

Makrolon® 3208

Polycarbonate
Covestro - Polycarbonates

Message:
MVR (300 °C/1.2 kg) 5.0 cm³/10 min; medical devices; suitable for ETO and steam sterilization at 121 °C; biocompatible according to many ISO 10993-1 test requirements; high viscosity; injection molding - melt temperature 280 - 320 °C; available in transparent and opaque colors

General Information			
UL YellowCard		E41613-233145	
Features		Biocompatible	
		Ethylene Oxide Sterilizable	
		High Viscosity	
		Steam Sterilizable	
Uses		Medical Devices	
		Medical/Healthcare Applications	
Agency Ratings		ISO 10993-Part 1	
RoHS Compliance		RoHS Compliant	
Appearance		Clear/Transparent	
		Colors Available	
		Opaque	
Processing Method		Injection Molding	
Multi-Point Data		Creep Modulus vs. Time (ISO 11403-1)	
		Isochronous Stress vs. Strain (ISO 11403-1)	
		Isothermal Stress vs. Strain (ISO 11403-1)	
		Secant Modulus vs. Strain (ISO 11403-1)	
		Shear Modulus vs. Temperature (ISO 11403-1)	
		Specific Volume vs Temperature (ISO 11403-2)	
		Viscosity vs. Shear Rate (ISO 11403-2)	
Physical	Nominal Value	Unit	Test Method
Density (23°C)	1.20	g/cm ³	ISO 1183
Apparent Density ¹	0.66	g/cm ³	ISO 60
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	5.5	g/10 min	ISO 1133
Melt Volume-Flow Rate (MVR) (300°C/1.2 kg)	5.00	cm ³ /10min	ISO 1133
Molding Shrinkage			
Across Flow	0.60 to 0.80	%	ISO 2577
Flow	0.60 to 0.80	%	ISO 2577

Across Flow : 2.00 mm ²	0.75	%	ISO 294-4
Flow : 2.00 mm ³	0.70	%	ISO 294-4
Water Absorption			ISO 62
Saturation, 23°C	0.30	%	
Equilibrium, 23°C, 50% RH	0.12	%	
Hardness	Nominal Value	Unit	Test Method
Ball Indentation Hardness	111	MPa	ISO 2039-1
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus (23°C)	2350	MPa	ISO 527-2/1
Tensile Stress			ISO 527-2/50
Yield, 23°C	65.0	MPa	
Break, 23°C	75.0	MPa	
Tensile Strain			ISO 527-2/50
Yield, 23°C	6.3	%	
Break, 23°C	120	%	
Nominal Tensile Strain at Break (23°C)	> 50	%	ISO 527-2/50
Tensile Creep Modulus			ISO 899-1
1 hr	2200	MPa	
1000 hr	1900	MPa	
Flexural Modulus ⁴ (23°C)	2350	MPa	ISO 178
Flexural Stress ⁵			ISO 178
3.5% Strain, 23°C	72.0	MPa	
23°C	95.0	MPa	
Flexural Strain at Flexural Strength ⁶ (23°C)	7.2	%	ISO 178
Flash Ignition Temperature	480	°C	ASTM D1929
Self Ignition Temperature	550	°C	ASTM D1929
ISO Shortname	ISO 7391-PC,M,(,)-05-9		
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength ⁷			ISO 7391
-30°C, Complete Break	18	kJ/m ²	
23°C, Partial Break	80	kJ/m ²	
Charpy Unnotched Impact Strength			ISO 179/1eU
-60°C	No Break		
-30°C	No Break		
23°C	No Break		
Notched Izod Impact Strength ⁸			ISO 7391
-30°C, Complete Break	20	kJ/m ²	
23°C, Partial Break	75	kJ/m ²	
Multi-Axial Instrumented Impact Energy			ISO 6603-2
-30°C	75.0	J	
23°C	65.0	J	

Multi-Axial Instrumented Impact Peak Force			ISO 6603-2
-30°C	6700	N	
23°C	5800	N	
Thermal	Nominal Value	Unit	Test Method
Heat Deflection Temperature			
0.45 MPa, Unannealed	142	°C	ISO 75-2/B
1.8 MPa, Unannealed	130	°C	ISO 75-2/A
Glass Transition Temperature ⁹	150	°C	ISO 11357-2
Vicat Softening Temperature			
--	150	°C	ISO 306/B50
--	151	°C	ISO 306/B120
Ball Pressure Test (141°C)	Pass		IEC 60695-10-2
CLTE			ISO 11359-2
Flow : 23 to 55°C	6.5E-5	cm/cm/°C	
Transverse : 23 to 55°C	6.5E-5	cm/cm/°C	
Thermal Conductivity ¹⁰ (23°C)	0.20	W/m/K	ISO 8302
Optical	Nominal Value	Unit	Test Method
Refractive Index ¹¹	1.587		ISO 489
Transmittance			ISO 13468-2
1000 µm	89.0	%	
2000 µm	89.0	%	
3000 µm	88.0	%	
4000 µm	87.0	%	
Haze (3000 µm)	< 0.80	%	ISO 14782
NOTE			
1.	Pellets		
2.	60x60x2 mm, 500 bar		
3.	60x60x2 mm, 500 bar		
4.	2.0 mm/min		
5.	2.0 mm/min		
6.	2 mm/min		
7.	Based on ISO 179-1eA, 3 mm		
8.	Based on ISO 180-A, 3 mm		
9.	10°C/min		
10.	Cross-flow		
11.	Method A		

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