60                           | -        | -              |
| Dissipation Factor <sup>(4)</sup>                    |                                |          |                |
| at 1.1 GHz                                           | 0.0029                         | -        | -              |
| at 5 GHz                                             | 0.0036                         | -        | -              |
| at 10 GHz                                            | 0.0046                         | -        | -              |
| Comparative Tracking Index <sup>(5)</sup>            | 150                            | V        | IEC 60112      |
| Comparative Tracking Index, M <sup>(5)</sup>         | 100                            | V        | IEC 60112      |
| Volume Resistivity                                   | 3.E+16                         | Ω.cm     | ASTM D257      |
| Dielectric Strength, in air, 1.6 mm                  | 24.8                           | kV/mm    | ASTM D149      |
| Dielectric Strength, in oil, 1.6 mm                  | 30.3                           | kV/mm    | ASTM D149      |
| Relative Permittivity, 1 kHz                         | 3.7                            | -        | ASTM D150      |
| Dissipation Factor, 1 kHz                            | 0.0015                         | -        | ASTM D150      |
| Comparative Tracking Index (UL) {PLC} <sup>(2)</sup> | 4                              | PLC Code | UL 746A        |
| Hot-Wire Ignition (HWI), PLC 1 <sup>(2)</sup>        | ≥3                             | mm       | UL 746A        |
| Hot-Wire Ignition (HWI), PLC 3 <sup>(2)</sup>        | ≥1.5                           | mm       | UL 746A        |
| High Amp Arc Ignition (HAI), PLC 3 <sup>(2)</sup>    | ≥1.5                           | mm       | UL 746A        |
| High Amp Arc Ignition (HAI), PLC 4 <sup>(2)</sup>    | ≥3                             | mm       | UL 746A        |
| High Voltage Arc Track Rate {PLC} <sup>(2)</sup>     | 3                              | PLC Code | UL 746A        |
| Arc Resistance, Tungsten {PLC} <sup>(2)</sup>        | 6                              | PLC Code | ASTM D495      |
| <b>FLAME CHARACTERISTICS <sup>(2)</sup></b>          |                                |          |                |
| UL Yellow Card Link                                  | <a href="#">E121562-221099</a> | -        | -              |
| UL Recognized, 94-5VA Flame Class Rating             | ≥1.2                           | mm       | UL 94          |
| UL Recognized, 94V-0 Flame Class Rating              | ≥0.25                          | mm       | UL 94          |
| Glow Wire Ignitability Temperature, 2.0 mm           | 900                            | °C       | IEC 60695-2-13 |
| Glow Wire Flammability Index, 2.0 mm                 | 960                            | °C       | IEC 60695-2-12 |
| Oxygen Index (LOI)                                   | 48                             | %        | ISO 4589       |
| Oxygen Index (LOI)                                   | 50                             | %        | ASTM D2863     |

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| PROPERTIES                          | TYPICAL VALUES | UNITS | TEST METHODS |
|-------------------------------------|----------------|-------|--------------|
| INJECTION MOLDING <sup>(3)</sup>    |                |       |              |
| Drying Temperature                  | 150            | °C    |              |
| Drying Time                         | 4 – 6          | Hrs   |              |
| Drying Time (Cumulative)            | 24             | Hrs   |              |
| Maximum Moisture Content            | 0.02           | %     |              |
| Melt Temperature                    | 350 – 410      | °C    |              |
| Nozzle Temperature                  | 345 – 410      | °C    |              |
| Front - Zone 3 Temperature          | 345 – 420      | °C    |              |
| Middle - Zone 2 Temperature         | 340 – 410      | °C    |              |
| Rear - Zone 1 Temperature           | 330 – 400      | °C    |              |
| Hopper Temperature                  | 80 – 120       | °C    |              |
| Mold Temperature                    | 135 – 180      | °C    |              |
| Shot to Cylinder Size               | 40 – 60        | %     |              |
| Vent Depth                          | 0.025 – 0.076  | mm    |              |
| Screw Speed                         | 40 – 70        | rpm   |              |
| Screw speed (Circumferential speed) | 0.15 – 0.25    | m/s   |              |
| Back Pressure                       | 0.3 – 1.5      | MPa   |              |

(1) The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.

(2) 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.

(3) Injection Molding parameters are only mentioned as general guidelines. These may not apply or may need adjustment in specific situations such as low shot sizes, large part molding, thin wall molding and gas-assist molding.

(4) Based on SPDR testing technique on dry as molded specimens.

(5) Value shown here is based on internal measurement.

## ADDITIONAL PRODUCT NOTES

No PFAS intentionally added: The grade listed in this document does not contain PFAS intentionally added during Seller's manufacturing process and is not expected to contain unintentional PFAS impurities. Each user is responsible for evaluating the presence of unintentional PFAS impurities.

## MORE INFORMATION

For curve data and CAE cards, please visit and register at <https://materialfinder.sabic-specialties.com>

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