# NORYL™ Resin SE1GFN2

REGION AMERICAS

## DESCRIPTION

NORYL SE1GFN2 resin is a 20% glass fiber reinforced blend of polyphenylene ether (PPE) + polystyrene (PS). This injection moldable grade contains non-brominated, non-chlorinated flame retardant and carries a UL94 flame rating of 5VA at 2mm and V1 at 1.5mm along with UL746C Outdoor Suitability rating of F1 in some regions and RTI of 110°C. NORYL SE1GFN2 exhibits high heat resistance, good dielectric strength, dimensional stability, hydrolytic stability, and very low moisture absorption. This material is an excellent candidate for a variety of applications such as solar frames, unattended power supply (UPS) inverter/charger, indoor and outdoor electrical enclosures / housings / connectors, and wall plates / sockets / switches.

| GENERAL INFORMATION | |
|---|---|
| **Features** | Flame Retardant, Hydrolytic Stability, Low Warpage, Amorphous, Low Shrinkage, Low Moisture Absorption, Low Specific Gravity, Non Cl/Br flame retardant, Non halogenated flame retardant, Dimensional stability, High stiffness/Strength, No PFAS intentionally added |
| **Fillers** | Glass Fiber (Total fluorine >50ppm only from inorganic fluorine) |
| **Polymer Types** | Polyphenylene Ether + PS (PPE+PS) |
| **Processing Techniques** | Injection Molding |

| INDUSTRY | SUB INDUSTRY |
|---|---|
| Automotive | Automotive EV Batteries |
| Electrical and Electronics | Energy Management, Mobile Phone - Computer - Tablets |
| Industrial | Electrical |

## TYPICAL PROPERTY VALUES

Revision 20261106

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|---|---|---|
| **MECHANICAL** [1] | | | |
| **Tensile Stress, brk, Type I, 5 mm/min** | 106 | MPa | ASTM D638 |
| **Tensile Strain, brk, Type I, 5 mm/min** | 5 | % | ASTM D638 |
| **Flexural Stress, yld, 2.6 mm/min, 100 mm span** | 151 | MPa | ASTM D790 |
| **Flexural Modulus, 2.6 mm/min, 100 mm span** | 5720 | MPa | ASTM D790 |
| **Hardness, Rockwell L** | 106 | - | ASTM D785 |
| **IMPACT** [1] | | | |
| **Izod impact, notched** | | | |
| 23°C | 106 | J/m | ASTM D256 |
| -40°C | 96 | J/m | ASTM D256 |
| **THERMAL** [1] | | | |
| **HDT, 0.45 MPa, 6.4 mm, unannealed** | 137 | °C | ASTM D648 |
| **HDT, 1.82 MPa, 6.4 mm, unannealed** | 132 | °C | ASTM D648 |
| **CTE, -40°C to 95°C, flow** | 3.6E-05 | 1/°C | ASTM E831 |
| **Relative Temp Index, Elec** [2] | 110 | °C | UL 746B |
| **Relative Temp Index, Mech w/impact** [2] | 105 | °C | UL 746B |
| **Relative Temp Index, Mech w/o impact** [2] | 110 | °C | UL 746B |
| **PHYSICAL** [1] | | | |

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| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|---|---|---|
| PFAS [3] | Not Intentionally added | - | |
| Specific Gravity | 1.23 | - | ASTM D792 |
| Water Absorption, (23°C/24hrs) | 0.06 | % | ASTM D570 |
| Mold Shrinkage, flow, 3.2 mm [4] | 0.2 – 0.5 | % | SABIC method |
| ELECTRICAL [1] | | | |
| Dielectric Strength, in oil, 3.2 mm | 23.6 | kV/mm | ASTM D149 |
| Relative Permittivity, 50/60 Hz | 2.98 | - | ASTM D150 |
| Dissipation Factor, 50/60 Hz | 0.0016 | - | ASTM D150 |
| High Voltage Arc Track Rate {PLC} | 3 | PLC Code | UL 746A |
| Comparative Tracking Index (UL) {PLC} | 1 | PLC Code | UL 746A |
| High Amp Arc Ignition (HAI), PLC 2 | ≥1.5 | mm | UL 746A |
| Hot-Wire Ignition (HWI), PLC 0 | ≥1.5 | mm | UL 746A |
| Arc Resistance, Tungsten {PLC} | 6 | PLC Code | ASTM D495 |
| FLAME CHARACTERISTICS [2] | | | |
| UL Yellow Card Link | E121562-600331 | - | - |
| UL Yellow Card Link 2 | E121562-624509 | - | - |
| UL Recognized, 94-5VA Flame Class Rating | ≥2 | mm | UL 94 |
| UL Recognized, 94V-0 Flame Class Rating | ≥6 | mm | UL 94 |
| UL Recognized, 94V-1 Flame Class Rating | ≥1.5 | mm | UL 94 |
| Glow Wire Flammability Index, 1.0 mm | 960 | °C | IEC 60695-2-12 |
| Glow Wire Flammability Index, 1.5 mm | 960 | °C | IEC 60695-2-12 |
| Glow Wire Ignitability Temperature, 1.0 mm | 775 | °C | IEC 60695-2-13 |
| Glow Wire Ignitability Temperature, 1.5 mm | 750 | °C | IEC 60695-2-13 |
| UV-light, water exposure/immersion | F1 | - | UL 746C |
| Oxygen Index (LOI) | 30.9 | % | ASTM D2863 |
| INJECTION MOLDING [5] | | | |
| Drying Temperature | 110 – 120 | °C | |
| Drying Time | 3 – 4 | Hrs | |
| Drying Time (Cumulative) | 8 | Hrs | |
| Maximum Moisture Content | 0.02 | % | |
| Melt Temperature | 300 – 325 | °C | |
| Nozzle Temperature | 300 – 325 | °C | |
| Front - Zone 3 Temperature | 290 – 325 | °C | |
| Middle - Zone 2 Temperature | 275 – 320 | °C | |
| Rear - Zone 1 Temperature | 265 – 315 | °C | |
| Mold Temperature | 80 – 110 | °C | |
| Back Pressure | 0.3 – 0.7 | MPa | |
| Screw Speed | 20 – 100 | rpm | |
| Shot to Cylinder Size | 30 – 70 | % | |

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(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, colors and regions. For details, please see the UL Yellow Card.

(3) 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.

(4) 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.

(5) 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.

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