

Makroblend® M4000 FR

 Covestro - Polycarbonates - *Polycarbonate + PBT*

General Information

Product Description

(PC+PBT) Blend, injection molding grade, flame retardant, excellent chemical resistance. Manufactured according to GMP, tested only according to ISO 10993-5 and ISO 10993-10 for contact with uncompromised skin only; for questions regarding biocompatibility we ask for an email inquiry under plastics@covestro.com. Limited colorability: recommended for whites and light colors only.

General

Material Status	• Commercial: Active
Availability	• Africa & Middle East • Europe • North America • Asia Pacific • Latin America
Additive	• Flame Retardant
Features	• Chemical Resistant • Flame Retardant
Uses	• Medical/Healthcare Applications
Agency Ratings	• ISO 10993-10 • ISO 10993-5
Processing Method	• Injection Molding

 Properties ¹

Physical	Nominal Value	Unit	Test Method
Density (73°F)	1.34	g/cm ³	ISO 1183
Melt Volume-Flow Rate (MVR) (260°C/5.0 kg)	18	cm ³ /10min	ISO 1133
Molding Shrinkage ²			ISO 2577
Across Flow	0.70 to 0.90	%	
Flow	0.70 to 0.90	%	
Water Absorption (Saturation, 73°F)	0.40	%	ISO 62
Water Absorption (Equilibrium, 73°F, 50% RH)	0.12	%	ISO 62
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus (73°F)	334000	psi	ISO 527-1/1
Tensile Stress (Yield, 73°F)	8120	psi	ISO 527-2/50
Tensile Strain (Yield, 73°F)	4.3	%	ISO 527-2/50
Nominal Tensile Strain at Break (73°F)	110	%	ISO 527-2/50
Flexural Modulus ³ (73°F)	334000	psi	ISO 178
Flexural Stress ³			ISO 178
3.5% Strain, 73°F	10900	psi	
73°F	12500	psi	
Impact	Nominal Value	Unit	Test Method
Notched Izod Impact Strength			ISO 180/A
-22°F	5.7	ft·lb/in ²	
73°F	19	ft·lb/in ²	
Hardness	Nominal Value	Unit	Test Method
Ball Indentation Hardness	17000	psi	ISO 2039-1
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load (66 psi, Unannealed)	239	°F	ISO 75-2/B
Deflection Temperature Under Load (264 psi, Unannealed)	185	°F	ISO 75-2/A
Vicat Softening Temperature	266	°F	ISO 306/B120
CLTE - Flow (73 to 131°F)	4.4E-5	in/in/°F	ISO 11359-2
CLTE - Transverse (73 to 131°F)	4.4E-5	in/in/°F	ISO 11359-2
Thermal Conductivity ⁴ (73°F)	1.4	Btu·in/hr/ft ² /°F	ISO 8302
Electrical	Nominal Value	Unit	Test Method



Surface Resistivity	1.0E+15 ohms	IEC 60093
Volume Resistivity (73°F)	1.0E+16 ohms·cm	IEC 60093
Electric Strength (73°F, 0.0394 in)	1200 V/mil	IEC 60243-1
Relative Permittivity		IEC 60250
73°F, 100 Hz	3.40	
73°F, 1 MHz	3.20	
Dissipation Factor		IEC 60250
100 Hz	2.0E-3	
1 MHz	0.020	
Comparative Tracking Index (Solution A)	225 V	IEC 60112
Flammability	Nominal Value	Unit
Flame Rating		UL 94
0.08 in	V-0	
0.12 in	5VA	
Fill Analysis	Nominal Value	Unit
Melt Viscosity ⁵ (500°F)	305 Pa·s	ISO 11443-A

Processing Information

Injection	Nominal Value	Unit
Drying Temperature - Dry Air Dryer	230	°F
Drying Time - Dry Air Dryer	2.0 to 4.0	hr
Suggested Max Moisture	< 0.010	%
Suggested Shot Size	30 to 70	%
Rear Temperature	473 to 491	°F
Middle Temperature	482 to 500	°F
Front Temperature	491 to 509	°F
Nozzle Temperature	491 to 518	°F
Processing (Melt) Temp	482 to 518	°F
Mold Temperature	140 to 212	°F
Back Pressure	725 to 2180	psi
Vent Depth	9.8E-4 to 3.0E-3	in

Injection Notes

Peripheral Screw Speed: 0.05 - 0.2 m/s
Standard Melt Temperature: 260°C
Hold Pressure (% of Injection Pressure): 50 - 75%

Notes

¹ Typical properties: these are not to be construed as specifications.

² 600 bar

³ 0.079 in/min

⁴ Across Flow

⁵ 1000s-1

