

Makrolon® 9415

Covestro - Polycarbonates - *Polycarbonate*

General Information

Product Description

MVR (300°C/1.2 kg) 6.0 cm³/10 min; 10 % glass fiber reinforced; flame retardant; UL 94V-0/1.5 mm and 5VA/3.0 mm; high viscosity; easy release; injection molding - melt temperature 310 - 330°C; available in opaque colors only

General

Material Status	• Commercial: Active
Availability	• Africa & Middle East • Europe • North America • Asia Pacific • Latin America
Filler / Reinforcement	• Glass Fiber, 10% Filler by Weight
Additive	• Flame Retardant
Features	• Flame Retardant • Good Mold Release • High Viscosity
RoHS Compliance	• RoHS Compliant
Appearance	• Colors Available • Opaque
Processing Method	• Injection Molding
ISO Designation	• ISO 7391-PC,MFR,(,)-09-9,GF10

Properties ¹

Physical	Nominal Value	Unit	Test Method
Density (73°F)	1.27	g/cm ³	ISO 1183
Apparent (Bulk) Density ²	0.64	g/cm ³	ISO 60
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	7.0	g/10 min	ISO 1133
Melt Volume-Flow Rate (MVR) (300°C/1.2 kg)	6.0	cm ³ /10min	ISO 1133
Molding Shrinkage			
Across Flow	0.40 to 0.60	%	ISO 2577
Flow	0.40 to 0.60	%	ISO 2577
Across Flow : 536°F, 0.0787 in ³	0.45	%	ISO 294-4
Flow : 0.0787 in ³	0.60	%	ISO 294-4
Water Absorption (Saturation, 73°F)	0.26	%	ISO 62
Water Absorption (Equilibrium, 73°F, 50% RH)	0.10	%	ISO 62
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus (73°F)	551000	psi	ISO 527-1/1
Tensile Stress (Yield, 73°F)	9280	psi	ISO 527-2/5
Tensile Stress (Break, 73°F)	6530	psi	ISO 527-2/5
Tensile Strain (Yield, 73°F)	4.4	%	ISO 527-2/5
Tensile Strain (Break, 73°F)	15	%	ISO 527-2/5
Tensile Creep Modulus (1 hr)	522000	psi	ISO 899-1
Tensile Creep Modulus (1000 hr)	421000	psi	ISO 899-1
Flexural Modulus ⁴ (73°F)	522000	psi	ISO 178
Flexural Stress ⁴			ISO 178
73°F	15200	psi	
3.5% Strain, 73°F	13800	psi	
Flexural Strain at Flexural Strength ⁵ (73°F)	5.8	%	ISO 178
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength ⁶ (73°F, Complete Break)	4.8	ft·lb/in ²	ISO 179/1eA
Charpy Unnotched Impact Strength			ISO 179/1eU
-76°F, Complete Break	48	ft·lb/in ²	
-22°F, Complete Break	57	ft·lb/in ²	



73°F, Complete Break	71 ft·lb/in ²	
Notched Izod Impact Strength ⁶ (73°F, Complete Break)	4.8 ft·lb/in ²	ISO 180/A
Multi-Axial Instrumented Impact Energy		ISO 6603-2
-22°F	11.1 ft·lb	
73°F	18.4 ft·lb	
Multi-Axial Instrumented Impact Peak Force		ISO 6603-2
-22°F	832 lbf	
73°F	899 lbf	
Hardness	Nominal Value Unit	Test Method
Ball Indentation Hardness	18600 psi	ISO 2039-1
Thermal	Nominal Value Unit	Test Method
Deflection Temperature Under Load (66 psi, Unannealed)	288 °F	ISO 75-2/B
Deflection Temperature Under Load (264 psi, Unannealed)	277 °F	ISO 75-2/A
Vicat Softening Temperature		
--	295 °F	ISO 306/B120
--	293 °F	ISO 306/B50
Ball Pressure Test (279°F)	Pass	IEC 60695-10-2
CLTE - Flow (73 to 131°F)	2.2E-5 in/in/°F	ISO 11359-2
CLTE - Transverse (73 to 131°F)	3.6E-5 in/in/°F	ISO 11359-2
Thermal Conductivity ⁷ (73°F)	1.5 Btu·in/hr/ft ² /°F	ISO 8302
RTI Elec (0.06 in)	257 °F	UL 746B
RTI Imp (0.06 in)	239 °F	UL 746B
RTI Str (0.06 in)	257 °F	UL 746B
Electrical	Nominal Value Unit	Test Method
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)	910 V/mil	IEC 60243-1
Relative Permittivity		IEC 60250
73°F, 100 Hz	3.20	
73°F, 1 MHz	3.20	
Dissipation Factor		IEC 60250
73°F, 100 Hz	1.0E-3	
73°F, 1 MHz	9.0E-3	
Comparative Tracking Index		IEC 60112
Solution A	175 V	
Solution B	125 V	
Electrolytic Corrosion (73°F)	A1	IEC 60426
Flammability	Nominal Value Unit	Test Method
Flame Rating		UL 94
0.030 in	V-2	
0.06 in	V-0	
0.12 in	5VA	
Glow Wire Flammability Index		IEC 60695-2-12
0.030 in	1760 °F	
0.06 in	1760 °F	
0.12 in	1760 °F	
Glow Wire Ignition Temperature		IEC 60695-2-13
0.030 in	1650 °F	
0.06 in	1650 °F	
0.12 in	1650 °F	
Oxygen Index ⁸	35 %	ISO 4589-2
Application of Flame from Small Burner		
78.7 mil ⁹	K1, F1	DIN 53438-1, -3
78.7 mil	B2	DIN 4102
Burning Rate ¹⁰ (> 39.4 mil)	passed	ISO 3795
Flash Ignition Temperature	878 °F	ASTM D1929
Flame Test		IEC 60695-2-10
	60 sec	
	120 sec	
	120 sec	



78.7 mil ¹²	120 sec	
0.12 in ¹¹	120 sec	
0.12 in ¹²	120 sec	
Self Ignition Temperature	1022 °F	ASTM D1929

Processing Information

Injection	Nominal Value	Unit
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	482 to 500	°F
Middle Temperature	518 to 536	°F
Front Temperature	536 to 554	°F
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
Standard Melt Temperature: 300°C
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 mm

⁷ Across Flow

⁸ Procedure A

⁹ Method K and F

¹⁰ US-FMVSS

¹¹ Method K

¹² Method F

