Makrolon® 1899

Flame retardant grades / Medium viscosity

MVR (300 °C/1.2 kg) 16 cm³/10 min; special flame retardent system; UL 94V-0/0.75 mm; impact modified; medium viscosity; easy release; Vicat softening temperature 50 N, 50 °C/h = 110 °C; injection molding - melt temperature 240 - 280 °C; available in opaque colors only; battery housing

ISO Shortname

PC-FR(40)

	Property	Test Condition	Unit	Standard	typical Value
Rheological properties					
C	Melt volume-flow rate	300 °C/ 1.2 kg	cm³/10 min	ISO 1133	16.0
	Melt mass-flow rate	300 °C/ 1.2 kg	g/10 min	ISO 1133	16.5
C	Molding shrinkage, parallel	60x60x2 mm/ 500 bar	%	ISO 294-4	0.6
C	Molding shrinkage, normal	60x60x2 mm/ 500 bar	%	ISO 294-4	0.65
Mechanical properties (23 °C/50 % r. h.)					
C	Tensile modulus	1 mm/min	MPa	ISO 527-1,-2	2600
C	Yield stress	50 mm/min	MPa	ISO 527-1,-2	68
C	Yield strain	50 mm/min	%	ISO 527-1,-2	4.8
C	Nominal strain at break	50 mm/min	%	ISO 527-1,-2	> 50
	Stress at break	50 mm/min	MPa	ISO 527-1,-2	60
	Strain at break	50 mm/min	%	b.o. ISO 527-1,-2	115
	Flexural modulus	2 mm/min	MPa	ISO 178	2600
	Flexural strength	2 mm/min	MPa	ISO 178	100
	Flexural strain at flexural strength	2 mm/min	%	ISO 178	5.8
	Flexural stress at 3.5 % strain	2 mm/min	MPa	ISO 178	82
C	Charpy impact strength	23 °C	kJ/m²	ISO 179/1eU	N
C	Puncture impact properties - maximum force	23 °C	N	ISO 6603-2	4500
C	Puncture impact properties - maximum force	-30 °C	N	ISO 6603-2	5400
C	Puncture energy	23 °C	J	ISO 6603-2	50
C	Puncture energy	-30 °C	J	ISO 6603-2	55
Thermal properties					
C	Temperature of deflection under load	1.80 MPa	°C	ISO 75-1,-2	96
C	Temperature of deflection under load	0.45 MPa	°C	ISO 75-1,-2	105
C	Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	110
C	Coefficient of linear thermal expansion, parallel	23 to 55 °C	10^{-4}/K	ISO 11359-1,-2	0.7
C	Coefficient of linear thermal expansion, normal	23 to 55 °C	10^{-4}/K	ISO 11359-1,-2	0.7
C	Burning behavior UL 94 [UL recognition]	0.75 mm	Class	UL 94	V-0
C	Burning behavior UL 94-5V	3.0 mm	Class	UL 94	5VA (Covestro Test)
C	Oxygen index	Method A	%	ISO 4589-2	35
	Relative temperature index (Tensile strength) [UL recognition]	0.75 mm	°C	UL 746B	80
	Relative temperature index (Tensile impact strength) [UL recognition]	0.75 mm	°C	UL 746B	80
	Relative temperature index (Electric strength) [UL recognition]	0.75 mm	°C	UL 746B	80
	Glow wire test (GWFI)	1.0 mm	°C	IEC 60695-2-12	960
	Flash ignition temperature		°C	ASTM D1929	460
	Self ignition temperature		°C	ASTM D1929	500
Electrical properties (23 °C/50 % r. h.)					
C	Comparative tracking index CTI	Solution A	Rating	IEC 60112	250
	Comparative tracking index CTI M	Solution B	Rating	IEC 60112	100M
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
	Bulk density	Pellets	kg/m³	ISO 60	640

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	Property	Test Condition	Unit	Standard	typical Value
Processing conditions for test specimens					
C	Injection molding - Melt temperature		°C	ISO 294	260
C	Injection molding - Mold temperature		°C	ISO 294	80
C	Injection molding - Injection velocity		mm/s	ISO 294	200
Recommended processing and drying conditions					
	Melt temperatures		°C	-	240 - 280
	Standard Melt temperature		°C	-	260
	Barrel Temperatures - Rear		°C	-	230 - 240
	Barrel Temperatures - Middle		°C	-	240 - 250
	Barrel Temperatures - Front		°C	-	250 - 265
	Barrel Temperatures - Nozzle		°C	-	245 - 265
	Mold Temperatures		°C	-	70 - 110
	Hold Pressure (% of injection pressure)		%	-	50 - 75
	Plastic Back Pressure (specific)		bar	-	100 - 200
	Peripheral Screw Speed		m/s	-	0.05 - 0.2
	Shot-to-Cylinder Size		%	-	30 - 70
	Dry Air Drying Temperature		°C	-	90
	Dry Air Drying Time		h	-	4
	Moisture Content max. (%)		%	-	<= 0,02
	Vent Depth		mm	-	0.025 - 0.075

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