



## LEDs HAVE MET THEIR MATCH.

Introducing 3M™ Envision™ Flexible Substrate FS-1, the flexible substrate optimized for use with LEDs.

### Get More and Go Green

3M™ Envision™ Flexible Substrate FS-1 is nearly twice as transmissive\*. This means more efficient use of LEDs and energy. So now you can build signs that use less energy and require less maintenance. Go greener without sacrificing performance.

### Increased Design Versatility

When using 3M™ Envision™ Flexible Substrate FS-1, you have the option of decorating with cut vinyl or direct printing with solvent, UV or latex inks.

## Other Benefits

- Seamless, wide-width flexible substrate
- Backed by the industry-leading 3M™ MCS™ Warranty
- Use with other LED-enabling products in the 3M Envision line of products for illuminated signs:
  - 3M™ Envision™ Translucent Film Series 3730
- Use with 3M™ Scotchcal™ Gloss Overlaminate 3658G or Matte Overlaminate 3660M, which offer up to nine years of outdoor durability.



Put  
LED  
Illuminated  
Signs  
in their  
Best Light

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For the most current 3M Technical Information available to successfully use this product, please view this Bulletin electronically and click on the blue underlined links to view the relevant documents.

## 1. Product Description

### A. Product Features

- 22 mil white-pigmented vinyl substrate with a polyester scrim
- Smooth front surface with a semi-gloss finish
- Decorate first or second surface with inkjet direct printing or first surface with cut film
- Medium to long-term durability
- Cost effective
- Enhanced light transmission for LED light boxes (See Characteristics Section 3 on page 5 for more details)



To learn more about the environmental benefits of Envision™ Products, visit [3Mgraphics.com/Sustainability](http://3Mgraphics.com/Sustainability).

### B. Recommended Types of Graphics and End Uses

When constructed and used as described in this Bulletin, these types of graphics and end uses may be eligible for the [3M™ MCS™ Warranty](#). Please read the entire Bulletin for details.

- Indoor and outdoor, day and night graphics for backlit signs mounted in a properly designed cabinet or frame

Typically for best results, 3M recommends:

- 3M™ Envision™ Flexible Substrate FS-1 for LED applications.
- [3M™ Panagraphics™ III Wide Width Flexible Substrate](#) for fluorescent lighting applications.

### C. Performance Overview

3M tests the performance of both individual products and finished graphic constructions. This table shows the best performance expected from this product both without a Warranty Period and with a Warranty Period.

For detailed graphic construction and application options along with specific Warranty Periods, please see the Warranty Information, Section 5 on page 7.

**Expected Performance Life.** This is the estimated period of time the product should perform satisfactorily.

Undecorated (no direct print or applied film) substrate with no graphic protection and properly mounted in a flat, vertical orientation for outdoor signage.

6 years  
Unwarranted Period

**3M™ MCS™ Warranty.** This is the maximum period of time 3M will warrant the finished graphic performance.

Substrate that is decorated with cut, colored film and protected with the best overlaminate for outdoor signage.

9 years  
Warranty Period

### D. Limitations of End Uses

This 3M product is not designed or recommended for the following uses. Please contact us to discuss other options.

- Do not remove existing graphics and attempt to reuse the substrate.
- Do not apply graphic decoration with more than three layers of film (base films plus overlaminate); see [3M Instruction Bulletin 4.26](#) for specifics.
- Do not use 3M™ Scotchcal™ Overlaminate 3640GPS or 3642GPS for graphic protection.

#### Important Note!

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.



## 2. Compatible Products

The following products are approved by 3M for use with the base film covered in this Bulletin, and used for the creation of a graphic that may be eligible for the 3M™ MCS™ Warranty. Click on the blue underlined text to view the Product Bulletin for that product.

See the Warranty Information section to determine which compatible products are approved for your graphic construction.

### A. Cut Film Decoration for 3M™ MCS™ Warranty

Best Choice for Fluorescent Lighting Applications

- [3M™ Scotchcal™ Translucent Film Series 3630](#)
- [3M™ Scotchcal™ Translucent Film IJ3630-20](#)

Best Choice for LED Applications

- [3M™ Envision™ Translucent Film Series 3730](#)
- [3M™ Envision™ Translucent Film IJ3730-50](#)
- [3M™ Envision™ Translucent Film IJ3730-60](#)

Light Management Films

- [3M™ Blockout Films 3635-20b and 3635-22b](#)
- [3M™ Day/night Films 3635-91 and 3635-0171](#)
- [3M™ Dual-Color Film Series 3635-200](#)
- [3M™ Diffuser Film 3635-30 and 3635-70](#)
- [3M™ Envision™ Diffuser Films 3735-50 and 3735-60](#)

Low Cost Translucent Signage

- [3M™ Scotchcal™ Opaque Film Series 50](#) for unwarranted graphics only

### B. Inkjet Inks and Printers for 3M™ MCS™ Warranty

#### Important Note!

Before using flexible substrate FS-1, determine whether your printer is capable of supporting the weight and roll diameter. To estimate the weight, multiply the roll width by 54.5 oz (62 kg).

Example: 59 (width in inches) x 54.5 = 3125 oz. (or 201 lb.)

1.5 (width in meters) x 134 = 60 kg

	Ink Series	Printer
(1) Solvent Inkjet Inks	• <a href="#">3M™ Piezo Inkjet Ink Series 1500v2</a>	• EFI™ VUTEK® 150, 2360/3360, 3300/5300 & 3000/5000 Printers
	• <a href="#">3M™ Piezo Inkjet Ink Series 4400</a>	• HP XLJet 1200 and 1500 Printers
	• <a href="#">SIIT GX 3M Ink Series</a>	• Seiko I Infotech ColorPainter™ H Series H-74s, H2-74s, H-104s, H2-104s, & W-64s Printers.
(2) Latex Inkjet Inks	• <a href="#">SIIT SX 3M Ink Series</a>	• Seiko I Infotech ColorPainter™ M-64s Printer
	• <a href="#">HP 3M LX600 Specialty Latex Ink</a>	• HP Designjet L65500; Scitex LX600, LX800, LX820 & LX850; Latex 820 & 850 Printers
	• <a href="#">HP LX610 Latex Ink</a> a 3M™ MCS™ Warranty Component	• HP Designjet L65500, Scitex LX600, LX800, LX820 & LX850; Latex 820 & 850 Printers
	• <a href="#">HP 792 Latex Ink</a> a 3M™ MCS™ Warranty Component	• HP Designjet L28500 (Latex 280) Printers.
	• <a href="#">HP 881 Latex Ink</a> a 3M™ MCS™ Warranty Component	• HP Latex 3000 Printer

### (3) UV Inkjet Inks and Printers

- [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® GSLXr 3M™ SuperFlex UV Ink](#) (excludes White Ink)
- 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

### C. Graphic Protection for Direct Print Graphics

- [3M™ Scotchcal™ Luster Overlamine 3619](#)
- [3M™ Scotchcal™ Matte Overlamine 3620](#)
- [3M™ Scotchcal™ Gloss Overlamine 3658G](#)
- [3M™ Scotchcal™ Matte Overlamine 3660M](#)
- [3M™ Scotchcal™ Gloss Overlamine 8518](#)
- [3M™ Scotchcal™ Luster Overlamine 8519](#)
- [3M™ Scotchcal™ Matte Overlamine 8520](#)
- [3M™ Scotchcal™ Ultra Matte Overlamine 8915](#)

Note: If you are decorating the substrate with film series 3630 or 3730 or films LJ3630 or LJ3730, refer to your decorating film's Product Bulletin for the recommended graphic protection options.

## 3. Characteristics

These are typical values for unprocessed product.

Property (Test Item)		Specification	Test Method
Thickness		20-24 mil (0.51-0.60 mm)	Micrometer
Light Transmission		46±3% <i>Unprocessed Envision flexible substrate FS-1 provides nearly twice the light transmission (46±3%) as unprocessed Panagraphics III flexible substrate (23±3%).</i>	Densitometer
Weight		19 ounces/sq yd (650 g/m <sup>2</sup> ) See Important Note about roll weight under Section 2.B on page 4.	Balance
Tensile Strength	MD	Min 100 lbs/in (17.86 kg/cm)	ASTM D751 - 06
	CD	Min 100 lbs/in (17.86 kg/cm)	
Elongation	MD	Max 50%	ASTM D751 - 06
	CD	Max 50%	
Tear Strength	MD	Typical 30 lbs (34.02 kg)	Internal
	CD	Typical 20 lbs (38.56 kg)	
Thread Count	MD	500 denier 18 +/- 1 threads/in (threads/25 mm)	FS 191A 5050; ASTM D1577-07
	CD	500 denier 18 +/- 1 threads/in (threads/25 mm)	
Interfacial Adhesion		Min 8 lbs/in (1.43 kg/cm)	ASTM D751 - 06
60 degree Gloss		3-13	ASTM D2457

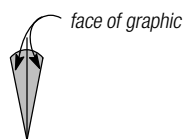
## Characteristics, continued...

Property (Test Item)	Specification	Test Method
Whiteness Index	Min 100	ASTM E313
Service Temperature Range	-22°F to +158°F (-30°C to + 70°C)	N/A
Installation Temperature	45°F (7°C) or higher, see Attachment and Tensioning. (See guidelines on page 8 for more details)	N/A
Maximum Finished Size	625 ft <sup>2</sup> (58 m <sup>2</sup> ) per warranted face	N/A
Flammability	Call 1-800-328-3908	ASTM E84
Safety and Regulatory Recognition	Call 1-800-328-3908	UL 879 - Standard for Electric Sign Components pending

## 4. Definitions

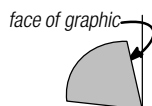
### A. Exposure Types

#### U.S. Vertical Exposure



The face of the graphic is +/- 10° from vertical.

#### U.S. Non-vertical Exposure



The face of the graphic is greater than 10° from vertical and greater than 5° from horizontal. This includes non-vertical surfaces of vehicle wraps or fleet graphics.

#### U.S. Horizontal Exposure



The face of the graphic is +/- 5° from horizontal.

#### U.S. Desert Southwest Exposure

Any outdoor graphic exposed to solar energy more than half of the daylight hours in Arizona, New Mexico and the desert areas of California, Nevada, Utah and Texas is subject to reduced warranties. A detailed map is available at 3Mgraphics.com under Warranties.

### B. Graphic Construction

The products used to make a graphic, which may include film and/or flexible substrate, graphic protection, ink, printer and application tape.

### C. Graphic Protection

Overlaminates films or clear coats used to protect the graphic and/or change gloss.

### D. Graphic Types

As identified in Product Warranty Matrices

#### Indoor Signs

Stationary graphics applied indoors and *not* exposed to the elements.

#### Outdoor Signs

Stationary graphics applied outdoors and exposed to the elements.

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## 5. Warranty Information

### A. Warranty Coverage Overview

The Warranty coverage for each graphic is based on the user(s) both reading and following all applicable and current 3M Product and Instruction Bulletins. 3M will honor eligible graphics for the Warranty Period stated in the version of this Product Bulletin that is current when the substrate was purchased. The Warranty Period may be reduced and stipulations may apply for certain constructions and applications, as covered in this Bulletin.

The following is made in lieu of all other express or implied warranties, including any implied warranty of merchantability or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade.

### B. 3M Basic Warranty

This Product is warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin and as further set forth in the [3M Graphics Warranties Brochure](#).

### C. Limited Remedy

3M will replace or refund the price of any 3M materials that do not meet this Warranty within the specified time periods. These remedies are exclusive.

### D. Limitation of Liability

Except where prohibited by law, 3M SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO PURCHASER OR USER FOR ANY DIRECT (EXCEPT FOR THE LIMITED REMEDY PROVIDED ABOVE), INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LABOR, NON-3M MATERIAL CHARGES, LOSS OF PROFITS, REVENUE, BUSINESS, OPPORTUNITY, OR GOODWILL) RESULTING FROM OR IN ANY WAY RELATED TO SELLER'S PRODUCTS, SERVICES or THIS BULLETIN. This limitation of liability applies regardless of the legal or equitable theory under which such losses or damages are sought including breach of contract, breach of warranty, negligence, strict liability, or any other legal or equitable theory.

### E. Additional Limitations

See the [3M Graphics Warranties Brochure](#) at 3Mgraphics.com, which gives the terms, additional limitations of the Warranty, if any, and limitations of liability.

### F. 3M™ MCS™ Warranty

Subject to Stipulations set forth in Section H, below

Finished graphics constructed with the materials specified and the exposure specified in the Warranty Period, Section F(1), may be eligible for the 3M™ MCS™ Warranty. For warranties for other exposures, see Section H.(1).

See Section 4 for complete definitions of these graphic types:

OUT = Outdoor Signs

IN = Indoor Signs

#### (1) Warranty Period for Cut Film Decoration for Finished Graphics in a Standard U.S. Vertical Exposure

Film	Ink Series	Graphic Protection	Outdoor
Unprinted Cut Film Decoration Applied to Envision Flexible Substrate			
3630	None	None	6
3730	None	3658G, 3660M	9
Screen Printed Cut Film Decoration Applied to Envision Flexible Substrate			
3630 3730	Refer to <a href="#">3M Product Bulletin 3630/3730</a> for ink and graphic protection recommendations.		5
Inkjet Printed Cut Film Decoration Applied to Envision Flexible Substrate			
IJ3630-20 IJ3730-50 IJ3730-60	Refer to <a href="#">3M Product Bulletin IJ3630/3730</a> . All constructions shown in that Bulletin carry the same warranty when applied to Envision™ Flexible Substrate.		

(2) **Warranty Period for Direct  
Print Substrate** for Finished Graphics  
in a Standard U.S. Vertical Exposure

Warranty Period for Finished Graphics, In Years

Direct Printed with Solvent Inkjet Inks and Printers	EFI™ VUTEK® 150, 2360/ 3360, 3300/5300, 3000/5000 Printers		HP XLJet Series 1200, 1500 Printers		Seiko I Infotech ColorPainter™ H-74s, H2-74s, H-104s, H2-104s & W-64s Printers	
	3M™ Ink Series 1500v2		3M™ Ink Series 4400		GX 3M Ink Series	
Graphic Protection	OUT	IN	OUT	IN	OUT	IN
3619, 3620, 3658G, 3660M	6	8	6	8	6	8
8518, 8519, 8520, 8915❖	4	8	4	8	4	8
none	2 ■	2 ■	2 ■	3 ■	—	—

Direct Printed with Solvent Inkjet Inks and Printers	Seiko I Infotech ColorPainter™ W-64s Printers	
	SX 3M Ink Series	
Graphic Protection	OUT	IN
3619, 3620, 3658G, 3660M	6	8
8518, 8519, 8520, 8915	4	8
none	—	—

Direct Printed with Latex Inkjet Inks and Printers	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 3M LX600 Specialty Latex Ink		HP LX610 Latex Ink <i>a 3M™ MCS™ Warranty Component</i>		HP 792 Latex Ink <i>a 3M™ MCS™ Warranty Component</i>	
Graphic Protection	OUT	IN	OUT	IN	OUT	IN
3619, 3620, 3658G, 3660M	5	7	4	6	4	6
8518, 8519, 8520, 8915	4	6	3	5	3	5

Direct Printed with Latex Inkjet Inks and Printers	HP Latex 3000 Printers	
	HP 881 Latex Ink <i>a 3M™ MCS™ Warranty Component</i>	
Graphic Protection	OUT	IN
3619, 3620, 3658G, 3660M	4	6
8518, 8519, 8520, 8915	3	5

Direct Printed with UV Inkjet Inks and Printers	EFI™ VUTEK® GS5000r and GS3250r Printers		EFI™ VUTEK® GS2000, GS3200, GS3250 Printers, including GS Pro Series		EFI™ VUTEK® QS2000, QS3200, QS3220, QS220 Printers	
	GSr 3M™ Premium UV Inks		GS 3M™ Premium UV Inks		3M™ Ink Series 2800UV	
Graphic Protection	OUT	IN	OUT	IN	OUT	IN
3619, 3620, 3658G, 3660M	5 ►►	8	5 ●	8	6 ►►	8
8518, 8519, 8520, 8915	4 ►►	8	4 ●	8	4 ►►	8
none	2 ►►	3	2 ●	3	2 ►►	3

See Key to symbols on page 9.



Warranty Period for Finished Graphics, In Years

Direct Printed with UV Inkjet Inks and Printers	EFI™ R3225 UV Roll-to-Roll Printer		EFI™ VUTEK® GS3250LXr Printer	
	EFI™ R3225 3M™ UV Ink		EFI™ VUTEK® GSLXr 3M™ SuperFlex UV Ink	
Graphic Protection	OUT	IN	OUT	IN
3619, 3620, 3658G, 3660M	5	8	4	6
8518, 8519, 8520, 8915	4	8	3	5
none	2	3	—	—

**Key**

- **White Ink:** 3M does warrant outdoor graphics that include the white ink in EFI™ VUTEK® GS 3M™ UV Ink.
- **For three layer prints where a white ink is used:** The maximum total ink laydown should be set to 660%, (280% colors +100% white + 280% colors).
- **FOR 1500v2, direct inkjet printing:** Printing in double strike mode is required to ensure adequate backlit color density and image durability.
- **For 4400, direct inkjet printing:** Printing in SD backlit mode is required to ensure adequate backlit color density and image durability.
- ❖ **Overlaminate 8915** is not approved for or warranted for use with Seiko I Infotech's GX 3M Ink Series.

**G. Maximum Warranted  
Size of Sign Face**

A maximum finished sign face of 625 square feet (58 square meters) per single sign face will be warranted when the seams are fabricated by a 3M Warranted Seaming Contractor. Contact Technical Service at 1-800-328-3908 for more information.

**H. General Warranty  
Stipulations for 3M™  
MCST™ Warranty**

These stipulations apply to graphics covered by the 3M™ MCST™ Warranty. Specific provisions of these stipulations are found in the [3M Graphics Warranties brochure](#) at 3Mgraphics.com.

**(1) Certificate of 3M™ MCST™  
Warranty for Inkjet Printed  
Graphics**

The digital graphics manufacturer must have a current Certificate of 3M™ MCST™ Warranty in order to extend this Warranty to their customers

**(2) Abrasion and Loss of Gloss**

Abrasion damage and loss of gloss are not covered by any 3M Warranty. This is considered normal wear and tear. However, to help maintain the appearance of your graphic, use the recommended graphic protection whenever:

- it is required for the construction and end use as shown in the Warranty Period tables.
- the graphic is exposed to abrasive conditions, harsh cleaners or chemicals.

**(3) Application Outside the U.S.**

Contact the 3M organization for that country.

**(4) Graphics Made with  
Components Not Sold or  
Recommended by 3M**

The 3M™ MCST™ Warranty does not, under any circumstances, cover graphics made with inks, film, graphic protection or application tapes not sold or recommended by 3M.

The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include any non-recommended or non-qualified products.

## I. 3M Basic Warranty for Substrate Decorated with Film Series 50 in U.S. Vertical Exposure

The 3M materials recommended in the film and graphic protection combinations shown below have been tested and are believed to be good solutions when used as recommended in the 3M Bulletins.

These products are covered by the 3M Basic Product Warranty and are guaranteed to be free of physical and manufacturing defects. Expected Performance Life is a good faith estimate of how long product may perform satisfactorily based on 3M testing. **There is no warranty for printability, visual appearance, fitness for use or durability.** See the 3M Commercial Graphics Warranty Brochure for the complete warranty and remedy details.

### Applied Unprinted Cut Film

Film	Graphic Protection	Expected Performance Life, in Years	
		Outdoor	Indoor
50	8519, 8520, None	3	5

## 6. Factors that Affect Graphic Performance Life

The actual performance life of a graphic is affected by:

- use of 3M compatible products, properly processed.
- decorating or imaging method.
- proper selection and preparation of the substrate.
- application methods.
- angle and direction of exposure.
- environmental conditions.
- cleaning methods.

## 7. Graphics Manufacturing



### CAUTION

Before using any equipment, always follow the manufacturers' instructions for safe operation.

### A. Making Graphics with Film Series 50, 3630, 3730, IJ3630, IJ3730

- When using film series 50, 3630, or 3730 to decorate the substrate, image it according to the methods described in [3M Product Bulletin 50](#) and [3M Product Bulletin 3630/3730](#). Apply the film to the substrate using a wet application method or dry, hand/roll lamination method.
- When using films IJ3630 or IJ3730 to decorate the substrate, image it and apply an approved graphic protection as described in [3M Product Bulletin IJ3630/3730](#), and then apply it to the substrate in sheets or as cut graphics using the dry method or dry, hand/roll lamination method.
- Apply no more than three layers (two layers of base film and an overlamine) to the substrate.
- The minimum recommended decorating temperature is 60°F (15°C). Also see Tensioning and Attachment Guidelines on page 12.
- Follow [3M Instruction Bulletin 5.30](#) for details on preparing the substrate and wet application techniques.

**B. 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.

**(1) 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).

**For 1500v2, direct inkjet printing:** Printing in double strike mode is required to ensure adequate backlit color density and image durability.

**For 4400, direct inkjet printing:** Printing in SD backlit mode is required to ensure adequate backlit color density and image durability.

**C. 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.

**(1) Adequately Dry Graphics****Important Note!**

Inadequate drying can result in graphic failure including curling, increased shrinkage and adhesion failure, which are not covered under any 3M Warranty.

Always build enough time into your process to ensure adequate drying of the image before doing further processing. Refer to the ink's Product Bulletin for important details on drying.

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

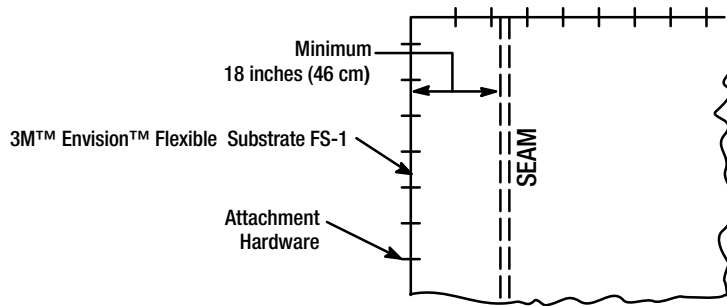
When printing on film that will be cut and applied to Envision™ Flexible Substrate, refer to the film's Product Bulletin for details about drying.

**D. Graphic Protection**

To maximize the performance of your sign, 3M recommends using one of the approved graphic protection options specified in this Product Bulletin to provide additional resistance to abrasion or wear due to frequent cleaning. Always use only the graphic protection options recommended in this Bulletin for this substrate. See [3M Product Bulletin GP-1](#) for more details about these options.

## E. Planning for a Seam

Plan your sign face so that the seam is at least 18 inches (46 cm) away from any attachment hardware that is perpendicular (at right angles) to the seam.



## 8. Application and Installation

In addition to other Bulletins specified in this document, the following Bulletins provide details that you may need to successfully apply a graphic.

- Scoring and cutting. [3M Instruction Bulletin 2.1](#).
- Hot and cold roll lamination for 3M overlaminates. [3M Instruction Bulletin 4.22](#).
- Using 3M application tapes; premasking and prespacing for films. [3M Instruction Bulletin 4.3](#).
- Application, substrate selection, preparation and substrate-specific application techniques. [3M Instruction Bulletin 5.1](#).
- Application, general procedures for indoor and outdoor dry applications. [3M Instruction Bulletin 5.5](#).
- Cleaning and repairing decorated awnings and sign facings. [3M Instruction Bulletin 6.1](#).

## 9. Attachment and Tensioning Guidelines

### A. Attaching and Tensioning

- 3M recommends attaching and tensioning this substrate in a cabinet at a temperature of 45°F (7°C) or higher, whether the work is being done in a fabricator's shop or in the field.
- Any existing attachment system used currently should be tested prior to actual application.

### B. Cold Temperature Field Installation

- Artificially warm the decorated substrate to at least 45°F (7°F) 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 60°F (15°C). A large sign face is one that is more than 275 square feet (25 m<sup>2</sup>) and has a height that exceeds 11 feet (3.3 m) or a width that exceeds 25 feet (7.5 m).

## 10. Cleaning

Use only mild detergent and water for cleaning. Clean the finished graphic annually. Clean the graphic more often in unusually dirty environments to maintain a good appearance. See [3M Instruction Bulletin 6.5](#) for details.



## 11. Shelf Life, Shipping and Storage

### A. Shelf Life and Storage

See [3M Instruction Bulletin 6.5](#) for details.

Also refer to the Product Bulletin for any compatible products you are using for details on proper handling of those products.

This substrate may be stored for up to 6 months undecorated and up to an additional 6 months decorated under the following conditions:

- Original container
- Away from direct sunlight
- In a cool, dry environment
- Bring all media to print room temperature before using

### B. Rolling a Finished Sign Face for Shipping

Follow these guidelines if the graphics already have been applied to the substrate.

#### Selecting a Core Size

- For a graphic with a single film layer, use a core at least 3 inches (7.6 cm) in diameter.
- For a graphic with multiple film layers, use a core at least 6 inches (15 cm) in diameter.

#### Rolling the Graphic

- Roll the graphic with the graphics facing out to help prevent damage.
- Do not use masking tape, which may stain the substrate, to secure the roll.

## 12. Health and Safety



### CAUTION

When handling any chemical products, read the manufacturers' container labels and the Safety Data Sheets (SDS) for important health, safety and environmental information. To obtain SDS sheets for 3M products go to [3M.com/MSDS](http://3M.com/MSDS), or by mail or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

### A. Building Codes that May Apply to 3M Flexible Substrates

The user is responsible for determining and complying with all applicable building codes that affect the use of materials in sign face applications, including flammability standards. For information on flammability requirements, contact your local building code officials.

**Contáctanos**

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