Product Description

- 22-mil, white-pigmented vinyl substrate with a polyester scrim
- For inkjet direct printing, film, and cut film application

Product Features

- Smooth front surface with a semi-gloss finish
- Decorates first or second surfaces with inkjet direct printing or first surface film
- Wide width, splice free for seamless backlit signs
- Medium- to long-term durability
- Cost-effective
- Enhanced light transmission for LED light boxes (See the "Characteristics" section on page 2 for more details.)
- Expected performance life of six years (unwarranted period for undecorated substrates with no graphic protection and properly mounted in a flat, vertical, orientation for outdoor signage)

Recommended Types of Graphics and End Uses

- 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

When constructed and used as described in this bulletin, these types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty. Please read the entire bulletin for details.

Recommended Compatible Products

See 3M.com/graphicswarranties for a complete list of compatible products approved by 3M for use with the base film covered in this bulletin and used to create graphics that may be eligible for the 3M™ MCS™ Warranty.

ⓘ **IMPORTANT NOTE**

Only use a printer capable of supporting the weight and roll diameter of flexible substrate FS-1 to avoid damaging the printer. To estimate the weight, multiply the roll width by 54.5 oz for imperial measurements, and by 61 kg for metric measurements.
Example: 59 in. (width) X 54.5 oz/in. = 3125 oz. (195 lbs)
　　　　　1.5 m (width) X 61 kg/m = 91.5 kg

Recommended Compatible Products for 3M™ MCS™ Warranty

- 3M™ Scotchcal™ Translucent Film Series 3630
- 3M™ Scotchcal™ Translucent Film IJ3630-20
- 3M™ Scotchcal™ Translucent Film Series 3730
- 3M™ Scotchcal™ Translucent Film IJ3730-50
- 3M™ Scotchcal™ Translucent Film IJ3730-60

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Light Management Films

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

Low Cost Translucent Signage

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

Graphic Protection for Direct Print Graphics

- [3M™ Scotchcal™ Luster Overlaminate 3619](#)
- [3M™ Scotchcal™ Matte Overlaminate 3620](#)
- [3M™ Scotchcal™ Gloss Overlaminate 3658G](#)
- [3M™ Scotchcal™ Matte Overlaminate 3660M](#)

Note: If you are decorating the substrate with film series 3630 or 3730 or Films IJ3630 or IJ3730, refer to your decorating film's 3M product bulletin for the recommended graphic protection options.

Certificate of 3M™ MCS™ Warranty

Graphic manufacturers who produce digitally printed graphics made with all branded 3M Graphics products, including 3M ink purchased through a qualified 3M distributor or 3M printing partner, may register to be recognized with a Certificate of 3M™ MCS™ Warranty. Only graphic manufacturers having a current Certificate of 3M™ MCS™ Warranty are eligible to extend this warranty to their customers.

NOTE: For non-digitally printed finished graphics, check your eligibility for the 3M™ MCS™ Warranty by viewing the warranty period found within this product bulletin or by using the warranty selector at www.3mgraphics.com/warranties.

Characteristics

These are the typical values for unprocessed product. Processing may change the values.

Characteristics	Specification	Test Method
Substrate	White-pigmented vinyl with a polyester scrim 59 in. to 197 in. by 164 ft. (150 cm to 500 cm by 50 m)	N/A
Thickness	20 mil to 24 mil (0.51mm to 0.60 mm)	Micrometer
Roll Sizes	A variety of widths ranging from 59 in. to 197 in. by 164 ft. (150 cm to 500cm by 50 m)	N/A
Light Transmission	46% ±3% Uprocessed Envision Flexible Substrate FS-1 provides nearly twice the light transmission of unprocessed Panagraphics III substrate (23% ±3%).	Densitometer
Service Temperature Range	-22°F to 158°F (-30°C to 70°C) (Though not for extended periods of time at the extremes.)	N/A
Installation Temperature	45°F (7°C) or higher See ["Attachment and Tensioning Guidelines" on page 5](#).	N/A
Tensile Strength (warp & weft)	Minimum 100 lbf/in. (440 N/25 mm)	ASTM D751-06
Elongation (warp & weft)	Maximum 50%	ASTM D751-06
Tear Strength	**Warp (typical):** 30 lbs (135 N) **Weft (typical):** 20 lbs (90 N)	ASTM D751-06
Thread Count (warp & weft)	500 denier 18 ±1 threads per in. (threads/25 mm)	ASTM D1577-07 FS 191A 5050
Interfacial Adhesion	Minimum 8 lbf/in (35 N/25 mm)	ASTM D751-06

Characteristics	Specification	Test Method
Weight	19 oz/sq yd (644 gf/sq m) See the Important Note about roll weight in <u>"Recommended Types of Graphics and End Uses" on page 1</u>.	Balance
Maximum Finished Size	625 sq ft (58 sq m) per warranted face	N/A
60 Degree Gloss	5–15 at 60° gloss	ASTM D2457
Whiteness Index (Reflective)	Min 90	ASTM E313
Flammability	Various reports	Call 1-800-328-3908
Safety and Regulatory Recognition	Call 1-800-328-3908	UL Recognized Component. Tested and found to comply with UL 879 - Standard for Electric Sign Components. US & Canada file E65361.

Factors Affecting Graphic Performance Life

The actual performance life of a graphic is affected by:

- The correct combinations of 3M-recommended graphics products
- Ink formulation
- Complete ink drying or curing
- Selection, condition, and preparation of the substrate
- Surface texture
- Application methods
- The angle and direction of sun exposure
- Environmental conditions
- Cleaning and maintenance methods

Graphics Manufacturing

Making Graphics with Film Series 50, 3630, 3730, IJ3630, IJ3730

Image the film according to the methods described in its 3M product bulletin.

- For film application, use a wet application method or dry roll lamination method.
- Apply no more than three layers (two layers of base film and an overlaminate) to the substrate.
- The minimum recommended decorating temperature is 60°F (15°C).

⚠️ **CAUTION**

Before using any equipment, always read the manufacturer's instructions for safe operation.

Inkjet Printing

Always read and follow the ink manufacturer's written instructions on usage.

Backlit Ink Density

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.

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:** 280% total ink coverage. See the ink's product bulletin for more information.
  - Solvent ink: 270% total ink coverage. See the ink's product bulletin for more information.
- **For three layer printers with white ink:** 660% (280% colors + 100% white + 280% colors maximum). The ink and printer combinations this is approved for are:
  - EFI™ VUTEk® QS2000, QS3200, QS3220, and QS220 printers using 3M™ Piezo Inkjet Series 2800UV
  - EFI™ VUTEk® Pv200 printers using 3M™ Piezo Inkjet Series 2200UV
  - EFI™ VUTEk® GS5000r printers using EFI™ VUTEk® GSr 3M™ Premium UV Inks
- **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.

Do not exceed the recommended total ink coverage for the ink series used on this product. Having too much physical ink on the product results in media characteristic changes, incomplete drying, overlaminate lifting, and/or poor graphic performance. For additional details about total ink coverage, users should refer to their 3M ink's product and instruction bulletins.

Completely Dry Graphics

ⓘ **IMPORTANT NOTE**

Incomplete drying or curing can result in graphic failure including curling, increased shrinkage, and adhesion failure, which are not covered under any 3M Graphics warranty.

See the ink's 3M product and instruction bulletins for more details.

Construction Options

ⓘ **IMPORTANT NOTE**

See [3M Instruction Bulletin 4.26](#) for detailed information.

Maximum Three Layers of Film

ⓘ **IMPORTANT NOTE**

A third layer of film on any one surface is warranted only if the top layer is an approved overlaminate and no more than two layers of any film are even with the edges of the substrate.

NEVER place an overlap over an existing overlap, as this creates four layers.

Cutting

See [3M Instruction Bulletin 4.1](#) for Sheeting, Scoring, and Film Cutting details.

Graphic Protection

Graphic protection may improve the appearance, performance, and durability of the graphic. Click on the graphic protection options listed in this product bulletin or see the 3M Graphics Materials Product Catalog for more information.

> (i) **IMPORTANT NOTE**
>
> During installation, scratches may occur on films without graphic protection.

Application Tapes

There are two types of application tapes. See 3M Instruction Bulletin AT-1 to determine what application tape is recommended for your film or finished graphic.

Premasking Tape

Premasking tape increases stiffness during application while preventing stretching and damage. Use when little or no liner is exposed. See 3M Instruction Bulletin 4.3 for complete details.

Prespacing Tape

Prespacing tape holds cut and weeded letters or graphics in place during application and after removal of the film liner, while preventing stretching and damage. Use when large amounts of liner are exposed. See 3M Instruction Bulletin 4.3 for complete details.

Application and Installation

In addition to other 3M bulletins specified in this document, the following bulletins provide details users may need to successfully apply a graphic.

- 3M Instruction Bulletin 4.1 Sheeting, Scoring and Film Cutting
- 3M Instruction Bulletin 4.22 Lamination Basics for Inkjet Printed Graphics
- 3M Instruction Bulletin 4.26 How to Construct Backlit Sign Faces
- 3M Instruction Bulletin 5.1 Select and Prepare Substrates for Graphic Application
- 3M Instruction Bulletin 5.30 Application of 3M Pressure-Sensitive Films to 3M Flexible Substrates
- 3M Instruction Bulletin 5.5 Application, General Procedures for Interior and Exterior Dry Application
  - For roll application, the dry method is acceptable.
- 3M Instruction Bulletin 5.7 Application, Wet Method for Translucent, Inkjet, Screen Printed and Cut Graphics
  - For applications by hand, the detergent and water application method is recommended for this pressure-sensitive film. Dry application by hand may leave dark streaks or bubbles that could be visible in transmitted light.
- 3M Instruction Bulletin 6.5 Storage, Handling, Maintenance, and Removal of Films and Sheetings

Attachment and Tensioning Guidelines

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 currently in use should be tested prior to actual application.

Cold Temperature Field Installation

- Artificially warm the decorated substrate to at least 45°F (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, film applied to the substrate becomes 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 sq. ft. (25 sq. m) and has a height that exceeds 11 ft. (3.3 m) or a width that exceeds 25 ft. (7.5 m).

Maintenance and Cleaning

Clean the finished graphic annually, using only a mild detergent and water. Clean the graphic more often in unusually dirty environments to maintain a good appearance. See 3M Instruction Bulletin 6.1 for details.

Shelf Life, Storage, and Shipping

Shelf Life

The shelf life of this product is **12 months from the date of manufacture** for inkjet direct printing, and **18 months from the date of manufacture** for cut film application.

Storage Conditions

- 40°F to 100°F (4°C to 38°C)
- Out of sunlight
- Clean, dry area
- Original container
- Bring the film to room temperature before use

Shipping Finished Graphics

Flat, or rolled printed side out on a 6 in. (15 cm) or larger core. This helps prevent the application tape, if used, from popping off.

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 for 3M products go to 3M.com/SDS. To request SDS by mail, or in case of an urgent situation, call 1-800-364-3577 or 1-651-737-6501.

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

⚠ **CAUTION**

When handling rolls beyond 10 ft. (3.2 m) wide, a minimum of three points of support is necessary to prevent injury and bending of the roll.

ⓘ **IMPORTANT NOTE**

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

Warranty Information

Warranty Coverage Overview

The warranty coverage for eligible graphics is based on the user both reading and following all applicable and current 3M Graphics product and instruction bulletins. The warranty period for eligible graphics is as stated in the 3M Graphics Warranties Matrices at the time the film was purchased. Information found at 3M.com/graphicswarranties includes:

- 3M Graphics Warranties Bulletin
  - This bulletin contains information on limitations, exceptions, and warranty period reductions for 3M Graphics warranties. The warranty period may be reduced and stipulations may apply for certain constructions, applications, and graphic exposures as covered in this bulletin.
- 3M Graphics Warranties Selector
  - Use this selector to search for your vertical warranty period by product type, ink type, film name, and/or ink/printer platform.
- U.S. Desert Southwest Region Map
  - Use this map of hot, arid desert areas to determine if you are subject to reduced warranted durabilities.

Technical Information

Technical information, guidance, and other statements provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license to any intellectual property rights is granted or implied with respect to this technical information.

Product Selection and Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment, reviewing all applicable regulations and standards, and reviewing the product label and use instructions. Failure to properly evaluate, select, and use a 3M product in accordance with instructions or to meet all applicable safety regulations may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer

Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

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