

NORYL™ RESIN GFN1

REGION ASIA

DESCRIPTION

NORYL™ GFN1 resin is a 10% 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 GFN1 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 GFN1F resin for FDA food compliant / NSF version.

TYPICAL PROPERTY VALUES

Revision 20200610

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|--|----------------|-------|--------------|
| MECHANICAL | | | |
| Tensile Stress, yld, Type I, 50 mm/min | 75 | MPa | ASTM D 638 |
| Tensile Stress, brk, Type I, 50 mm/min | 75 | MPa | ASTM D 638 |
| Tensile Strain, yld, Type I, 50 mm/min | 3.5 | % | ASTM D 638 |
| Tensile Strain, brk, Type I, 50 mm/min | 3.5 | % | ASTM D 638 |
| Tensile Modulus, 5 mm/min | 4400 | MPa | ASTM D 638 |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 105 | MPa | ASTM D 790 |
| Flexural Modulus, 1.3 mm/min, 50 mm span | 3400 | MPa | ASTM D 790 |
| Tensile Stress, yield, 50 mm/min | 60 | MPa | ISO 527 |
| Tensile Stress, break, 50 mm/min | 60 | MPa | ISO 527 |
| Tensile Strain, yield, 50 mm/min | 4.5 | % | ISO 527 |
| Tensile Strain, break, 50 mm/min | 4.5 | % | ISO 527 |
| Tensile Modulus, 1 mm/min | 3900 | MPa | ISO 527 |
| Flexural Stress, yield, 2 mm/min | 115 | MPa | ISO 178 |
| Flexural Modulus, 2 mm/min | 3700 | MPa | ISO 178 |
| IMPACT | | | |
| Izod Impact, unnotched, 23°C | 410 | J/m | ASTM D 4812 |
| Izod Impact, notched, 23°C | 84 | J/m | ASTM D 256 |
| Izod Impact, notched, -30°C | 80 | J/m | ASTM D 256 |
| Instrumented Impact Total Energy, 23°C | 20 | J | ASTM D 3763 |
| Izod Impact, unnotched 80°10°4 +23°C | 30 | kJ/m² | ISO 180/1U |
| Izod Impact, unnotched 80°10°4 -30°C | 30 | kJ/m² | ISO 180/1U |
| Izod Impact, notched 80°10°4 +23°C | 10 | kJ/m² | ISO 180/1A |
| Izod Impact, notched 80°10°4 -30°C | 9 | kJ/m² | ISO 180/1A |
| Charpy 23°C, V-notch Edgew 80°10°4 sp=62mm | 8 | kJ/m² | ISO 179/1eA |
| THERMAL | | | |
| Vicat Softening Temp, Rate B/50 | 138 | °C | ASTM D 1525 |
| HDT, 0.45 MPa, 3.2 mm, unannealed | 135 | °C | ASTM D 648 |
| HDT, 1.82 MPa, 3.2mm, unannealed | 130 | °C | ASTM D 648 |
| CTE, -40°C to 40°C, flow | 4.5E-05 | 1/°C | ASTM E 831 |
| CTE, -40°C to 40°C, xflow | 8.2E-05 | 1/°C | ASTM E 831 |
| CTE, -40°C to 40°C, flow | 3.8E-05 | 1/°C | ISO 11359-2 |
| CTE, -40°C to 40°C, xflow | 8.5E-05 | 1/°C | ISO 11359-2 |

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|--------------------------------|-------------------------|--------------|
| Vicat Softening Temp, Rate B/50 | 138 | °C | ISO 306 |
| Vicat Softening Temp, Rate B/120 | 140 | °C | ISO 306 |
| HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm | 129 | °C | ISO 75/Af |
| Relative Temp Index, Elec ⁽¹⁾ | 90 | °C | UL 746B |
| Relative Temp Index, Mech w/impact ⁽¹⁾ | 90 | °C | UL 746B |
| Relative Temp Index, Mech w/o impact ⁽¹⁾ | 90 | °C | UL 746B |
| PHYSICAL | | | |
| Specific Gravity | 1.17 | - | ASTM D 792 |
| Mold Shrinkage, flow, 3.2 mm | 0.55 – 0.66 | % | SABIC method |
| Melt Flow Rate, 280°C/5.0 kgf | 4 | g/10 min | ASTM D 1238 |
| Density | 1.17 | g/cm ³ | ISO 1183 |
| Water Absorption, (23°C/saturated) | 0.12 | % | ISO 62-1 |
| Moisture Absorption (23°C / 50% RH) | 0.04 | % | ISO 62 |
| Melt Volume Rate, MVR at 280°C/5.0 kg | 4 | cm ³ /10 min | ISO 1133 |
| ELECTRICAL | | | |
| Comparative Tracking Index (UL) {PLC} | 3 | PLC Code | UL 746A |
| High Amp Arc Ignition (HAI), PLC 3 | ≥1.5 | mm | UL 746A |
| High Amp Arc Ignition (HAI), PLC 4 | ≥3 | mm | UL 746A |
| Hot-Wire Ignition (HWI), PLC 1 | ≥1.5 | mm | UL 746A |
| Hot-Wire Ignition (HWI), PLC 2 | ≥3 | mm | UL 746A |
| High Voltage Arc Track Rate {PLC} | 4 | PLC Code | UL 746A |
| Arc Resistance, Tungsten {PLC} | 6 | PLC Code | ASTM D 495 |
| FLAME CHARACTERISTICS ⁽¹⁾ | | | |
| UL Yellow Card Link | E207780-228544 | - | - |
| UL Yellow Card Link 2 | E45587-237019 | - | - |
| UL Recognized, 94HB Flame Class Rating | ≥1.5 | mm | UL 94 |
| UV-light, water exposure/immersion | F1 | - | UL 746C |
| INJECTION MOLDING | | | |
| Drying Temperature | 105 – 110 | °C | |
| Drying Time | 3 – 4 | hrs | |
| Drying Time (Cumulative) | 8 | hrs | |
| Maximum Moisture Content | 0.02 | % | |
| Melt Temperature | 295 – 315 | °C | |
| Nozzle Temperature | 295 – 315 | °C | |
| Front - Zone 3 Temperature | 280 – 315 | °C | |
| Middle - Zone 2 Temperature | 270 – 310 | °C | |
| Rear - Zone 1 Temperature | 260 – 305 | °C | |
| Mold Temperature | 75 – 105 | °C | |
| Back Pressure | 0.3 – 0.7 | MPa | |
| Screw Speed | 20 – 100 | rpm | |
| Shot to Cylinder Size | 30 – 70 | % | |

(1) 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.



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