Product Bulletin 580 E
Release C, Effective June, 2009

Scotchlite™
Reflective Graphic Film Series 580 E

Description

Advantages

- Durable, flexible, enclosed-lens, retroreflective film
- Similar daytime and nighttime appearance
- According to the UN/ECE Regulation 104
- ECE104 approval marks are only visible perpendicular to the surface
- Up to 8 years exterior durability
- Retains 90% of its retroreflectivity when totally wet
- Screen printable
- Unprocessed film resists fuel vapors or occasional spills

Application and Uses

Series 580 E is intended for making permanent vertical graphics when used with the listed Compatible Products in the following applications. These applications are warranted by the 3M™ MCS™ Warranty.

- Commercial vehicle and fleet graphics
- Vehicle emblems and markings

Limitations of End Uses

We do not normally warrant other applications, but please contact us to discuss your needs or let us suggest other 3M products.

Specifically, we do not warrant this film for the following:

- Permanent, regulatory traffic signs
- Graphics made for automotive Original Equipment Manufacturers (OEM); please contact 3M Automotive Division for alternatives.

Compatible Products

Screen Print Applications

- 3M™ Scotchlite™ Transparent Screen Printing Ink Series 2900 (line color and halftone)
- 3M™ Screen Printing Ink Series 9700UV (transparent color and halftone)

All Applications

- Selected 3M application tapes

Product line

This information is subject to change. Be sure this is the most current Product Bulletin.

Property	Description
Number and color	580 E – 10 White – 14 Orange – 64 Gold – 71 Yellow – 72 Red – 75 Blue – 76 Light blue – 77 Green – 82 Ruby red – 85 Black (reflects white)

Characteristics

Property	Description
Adhesive color and type	Clear, pressure sensitive
Liner	Lay flat
Application surfaces	Flat, flat with rivets, moderately curved or corrugated
Application substrates	Aluminum, automotive paint
Application temperature range for air and substrate	13°C to 38°C flat surfaces without rivets 16°C to 38°C flat or curved surfaces with rivets

General Performance Characteristics

The durability of Scotchlite™ Reflective Graphic Film 580 E depends on the following:

- Correct combination of film, ink and overprint clear
- Ink formulation (screen print)
- Ink drying/curing methods (screen print)
- Selection, preparation and temperature of the substrate
- Application methods
- Cleaning and maintenance methods
- Exposure conditions

Note: For the full product names of the 3M products listed on this page, please see page 1.

Fabrication

Color match

For a multi sheet graphic application you should use reflective sheeting out of one material roll. If the use of more than one roll is necessary, make sure that you use material of the same lot number. Check material which will be applied next to each other for day and night color appearance similarity. Contact Technical Service for details.

Color-matched Scotchlite™ Removable Reflective Graphic Film with Comply™ Adhesive Series 680CR E CM-10 is available by special order. Contact your 3M sales representative.

Screen Printing

- Durability

  To obtain maximum durability, use only approved combinations of ink and overprint clear

  Formulations and processing conditions can affect the ink durability. Carefully follow the limitations of the specific inks and the instructions in the appropriate Product and Instruction Bulletins. Refer to the 3M Related Literature.

- Drying

  It is recommended to check the proper temperature of the conveyor prior to screen printing by using irreversible temperature strips.

Cutting

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

Recommended Cutting Methods

- Band sawing
- Hand cut
- Hot kiss cutting
- Guillotine
- Cold and hot steel-ruled die cutting
- Drum-type electronic cutting
- Flat-bed electronic cutting

Weeding Considerations

Electronically cut graphics may be difficult to cut and weed. The customer must assume responsibility for testing and approving this cutting method.

Weed the film within 24 hours of cutting it. The adhesive may flow after cutting.

Refer to Instruction Bulletin 4.1 for more details.

Design Factors

- Use a minimum letter height of 80 mm.
- Use a minimum stroke width of 10 mm.
- Use a minimum radius for a point of 1.6 mm.
- Order "roll applicator splices" for roll striping. Butt splices may have a small gap.

Application Tapes

The type of application tape to use depends on the type of graphic produced and the ink and overprint clear.
Refer to Instruction Bulletin 4.3 for more details.

- Use a prespacing tape if the graphic has large amounts of exposed liner.
- Use a premasking tape if very little of the liner is exposed.

Premasking IS NOT recommended for:

- Continuous rolls or striping wider than 300 mm
- Rolls wider than 310 mm that will be slit

Premasking IS recommended for:

- Graphics larger than 0.5 m^2
- Striping greater than 100 mm wide

Overprint Clear	Premask Tape	Prespace Tape
Unprinted film	SCPS 100	SCPS 2
2920	SCPS 2	SCPS 2

Handling Prespaced Graphics

For the best results when using prespace tape, we recommend these practices:

- Store and ship prespaced film lying flat (do not roll it). This allows adhesion to build and minimizes the chance of the prespace tape from popping off of the liner or film.
- Handle the prespaced graphic as little as possible and keep it flat during processing.
- Remove as much liner as possible.

Application

This Bulletin does not contain detailed application procedures. Refer to the 3M Related Literature.

Temperature

Check the proper substrate temperature using an Infrared-Thermometer like 3M Scotchtrak™.

- 13°C to 38°C
  flat surfaces without rivets
- 16°C to 38°C
  Flat, flat with rivets, moderately curved or corrugated

Note: For the full product names of the 3M products listed on this page, please see page 1.

Application Method

Use a dry method. Do not use a detergent and water or a commercial application liquid to position the graphic.

Substrate

Some substrates such as under-cured polyurethane paint, fiberglass, and some paint systems may continue to outgas for some time. Two-part polyurethane paints and clear coats may stop curing when the air and surface temperatures are lower than 24°C. Be aware that outgassing causes this sheeting to bubble.

Maintenance and Cleaning

Use a cleaner such as the kind used for high quality painted surfaces. The cleaner must be wet, non-abrasive, without strong solvents and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline).

Removal

Caution: Solvents may ignite near heat or open flame. Do not use heat sources near solvents. Failure to avoid the use of heat sources near solvents can cause flash fire.

Graphic Film Series 580 is not a removable product. Heat helps take off the top layer, but removing the adhesive requires a solvent-based remover.

Refer to Instruction Bulletins 6.5 for more details.

Shelf Life and Storage

- The combined shelf life as processed and unprocessed film series 580 E cannot exceed 2 years from the date of receipt from 3M. However, the film must be used within 1 year of processing even if the combined shelf life is less than 2 years.
- Leave the rolls of film in the original shipping carton or suspend the rolls horizontally.
- Store cut sheets lying flat.
- Store the film and the processed graphics in a clean, dry area and away from direct sunlight.
- Graphics should be stored at a temperature lower than 38°C.
- Ship the finished graphics lying flat or in a roll. To roll the graphic, wrap it film-side-out on a minimum 150 mm diameter core. These methods help prevent the film and premasking from wrinkling or popping off the liner.

Product Data

Retroreflection

At a 5° entrance angle and a 0,33° observation angle, unprinted film 580 E has the following typical coefficient of retroreflection. It is expressed in candelas per lux per square meter [cd/(lx·m^2)].

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.

An observation angle is formed by the light beam striking the reflective surface and returning to the observer.

Film and Color			Typical Coefficient of Retroreflection
580 E	-10	White	50
	-14	Orange	25
	-64	Gold	50
	-71	Yellow	50
	-72	Red	25
	-75	Blue	10
	-76	Light blue	10
	-77	Green	20
	-82	Ruby red	15
	-85	Black	35

Physical Characteristics

The data is for unprinted and printed film with overprint clear.

Property	Metric Units
Thickness (film and adhesive)	0,18 to 0,20mm
Service temperature range	-34°C to +93°C
Applied shrinkage	0.4 mm
Tensile strength	44 N/25mm at 23°C

Adhesion Characteristics (24 hours after application)

Substrate	Metric Units *N/25mm*
Aluminum, anodized	22
Aluminum, etched	22
FRP	17
Fruehauf painted panels	19,5

Chemical Resistance

- Resists mild acids, mild alkalis and salts
- Excellent water resistance
- Resists occasional fuel spills

Health and Safety

Caution: When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information.

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

Important Notice

This bulletin provides technical information only.

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

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

Complementary Information

- Details about 3M MCS Warranty and 3M Performance Guarantee
- Complementary Instruction Bulletins
- Product Overview about materials 3M is offering for digital printing

Visit the web site of your local 3M subsidiary or step for our European web site (English).

3M Europe S.A./N.V.
Hermeslaan 7
B-1831 Diegem

Responsible for this technical bulletin
3M Deutschland GmbH
Display and Graphics Laboratory
Carl-Schurz-Str.1; D-41453 Neuss