

AUTOFLEX EB

Product data sheet

Polyester film is tougher and more durable than polycarbonate and PVC films. It offers enhanced chemical resistance and dramatically improved flex life. The Autoflex range of hard coated polyester films extends the functionality of polyester film into areas demanding high abrasion resistance together with excellent receptivity to graphic inks and selective textures. Autoflex EB has been developed for applications requiring a combination of high abrasion resistance and flexibility, such as embossed membrane switches and optical displays, e.g. touch screens.

1. PRODUCT DESCRIPTION

Autoflex EB is a high quality, embossable, hard coated polyester film, consisting of a base polyester and an embossable, texturable, chemically bonded UV-cured hard surface coating. It is available in sheets and rolls, print receptive side cling film laminated as standard.

Product range:

Autoflex EB Gloss G130, G180, G250
gloss finish, 130, 180, 250 micron

Autoflex EB Antiglare A130, A180, A250
antiglare finish, 130, 180, 250 micron

Primer:

Autoflex EB has an ink adhesion primer on the second surface. This primer confers excellent adhesion to a wide range of solvent based graphic inks. The primer is not recommended for use with UV-cured graphic inks or a combination of solvent and UV graphic inks because the adhesion performance will be inconsistent. A special primer is available for use with UV inks, please see Autoflex EB (7 Series) Product Data Sheet.

Polyester films with high gloss surfaces are prone to blocking when stored with the film surfaces touching each other. Blocking is the term given when two surfaces adhere or merge into each other and when separated leave un-removable marks on the film. For this reason MacDermid Autotype supply the Autoflex film range with a protective laminate and recommend that the laminate remains in place until the first print pass.

Textures:

Autoflex EB can be screen printed with Fototex to obtain selective textures (see Fototex product data sheet).

Outdoor use:

In common with most other plastics, Autoflex EB has limited long term resistance to UV light and therefore is not recommended for long term use outdoors. MacDermid Autotype has developed a textured, UV resistant film, which can be used outside. Please see Autotex XE Product Data Sheet.

No outdoor version of Autoflex EB is available.

2. PRODUCT APPLICATIONS

Autoflex EB is used as a substrate in the following markets:

Markets

Membrane switch overlays
 Touch screens
 Fascia panels
 Nameplates
 Labels/Product marking

Major Benefits

- ▶ Excellent scratch resistance
- ▶ Chemical and household cleaner resistance even at the edges
- ▶ Receptive to Fototex texturing varnishes
- ▶ Embossable
- ▶ Consistent gloss/antiglare surface
- ▶ Attractive appearance
- ▶ Superior flex life

3. Chemical Properties

| Property | Autoflex EB | Test Method |
|--|---|--|
| Chemical Resistance | Resistant to: Alcohols Dilute acids Dilute alkalis Esters Hydrocarbons Ketones Household cleaning agents * | DIN 42 115 |
| Coefficient of hygroscopic expansion ¹ | MD 8 x 10 ⁻⁶ (per 1% RH) | DuPont Teijin Films Method ¹ Between 40-80% RH |
| Moisture vapour transmission rate (MVTR) ¹ 125μ | 2.6g/m ² /24hr | RTM 607 |
| Oxygen transmission rate ¹ 125μ | 5.3ml/m ² /24 hours | RTM 608 |

¹ Data derived from DuPont Teijin Films literature. The Autoflex coating slightly enhances most properties.

* For more detailed information refer to Autoflex solvent resistance sheet.

4. Electrical Properties

| Property | Autoflex EB | Test Method |
|---|--|--|
| Dielectric strength ¹ 125μ 175μ | 125kV/mm = 15.6 kV 105kV/mm = 18.4 kV | ASTM D149-81 6.35mm electrodes in dry air @ 25°C |
| Dissipation factor ¹ 125μ | 0.006 (1kHz) | ASTM D150-70 |
| Surface resistivity | >10 ¹³ Ω/sq 500Vd.c | ASTM D257-83 @ 20°C/54% RH |
| Volume resistivity ¹ | 10 ¹⁵ Ωm 100Vd.c | ASTM D257-83 @ 25°C/1000s |

¹ Data derived from DuPont Teijin Films literature. The Autoflex coating slightly enhances most properties.

5. Mechanical Properties

| Property | Autoflex EB | Test Method |
|--|-----------------------|---|
| Young's modulus ¹ 125μ (1% secant) | 3600N/mm ² | ASTM D882-88 |
| Elongation at break | 80% | ASTM D882-88 23°C, @ 50% RH Strain rate - 50%/minute |
| Switch life | >5 million flexes | Autotype Method ² |
| Tensile strength at break ¹ 125μ | 175N/mm ² | ASTM D882-83 (strain rate 50%/min) |
| Yield strength ¹ 125μ | 100N/mm ² | ASTM D882-88 |

¹ Data derived from DuPont Teijin Films literature ² Adapted to Autotype Method, see Test method manual

6. Optical Properties

| Property | Autoflex EB | Test Method |
|--|--|----------------------------|
| Gardner Haze ¹ | Gloss <1% Antiglare 9% ± 2% | ASTM D1003-77 ² |
| Gloss Level (60°) ¹ | Gloss 96% ± 2% Antiglare TD 55% ± 2% MD 63% ± 2% | ASTM D2457-70 ² |
| Total luminous transmission ¹ | Gloss 91% ± 2% Antiglare 91% ± 2% | ASTM D1003-77 ² |
| Yellowness index ¹ | Gloss <3.5 Antiglare <3.5 | ASTM D1925-70 |

¹ Typical value for 180μ product ² Adapted to Autotype method, see Test method manual



7. Physical Properties

| Property | Autoflex EB | Test Method |
|---|--|---|
| Density ¹ | 1.40g/cm ³ | ASTM D1505-85 modified to Melinex test method at 23°C |
| Taber Abrasion | Gloss <5% haze Antiglare Not applicable | ASTM D1044-82 100 cycles, 500g load CS10F wheels |
| Pencil hardness | 3H | Autotype Method ² |
| Thicknesses G130/A130 G180/A180 G250/A250 | 130μ ± 10% 180μ ± 10% 250μ ± 10% | |

¹ Data derived from DuPont Teijin Films literature ² See Test method manual

8. Thermal Properties

| Property | Autoflex EB | Test Method |
|---|--|---|
| Coefficient of thermal expansion ¹ | MD 19 x 10 ⁻⁶ cm cm ⁻¹ °C ⁻¹ TD 16 x 10 ⁻⁶ cm cm ⁻¹ °C ⁻¹ | DuPont Teijin Films Method ¹ between 20-50°C |
| Coefficient of hygroscopic expansion | 8x10 ⁻⁶ (per 1%RH) | DuPont Teijin Films Method ¹ 40-80%RH |
| Dimensional stability | <0.2% at 120°C MD maximum shrinkage | Autotype Method ² |
| Maximum long term use temperature | Low humidity (<10%RH) 85°C High humidity (10-95%RH) ≤60°C | |
| Minimum use temperature | -40°C | Autotype Method ² |

¹ Data derived from DuPont Teijin Films literature for 125μ Melinex OD ² See Test method manual

9. OZONE DEPLETING SUBSTANCES

EC Regulation 594/91 classifies ozone depleting substances into a number of different groups, I-VI. Autoflex EB does NOT contain any substance classified in groups I-VI nor have any of the substances been used by MacDermid Autotype during manufacture.

For details of the content of each of the groups, please see separate ozone depleting substances document.

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