



Makrolon AL2647

Speciality grades / Automotive lighting

Global grade; MFR 13 g/10 min; Automotive lenses; Medium viscosity; UV stabilized; Easy release; Injection molding; Available in clear tints only; Headlamp lenses for automotive forward lighting

ISO Shortname

ISO 7391-PC,MLR,55-18-9

Property	Test Condition	Unit	Standard	Value
Rheological properties				
C Melt volume-flow rate	300 °C; 1.2 kg	cm ³ /(10 min)	ISO 1133	12
Molding shrinkage, parallel/normal	Value range based on general practical experience	%	acc. 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	2400
C Yield stress	50 mm/min	MPa	ISO 527-1,-2	67
C Yield strain	50 mm/min	%	ISO 527-1,-2	6.1
C Nominal strain at break	50 mm/min	%	ISO 527-1,-2	> 50
Stress at break	50 mm/min	MPa	ISO 527-1,-2	65
Strain at break	50 mm/min	%	acc. ISO 527-1,-2	115
C Tensile creep modulus	1 h	MPa	ISO 899-1	2200
C Tensile creep modulus	1000 h	MPa	ISO 899-1	1900
Flexural modulus	2 mm/min	MPa	ISO 178	2350
Flexural strength	2 mm/min	MPa	ISO 178	98
Flexural strain at flexural strength	2 mm/min	%	ISO 178	7.0
Flexural stress at 3.5 % strain	2 mm/min	MPa	ISO 178	74
C Charpy impact strength	23 °C	kJ/m ²	ISO 179-1eU	N
C Charpy impact strength	-30 °C	kJ/m ²	ISO 179-1eU	N
Charpy notched impact strength	23 °C; 3 mm	kJ/m ²	acc. ISO 179-1eA	70P(C)
Charpy notched impact strength	-30 °C; 3 mm	kJ/m ²	acc. ISO 179-1eA	12C
Izod notched impact strength	23 °C; 3.2 mm	kJ/m ²	acc. ISO 180-A	85P(C)
Izod notched impact strength	-30 °C; 3.2 mm	kJ/m ²	acc. ISO 180-A	12C
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/mm ²	ISO 2039-1	115
Thermal properties				
C Glass transition temperature	10 °C/min	°C	ISO 11357-1,-2	145
C Temperature of deflection under load	1.80 MPa	°C	ISO 75-1,-2	123
C Temperature of deflection under load	0.45 MPa	°C	ISO 75-1,-2	136
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	143
Vicat softening temperature	50 N; 120 °C/h	°C	ISO 306	144
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 (1.6 mm) [UL listed]	1.5 mm	Class	UL 94	V-2
C Burning behavior UL 94 [UL listed]	2.5 mm	Class	UL 94	HB
Burning behavior UL 94 [UL listed]	0.75 mm	Class	UL 94	V-2
Burning behavior UL 94 [UL listed]	3.0 mm	Class	UL 94	HB
Burning behavior UL 94 [UL listed]	6.0 mm	Class	UL 94	HB
C Oxygen index	Method A	%	ISO 4589-2	27
Thermal conductivity	23 °C	W/(m·K)	ISO 8302	0.20
Resistance to heat (ball pressure test)		°C	IEC 60335-1	134
Relative temperature index (Tensile strength) [UL listed]	1.5 mm	°C	UL 746 B	125
Relative temperature index (Tensile impact strength) [UL listed]	1.5 mm	°C	UL 746 B	115
Relative temperature index (Electric strength) [UL listed]	1.5 mm	°C	UL 746 B	125
Flash ignition temperature	Procedure B	°C	ASTM D1929	470
Self ignition temperature	Procedure B	°C	ASTM D1929	540
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 % RH	%	ISO 62	0.12



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Property	Test Condition	Unit	Standard	Value
C Density		kg/m ³	ISO 1183	1200
Bulk density	Pellets	kg/m ³	ISO 60	660
Material specific properties				
C Viscosity number		cm ³ /g	ISO 1628-4	56
Refractive index	Procedure A	-	ISO 489	1.587
Haze for transparent materials	3 mm	%	ISO 14782	< 0.5
Luminous transmittance (clear transparent materials)	1 mm	%	ISO 13468-2	89
C Luminous transmittance (clear transparent materials)	2 mm	%	ISO 13468-2	89
Luminous transmittance (clear transparent materials)	3 mm	%	ISO 13468-2	88
Luminous transmittance (clear transparent materials)	4 mm	%	ISO 13468-2	> 87
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

