

# NORYL GTX™ RESIN GTX944

REGION EUROPE

## DESCRIPTION

NORYL GTX944 resin is a non-reinforced alloy of Polyphenylene Ether (PPE) + Polyamide (PA). This injection moldable grade exhibits high heat resistance along with improved processability and increased impact performance. NORYL GTX944 resin may be an excellent candidate for Firefighter Helmet applications.

### GENERAL INFORMATION

#### Features

Chemical Resistance, Hydrolytic Stability, Low Warpage, Low Shrinkage, Low Moisture Absorption, Low Specific Gravity, Dimensional stability, High stiffness/Strength, High temperature resistance, Impact resistant, No PFAS intentionally added

#### Fillers

Unreinforced

#### Polymer Types

Polyphenylene Ether + PA (PPE+Nylon)

#### Processing Techniques

Injection Molding

### INDUSTRY

Building and Construction

Electrical and Electronics

### SUB INDUSTRY

Building Component

Electronic Components

## TYPICAL PROPERTY VALUES

Revision 20231109

| PROPERTIES                                   | TYPICAL VALUES | UNITS             | TEST METHODS |
|----------------------------------------------|----------------|-------------------|--------------|
| <strong>MECHANICAL <sup>(1)</sup></strong>   |                |                   |              |
| Tensile Stress, yld, Type I, 50 mm/min       | 50             | MPa               | ASTM D638    |
| Tensile Stress, brk, Type I, 50 mm/min       | 45             | MPa               | ASTM D638    |
| Tensile Strain, yld, Type I, 50 mm/min       | 6              | %                 | ASTM D638    |
| Tensile Strain, brk, Type I, 50 mm/min       | 100            | %                 | ASTM D638    |
| Tensile Modulus, 50 mm/min                   | 1900           | MPa               | ASTM D638    |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 75             | MPa               | ASTM D790    |
| Flexural Modulus, 1.3 mm/min, 50 mm span     | 1950           | MPa               | ASTM D790    |
| Tensile Stress, yield, 50 mm/min             | 50             | MPa               | ISO 527      |
| Tensile Stress, break, 50 mm/min             | 45             | MPa               | ISO 527      |
| Tensile Strain, yield, 50 mm/min             | 3.5            | %                 | ISO 527      |
| Tensile Strain, break, 50 mm/min             | 50             | %                 | ISO 527      |
| Tensile Modulus, 1 mm/min                    | 2000           | MPa               | ISO 527      |
| Flexural Stress, yield, 2 mm/min             | 75             | MPa               | ISO 178      |
| Flexural Modulus, 2 mm/min                   | 1900           | MPa               | ISO 178      |
| Ball Indentation Hardness, H358/30           | 75             | MPa               | ISO 2039-1   |
| <strong>IMPACT <sup>(1)</sup></strong>       |                |                   |              |
| Izod Impact, notched, 23°C                   | 680            | J/m               | ASTM D256    |
| Izod Impact, notched, -30°C                  | 280            | J/m               | ASTM D256    |
| Instrumented Dart Impact Total Energy, 23°C  | 55             | J                 | ASTM D3763   |
| Izod Impact, notched 80°10°4 +23°C           | 55             | kJ/m <sup>2</sup> | ISO 180/1A   |

| PROPERTIES                                         | TYPICAL VALUES | UNITS                   | TEST METHODS      |
|----------------------------------------------------|----------------|-------------------------|-------------------|
| Izod Impact, notched 80*10*4 -20°C                 | 25             | kJ/m <sup>2</sup>       | ISO 180/1A        |
| Izod Impact, notched 80*10*4 -30°C                 | 25             | kJ/m <sup>2</sup>       | ISO 180/1A        |
| Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm         | 55             | kJ/m <sup>2</sup>       | ISO 179/1eA       |
| Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm        | 25             | kJ/m <sup>2</sup>       | ISO 179/1eA       |
| <b>THERMAL <sup>(1)</sup></b>                      |                |                         |                   |
| Vicat Softening Temp, Rate B/50                    | 180            | °C                      | ASTM D1525        |
| HDT, 0.45 MPa, 3.2 mm, unannealed                  | 185            | °C                      | ASTM D648         |
| CTE, -40°C to 40°C, flow                           | 9.E-05         | 1/°C                    | ASTM E831         |
| CTE, -40°C to 40°C, xflow                          | 1.E-04         | 1/°C                    | ASTM E831         |
| Thermal Conductivity                               | 0.24           | W/m-°C                  | ISO 8302          |
| CTE, 23°C to 60°C, flow                            | 9.E-05         | 1/°C                    | ISO 11359-2       |
| CTE, 23°C to 60°C, xflow                           | 9.E-05         | 1/°C                    | ISO 11359-2       |
| Ball Pressure Test, 125°C +/- 2°C                  | PASSES         | -                       | IEC 60695-10-2    |
| Vicat Softening Temp, Rate A/50                    | 240            | °C                      | ISO 306           |
| Vicat Softening Temp, Rate B/50                    | 180            | °C                      | ISO 306           |
| Vicat Softening Temp, Rate B/120                   | 185            | °C                      | ISO 306           |
| HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm            | 175            | °C                      | ISO 75/Be         |
| <b>PHYSICAL <sup>(1)</sup></b>                     |                |                         |                   |
| Specific Gravity                                   | 1.08           | -                       | ASTM D792         |
| Mold Shrinkage on Tensile Bar, flow <sup>(2)</sup> | 1.4 – 1.8      | %                       | SABIC method      |
| Mold Shrinkage, flow, 3.2 mm <sup>(2)</sup>        | 1.4 – 1.7      | %                       | SABIC method      |
| Mold Shrinkage, xflow, 3.2 mm <sup>(2)</sup>       | 1.1 – 1.4      | %                       | SABIC method      |
| Melt Flow Rate, 280°C/5.0 kgf                      | 12.5           | g/ 10 min               | ASTM D1238        |
| Density                                            | 1.07           | g/cm <sup>3</sup>       | ISO 1183          |
| Water Absorption, (23°C/saturated)                 | 3.5            | %                       | ISO 62-1          |
| Moisture Absorption (23°C / 50% RH)                | 1.2            | %                       | ISO 62            |
| Melt Volume Rate, MVR at 280°C/5.0 kg              | 12             | cm <sup>3</sup> /10 min | ISO 1133          |
| <b>ELECTRICAL <sup>(1)</sup></b>                   |                |                         |                   |
| Volume Resistivity                                 | 2.2E+13        | Ω.cm                    | IEC 60093         |
| Dielectric Strength, in oil, 3.2 mm                | 20             | kV/mm                   | IEC 60243-1       |
| Relative Permittivity, 1 MHz                       | 2.7            | -                       | IEC 60250         |
| Dissipation Factor, 50/60 Hz                       | 0.072          | -                       | IEC 60250         |
| Dissipation Factor, 1 MHz                          | 0.024          | -                       | IEC 60250         |
| Comparative Tracking Index                         | 600            | V                       | IEC 60112         |
| Relative Permittivity, 50/60 Hz                    | 3.5            | -                       | IEC 60250         |
| <b>FLAME CHARACTERISTICS <sup>(1)</sup></b>        |                |                         |                   |
| UL Compliant, 94HB Flame Class Rating              | 1.6            | mm                      | UL 94 by SABIC-IP |
| Oxygen Index (LOI)                                 | 21             | %                       | ISO 4589          |
| <b>INJECTION MOLDING <sup>(3)</sup></b>            |                |                         |                   |
| Drying Temperature                                 | 100 – 120      | °C                      |                   |
| Drying Time                                        | 2 – 3          | Hrs                     |                   |
| Maximum Moisture Content                           | 0.07           | %                       |                   |
| Melt Temperature                                   | 290 – 320      | °C                      |                   |
| Nozzle Temperature                                 | 280 – 310      | °C                      |                   |
| Front - Zone 3 Temperature                         | 290 – 320      | °C                      |                   |

| PROPERTIES                  | TYPICAL VALUES | UNITS | TEST METHODS |
|-----------------------------|----------------|-------|--------------|
| Middle - Zone 2 Temperature | 280 – 300      | °C    |              |
| Rear - Zone 1 Temperature   | 260 – 280      | °C    |              |
| Hopper Temperature          | 60 – 80        | °C    |              |
| Mold 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) 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.

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