

## Covestro Makrolon® LQ2647 Polycarbonate

Category : Polymer , Thermoplastic , Polycarbonate (PC) , Polycarbonate, Molded , Polycarbonate, UV Stabilized

### Material Notes:

Main characteristics:• High toughness• Good heat resistance• Glass-like transparency, optical quality• High dimensional accuracy and stability  
Grade characteristics:• Optical lens, safety glasses• Medium viscosity, easy release• UV stabilized  
As of 1 September 2015, Bayer MaterialScience was separated from Bayer AG and officially adopted its new name – Covestro.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Covestro-Makrolon-LQ2647-Polycarbonate.php](http://www.lookpolymers.com/polymer_Covestro-Makrolon-LQ2647-Polycarbonate.php)

| Physical Properties                | Metric                                                      | English                                                            | Comments                                               |
|------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------|
| Bulk Density                       | 0.660 g/cc                                                  | 0.0238 lb/in <sup>3</sup>                                          | pellets; ISO 60                                        |
| Density                            | 1.20 g/cc                                                   | 0.0434 lb/in <sup>3</sup>                                          | ISO 1183-1                                             |
| Moisture Absorption at Equilibrium | 0.12 %                                                      | 0.12 %                                                             | ISO 62, 50% RH                                         |
| Water Absorption at Saturation     | 0.30 %                                                      | 0.30 %                                                             | ISO 62                                                 |
| Water Vapor Transmission           | 15.0 g/m <sup>2</sup> /day<br>@Thickness 0.100 mm           | 0.966 g/100 in <sup>2</sup> /day<br>@Thickness 0.00394 in          | 85% RH, film; ISO 15106-1                              |
| Oxygen Transmission                | 67.0 cc-mm/m <sup>2</sup> -24hr-atm<br>@Thickness 0.100 mm  | 170 cc-mil/100 in <sup>2</sup> -24hr-atm<br>@Thickness 0.00394 in  | 670 cc/m <sup>2</sup> -24hr-bar; film; b.o. ISO 2556   |
|                                    | 70.0 cc-mm/m <sup>2</sup> -24hr-atm<br>@Thickness 0.0254 mm | 178 cc-mil/100 in <sup>2</sup> -24hr-atm<br>@Thickness 0.00100 in  | 2760 cc/m <sup>2</sup> -24hr-bar; film; b.o. ISO 2556  |
| Nitrogen Transmission              | 12.0 cc-mm/m <sup>2</sup> -24hr-atm<br>@Thickness 0.100 mm  | 30.5 cc-mil/100 in <sup>2</sup> -24hr-atm<br>@Thickness 0.00394 in | 120 cc/m <sup>2</sup> -24hr-bar; film; b.o. ISO 2556   |
|                                    | 13.0 cc-mm/m <sup>2</sup> -24hr-atm<br>@Thickness 0.0254 mm | 33.0 cc-mil/100 in <sup>2</sup> -24hr-atm<br>@Thickness 0.00100 in | 510 cc/m <sup>2</sup> -24hr-bar; film; b.o. ISO 2556   |
| Carbon Dioxide Transmission        | 380 cc-mm/m <sup>2</sup> -24hr-atm<br>@Thickness 0.100 mm   | 965 cc-mil/100 in <sup>2</sup> -24hr-atm<br>@Thickness 0.00394 in  | 3800 cc/m <sup>2</sup> -24hr-bar; film; b.o. ISO 2556  |
|                                    | 429 cc-mm/m <sup>2</sup> -24hr-atm<br>@Thickness 0.0254 mm  | 1090 cc-mil/100 in <sup>2</sup> -24hr-atm<br>@Thickness 0.00100 in | 16900 cc/m <sup>2</sup> -24hr-bar; film; b.o. ISO 2556 |

| Physical Properties               | Metric                               | English                              | Comments                       |
|-----------------------------------|--------------------------------------|--------------------------------------|--------------------------------|
| Linear Mold Shrinkage, Flow       | 0.0070 cm/cm                         | 0.0070 in/in                         | 60x60x2 mm; 500 bar; ISO 294-4 |
|                                   | @Thickness 2.00 mm                   | @Thickness 0.0787 in                 |                                |
| Linear Mold Shrinkage, Transverse | 0.0075 cm/cm                         | 0.0075 in/in                         | 60x60x2 mm; 500 bar; ISO 294-4 |
|                                   | @Thickness 2.00 mm                   | @Thickness 0.0787 in                 |                                |
| Melt Flow                         | 13 g/10 min                          | 13 g/10 min                          | ISO 1133                       |
|                                   | @Load 1.20 kg,<br>Temperature 300 °C | @Load 2.65 lb,<br>Temperature 572 °F |                                |

| Mechanical Properties      | Metric                                      | English                                      | Comments                         |
|----------------------------|---------------------------------------------|----------------------------------------------|----------------------------------|
| Puncture Resistance        | 5400 N                                      | 1210 lb (f)                                  | ISO 6603-2                       |
|                            | @Temperature 23.0 °C                        | @Temperature 73.4 °F                         |                                  |
|                            | 6300 N                                      | 1420 lb (f)                                  | ISO 6603-2                       |
|                            | @Temperature -30.0 °C                       | @Temperature -22.0 °F                        |                                  |
| Ball Indentation Hardness  | 116 MPa                                     | 16800 psi                                    | ISO 2039-1                       |
| Tensile Strength at Break  | 70.0 MPa                                    | 10200 psi                                    | 50 mm/min; ISO 527-1,-2          |
| Tensile Strength, Yield    | 67.0 MPa                                    | 9720 psi                                     | 50 mm/min; ISO 527-1,-2          |
| Elongation at Break        | >= 50 %                                     | >= 50 %                                      | Nominal, 50 mm/min; ISO 527-1,-2 |
|                            | 130 %                                       | 130 %                                        | 50 mm/min; b.o. ISO 527-1,-2     |
| Elongation at Yield        | 6.1 %                                       | 6.1 %                                        | 50 mm/min; ISO 527-1,-2          |
| Tensile Modulus            | 2.40 GPa                                    | 348 ksi                                      | 1 mm/min; ISO 527-1,-2           |
| Flexural Strength          | 98.0 MPa                                    | 14200 psi                                    | 2 mm/min; ISO 178                |
| Flexural Yield Strength    | 74.0 MPa                                    | 10700 psi                                    | 2 mm/min; ISO 178                |
|                            | @Strain 3.50 %                              | @Strain 3.50 %                               |                                  |
| Flexural Modulus           | 2.40 GPa                                    | 348 ksi                                      | 2 mm/min; ISO 178                |
| Izod Impact, Notched (ISO) | 12.0 kJ/m²                                  | 5.71 ft-lb/in²                               | complete break; b.o. ISO 180-A   |
|                            | @Thickness 3.20 mm,<br>Temperature -30.0 °C | @Thickness 0.126 in,<br>Temperature -22.0 °F |                                  |
|                            | 80.0 kJ/m²                                  | 38.1 ft-lb/in²                               | partial break; b.o. ISO 180-A    |
|                            | @Thickness 3.20 mm,<br>Temperature 23.0 °C  | @Thickness 0.126 in,<br>Temperature 73.4 °F  |                                  |
| Charpy Impact Unnotched    | NB                                          | NB                                           | ISO 179-1eU                      |
|                            | @Temperature 23.0 °C                        | @Temperature 73.4 °F                         |                                  |

| Mechanical Properties             | <sup>NB</sup><br>Metric                     | <sup>NB</sup><br>English                     | Comments<br>ISO 179-1eU                   |
|-----------------------------------|---------------------------------------------|----------------------------------------------|-------------------------------------------|
|                                   | @Temperature -30.0 °C                       | @Temperature -22.0 °F                        |                                           |
|                                   | NB                                          | NB                                           | ISO 179-1eU                               |
|                                   | @Temperature -60.0 °C                       | @Temperature -76.0 °F                        |                                           |
| Charpy Impact, Notched            | 1.40 J/cm²                                  | 6.66 ft-lb/in²                               | complete break; ISO 7391/b.o. ISO 179-1eA |
|                                   | @Thickness 3.00 mm,<br>Temperature -30.0 °C | @Thickness 0.118 in,<br>Temperature -22.0 °F |                                           |
|                                   | 7.00 J/cm²                                  | 33.3 ft-lb/in²                               | partial break; ISO 7391/b.o. ISO 179-1eA  |
|                                   | @Thickness 3.00 mm,<br>Temperature 23.0 °C  | @Thickness 0.118 in,<br>Temperature 73.4 °F  |                                           |
| Puncture Energy                   | 60.0 J                                      | 44.3 ft-lb                                   | ISO 6603-2                                |
|                                   | @Temperature 23.0 °C                        | @Temperature 73.4 °F                         |                                           |
|                                   | 65.0 J                                      | 47.9 ft-lb                                   | ISO 6603-2                                |
|                                   | @Temperature -30.0 °C                       | @Temperature -22.0 °F                        |                                           |
| Tensile Creep Modulus, 1 hour     | 2200 MPa                                    | 319000 psi                                   | ISO 899-1                                 |
| Tensile Creep Modulus, 1000 hours | 1900 MPa                                    | 276000 psi                                   | ISO 899-1                                 |

| Thermal Properties                             | Metric                         | English                       | Comments             |
|------------------------------------------------|--------------------------------|-------------------------------|----------------------|
| CTE, linear, Parallel to Flow                  | 65.0 µm/m-°C                   | 36.1 µin/in-°F                | ISO 11359-1,-2       |
|                                                | @Temperature 23.0 -<br>55.0 °C | @Temperature 73.4 -<br>131 °F |                      |
| CTE, linear, Transverse to Flow                | 65.0 µm/m-°C                   | 36.1 µin/in-°F                | ISO 11359-1,-2       |
|                                                | @Temperature 23.0 -<br>55.0 °C | @Temperature 73.4 -<br>131 °F |                      |
| Thermal Conductivity                           | 0.200 W/m-K                    | 1.39 BTU-in/hr-ft²-°F         | cross-flow; ISO 8302 |
| Hot Ball Pressure Test                         | 135 °C                         | 275 °F                        | IEC 60695-10-2       |
| Deflection Temperature at 0.46 MPa<br>(66 psi) | 135 °C                         | 275 °F                        | ISO 75-1,-2          |
| Deflection Temperature at 1.8 MPa<br>(264 psi) | 123 °C                         | 253 °F                        | ISO 75-1,-2          |
| Vicat Softening Point                          | 143 °C                         | 289 °F                        | 50°C/h; ISO 306      |
|                                                | @Load 5.10 kg                  | @Load 11.2 lb                 |                      |
|                                                | 144 °C                         | 291 °F                        | 120°C/h; ISO 306     |
|                                                | @Load 5.10 kg                  | @Load 11.2 lb                 |                      |

| Glass Transition Temp, Tg<br>Thermal Properties | 144 °C<br>Metric    | 291 °F<br>English    | 10°C/min: ISO 11357-1,-2<br>Comments |
|-------------------------------------------------|---------------------|----------------------|--------------------------------------|
| UL RTI, Electrical                              | 125 °C              | 257 °F               | UL 746B                              |
| UL RTI, Mechanical with Impact                  | 115 °C              | 239 °F               | UL 746B                              |
| UL RTI, Mechanical without Impact               | 125 °C              | 257 °F               | UL 746B                              |
| Flammability, UL94                              | HB                  | HB                   |                                      |
|                                                 | @Thickness 2.50 mm  | @Thickness 0.0984 in |                                      |
|                                                 | V-2                 | V-2                  |                                      |
|                                                 | @Thickness 0.750 mm | @Thickness 0.0295 in |                                      |
| Flash Point                                     | 480 °C              | 896 °F               | ASTM D 1929                          |
|                                                 | 550 °C              | 1020 °F              | self ignition; ASTM D 1929           |
| Oxygen Index                                    | 28 %                | 28 %                 | Method A; ISO 4589-2                 |

| Optical Properties    | Metric             | English              | Comments             |
|-----------------------|--------------------|----------------------|----------------------|
| Refractive Index      | 1.586              | 1.586                | Procedure A; ISO 489 |
| Haze                  | <= 0.50 %          | <= 0.50 %            |                      |
|                       | @Thickness 3.00 mm | @Thickness 0.118 in  | ISO 14782            |
| Transmission, Visible | >= 87 %            | >= 87 %              |                      |
|                       | @Thickness 4.00 mm | @Thickness 0.157 in  | ISO 13468-2          |
|                       | 88 %               | 88 %                 |                      |
|                       | @Thickness 3.00 mm | @Thickness 0.118 in  | ISO 13468-2          |
|                       | 89 %               | 89 %                 |                      |
|                       | @Thickness 1.00 mm | @Thickness 0.0394 in | ISO 13468-2          |
|                       | 89 %               | 89 %                 |                      |
|                       | @Thickness 2.00 mm | @Thickness 0.0787 in | ISO 13468-2          |

| Electrical Properties | Metric                | English               | Comments  |
|-----------------------|-----------------------|-----------------------|-----------|
| Volume Resistivity    | 1.00e+16 ohm-cm       | 1.00e+16 ohm-cm       | IEC 60093 |
| Surface Resistance    | 1.00e+16 ohm          | 1.00e+16 ohm          | IEC 60093 |
| Dielectric Constant   | 3.0                   | 3.0                   |           |
|                       | @Frequency 1.00e+6 Hz | @Frequency 1.00e+6 Hz | IEC 60250 |

| Electrical Properties      | Metric                | English               | Comments                     |
|----------------------------|-----------------------|-----------------------|------------------------------|
|                            | @Frequency 100 Hz     | @Frequency 100 Hz     |                              |
| Dielectric Strength        | 34.0 kV/mm            | 864 kV/in             | IEC 60243-1                  |
|                            | @Thickness 1.00 mm    | @Thickness 0.0394 in  |                              |
| Dissipation Factor         | 0.00050               | 0.00050               | IEC 60250                    |
|                            | @Frequency 100 Hz     | @Frequency 100 Hz     |                              |
|                            | 0.0095                | 0.0095                | IEC 60250                    |
|                            | @Frequency 1.00e+6 Hz | @Frequency 1.00e+6 Hz |                              |
| Comparative Tracking Index | 125 V                 | 125 V                 | CTI M; Solution B; IEC 60112 |
|                            | 250 V                 | 250 V                 |                              |
|                            |                       |                       | Solution A; IEC 60112        |

| Processing Properties | Metric  | English | Comments                   |
|-----------------------|---------|---------|----------------------------|
| Melt Temperature      | 290 °C  | 554 °F  | Injection molding; ISO 294 |
| Mold Temperature      | 80.0 °C | 176 °F  | Injection molding; ISO 294 |

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