# Scotchlite™ Reflective Graphic Film

## Series 680
## 680-10

for Screen Printing
for Electrostatic or Screen Printing

### 1. Product Description

These 7-mil, permanent, enclosed lens, retroreflective, engineer grade films feature flexibility and versatility with slideable, pressure-activated adhesive. Use these long-term durable films for commercial vehicle, sign, railcar and bus graphics and striping on vertical, flat, curved or corrugated surfaces, with or without rivets.

#### A. Advantages

- Up to 9 year expected performance life and up to 7 year 3M™ MCS™ Warranty on many applications
- Available in 11 colors, including black (which reflects white)
- Similar daytime and nighttime appearance that retains most of its reflectivity when wet
- Excellent angularity
- Unprocessed film resists fuel vapors or occasional spills

### 2. 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 warranted by the 3M™ MCS™ Warranty. Please read the entire Bulletin for details.

- Vertical commercial vehicle, railcar and bus graphics
- Vertical commercial signs and striping
- Vertical indoor and outdoor signage

#### A. Limitations of End Uses

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

##### (1) Unsuitable End Uses for This Film

- Do not apply this film on:
  - Walls
  - Substrates with compound curves
  - Substrates that do not have a clean, smooth surface or have poor paint-to-substrate adhesion
  - Stainless steel
  - FRP with a Tedlar® coating
  - Flexible substrates
- Paint that is not thoroughly cured or dried.
- Low surface energy substrates (some plastics, powder-coated paints, etc.)

### 3. Compatible Products

This Bulletin provides details about the base film, **recommended construction options, warranted durability and warranty limitations for the constructions shown in the Warranted Durability Tables.** Additional specific information about compatible products can be found in the Product and Instruction Bulletins listed in **3M Related Literature** at the end of this bulletin.

See the Warranty matrix to determine which Compatible Products are approved for your graphic construction.

#### A. Screen Printing

- 3M™ Screen Printing Ink Series 1900
- 3M™ Screen Printing UV Ink Series 9800
- 3M™ Scotchlite™ Screen Printing Ink Series 2900

### B. Electrostatic Printing

- Scotchprint® Toner Series 8700/8800
- 3M™ Trident Transfer Paper

### C. Graphic Protection

- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print UV Gloss Clear 9720i
- 3M™ Screen Print Gloss Clear 9720UV
- 3M™ Screen Printing Gloss Clear 9800CL
- 3M™ Scotchcal™ Luster Overlaminate 8519
- 3M™ High Gloss Graffiti Resistant Overlaminate 8912 *not for use on rivets*
- 3M™ Screen Print Clear 8920 ES *not for use on corrugations*

### D. Other Products

- 3M™ Prespacing Tape SCPS-2
- 3M™ Prespacing Tape SCPM-53X
- 3M™ Premasking Tape SCPM-3
- 3M™ Premasking Tape SCPM-44X
- 3M™ Edge Sealer 3950

## 4. Characteristics

These are typical values for unprocessed product; processing may change the values. Contact your 3M representative for a custom specification.

### A. Physical Characteristics

| Characteristic | Value |
|---|---|
| Material | Vinyl |
| Thickness | **With adhesive:** 7 to 8 mils (0.18 to 0.20 mm) |
| Film colors & typical retroreflection | At -4° entrance angle and 0.2° observation angle.<br>**Film Number** / **Color Name** / **Typical Coefficient of Retroreflection**<br>680-10 White 100<br>680-14 Orange 20<br>680-64 Gold 70<br>680-71 Yellow 65<br>680-72 Red 20<br>680-75 Blue 10<br>680-76 Light blue 10<br>680-77 Green 20<br>680-81 Lemon yellow 75<br>680-82 Ruby red 15<br>680-85 Black 30 |
| Adhesive color | Clear with silver underneath |
| Retroreflection Definition | The typical coefficient of retroreflection defined is measured at a -4° entrance angle and a 0.2° observation angle. It is expressed in candlepower per foot-candle per square foot (candela/lux/square meter) per ASTME 810.<br>The entrance angle is formed by a light beam striking the surface at a point and a line that is perpendicular to the surface at the same point.<br>An observation angle is formed by the light beam striking the reflective surface and returning to the observer. From 800 feet (249 meters), a motorist normally views a graphic at a 0.2° angle. |
| Adhesive type | Pressure-activated, slideable |
| Liner | Polyethylene-coated paper |

Physical Characteristics, *Continued*

| Characteristic | Value |
|---|---|
| Safety Standards | See Section 13. for ASTM, NFPA and AAR information. |
| Chemical resistance | • Resists mild alkalis, mild acids, and salt<br>• Excellent resistance to rain *(not immersion)*<br>• Resists occasional fuel spills |
| Flammability | Call 1-800-328-3908 for information |

### B. Application Characteristics

| Characteristic | Value |
|---|---|
| Finished graphic application recommendation | **Surface type:** Flat, with/without rivets; moderate curves; corrugations<br>**Substrate type:** Aluminum, FRP, paint<br>**Graphic orientation:** Vertical only<br>**Application method:** Dry |
| Application temperature | **Application temperature:** *air and substrate*<br>• 50° to 100°F (10° to 38°C) flat surfaces without rivets<br>• 55° to 100°F (13° to 38°C) flat, curved or corrugated surfaces with rivets |
| Adhesion *24 hours after application* | **Aluminum:** 6.0 pounds/inch (1.1 kg/cm)<br>**FRP (Fiberglass Reinforced Plywood):** 3.0 lb/inch (0.5 kg/cm)<br>**Painted aluminum panels:** 4.5 pounds/inch (0.8 kg/cm) |
| In use temperature range | -30° to +200°F (-34° to +93°C) |

## 5. Definitions

### A. Exposure

**U.S. Vertical Exposure**


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

**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 Types

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

**Outdoor Signs** — Stationary graphics applied outdoors and exposed to the elements.

**Railroad** — Graphics applied on railroad cars but not railroad engines.

**OEM** — Labels and decorative graphics produced for and used by original equipment manufacturers.

### C. Vehicle Types

**Fleet Vehicle** — Straight trucks, semi-tractors and trailers used in commercial fleets. Excludes air shields.

**Recreational Vehicle (RV)** — Vehicles used for personal pleasure, such as campers, motor homes and trailers, that are not used in connection with any commercial or business enterprise. 3M specifically excludes watercraft from this definition.

**Standard Vehicle** — Buses, vans, automobiles, recreational vehicles unless otherwise noted.

### D. Graphic Construction

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

### E. Graphic Protection

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

## 6. Warranty Information

### A. Limitations and Disclaimers Applicable to All Warranties & Warranty Coverage Overview

Both the warranty coverage and the durability for each graphic is based on the user(s) reading and following all applicable and current 3M Product and Instruction Bulletins. 3M will honor the Warranted Durability stated in the base film or substrate Product Bulletin that is current when the film was purchased. Warranted durabilities 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. 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. **In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non-3M materials charges.**

See the *3M Graphics Market Center Warranty Brochure* at 3Mgraphics.com, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

### B. 3M Basic Product Warranty

All 3M products are 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 Market Center Warranty Brochure.

### C. 3M™ MCS™ Warranty

Subject to Stipulations set forth in Section D., below

Finished graphics constructed with the materials specified and the exposure specified in the Warranted Durability Tables, Section C.(1), is eligible for the 3M™ MCS™ Warranty. For warranties for other exposures, see Section D.(1).

#### (1) Warranted Durability Table for Finished Graphics in a Standard U.S. Vertical Exposure

VEH = Fleet, Standard and Recreational Vehicle Graphics
RAIL = Railroad Graphics
OUT = Outdoor Signs
IN = Indoor Signs

#### a. Screen Printing for Film Series

*Warranted Durability for Vertical Finished Graphics, In Years*

| 3M Ink | SOLVENT Ink Series 2900 | | | | | SOLVENT Ink Series 1900 | | |
|---|---|---|---|---|---|---|---|---|
| | *line color* | | | *4-color* | | *line color* | | |
| **Graphic Protection** | VEH | RAIL | OUT | VEH | OUT | VEH | RAIL | OUT |
| 1920DR | 7 | 5 | 5 | 5 | 5 | 7 | 7 | 7 |
| 9720i | 7 | 5 | 5 | 5 | 5 | 7 | 5 | 5 |
| 9720UV | 7 | 5 | 5 | 5 | 5 | 7 | 5 | 5 |

*Warranted Durability for Vertical Finished Graphics, In Years*

| 3M Ink | UV Ink Series 9800 | | | | |
|---|---|---|---|---|---|
| | *line color* | | | *4-color* | |
| **Graphic Protection** | VEH | RAIL | OUT | VEH | OUT |
| 1920DR | — | — | — | — | — |
| 9720i | 7 | 5 | 5 | 5 | 5 |
| 9720UV | 7 | 5 | 5 | 5 | 5 |
| 9800CL | 5 | 5 | 5 | 5 | 5 |

### b. Electrostatic Printing for Film

*Warranted Durability for Vertical Finished Graphics, In Years*

| 3M Toner | Series 8700 | |
|---|---|---|
| **Graphic Protection** | VEH | OUT |
| 8519 | 5 | 4 |
| 8912 | 5 | 4 |
| 8920 | 5 | 4 |

### (2) Unprinted Film with No Graphic Protection, and a U.S. Vertical Exposure

For unprinted film, 3M offers a:

- Warranted Durability for finished graphics covered by the 3M™ MCS™ Warranty.
- Expected Performance Life is a good faith estimate of how long unprinted product may perform satisfactorily based on 3M testing. However, there is no warranty for performance or durability.

*Vertical Finished Graphics, in Years*

| | Ink and Graphic Protection | VEH | RAIL | OUT |
|---|---|---|---|---|
| **3M™ MCS™ Warranted Durability** | None | 7 | 5 | 7 |
| **Expected Performance Life, Unwarranted** | None | 9 | 7 | 9 |

### (3) Labor Reimbursement for Trailers Only

3M will reimburse up to 100% of the labor costs for the removal, remanufacture and reapplication of a graphic for *commercial fleet vehicles only* to the extent that 3M determines such amount is reasonable and necessary in the circumstances. This labor cost reimbursement will be determined by 3M on a case-by-case basis taking into account the expected amount of labor needed to make such repairs and other considerations.

## D. General Warranty Stipulations for 3M™ MCS™ Warranty

These stipulations apply to graphics covered by the 3M™ MCS™ Warranty. Specific provisions of these stipulations are found in the *3M Graphics Market Center Warranty Brochure* at 3Mgraphics.com.

### (1) Reduced Warranted Durability for Selected Graphic Exposures

For each exposure shown below, multiply the warranted durability years for your graphic construction as shown in the applicable Warranted Durability Tables, Section C.(1), by the percentage shown for the intended graphic exposure. This is the reduced warranty.

| If the Outdoor Graphic Exposure is: | Use this Percentage of U.S. Vertical Exposure, Warranted Durability | Examples |
|---|---|---|
| Desert Southwest Vertical | 70% (0.7) | 0.7 x 5 years = 3.5 years |
| Non-vertical | 0 | 0 |

### (2) Reduced Warranty for Graphics Exposed to Heat

Long exposure to continuous high heat decreases the durability of this film by 2 years. High heat is a temperature above 150°F (65°C). It may occur in areas such as railroad locomotives, vehicle engine compartments, non-insulated tankers exposed to frequent internal steam cleaning, or compartments that carry hot cargo.

### (3) 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.

### (4) Application to Glass

3M accepts no liability for glass breakage when using this film for window graphics. See Instruction Bulletin 5.1 for details.

### (5) Application Outside the U.S.

Contact the 3M organization for that country.

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

The 3M™ MCS™ Warranty does not cover finished graphics made with inks, film, graphic protection and/or application tapes that are not sold or recommended by 3M. The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include any other products.

**(7) Graphic Protection**

Any graphic exposed to abrasive conditions (including vehicles), harsh cleaners or chemicals must include graphic protection in order to be warranted. Abrasion damage and gloss loss are not covered.

**(8) Rivets**

This film may tent when applied over rivets. If the rivets are closely spaced, the film will likely bridge between rivets. Tented or bridged film may fail prematurely, which is not covered by any 3M warranty.

## 7. Factors that Affect Graphic Performance Life

The actual performance life of a graphic is affected by all of the following.

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

## 8. Graphics Manufacturing

**⚠ CAUTION**

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

### A. Screen Printing

Ink formulations and processing conditions can affect ink durability. Refer to the Product and Instruction Bulletins for your ink for limitations and proper usage.

- Ink series 1900 and some colors in ink series 9800 are opaque. Be aware that opaque ink can prevent the film from retroreflecting in the screen printed areas. Ink series 2900 and the transparent colors from ink series 9800 are good choices when retroreflection is important in the screen printed areas.
- For graphics subjected to fuel vapors or occasional spills, use screen printing ink series 2900 and clear 1920DR.
- Oven dry the last color and the clear when using solvent-based inks on graphics needed for any corrugated application.

### B. Electrostatic Printing

Refer to the 3M Related Literature section for Instruction Bulletins that discuss digital printing methods.

An image is printed on electrostatic paper and transferred with heat and pressure to the film. Graphic protection is required.

### C. Cutting

**(1) Methods**

The following are common cutting methods for this film. See Instruction Bulletin 4.1 for details.

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

**(2) Design Considerations**

- Use a minimum letter height of 1 inch (2.5 cm).
- Use a minimum stroke width of 3/8 inch (1.0 cm).
- Use a minimum radius for a point of 1/16 inch (1.6 mm).
- For uniform color and brightness when making a graphic with multiple pieces of the film together, be sure the pieces are properly color matched. See Instruction Bulletin 2.1 for details. Color-matched white film is available by special order at no extra charge. Contact your 3M sales representative.
- Order “roll applicator splices" for roll striping. Butt splices may have a small gap.

**(3) Weeding Considerations**

- For the best results, weed the film within 24 hours of cutting it.
- Perform weeding carefully. Removing the film from the liner reduces or may eliminate the slideability feature.
- Refer to Instruction Bulletin 4.1 for more details.

## D. Liner Exchanging

Do not attempt to exchange the liner. This will compromise the slideability of the film, and could negatively impact adhesion or appearance of the applied graphic, which is not covered by any 3M warranty.

## E. Application Tapes

**(1) When to Use Premasking Tape**

- As an application aid to increase stiffness, and prevent stretching and damage during application.
- Graphics larger than 4 square feet (0.4 $m^2$).
- Striping greater than 4 inches (10 cm) wide.

**(2) When NOT to Use Premasking Tape**

- Continuous rolls or striping wider than 12 inches (31 cm).
- Rolls wider than 12 inches (31 cm) that will be slit.

**(3) When to Use Prespacing Tape**

- Hold cut and weeded letters or graphics in registration after removing the film liner.
- Protect cut graphic parts from scratching or damage during application.
- Use when large amounts of liner are exposed.

**(4) How to Select an Application Tape**

Determine whether you want to premask the graphic or prespace cut graphics. Then select the application tape that corresponds to the graphic protection used. See Instruction Bulletin 4.3 for complete details.

**Graphic Protection** Refer to the Warranty table to determine what graphic protection is approved for your graphic construction.

**c. Screen Printing**

| Application Tape | Screen Print Inks | 1920DR | 9720i 9720UV 9800CL |
|---|---|---|---|
| Premasking SCPM-3 | 1900 2900 | ■ | |
| Prespacing SCPS-2 | | ■ | |
| Premasking SCPM-44X | 9800 | | ■ |
| Prespacing SCPS-53X | | | ■ |

**d. Electrostatic Printing**

| Application Tape | Electrostatic Toners | 1920DR | 8920 | 8519, 8912 |
|---|---|---|---|---|
| Premasking SCPM-3 | 8700 | ■ | | ■ |
| Prespacing SCPS-2 | | ■ | | ■ |
| Premasking SCPM-44X | | | ■ | |
| Prespacing SCPS-53X | | | ■ | |

### e. No Printing or Graphic Protection

- Premasking Tape SCPM-3
- Prespacing Tape SCPS-2

## 9. Application and Installation

Install the film using the dry application method.

Refer to the 3M Related Literature section, located at the end of this bulletin, for a list of the Instruction Bulletins that may be needed to apply or install this film.

### A. Adhesive

This film has a pressure-activated adhesive that allows the film to slide easily on the substrate. Any pressure applied by hand, squeegee or application tool immediately bonds the film to the substrate and the slideability feature is lost. The film cannot be lifted and repositioned without damage.

### B. Substrate Considerations

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 screen print clears may stop curing when the air and surface temperatures are lower than 75°F (24°C).

This film is not recommended for use on low surface energy substrates such as some plastics, powder-coated paint, etc. The user must assume responsibility for testing and approving these substrates.

This film can be applied over other recommended 3M graphic systems. Graphics printed with clear 1920DR must be weathered for at least one year before applying this film over it. See Instruction Bulletin 5.1 for details.

### C. Finishing

- If needed or recommended, use edge sealer 3950.
- Most graphics made with these films do not require an edge sealer, although certain applications may benefit from its use.
- All processed and unprocessed graphics subjected to fuel vapors or occasional fuel spills do require edge sealer.
- Edge sealing in the following applications is not required, but it may help keep the edges adhered when subjected to external sources such as abrasion and/or high pressure washing.
  - graphics exposed to severe abrasion or high pressure washing
  - graphics applied to chrome substrates
  - graphics applied to locomotives and rolling railroad stock
  - graphics applied to truck rollup doors

## 10. Maintenance and Cleaning

Use a cleaner designed 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.)

Refer to Instruction Bulletin 6.5 for details on pressure cleaning. Exceeding 3M's recommendations will void the warranty whether or not an edge sealer was properly used.

## 11. Removal

This film is not removable.

## 12. Shelf Life, Storage and Shipping

### A. Shelf Life

**Total shelf life: 3 years** from the date of manufacture on the original box. Up to 3 years unprocessed, ***OR*** process within 2 years ***and*** then apply within 1 year of processing.

### B. Storage Conditions

for Unprocessed Film or Unapplied Finished Graphics

- 40° to 100°F (4° to 38°C)
- Out of sunlight
- Clean dry area
- Store unprocessed film in original container
- Cut sheets must lie flat
- Bring the film to print room temperature before using

### C. Shipping Finished Graphics

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

See Instruction Bulletin 6.5 for details.

## 13. 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. To obtain MSDS sheets for 3M products go to 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. Standards

This information is important for applications that are regulated by ASTM or NFPA standards, for example, traffic control signs, emergency vehicles and certain railroad graphics. The user is solely responsible for determining and complying with all current and applicable local, state and federal regulations regarding the use and application of graphics materials.

### B. ASTM D-4956-07: Standard Specification for Retroreflective Sheeting for Traffic Control

ASTM D-4956-07 covers flexible, non-exposed glass bead lens and microprismatic retroreflective sheeting designed for use on traffic control signs, delineators, barricades and other devices. For Type 1 sheeting it specifically covers these colors: white, yellow, orange, green, red, blue and brown. As defined in ASTM D-4956-07, film series 680 are classified as Type I sheeting (section 4.2.1) with a Class 3 adhesive (section 4.3.3). For corresponding colors covered by ASTM D-4956-07, the aforementioned films (except orange) meet the requirements specified in section 6.1.1 (minimum performance requirements for Type I sheeting).

### C. NFPA® 1901: Standard for Automotive Fire Apparatus (2009 Edition)

According to NFPA® 1901, section 15.9.3.3 specifies that all retroreflective materials required by section 15.9.3.1 and 15.9.3.2 shall conform to the requirements of ASTM D 4956, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Section 6.1.1 for Type I sheeting. Section 15.9.3.3.1 specifies that colors not listed in ASTM D-4956 can be used on the front and sides of the fire apparatus as long as the sheeting has a minimum coefficient of retroreflection of 10 when measured with an observation angle of 0.2° and an entrance angle of -4°.

| | Red | Ruby Red | Yellow | Lemon Yellow | White | Blue | Light Blue | Green | Gold | Black |
|---|---|---|---|---|---|---|---|---|---|---|
| **Color Number** | 72 | 82 | 71 | 81 | 10 | 75 | 76 | 77 | 64 | 85 |
| **Section 15.9.3.1 (Front & Sides)** | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| **Section 15.9.3.2 (Chevrons)** | ● | ● | ● | ● | | | | | | |

### D. AAR: Standard and Recommended Practices

This product is approved for use by the Association of American Railroads (AAR), Safety and Operations, as listed in the Manual of Standards and Recommended Practices, Section L - Lettering and Marking of Cars, Specification M-947, Adhesive-Backed Films.

## 14. 3M Related Literature

**Before starting any job, be sure you have the most current Product and Instruction Bulletins.**

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins are available at 3Mgraphics.com. The following applicable Bulletins provide information and processes you need to properly make the graphics described in this Bulletin. Additional Bulletins may be needed as indicated in the 3M Related Literature section of other 3M components you use.

Bulletin types: PB = Product Bulletin; PB-IB = Product & Instruction Bulletin; IB = Instruction Bulletin

| Subject | Type | Bulletin No. |
|---|---|---|
| 3M Graphic Protection Products | PB | GP-1 |
| 3M™ Screen Print UV Clears 9720i, 9720UV, 9730UV | PB-IB | Clears 9720 |
| 3M™ Screen Printing Ink Series 1900 and Clear 1920DR<br>- Screen printing with ink series 1900- line color | PB<br>IB | 1900<br>3.12 |
| 3M™ Scotchlite™ Screen Printing UV Ink Series 2900<br>- Screen printing with Ink Series 2900 - line color<br>- 4-color | PB<br>IB<br>IB | 2900<br>3.18<br>3.19 |
| 3M™ Screen Printing UV Ink Series 9800<br>- Screen printing with UV ink series 9800 - line color<br>- 4-color | PB<br>IB<br>IB | 9800<br>3.20<br>3.21 |
| Cold roll lamination | IB | 4.22 |
| Design of graphics | IB | 2.1 |
| Transferring and laminating electrostatically printed images | IB | 4.7 |
| 3M™ Screen Print Clear 8920 | PB-IB | 8920 |
| Edge Sealer 3950 and 4150S, Edge Sealer Tape 8914 | PB-IB | Edge Sealers |
| Scoring and cutting | IB | 4.1 |
| Using 3M application tapes; premasking and prespacing for films | IB | 4.3 |
| Application, substrate selection, preparation,substrate-specific techniques | IB | 5.1 |
| Application, special applications and vehicles | IB | 5.4 |
| Application, general procedures for indoor and outdoor dry applications | IB | 5.5 |
| Applicator's quick reference guide for vehicle film | IB | 5.35 |
| Storage, handling, maintenance, removal | IB | 6.5 |
| 3M Graphics Market Center Warranty Brochure | go to www.3Mgraphics.com, Warranties | |



## 15. Bulletin Change Summary

Added clarification to Section 6.C.2. about warranted durability vs. expected durability for unprinted film. A limitation for film 680-14 (orange) has been added to the ASTM standard description in Section 13.B..

Section 2.A.1 and 9.B. New limitations for non-recommended uses: Paint that is not thoroughly cured or dried. Low surface energy substrates (some plastics, powder-coated paints, etc.).

Additional detail was added about not exchanging the liner in Section 8.D.

Changed total Shelf Life from 2 years to 3 years in Section 12.A.

Added information about using this product in railroad applications to Section 13.D.

3M

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