

## Covestro Makrolon® FS 2000 Polycarbonate

Category : Polymer , Thermoplastic , Polycarbonate (PC) , Polycarbonate, Molded

### Material Notes:

Main characteristics:• High toughness• Good heat resistance• Glass-like transparency, optical quality• High dimensional accuracy and stability  
Grade characteristics:• Low viscosity  
As of 1 September 2015, Bayer Material Science was separated from Bayer AG and officially adopted its new name – Covestro.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Covestro-Makrolon-FS-2000-Polycarbonate.php](http://www.lookpolymers.com/polymer_Covestro-Makrolon-FS-2000-Polycarbonate.php)

Physical Properties	Metric	English	Comments
Bulk Density	0.660 g/cc	0.0238 lb/in <sup>3</sup>	pellets; ISO 60
Density	1.19 g/cc	0.0430 lb/in <sup>3</sup>	ISO 1183-1
Moisture Absorption at Equilibrium	0.12 %	0.12 %	ISO 62, 50% RH
Water Absorption at Saturation	0.30 %	0.30 %	ISO 62
Linear Mold Shrinkage, Flow	0.0060 cm/cm @Thickness 2.00 mm	0.0060 in/in @Thickness 0.0787 in	60x60x2 mm; 500 bar; ISO 294-4
Linear Mold Shrinkage, Transverse	0.0060 cm/cm @Thickness 2.00 mm	0.0060 in/in @Thickness 0.0787 in	60x60x2 mm; 500 bar; ISO 294-4

Mechanical Properties	Metric	English	Comments
Puncture Resistance	4700 N @Temperature 23.0 °C	1060 lb (f) @Temperature 73.4 °F	ISO 6603-2
	5700 N @Temperature -30.0 °C	1280 lb (f) @Temperature -22.0 °F	ISO 6603-2
Ball Indentation Hardness	115 MPa	16700 psi	ISO 2039-1
Tensile Strength at Break	55.0 MPa	7980 psi	50 mm/min; ISO 527-1,-2
Tensile Strength, Yield	63.0 MPa	9140 psi	50 mm/min; ISO 527-1,-2
Elongation at Break	>= 50 %	>= 50 %	Nominal, 50 mm/min; ISO 527-1,-2
	100 %	100 %	50 mm/min; b.o. ISO 527-1,-2
Elongation at Yield	5.9 %	5.9 %	50 mm/min; ISO 527-1,-2
Tensile Modulus	2.35 GPa	341 ksi	1 mm/min; ISO 527-1,-2
Flexural Strength	97.0 MPa	14100 psi	2 mm/min; ISO 178

Mechanical Properties	Metric 12.0 MPa	English 1000 psi	Comments
Flexural Yield Strength	@Strain 3.50 %	@Strain 3.50 %	2 mm/min; ISO 178
Flexural Modulus	2.35 GPa	341 ksi	2 mm/min; ISO 178
Izod Impact, Notched (ISO)	12.0 kJ/m <sup>2</sup>	5.71 ft-lb/in <sup>2</sup>	complete break; b.o. ISO 180-A
	@Thickness 3.20 mm, Temperature -30.0 °C	@Thickness 0.126 in, Temperature -22.0 °F	
	55.0 kJ/m <sup>2</sup>	26.2 ft-lb/in <sup>2</sup>	partial break; b.o. ISO 180-A
	@Thickness 3.20 mm, Temperature 23.0 °C	@Thickness 0.126 in, Temperature 73.4 °F	
Charpy Impact Unnotched	NB	NB	ISO 179-1eU
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	NB	NB	
	@Temperature -30.0 °C	@Temperature -22.0 °F	ISO 179-1eU
	NB	NB	
	@Temperature -60.0 °C	@Temperature -76.0 °F	ISO 179-1eU
	1.20 J/cm <sup>2</sup>	5.71 ft-lb/in <sup>2</sup>	
Charpy Impact, Notched	@Thickness 3.00 mm, Temperature -30.0 °C	@Thickness 0.118 in, Temperature -22.0 °F	
	5.00 J/cm <sup>2</sup>	23.8 ft-lb/in <sup>2</sup>	partial break; ISO 7391/b.o. ISO 179-1eA
	@Thickness 3.00 mm, Temperature 23.0 °C	@Thickness 0.118 in, Temperature 73.4 °F	
	50.0 J	36.9 ft-lb	ISO 6603-2
Puncture Energy	@Temperature 23.0 °C	@Temperature 73.4 °F	
	55.0 J	40.6 ft-lb	ISO 6603-2
	@Temperature -30.0 °C	@Temperature -22.0 °F	

Thermal Properties	Metric	English	Comments
CTE, linear, Parallel to Flow	65.0 µm/m-°C	36.1 µin/in-°F	ISO 11359-1,-2
	@Temperature 23.0 - 55.0 °C	@Temperature 73.4 - 131 °F	
CTE, linear, Transverse to Flow	65.0 µm/m-°C	36.1 µin/in-°F	ISO 11359-1,-2
	@Temperature 23.0 - 55.0 °C	@Temperature 73.4 - 131 °F	
Thermal Conductivity	0.200 W/m-K	1.39 BTU-in/hr-ft <sup>2</sup> -°F	cross-flow; ISO 8302

Hot Ball Pressure Test Thermal Properties	136 °C Metric	277 °F English	IEC 60895-10-2 Comments
Deflection Temperature at 0.46 MPa (66 psi)	138 °C	280 °F	ISO 75-1,-2
Deflection Temperature at 1.8 MPa (264 psi)	124 °C	255 °F	ISO 75-1,-2
Vicat Softening Point	145 °C	293 °F	50°C/h; ISO 306
	@Load 5.10 kg	@Load 11.2 lb	
	146 °C	295 °F	120°C/h; ISO 306
	@Load 5.10 kg	@Load 11.2 lb	
Glass Transition Temp, Tg	145 °C	293 °F	10°C/min; ISO 11357-1,-2
UL RTI, Electrical	125 °C	257 °F	UL 746B
UL RTI, Mechanical with Impact	115 °C	239 °F	UL 746B
UL RTI, Mechanical without Impact	125 °C	257 °F	UL 746B
Flash Point	480 °C	896 °F	ASTM D 1929
	550 °C	1020 °F	self ignition; ASTM D 1929
Oxygen Index	28 %	28 %	Method A; ISO 4589-2

Optical Properties	Metric	English	Comments
Refractive Index	1.584	1.584	Procedure A; ISO 489
Haze	<= 0.50 %	<= 0.50 %	ISO 14782
	@Thickness 3.00 mm	@Thickness 0.118 in	
Transmission, Visible	>= 89 %	>= 89 %	ISO 13468-2
	@Thickness 1.00 mm, Wavelength 550 nm	@Thickness 0.0394 in, Wavelength 550 nm	
	>= 90 %	>= 90 %	ISO 13468-2
	@Thickness 1.00 mm, Wavelength 800 nm	@Thickness 0.0394 in, Wavelength 800 nm	

Processing Properties	Metric	English	Comments
Melt Temperature	280 °C	536 °F	Injection molding; ISO 294
Mold Temperature	80.0 °C	176 °F	Injection molding; ISO 294
Injection Velocity	200 mm/sec	7.87 in/sec	ISO 294

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