

Overview

This bulletin covers aspects of graphic design to help manufacturers create clear and effective displays, as well as discussing how to best handle, care for, and store graphics after fabrication but before installation.

Of particular note in design considerations in the color matching process for 3M™ Scotchlite™ Reflective Graphic Film. This includes specific notes on certain films, broken down by category.

3M also recommends specific storage and handling procedures for users to best preserve their graphics once created. This includes temporary and longer term storage and covering of graphics.

Users should read and understand this bulletin before starting to create graphics and before storing them prior to application. Reading the supporting product and instruction bulletins referenced in this bulletin, especially for any products they are using, will also help users create successful graphics.

Color Matching

Color matching is a method for ensuring multiple pieces of the same film and color have a consistent appearance across an entire graphic. The reflective properties of some films can make the color shift as light hits it if color matching is not done.

3M™ Scotchlite™ Reflective Graphic Film

Multi-panel graphics made from 3M™ Scotchlite™ Reflective Graphic Film should always be color matched to ensure uniform day color and night reflective appearance. Film should also be matched for color and reflective brilliance at splices within the rolls.

Even identical product lots of reflective film need to be visually checked for color matching in adjacent panels.

The instructions below suggest ways to minimize the effects of within-lot and crossweb variations.

NOTE

Close color matching of large multi-panel graphics is difficult with retroreflective materials due to production lot variability for both day and night colors and processing variabilities when using transparent process inks.

General Procedure

1. All panels must be matched for day color and night reflective appearance. Hold a reflector spot lamp directly in front of the film's face and view it at a distance of at least 50 ft (15 m). Ensure the light source is at nearly right angles to the film. However, do NOT position the light source exactly perpendicular to the film, as specular glare from the film surface may cause errors in matching.
2. After panels have been matched, ensure they are not mixed during application. If one panel of a set is ruined, match a new panel for day color and night reflective appearance. It may be economical to set aside all damaged sets and match the good panels into complete sets at the end of the run.
3. In general, translucent film and reflective film from a roll can be matched as shown in Figure 1. The dark lines represent one edge of the film or films.

Notice that the matching edges are always rotated to meet each other. Panels 1 and 2 are a matched set. Panels 1, 2, and 3 are matched, etc. By following this method users can match as many panels from a roll as are required for any size sign.

Contact 3M Technical Support or a local 3M application engineer for information and assistance if needed.

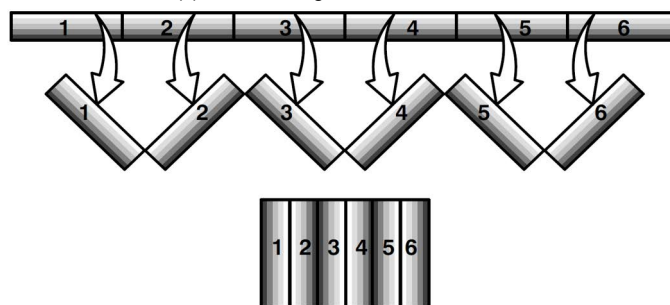


Figure 1. Color Matching

Product-Specific Notes

Film Type	Film Series	Colors
Fluorescent Films	7725SE	404, 405, 406, 407, 413, 414
To ensure a uniform appearance for the graphic’s entire life, make each graphic from a single roll or production run, particularly where splicing is required.		
Metallic Films	180	201, 203, 211, 216, 217, 220, 221, 227, 228, 229, 237, 239, 241
	220	120, 131, 201, 206, 208, 209, 211, 216, 217, 218, 227, 229, 231, 237
	7725	120, 121
Dusted Crystal Films	7725SE	314
These films have metallic flakes that orient themselves during the manufacturing process. This causes the film to appear lighter or darker in color depending on the viewing angle. Orient multiple panel graphics so that the printing on the liner faces the same direction for each panel.		
Translucent Films	3630	All colors
Frosted Crystal Films	7725SE	323, 324, 326, 327, 331
All Reflective Films	680	All colors
	680CR	
	5000	
	5100R	
Whenever two or more translucent film, frosted crystal film, or reflective film panels of the same color are seamed together as a continuous band of color, match them to ensure uniform daytime color. Also match reflective and translucent films for uniform nighttime appearance.		

NOTE

To achieve identical color matching for reflective films, use film from a single roll for each complete graphic.

NOTE

See the ["3M Related Literature" section on page 4](#) for further product information.

Storage Conditions

These guidelines are typical. Refer to a film's product bulletin for specific storage information.

Rolls

- Store rolls of film horizontally in their shipping carton with the end caps in place and covered with the original plastic.
- Rolls that have been removed from the carton can be suspended horizontally from a rod or pipe placed through the core.

Cut Sheets

- Store cut sheets lying flat.
- Do NOT stack cut sheets face-to-face.
- Do NOT apply pressure to stacks of cut sheets.
- Wrap stacks of cut sheets with polyethylene film and seal the film with tape to prevent liners absorbing moisture, as this can cause sheets to curl or ripple.

Unapplied Graphics

- Clean dry area
- Away from direct sunlight and excessive moisture or humidity
- Ambient temperatures less than 100°F (38°C) and a relative humidity less than 80%
- Apply graphics to a substrate within the time period specified in the product bulletin of the product(s) used.

Fabricated Sheets: Most Screen Printed

NOTE

Check the base film's product bulletin for any unique details.

- Store and ship sheets lying flat, or rolled onto a core.
 - For rolling screen printed graphics or electronically cut graphics, use a core with a diameter of 6 in. (15.2 cm) or larger.
 - Wrap the graphic onto the core, graphics-side out. This helps prevent graphics and premask tape from popping off the liner.
- Do NOT stack cut sheets face-to-face.
- A sheet's final color and/or overprint clear must be completely dry before packaging.
- When slip sheeting is necessary, apply 3M™ Easy Release Liner SCW-33 (or any 3M graphic film release liner) so the shiny side faces the printed graphic. Slip sheeting between graphics is not necessary unless one or both of the following conditions apply:
 - The protective liner has been printed on by the customer.
 - The film has a heat-activated adhesive.

3M™ Scotchlite™ Reflective Graphic Films

Cut graphics made from 3M™ Scotchlite™ Reflective Graphic Films *and* using 3M™ Prespacing Tape SCPS-55 should only be stored and shipped lying flat.

Applied Graphics: On Panels, Sheet Metal, Plastic Sheeting, etc.

- Protect each graphic with 3M™ Easy Release Liner SCW-33 (or any 3M graphic film release liner), applying it so the shiny side faces the printed graphic.
- If the substrate has been printed or decorated on both sides, protect each side with the liner.
- Pad large graphics to reduce the risk of damage.
- Store applied panels on edge.
- Avoid banding; crating or stacking; and corrugated cardboard dividers, all of which put severe pressure on applied graphics.
- Store indoors and keep dry until ready to use.
- If packaged graphics become wet, remove the slip sheeting and padding immediately, lay the graphics flat, and allow them to dry. Repackage using new, dry materials.

Handling

Applied graphics must be handled carefully during shipment and installation to prevent damage.

Remove Application Tape Before Exposing Graphics to Sunlight

Always remove any application tape from a graphic immediately after installation. Application tape left on a graphic after installation can quickly and permanently adhere to the graphic when exposed to sunlight.

Temporarily Covering Installed Graphics

Use caution when temporarily covering installed graphics (also known as “bagging”) in order to avoid damaging them.

- Porous cloth covers folded over the graphic edges and secured to the back of the graphic work well for one-sided graphics. For two-sided graphics, use two porous cloth covers and secure the cloths to one another, NOT to the graphic.
- 3M graphic films with an adhesive categorized as “Ultra Removable” may be temporarily applied over 3M finished graphics when each film component of the finished graphic has an adhesive categorized as “Removable with Heat”, “Removable with Heat and/or Chemicals,” or “Not Removable.” See [3M Instruction Bulletin Removal](#) for details. Remove the film with an “Ultra Removable” adhesive by peeling it off at a high angle in order to avoid peeling the underlying graphic off of the substrate. Re-squeegee all edges of the underlying graphic after removing the film with an “Ultra Removable” adhesive.

NOTE

Do NOT bag any graphic applied to a 3M™ Flexible Substrate.

- Avoid using:
 - Any type of tape, as it can quickly and permanently bond to the graphic.
 - Paper or plastic covers, due to possible plasticizer migration.
 - Ropes or wire fasteners, as these may abrade the graphic.

3M Related Literature

The following bulletins provide information and processes users may need to properly design, make, and install graphics. Additional bulletins may be needed as indicated in the 3M Related Literature sections of the product bulletins for 3M components used by graphic manufacturers.

- [3M Product Bulletin 680](#) 3M™ Scotchlite™ Reflective Graphic Film Series 680
- [3M Product Bulletin 680CR](#) 3M™ Scotchlite™ Removable Reflective Graphic Film Series 680CR with Comply™ Adhesive
- [3M Product Bulletin 5000/IJ5000](#) 3M™ Scotchlite™ Reflective Graphic Film 5000
- [3M Product Bulletin 5100R/IJ5100R](#) 3M™ Scotchlite™ Reflective Graphic Film Series 5100R
- [3M Product Bulletin 7725](#) 3M™ Scotchlite™ ElectroCut™ Graphic Film Series 7725
- [3M Product Bulletin 9800](#) 3M™ Screen Printing UV Ink Series 9800
- [3M Product & Instruction Bulletin 2900](#) 3M™ Scotchlite™ Transparent Screen Printing Ink Series 2900
- [3M Instruction Bulletin Production: Screen Printing](#)
- [3M Instruction Bulletin Removal](#)

Health and Safety

Tools and Equipment Usage

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

Chemicals

When handling any chemical products, read the manufacturers’ container labels and the Safety Data Sheets (SDS) for important health, safety, and environmental information.

[Follow this link to obtain SDS sheets for 3M products.](#)

[Follow this link to obtain information about substances of very high concern \(SVHC\) for EU products.](#)

Warranty Information

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.

Limitation of Liability

Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.

Commercial Branding and Transportation

3M Center, Building 223-3N-30
St. Paul, MN 55144

1-800-328-3908
3M.com/Graphics

© 3M 2024. All rights reserved.
3M, Comply, ElectroCut, Scotchcal, and Scotchlite are trademarks of 3M. Used under license in Canada.
All other trademarks are property of their respective owners.
Revision A, December 2024 Please recycle.

