

Makrolon® Rx3440

Covestro - Polycarbonates - *Polycarbonate*

General Information

Product Description

high viscosity; MVR (300 °C/1.2 kg) 4.5 cm³/10 min; medical devices; high lipid resistance; suitable for sterilization with high-energy radiation; biocompatible according to many ISO 10993-1 test requirements; improved oncology drug resistance; injection molding - melt temperature 280 - 320 °C; transparent parts for medical devices

General

| | |
|-------------------|--------------------------------------------------------------------------------|
| Material Status | • Commercial: Active |
| Availability | • Africa & Middle East • Asia Pacific • Europe • Latin America • North America |
| Features | • Biocompatible • High Viscosity • Radiation Sterilizable |
| Uses | • Medical Devices • Medical/Healthcare Applications |
| Agency Ratings | • ISO 10993-1 • USP Class VI |
| RoHS Compliance | • RoHS Compliant |
| Appearance | • Clear/Transparent |
| Processing Method | • Injection Molding |
| ISO Designation | • PC |

Properties ¹

| Physical | Nominal Value | Unit | Test Method |
|----------------------------------------------------------|---------------|------------------------|--------------|
| Density (73°F) | 1.20 | g/cm ³ | ISO 1183 |
| Apparent (Bulk) Density ² | 0.66 | g/cm ³ | ISO 60 |
| Melt Mass-Flow Rate (MFR) (300°C/1.2 kg) | 4.7 | g/10 min | ISO 1133 |
| Melt Volume-Flow Rate (MVR) (300°C/1.2 kg) | 4.5 | cm ³ /10min | ISO 1133 |
| Molding Shrinkage | | | |
| Across Flow : 0.0787 in ³ | 0.70 | % | ISO 294-4 |
| Across Flow : 0.0787 in | 0.60 to 0.80 | % | ISO 2577 |
| Flow : 0.0787 in ³ | 0.70 | % | ISO 294-4 |
| Flow : 0.0787 in | 0.60 to 0.80 | % | ISO 2577 |
| Water Absorption (Saturation, 73°F) | 0.30 | % | ISO 62 |
| Water Absorption (Equilibrium, 73°F, 50% RH) | 0.12 | % | ISO 62 |
| Mechanical | Nominal Value | Unit | Test Method |
| Tensile Modulus (73°F) | 334000 | psi | ISO 527-1/1 |
| Tensile Stress (Yield, 73°F) | 9430 | psi | ISO 527-2/50 |
| Tensile Stress (Break, 73°F) | 10900 | psi | ISO 527-2/50 |
| Tensile Strain (Yield, 73°F) | 6.4 | % | ISO 527-2/50 |
| Tensile Strain (Break, 73°F) | 140 | % | ISO 527-2/50 |
| Nominal Tensile Strain at Break (73°F) | > 50 | % | ISO 527-2/50 |
| Flexural Modulus ⁴ (73°F) | 334000 | psi | ISO 178 |
| Flexural Stress ⁴ | | | ISO 178 |
| 73°F | 14200 | psi | |
| 3.5% Strain, 73°F | 10600 | psi | |
| Flexural Strain at Flexural Strength ⁵ (73°F) | 7.4 | % | ISO 178 |
| Impact | Nominal Value | Unit | Test Method |
| Charpy Notched Impact Strength ⁶ | | | ISO 179/1eA |
| -22°F, Complete Break | 9.0 | ft·lb/in ² | |
| 73°F, Partial Break | 43 | ft·lb/in ² | |
| Charpy Unnotched Impact Strength | | | ISO 179/1eU |



| | | |
|---------------------------------------------------------|-----------------------------------|--------------------|
| -76°F | No Break | |
| -22°F | No Break | |
| 73°F | No Break | |
| Notched Izod Impact Strength ⁶ | | ISO 180/A |
| -22°F, Complete Break | 6.7 ft·lb/in ² | |
| 73°F, Partial Break | 38 ft·lb/in ² | |
| Multi-Axial Instrumented Impact Energy | | ISO 6603-2 |
| -22°F | 51.6 ft·lb | |
| 73°F | 47.9 ft·lb | |
| Multi-Axial Instrumented Impact Peak Force | | ISO 6603-2 |
| -22°F | 1480 lbf | |
| 73°F | 1280 lbf | |
| Hardness | Nominal Value Unit | Test Method |
| Ball Indentation Hardness | 16500 psi | ISO 2039-1 |
| Thermal | Nominal Value Unit | Test Method |
| Deflection Temperature Under Load (66 psi, Unannealed) | 282 °F | ISO 75-2/B |
| Deflection Temperature Under Load (264 psi, Unannealed) | 259 °F | ISO 75-2/A |
| Glass Transition Temperature ⁷ | 293 °F | ISO 11357-2 |
| Vicat Softening Temperature | | |
| -- | 295 °F | ISO 306/B120 |
| -- | 291 °F | ISO 306/B50 |
| Ball Pressure Test (275°F) | Pass | IEC 60695-10-2 |
| CLTE - Flow (73 to 131°F) | 3.6E-5 in/in/°F | ISO 11359-2 |
| CLTE - Transverse (73 to 131°F) | 3.6E-5 in/in/°F | ISO 11359-2 |
| Thermal Conductivity ⁸ (73°F) | 1.4 Btu·in/hr/ft ² /°F | ISO 8302 |
| Flammability | Nominal Value Unit | Test Method |
| Oxygen Index ⁹ | 27 % | ISO 4589-2 |
| Flash Ignition Temperature | 896 °F | ASTM D1929 |
| Self Ignition Temperature | 1022 °F | ASTM D1929 |

Processing Information

| | Nominal Value Unit |
|------------------------------------|---------------------|
| Injection | |
| Drying Temperature - Dry Air Dryer | 248 °F |
| Drying Time - Dry Air Dryer | 2.0 to 3.0 hr |
| Suggested Max Moisture | < 0.020 % |
| Suggested Shot Size | 30 to 70 % |
| Rear Temperature | 500 to 518 °F |
| Middle Temperature | 536 to 554 °F |
| Front Temperature | 554 to 572 °F |
| Nozzle Temperature | 572 to 590 °F |
| Processing (Melt) Temp | 554 to 626 °F |
| Mold Temperature | 176 to 248 °F |
| Back Pressure | 725 to 2180 psi |
| Vent Depth | 9.8E-4 to 3.0E-3 in |

Injection Notes

Standard Melt Temperature: 310°C
Peripheral Screw Speed: 0.05 - 0.2 m/s
Hold Pressure (% of Injection Pressure): 50 - 75%

Notes

¹ Typical properties: these are not to be construed as specifications.

² Pellets

³ 60x60x2mm, 500 bar

⁴ 0.079 in/min

⁵ 2.0 mm/min

⁶ 3.0 mm

⁷ 10°C/min

