

Noryl* Resin SE1

Americas: COMMERCIAL

PPE+PS blend. Unfilled. Non-brominated, non-chlorinated FR system. UL94 V1, UL746C F1. Dielectric strength. Suitable for E/E market indoor/outdoor applications.

| TYPICAL PROPERTIES ¹ | TYPICAL VALUE | UNIT | STANDARD |
|---|---------------|---------------------|-------------|
| MECHANICAL | | | |
| Tensile Stress, yld, Type I, 50 mm/min | 660 | kgf/cm ² | ASTM D 638 |
| Tensile Stress, brk, Type I, 50 mm/min | 540 | kgf/cm ² | ASTM D 638 |
| Tensile Strain, yld, Type I, 50 mm/min | 4 | % | ASTM D 638 |
| Tensile Strain, brk, Type I, 50 mm/min | 15 | % | ASTM D 638 |
| Tensile Modulus, 50 mm/min | 25400 | kgf/cm ² | ASTM D 638 |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 1010 | kgf/cm ² | ASTM D 790 |
| Flexural Stress, yld, 2.6 mm/min, 100 mm span | 990 | kgf/cm ² | ASTM D 790 |
| Flexural Modulus, 1.3 mm/min, 50 mm span | 27500 | kgf/cm ² | ASTM D 790 |
| Flexural Modulus, 2.6 mm/min, 100 mm span | 24400 | kgf/cm ² | ASTM D 790 |
| Tensile Stress, yield, 50 mm/min | 61 | MPa | ISO 527 |
| Tensile Stress, break, 50 mm/min | 50 | MPa | ISO 527 |
| Tensile Strain, yield, 50 mm/min | 4.3 | % | ISO 527 |
| Tensile Strain, break, 50 mm/min | 20.7 | % | ISO 527 |
| Tensile Modulus, 1 mm/min | 2670 | MPa | ISO 527 |
| Flexural Stress, yield, 2 mm/min | 99 | MPa | ISO 178 |
| Flexural Modulus, 2 mm/min | 2560 | MPa | ISO 178 |
| IMPACT | | | |
| Izod Impact, unnotched, 23°C | 265 | cm-kgf/cm | ASTM D 4812 |
| Izod Impact, notched, 23°C | 18 | cm-kgf/cm | ASTM D 256 |
| Izod Impact, notched, -30°C | 10 | cm-kgf/cm | ASTM D 256 |
| Instrumented Impact Total Energy, 23°C | 506 | cm-kgf | ASTM D 3763 |
| Izod Impact, notched 80*10*4 +23°C | 14 | kJ/m ² | ISO 180/1A |

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. All properties, except the melt volume rate are measured on injection moulded samples. All samples are prepared according to ISO 294.

2) Only typical data for material selection purpose. 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) Own measurement according to UL.

Source, GMD, Last Update: 05/11/2004

PLEASE CONTACT YOUR LOCAL SALES OFFICE FOR AVAILABILITY IN YOUR AREA. **DISCLAIMER: THE MATERIALS, PRODUCTS AND SERVICES OF SABIC INNOVATIVE PLASTICS HOLDING BV, ITS SUBSIDIARIES AND AFFILIATES ("SELLER"), ARE SOLD SUBJECT TO SELLER'S STANDARD CONDITIONS OF SALE, WHICH CAN BE FOUND AT <http://www.sabic-ip.com>. AND ARE AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION OR RECOMMENDATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SELLER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (i) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING SELLER'S PRODUCTS, SERVICES OR RECOMMENDATIONS. EXCEPT AS PROVIDED IN SELLER'S STANDARD CONDITIONS OF SALE, SELLER SHALL NOT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS PRODUCTS OR SERVICES DESCRIBED HEREIN.** Each user is responsible for making its own determination as to the suitability of Seller's products, services or recommendations for the user's particular use through appropriate end-use testing and analysis. Nothing in any document or oral statement shall be deemed to alter or waive any provision of Seller's Standard Conditions of Sale or this Disclaimer, unless it is specifically agreed to in a writing signed by Seller. No statement by Seller concerning a possible use of any product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Seller or as a recommendation for the use of such product, service or design in a manner that infringes any patent or other intellectual property right.

* Noryl is a trademark of SABIC INNOVATIVE PLASTICS HOLDING BV

© 1997-2008 SABIC INNOVATIVE PLASTICS HOLDING BV. All rights reserved

Noryl* Resin SE1

Americas: COMMERCIAL

| TYPICAL PROPERTIES ¹ | TYPICAL VALUE | UNIT | STANDARD |
|--|---------------|-------------------------|--------------|
| THERMAL | | | |
| HDT, 0.45 MPa, 3.2 mm, unannealed | 126 | °C | ASTM D 648 |
| HDT, 1.82 MPa, 3.2mm, unannealed | 112 | °C | ASTM D 648 |
| HDT, 0.45 MPa, 6.4 mm, unannealed | 129 | °C | ASTM D 648 |
| HDT, 1.82 MPa, 6.4 mm, unannealed | 118 | °C | ASTM D 648 |
| CTE, -40°C to 40°C, flow | 8.04E-05 | 1/°C | ASTM E 831 |
| CTE, -40°C to 40°C, xflow | 8.81E-05 | 1/°C | ASTM E 831 |
| Vicat Softening Temp, Rate B/50 | 132 | °C | ISO 306 |
| Vicat Softening Temp, Rate B/120 | 135 | °C | ISO 306 |
| HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm | 129 | °C | ISO 75/Be |
| HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm | 115 | °C | ISO 75/Ae |
| Relative Temp Index, Elec | 110 | °C | UL 746B |
| Relative Temp Index, Mech w/impact | 105 | °C | UL 746B |
| Relative Temp Index, Mech w/o impact | 110 | °C | UL 746B |
| PHYSICAL | | | |
| Specific Gravity | 1.09 | - | ASTM D 792 |
| Water Absorption, 24 hours | 0.06 | % | ASTM D 570 |
| Mold Shrinkage, flow, 3.2 mm | 0.5 - 0.7 | % | SABIC Method |
| Mold Shrinkage on Tensile Bar, xflow (2) | 0.5 - 0.7 | % | SABIC Method |
| Melt Flow Rate, 280°C/5.0 kgf | 8.5 | g/10 min | ASTM D 1238 |
| Melt Volume Rate, MVR at 280°C/5.0 kg | 8 | cm ³ /10 min | ISO 1133 |
| ELECTRICAL | | | |
| Volume Resistivity | 2.3E+16 | Ohm-cm | ASTM D 257 |
| Surface Resistivity | >1.E+15 | Ohm | ASTM D 257 |
| Dielectric Strength, in oil, 3.2 mm | 18.1 | kV/mm | ASTM D 149 |
| Relative Permittivity, 50/60 Hz | 2.52 | - | ASTM D 150 |

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. All properties, except the melt volume rate are measured on injection moulded samples. All samples are prepared according to ISO 294.

2) Only typical data for material selection purpose. 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) Own measurement according to UL.

Source, GMD, Last Update:05/11/2004

PLEASE CONTACT YOUR LOCAL SALES OFFICE FOR AVAILABILITY IN YOUR AREA. **DISCLAIMER:** THE MATERIALS, PRODUCTS AND SERVICES OF SABIC INNOVATIVE PLASTICS HOLDING BV, ITS SUBSIDIARIES AND AFFILIATES ("SELLER"), ARE SOLD SUBJECT TO SELLER'S STANDARD CONDITIONS OF SALE, WHICH CAN BE FOUND AT <http://www.sabic-ip.com> AND ARE AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION OR RECOMMENDATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SELLER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (I) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (II) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING SELLER'S PRODUCTS, SERVICES OR RECOMMENDATIONS. EXCEPT AS PROVIDED IN SELLER'S STANDARD CONDITIONS OF SALE, SELLER SHALL NOT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS PRODUCTS OR SERVICES DESCRIBED HEREIN. Each user is responsible for making its own determination as to the suitability of Seller's products, services or recommendations for the user's particular use through appropriate end-use testing and analysis. Nothing in any document or oral statement shall be deemed to alter or waive any provision of Seller's Standard Conditions of Sale or this Disclaimer, unless it is specifically agreed to in a writing signed by Seller. No statement by Seller concerning a possible use of any product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Seller or as a recommendation for the use of such product, service or design in a manner that infringes any patent or other intellectual property right.

* Noryl is a trademark of SABIC Innovative Plastics IP BV

© 1997-2008 SABIC Innovative Plastics IP BV. All rights reserved

Noryl* Resin SE1
Americas: COMMERCIAL

| TYPICAL PROPERTIES ¹ | TYPICAL VALUE | UNIT | STANDARD |
|---|---------------|----------|------------|
| ELECTRICAL | | | |
| Relative Permittivity, 1 MHz | 2.46 | - | ASTM D 150 |
| Dissipation Factor, 50/60 Hz | 0.0034 | - | ASTM D 150 |
| Dissipation Factor, 1 MHz | 0.0021 | - | ASTM D 150 |
| Arc Resistance, Tungsten {PLC} | 6 | PLC Code | ASTM D 495 |
| High Voltage Arc Track Rate {PLC} | 4 | PLC Code | UL 746A |
| Comparative Tracking Index (UL) {PLC} | 1 | PLC Code | UL 746A |
| FLAME CHARACTERISTICS | | | |
| UL Recognized, 94V-1 Flame Class Rating (3) | 1.47 | mm | UL 94 |
| UL Recognized, 94V-0 Flame Class Rating (3) | 5.99 | mm | UL 94 |
| Radiant Panel Listing | RP100 | - | UL Tested |
| UV-light, water exposure/immersion | F1 | - | UL 746C |

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.
All properties, except the melt volume rate are measured on injection moulded samples.
All samples are prepared according to ISO 294.

2) Only typical data for material selection purpose. 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) Own measurement according to UL.

Source, GMD, Last Update: 05/11/2004

PLEASE CONTACT YOUR LOCAL SALES OFFICE FOR AVAILABILITY IN YOUR AREA. **DISCLAIMER: THE MATERIALS, PRODUCTS AND SERVICES OF SABIC INNOVATIVE PLASTICS HOLDING BV, ITS SUBSIDIARIES AND AFFILIATES ("SELLER"), ARE SOLD SUBJECT TO SELLER'S STANDARD CONDITIONS OF SALE, WHICH CAN BE FOUND AT <http://www.sabic-ip.com>, AND ARE AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION OR RECOMMENDATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SELLER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED. (i) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING SELLER'S PRODUCTS, SERVICES OR RECOMMENDATIONS. EXCEPT AS PROVIDED IN SELLER'S STANDARD CONDITIONS OF SALE, SELLER SHALL NOT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS PRODUCTS OR SERVICES DESCRIBED HEREIN.** Each user is responsible for making its own determination as to the suitability of Seller's products, services or recommendations for the user's particular use through appropriate end-use testing and analysis. Nothing in any document or oral statement shall be deemed to alter or waive any provision of Seller's Standard Conditions of Sale or this Disclaimer, unless it is specifically agreed to in a writing signed by Seller. No statement by Seller concerning a possible use of any product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Seller or as a recommendation for the use of such product, service or design in a manner that infringes any patent or other intellectual property right.

* Noryl is a trademark of SABIC Innovative Plastics IP BV

© 1997-2008 SABIC Innovative Plastics IP BV. All rights reserved

Noryl* Resin SE1
Americas: COMMERCIAL

| PROCESSING PARAMETERS | TYPICAL VALUE | UNIT |
|-----------------------------|---------------|------|
| Injection Molding | | |
| Drying Temperature | 105 - 110 | °C |
| Drying Time | 3 - 4 | hrs |
| Drying Time (Cumulative) | 8 | hrs |
| Maximum Moisture Content | 0.02 | % |
| Melt Temperature | 280 - 310 | °C |
| Nozzle Temperature | 280 - 310 | °C |
| Front - Zone 3 Temperature | 270 - 310 | °C |
| Middle - Zone 2 Temperature | 260 - 305 | °C |
| Rear - Zone 1 Temperature | 250 - 300 | °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) 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.
All properties, except the melt volume rate are measured on injection moulded samples.
All samples are prepared according to ISO 294.

2) Only typical data for material selection purpose. 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) Own measurement according to UL.

Source, GMD, Last Update: 05/11/2004

PLEASE CONTACT YOUR LOCAL SALES OFFICE FOR AVAILABILITY IN YOUR AREA. **DISCLAIMER: THE MATERIALS, PRODUCTS AND SERVICES OF SABIC INNOVATIVE PLASTICS HOLDING BV, ITS SUBSIDIARIES AND AFFILIATES ("SELLER"), ARE SOLD SUBJECT TO SELLER'S STANDARD CONDITIONS OF SALE, WHICH CAN BE FOUND AT <http://www.sabic-ip.com>, AND ARE AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION OR RECOMMENDATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SELLER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (I) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (II) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING SELLER'S PRODUCTS, SERVICES OR RECOMMENDATIONS. EXCEPT AS PROVIDED IN SELLER'S STANDARD CONDITIONS OF SALE, SELLER SHALL NOT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS PRODUCTS OR SERVICES DESCRIBED HEREIN.** Each user is responsible for making its own determination as to the suitability of Seller's products, services or recommendations for the user's particular use through appropriate end-use testing and analysis. Nothing in any document or oral statement shall be deemed to alter or waive any provision of Seller's Standard Conditions of Sale or this Disclaimer, unless it is specifically agreed to in a writing signed by Seller. No statement by Seller concerning a possible use of any product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Seller or as a recommendation for the use of such product, service or design in a manner that infringes any patent or other intellectual property right.

* Noryl is a trademark of SABIC Innovative Plastics IP BV

© 1997-2008 SABIC Innovative Plastics IP BV. All rights reserved