

# Makrolon® 1095

**Glass fiber (Normal fiber) reinforced grades / 15 % Glass fiber reinforced** MVR (300 °C/1.2 kg) 6.0 cm<sup>3</sup>/10 min; 15 % glass fiber reinforced; UL 94V-0/3.0 mm; high viscosity; easy release; injection molding - melt temperature 310 - 330 °C; extrusion; available in opaque colors only; housings for power tools

ISO Shortname ISO 7391-PC,MR,(,)-09-9,GF15

Property	Test Condition	Unit	Standard	typical Value
<b>Rheological properties</b>				
C Melt volume-flow rate	300 °C; 1.2 kg	cm <sup>3</sup> /10 min	ISO 1133	6.0
C Molding shrinkage, parallel	60x60x2 mm; 500 bar	%	ISO 294-4	0.45
C Molding shrinkage, normal	60x60x2 mm; 500 bar	%	ISO 294-4	0.45
Melt mass-flow rate	300 °C; 1.2 kg	g/10 min	ISO 1133	7.0
<b>Mechanical properties (23 °C/50 % r. h.)</b>				
C Tensile modulus	1 mm/min	MPa	ISO 527-1,-2	4600
Yield stress	5 mm/min	MPa	ISO 527-1,-2	64
Yield strain	5 mm/min	%	ISO 527-1,-2	4.6
C Stress at break	5 mm/min	MPa	ISO 527-1,-2	45
C Strain at break	5 mm/min	%	ISO 527-1,-2	12
Flexural modulus	2 mm/min	MPa	ISO 178	4400
Flexural strength	2 mm/min	MPa	ISO 178	105
Flexural strain at flexural strength	2 mm/min	%	ISO 178	5.8
Flexural stress at 3.5 % strain	2 mm/min	MPa	ISO 178	95
C Charpy impact strength	23 °C	kJ/m <sup>2</sup>	ISO 179-1eU	120C
C Charpy impact strength	-30 °C	kJ/m <sup>2</sup>	ISO 179-1eU	100C
Charpy impact strength	-60 °C	kJ/m <sup>2</sup>	ISO 179-1eU	90C
Charpy notched impact strength	23 °C; 3 mm	kJ/m <sup>2</sup>	ISO 7391/b.o. ISO 179-1eA	10C
Izod notched impact strength	23 °C; 3 mm	kJ/m <sup>2</sup>	ISO 7391/b.o. ISO 180-A	10C
C Puncture maximum force	23 °C	N	ISO 6603-2	3600
C Puncture maximum force	-30 °C	N	ISO 6603-2	3000
C Puncture energy	23 °C	J	ISO 6603-2	25
C Puncture energy	-30 °C	J	ISO 6603-2	13
Ball indentation hardness		N/mm <sup>2</sup>	ISO 2039-1	129

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Property	Test Condition	Unit	Standard	typical Value
<b>Thermal properties</b>				
C Temperature of deflection under load	1.80 MPa	°C	ISO 75-1,-2	135
C Temperature of deflection under load	0.45 MPa	°C	ISO 75-1,-2	141
C Vicat softening temperature	50 N; 50 °C/h	°C	ISO 306	142
C Vicat softening temperature	50 N; 120 °C/h	°C	ISO 306	145
C Coefficient of linear thermal expansion, parallel	23 to 55 °C	10 <sup>-4</sup> /K	ISO 11359-1,-2	0.35
C Coefficient of linear thermal expansion, transverse	23 to 55 °C	10 <sup>-4</sup> /K	ISO 11359-1,-2	0.65
C Burning behavior UL 94 (1.5 mm) [UL recognition]	1.5 mm	Class	UL 94	V-2
C Burning behavior UL 94 [UL recognition]	3.0 mm	Class	UL 94	V-0
C Oxygen index	Method A	%	ISO 4589-2	27
Resistance to heat (ball pressure test)		°C	IEC 60695-10-2	136
Relative temperature index (Tensile strength) [UL recognition]	1.5 mm	°C	UL 746B	80
Relative temperature index (Tensile impact strength) [UL recognition]	1.5 mm	°C	UL 746B	80
Relative temperature index (Electric strength) [UL recognition]	1.5 mm	°C	UL 746B	80
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	960
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	850
Glow wire test (GWIT)	1.5 mm	°C	IEC 60695-2-13	900
Glow wire test (GWIT)	3.0 mm	°C	IEC 60695-2-13	900
Needle flame test	Method K; 1.5 mm	s	IEC 60695-11-5	60
Needle flame test	Method K; 2.0 mm	s	IEC 60695-11-5	60
Needle flame test	Method K; 3.0 mm	s	IEC 60695-11-5	120
Needle flame test	Method F; 1.5 mm	s	IEC 60695-11-5	120
Needle flame test	Method F; 2.0 mm	s	IEC 60695-11-5	120
Needle flame test	Method F; 3.0 mm	s	IEC 60695-11-5	120
Burning rate (US-FMVSS)	>=1.0 mm	mm/min	ISO 3795	passed
Flash ignition temperature		°C	ASTM D1929	470
Self ignition temperature		°C	ASTM D1929	550
<b>Electrical properties (23 °C/50 % r. h.)</b>				
C Relative permittivity	100 Hz	-	IEC 60250	3.2
C Relative permittivity	1 MHz	-	IEC 60250	3.2
C Dissipation factor	100 Hz	10 <sup>-4</sup>	IEC 60250	10
C Dissipation factor	1 MHz	10 <sup>-4</sup>	IEC 60250	90
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	38
C Comparative tracking index CTI	Solution A	Rating	IEC 60112	175
Comparative tracking index CTI M	Solution B	Rating	IEC 60112	125M
Electrolytic corrosion		Rating	IEC 60426	A1
<b>Other properties (23 °C)</b>				
C Water absorption (saturation value)	Water at 23 °C	%	ISO 62	0.24
C Water absorption (equilibrium value)	23 °C; 50 % r. h.	%	ISO 62	0.10
C Density		kg/m <sup>3</sup>	ISO 1183-1	1290
Glass fiber content	Method A	%	b.o. ISO 3451-1	15
Bulk density	Pellets	kg/m <sup>3</sup>	ISO 60	640
<b>Processing conditions for test specimens</b>				
C Injection molding-Melt temperature		°C	ISO 294	300
C Injection molding-Mold temperature		°C	ISO 294	110
C Injection molding-Injection velocity		mm/s	ISO 294	200

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Property	Test Condition	Unit	Standard	typical Value
<b>Recommended Processing and Drying Conditions</b>				
Melt Temperatures		°C	-	310 - 330
Standard Melt Temperature		°C	-	320
Barrel Temperatures - Rear		°C	-	230 - 240
Barrel Temperatures - Middle		°C	-	235 - 245
Barrel Temperatures - Front		°C	-	240 - 270
Barrel Temperatures - Nozzle		°C	-	265 - 275
Mold Temperatures		°C	-	70 - 95
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	-	120
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



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## Disclaimer

### Typical value

These values are typical values only. Unless explicitly agreed in written form, they 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.

### Recommended Processing and Drying Conditions

Barrel temperatures are valid for a standard 3-zone barrel. Temperature set-up for different barrel types may change according to configuration. Values for hold pressure as percentage of injection pressure may vary depending on, amongst others, part geometry, injection molding machine and injection mold. Drying conditions are for dry air dryers only. Drying times and drying temperatures may differ depending on valid dryer type. Further information is provided by your local Covestro support as well as in the following brochures: Injection Molding of High Quality Molded Parts - Drying; Determining the Dryness of Makrolon by TVI Test; The fundamentals of shrinkage in thermoplastics; Shrinkage and deformation of glass fiber reinforced thermoplastics [...]. <https://www.plastics.covestro.com/Library/Overview.aspx>

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