

# LNPT<sup>™</sup> ELCRIN<sup>™</sup> EXL9330B

## DESCRIPTION

ELCRIN EXL9330B polycarbonate (PC) siloxane copolymer resin is a UV stabilized high flow opaque injection molding (IM) grade with major component synthesized from Bio source. This resin offers UL94 V0 @1.5mm flame retardancy based on non-bromine, non-chlorine FR systems, extreme low temperature ductility (-60°C) characteristics and excellent processability with opportunities for shorter IM cycle times compared to standard PC. ELCRIN EXL9330B resin is a product available in a wide range of opaque colors and may be an excellent candidate for a wide range of applications.

### GENERAL INFORMATION

|                       |                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------|
| Features              | Flame Retardant, Good Processability, Non Cl/Br flame retardant, Low temperature impact |
| Fillers               | Unreinforced                                                                            |
| Polymer Types         | Polycarbonate (PC)                                                                      |
| Processing Techniques | Injection Molding                                                                       |

### INDUSTRY

Consumer  
Electrical and Electronics  
Industrial

### SUB INDUSTRY

Personal Accessory, Home Appliances  
Mobile Phone - Computer - Tablets  
Electrical

## TYPICAL PROPERTY VALUES

Revision 20231109

| PROPERTIES                                | TYPICAL VALUES | UNITS             | TEST METHODS |
|-------------------------------------------|----------------|-------------------|--------------|
| <b>MECHANICAL <sup>(1)</sup></b>          |                |                   |              |
| Tensile Stress, yld, Type I, 50 mm/min    | 58             | MPa               | ASTM D638    |
| Tensile Stress, brk, Type I, 50 mm/min    | 61             | MPa               | ASTM D638    |
| Tensile Strain, yld, Type I, 50 mm/min    | 6              | %                 | ASTM D638    |
| Tensile Strain, brk, Type I, 50 mm/min    | 130            | %                 | ASTM D638    |
| Tensile Modulus, 50 mm/min                | 2100           | MPa               | ASTM D638    |
| Flexural Strength, 1.3 mm/min, 50 mm span | 88             | MPa               | ASTM D790    |
| Flexural Modulus, 1.3 mm/min, 50 mm span  | 2060           | MPa               | ASTM D790    |
| Tensile Stress, yield, 50 mm/min          | 55             | MPa               | ISO 527      |
| Tensile Stress, break, 50 mm/min          | 60             | MPa               | ISO 527      |
| Tensile Strain, yield, 50 mm/min          | 6              | %                 | ISO 527      |
| Tensile Strain, break, 50 mm/min          | 125            | %                 | ISO 527      |
| Tensile Modulus, 1 mm/min                 | 2100           | MPa               | ISO 527      |
| Flexural Strength, 2 mm/min               | 85             | MPa               | ISO 178      |
| Flexural Modulus, 2 mm/min                | 2200           | MPa               | ISO 178      |
| Ball Indentation Hardness, H358/30        | 90             | MPa               | ISO 2039-1   |
| <b>IMPACT <sup>(1)</sup></b>              |                |                   |              |
| Izod Impact, notched, 23°C                | 801            | J/m               | ASTM D256    |
| Izod Impact, notched, 23°C, 6.4mm         | 640            | J/m               | ASTM D256    |
| Izod Impact, notched, -30°C               | 678            | J/m               | ASTM D256    |
| Izod Impact, notched, -50°C               | 587            | J/m               | ASTM D256    |
| Izod Impact, notched 80*10*3 +23°C        | 70             | kJ/m <sup>2</sup> | ISO 180/1A   |

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CHEMISTRY THAT MATTERS<sup>™</sup>

| PROPERTIES                                          | TYPICAL VALUES | UNITS                   | TEST METHODS   |
|-----------------------------------------------------|----------------|-------------------------|----------------|
| Izod Impact, unnotched 80*10*3 +23°C                | NB             | kJ/m <sup>2</sup>       | ISO 180/1U     |
| Izod Impact, notched 80*10*3 -30°C                  | 55             | kJ/m <sup>2</sup>       | ISO 180/1A     |
| Izod Impact, unnotched 80*10*3 -30°C                | NB             | kJ/m <sup>2</sup>       | ISO 180/1U     |
| Izod Impact, notched 63.5*12.7*3.2, 23°C            | 80             | kJ/m <sup>2</sup>       | ISO 180/4A     |
| Izod Impact, notched 63.5*12.7*3.2, -30°C           | 65             | kJ/m <sup>2</sup>       | ISO 180/4A     |
| Izod Impact, double-gated, 23°C                     | 1068           | J/m                     | SABIC method   |
| Charpy 23°C, V-notch Edgew 80*10*3 sp=62mm          | 75             | kJ/m <sup>2</sup>       | ISO 179/1eA    |
| Charpy 23°C, Unnotch Edgew 80*10*3 sp=62mm          | NB             | kJ/m <sup>2</sup>       | ISO 179/1eU    |
| Charpy -30°C, V-notch Edgew 80*10*3 sp=62mm         | 60             | kJ/m <sup>2</sup>       | ISO 179/1eA    |
| Charpy -30°C, Unnotch Edgew 80*10*3 sp=62mm         | NB             | kJ/m <sup>2</sup>       | ISO 179/1eU    |
| Instrumented Dart Impact Total Energy, 23°C         | 52             | J                       | ASTM D3763     |
| <b>THERMAL <sup>(1)</sup></b>                       |                |                         |                |
| HDT, 0.45 MPa, 3.2 mm, unannealed                   | 134            | °C                      | ASTM D648      |
| HDT, 1.82 MPa, 3.2mm, unannealed                    | 120            | °C                      | ASTM D648      |
| HDT, 1.82 MPa, 6.4 mm, unannealed                   | 124            | °C                      | ASTM D648      |
| HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm             | 135            | °C                      | ISO 75/Be      |
| HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm             | 124            | °C                      | ISO 75/Ae      |
| CTE, -40°C to 40°C, flow                            | 6.66E-05       | 1/°C                    | ASTM E831      |
| CTE, -40°C to 40°C, xflow                           | 6.66E-05       | 1/°C                    | ASTM E831      |
| CTE, 23°C to 80°C, flow                             | 7.2E-05        | 1/°C                    | ISO 11359-2    |
| CTE, 23°C to 80°C, xflow                            | 7.7E-05        | 1/°C                    | ISO 11359-2    |
| Vicat Softening Temp, Rate B/50                     | 142            | °C                      | ASTM D1525     |
| Vicat Softening Temp, Rate B/50                     | 140            | °C                      | ISO 306        |
| Vicat Softening Temp, Rate B/120                    | 142            | °C                      | ISO 306        |
| Relative Temp Index, Elec <sup>(2)</sup>            | 125            | °C                      | UL 746B        |
| Relative Temp Index, Mech w/impact <sup>(2)</sup>   | 115            | °C                      | UL 746B        |
| Relative Temp Index, Mech w/o impact <sup>(2)</sup> | 125            | °C                      | UL 746B        |
| Ball Pressure Test, 125°C +/- 2°C                   | PASSES         | -                       | IEC 60695-10-2 |
| <b>PHYSICAL <sup>(1)</sup></b>                      |                |                         |                |
| Specific Gravity                                    | 1.18           | -                       | ASTM D792      |
| Density                                             | 1.19           | g/cm <sup>3</sup>       | ISO 1183       |
| Moisture Absorption (23°C / 50% RH)                 | 0.15           | %                       | ISO 62         |
| Water Absorption, (23°C/saturated)                  | 0.35           | %                       | ISO 62-1       |
| Melt Flow Rate, 300°C/1.2 kgf                       | 10             | g/10 min                | ASTM D1238     |
| Melt Volume Rate, MVR at 300°C/1.2 kg               | 9              | cm <sup>3</sup> /10 min | ISO 1133       |
| Mold Shrinkage, flow, 3.2 mm <sup>(3)</sup>         | 0.4 – 0.8      | %                       | SABIC method   |
| Mold Shrinkage, xflow, 3.2 mm <sup>(3)</sup>        | 0.4 – 0.8      | %                       | SABIC method   |
| <b>ELECTRICAL <sup>(1)</sup></b>                    |                |                         |                |
| Surface Resistivity, ROA                            | >1.E+15        | Ω                       | IEC 60093      |
| Volume Resistivity                                  | >1.E+15        | Ω.cm                    | IEC 60093      |
| Dielectric Strength, in oil, 3.2 mm                 | 17             | kV/mm                   | ASTM D149      |
| Dielectric Strength, in oil, 3.2 mm                 | 16             | kV/mm                   | IEC 60243-1    |
| Dielectric Constant, 1.1 GHz                        | 2.84           | -                       | SABIC method   |
| Dissipation Factor, 1.1 GHz                         | 0.0059         | -                       | SABIC method   |
| Dielectric Constant, 1.9 GHz                        | 2.85           | -                       | SABIC method   |

| PROPERTIES                                                | TYPICAL VALUES                    | UNITS    | TEST METHODS   |
|-----------------------------------------------------------|-----------------------------------|----------|----------------|
| Dissipation Factor, 1.9 GHz                               | 0.0059                            | -        | SABIC method   |
| Dielectric Constant, 5 GHz                                | 2.82                              | -        | SABIC method   |
| Dissipation Factor, 5 GHz                                 | 0.0059                            | -        | SABIC method   |
| Hot-Wire Ignition (HWI), PLC 1 <sup>(2)</sup>             | ≥3                                | mm       | UL 746A        |
| Hot-Wire Ignition (HWI), PLC 2 <sup>(2)</sup>             | ≥1.5                              | mm       | UL 746A        |
| Hot-Wire Ignition (HWI), PLC 3 <sup>(2)</sup>             | ≥0.6                              | mm       | UL 746A        |
| High Amp Arc Ignition (HAI), PLC 0 <sup>(2)</sup>         | ≥2.3                              | mm       | UL 746A        |
| High Amp Arc Ignition (HAI), PLC 1 <sup>(2)</sup>         | ≥0.6                              | mm       | UL 746A        |
| Comparative Tracking Index (UL) {PLC} <sup>(2)</sup>      | 3                                 | PLC Code | UL 746A        |
| Comparative Tracking Index                                | 225                               | V        | IEC 60112      |
| <b>FLAME CHARACTERISTICS <sup>(2)</sup></b>               |                                   |          |                |
| UL Yellow Card Link                                       | <a href="#">E207780-102516601</a> | -        | -              |
| UL Yellow Card Link 2                                     | <a href="#">E207780-228378</a>    | -        | -              |
| UL Recognized, 94-5VA Flame Class Rating                  | ≥3                                | mm       | UL 94          |
| UL Recognized, 94-5VB Flame Class Rating                  | ≥2.5                              | mm       | UL 94          |
| UL Recognized, 94V-0 Flame Class Rating                   | ≥1.5                              | mm       | UL 94          |
| UL Recognized, 94V-1 Flame Class Rating                   | ≥0.8                              | mm       | UL 94          |
| UL Recognized, 94HB Flame Class Rating                    | ≥0.6                              | mm       | UL 94          |
| Glow Wire Ignitability Temperature, 1.0 mm <sup>(1)</sup> | 825                               | °C       | IEC 60695-2-13 |
| Glow Wire Flammability Index, 1.0 mm <sup>(1)</sup>       | 960                               | °C       | IEC 60695-2-12 |
| Oxygen Index (LOI) <sup>(1)</sup>                         | 35                                | %        | ISO 4589       |
| UV-light, water exposure/immersion                        | f1                                | -        | UL 746C        |
| <b>INJECTION MOLDING <sup>(4)</sup></b>                   |                                   |          |                |
| Drying Temperature                                        | 120                               | °C       |                |
| Drying Time                                               | 3 – 4                             | Hrs      |                |
| Drying Time (Cumulative)                                  | 48                                | Hrs      |                |
| Maximum Moisture Content                                  | 0.02                              | %        |                |
| Melt Temperature                                          | 295 – 315                         | °C       |                |
| Nozzle Temperature                                        | 290 – 310                         | °C       |                |
| Front - Zone 3 Temperature                                | 295 – 315                         | °C       |                |
| Middle - Zone 2 Temperature                               | 280 – 305                         | °C       |                |
| Rear - Zone 1 Temperature                                 | 275 – 295                         | °C       |                |
| Mold Temperature                                          | 70 – 95                           | °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.



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