Scotchlite™ Removable Reflective Graphic Film with Comply™ Adhesive

IJ680CR-10, RG680CR-10 for Solvent, UV and Latex Inkjet Printing

1. Product Description

A. Product Features and Advantages

- 6-mil flexible, enclosed lens, retroreflective films
- Available in white only
- Similar daytime and nighttime appearance that retains most of its reflectivity when wet
- Excellent angularity
- Pressure-activated adhesive for easy sliding and tacking
- Removable with heat
- Designed for excellent cutting and weeding with computer sign cutting equipment
- Air release channels for fast and easy, bubble-free graphic installation
- Unprocessed film resists fuel vapors or occasional spills

B. 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 or the 3M Performance Guarantee. Please read the entire Bulletin for details.

- Commercial straight trucks, semi-tractors and semi-trailers
- Buses, vans, passenger vehicles, delivery and pickup trucks and enclosed trailers
- Rail and lead cars of trains
- Non-regulated, indoor and outdoor signage, emblems and striping
- Indoor and outdoor graphics and signs
- Small format original equipment manufacturer's (OEM) decorative and identification graphics, cautionary and safety labeling

C. Performance Overview

3M tests the performance of both individual products and finished graphic constructions. This table shows the best performance expected from this product both without a Warranty Period and with a Warranty Period.

For detailed graphic construction and application options along with specific Warranty Periods, please see the Warranty Information, Section 5.

Note: *Film RG680CR-10 is available for purchase and use with only a 3M Basic Product Warranty on a customer test and approve basis.

Expected Performance Life. This is the estimated period of time the product should perform satisfactorily.	
Unprinted film with no graphic protection, applied to a flat vertical outdoor surface.	7 years Unwarranted Period
3M™ MCS™ Warranty. This is the maximum period of time 3M will warrant the finished graphic performance.	
Printed film with the best 3M ink and graphic protection option, applied to a flat, vertical, vehicle type surface.	7 years Warranty Period
3M Performance Guarantee. This is the maximum period of time 3M will warrant the performance of the 3M materials used.	
Printed film with the best ink and graphic protection option, applied to a flat, vertical, vehicle type surface.	2 years Warranty Period

D. 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 without a clean, smooth surface or poor paint-to-substrate adhesion.
  - stainless steel.
  - unpainted metal other than aluminum: contact 3M Technical Service for details.
  - paint that is not fully cured.
  - FRP with a Tedlar® coating.
  - flexible substrates.
- Paint that is not thoroughly cured or dried. *Read the Important Note for **Substrate Consideration** on page 10!*
- Low surface energy substrates (some plastics, powder-coated paints, etc.)
- Also see limitations of graphic removal, page 7.

2. Compatible Products

This section provides a list of products that are approved by 3M for use with the base film covered in this Bulletin, and used for the creation of a graphic that is covered by the 3M™ MCS™ Warranty or 3M Performance Guarantee. Refer to the Product and Instruction Bulletins listed in 3M Related Literature at the end of this Bulletin for more information about the compatible products.

See the **Warranty Information** section to determine which compatible products are approved for your graphic construction.

A. Solvent Inkjet Inks and Printers for the 3M™ MCS™ Warranty

Ink Series	Printer
• 3M™ Piezo Inkjet Ink Series 1500v2	EFI™ VUTEk® 150, 2360/3360, 3300/5300 & 3000/5000 Printers
• 3M™ Piezo Inkjet Ink Series 4400	HP XL1200, XL1500 Printers
• 3M™ Piezo Inkjet Ink Series 4800	HP Scitex TJ8300, TJ8350 Industrial Presses
• 3M™ Piezo Inkjet Ink Series 6200	Agfa :Jeti 3312, 3318, 3324, 5024 [Gandinnovations] Printers
• SIIT GX 3M Ink Series	Seiko I Infotech ColorPainter™ H-74s, H2-74s, H-104s, H2-104s W-54s & W-64s Printers

B. Latex Inkjet Inks and Printers for the 3M™ MCS™ Warranty

• HP 3M LX600 Specialty Latex Ink	HP Designjet L65500 Printer and Scitex LX600, LX800, LX820 & LX850 Printers
• HP LX610 Latex Ink a 3M™ MCS™ Warranty Component	HP Designjet L65500 Printer and Scitex LX600, LX800, LX820 & LX850 Printers
• HP 792 Latex Ink a 3M™ MCS™ Warranty Component	HP Designjet L26100, L26500, and L28500 Printers

C. UV Inkjet Inks and Printers for the 3M™ MCS™ Warranty

• 3M™ Piezo Inkjet UV Ink Series 2200UV	EFI™ VUTEk® PV200 Printer
• 3M™ Piezo Inkjet UV Ink Series 2700UV	Durst Rho 160R & 351R Printers
• 3M™ Piezo Inkjet UV Ink Series 2800UV	EFI™ VUTEk® QS2000, QS3200, QS3220 and QS220 Printers
• GS 3M™ Premium UV Inks	EFI™ VUTEk® GS2000, GS3200 & GS3250 Printers, including GS Pro Series
• GSr 3M™ Premium UV Inks	EFI™ VUTEk® GS5000r & GS3250r Printers
• EFI™ R3225 3M™ UV Ink	EFI™ R3225 UV Roll-to-Roll Printer
• Mimaki Ink Series LF-200 *Manufactured by 3M*	Mimaki UJV-160, JFX-1631 & 1615R Printers

D. OEM Inkjet Printers and Inks for the 3M Performance Guarantee

- For the most current information, please click here: 3M Performance Guarantee Matrix.

E. Graphic Protection

- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print UV Gloss Clear 9740i
- 3M™ Scotchcal™ Gloss Overlaminate 8518
- 3M™ Scotchcal™ Luster Overlaminate 8519

F. Other Products

- 3M™ Prespacing Tape SCPS-55
- 3M™ Premasking Tape SCPM-3
- 3M™ Premasking Tape SCPM-44X
- 3M™ Edge Sealer 3950

3. 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	**Film Number** / **Color Name** / **Typical Coefficient of Retroreflection** IJ680CR-10 / White / 100
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 ASTM E810. 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. 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, with air release channels
Adhesive color	White
Liner	Polyethylene-coated paper
Safety Standards	See Section 13 for ASTM, NFPA® and AAR information.
Chemical resistance	• Resists mild alkalis, mild acids, and salt • Excellent resistance to rain *(not immersion)* • 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 or without rivets; moderate curves, corrugations **Substrate type:** Aluminum, FRP, paint **Graphic orientation:** Vertical only **Application method:** Dry • 40° – 100°F (4° – 38°C) flat surfaces without rivets • 45° – 100°F (7° – 38°C) flat, curved or corrugated surfaces with rivets

Continued on the next page.

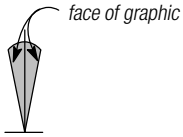
Application Characteristics, continued

Characteristic	Value
Adhesion *24 hours after application*	**Aluminum:** 4.8 lb/in (0.86 kg/cm) **FRP (Fiberglass Reinforced Plywood):** 3.7 lb/in (0.7 kg/cm) **Painted aluminum panels:** 2.6 pounds/inch (0.5 kg/cm)
Temperature range after application	-30° – +200°F (-34° – +93°C)

4. Definitions

A. Exposure

U.S. Vertical Exposure

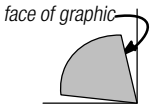


The face of the graphic is +/- 10° from vertical.

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. Click here for a detailed map.

U.S. Non-vertical Exposure



For reflective films only: The face of the graphic is greater than 10° from vertical and greater than 45° from horizontal. This includes non-vertical surfaces of vehicle or fleet graphics.

B. Graphic Construction

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

C. Graphic Protection

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

D. Graphic Types

As identified in Warranty Period Tables

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

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

OEM Labels and decorative graphics produced for and used by original equipment manufacturers. May also be called decals.

Vehicle Types

Vehicle. Buses, vans, passenger vehicles, delivery trucks, pickup trucks, enclosed trailers.

Straight Trucks. Semi-Tractors and Semi-Trailers. Straight trucks, semi-tractors and semi-trailers used for commercial business purposes. Excludes air shields.

Rail. Rail cars and lead cars of trains, light rail and subways, but not locomotives or engines.

E. Removable with Heat

Film is removable when heat is used within the specified time period and leaves no more than 10% adhesive residue on flat and simple curves without rivets, and no more than 30% adhesive residue on rivets and/or corrugations.

5. Warranty Information

A. Warranty Coverage Overview

The warranty coverage for each graphic is based on the user(s) both reading and following all applicable and current 3M Product and Instruction Bulletins. 3M will honor the Warranty Period stated in the base film's Product Bulletin that is current when the film was purchased. The Warranty Period 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.

B. 3M Basic Product Warranty

This product is 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 Warranties Brochure.

C. Limited Remedy

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.

D. Limitation of Liability

Except where prohibited by law, 3M SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO PURCHASER OR USER FOR ANY DIRECT (EXCEPT FOR THE LIMITED REMEDY PROVIDED ABOVE), INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LABOR, NON-3M MATERIAL CHARGES, LOSS OF PROFITS, REVENUE, BUSINESS, OPPORTUNITY, OR GOODWILL) RESULTING FROM OR IN ANY WAY RELATED TO SELLER'S PRODUCTS, SERVICES or THIS BULLETIN. This limitation of liability applies regardless of the legal or equitable theory under which such losses or damages are sought including breach of contract, breach of warranty, negligence, strict liability, or any other legal or equitable theory.

E. Additional Limitations

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

F. 3M Performance Guarantee Warranty Period

Subject to Stipulations set forth in Section H., below

Graphics constructed with the 3M materials specified and in the exposure specified in the Warranty Period, Section F.(1), are eligible for the 3M Performance Guarantee. This warranty only covers the performance of the recommended 3M products used in the graphic construction when imaged with the printers and OEM inks listed in the most current version of the Performance Guarantee Matrix. The Matrix may also list certain restrictions for using the film covered in this Bulletin. For warranties for other exposures, see Section H.(2).

(1) Warranty Period Table for 3M Product Performance Only in a Standard U.S. Vertical Exposure

Warranty Period for 3M Product Performance Only, in Years

Film	Graphic Protection	VEH	IN	OUT	Inks and Printers*
IJ680CR-10	8518 8519 1920DR 9740i	3	3	3	See the Performance Guarantee Matrix

* Some of the graphic protection products and graphic types may not be approved for this film on certain printing platforms. Always refer to the Performance Guarantee Matrix.

G. 3M™ MCS™ Warranty

Subject to Stipulations set forth in Section H.

Finished graphics constructed with the materials specified and the exposure specified in the Warranty Period, Section G.(1), are eligible for the 3M™ MCS™ Warranty. For warranties for other exposures, see Section H.(2).

(1) Warranty Period for Finished Graphics in a Standard U.S. Vertical Exposure

VEH = Vehicles
RAIL = Rail Car and Lead Car Graphics
OUT = Outdoor Signs, OEM Graphics
IN = Indoor Signs, OEM Graphics
See Section 4.D. for further definition.

a. 3M Inkjet Printing

Warranty Period for Finished Graphics, in Years

Solvent Inks and Printers	EFI™ VUTEk® 150, 2360/3360, 3300/5300, 3000/5000				HP XL1200, XL1500 Printers				HP Scitex TJ8300 and TJ8350 Industrial Presses			
	3M™ Ink Series 1500v2				3M™ Ink Series 4400				3M™ Ink Series 4800			
Graphic Protection	VEH	OUT	RAIL	IN	VEH	OUT	RAIL	IN	VEH	OUT	RAIL	IN
8518, 8519	7	4	4	8	7	4	4	8	7	4	4	8
1920DR	3	3	3	5	—	—	—	—	3	3	3	5
9740i	5	4	4	8	5	4	4	8	5	4	4	8
None	—	2	—	3	—	2	—	3	—	2	—	3

Solvent Inks and Printers	Agfa :Jeti 3312, 3318, 3324, 5024 [Gandinnovations] Printers				Seiko I Infotech ColorPainter™ H-74s, H2-74s, H-104s, H2-104s W-54s, & W-64s Printers			
	3M™ Ink Series 6200				**GX 3M Ink Series**			
Graphic Protection	VEH	OUT	RAIL	IN	VEH	OUT	RAIL	IN
8518, 8519	7	4	4	8	7	4	4	8
1920DR	5	4	4	8	3	3	3	5
9740i	5	4	4	8	5	4	4	8
None	—	3	—	3	—	2	—	3

Warranty Period for Finished Graphics, in Years

Latex Inks and Printers	HP Designjet L65500 Printer and Scitex LX600, LX800, LX820 & LX850 Printers			HP Designjet L65500 Printer and Scitex LX600, LX800, LX820 & LX850 Printers			HP Designjet L26100, L26500, and L28500 Printers		
	HP 3M LX600 Specialty Latex Ink			**HP 3M LX610 Latex Ink** a 3M™ MCS™ Warranty Component			**HP 3M LX610 Latex Ink** a 3M™ MCS™ Warranty Component		
Graphic Protection	VEH	OUT	IN	VEH	OUT	IN	VEH	OUT	IN
8518, 8519	5	4	7	5	4	7	5	3	5
1920DR	2	2	2	2	2	2	2	2	2

UV Inks and Printers	EFI™ VUTEk® PV200 Printer				EFI™ VUTEk® GS5000r and GS3250r Printers				EFI™ VUTEK® GS2000, GS3200, GS3250 Printers,. Including GS Pro Series			
	3M™ Ink Series 2200UV				**GSr 3M™ Premium UV Inks**				**GS 3M™ Premium UV Inks**			
Graphic Protection	VEH	OUT	RAIL	IN	VEH	OUT	RAIL	IN	VEH	OUT	RAIL	IN
8518, 8519	7	4	4	8	5	4	4	8	5	4	4	8
1920DR	—	—	—	—	3	2	—	5	3	2	—	5
9740i	5	4	4	8	4	3	3	8	4	3	3	8
none	—	3	—	3	—	2	—	3	—	2	—	3

UV Inks and Printers	EFI™ VUTEk® QS2000, QS3200, QS3220, QS220 Printers				EFI™ R3225 UV Roll-to-Roll Printers				Durst Rho 160R & 351R			
	3M™ Ink Series 2800UV				**R3235 3M™ UV Ink**				**3M™ Ink Series 2700UV**			
Graphic Protection	VEH	OUT	RAIL	IN	VEH	OUT	RAIL	IN	VEH	OUT	RAIL	IN
8518, 8519, 8520, 8915	7	4	4	8	5	4	4	8	7	4	4	8
1920DR	—	—	—	—	3	2	—	5	—	—	—	—
9740i	5	4	4	8	4	3	3	8	5	4	4	8
none	—	3	—	3	—	2	—	3	—	3	—	3

UV Inks and Printers	Mimaki UJV-160, JFX-1631 & 1615R Printers			
	Mimaki Ink Series LF-200 *Manufactured by 3M*			
Graphic Protection	VEH	OUT	RAIL	IN
8518, 8519	7	4	4	8
9740i	—	—	—	—
none	—	—	—	—

H. General Warranty Stipulations for 3M™ MCS™ Warranty and 3M Performance Guarantee

These stipulations apply to the 3M™ MCS™ Warranty and 3M Performance Guarantee. General provisions for these stipulations are covered in the 3M Graphics Warranties Brochure.

(1) Removal Warranty with Heat

a. For the 3M™ MCS™ Warranty and 3M Performance Guarantee

Within the stated Warranty Period, if this film cannot be removed with heat, or if more than 30% of the adhesive residue remains on the substrate, 3M will reimburse a reasonable portion of extra removal costs.

b. Removal Warranty Exceptions

The following exceptions are not covered by the Removal Warranty.

- Substrate damage due to:
  - removing film from a pre-existing graphic.
  - removing film that was applied to painted wallboard or unapproved substrates.
  - removing film from paint that is not firmly bonded to the substrate.
- No guarantee is made for:
  - ease or speed of removal of any graphic.
  - removal from railroad cars or engines (even when the graphic is a recommended use), or stainless steel or bare aluminum.
  - removal from paint that is improperly cured.
  - removal from aged paint or metals, surface oxidation or chalking; user must test, approve and accept liability for such applications.

c. Removal Factors

The ease and rate of removal using heat depends on several factors. Also see Instruction Bulletin 6.5 .

- Substrate type and condition
- Graphic age and weathering conditions
- Removal is performed when the air and surface temperature is above 60°F (15°C)
- Angle of removal, which should be less than 90 degrees

(2) Reduced Warranty Period for Selected Graphic Exposures

For each exposure shown below, multiply the Warranty Period (in years) in the applicable warranty, Section F.(1) or Section G.(1), for your graphic construction by the percentage shown for the intended graphic exposure. This is the reduced warranty.

If the Outdoor Graphic Exposure is:	Multiply Warranty Period by this Percentage:	Examples
Desert Southwest Vertical	70% (0.7)	0.7 x 7 years = 4.9 years 0.7 x 2 years = 1.4 years
Non-vertical	0	0

(3) Reduced Warranty Period for Graphics Exposed to Heat

Long exposure to continuous high heat decreases the Warranty Period 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.

(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 and performance of graphic constructions that include any other products.

The 3M Performance Guarantee covers selected 3M branded graphics products when used with qualified printers and inks.

(7) Graphic Protection

- Graphic protection can improve the appearance, performance and durability of your graphics. It is required for many warranted constructions. Refer to the Warranty Period tables for details.
- Any printed 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.

6. 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
- 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

7. Graphics Manufacturing

CAUTION

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

A. Inkjet Printing

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

(1) Total Ink Coverage for 3M™ MCS™ Warranty Solutions

250% is the maximum recommended total ink coverage for this film for all solvent, latex and UV inks.

Too high a total physical ink amount on the film results in media characteristic changes, inadequate drying, overlaminate lifting, and/or poor graphic performance. Make sure that the ink lay down is within the limits of what the dryer can handle to prevent ink smearing. The Product & Instruction Bulletin for each 3M ink series includes additional details about total ink coverage.

(2) Total Ink Coverage for 3M Performance Guarantee Solutions

Refer to the Performance Guarantee Matrix for details.

(3) Color Consistency

Be sure to check the consistency of color on reflective film as it may appear different in daytime and nighttime lighting.

(4) Adequately Dry Graphics

Important Note!

Inadequate drying can result in graphic failure including curling, increased shrinkage and adhesion failure, which are not covered under warranty.

Always build enough time into your process to ensure adequate drying of the graphic. Poorly dried film may become soft and stretchy, and the adhesive may become too aggressive. This can cause difficulty when applying an overlaminate, rolling or applying the graphic. See the ink's Instruction Bulletin for more details.

B. Cutting

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

(1) Methods

- Cold and hot steel-ruled die cutting
- Hot kiss cutting
- Drum-type electronic cutting
- Flat-bed electronic cutting
- Guillotine
- Hand cut
- Knifeless™ Tape (http://knifelesstechsystems.com/Home.aspx for details)

(2) Minimum Cutting Sizes

- 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 and air release feature.
- Refer to Instruction Bulletin 4.1 for more details.

C. Liner Exchanging

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

D. 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.

	Select the tape based on what is on top of the graphic			
Application Tape	**None**	**8519**	**1920DR**	**9740i**
Premasking Tape SCPM-3	■[1]	■	■	—
Premasking Tape SCPM-44X	■[2]	—	—	■
Prespacing Tape SCPS-55	■	■	■	■

[1]. All solvent inks.
[2]. All UV inks.
— = Use of application tape not recommended for this construction

E. Handling Prespaced Graphics

For the best results when using prespacing tape SCPS-55, 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 prespacing tape 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.

8. 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.

Solvent from solvent-based ink that has not completely dried also affects slideability.

These films have air release channels, a characteristic of Comply adhesive.

Always work from the center out to the edges of the graphic to allow trapped air to exit through the air release channels. If the channels are closed off by firm pressure and air is trapped, use an air release tool to aid in removing air bubbles. See Instruction Bulletin 5.4 for details.

B. Substrate Considerations

Important Note!

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 may help minimize bubbles due to outgassing.

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.

C. Graphics Printed with UV Inkjet Inks are Heat Sensitive

UV inkjet inks may crack if too much heat is used during graphic application to complex curves and deep contours as well as around rivets. When using a heat gun or other heat source during application, make sure the film surface temperature does not exceed 212°F (100°C).

Using additional heat in the post-application process may cause UV inkjet ink to crack.

For the best results ***always do a test application*** of a UV inkjet printed graphic to determine how much heat can be used without damaging the image.

D. Edge Sealing

- 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 locomotives and rolling railroad stock.
  - Graphics applied to truck rollup doors.

9. 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.

10. Removal

These films are removable with heat from most substrates within the warranty period specified for your construction. See Instruction Bulletin 6.5 for details on how to remove graphics.

11. Shelf Life, Storage and Shipping

A. Shelf Life

Total shelf life: 3 years from the date of manufacture on the original box.
If you do process the film, do so within 2 years and apply within 1 year.
If you do not process the film, apply it within 3 years.

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

Film with prespaced graphics using prespacing tape SCPS-55 applied: Flat only

All other constructions: 680CR, IJ680CR 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.

12. 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 D4956-11a: Standard Specification for Retroreflective Sheeting for Traffic Control

ASTM D4956-11a covers flexible, non-exposed glass bead lenses and microprismatic retroreflective sheeting designed for use on traffic control signs, delineators, barricades and other devices. As defined in ASTM D4956-11a, film IJ680CR-10 (white) is classified as Type I sheeting (section 4.2.1) with a Class 3 adhesive (section 4.3.3). Film IJ680CR-10 (white) meets 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. Film IJ680CR-10 (white) meets the requirements of NFPA 1901, Section 15.9.3.1 (Front and Sides).

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.

13. 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™ Piezo Inkjet Ink Series 1500v2	PB-IB	1500
3M™ Piezo Inkjet Ink Series 4400	PB-IB	4400
3M™ Piezo Inkjet Ink Series 4800	PB-IB	4800
3M™ Piezo Inkjet Ink Series 6200	PB-IB	6200
SIIT GX 3M Ink Series	PB-IB	GX
HP 3M LX600 Specialty Latex Ink	PB-IB	LX600
HP 3M LX610 Specialty Latex Ink a 3M™ MCS™ Warranty Component	PB-IB	LX610
HP 792 Latex Ink a 3M™ MCS™ Warranty Component	PB-IB	792
3M™ Piezo Inkjet UV Ink Series 2700UV	PB-IB	2700UV
3M™ Piezo Inkjet UV Ink Series 2200UV	PB-IB	2200UV
3M™ Piezo Inkjet UV Ink Series 2800UV	PB-IB	2800UV
GS 3M™ Premium UV Inks	PB-IB	GS
GSr 3M™ Premium UV Inks	PB-IB	GSr
Mimaki Ink Series LF-200 *Manufactured by 3M*	PB-IB	LF200
EFI™ R3225 3M™ UV Ink	PB-IB	R3225
3M™ Screen Print UV Clears 9740i, 9730UV	PB-IB	UV Clears
3M Graphic Protection Products - Hot and cold roll lamination	PB IB	GP-1 4.22
Design of graphics	IB	2.1
Edge Sealer 3950 and 4150S, Edge Sealer Tape 8914	PB-IB	Edge Sealers
Sheeting, scoring and film cutting	IB	4.1
Using 3M application tapes; premasking and prespacing for films	PB-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
Storage, handling, maintenance, removal	IB	6.5
3M Graphics Warranties Brochure		

14. Bulletin Change Summary

New Compatible Products: Added Printers W-54s and W-64S to approved printers for the SIIT GX 3M Ink Series Seiko I Infotech ColorPainter™ Printers. Black bars in the margin indicate a change or addition.

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