



3M™ Envision™ Flexible Substrate FS-1

Product Bulletin



Product Description

3M™ Envision™ Flexible Substrate FS-1 is a wide-width flexible substrate for LED illuminated signs. This flexible substrate is printable with solvent, UV or latex inks.

Product Line Illuminated signage Envision™ FS-1 white, translucent, glossy

Product Characteristics

These are typical values for unprocessed products. Contact your 3M representative for a custom specification.

Physical & Application

Material	white-pigmented vinyl with a polyester scrim
Surface finish	glossy
Thickness	550 µm - 590 µm (0.55 mm - 0.59 mm)
Light transmission	46% ± 3%
Weight	650 g/m ²
Tensile strength	
- Down web	17 kg / cm
- Cross web	17 kg / cm
Tear strength	
- Down web	34 kg / cm
- Cross web	38 kg / cm
Elongation cross web/ down web	max 50 %
Maximum finished size	58 m ² per warranted face
Installation temperature	min 7 °C
Service temperature	-30 °C to +70 °C

Storage

Shelf life	Use within one year from the date of manufacture on the sealed original box. Use within 6 months decorated.
Storage conditions!	+4 °C to +40 °C, out of sunlight, original container in clean and dry area.

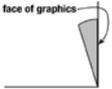
Flammability

Flammability standards are different from country to country. Ask your local 3M contact for details, please.

Durability

Unprocessed flexible substrate The following durability data are given for unprocessed flexible substrate only!

3M™ Performance Guarantee and MCS™ Warranty In addition, 3M provides a guarantee/warranty on a finished applied graphic within the framework of 3M™ Performance Guarantee and/or 3M™ MCS™ warranty programs.

Important Notice	Flexible Substrate FS-1 that is decorated with cut, colored film 3M™ Scotchcal™ Translucent Graphic Film 3630 / 3M™ Envision™ Translucent Graphic Film 3730 and protected with 3M™ Scotchcal™ Gloss Overlamine 3658G / 3M™ Scotchcal™ Matte Overlamine 3660M (full web applied) for outdoor signage will be warranted up to 10 years (Zone 1). This is the maximum period of time 3M will warrant the finished graphic performance. Visit www.3mgraphics.com for getting more details about 3M's comprehensive graphic solutions.		
Climatic zones	Graphic durability is largely determined by the climate and the angle of exposure. Find below a table showing the durability of a product according to the angle of exposure and the geographical location of the application.		
	Zone 1	Northern Europe, Italy (north of Rome), Russia	
	Zone 2	Mediterranean area without North Africa, South Africa	
	Zone 3	Gulf area, Africa	
Exposure types	Vertical:		The face of the graphic is ±10° from vertical.
	Interior:	Interior means an application inside a building without direct exposure to elements.	
Vertical outdoor exposure	Zone 1	Zone 2	Zone 3
	8 years	6 years	3 years

Limitations of End Uses

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs to recommend other products.

Graphics applied to

- removing existing graphics and reusing the substrate
- graphic decoration with more than three layers of flexible substrate (base flexible substrate plus overlamine)
- using 3M™ Scotchcal™ Overlamine 3640GPS or 3642GPS for graphic protection

Important Notice

- 3M Commercial Graphics Division products are not tested against automotive manufacturer specifications!

Graphics Manufacturing

Be sure the printer you are using is capable of supporting the weight and roll diameter of flexible substrate FS-1 to avoid damaging the printer.

Important Notice

Inkjet Inks and Printers

(1) Solvent Inkjet Inks

Ink Series

- 3M™ Piezo Inkjet Ink Series 1500v2
- 3M™ Piezo Inkjet Ink Series 4400
- SIIT GX 3M™ Ink Series
- SIIT SX 3M™ Ink Series

Printer

- EFI™ VUTEK® 150, 2360/3360, 3300/5300 & 3000/5000 Printers
- HP XLJet 1200 and 1500 Printers
- Seiko I Infotech ColorPainter H Series H-74s, H2-74s, H-104s, H2-104s & W-64s Printers
- Seiko I Infotech ColorPainter M-64s Printers

(2) Latex Inkjet Inks	<ul style="list-style-type: none"> - HP 3M™ LX600 Specialty Latex Ink - HP LX610 Latex Ink - HP 792 Latex Ink - HP 881 Latex Ink 	<ul style="list-style-type: none"> - HP Designjet L65500; Scitex LX600, LX800, LX820 & LX850; Latex 820 & 850 Printers - HP Designjet L65500; Scitex LX600, LX800, LX820 & LX850; Latex 820 & 850 Printers - HP Designjet L28500 (Latex 280) Printers - HP Latex 3000 Printer
(3) UV Inkjet Inks and Printers	<ul style="list-style-type: none"> - 3M™ Piezo Inkjet Ink Series 2800UV - EFI™ VUTEK® GS 3M™ Premium UV Inks - EFI™ VUTEK® GSr 3M™ Premium UV Inks - EFI™ R3225 3M™ UV Ink - EFI™ VUTEK® GSLXr3M™ SuperFlex UV Ink 	<ul style="list-style-type: none"> - EFI™ VUTEK® QS2000, QS3200, QS3220 and QS220 Printers - EFI™ VUTEK® GS2000, GS3200 & GS3250 Printers, including GS Pro Series - EFI™ VUTEK® GS5000r & GS3250r Printers - EFI™ R3225 UV Roll-to-Roll Printer - EFI™ VUTEK® GS3250LXr Pro Printer

When to use an overprint clear or overlaminate See instruction bulletin GPO 'graphic protection options' for further information about selection and use of protective overlaminates and printable clears.
[> Product Bulletin Graphic Protection Options <](#)

Shipping Finished Graphics Rolled flexible substrate side out on 150 mm (6 inch) or larger core. Do not use masking tape to secure the roll. It may stain the substrate.

Making Graphics with 3M™ Envision™ Translucent Graphic Film Series 3730, 3M™ Scotchcal™ Translucent Graphic Film Series 3630 or 3M™ Scotchcal™ Graphic Film Series 50, and 100 Applying to Envision™ Flexible Substrate FS-1, film series 3630, Envision™ film series 3730 can be screen printed and/or electronically cut and film series 3M™ Scotchcal™ 50 and 100 can only be electronically cut. Apply the film to the substrate using the wet application method or dry/roll lamination for front-lit graphics. No more than two layers of film may be applied to the substrate. The minimum decorating temperature recommended is 7 °C. See paragraph Tensioning and Attaching.

Refer to Instruction Bulletin FS-1 'Application of Flexible Substrate for Backlit Illuminated Signs using LEDs', for application information.

[> Application of Flexible Substrate for Backlit Illuminated Signs using LEDs <](#)

Converting Information Direct Inkjet Printing

This substrate can be direct printed using the solvent, latex or UV inkjet inks recommended in this Bulletin.
 For the best results, follow the printing guidelines and procedures in the Product & Instruction Bulletin for the inks you are using.

Total Ink Coverage Backlit images require greater density. This can be achieved by using the printer's double strike input mode (if available). When using this mode, you have reached the maximum total ink coverage when you can no longer obtain color consistency throughout the graphic and/or the graphic cannot be adequately dried after printing.
 For most graphics: 300% total ink coverage.
 For three layer printers with white ink: 660%, (280% colors +100% white + 280% colors maximum).

Double-sided Inkjet Printing for Backlit Images Double-sided Inkjet printing allows for a balanced day/night graphic appearance. A backlit image with proper color density can be achieved by printing a single strike image directly on both the first and second surface of the substrate. The second surface print must be reversed and registered to the first surface print. Consult with your printer manufacturer for process guidance.

Adequately Dry Graphics Inadequate drying can result in graphic failure including curling, increased shrinkage and adhesion failure, which are not covered under warranty. Build enough time into your process to ensure adequate drying of the graphic.

Poorly dried flexible substrate becomes soft and stretchy, and the adhesive becomes too aggressive. 3M recommends at least a minimum drying time of 24 hrs before further processing. Dry the graphic unrolled or at least as a loose wound roll standing upright.

When direct printing on Envision™ Flexible Substrate, an inadequately dried image may result in these problems, which are not covered by any 3M Warranty:

- prevent the overlamine from adhering well.
- distort the image if the printed substrate is rolled immediately.
- cause transport problems when printing the second side.

When printing on film that will be cut and applied to Envision™ Flexible Substrate, refer to the film's Product Bulletin for details about drying.

Attaching and Tensioning

Cold temperature field installation

3M recommends attaching and tensioning this substrate in a cabinet at a temperature equal to or more than 7 °C, whether the work is being done in a fabricator's shop or in the field.

Artificially warm the decorated substrate to at least 7 °C before attaching or tensioning the sign face in a cabinet or frame.

Do not stress the decorated substrate by folding, crimping, creasing, or forming it around corners. In cooler temperatures, the films applied to the substrate become less flexible and may crack if handled roughly.

Check and re-tension large sign faces as needed when the temperature warms to more than 15 °C. A large sign face is one that is more than 25 m² and has a height that exceeds 3.3 m or a width that exceeds 7.5 m.

Maintenance and Cleaning

Use a cleaner which must be wet, non-abrasive, without strong solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline). Clean the finished graphic annually. Clean the graphic more often in unusually dirty environments.

Remarks

This bulletin provides technical information only.

Important notice

All questions of warranty and liability relating to this product are governed by the terms and conditions of the sale, subject, where applicable, to the prevailing law.

Before using, the user must determine the suitability of the product for its required or intended use, and the user assumes all risk and liability whatsoever in connection therewith.

Additional Information

Visit the web site of your local subsidiary at www.3Mgraphics.com for getting:

- more details about 3M™ MCS™ Warranty and 3M™ Performance Guarantee
- additional instruction bulletins
- a complete product overview about materials 3M is offering



Commercial Solutions Division

Hermeslaan 7

1831 Diegem, Belgium

Responsible for this technical bulletin

3M Deutschland GmbH | Safety & Graphics Laboratory

Carl-Schurz-Str. 1 | 41453 Neuss, Germany

3M, Controltac, Envision, Panagraphics, Scotchcal, Comply and MCS are trademarks of 3M Company. All other trademarks are the property of their respective owners.

The use of trademark signs and brand names in this bulletin is based upon US standards. These standards may vary from country to country outside the USA.