

# Makrofol<sup>®</sup> LM228 2-4 160005

## Description and Application Information

Makrofol<sup>®</sup> LM228 2-4 160005 is an extruded polycarbonate film filled with light-scattering agent.

It displays a smooth homogenous illumination of the front side of a backlight part even if a point source light is applied.

Makrofol<sup>®</sup> LM228 2-4 160005 is available in the standard thicknesses of 300 microns and 500 microns.

Typical applications are automotive instrument panels and backlight displays.

## Guide data\*

General properties			
Property	Value	Unit of measurement	Method
Density	1.2	g/cm <sup>3</sup>	ISO 1183, 20°C, Method C
Thickness	300, 500	µm	acc. to ISO 4593, 23°C
Gloss		Digits	ISO 2813, Angle 60°, backprinted black
top surface	≥ 80		
back surface	< 6		
Roughness R3z		µm	acc. to ISO 4287/88, Lm12,5mm, lc 2,5mm, Average over 3-5 measurements
top surface	≤ 2		
back surface	< 11		

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<b>Optical properties</b>			
<b>Property</b>	<b>Value</b>	<b>Unit of measurement</b>	<b>Method</b>
Luminous transmittance		%	ISO 13468-2
300 µm, back surface	73		
300 µm, top surface	72		
500 µm, back surface	65		
500 µm, top surface	65		
Haze		%	ASTM D1003
300 µm, back surface	100		
300 µm, top surface	100		
500 µm, back surface	100		
500 µm, top surface	100		
Half-power angle		Degree	following DIN 5036
300 µm, top surface	39		
500 µm, top surface	51		
<b>Mechanical properties</b>			
<b>Property</b>	<b>Value</b>	<b>Unit of measurement</b>	<b>Method</b>
Stress at break		MPa	ISO 527-1,-3
machine direction	≥ 50		
transverse direction	≥ 50		
Strain at break		%	ISO 527-1,-3
machine direction	≥ 105		
transverse direction	≥ 100		
Tensile Modulus		MPa	ISO 527-1,-3
machine direction	≥ 1850		
transverse direction	≥ 1800		
<b>Thermal properties</b>			
<b>Property</b>	<b>Value</b>	<b>Unit of measurement</b>	<b>Method</b>
Relative temperature index	80	°C	UL 746 B
<b>Electrical properties</b>			
<b>Property</b>	<b>Value</b>	<b>Unit of measurement</b>	<b>Method</b>
Surface resistivity	10 <sup>16</sup>	Ohm	following DIN IEC 60093
<b>Other properties</b>			
<b>Property</b>	<b>Value</b>	<b>Unit of measurement</b>	<b>Method</b>
Water absorption	0.2	%	following ISO 62

\* These values provide general information and are not part of the product specification.

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## Remark

(1) This is the typical value, would need more production runs to confirm.

## Labeling and REACH applications

**This product data sheet is only valid in conjunction with the latest edition of the corresponding Safety Data Sheet.**

Any updating of safety-relevant information – in accordance with statutory requirements – will only be reflected in the Safety Data Sheet, copies of which will be revised and distributed. Information relating to the current classification and labeling, applications and processing methods and further data relevant to safety can be found in the currently valid Safety Data Sheet.

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance, information and recommendations to determine to your own satisfaction whether our products, technical assistance and information are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by Covestro. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale which are available upon request. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with any claim of any patent relative to any material or its use. No license is implied or in fact granted under the claims of any patent.

This product is not designated for the manufacture of a medical device (1) or of intermediate products for medical devices. 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.

This is a trial product. Further information, including amended or supplementary data on hazards associated with its use, may be compiled in the future. For this reason no assurances are given as to type conformity, processability, long-term performance characteristics or other production or application parameters. Therefore, the purchaser/user uses the product entirely at his own risk without having been given any warranty or guarantee and agrees that the supplier shall not be liable for any damage, of whatever nature, arising out of such use. Commercialisation and continued supply of this material are not assured. Its supply may be discontinued at any time.

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