



# NORYL™ Resin GFN2 - Americas

SABIC - Polyphenylene Ether + PS

## General Information

### Product Description

NORYL™ GFN2 resin is a 20% glass reinforced blend of polyphenylene ether (PPE) + high impact polystyrene (HIPS). This general-purpose injection moldable grade exhibits very low moisture absorption, high strength, hydrolytic stability, Low warpage, low specific gravity, and dimensional stability. NORYL GFN2 carries a UL746C outdoor suitability rating of F1 and is an excellent candidate for a variety of indoor and outdoor applications including construction, electrical components + displays, lawn and garden equipment. \*See NORYL GFN2F resin for FDA food compliant / NSF version.

### General

|      |                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |                                                                                                                                                                                                     |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Uses | <ul style="list-style-type: none"> <li>Appliances</li> <li>Automotive Exterior Parts</li> <li>Automotive Under the Hood</li> <li>Construction Applications</li> <li>Electrical/Electronic Applications</li> </ul> | <ul style="list-style-type: none"> <li>Electronic Displays</li> <li>Industrial Applications</li> <li>Lawn and Garden Equipment</li> <li>Lighting Applications</li> <li>Medical/Healthcare Applications</li> </ul> | <ul style="list-style-type: none"> <li>Non-specific Food Applications</li> <li>Oil/Gas Applications</li> <li>Outdoor Applications</li> <li>Pharmaceuticals</li> <li>Textile Applications</li> </ul> |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## ASTM & ISO Properties <sup>1</sup>

| Physical                                             | Nominal Value | Unit                   | Test Method     |
|------------------------------------------------------|---------------|------------------------|-----------------|
| Density / Specific Gravity                           | 1.20          | g/cm <sup>3</sup>      | ASTM D792       |
| Melt Mass-Flow Rate (MFR) (300°C/5.0 kg)             | 9.0           | g/10 min               | ASTM D1238      |
| Melt Volume-Flow Rate (MVR) (300°C/5.0 kg)           | 8.0           | cm <sup>3</sup> /10min | ISO 1133        |
| Molding Shrinkage - Flow (3.20 mm)                   | 0.20 to 0.50  | %                      | Internal Method |
| Water Absorption (24 hr, 23°C)                       | 0.060         | %                      | ASTM D570       |
| Outdoor Suitability                                  | f1            |                        | UL 746C         |
| Mechanical                                           | Nominal Value | Unit                   | Test Method     |
| Tensile Modulus <sup>2</sup>                         | 6200          | MPa                    | ASTM D638       |
| Tensile Modulus                                      | 7070          | MPa                    | ISO 527-2/1     |
| Tensile Strength <sup>3</sup> (Break)                | 90.0          | MPa                    | ASTM D638       |
| Tensile Stress (Break)                               | 97.0          | MPa                    | ISO 527-2/5     |
| Tensile Elongation <sup>3</sup> (Break)              | 2.6           | %                      | ASTM D638       |
| Tensile Strain (Break)                               | 2.5           | %                      | ISO 527-2/5     |
| Flexural Modulus <sup>4</sup> (50.0 mm Span)         | 5800          | MPa                    | ASTM D790       |
| Flexural Modulus <sup>5</sup>                        | 6540          | MPa                    | ISO 178         |
| Flexural Stress <sup>5, 6</sup>                      | 167           | MPa                    | ISO 178         |
| Flexural Strength <sup>4</sup> (Yield, 50.0 mm Span) | 160           | MPa                    | ASTM D790       |
| Impact                                               | Nominal Value | Unit                   | Test Method     |
| Charpy Notched Impact Strength (23°C)                | 11            | kJ/m <sup>2</sup>      | ISO 179/2C      |
| Notched Izod Impact                                  |               |                        | ASTM D256       |
| -40°C                                                | 96            | J/m                    |                 |
| 23°C                                                 | 120           | J/m                    |                 |
| Notched Izod Impact Strength <sup>7</sup> (23°C)     | 11            | kJ/m <sup>2</sup>      | ISO 180/1A      |
| Unnotched Izod Impact (23°C)                         | 650           | J/m                    | ASTM D4812      |
| Instrumented Dart Impact (23°C, Total Energy)        | 22.0          | J                      | ASTM D3763      |

NORYL™ Resin GFN2 - Americas

SABIC - Polyphenylene Ether + PS

| Hardness                                   | Nominal Value | Unit     | Test Method  |
|--------------------------------------------|---------------|----------|--------------|
| Rockwell Hardness (L-Scale)                | 106           |          | ASTM D785    |
| Thermal                                    | Nominal Value | Unit     | Test Method  |
| Deflection Temperature Under Load          |               |          | ASTM D648    |
| 0.45 MPa, Unannealed, 3.20 mm              | 140           | °C       |              |
| 0.45 MPa, Unannealed, 6.40 mm              | 143           | °C       |              |
| Heat Deflection Temperature <sup>8</sup>   |               |          | ISO 75-2/Be  |
| 0.45 MPa, Unannealed, 4.00 mm, 100 mm Span | 143           | °C       |              |
| Deflection Temperature Under Load          |               |          | ASTM D648    |
| 1.8 MPa, Unannealed, 3.20 mm               | 135           | °C       |              |
| 1.8 MPa, Unannealed, 6.40 mm               | 137           | °C       |              |
| Heat Deflection Temperature <sup>8</sup>   |               |          | ISO 75-2/Ae  |
| 1.8 MPa, Unannealed, 4.00 mm, 100 mm Span  | 137           | °C       |              |
| Vicat Softening Temperature                |               |          |              |
| --                                         | 146           | °C       | ISO 306/B120 |
| --                                         | 143           | °C       | ISO 306/B50  |
| CLTE - Flow (-40 to 40°C)                  | 2.9E-5        | cm/cm/°C | ASTM E831    |
| CLTE - Transverse (-40 to 40°C)            | 8.3E-5        | cm/cm/°C | ASTM E831    |
| RTI Elec <sup>9</sup>                      | 90.0          | °C       | UL 746       |
| RTI Imp <sup>9</sup>                       | 90.0          | °C       | UL 746       |
| RTI Str <sup>9</sup>                       | 90.0          | °C       | UL 746       |
| Electrical                                 | Nominal Value | Unit     | Test Method  |
| Dielectric Strength (3.20 mm, in Oil)      | 17            | kV/mm    | ASTM D149    |
| Dielectric Constant                        |               |          | ASTM D150    |
| 60 Hz                                      | 2.86          |          |              |
| 50 kHz                                     | 2.86          |          |              |
| Dissipation Factor                         |               |          | ASTM D150    |
| 50 Hz                                      | 8.0E-4        |          |              |
| 60 Hz                                      | 8.0E-4        |          |              |
| Arc Resistance <sup>10</sup>               | PLC 7         |          | ASTM D495    |
| High Amp Arc Ignition (HAI)                |               |          | UL 746       |
| > 1.5 mm                                   | PLC 4         |          |              |
| > 6.0 mm                                   | PLC 3         |          |              |
| High Voltage Arc Tracking Rate (HVTR)      | PLC 4         |          | UL 746       |
| Hot-wire Ignition (HWI)                    |               |          | UL 746       |
| > 1.5 mm                                   | PLC 4         |          |              |
| > 6.0 mm                                   | PLC 1         |          |              |
| Flammability                               | Nominal Value | Unit     | Test Method  |
| Flame Rating <sup>9</sup> (> 1.5 mm)       | HB            |          | UL 94        |
| Oxygen Index                               | 26            | %        | ASTM D2863   |

| Processing Information |               |      |
|------------------------|---------------|------|
| Injection              | Nominal Value | Unit |
| Drying Temperature     | 110 to 120    | °C   |
| Drying Time            | 3.0 to 4.0    | hr   |
| Suggested Max Moisture | 0.020         | %    |
| Suggested Shot Size    | 30 to 70      | %    |
| Rear Temperature       | 265 to 315    | °C   |
| Middle Temperature     | 275 to 320    | °C   |

NORYL™ Resin GFN2 - Americas  
SABIC - Polyphenylene Ether + PS

| Injection              | Nominal Value  | Unit |
|------------------------|----------------|------|
| Front Temperature      | 290 to 325     | °C   |
| Nozzle Temperature     | 300 to 325     | °C   |
| Processing (Melt) Temp | 300 to 325     | °C   |
| Mold Temperature       | 80 to 110      | °C   |
| Back Pressure          | 0.300 to 0.700 | MPa  |
| Screw Speed            | 20 to 100      | rpm  |

Injection Notes

- Injection Molding Parameters
- Drying Time (Cumulative): 8 hrs