

Autoflex® AutoForm™

Product Data Sheet

IMD techniques are used for cost effective manufacture of facias, panels and casings in a variety of markets. MacDermid Autotype Limited films now offer advances in the durability of the film substrate, both in terms of chemical resistance and in terms of abrasion resistance.

™

PRODUCT DESCRIPTION

The product is a formable hard-coated polycarbonate film available in 180 - 480µm thickness. The coating is designed to allow shallow formability whilst retaining its abrasion resistant properties. The abrasion resistance of the product is comparable with conventional hardcoated polycarbonates.

Product range:

Autoflex Autoform PC G180L, G180 HCL, G180 2L, G250L, G250 2L, G380L,
G480L, G480 2L

Gloss finish 180, 250, 380, 480 micron

Autoflex Autoform PC A180, A250, A380, A480
Antiglare finish 180, 250, 380, 480 micron

Key

HCL – Hard-coat laminate

2L – 2 sides laminate

L – Laminate

PRODUCT APPLICATIONS

The film is designed for in-mould decoration. The part is printed on the reverse, moulded to the shape required, and finally injection moulded on the reverse to give increased rigidity. The technique has applications in:

- White goods - Home appliance facias
- Brown Goods - Electronics facias
- Automotive - Heater controls
- Telecommunications - Mobile Telephones, Pagers

Major Benefits:

- Low hazard compared with spray coating.
- Easily formable by thermoforming or pressure forming.
- Provides a scratch resistant surface to the polycarbonate used as substrate.
- High gloss finish.



TYPICAL PROPERTY VALUES

CHEMICAL PROPERTIES

| Property | Autoflex ® Autoform™ | Test Method |
|----------------------------------|---|-------------|
| Chemical Resistance ² | Resistant to: [*] Alcohols Dilute Acids Dilute Alkalies Diesel Petrol Most Household cleaning agents Some aggressive organic solvents may leave small coating blisters | DIN 42 115 |

² See Test Method Manual^{*} For more information, see page C15

OPTICAL PROPERTIES

| Property | Autoflex ® Autoform™ | Test Method |
|---|----------------------|---------------|
| Gardner haze ² | | |
| Gloss Antiglare | <0.3% 9% ±2% | ASTM D1003-77 |
| Gloss Level (60°) ² | | |
| Gloss Antiglare | 93% ±5% 55% ±5% | ASTM D2457-70 |
| Total Luminous Transmission ² | 92% ±2% | ASTM D1003-77 |
| Yellowness Index ² | <2 | ASTM D1925-77 |

² See Test Method Manual.

Results based upon Gloss 250µm and Antiglare 480µm

MECHANICAL PROPERTIES

| Property | Autoflex ® Autoform™ | Test Method |
|--|------------------------------------|--|
| Elongation at modulus ¹ | >2.1 Gpa | ASTM D882-83/ISO 527 |
| Elongation at break ¹ | >100% | ASTM D882-83/ISO 527 |
| Tensile strength at break ¹ | ≥61 Mpa | ASTM D882-83/ISO 527 |
| Yield Strength ¹ | 60 Mpa | ASTM D882-83/ISO 527 |
| Taber Abrasion ² | | ASTM D1044-82 100 cycles 500g load, CS10F wheels |
| Gloss Antiglare | <5% Not applicable | |
| Pencil Hardness | HB | MacDermid Autotype Method ² |
| Flexibility | Passes 0.25" diameter fold test | ASTM D522 0.25" Mandrel Bar |

¹ Values derived from polycarbonate manufacturers data² See Test Method Manual

GENERAL PROPERTIES

| Property | Autoflex ® Autoform™ | Test Method |
|------------------------------------|--|---|
| Relative Density ¹ | 1.2 | ASTM D1505-85 |
| Dimensional Stability ¹ | <0.2% at 135 °C MD Maximum Shrinkage | ASTM D1204 |
| Humidity Testing | 60°C/95% RH for 1 week No visible change | MacDermid Autotype Method ² |
| Thermal Testing | 4 weeks at 50 °C No visible change | MacDermid Autotype Method ² |
| Thickness ¹ | ≤180µm ±10% 180 - 380µm ±7.5% >375µm ±5% | |

Quoted figures are typical results based upon 250µ Film

¹ Values derived from polycarbonate manufacturers data

² See Test Method Manual

PROCESS OUTLINE

During the decoration steps, prior to forming, handle the film with care.

Printing/Decoration:

Second surface decoration can be achieved with a variety of suitable screen printing inks.

Forming:

Thermoforming or pressure forming by the Niebling process should be carried out after decoration.

Cutting:

Trimming of the formed part.

Injection Molding:

The printed, formed and trimmed part is then inserted into a suitably designed injection mold tool cavity and resin injected onto the printed side of the film.

For further details contact the IMD Support Team.

HAZARDS & WARNINGS

ENSURE ALL USERS READ THIS INFORMATION

This product is solely intended for use as an industrial film substrate for use in vacuum/thermoforming and pressure forming applications. MacDermid Autotype Limited accepts no liability for use in any other way.

The main hazard associated with the film is the vapour produced when the film is exposed to heat prior to forming. Ensure that local exhaust extraction is in place to remove the vapour produced. See first aid instructions.

Ensure that light cotton gloves are worn throughout processing of the film. There is a minor possibility of irritation and/or sensitisation from the coating.

Do not touch the film while hot. Allow to cool before handling.

FIRE PRECAUTIONS

Extinguisher Media: Use water, foam, PCF, CO₂



Exposure Hazards: Toxic fumes CO, CO₂, NO_x evolved during combustion.

SPILLAGE

N/A

FIRST AID

Inhalation of fumes during processing: Remove to fresh air. Give artificial respiration if necessary. Seek medical attention.

Ingestion & Eyes: N/A

Skin: Wash immediately with soap and water.

SHELF LIFE & STORAGE

This product should not deteriorate if stored in cool, dry conditions away from light and sources of UV, in the original sealed packaging. Use recommended within two years.

DISPOSAL

Can be treated as normal solid waste and disposed of via landfill or authorised incineration.

PACKAGING

Sheets 100 sheets per pack <380µm, 50 sheets per pack ≥380µm
Rolls Maximum width 122cm on a 6" core.

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US 5,108,530

US 5,733,651

US 5,648,414

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