

## Product Description

- For screen printing and electronic cutting
- Durable, flexible, enclosed-lens, retroreflective film

## Product Features

- Pressure-sensitive adhesive
- Similar daytime and nighttime appearance
- According to the UN/ECE Regulation 104
- ECE104 approval marks are only visible perpendicular to the surface
- Expected performance life of eight years (unwarranted period for unprinted film with no graphic protection, applied to a flat, vertical, outdoor surface)

## Recommended Types of Graphics and End Uses

- Commercial vehicle and fleet graphics, emblems, or striping

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

## Recommended Compatible Products

### Graphic Protection

- [3M™ Gloss Wrap Overlamine 8418G](#)
- [3M™ Scotchcal™ Gloss Overlamine 8518](#)
- [3M™ Scotchcal™ Luster Overlamine 8519](#)
- [3M™ Scotchcal™ Gloss Overlamine 8528](#)
- [3M™ Envision™ Gloss Wrap Overlamine 8548G](#)
- [3M™ Envision™ Luster Wrap Overlamine 8549L](#)
- [3M™ Screen Print Gloss Clear 1920DR](#)
- [3M™ Screen Print UV Gloss Clear 9740i](#)
- [3M™ Screen Print UV Gloss Clear 9800CL](#)

## Typical Physical Properties

**NOTE:** The following technical information and data is based upon limited 3M testing conditions and should not be used for specification purposes.

### Physical Characteristics

Characteristic	Value
Material	Cast vinyl
Surface finish	Glossy
Thickness	With adhesive: 0.18 - 0.20 mm (7 - 8 mil)
Adhesive	Pressure-sensitive
Adhesive appearance	Transparent with silver underneath
Liner	Double-sided Polyethylene-coated paper
Typical Adhesion 24 Hours After Application FTM 1, 24 h 23°C/50%RH	19 N/25 mm
Chemical Resistance	<ul style="list-style-type: none"> <li>Resists mild alkalis, mild acids, and salt</li> <li>Excellent resistance to water (does not include immersion)</li> <li>Resists fuel vapors and occasional fuel spills</li> </ul>
Flammability	Flammability standards are different from country to country. Ask your local 3M contact for details, please.

### Application Characteristics

Characteristic	Value
Finished Graphic Application Recommendation	<b>Surface type:</b> Flat, with and without rivets, simple curves <b>Substrate type:</b> Painted metal, aluminum <b>Application method:</b> Dry <b>Application temperature (air and substrate):</b> 15°C
Applied Shrinkage	0.4 mm
Temperature Range After Application	-34°C to +93°C (Though not for extended periods of time at the extremes.)
Graphic Removal	Hard to remove from supported substrates

## Factors Affecting Graphic Performance Life

The actual performance of a graphic is affected by:

- Complete ink drying or curing
- The combination of graphic materials used
- Selection, condition, and preparation of the substrate
- Surface texture
- Application methods
- Environmental conditions
- Angle and direction of sun exposure
- Cleaning and maintenance methods
- Removal methods and conditions

## Retroreflection

The typical value of retroreflection is dependent on the film color. It is measured at a 5° entrance angle and a 0.33° observation angle and expressed in candelas per lux per square meter [cd/(lx·m²)].

The entrance angle is formed by a light beam striking the surface at a point and at a line that is perpendicular to the surface at the same point. Unprinted 3M™ Scotchlite™ Graphic Film 580E has the following typical value of retroreflection.

Film number 580E	Color	Typical value	ECE104 class
-10	White	40	without
-10	White	40	E
-14	Orange	15	E
-64	Gold	40	E
-71	Yellow	35	E
-81	Lemon Yellow	35	D/E (marked D)
-72	Red	15	E
-75	Blue	7	E
-76	Light Blue	6	E
-77	Green	15	E
-82	Ruby Red	15	E
-85	Black	25	E

According to ECE104 film series 580E is approved Class E. 580-81E Lemon Yellow is approved Class D/E, but material is marked D.

## Graphics Manufacturing



### CAUTION

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

## Screen Printing

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

## 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.

## 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.



### 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 3M Graphics Products. Finished graphics eligible for any 3M warranty must be constructed using approved 3M Graphics Products. See the [3M Graphics Warranty Bulletin](#) for more details.

## Premasking Tape

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

## Matching

Whenever two or more pieces of the same reflective graphic film are seamed together as a continuous band of graphic film, they should be matched to ensure uniform daytime and night appearance.

Material from a single roll or lot must be used on a single graphic or sign for identical matching.

In general, reflective graphic film from a roll must be matched as shown in Figure 1. The dark line represents one edge of the film.

The matching edges are always swung 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 sheets from a roll as are required for any size sign. Do NOT assume exact color matching between different run numbers.

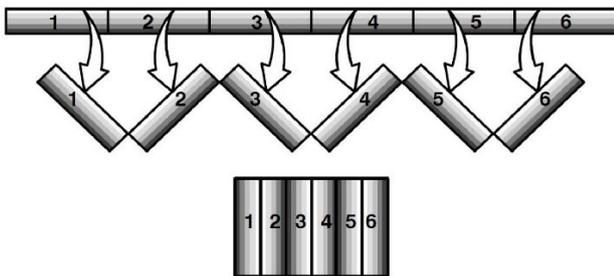


Figure 1: Color matching

## 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 5.36](#) Application Techniques for Automobiles, Vans and Buses
  - Complete the 3M Pre-Installation Inspection Record found in 5.36 prior to manufacturing or applying a graphic to an automobile, van, or bus.
- [3M Instruction Bulletin 5.4](#) Application, Fleet Trucks
- [3M Instruction Bulletin 5.5](#) Application, General Procedures for Interior and Exterior Dry Application
- [3M Instruction Bulletin 6.5](#) Storage, Handling, Maintenance, and Removal of Films and Sheetings

## Maintenance and Cleaning

Use a cleaner designed for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline). See [3M Instruction Bulletin 6.5](#) for details.

## Removal

These films are not intended to be removed. In some cases they can be removed, but with great difficulty and could damage the substrate. If they are removed, they may leave significant adhesive residue. The ease and rate of removal depend on a number of factors. See 3M Instruction Bulletin 6.5 for details.

## Shelf Life, Storage, and Shipping

### Shelf Life

The shelf life is **never more than two years** from the date of manufacture on the original box. Processing the film changes its shelf life to **one year** from the processing date, but no later than two years from the manufacturing date.

### Storage Conditions

- 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 liner, if used, from popping off.

## 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 the link to obtain SDS sheets for 3M products on 3M.com/SDS.](#)

[Follow the link to obtain information about substances of very high concern \(SVHC\).](#)

## 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.

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