

## Makrolon® 2458

Covestro - Polycarbonates - *Polycarbonate*

### General Information

#### Product Description

MVR (300°C/1.2 kg) 19 cm<sup>3</sup>/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		
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	• USP Class VI	
RoHS Compliance	• RoHS Compliant		
Appearance	• Clear/Transparent	• Colors Available	
Processing Method	• Injection Molding		
ISO Designation	• ISO 7391-PC,MR,(,)-18-9		

### Properties <sup>1</sup>

Physical	Nominal Value	Unit	Test Method
Density (73°F)	1.20	g/cm <sup>3</sup>	ISO 1183
Apparent (Bulk) Density <sup>2</sup>	0.66	g/cm <sup>3</sup>	ISO 60
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	20	g/10 min	ISO 1133
Melt Volume-Flow Rate (MVR) (300°C/1.2 kg)	19	cm <sup>3</sup> /10min	ISO 1133
Molding Shrinkage			
Across Flow	0.50 to 0.70	%	ISO 2577
Flow	0.50 to 0.70	%	ISO 2577
Across Flow : 536°F, 0.0787 in <sup>3</sup>	0.70	%	ISO 294-4
Flow : 0.0787 in <sup>3</sup>	0.65	%	ISO 294-4
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)	348000	psi	ISO 527-1/1
Tensile Stress (Yield, 73°F)	9430	psi	ISO 527-2/50
Tensile Stress (Break, 73°F)	10200	psi	ISO 527-2/50
Tensile Strain (Yield, 73°F)	6.1	%	ISO 527-2/50
Tensile Strain (Break, 73°F)	130	%	ISO 527-2/50
Nominal Tensile Strain at Break (73°F)	> 50	%	ISO 527-2/50
Tensile Creep Modulus (1 hr)	319000	psi	ISO 899-1
Tensile Creep Modulus (1000 hr)	276000	psi	ISO 899-1
Flexural Modulus <sup>4</sup> (73°F)	341000	psi	ISO 178
Flexural Stress <sup>4</sup>			ISO 178
73°F	14100	psi	
3.5% Strain, 73°F	10600	psi	
Flexural Strain at Flexural Strength <sup>5</sup> (73°F)	7.1	%	ISO 178
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength <sup>6</sup>			ISO 179/1eA



-22°F, Complete Break	6.7 ft·lb/in <sup>2</sup>		
73°F, Partial Break	31 ft·lb/in <sup>2</sup>		
Charpy Unnotched Impact Strength			ISO 179/1eU
-76°F	No Break		
-22°F	No Break		
73°F	No Break		
Notched Izod Impact Strength <sup>6</sup>			ISO 180/A
-22°F, Complete Break	7.1 ft·lb/in <sup>2</sup>		
73°F, Partial Break	31 ft·lb/in <sup>2</sup>		
Multi-Axial Instrumented Impact Energy			ISO 6603-2
-22°F	47.9 ft·lb		
73°F	40.6 ft·lb		
Multi-Axial Instrumented Impact Peak Force			ISO 6603-2
-22°F	1350 lbf		
73°F	1150 lbf		
<b>Hardness</b>	<b>Nominal Value</b>	<b>Unit</b>	<b>Test Method</b>
Ball Indentation Hardness	16700	psi	ISO 2039-1
<b>Thermal</b>	<b>Nominal Value</b>	<b>Unit</b>	<b>Test Method</b>
Deflection Temperature Under Load (66 psi, Unannealed)	282	°F	ISO 75-2/B
Deflection Temperature Under Load (264 psi, Unannealed)	257	°F	ISO 75-2/A
Glass Transition Temperature <sup>7</sup>	295	°F	ISO 11357-2
Vicat Softening Temperature			
--	295	°F	ISO 306/B120
--	293	°F	ISO 306/B50
Ball Pressure Test (280°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 <sup>8</sup> (73°F)	1.4	Btu·in/hr/ft <sup>2</sup> /°F	ISO 8302
<b>Electrical</b>	<b>Nominal Value</b>	<b>Unit</b>	<b>Test Method</b>
Surface Resistivity	1.0E+16	ohms	IEC 60093
Volume Resistivity (73°F)	1.0E+16	ohms·cm	IEC 60093
Electric Strength (73°F, 0.0394 in)	860	V/mil	IEC 60243-1
Relative Permittivity			IEC 60250
73°F, 100 Hz	3.10		
73°F, 1 MHz	3.00		
Dissipation Factor			IEC 60250
73°F, 100 Hz	5.0E-4		
73°F, 1 MHz	9.0E-3		
Comparative Tracking Index (Solution A)	250	V	IEC 60112
<b>Flammability</b>	<b>Nominal Value</b>	<b>Unit</b>	<b>Test Method</b>
Oxygen Index <sup>9</sup>	28	%	ISO 4589-2
Flash Ignition Temperature	896	°F	ASTM D1929
Self Ignition Temperature	1022	°F	ASTM D1929
<b>Optical</b>	<b>Nominal Value</b>	<b>Unit</b>	<b>Test Method</b>
Refractive Index <sup>10</sup>	1.586		ISO 489
Light Transmittance			ISO 13468-2
39.37 mil	89.0	%	
78.74 mil	89.0	%	
118.1 mil	88.0	%	
157.5 mil	87.0	%	
Haze (118.1 mil)	< 0.800	%	ISO 14782

### Processing Information

<b>Injection</b>	<b>Nominal Value</b>	<b>Unit</b>
Drying Temperature - Dry Air Dryer	248	°F
Drying Time - Dry Air Dryer	2.0 to 3.0	hr
Suggested Max Moisture	< 0.020	%
Hot Size	30 to 7	
Temperature	482 to 50	
Temperature	518 to 53	
Temperature	536 to 55	

Nozzle Temperature	554 to 572 °F
Processing (Melt) Temp	536 to 608 °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

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

#### Notes

- <sup>1</sup> Typical properties: these are not to be construed as specifications.
- <sup>2</sup> Pellets
- <sup>3</sup> 60x60x2mm, 500 bar
- <sup>4</sup> 0.079 in/min
- <sup>5</sup> 2.0 mm/min
- <sup>6</sup> 3 mm
- <sup>7</sup> 10°C/min
- <sup>8</sup> Across Flow
- <sup>9</sup> Procedure A
- <sup>10</sup> Method A

