

NORYL™ RESIN GFN3

REGION AMERICAS

DESCRIPTION

NORYL GFN3 resin is a 30% glass fiber reinforced blend of polyphenylene ether (PPE) + polystyrene (PS). This general-purpose injection moldable grade exhibits very low moisture absorption, high strength, hydrolytic stability, Low warpage, low specific gravity, and dimensional stability. NORYL GFN3 carries a UL746C outdoor suitability rating of F2 and is an excellent candidate for a variety of indoor and outdoor applications including construction, electrical components + displays, lawn and garden equipment. *See NORYL GFN3F resin for FDA food compliant / NSF version.

| 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 |
| Polymer Types | Polyphenylene Ether + PS (PPE+PS) |
| Processing Techniques | Injection Molding |

| INDUSTRY | SUB INDUSTRY |
|----------------------------|--|
| Building and Construction | Building Component |
| Consumer | Commercial Appliance |
| Electrical and Electronics | Electronic Components, Mobile Phone - Computer - Tablets |

TYPICAL PROPERTY VALUES

Revision 20231109

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|----------------|-------------------|--------------|
| MECHANICAL ⁽¹⁾ | | | |
| Tensile Stress, brk, Type I, 5 mm/min | 116 | MPa | ASTM D638 |
| Tensile Strain, brk, Type I, 5 mm/min | 2 | % | ASTM D638 |
| Tensile Modulus, 5 mm/min | 9150 | MPa | ASTM D638 |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 180 | MPa | ASTM D790 |
| Flexural Stress, yld, 2.6 mm/min, 100 mm span | 162 | MPa | ASTM D790 |
| Flexural Modulus, 1.3 mm/min, 50 mm span | 8000 | MPa | ASTM D790 |
| Flexural Modulus, 2.6 mm/min, 100 mm span | 7170 | MPa | ASTM D790 |
| Hardness, Rockwell L | 108 | - | ASTM D785 |
| Tensile Stress, break | 117 | MPa | ISO 527 |
| Tensile Strain, break | 1.8 | % | ISO 527 |
| Tensile Modulus, 1 mm/min | 8740 | MPa | ISO 527 |
| Flexural Stress | 183 | MPa | ISO 178 |
| Flexural Modulus | 8710 | MPa | ISO 178 |
| IMPACT ⁽¹⁾ | | | |
| Izod Impact, unnotched, 23°C | 588 | J/m | ASTM D4812 |
| Izod Impact, notched, 23°C | 117 | J/m | ASTM D256 |
| Izod Impact, notched, -30°C | 124 | J/m | ASTM D256 |
| Izod Impact, unnotched 80°10°4 +23°C | 31 | kJ/m ² | ISO 180/1U |
| Izod Impact, unnotched 80°10°4 -30°C | 35 | kJ/m ² | ISO 180/1U |

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|--------------------------------|-------------------------|--------------|
| Izod Impact, notched 80*10*4 +23°C | 12 | kJ/m ² | ISO 180/1A |
| Izod Impact, notched 80*10*4 -30°C | 11 | kJ/m ² | ISO 180/1A |
| Charpy Impact, notched, 23°C | 12 | kJ/m ² | ISO 179/2C |
| Charpy Impact, notched, -30°C | 11 | kJ/m ² | ISO 179/2C |
| Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm | 39 | kJ/m ² | ISO 179/1eU |
| Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm | 47 | kJ/m ² | ISO 179/1eU |
| THERMAL ⁽¹⁾ | | | |
| HDT, 0.45 MPa, 3.2 mm, unannealed | 142 | °C | ASTM D648 |
| HDT, 1.82 MPa, 3.2mm, unannealed | 137 | °C | ASTM D648 |
| HDT, 0.45 MPa, 6.4 mm, unannealed | 158 | °C | ASTM D648 |
| HDT, 1.82 MPa, 6.4 mm, unannealed | 137 | °C | ASTM D648 |
| CTE, -40°C to 40°C, flow | 3.06E-05 | 1/°C | ASTM E831 |
| CTE, -40°C to 40°C, xflow | 6.18E-05 | 1/°C | ASTM E831 |
| Vicat Softening Temp, Rate B/50 | 143 | °C | ISO 306 |
| Vicat Softening Temp, Rate B/120 | 147 | °C | ISO 306 |
| HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm | 143 | °C | ISO 75/Bf |
| HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm | 137 | °C | ISO 75/Af |
| Relative Temp Index, Elec ⁽²⁾ | 90 | °C | UL 746B |
| Relative Temp Index, Mech w/impact ⁽²⁾ | 90 | °C | UL 746B |
| Relative Temp Index, Mech w/o impact ⁽²⁾ | 90 | °C | UL 746B |
| PHYSICAL ⁽¹⁾ | | | |
| Specific Gravity | 1.29 | - | ASTM D792 |
| Water Absorption, (23°C/24hrs) | 0.06 | % | ASTM D570 |
| Mold Shrinkage, flow, 3.2 mm ⁽³⁾ | 0.1 – 0.4 | % | SABIC method |
| Melt Flow Rate, 300°C/5.0 kgf | 8.6 | g/10 min | ASTM D1238 |
| Melt Volume Rate, MVR at 300°C/5.0 kg | 7 | cm ³ /10 min | ISO 1133 |
| ELECTRICAL ⁽¹⁾ | | | |
| Dielectric Strength, in oil, 3.2 mm | 21.6 | kV/mm | ASTM D149 |
| Relative Permittivity, 50/60 Hz | 2.93 | - | ASTM D150 |
| Dissipation Factor, 50/60 Hz | 0.0009 | - | ASTM D150 |
| High Voltage Arc Track Rate {PLC} | 3 | PLC Code | UL 746A |
| Comparative Tracking Index (UL) {PLC} | 4 | PLC Code | UL 746A |
| High Amp Arc Ignition (HAI), PLC 4 | ≥1.5 | mm | UL 746A |
| Hot-Wire Ignition (HWI), PLC 1 | ≥6 | mm | UL 746A |
| Hot-Wire Ignition (HWI), PLC 4 | ≥3 | mm | UL 746A |
| Hot-Wire Ignition (HWI), PLC 5 | ≥1.5 | mm | UL 746A |
| Arc Resistance, Tungsten {PLC} | 7 | PLC Code | ASTM D495 |
| FLAME CHARACTERISTICS ⁽²⁾ | | | |
| UL Yellow Card Link | E121562-221162 | - | - |
| UL Recognized, 94HB Flame Class Rating ⁽²⁾ | ≥1.5 | mm | UL 94 |
| UV-light, water exposure/immersion | F2 | - | UL 746C |
| Oxygen Index (LOI) | 26 | % | ASTM D2863 |
| INJECTION MOLDING ⁽⁴⁾ | | | |
| Drying Temperature | 110 – 120 | °C | |
| Drying Time | 3 – 4 | Hrs | |

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|-----------------------------|----------------|-------|--------------|
| 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 | % | |

- (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) 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.
- (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.

DISCLAIMER

Any sale by SABIC, its subsidiaries and affiliates (each a "seller"), is made exclusively under seller's standard conditions of sale (available upon request) unless agreed otherwise in writing and signed on behalf of the seller. While the information contained herein is given in good faith, SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY, NOR ASSUMES ANY LIABILITY, DIRECT OR INDIRECT, WITH RESPECT TO THE PERFORMANCE, SUITABILITY OR FITNESS FOR INTENDED USE OR PURPOSE OF THESE PRODUCTS IN ANY APPLICATION. Each customer must determine the suitability of seller materials for the customer's particular use through appropriate testing and analysis. No statement by seller concerning a possible use of any product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right.