

XTRAFORM™ 3D

Formable Hardcoated Polycarbonate Film

PRODUCT DESCRIPTION

XtraForm 3D is a formable hardcoated polycarbonate film. It is designed for deep draw 3D film insert molding (FIM) applications using the Xtraform process. The improved coating gives a product that is more consistently black in the deep draw areas. It is available in different gauges and two finishes.

XtraForm 3D 2L is a formable hardcoated polycarbonate film with a gloss finish on both sides of the film. The print side has a laminate in place to protect the surface prior to processing, but this must be removed before printing. This laminate is more transparent than the first (hardcoat) surface laminate and has higher peel strength.

XtraForm 3D M HCL is a formable hard-coated polycarbonate with a gloss finish on the hard-coat side of the film and matt on the reverse. The hard-coat surface of the product is supplied with a protective laminate.



READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

PRODUCT RANGE

Product	Base	180 µm	250 µm	380 µm
XtraForm 3D	Gloss	G180 2L	G250 2L	G380 2L
	Matt	G180M HCL	G250M HCL	G380M HCL

Key: 2L = Laminated on both surfaces
HCL = Laminated on Hardcoat surface only

TYPICAL PROPERTIES

Property	Typical Value	Specification ¹
Thickness 180 µm 250 µm 380 µm	180 µm ± 10% 258 µm ± 8% 380 µm ± 8%	Test Method 096
Haze	< 1.6%	ASTM D1003
Total Luminous Transmission	≥ 90%	ASTM D1003
Yellowness Index Cured Uncured	≤ 4 ≤ 6	ASTM E313
Resistance to Humidity	No adhesion loss or visible change	72 hours @ 85 °C, 85% RH
Gloss Level 20° 60° 85°	85 GU 92 GU 100 GU	ASTM D523 Flat, black back-printed
Heat Aging	No adhesion loss or visible change	240 hours @ 90 °C
Taber Abrasion - 100 Cycles	< 15.0% change in haze	Test Method 103 CS10F Wheel, 500 Grams

Note: All evaluation results are obtained from lab produced samples at MacDermid Alpha Electronics Solutions. They are for general guidance only and do not represent the final product's properties.

¹ For details of test method, please contact MacDermid Alpha Electronics Solutions

AUTOMOTIVE TEST PERFORMANCE²

Test Method Name	Variant	Result
SAE J2412 – Accelerated Exposure of Automotive Interior trim Components Using a Controlled Irradiance Xenon-Arc Apparatus	225 kJ	Pass
VW PV1303 – Non-Metallic Materials, Exposure Test of Passenger Compartment Components	5 cycles	Pass

² XtraForm 3D achieves various interior test specifications for many Automotive OEMs, details of which can be provided on request

BASE FILM DATA³

Property	Gloss ⁴	Matt ⁴	Test Method
Tensile Strength	≥ 60 MPa / 23 °C	≥ 55 MPa / 23 °C	ASTM D882
Water Absorption Equilibrium	0.35%	0.4%	ASTM D570
Specific Gravity	1.2 g / cm ³	1.2 g / cm ³	ASTM D792
Elongation at Break	≥ 100% / 23 °C	≥ 90% / 23 °C	ASTM D882

³ Derived from suppliers' literature. The coating slightly enhances most properties

⁴ Typical Values

PROCESS RECOMMENDATIONS

Method	Recommendations
Handling	The film must be handled in UV safe conditions at every process stage until the UV cure is complete
Printing / Decoration	Second surface decoration can be achieved with a variety of suitable screen printing inks, <u>excluding</u> UV inks. The hard coating will slightly retard the drying of solvent inks. The Ink manufacturer's process recommendations must be used to develop production processes. We do not recommend that baking cycles in the printing process exceed 5 hours at 80 °C. Color matching of the ink and film must be undertaken with the protective layers removed ⁵
Forming	In a constant smooth action, remove the protective layer on top of the hard coat surface prior to forming. Use static control measures to prevent contamination. Thermoforming or pressure forming by the Niebling process must be carried out <u>after</u> decoration ⁵
Curing	The formed part must be UV cured immediately after forming to prevent any scratching during subsequent processing ⁵
Cutting	Trimming of the formed part should be carried out with precision matched metal tooling for optimum results ⁵
Injection Moulding	The printed, formed and trimmed part is inserted into a suitably designed injection mold tool cavity and resin injected onto the printed side of the film ⁵
Hazard Warnings	Refer to MSDS

⁵ Full processing guidelines for printing, cutting, moulding, UV curing and forming are available and must be referred to when designing a process using this product

LAMINATE

Where present, the protective laminate on the print surface should be left in place until the first ink print pass.

The laminate on the print side is clearer than the one on the hardcoated side. The hardcoat laminate is hazy in appearance.

SHELF LIFE & STORAGE CONDITIONS

The recommended shelf life is 6 months from the date of manufacture. MacDermid Alpha Electronics Solutions guarantees a minimum remaining shelf life of 8 weeks at the time of despatch.

The recommended shelf life represents the maximum processing lifetime of the product from the date of manufacture when stored correctly and in unopened packaging. The following storage conditions are recommended:

Storage Conditions	
Temperature	15 to 25 °C
Relative Humidity	< 55%
Packaging	Store in original protective packaging Once the packaging has been opened, the processing lifetime can be compromised due to air ingress, contamination or UV light
Stacking	For material $\leq 250 \mu\text{m}$ thick, 100 sheet packs should be stacked no more than 10 packs high

IMDS ID-No

By arrangement with our regulatory affairs team.

SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use.

Safety Data Sheets are available.

WASTE TREATMENT

Prior to using any recommendations or suggestions for waste treatment, the user is required to know the appropriate local/state/federal regulations for on-site or off-site treatment which may require permits. If there is any conflict regarding our recommendations, local/state/federal regulations take precedent.

CONTACT INFORMATION

To confirm this document is the most recent version, please contact

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE. Emergency safety directory assistance: US +1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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