Makrolon® LED2643

Covestro - Polycarbonates - *Polycarbonate*

General Information

Product Description			
MVR (300°C/1.2 kg) 13 cm³/10 min; LED Lighting, optics and lenses; PC with highest transmission; medium viscosity; UV stabilized; injection molding - melt temperature 280 - 320°C; available in color code 551053 only			
General			
Material Status	• Commercial: Active		
Availability	• Africa & Middle East • Asia Pacific	• Europe • Latin America	• North America
Additive	• UV Stabilizer		
Features	• High Clarity	• Medium Viscosity	• UV Stabilized
Uses	• LEDs • Lenses	• Lighting Applications • Optical Applications	
RoHS Compliance	• RoHS Compliant		
Processing Method	• Injection Molding		
ISO Designation	• ISO 7391-PC,MLT,(,,)-18-9		

Properties [1]

Physical	Nominal Value	Unit	Test Method
Density (73°F)	1.20	g/cm³	ISO 1183
Apparent (Bulk) Density [2]	0.66	g/cm³	ISO 60
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	13	g/10 min	ISO 1133
Melt Volume-Flow Rate (MVR) (300°C/1.2 kg)	13	cm³/10min	ISO 1133
Molding Shrinkage			
Across Flow	0.60 to 0.80	%	ISO 2577
Flow	0.60 to 0.80	%	ISO 2577
Across Flow : 536°F, 0.0787 in [3]	0.75	%	ISO 294-4
Flow : 0.0787 in [3]	0.70	%	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)	341000	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)	6.3	%	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
Flexural Modulus [4] (73°F)	341000	psi	ISO 178
Flexural Stress [4]			ISO 178
73°F	13900	psi	
3.5% Strain, 73°F	10400	psi	
Flexural Strain at Flexural Strength [5] (73°F)	7.0	%	ISO 178
Films	**Nominal Value**	**Unit**	**Test Method**
Gas Permeation			ISO 2556
Carbon Dioxide : 3.9 mil	3800	cm³/m²/bar/24 hr	
Nitrogen : 3.9 mil	120	cm³/m²/bar/24 hr	
Oxygen : 3.9 mil	670	cm³/m²/bar/24 hr	
Impact	**Nominal Value**	**Unit**	**Test Method**

Charpy Notched Impact Strength [6]			ISO 179/1eA
-22°F, Complete Break	6.7	ft·lb/in²	
73°F, Partial Break	33	ft·lb/in²	
Charpy Unnotched Impact Strength			ISO 179/1eU
-76°F	No Break		
-22°F	No Break		
73°F	No Break		
Notched Izod Impact Strength [6]			ISO 180/A
-22°F, Complete Break	7.1	ft·lb/in²	
73°F, Partial Break	31	ft·lb/in²	
Multi-Axial Instrumented Impact Energy			ISO 6603-2
-22°F	47.9	ft·lb	
73°F	44.3	ft·lb	
Multi-Axial Instrumented Impact Peak Force			ISO 6603-2
-22°F	1420	lbf	
73°F	1210	lbf	
Hardness	**Nominal Value**	**Unit**	**Test Method**
Ball Indentation Hardness	16700	psi	ISO 2039-1
Thermal	**Nominal Value**	**Unit**	**Test Method**
Deflection Temperature Under Load (66 psi, Unannealed)	280	°F	ISO 75-2/B
Deflection Temperature Under Load (264 psi, Unannealed)	259	°F	ISO 75-2/A
Glass Transition Temperature [7]	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 [8] (73°F)	1.4	Btu·in/hr/ft²/°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)	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	9.5E-3		
Comparative Tracking Index			IEC 60112
Solution A	250	V	
Solution B	125	V	
Flammability	**Nominal Value**	**Unit**	**Test Method**
Flame Rating			UL 94
0.10 in	HB		
0.030 in	V-2		
Glow Wire Flammability Index			IEC 60695-2-12
0.030 in	1560	°F	
0.06 in	1560	°F	
0.12 in	1760	°F	
Glow Wire Ignition Temperature			IEC 60695-2-13
0.030 in	1610	°F	
0.06 in	1610	°F	
	1610	°F	
x [9]	28	%	ISO
[10] (> 39.4 mil)	passed		ISO
Temperature	896	°F	AST

Self Ignition Temperature	1022 °F	ASTM D1929

Optical	Nominal Value	Unit	Test Method
Refractive Index [11]	1.586		ISO 489
Light Transmittance			ISO 13468-2
39.37 mil	90.0	%	
78.74 mil	90.0	%	
118.1 mil	> 89.0	%	
157.5 mil	> 89.0	%	
Haze (118.1 mil)	< 1.00	%	ISO 14782

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] 3.0 mm

[7] 10°C/min

[8] Across Flow

[9] Procedure A

[10] US-FMVSS

[11] Method A