

## Noryl\* Resin SE0

### Europe-Africa-Middle East: COMMERCIAL

NORYL SE0 is an unfilled, flame retardant material with a Vicat B/120 of 130°C according ISO 306. NORYL SE0 is V0 at 1.6 mm according UL94 and halogen free according VDE/DIN 472 part 815. NORYL SE0 is available in all colours.

| TYPICAL PROPERTIES <sup>1</sup>             | TYPICAL VALUE | Unit              | Standard       |
|---|---------------|-------------------|----------------|
| <b>MECHANICAL</b>                           |               |                   |                |
| Taber Abrasion, CS-17, 1 kg                 | 40            | mg/1000cy         | SABIC Method   |
| Tensile Stress, yield, 50 mm/min            | 60            | MPa               | ISO 527        |
| Tensile Stress, break, 50 mm/min            | 50            | MPa               | ISO 527        |
| Tensile Strain, yield, 50 mm/min            | 4             | %                 | ISO 527        |
| Tensile Strain, break, 50 mm/min            | 15            | %                 | ISO 527        |
| Tensile Modulus, 1 mm/min                   | 2500          | MPa               | ISO 527        |
| Flexural Stress, yield, 2 mm/min            | 80            | MPa               | ISO 178        |
| Flexural Modulus, 2 mm/min                  | 2200          | MPa               | ISO 178        |
| Hardness, H358/30                           | 97            | MPa               | ISO 2039-1     |
| <b>IMPACT</b>                               |               |                   |                |
| Izod Impact, notched 80*10*4 +23°C          | 10            | 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  | 10            | kJ/m <sup>2</sup> | ISO 179/1eA    |
| Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm | 6             | kJ/m <sup>2</sup> | ISO 179/1eA    |
| <b>THERMAL</b>                              |               |                   |                |
| Thermal Conductivity                        | 0.23          | W/m-°C            | ISO 8302       |
| CTE, 23°C to 80°C, flow                     | 7.E-05        | 1/°C              | ISO 11359-2    |
| CTE, 23°C to 80°C, xflow                    | 9.E-05        | 1/°C              | ISO 11359-2    |
| Ball Pressure Test, 75°C +/- 2°C            | PASSES        | -                 | IEC 60695-10-2 |
| Vicat Softening Temp, Rate A/50             | 130           | °C                | ISO 306        |
| Vicat Softening Temp, Rate B/50             | 120           | °C                | ISO 306        |
| Vicat Softening Temp, Rate B/120            | 125           | °C                | ISO 306        |
| HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm     | 115           | °C                | ISO 75/Be      |

(1) Typical values only. Variations within normal tolerances are possible for various colors. All values are measured after at least 48 hours storage at 23±176.C/50% relative humidity. All properties, except the melt volume and melt flow rates, are measured on injection molded samples. All samples tested under ISO test standards are prepared according to ISO 294.

(2) Only typical data for selection purposes. Not to be used for part or tool design.

(3) This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

(4) Internal measurements according to UL standards.

(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.

Source GMD, last updated:

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|---|---------------|-------------------------|----------------|
| <b>THERMAL</b>                                |               |                         |                |
| HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm       | 100           | °C                      | ISO 75/Ae      |
| Relative Temp Index, Elec                     | 95            | °C                      | UL 746B        |
| Relative Temp Index, Mech w/impact            | 80            | °C                      | UL 746B        |
| Relative Temp Index, Mech w/o impact          | 95            | °C                      | UL 746B        |
| <b>PHYSICAL</b>                               |               |                         |                |
| Mold Shrinkage on Tensile Bar, flow (2)       | 0.5 - 0.7     | %                       | SABIC Method   |
| Density                                       | 1.1           | g/cm <sup>3</sup>       | ISO 1183       |
| Water Absorption, (23°C/sat)                  | 0.37          | %                       | ISO 62         |
| Moisture Absorption (23°C / 50% RH)           | 0.07          | %                       | ISO 62         |
| Melt Volume Rate, MVR at 280°C/3.8 kg         | 15            | cm <sup>3</sup> /10 min | ISO 1133       |
| <b>ELECTRICAL</b>                             |               |                         |                |
| Volume Resistivity                            | 1.E+15        | Ohm-cm                  | IEC 60093      |
| Surface Resistivity, ROA                      | >1.E+15       | Ohm                     | IEC 60093      |
| Dielectric Strength, in oil, 0.8 mm           | 33            | kV/mm                   | IEC 60243-1    |
| Dielectric Strength, in oil, 1.6 mm           | 26            | kV/mm                   | IEC 60243-1    |
| Dielectric Strength, in oil, 3.2 mm           | 16            | kV/mm                   | IEC 60243-1    |
| Relative Permittivity, 1 MHz                  | 2.6           | -                       | IEC 60250      |
| Dissipation Factor, 50/60 Hz                  | 0.008         | -                       | IEC 60250      |
| Dissipation Factor, 1 MHz                     | 0.004         | -                       | IEC 60250      |
| Comparative Tracking Index                    | 400           | V                       | IEC 60112      |
| Relative Permittivity, 50/60 Hz               | 2.7           | -                       | IEC 60250      |
| <b>FLAME CHARACTERISTICS</b>                  |               |                         |                |
| UL Recognized, 94V-0 Flame Class Rating (3)   | 1.5           | mm                      | UL 94          |
| Glow Wire Flammability Index 960°C, passes at | 3.2           | mm                      | IEC 60695-2-12 |
| Glow Wire Ignitability Temperature, 1.0 mm    | 775           | °C                      | IEC 60695-2-13 |
| Oxygen Index (LOI)                            | 32            | %                       | ISO 4589       |

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| PROCESSING PARAMETERS       | TYPICAL VALUE | Unit |
|-----------------------------|---------------|------|
| <b>Injection Molding</b>    |               |      |
| Drying Temperature          | 100 - 120     | °C   |
| Drying Time                 | 2 - 3         | hrs  |
| Melt Temperature            | 280 - 300     | °C   |
| Nozzle Temperature          | 260 - 280     | °C   |
| Front - Zone 3 Temperature  | 280 - 300     | °C   |
| Middle - Zone 2 Temperature | 260 - 280     | °C   |
| Rear - Zone 1 Temperature   | 240 - 260     | °C   |
| Hopper Temperature          | 60 - 80       | °C   |
| Mold Temperature            | 80 - 120      | °C   |

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