

Makrolon® 2458

Covestro - Polycarbonates - Polycarbonate

Thursday, December 21, 2023

General Information

Product Description

MVR (300°C/1.2 kg) 19 cm³/10 min; medical devices; suitable for ETO and steam sterilization at 121°C; biocompatible according to many ISO 10993-1 test requirements; low viscosity; easy release; injection molding - melt temperature 280 - 320°C; available in transparent and opaque colors

General

Material Status	• Commercial: Active		
Regional Availability	• Africa & Middle East • Asia Pacific	• Europe • Latin America	• North America
Features	• Biocompatible • Ethylene Oxide Sterilizable	• Good Mold Release • Low Viscosity	• Steam Sterilizable
Uses	• Medical Devices • Medical/Healthcare Applications		
Agency Ratings	• ISO 10993-1		
RoHS Compliance	• RoHS Compliant		
Appearance	• Clear/Transparent	• Colors Available	
Processing Method	• Injection Molding		
ISO Shortname	• ISO 7391-PC,MR,(,,-)18-9		

ASTM & ISO Properties ¹

Physical	Typical Value (English)	Typical Value (SI)	Test Method
Density (73°F (23°C))	1.20 g/cm ³	1.20 g/cm ³	ISO 1183
Apparent (Bulk) Density ²	0.66 g/cm ³	0.66 g/cm ³	ISO 60
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	20 g/10 min	20 g/10 min	ISO 1133
Melt Volume-Flow Rate (MVR) (300°C/1.2 kg)	19 cm ³ /10min	19 cm ³ /10min	ISO 1133
Molding Shrinkage			
Across Flow	0.50 to 0.70 %	0.50 to 0.70 %	ISO 2577
Flow	0.50 to 0.70 %	0.50 to 0.70 %	ISO 2577
Across Flow : 536°F (280°C), 0.0787 in (2.00 mm) ³	0.70 %	0.70 %	ISO 294-4
Flow : 0.0787 in (2.00 mm) ³	0.65 %	0.65 %	ISO 294-4
Water Absorption			
Saturation, 73°F (23°C)	0.30 %	0.30 %	ISO 62
Equilibrium, 73°F (23°C), 50% RH	0.12 %	0.12 %	
Mechanical	Typical Value (English)	Typical Value (SI)	Test Method
Tensile Modulus (73°F (23°C))	348000 psi	2400 MPa	ISO 527-1/1
Tensile Stress			
Yield, 73°F (23°C)	9430 psi	65.0 MPa	ISO 527-2/50
Break, 73°F (23°C)	10200 psi	70.0 MPa	

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Makrolon® 2458

Covestro - Polycarbonates - Polycarbonate

Mechanical	Typical Value (English)	Typical Value (SI)	Test Method
Tensile Strain			ISO 527-2/50
Yield, 73°F (23°C)	6.1 %	6.1 %	
Break, 73°F (23°C)	130 %	130 %	
Nominal Tensile Strain at Break			ISO 527-2/50
73°F (23°C)	> 50 %	> 50 %	
Tensile Creep Modulus			ISO 899-1
1 hr	319000 psi	2200 MPa	
1000 hr	276000 psi	1900 MPa	
Flexural Modulus ⁴ (73°F (23°C))	341000 psi	2350 MPa	ISO 178
Flexural Stress ⁴			ISO 178
73°F (23°C)	14100 psi	97.0 MPa	
3.5% Strain, 73°F (23°C)	10600 psi	73.0 MPa	
Flexural Strain at Flexural Strength ⁵			ISO 178
73°F (23°C)	7.1 %	7.1 %	
Impact	Typical Value (English)	Typical Value (SI)	Test Method
Charpy Notched Impact Strength ⁶			ISO 179/1eA
-22°F (-30°C), Complete Break	6.7 ft·lb/in ²	14 kJ/m ²	
73°F (23°C), Partial Break	31 ft·lb/in ²	65 kJ/m ²	
Charpy Unnotched Impact Strength			ISO 179/1eU
-76°F (-60°C)	No Break	No Break	
-22°F (-30°C)	No Break	No Break	
73°F (23°C)	No Break	No Break	
Notched Izod Impact Strength ⁶			ISO 180/A
-22°F (-30°C), Complete Break	7.1 ft·lb/in ²	15 kJ/m ²	
73°F (23°C), Partial Break	31 ft·lb/in ²	65 kJ/m ²	
Multi-Axial Instrumented Impact Energy			ISO 6603-2
-22°F (-30°C)	47.9 ft·lb	65.0 J	
73°F (23°C)	40.6 ft·lb	55.0 J	
Multi-Axial Instrumented Impact Peak Force			ISO 6603-2
-22°F (-30°C)	1350 lbf	6000 N	
73°F (23°C)	1150 lbf	5100 N	
Hardness	Typical Value (English)	Typical Value (SI)	Test Method
Ball Indentation Hardness	16700 psi	115 MPa	ISO 2039-1

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Makrolon® 2458

Covestro - Polycarbonates - Polycarbonate

Thermal	Typical Value (English)	Typical Value (SI)	Test Method
Deflection Temperature Under Load			
66 psi (0.45 MPa), Unannealed	282 °F	139 °C	ISO 75-2/B
264 psi (1.8 MPa), Unannealed	257 °F	125 °C	ISO 75-2/A
Glass Transition Temperature ⁷	295 °F	146 °C	ISO 11357-2
Vicat Softening Temperature			
--	295 °F	146 °C	ISO 306/B120
--	293 °F	145 °C	ISO 306/B50
Ball Pressure Test (280°F (138°C))	Pass	Pass	IEC 60695-10-2
CLTE			ISO 11359-2
Flow : 73 to 131°F (23 to 55°C)	3.6E-5 in/in/°F	6.5E-5 cm/cm/°C	
Transverse : 73 to 131°F (23 to 55°C)	3.6E-5 in/in/°F	6.5E-5 cm/cm/°C	
Thermal Conductivity ⁸ (73°F (23°C))	1.4 Btu·in/hr/ft ² /°F	0.20 W/m/K	ISO 8302
Electrical	Typical Value (English)	Typical Value (SI)	Test Method
Surface Resistivity	1.0E+16 ohms	1.0E+16 ohms	IEC 60093
Volume Resistivity (73°F (23°C))	1.0E+16 ohms·cm	1.0E+16 ohms·cm	IEC 60093
Electric Strength			IEC 60243-1
73°F (23°C), 0.0394 in (1.00 mm)	860 V/mil	34 kV/mm	
Relative Permittivity			IEC 60250
73°F (23°C), 100 Hz	3.10	3.10	
73°F (23°C), 1 MHz	3.00	3.00	
Dissipation Factor			IEC 60250
73°F (23°C), 100 Hz	5.0E-4	5.0E-4	
73°F (23°C), 1 MHz	9.0E-3	9.0E-3	
Comparative Tracking Index (Solution A)	250 V	250 V	IEC 60112
Flammability	Typical Value (English)	Typical Value (SI)	Test Method
Oxygen Index ⁹	28 %	28 %	ISO 4589-2
Flash Ignition Temperature	896 °F	480 °C	ASTM D1929
Self Ignition Temperature	1022 °F	550 °C	ASTM D1929
Optical	Typical Value (English)	Typical Value (SI)	Test Method
Refractive Index ¹⁰	1.586	1.586	ISO 489
Light Transmittance			ISO 13468-2
39.37 mil (1000 µm)	89.0 %	89.0 %	
78.74 mil (2000 µm)	89.0 %	89.0 %	
118.1 mil (3000 µm)	88.0 %	88.0 %	
157.5 mil (4000 µm)	87.0 %	87.0 %	
Haze (118.1 mil (3000 µm))	< 0.800 %	< 0.800 %	ISO 14782

Processing Information

Injection	Typical Value (English)	Typical Value (SI)
Drying Temperature - Dry Air Dryer	248 °F	120 °C
Drying Time - Dry Air Dryer	2.0 to 3.0 hr	2.0 to 3.0 hr
Suggested Max Moisture	< 0.020 %	< 0.020 %
Suggested Shot Size	30 to 70 %	30 to 70 %
Rear Temperature	482 to 500 °F	250 to 260 °C

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Makrolon® 2458

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Injection	Typical Value (English)	Typical Value (SI)
Middle Temperature	518 to 536 °F	270 to 280 °C
Front Temperature	536 to 554 °F	280 to 290 °C
Nozzle Temperature	554 to 572 °F	290 to 300 °C
Processing (Melt) Temp	536 to 608 °F	280 to 320 °C
Mold Temperature	176 to 248 °F	80 to 120 °C
Back Pressure	725 to 2180 psi	5.00 to 15.0 MPa
Vent Depth	9.8E-4 to 3.0E-3 in	0.025 to 0.075 mm

Injection Notes

Peripheral Screw Speed: 0.05 - 0.2 m/s
Hold Pressure (% of Injection Pressure): 50 - 75%
Standard Melt Temperature: 300°C

Notes

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

² Pellets

³ 60x60x2mm, 500 bar

⁴ 0.079 in/min (2.0 mm/min)

⁵ 2.0 mm/min

⁶ 3 mm

⁷ 10°C/min

⁸ Across Flow

⁹ Procedure A

¹⁰ Method A

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