

# LEXAN™ EXL5689 resin

Polycarbonate

SABIC Innovative Plastics

## Message:

Lexan® EXL5689 polycarbonate (PC) resin is a GF reinforced, UV stabilized, flame retardant injection molding copolymer blend. This medium flow resin features UL94 V0 @ 1.5mm flame retardancy based on non-chlorine, non-bromine FR agents with excellent processability and improved release performance. Lexan EXL5689 resin offers much improved impact strength and ductility over conventional GF reinforced PC resins. This product is an excellent candidate for a broad range of applications, including electrical and electronic enclosures amongst others.

| General Information                        |                                    |                        |                     |
|--------------------------------------------|------------------------------------|------------------------|---------------------|
| Filler / Reinforcement                     | Glass Fiber                        |                        |                     |
| Additive                                   | Flame Retardant                    |                        |                     |
|                                            | UV Stabilizer                      |                        |                     |
| Features                                   | Bromine Free                       |                        |                     |
|                                            | Chlorine Free                      |                        |                     |
|                                            | Copolymer                          |                        |                     |
|                                            | Ductile                            |                        |                     |
|                                            | Flame Retardant                    |                        |                     |
|                                            | Good Impact Resistance             |                        |                     |
|                                            | Good Mold Release                  |                        |                     |
|                                            | Good Processability                |                        |                     |
|                                            | Good UV Resistance                 |                        |                     |
|                                            | Medium Flow                        |                        |                     |
| Uses                                       | Electrical Housing                 |                        |                     |
|                                            | Electrical/Electronic Applications |                        |                     |
| Processing Method                          | Injection Molding                  |                        |                     |
| Physical                                   | Nominal Value                      | Unit                   | Test Method         |
| Specific Gravity                           | 1.26                               | g/cm <sup>3</sup>      | ASTM D792, ISO 1183 |
| Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)   | 9.0                                | g/10 min               | ASTM D1238          |
| Melt Volume-Flow Rate (MVR) (300°C/1.2 kg) | 8.00                               | cm <sup>3</sup> /10min | ISO 1133            |
| Molding Shrinkage - Flow (3.20 mm)         | 0.20 to 0.60                       | %                      | Internal Method     |
| Water Absorption                           |                                    |                        | ISO 62              |
| Saturation, 23°C                           | 0.35                               | %                      |                     |
| Equilibrium, 23°C, 50% RH                  | 0.15                               | %                      |                     |
| Mechanical                                 | Nominal Value                      | Unit                   | Test Method         |
| Tensile Modulus                            |                                    |                        |                     |
| -- <sup>1</sup>                            | 3500                               | MPa                    | ASTM D638           |

|                                                                              |               |                   |                                        |
|------------------------------------------------------------------------------|---------------|-------------------|----------------------------------------|
| --                                                                           | 3600          | MPa               | ISO 527-2/1                            |
| Tensile Strength                                                             |               |                   |                                        |
| Yield <sup>2</sup>                                                           | 55.0          | MPa               | ASTM D638                              |
| Yield                                                                        | 54.0          | MPa               | ISO 527-2/5                            |
| Break <sup>3</sup>                                                           | 44.0          | MPa               | ASTM D638                              |
| Break                                                                        | 46.0          | MPa               | ISO 527-2/5                            |
| Tensile Elongation                                                           |               |                   |                                        |
| Yield <sup>4</sup>                                                           | 4.4           | %                 | ASTM D638                              |
| Yield                                                                        | 4.4           | %                 | ISO 527-2/5                            |
| Break <sup>5</sup>                                                           | 15            | %                 | ASTM D638                              |
| Break                                                                        | 13            | %                 | ISO 527-2/5                            |
| Flexural Modulus                                                             |               |                   |                                        |
| 50.0 mm Span <sup>6</sup>                                                    | 3150          | MPa               | ASTM D790                              |
| -- <sup>7</sup>                                                              | 3400          | MPa               | ISO 178                                |
| Flexural Stress                                                              |               |                   |                                        |
| --                                                                           | 96.0          | MPa               | ISO 178                                |
| Yield, 50.0 mm Span <sup>8</sup>                                             | 97.0          | MPa               | ASTM D790                              |
| Impact                                                                       | Nominal Value | Unit              | Test Method                            |
| Charpy Notched Impact Strength <sup>9</sup>                                  |               |                   | ISO 179/1eA                            |
| -30°C                                                                        | 15            | kJ/m <sup>2</sup> |                                        |
| 23°C                                                                         | 30            | kJ/m <sup>2</sup> |                                        |
| Charpy Unnotched Impact Strength <sup>10</sup>                               |               |                   | ISO 179/1eU                            |
| -30°C                                                                        | No Break      |                   |                                        |
| 23°C                                                                         | No Break      |                   |                                        |
| Notched Izod Impact                                                          |               |                   |                                        |
| -30°C                                                                        | 150           | J/m               | ASTM D256                              |
| 23°C                                                                         | 340           | J/m               | ASTM D256                              |
| -30°C <sup>11</sup>                                                          | 10            | kJ/m <sup>2</sup> | ISO 180/1A                             |
| 23°C <sup>12</sup>                                                           | 25            | kJ/m <sup>2</sup> | ISO 180/1A                             |
| Unnotched Izod Impact Strength <sup>13</sup>                                 |               |                   | ISO 180/1U                             |
| -30°C                                                                        | No Break      |                   |                                        |
| 23°C                                                                         | No Break      |                   |                                        |
| Instrumented Dart Impact (23°C, Total Energy)                                | 40.0          | J                 | ASTM D3763                             |
| Thermal                                                                      | Nominal Value | Unit              | Test Method                            |
| Heat Deflection Temperature <sup>14</sup> (1.8 MPa, Unannealed, 100 mm Span) | 132           | °C                | ISO 75-2/Ae                            |
| Vicat Softening Temperature                                                  |               |                   |                                        |
| --                                                                           | 146           | °C                | ASTM D1525, ISO 306/B120 <sup>15</sup> |
| --                                                                           | 145           | °C                | ISO 306/B50                            |
| Ball Pressure Test (125°C)                                                   | Pass          |                   | IEC 60695-10-2                         |
| CLTE                                                                         |               |                   | ASTM E831, ISO 11359-2                 |

|                                        |                      |             |                    |
|----------------------------------------|----------------------|-------------|--------------------|
| Flow : -40 to 40°C                     | 4.7E-5               | cm/cm/°C    |                    |
| Transverse : -40 to 40°C               | 7.0E-5               | cm/cm/°C    |                    |
| <b>Electrical</b>                      | <b>Nominal Value</b> | <b>Unit</b> | <b>Test Method</b> |
| Comparative Tracking Index (CTI)       | PLC 3                |             | UL 746             |
| Comparative Tracking Index             | 175                  | V           | IEC 60112          |
| <b>Flammability</b>                    | <b>Nominal Value</b> | <b>Unit</b> | <b>Test Method</b> |
| Flame Rating                           |                      |             | UL 94              |
| 0.750 mm                               | HB                   |             |                    |
| 1.20 mm                                | V-1                  |             |                    |
| 1.50 mm                                | V-0                  |             |                    |
| Glow Wire Flammability Index (1.10 mm) | 960                  | °C          | IEC 60695-2-12     |
| Glow Wire Ignition Temperature         |                      |             | IEC 60695-2-13     |
| 1.00 mm                                | 825                  | °C          |                    |
| 2.00 mm                                | 825                  | °C          |                    |
| 2.50 mm                                | 825                  | °C          |                    |
| 3.00 mm                                | 825                  | °C          |                    |
| <b>Injection</b>                       | <b>Nominal Value</b> | <b>Unit</b> |                    |
| Drying Temperature                     | 121                  | °C          |                    |
| Drying Time                            | 3.0 to 4.0           | hr          |                    |
| Drying Time, Maximum                   | 48                   | hr          |                    |
| Suggested Max Moisture                 | 0.020                | %           |                    |
| Suggested Shot Size                    | 40 to 60             | %           |                    |
| Rear Temperature                       | 288 to 310           | °C          |                    |
| Middle Temperature                     | 299 to 321           | °C          |                    |
| Front Temperature                      | 310 to 332           | °C          |                    |
| Nozzle Temperature                     | 304 to 327           | °C          |                    |
| Processing (Melt) Temp                 | 310 to 332           | °C          |                    |
| Mold Temperature                       | 82.2 to 116          | °C          |                    |
| Back Pressure                          | 0.345 to 0.689       | MPa         |                    |
| Screw Speed                            | 40 to 70             | rpm         |                    |
| Vent Depth                             | 0.025 to 0.076       | mm          |                    |
| <b>NOTE</b>                            |                      |             |                    |
| 1.                                     | 5.0 mm/min           |             |                    |
| 2.                                     | Type I, 5.0 mm/min   |             |                    |
| 3.                                     | Type I, 5.0 mm/min   |             |                    |
| 4.                                     | Type I, 5.0 mm/min   |             |                    |
| 5.                                     | Type I, 5.0 mm/min   |             |                    |
| 6.                                     | 1.3 mm/min           |             |                    |
| 7.                                     | 2.0 mm/min           |             |                    |
| 8.                                     | 1.3 mm/min           |             |                    |
| 9.                                     | 80*10*3 sp=62mm      |             |                    |
| 10.                                    | 80*10*3 sp=62mm      |             |                    |

|     |                                    |
|-----|------------------------------------|
| 11. | 80*10*3                            |
| 12. | 80*10*3                            |
| 13. | 80*10*3                            |
| 14. | 120*10*4 mm                        |
| 15. | Rate B (120°C/h), Loading 2 (50 N) |

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