Makrolon® LED2643

Grades / Light guides	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
ISO Shortname	ISO 7391-PC,MLT,(,,)-18-9

	Property	Test Condition	Unit	Standard	typical Value
Rheological properties					-
C	Melt volume-flow rate	300 °C; 1.2 kg	cm³/10 min	ISO 1133	13
C	Molding shrinkage, parallel	60x60x2 mm; 500 bar	%	ISO 294-4	0.7
C	Molding shrinkage, normal	60x60x2 mm; 500 bar	%	ISO 294-4	0.75
	Molding shrinkage, parallel/normal	Value range based on general practical experience	%	b.o. ISO 2577	0.6 - 0.8
	Melt mass-flow rate	300 °C; 1.2 kg	g/10 min	ISO 1133	13
Mechanical properties (23 °C/50 % r. h.)					
C	Tensile modulus	1 mm/min	MPa	ISO 527-1,-2	2350
C	Yield stress	50 mm/min	MPa	ISO 527-1,-2	65
C	Yield strain	50 mm/min	%	ISO 527-1,-2	6.3
C	Nominal strain at break	50 mm/min	%	ISO 527-1,-2	> 50
	Stress at break	50 mm/min	MPa	ISO 527-1,-2	70
	Strain at break	50 mm/min	%	b.o. ISO 527-1,-2	130
	Flexural modulus	2 mm/min	MPa	ISO 178	2350
	Flexural strength	2 mm/min	MPa	ISO 178	96
	Flexural strain at flexural strength	2 mm/min	%	ISO 178	7.0
	Flexural stress at 3.5 % strain	2 mm/min	MPa	ISO 178	72
C	Charpy impact strength	23 °C	kJ/m²	ISO 179-1eU	N
C	Charpy impact strength	-30 °C	kJ/m²	ISO 179-1eU	N
	Charpy impact strength	-60 °C	kJ/m²	ISO 179-1eU	N
	Charpy notched impact strength	23 °C; 3 mm	kJ/m²	ISO 7391/b.o. ISO 179-1eA	70P
	Charpy notched impact strength	-30 °C; 3 mm	kJ/m²	ISO 7391/b.o. ISO 179-1eA	14C
	Izod notched impact strength	23 °C; 3 mm	kJ/m²	ISO 7391/b.o. ISO 180-A	65P
	Izod notched impact strength	-30 °C; 3 mm	kJ/m²	ISO 7391/b.o. ISO 180-A	15C
C	Puncture maximum force	23 °C	N	ISO 6603-2	5400
C	Puncture maximum force	-30 °C	N	ISO 6603-2	6300
C	Puncture energy	23 °C	J	ISO 6603-2	60
C	Puncture energy	-30 °C	J	ISO 6603-2	65
	Ball indentation hardness		N/mm²	ISO 2039-1	115

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	Property	Test Condition	Unit	Standard	typical Value
Thermal properties					
C	Glass transition temperature	10 °C/min	°C	ISO 11357-1,-2	146
C	Temperature of deflection under load	1.80 MPa	°C	ISO 75-1,-2	126
C	Temperature of deflection under load	0.45 MPa	°C	ISO 75-1,-2	138
C	Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	145
	Vicat softening temperature	50 N; 120 °C/h	°C	ISO 306	146
C	Coefficient of linear thermal expansion, parallel	23 to 55 °C	10^{-4}/K	ISO 11359-1,-2	0.65
C	Coefficient of linear thermal expansion, transverse	23 to 55 °C	10^{-4}/K	ISO 11359-1,-2	0.65
C	Burning behavior UL 94 [UL recognition]	0.75 mm	Class	UL 94	V-2
	Burning behavior UL 94 [UL recognition]	2.5 mm	Class	UL 94	HB
C	Oxygen index	Method A	%	ISO 4589-2	28
	Thermal conductivity, cross-flow	23 °C; 50 % r. h.	W/(m·K)	ISO 8302	0.20
	Resistance to heat (ball pressure test)		°C	IEC 60695-10-2	138
	Relative temperature index (Tensile strength) [UL recognition]	1.5 mm	°C	UL 746B	125
	Relative temperature index (Tensile impact strength) [UL recognition]	1.5 mm	°C	UL 746B	115
	Relative temperature index (Electric strength) [UL recognition]	1.5 mm	°C	UL 746B	125
	Glow wire test (GWFI)	0.75 mm	°C	IEC 60695-2-12	850
	Glow wire test (GWFI)	1.5 mm	°C	IEC 60695-2-12	850
	Glow wire test (GWFI)	3.0 mm	°C	IEC 60695-2-12	960
	Glow wire test (GWIT)	0.75 mm	°C	IEC 60695-2-13	875
	Glow wire test (GWIT)	1.5 mm	°C	IEC 60695-2-13	875
	Glow wire test (GWIT)	3.0 mm	°C	IEC 60695-2-13	875
	Burning rate (US-FMVSS)	>=1.0 mm	mm/min	ISO 3795	passed
	Flash ignition temperature		°C	ASTM D1929	480
	Self ignition temperature		°C	ASTM D1929	550
Electrical properties (23 °C/50 % r. h.)					
C	Relative permittivity	100 Hz	-	IEC 60250	3.1
C	Relative permittivity	1 MHz	-	IEC 60250	3.0
C	Dissipation factor	100 Hz	10^{-4}	IEC 60250	5
C	Dissipation factor	1 MHz	10^{-4}	IEC 60250	95
C	Volume resistivity		Ohm·m	IEC 60093	1E14
C	Surface resistivity		Ohm	IEC 60093	1E16
C	Electrical strength	1 mm	kV/mm	IEC 60243-1	34
C	Comparative tracking index CTI	Solution A	Rating	IEC 60112	250
	Comparative tracking index CTI M	Solution B	Rating	IEC 60112	125M
Other properties (23 °C)					
C	Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.30
C	Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.12
C	Density		kg/m³	ISO 1183-1	1200
	Gas permeation	Oxygen; 100 µm film	cm³/(m²·24 h·bar)	b.o. ISO 2556	670
	Gas permeation	Nitrogen; 100 µm film	cm³/(m²·24 h·bar)	b.o. ISO 2556	120
	Gas permeation	Carbon dioxide; 100 µm film	cm³/(m²·24 h·bar)	b.o. ISO 2556	3800
	Bulk density	Pellets	kg/m³	ISO 60	660
Material specific properties					
	Refractive index	Procedure A	-	ISO 489	1.586
	Haze for transparent materials	3 mm	%	ISO 14782	< 1.0
	Luminous transmittance	1 mm	%	ISO 13468-2	90
	Luminous transmittance	2 mm	%	ISO 13468-2	90
	Luminous transmittance	3 mm	%	ISO 13468-2	> 89
	Luminous transmittance	4 mm	%	ISO 13468-2	> 89

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	Property	Test Condition	Unit	Standard	typical Value
Processing conditions for test specimens					
C	Injection molding-Melt temperature		°C	ISO 294	290
C	Injection molding-Mold temperature		°C	ISO 294	80
C	Injection molding-Injection velocity		mm/s	ISO 294	200

C These property characteristics are taken from the CAMPUS plastics data bank and are based on the international catalogue of basic data for plastics according to ISO 10350.

Impact properties: N = non-break, P = partial break, C = complete break

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Disclaimer

Information Impact properties

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Typical value

These values are typical values only. Unless explicitly agreed in written form, the do not constitute a binding material specification or warranted values. Values may be affected by the design of the mold/die, the processing conditions and coloring/pigmentation of the product. Unless specified to the contrary, the property values given have been established on standardized test specimens at room temperature.

General

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Disclaimer Non Medical Grade

This product is not designated for the manufacture of a medical device or of intermediate products for medical devices (1). [This product is also not designated for Food Contact (2), including drinking water, or cosmetic applications. If the intended use of the product is for the manufacture of a medical device or of intermediate products for medical devices, for Food Contact products or cosmetic applications Covestro must be contacted in advance to provide its agreement to sell such product for such purpose.] Nonetheless, any determination as to whether a product is appropriate for use in a medical device or intermediate products for medical devices, for Food Contact products or cosmetic applications must be made solely by the purchaser of the product without relying upon any representations by Covestro. 1) Please see the "Guidance on Use of Covestro Products in a Medical Application" document. 2) As defined in Commission Regulation (EU) 1935/2004.

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