# LNP™ ELCRES™ EXL9533

## DESCRIPTION

LNP ELCRES EXL9533 is based on Polycarbonate (PC) copolymer resin with medium flowability, good flame retardancy, good low temperature ductility and UV stabilized performance. It has good electrical tracking resistance with UL CTI PLC=0 and IEC CTI=600V intended for high voltage applications such as EV Charger or other related electrical devices.

| GENERAL INFORMATION | |
|---|---|
| **Features** | Flame Retardant, Low temperature impact, Tracking resistance |
| **Fillers** | Unreinforced |
| **Polymer Types** | Polycarbonate (PC) |
| **Processing Techniques** | Injection Molding |

| INDUSTRY | SUB INDUSTRY |
|---|---|
| Automotive | Automotive EV Batteries |
| Electrical and Electronics | Energy Management |
| Hydrocarbon and Energy | Energy Storage |
| Industrial | Electrical |

## TYPICAL PROPERTY VALUES

Revision 20240627

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|---|---|---|
| **MECHANICAL** [1] | | | |
| **Tensile Stress, yld, Type I, 5 mm/min** | 53 | MPa | ASTM D638 |
| **Tensile Stress, brk, Type I, 5 mm/min** | 55 | MPa | ASTM D638 |
| **Tensile Strain, brk, Type I, 5 mm/min** | 78.5 | % | ASTM D638 |
| **Tensile Modulus, 5 mm/min** | 2050 | MPa | ASTM D638 |
| **Flexural Strength, 1.3 mm/min, 50 mm span** | 86 | MPa | ASTM D790 |
| **Flexural Modulus, 1.3 mm/min, 50 mm span** | 2110 | MPa | ASTM D790 |
| **Tensile Stress, yield, 5 mm/min** | 53 | MPa | ISO 527 |
| **Tensile Stress, break, 5 mm/min** | 54 | MPa | ISO 527 |
| **Tensile Strain, break, 5 mm/min** | 78.5 | % | ISO 527 |
| **Tensile Modulus, 1 mm/min** | 2100 | MPa | ISO 527 |
| **Flexural Strength, 2 mm/min** | 80 | MPa | ISO 178 |
| **Flexural Modulus, 2 mm/min** | 2070 | MPa | ISO 178 |
| **IMPACT** [1] | | | |
| **Izod Impact** | | | |
| notched, 23°C | 720 | J/m | ASTM D256 |
| notched, -30°C | 630 | J/m | ASTM D256 |
| notched, -35°C | 540 | J/m | ASTM D256 |
| notched, -40°C | 410 | J/m | ASTM D256 |
| unnotched, 23°C | NB | J/m | ASTM D4812 |
| unnotched, -30°C | NB | J/m | ASTM D4812 |

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|---|---|---|
| notched 80*10*3 +23°C | 60 | kJ/m² | ISO 180/1A |
| notched 80*10*3 -30°C | 58 | kJ/m² | ISO 180/1A |
| unnotched 80*10*3 +23°C | NB | kJ/m² | ISO 180/1U |
| unnotched 80*10*3 -30°C | NB | kJ/m² | ISO 180/1U |
| **Instrumented Dart Impact Energy @ peak, 23°C** | 63 | J | ASTM D3763 |
| **Instrumented Dart Impact Total Energy, 23°C** | 64 | J | ASTM D3763 |
| **THERMAL** [1] | | | |
| **HDT, 1.82 MPa, 3.2mm, unannealed** | 122 | °C | ASTM D648 |
| **HDT, 0.45 MPa, 3.2 mm, unannealed** | 136 | °C | ASTM D648 |
| **CTE, 23°C to 80°C, flow** | 7.9E-5 | 1/°C | ASTM E831 |
| **CTE, 23°C to 80°C, xflow** | 8.3E-5 | 1/°C | ASTM E831 |
| **CTE, -40°C to 40°C, flow** | 6.5E-5 | 1/°C | ASTM E831 |
| **CTE, -40°C to 40°C, xflow** | 7.1E-5 | 1/°C | ASTM E831 |
| **Vicat Softening Temp, Rate B/50** | 142 | °C | ISO 306 |
| **Vicat Softening Temp, Rate B/120** | 143 | °C | ISO 306 |
| **Relative Temp Index, Elec** [2] | 130 | °C | UL 746B |
| **Relative Temp Index, Mech w/impact** [2] | 115 | °C | UL 746B |
| **Relative Temp Index, Mech w/o impact** [2] | 130 | °C | UL 746B |
| **PHYSICAL** [1] | | | |
| **Specific Gravity** | 1.22 | - | ASTM D792 |
| **Water Absorption, (23°C/24hrs)** | 0.06 | % | ISO 62-1 |
| **Melt Flow Rate, 300°C/1.2 kgf** | 8 | g/10 min | ASTM D1238 |
| **Melt Volume Rate, MVR at 300°C/1.2 kg** | 7 | cm³/10 min | ASTM D1238 |
| **Mold Shrinkage, flow** [3] | 0.7 – 0.9 | % | SABIC method |
| **Mold Shrinkage, xflow** [3] | 0.7 – 0.9 | % | SABIC method |
| **ELECTRICAL** [1] | | | |
| **Surface Resistivity** | 8.6E15 | Ω | ASTM D257 |
| **Volume Resistivity** | 1.8E15 | Ω.cm | ASTM D257 |
| **Dielectric Constant, 1.1 GHz** | 2.87 | - | SABIC method |
| **Dissipation Factor, 1.1 GHz** | 0.0105 | - | SABIC method |
| **Dielectric Constant, 1.9 GHz** | 2.88 | - | SABIC method |
| **Dissipation Factor, 1.9 GHz** | 0.0097 | - | SABIC method |
| **Dielectric Constant, 5 GHz** | 2.87 | - | SABIC method |
| **Dissipation Factor, 5 GHz** | 0.0079 | - | SABIC method |
| **Dielectric Constant, 10 GHz** | 2.87 | - | SABIC method |
| **Dissipation Factor, 10 GHz** | 0.0074 | - | SABIC method |
| **Comparative Tracking Index (UL) {PLC}** [2] | 0 | PLC Code | UL 746A |
| **FLAME CHARACTERISTICS** [2] | | | |
| **UL Yellow Card Link** | E207780-104626639 | - | - |
| **UL Recognized, 94-5VA Flame Class Rating** | ≥3.0 | mm | UL 94 |
| **UL Recognized, 94-5VB Flame Class Rating** | ≥2.5 | mm | UL 94 |
| **UL Recognized, 94V-0 Flame Class Rating** | ≥1.3 | mm | UL 94 |
| **INJECTION MOLDING** [4] | | | |
| **Drying Temperature** | 120 | °C | |
| **Drying Time** | 3 – 4 | Hrs | |

| PROPERTIES | TYPICAL VALUES | UNITS | TEST METHODS |
|---|---|---|---|
| Maximum Moisture Content | 0.02 | % | |
| Melt Temperature | 260 – 290 | °C | |
| Nozzle Temperature | 250 – 285 | °C | |
| Front - Zone 3 Temperature | 260 – 290 | °C | |
| Middle - Zone 2 Temperature | 255 – 285 | °C | |
| Rear - Zone 1 Temperature | 250 – 280 | °C | |
| Mold Temperature | 70 – 120 | °C | |
| Back Pressure | 0.3 – 0.7 | MPa | |
| Screw Speed | 40 – 70 | rpm | |

(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) 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.

(3) 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.

(4) 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.

## DISCLAIMER