

Makrolon® 9415

Polycarbonate

Covestro - Polycarbonates

Message:

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 Information			
UL YellowCard	E41613-233164	E41613-233165	
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		
Multi-Point Data	Specific Volume vs Temperature (ISO 11403-2)		
	Viscosity vs. Shear Rate (ISO 11403-2)		
Physical	Nominal Value	Unit	Test Method
Density (23°C)	1.27	g/cm ³	ISO 1183
Apparent Density ¹	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)	6.00	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 : 2.00 mm ²	0.45	%	ISO 294-4
Flow : 2.00 mm ³	0.60	%	ISO 294-4
Water Absorption			ISO 62
Saturation, 23°C	0.26	%	
Equilibrium, 23°C, 50% RH	0.10	%	
Hardness	Nominal Value	Unit	Test Method
Ball Indentation Hardness	128	MPa	ISO 2039-1
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus (23°C)	3800	MPa	ISO 527-2/1

Tensile Stress			ISO 527-2/5
Yield, 23°C	64.0	MPa	
Break, 23°C	45.0	MPa	
Tensile Strain			ISO 527-2/5
Yield, 23°C	4.4	%	
Break, 23°C	15	%	
Tensile Creep Modulus			ISO 899-1
1 hr	3600	MPa	
1000 hr	2900	MPa	
Flexural Modulus ⁴ (23°C)	3600	MPa	ISO 178
Flexural Stress ⁵			ISO 178
3.5% Strain, 23°C	95.0	MPa	
23°C	105	MPa	
Flexural Strain at Flexural Strength (23°C) ⁶	5.8	%	ISO 178
Application of Flame from Small Burner			
2.00 mm	B2		DIN 4102
Method K and F : 2.00 mm	K1, F1		DIN 53438-1, -3
Burning Rate - US-FMVSS (> 1.00 mm)	passed		ISO 3795
Flash Ignition Temperature	470	°C	ASTM D1929
Needle Flame Test			IEC 60695-11-5
Method F : 1.50 mm	2.0	min	
Method F : 2.00 mm	2.0	min	
Method F : 3.00 mm	2.0	min	
Method K : 1.50 mm	1.0	min	
Method K : 2.00 mm	2.0	min	
Method K : 3.00 mm	2.0	min	
Self Ignition Temperature	550	°C	ASTM D1929
Electrolytical Corrosion (23°C)	A1		IEC 60426
ISO Shortname	ISO 7391-PC,MFR,(,,)-09-9,GF10		
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength ⁷ (23°C, Complete Break)	10	kJ/m ²	ISO 7391
Charpy Unnotched Impact Strength			ISO 179/1eU
-60°C, Complete Break	100	kJ/m ²	
-30°C, Complete Break	120	kJ/m ²	
23°C, Complete Break	150	kJ/m ²	
Notched Izod Impact Strength ⁸ (23°C, Complete Break)	10	kJ/m ²	ISO 7391
Multi-Axial Instrumented Impact Energy			ISO 6603-2
-30°C	15.0	J	
23°C	25.0	J	
Multi-Axial Instrumented Impact Peak Force			ISO 6603-2

-30°C	3700	N	
23°C	4000	N	
Thermal	Nominal Value	Unit	Test Method
Heat Deflection Temperature			
0.45 MPa, Unannealed	142	°C	ISO 75-2/B
1.8 MPa, Unannealed	136	°C	ISO 75-2/A
Vicat Softening Temperature			
--	145	°C	ISO 306/B50
--	146	°C	ISO 306/B120
Ball Pressure Test (137°C)	Pass		IEC 60695-10-2
CLTE			ISO 11359-2
Flow : 23 to 55°C	4.0E-5	cm/cm/°C	
Transverse : 23 to 55°C	6.5E-5	cm/cm/°C	
Thermal Conductivity ⁹ (23°C)	0.22	W/m/K	ISO 8302
RTI Elec (1.50 mm)	125	°C	UL 746
RTI Imp (1.50 mm)	115	°C	UL 746
RTI Str (1.50 mm)	125	°C	UL 746
Electrical	Nominal Value	Unit	Test Method
Surface Resistivity	1.0E+16	ohms	IEC 60093
Volume Resistivity (23°C)	1.0E+16	ohms·cm	IEC 60093
Electric Strength (23°C, 1.00 mm)	36	kV/mm	IEC 60243-1
Relative Permittivity			IEC 60250
23°C, 100 Hz	3.20		
23°C, 1 MHz	3.20		
Dissipation Factor			IEC 60250
23°C, 100 Hz	1.0E-3		
23°C, 1 MHz	9.0E-3		
Comparative Tracking Index			IEC 60112
Solution A	175	V	
Solution B	125	V	
Flammability	Nominal Value	Unit	Test Method
Flame Rating			UL 94
0.750 mm	V-2		
1.50 mm	V-0		
3.00 mm	5VA		
Glow Wire Flammability Index			IEC 60695-2-12
0.750 mm	960	°C	
1.50 mm	960	°C	
3.00 mm	960	°C	
Glow Wire Ignition Temperature			IEC 60695-2-13
0.750 mm	900	°C	
1.50 mm	900	°C	

3.00 mm	900	°C	
Oxygen Index ¹⁰	35	%	ISO 4589-2
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.	Cross-flow		
10.	Procedure A		

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Recommended distributors for this material

Susheng Import & Export Trading Co.,Ltd.

Tel: +86 21 5895 8519

Phone: +86 13424755533

Email: sales@su-jiao.com

No. 215, Lianhe North Road, Fengxian District, Shanghai, China

