

# ULTEM™ RESIN 9085

## DESCRIPTION

ULTEM 9085 resin is a polyetherimide blend. The material is designed for use in Aerospace cabin interiors but can also be used for FDM printing and in e.g. Rail applications. The material meets Aerospace FAR25.853 and OSU55/55 heat release requirements. It is approved by main Aerospace OEMs. Material has Rail EN45545 R6-HL3 rating. The material may offer excellent flow, stiffness and ductility balance, enabling thin wall lightweight designs. 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, Good Processability, High Flow, Hydrolytic Stability, Low Smoke and Toxicity, Thin Wall, Amorphous, Low Shrinkage, Sustainable (bio-based offerings), Non halogenated flame retardant, Electroplatable, Creep resistant, Dimensional stability, High stiffness/Strength, High temperature resistance, No PFAS intentionally added |
| Fillers               | Unreinforced                                                                                                                                                                                                                                                                                                                                                            |
| Polymer Types         | Polyetherimide (PEI)                                                                                                                                                                                                                                                                                                                                                    |
| Processing Techniques | Large Format Additive Manufacturing (LFAM), 3D printing, Fused Deposition Modeling (FDM) printing, Sheet extrusion, Injection Molding, Profile Extrusion, Thermoforming                                                                                                                                                                                                 |
| Regional Availability | Europe, Asia, Americas                                                                                                                                                                                                                                                                                                                                                  |

### INDUSTRY

### SUB INDUSTRY

Automotive

Aerospace

Mass Transportation

Rail

## TYPICAL PROPERTY VALUES

Revision 20230607

| PROPERTIES                                   | TYPICAL VALUES | UNITS | TEST METHODS |
|----------------------------------------------|----------------|-------|--------------|
| MECHANICAL <sup>(1)</sup>                    |                |       |              |
| Tensile Stress, yld, Type I, 50 mm/min       | 94             | MPa   | ASTM D638    |
| Tensile Strain, yld, Type I, 50 mm/min       | 7              | %     | ASTM D638    |
| Tensile Strain, brk, Type I, 50 mm/min       | 70             | %     | ASTM D638    |
| Tensile Stress, yld, Type I, 5 mm/min        | 86             | MPa   | ASTM D638    |
| Tensile Strain, yld, Type I, 5 mm/min        | 7              | %     | ASTM D638    |
| Tensile Strain, brk, Type I, 5 mm/min        | 70             | %     | ASTM D638    |
| Tensile Modulus, 5 mm/min                    | 3000           | MPa   | ASTM D638    |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 138            | MPa   | ASTM D790    |
| Flexural Modulus, 1.3 mm/min, 50 mm span     | 2800           | MPa   | ASTM D790    |
| Tensile Stress, yield, 50 mm/min             | 94             | MPa   | ISO 527      |
| Tensile Strain, yield, 50 mm/min             | 6.7            | %     | ISO 527      |
| Tensile Strain, break, 50 mm/min             | 70             | %     | ISO 527      |
| Tensile Stress, yield, 5 mm/min              | 88             | MPa   | ISO 527      |
| Tensile Strain, yield, 5 mm/min              | 6.5            | %     | ISO 527      |
| Tensile Strain, break, 5 mm/min              | 70             | %     | ISO 527      |
| Tensile Modulus, 1 mm/min                    | 2850           | MPa   | ISO 527      |
| Flexural Stress, yield, 2 mm/min             | 129            | MPa   | ISO 178      |

| PROPERTIES                                     | TYPICAL VALUES | UNITS                   | TEST METHODS |
|------------------------------------------------|----------------|-------------------------|--------------|
| Flexural Modulus, 2 mm/min                     | 2700           | MPa                     | ISO 178      |
| Hardness, Rockwell M                           | 115            | -                       | ISO 2039-2   |
| <b>IMPACT <sup>(1)</sup></b>                   |                |                         |              |
| Izod Impact, unnotched, 23°C                   | NB             | J/m                     | ASTM D4812   |
| Izod Impact, unnotched, -30°C                  | NB             | J/m                     | ASTM D4812   |
| Izod Impact, notched, 23°C                     | 115            | J/m                     | ASTM D256    |
| Izod Impact, notched, -30°C                    | 65             | J/m                     | ASTM D256    |
| Izod Impact, unnotched 80*10*4 +23°C           | NB             | kJ/m <sup>2</sup>       | ISO 180/1U   |
| Izod Impact, unnotched 80*10*4 -30°C           | NB             | kJ/m <sup>2</sup>       | ISO 180/1U   |
| 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             | 8              | kJ/m <sup>2</sup>       | ISO 180/1A   |
| Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm     | NB             | kJ/m <sup>2</sup>       | ISO 179/1eU  |
| Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm    | NB             | kJ/m <sup>2</sup>       | ISO 179/1eU  |
| 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    | 8              | kJ/m <sup>2</sup>       | ISO 179/1eA  |
| <b>THERMAL</b>                                 |                |                         |              |
| HDT, 0.45 MPa, 3.2 mm, unannealed              | 169            | °C                      | ASTM D648    |
| HDT, 1.82 MPa, 3.2mm, unannealed               | 153            | °C                      | ASTM D648    |
| CTE, -30°C to 80°C, flow                       | 6.5E-05        | 1/°C                    | ASTM E831    |
| CTE, -30°C to 80°C, xflow                      | 7.E-05         | 1/°C                    | ASTM E831    |
| HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm         | 169            | °C                      | ISO 75/Bf    |
| HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm          | 152            | °C                      | ISO 75/Af    |
| Vicat Softening Temp, Rate B/50                | 173            | °C                      | ISO 306      |
| Vicat Softening Temp, Rate B/120               | 175            | °C                      | ISO 306      |
| CTE, -30°C to 80°C, flow                       | 6.5E-05        | 1/°C                    | ISO 11359-2  |
| CTE, -30°C to 80°C, xflow                      | 7.0E-05        | 1/°C                    | ISO 11359-2  |
| <b>PHYSICAL <sup>(1)</sup></b>                 |                |                         |              |
| Specific Gravity                               | 1.34           | -                       | ASTM D792    |
| Melt Flow Rate, 295°C/6.6 kgf                  | 8.9            | g/10 min                | ASTM D1238   |
| Density                                        | 1.34           | 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) | 0.4            | %                       | ISO 62-4     |
| Water Absorption, (23°C/24hrs)                 | 0.15           | %                       | ISO 62-1     |
| Water Absorption, (23°C/saturated)             | 0.7            | %                       | ISO 62-1     |
| Melt Volume Rate, MVR at 340°C/5.0 kg          | 40             | cm <sup>3</sup> /10 min | ISO 1133     |
| Mold Shrinkage, flow, 3.2 mm <sup>(2)</sup>    | 0.5 – 0.7      | %                       | SABIC method |
| <b>FLAME CHARACTERISTICS <sup>(1)</sup></b>    |                |                         |              |
| FAA Flammability, FAR 25.853 A/B               | <5             | -                       | FAR 25.853   |
| OSU total heat release (2 minute test)         | ≤55            | kW-min/m <sup>2</sup>   | FAR 25.853   |
| OSU peak heat release rate (5 minute test)     | ≤55            | kW/m <sup>2</sup>       | FAR 25.853   |
| Vertical Burn at 60 Seconds <sup>(3)</sup>     | PASS           | -                       | FAR 25.853   |
| Oxygen Index (LOI)                             | 49             | %                       | ASTM D2863   |
| <b>INJECTION MOLDING <sup>(4)</sup></b>        |                |                         |              |
| Drying Temperature                             | 120 – 130      | °C                      |              |
| Drying Time                                    | 4 – 6          | Hrs                     |              |

| PROPERTIES                          | TYPICAL VALUES | UNITS | TEST METHODS |
|-------------------------------------|----------------|-------|--------------|
| Maximum Moisture Content            | 0.02           | %     |              |
| Melt Temperature                    | 330 – 350      | °C    |              |
| Nozzle Temperature                  | 330 – 350      | °C    |              |
| Front - Zone 3 Temperature          | 330 – 350      | °C    |              |
| Middle - Zone 2 Temperature         | 325 – 345      | °C    |              |
| Rear - Zone 1 Temperature           | 315 – 340      | °C    |              |
| Mold Temperature                    | 120 – 150      | °C    |              |
| Back Pressure                       | 0.3 – 0.7      | MPa   |              |
| Screw speed (Circumferential speed) | 0.2 – 0.3      | m/s   |              |
| Shot to Cylinder Size               | 40 – 60        | %     |              |
| Vent Depth                          | 0.025 – 0.076  | mm    |              |
| PROFILE EXTRUSION                   |                |       |              |
| Drying Temperature                  | 120 – 130      | °C    |              |
| Drying Time                         | 4 – 6          | Hrs   |              |
| Maximum Moisture Content            | 0.02           | %     |              |
| Melt Temperature                    | 280 – 310      | °C    |              |
| Barrel - Zone 1 Temperature         | 265 – 275      | °C    |              |
| Barrel - Zone 2 Temperature         | 280 – 295      | °C    |              |
| Barrel - Zone 3 Temperature         | 290 – 305      | °C    |              |
| Barrel - Zone 4 Temperature         | 295 – 310      | °C    |              |
| Hopper Temperature                  | 80 – 100       | °C    |              |
| Adapter Temperature                 | 270 – 310      | °C    |              |
| Die Temperature                     | 260 – 310      | °C    |              |
| Calibrator Temperature              | 130 – 160      | °C    |              |
| Calibrator 2 Temperature            | 80 – 120       | °C    |              |

- (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) 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.
- (3) Type A, at 2mm
- (4) 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.

## 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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