

## Makrolon® LED2045

Covestro - Polycarbonates - *Polycarbonate*

### General Information

#### Product Description

MVR (250°C/2.16 kg) 17 cm<sup>3</sup>/10 min; light guides; PC with highest transmission; low viscosity; easy release; injection molding - melt temperature 260 - 300°C; available in color code 000000 only

#### General

Material Status	• Commercial: Active		
Availability	• Africa & Middle East • Asia Pacific	• Europe • Latin America	• North America
Features	• Good Mold Release	• High Clarity	• Low Viscosity
Uses	• Lighting Applications		
RoHS Compliance	• RoHS Compliant		
Processing Method	• Injection Molding		
ISO Designation	• PC		

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

Physical	Nominal Value	Unit	Test Method
Density (73°F)	1.19	g/cm <sup>3</sup>	ISO 1183
Apparent (Bulk) Density <sup>2</sup>	0.66	g/cm <sup>3</sup>	ISO 60
Melt Volume-Flow Rate (MVR)			ISO 1133
250°C/2.16 kg	17	cm <sup>3</sup> /10min	
300°C/1.2 kg	61	cm <sup>3</sup> /10min	
Molding Shrinkage <sup>3</sup>			ISO 294-4
Across Flow : 536°F, 0.0787 in	0.65	%	
Flow : 0.0787 in	0.60	%	
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)	9140	psi	ISO 527-2/50
Tensile Stress (Break, 73°F)	7980	psi	ISO 527-2/50
Tensile Strain (Yield, 73°F)	6.0	%	ISO 527-2/50
Tensile Strain (Break, 73°F)	100	%	ISO 527-2/50
Nominal Tensile Strain at Break (73°F)	> 50	%	ISO 527-2/50
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	10400	psi	
Flexural Strain at Flexural Strength <sup>5</sup> (73°F)	7.3	%	ISO 178
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength <sup>6</sup>			ISO 179/1eA
-22°F, Complete Break	5.7	ft·lb/in <sup>2</sup>	
73°F, Partial Break	24	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	5.7	ft·lb/in <sup>2</sup>	
73°F, Partial Break	24	ft·lb/in <sup>2</sup>	
Multi-Axial Instrumented Impact Energy			ISO 6603-2
-22°F	40.6	ft·lb	
73°F	36.9	ft·lb	
Multi-Axial Instrumented Impact Peak Force			ISO 6603-2
-22°F	1280	lbf	
73°F	1060	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)	279	°F	ISO 75-2/B
Deflection Temperature Under Load (264 psi, Unannealed)	255	°F	ISO 75-2/A
Glass Transition Temperature <sup>7</sup>	291	°F	ISO 11357-2
Vicat Softening Temperature			
--	295	°F	ISO 306/B120
--	293	°F	ISO 306/B50
Ball Pressure Test (277°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
RTI Elec (0.028 in)	257	°F	UL 746B
RTI Imp (0.028 in)	239	°F	UL 746B
RTI Str (0.028 in)	257	°F	UL 746B
<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			IEC 60112
Solution A	225	V	
Solution B	125	V	
<b>Flammability</b>	<b>Nominal Value</b>	<b>Unit</b>	<b>Test Method</b>
Flame Rating (0.028 in, NC)	V-2		UL 94
Oxygen Index <sup>9</sup>	27	%	ISO 4589-2
Burning Rate <sup>10</sup> (> 39.4 mil)	passed		ISO 3795
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>11</sup>	1.584		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	%	
157.5 mil, 400 nm	> 87.5	%	
Haze (118.1 mil)	< 0.500	%	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
Max Moisture	< 0.02	
Hot Size	30 to 7	
Temperature	446 to 46	
Temperature	482 to 50	

Front Temperature	500 to 518 °F
Nozzle Temperature	500 to 518 °F
Processing (Melt) Temp	482 to 572 °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

Standard Melt Temperature: 270°C  
 Hold Pressure (% of Injection Pressure): 50 - 75%  
 Peripheral Screw Speed: 0.05 - 0.2 m/s

### 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> 3.0 mm

<sup>7</sup> 10°C/min

<sup>8</sup> Across Flow

<sup>9</sup> Procedure A

<sup>10</sup> US-FMVSS

<sup>11</sup> Method A

