



MAKROFOL® DE 1-4 000000

Polycarbonate Film

Description and Application

Makrofol DE 1-4 000000 is an extrusion film based on Makrolon® polycarbonate. It comprises all of the well known advantages of polycarbonate, such as excellent mechanical and optical properties. Makrofol DE 1-4 000000 maintains accurate graphic registration regardless of the forming method due to low internal stress. Cost savings relative to gloss/gloss films are realized using this product as no masking is supplied in Makrofol DE 1-4 000000's standard configuration.

Typical applications are automotive, labels, membrane switches, nameplates, and medical packaging. Makrofol DE 1-4 000000 is available in various standard thicknesses from 0.005" to 0.030" (125 microns to 750 microns). Other thicknesses are available on request. The surface combination of Makrofol DE 1-4 000000 is one side gloss and one side fine matte for printability. As with any product, use of Makrofol DE 1-4 000000 in a given application must be tested (including but not limited to field testing) in advance by the user to determine suitability.

Typical Properties*

Property	Test Method	Unit	Value
General			
Specific Gravity	ASTM D 792		1.20
Conversion Factor		ft ² /lb·mil m ² /kg·mm	161 0.833
Gloss 60° top side, black inked second surface	ASTM D 2457	gloss unit	> 90
Gloss 60° reverse side	ISO 2813	gloss unit	< 9
Roughness, R3z, top side	ISO 4287/88	µm	≤ 0.5
Roughness, R3z, reverse side	ISO 4287/88	µm	< 14
Surface			gloss/f.matte
Mechanical			
Tensile Strength, Yield	ASTM D 882	psi	9,100
Tensile Strength, Break	ASTM D 882	psi	10,500
Elongation at Break	ASTM D 882	%	125
Flexural Modulus	ASTM D 790	psi	330,000
Tear Strength, Initiation	ASTM D 1004	lb/in	1,100
Thermal			
Coefficient of linear thermal expansion, parallel 20°C to 120°C	DIN 53752	10 ⁻⁶ /K	70
Coefficient of linear thermal expansion, across 20°C to 120°C	DIN 53752	10 ⁻⁶ /K	70
Shrinkage, parallel 130°C, 1h	IEC 60674-2	%	< 0.4
Shrinkage, across 130°C, 1h	IEC 60674-2	%	< 0.4
Heat Deflection Temperature			
1.82 MPa	ASTM D 648	°F	270
0.45 MPa	ASTM D 648	°F	288
Vicat Softening Temperature, Rate A	ASTM D 1525	°F	297
Flammability			
Burning Rate (FMVSS 302)	ISO 3795	mm/min	≤ 100
UL Listing	UL 94 V-0	min. thickness	--
UL Listing	UL 94 V-2	min. thickness	0.015" (375 µm)
UL Listing	UL 94 VTM-0	min. thickness	--
UL Listing	UL 94 VTM-2	min. thickness	0.005" (125 µm)
Optical			
Haze	ASTM D 1003	%	--
Light Transmittance	ASTM D 1003	%	> 70 (> 20 mil) > 80 (> 20 mil)
Yellowness Index	ASTM E 313		1
Other			
Water Absorption (saturation)	ISO 62	%	0.20
Water Absorption (immersion at 73°F/24h)	ASTM D 570	%	0.33

* These items are provided as general information only. They are approximate values and are not part of the product specifications.

Page 1 of 2 — Document contains important information and must be read in its entirety.

Health And Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling Makrofol DE 1-4 000000. Before working with these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets and product labels. Consult your local Bayer MaterialScience representative or contact Bayer's Product Safety and Regulatory Affairs Department in Pittsburgh, PA.

Note: The information contained in this bulletin is current as of March 2012, please contact Bayer MaterialScience to determine whether this publication has been revised.

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