

# NORYL™ RESIN NHP9023

REGION ASIA

## DESCRIPTION

NORYL NHP9023 resin is a 15% 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 V0 1.5mm and V1 at 0.75mm for thin-wall molding capability. NORYL NHP9023 is based on a unique co-polymer technology and exhibits good dimensional stability, high heat resistance, strong electrical performance, and very low specific gravity. It is an excellent candidate for copier fuser units, business equipment internal components, and electrical applications where thin-wall FR, modulus retention, and high heat resistance are required.

### GENERAL INFORMATION

**Features**

Flame Retardant, Good Processability, Heat Stabilized, 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, High temperature resistance, Impact resistant, No PFAS intentionally added

**Fillers**

Glass Fiber

**Polymer Types**

Polyphenylene Ether + PS (PPE+PS)

**Processing Techniques**

Injection Molding

**INDUSTRY**

Consumer

Electrical and Electronics

Industrial

**SUB INDUSTRY**

Commercial Appliance

Electronic Components, Mobile Phone - Computer - Tablets

Electrical

## TYPICAL PROPERTY VALUES

Revision 20231109

| PROPERTIES                                   | TYPICAL VALUES | UNITS | TEST METHODS |
|----------------------------------------------|----------------|-------|--------------|
| <b>MECHANICAL</b> <sup>(1) (2) (3) (4)</sup> |                |       |              |
| Tensile Stress, brk, Type I, 5 mm/min        | 112            | MPa   | ASTM D638    |
| Tensile Strain, brk, Type I, 5 mm/min        | 2.9            | %     | ASTM D638    |
| Tensile Modulus, 5 mm/min                    | 5400           | MPa   | ASTM D638    |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 163            | MPa   | ASTM D790    |
| Flexural Modulus, 1.3 mm/min, 50 mm span     | 5200           | MPa   | ASTM D790    |
| Hardness, Rockwell R                         | 121            | -     | ASTM D785    |
| Tensile Stress, break, 5 mm/min              | 112            | MPa   | ISO 527      |
| Tensile Strain, break, 5 mm/min              | 2.7            | %     | ISO 527      |
| Tensile Modulus, 1 mm/min                    | 5600           | MPa   | ISO 527      |
| Flexural Stress, yield, 2 mm/min             | 163            | MPa   | ISO 178      |
| Flexural Modulus, 2 mm/min                   | 5200           | MPa   | ISO 178      |
| <b>IMPACT</b> <sup>(1) (2) (3) (4)</sup>     |                |       |              |
| Izod Impact, unnotched, 23°C                 | 500            | J/m   | ASTM D4812   |
| Izod Impact, unnotched, -30°C                | 500            | J/m   | ASTM D4812   |
| Izod Impact, notched, 23°C                   | 72             | J/m   | ASTM D256    |
| Izod Impact, notched, -30°C                  | 61             | J/m   | ASTM D256    |
| Instrumented Dart Impact Total Energy, 23°C  | 10             | J     | ASTM D3763   |

| PROPERTIES                                  | TYPICAL VALUES                    | UNITS             | TEST METHODS |
|---------------------------------------------|-----------------------------------|-------------------|--------------|
| Izod Impact, unnotched 80*10*4 +23°C        | 27                                | kJ/m <sup>2</sup> | ISO 180/1U   |
| Izod Impact, unnotched 80*10*4 -30°C        | 28                                | kJ/m <sup>2</sup> | ISO 180/1U   |
| Izod Impact, notched 80*10*4 +23°C          | 7                                 | kJ/m <sup>2</sup> | ISO 180/1A   |
| Izod Impact, notched 80*10*4 -30°C          | 6                                 | kJ/m <sup>2</sup> | ISO 180/1A   |
| Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm  | 7                                 | kJ/m <sup>2</sup> | ISO 179/1eA  |
| <b>THERMAL</b> <sup>(1) (2) (3) (4)</sup>   |                                   |                   |              |
| HDT, 1.82 MPa, 3.2mm, unannealed            | 153                               | °C                | ASTM D648    |
| HDT, 1.82 MPa, 6.4 mm, unannealed           | 154                               | °C                | ASTM D648    |
| CTE, 23°C to 80°C, flow                     | 3.5E-05                           | 1/°C              | ISO 11359-2  |
| CTE, 23°C to 80°C, xflow                    | 6.4E-05                           | 1/°C              | ISO 11359-2  |
| Vicat Softening Temp, Rate B/50             | 161                               | °C                | ISO 306      |
| Vicat Softening Temp, Rate B/120            | 163                               | °C                | ISO 306      |
| HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm       | 155                               | °C                | ISO 75/Af    |
| Relative Temp Index, Elec                   | 65                                | °C                | UL 746B      |
| Relative Temp Index, Mech w/impact          | 65                                | °C                | UL 746B      |
| Relative Temp Index, Mech w/o impact        | 65                                | °C                | UL 746B      |
| <b>PHYSICAL</b> <sup>(1) (2) (3) (4)</sup>  |                                   |                   |              |
| Specific Gravity                            | 1.21                              | -                 | ASTM D792    |
| Mold Shrinkage, flow, 3.2 mm <sup>(5)</sup> | 0.5                               | %                 | SABIC method |
| Melt Flow Rate, 300°C/5.0 kgf               | 20                                | g/10 min          | ASTM D1238   |
| Density                                     | 1.21                              | g/cm <sup>3</sup> | ISO 1183     |
| Water Absorption, (23°C/saturated)          | 0.2                               | %                 | ISO 62-1     |
| Moisture Absorption (23°C / 50% RH)         | 0.05                              | %                 | ISO 62       |
| <b>ELECTRICAL</b> <sup>(4)</sup>            |                                   |                   |              |
| Comparative Tracking Index (UL) {PLC}       | 3                                 | PLC Code          | UL 746A      |
| <b>FLAME CHARACTERISTICS</b> <sup>(6)</sup> |                                   |                   |              |
| UL Yellow Card Link                         | <a href="#">E207780-102131113</a> | -                 | -            |
| UL Recognized, 94V-1 Flame Class Rating     | ≥0.75                             | mm                | UL 94        |
| UL Recognized, 94V-0 Flame Class Rating     | ≥1.5                              | mm                | UL 94        |
| <b>INJECTION MOLDING</b> <sup>(7)</sup>     |                                   |                   |              |
| 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                           | %                 |              |



- (1) Typical values only. Variations within normal tolerances are possible for various colours. All values are measured at least after 48 hours storage at 23°C/50% relative humidity.
- (2) All properties, except the melt volume rate are measured on injection moulded samples. All samples are prepared according to ISO 294.
- (3) Only typical data for material selection purpose. Not to be used for part or tool design.
- (4) 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.
- (5) 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.
- (6) 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.
- (7) 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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