



Controltac™ Wrap Film with Comply™ v3 Adhesive IJ380Cv3

For Solvent, UV and Latex Inkjet Printing Only

1. Product Description

A. Product Features

- 2-mil white, vinyl film with a luster finish
- Pressure-activated adhesive for easy sliding, tacking, snap up and repositioning
- Non-visible, air release channels for fast, easy, bubble-free installations
- Superior conformability and lift resistance; perfect for vehicle wraps with deep channels or concave areas
 - Stretch selected finished graphic constructions up to 150% (i.e., a 10 inch film piece can stretch to 15 inches) without primer or relief cuts and maintain lift resistance; see details and exceptions in Section 10.
- Removable with heat and/or chemicals

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.

- Vehicle wrap graphics
- Watercraft graphics applied above the static water line only
- Non-vertical and horizontal vehicle wraps when protected with 3M overlamine 8548G

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 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.

| | |
|---|--------------------------------|
| 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 in a non-abusive environment. | 10 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 surface. | 5 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 surface. | 4 years Warranty Period |

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

- Graphics applied to:
 - stainless steel
 - non-3M films (see Removal Warranty)
 - watercraft when the graphic is below the static water line
 - watercraft graphics that are not edge sealed
 - painted substrates with poor paint to substrate, or paint-to-paint bond
 - substrate surfaces that are not clean and smooth (little or no variation in texture)
- Do not use prespacing tape in cut and weeded applications where the tape must adhere to the exposed liner.
- Film without graphic protection
- Graphic removal from:
 - applications with poor paint-to-substrate adhesion
 - existing graphics that must remain intact; damage may occur during removal of this film
 - outdoor, horizontal applications (except graphics using overlamine 8548G as described in this Bulletin)
- Graphics subjected to gasoline vapors or spills at gas pumps, automobile fuel-tank ports, or top-feeding, petroleum tankers

(2) Important Information About Bus Applications

Film used on buses must not be applied so as to restrict the safe use of emergency window exits. See the most current version of [Instruction Bulletin 5.4](#) for details.

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.

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

(1) Solvent Inks and Printers

| Ink Series | Printer |
|--------------------------------------|---|
| • 3M™ Piezo Inkjet Ink Series 1500v2 | EFI™ VUTEK® 150, 2360/3360, 3300/5300 and 3000/5000 Printers |
| • 3M™ Piezo Inkjet Ink Series 4400 | HP XL 1200 and XL 1500 Printers |
| • 3M™ Piezo Inkjet Ink Series 4800 | HP Scitex TJ8300 and 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 and W-64s Printers |

(2) Latex Inkjet Inks and Printers

| | |
|---|---|
| • HP 3M LX600 Specialty Latex Ink | HP Designjet L65500; Scitex LX600, LX800, LX820 & LX850; Latex 820 & 850 Printers |
| • HP LX610 Latex Ink a 3M™ MCS™ Warranty Component | HP Designjet L65500, Scitex LX600, LX800, LX820 & LX850; Latex 820 & 850 Printers |
| • HP 792 Latex Ink a 3M™ MCS™ Warranty Component | HP Designjet L26100, L26500 & L28500 Latex 210, 260 & 280 Printers |
| • HP 881 Latex Ink a 3M™ MCS™ Warranty Component | HP Latex 3000 Printer |

(3) UV Inkjet Inks and Printers

- 3M™ Piezo Inkjet Ink Series 2200UV EFI™ VUTEk® PV200 Printer
- 3M™ Piezo Inkjet Ink Series 2700UV Durst Rho 160R and 351R Printers
- 3M™ Piezo Inkjet Ink Series 2800UV EFI™ VUTEk® QS2000, QS3200, QS3220 and QS220 Printers
- EFI™ VUTEk® GS 3M™ Premium UV Inks EFI™ VUTEk® GS2000, GS3200 & GS3250 Printers, including GS Pro Series
- EFI™ VUTEk® GSr 3M™ Premium UV Inks EFI™ VUTEk® GS5000r & GS3250r Printers
- EFI™ R3225 3M™ UV Ink EFI™ R3225 UV Roll-to-Roll Printer
- Mimaki LF-200 UV Inks* Mimaki UJV-160, JFX-1631 & -1615R Printers
- Mimaki UV Ink LUS-200* Mimaki UJV500-160 Printer

* Manufactured by 3M.

B. OEM Inkjet Inks and Printers for 3M Performance Guarantee

- For the most current information, please click here: [3M Performance Guarantee Matrix](#).

C. Graphic Protection Options

- 3M™ Envision™ Gloss Wrap Overlamine 8548G*
- 3M™ Scotchcal™ Gloss Overlamine 8580
- 3M™ Screen Print Gloss Clear 1920DR

* with horizontal vehicle warranty (see page 8)

D. Other Products

- 3M™ Premasking Tape SCPM-3
- 3M™ Premasking Tape SCPM-19
- 3M™ Prespacing Tape SCPS-55
- 3M™ Vehicle Channel Applicator Tool VCAT-2
- 3M™ Roller L (larger hard roller)
- 3M™ Roller S (small hard roller)
- 3M™ Edge Sealer 3950
- 3M™ Edge Sealer Tape 8914

3. Characteristics

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

A. Physical Characteristics

| Characteristic | Value |
|---|---|
| Film | Cast vinyl with superior conformability |
| Film color | White, opaque |
| Thickness | Without adhesive: 2 mil (0.05 mm) With adhesive: 3-4 mil (0.08-0.10 mm) |
| Adhesive | Pressure-activated (slide, tack, snap up, reposition) with air release channels |
| Adhesive color | Gray |
| Liner | Polyethylene-coated paper |
| Adhesion, Typical 24 hours after application | ABS 4-5 pounds/inch (0.72-0.89 kg/cm) Acrylic enamel 4-5 pounds/inch (0.75-0.89 kg/cm) Aluminum, anodized 7-8 pounds/inch (1.26-1.43 kg/cm) Automotive clear coats 3-5 pounds/inch (0.54-0.89 kg/cm) |
| Tensile strength | 4 pounds/inch at 73°F (0.77 kg/cm at 23°C) |
| Chemical resistance | <ul style="list-style-type: none"> • Resists mild alkalis, mild acids, and salt • Excellent resistance to water (<i>does not include immersion</i>) • Resists occasional fuel spills |
| Flammability | Call 1-800-328-3908 for more information |

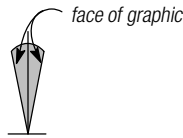
B. Application Characteristics

| Characteristic | Value |
|---|--|
| Finished graphic application recommendation | <p>Surface type: Flat, simple curves, compound curves and deep channels</p> <p>Substrate type: ABS resins, chrome, glass, paint</p> <p>Application method: Dry</p> <p>Application temperature: (air and substrate) 60° - 90°F (16° - 32°C)</p> |
| Applied shrinkage | 0.015 inches (0.4 mm) |
| Temperature range after application | Equivalent to temperatures to which recommended substrates are typically exposed |
| Graphic removal | Removable with heat and/or chemicals from most substrates within the Warranty Period at 50°F (10°C) minimum (air and substrate) |

4. Definitions

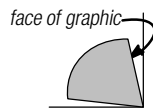
A. Exposure Types

U.S. Vertical Exposure



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

U.S. Non-vertical Exposure



The face of the graphic is greater than 10° from vertical and greater than 5° from horizontal. This includes non-vertical surfaces of vehicle wraps or fleet graphics.

U.S. Horizontal Exposure



The face of the graphic is +/- 5° from horizontal.

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.

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

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

D. Graphic Types

Vehicle

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

Watercraft

Boats intended for personal pleasure such as runabouts and speedboats having aluminum and/or smooth fiberglass/gel coat bodies, including boats used in fishing tournaments and off-shore racing boats, but not 1 to 3 person personal watercraft or other boats used in connection with commercial or business enterprise. 3M specifically excludes all other recreational vehicles from this definition.

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

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 Table, 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 Performance Guarantee Printer and Ink Matrix at 3Mgraphics.com. The Matrix may also list certain restrictions for using the film covered in this Bulletin. For warranties for other exposures, see Section H.(1).

Warranty Period for 3M Product Performance, in Years

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

| Film | Ink Type | Graphic Protection | Vehicle | Watercraft | Inks and Printers** |
|----------|----------|--------------------|---------|------------|--|
| IJ380Cv3 | Solvent | 8548G* | 4 | 2 | See the Performance Guarantee Matrix at 3Mgraphics.com |
| | Latex | 8580 | 3 | 2 | |
| | UV | | | | |

* For information about overlaminates 8548G horizontal warranty, please see Section H.(2).

** 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.

NOTE: See Section 8.C. regarding the effect of UV inkjet ink on stretched film.

G. 3M™ MCST™ Warranty

Subject to Stipulations set forth in Section H., below

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

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

See Section 4. for Graphic Type definitions:
 VEH = Fleet, Standard and Recreational Vehicle Graphics
 WATER = Watercraft Graphics

Warranty Period for Finished Graphics, in Years

| SOLVENT PRINTERS and INKS | EFI™ VUTEK® 150, 2360/3360, 3300/5300, 3000/5000 Printers | | HP Scitex XL 1200, XL 1500 Printers | | HP Scitex TJ8300 and TJ8350 Industrial Presses | |
|---------------------------|---|-------|-------------------------------------|-------|--|-------|
| | 3M Ink Series 1500v2 | | 3M Ink Series 4400 | | 3M Ink Series 4800 | |
| Graphic Protection | VEH | WATER | VEH | WATER | VEH | WATER |
| 8548G ■ | 5/2 | 2 | 5/2 | 2 | 5/2 | 2 |
| 8580 | 3 | 2 | 3 | 2 | 3 | 2 |
| 1920DR | 3 | 2 | — | — | 3 | 2 |

| SOLVENT PRINTERS and INKS | Agfa :Jeti 3312, 3318, 3324, 5024 [Gandinnovations] Printers | | SIIT ColorPainter H-74s, H-104s, H2-74s, H2-104s, W-54s & W-64s Printers | |
|---------------------------|--|-------|--|-------|
| | 3M Ink Series 6200 | | SIIT GX 3M Ink Series | |
| Graphic Protection | VEH | WATER | VEH | WATER |
| 8548G ■ | 5/2 | 2 | 5/2 | 2 |
| 8580 | 3 | 2 | 3 | 2 |
| 1920DR | 3 | 2 | 3 | 2 |

| LATEX PRINTERS and INKS | HP Designjet L65500; Scitex LX600, LX800, LX820, LX850; Latex 820, 850 Printers | | HP Designjet L65500; Scitex LX600, LX800, LX820, LX850; Latex 820, 850 Printers | | HP Designjet L26100, L26500, L28500; Latex 210, 260, 280 Printers | |
|-------------------------|---|-------|---|-------|---|-------|
| | HP 3M LX600 Specialty Latex Ink | | HP LX610 Latex Ink a 3M™ MCST™ Warranty Component | | HP 792 Latex Ink a 3M™ MCST™ Warranty Component | |
| Graphic Protection | VEH | WATER | VEH | WATER | VEH | WATER |
| 8548G ■ | 5/2 | 2 | 5/2 | 2 | 5/2 | 2 |
| 8580 | 3 | 2 | 3 | 2 | 3 | 2 |
| 1920DR | 2 | — | 2 | — | 2 | — |

| LATEX PRINTERS and INKS | HP Latex 3000 Printer | |
|-------------------------|--|-------|
| | HP 881 Latex Ink a 3M™ MCST™ Warranty Component | |
| Graphic Protection | VEH | WATER |
| 8548G ■ | 5/2 | 2 |
| 8580 | 3 | 2 |
| 1920DR | 2 | — |

| UV PRINTERS and INKS | EFI™ VUTEK® PV200 Printer | | Durst Rho 160R & 351R Printers | | EFI™ VUTEK® QS2000, QS3200, QS3220, QS220 Printers | |
|----------------------|---------------------------|-------|--------------------------------|-------|--|-------|
| | 3M Ink Series 2200UV | | 3M Ink Series 2700UV | | 3M Ink Series 2800UV | |
| Graphic Protection | VEH | WATER | VEH | WATER | VEH | WATER |
| 8548G ■ | 5/2 | 2 | 5/2 | 2 | 5/2 | 2 |
| 8580 | 3 | 2 | 3 | 2 | 3 | 2 |

■ Overlaminated 8548G: first number represents the vertical warranty and the second number the horizontal warranty on vehicle graphics. Please see Section H.(2).

NOTE: See Section 8.C. regarding the effect of UV inkjet inks and stretching.

Warranty Period for Finished Graphics, in Years

| UV PRINTERS and INKS | EFI™ R3225 UV Roll-to-Roll Printer | | EFI™ VUTEK® GS2000, GS3200, GS3250 & GS Pro Series Printers | | EFI™ VUTEK® GS5000r & GS3250r Printers | |
|----------------------|------------------------------------|-------|---|-------|--|-------|
| | R3225 3M UV Inks | | GS Premium UV Inks | | GSr Premium UV Inks | |
| Graphic Protection | VEH | WATER | VEH | WATER | VEH | WATER |
| 8548G ■ | 5/2 | 2 | 5/2 | 2 | 5/2 | 2 |
| 8580 | 3 | 2 | 3 | 2 | 3 | 2 |

| UV PRINTERS and INKS | Mimaki UJV-160, JFX-1631 and -1615R Printers | | Mimaki UJV500-160 Printer | |
|----------------------|--|-------|---|-------|
| | UV Ink Series LF-200 Manufactured by 3M | | Mimaki UV Ink LUS-200 Manufactured by 3M | |
| Graphic Protection | VEH | WATER | VEH | WATER |
| 8548G ■ | 5/2 | 2 | 5/2 | 2 |
| 8580 | 3 | 2 | 2 | 2 |

■ Overlamine 8548G: first number represents the vertical warranty and the second number the horizontal warranty on vehicle graphics. Please see Section H.(2).

NOTE: See Section 8.C. regarding the effect of UV inkjet inks and stretching.

(2) Paint Refurbishing Reimbursement Remedy

a. Paint Staining

See the General Warranty Stipulations, Section H.(3)c.

b. For Commercial and Recreational Vehicles

This Policy applies to commercial vehicles (e.g., automobiles, vans, buses) and recreational vehicles only, and specifically does not include Personal Vehicles or Watercraft. Refer to [Instruction Bulletin 5.36](#) for complete details.

- A *Pre-Installation and Inspection Report* (in Instruction Bulletin 5.36) must be completed **prior to graphic installation** and submitted with any claim for paint damage sustained during the removal of 3M removable or changeable graphic film from vehicles.
- A separate report for each vehicle involved in a claim is required.

c. For Watercraft

This applies to Watercraft only and specifically does not include any other type of vehicle. Refer to [Instruction Bulletin 5.42](#) for complete details.

- A *Pre-Installation and Inspection Report* (in Instruction Bulletin 5.42) must be completed **prior to graphic installation** and submitted with any claim.
- A separate report for each watercraft involved in a claim is required.
- Graphics must be applied above the static water line.
- Graphics must be cut at seams and all edges and seams and edges must be sealed.

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

These stipulations apply to both the 3M™ MCS™ Warranty and 3M Performance Guarantee. General provisions for these stipulations are covered in the [3M Commercial Graphics Brochure](#) at 3Mgraphics.com.

(1) Reduced Warranty Period for Other Graphic Exposures

For graphics oriented in a non-vertical or desert southwest, outdoor exposure, multiply the Warranty Period (in years) for your graphic construction as shown in the applicable Warranty Period Table, Section G.(1) or Section F.(1), by the percentage shown for the intended graphic exposure.

| If the Graphic Exposure is: | Use this Percentage of U.S. Vertical Exposure, Warranty Period | Calculation Examples |
|------------------------------------|---|--|
| U.S. Non-vertical | 50% (0.5) | 0.5 x 5 years = 2.5 years 0.5 x 3 years = 1.5 years |
| Desert Southwest Vertical | 70% (0.7) | 0.7 x 5 years = 3.5 years 0.7 x 3 years = 2.1 years |
| Desert Southwest Non-vertical | 35% (0.35) | 0.35 x 5 years = 1.75 years 0.35 x 3 years = 1.05 years |
| Horizontal | 0% | 0 |

(2) Overlaminates 8548G Horizontal Warranty

Printed film as specified in this bulletin with overlaminate 8548G for vehicle graphics:
U.S. - 2 years; Desert S.W. = 1.4 years

(3) Removal Warranty with Heat or Chemicals

a. For the 3M™ MCS™ Warranty Only

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

b. For the 3M Performance Guarantee

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

c. 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 any unapproved substrate.
 - removing film from paint that is not firmly bonded to the substrate.
- No guarantee is made for:
 - paint staining. 3M does not warrant vehicle paint staining that may be visible after removing an inkjet printed graphic with an overlaminate. To reduce the risk of this problem, always remove the graphic by the end of the Warranty Period.
 - ease or speed of removal of any graphic.
 - 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.
 - removal from horizontally-exposed outdoor applications (except graphics using overlaminate 8548G as described in this Bulletin).

(4) 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. However, to help maintain the appearance of your graphic, use the recommended graphic protection whenever:

- it is required for the construction and end use as shown in the Warranty Period tables.
- the graphic, **including printed vehicle or watercraft graphics**, is exposed to abrasive conditions, harsh cleaners or chemicals.

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

Contact the 3M organization for that country.

(6) **Application to Glass**

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

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

The **3M™ MCS™ Warranty** does not, under any circumstances, cover graphics made with inks, film, graphic protection and/or application tapes that are not sold or recommended by 3M.

The **3M Performance Guarantee** does not, under any circumstances, cover OEM inks, even those approved by 3M for this program, or any type of 3M product failure that results from their use.

The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include any non recommended or qualified products.

6. Factors that Affect Graphic Performance Life

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

- correct combination of 3M-recommended graphics products.
- adequate ink drying or curing.
- selection 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**

The maximum recommended total ink coverage for this film is:

- **270%** when printed with all approved 3M inkjet inks.
- **250%** when printed on the Mimaki JV5 Series printer with HS ink series (3M Performance Guarantee).

Do not exceed the recommended total ink coverage for the ink series used on this film. Too high a total physical ink amount on the film results in media characteristic changes, incomplete drying, overlamine lifting, and/or poor graphic performance. For additional details about total ink coverage, refer to the Product & Instruction Bulletins for 3M inks or the [Performance Guarantee Matrix](#) for OEM inks.

(2) **Completely Dry Graphics**

Important Note!

Incomplete 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 complete 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 overlamine, 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**

- Flat-bed electronic cutting
- Hand cut
- Guillotine
- [Knifeless™ Tape](#)

(2) Size of Cut Text

These values are based on upper case Helvetica medium type. Weeding can be more difficult with smaller text.

| | |
|-----------------------------------|----------------------|
| Minimum stroke width: | 0.25 inch (6.35 mm) |
| Minimum height: | 3.0 inch (76.2 mm) |
| Minimum radius for end of stripe: | 0.125 inch (3.18 mm) |

C. Graphic Protection

Graphic protection may improve the appearance, performance and durability of the graphic.

- Overlaminates must be cold or hot roll applied. When overlaminating UV inkjet printed graphics, 3M recommends using hot roll lamination to help minimize a silvered graphic appearance caused by bubbles being trapped within the valleys of a graphic. See [Instruction Bulletin 4.22](#) for details.

D. Application Tapes

(1) When to Use Premasking Tape

- Use as an application aid to increase stiffness, and prevent stretching and damage during application.
- Use when little or no liner is exposed.
- Use premasking tape SCPM-3.

(2) When to Use Prespacing Tape

- Use to hold cut and weeded letters or graphics in registration after removing the film liner.
- Use to protect cut graphic parts from scratching or damage during application.
- Use when large amounts of liner are exposed.
- Use prespacing tape SCPS-55.

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. Pressure-activated Adhesive

- The pressure-activated adhesive on this film offers:
 - smooth sliding into position on a substrate;
 - fast finger tacking to check position; and
 - easy snap up and repositioning when you need it.
- The **snap up and reposition feature is lost:**
 - when firm pressure with a squeegee or other application tool is applied.
 - at application temperatures above 90°F (32°C) even if only light finger pressure was used for tacking.
 - if any part of the film is removed from the original liner and reapplied to the same or another liner.
 - solvent from inkjet ink has not completely dried or cured, which affects both slide-ability and snap up.

B. Working with Air Release Channels

Air release channels are a characteristic of 3M's Comply adhesive that allow fast, easy, virtually bubble-free installations.

- The channels will be damaged and effective air removal affected if you remove and attempt to change liners or reapply the same liner.
- For the best results, 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.

Video



See how 3M's Comply adhesive technology works.

C. Graphics Printed with UV Inkjet Inks are Heat Sensitive!

UV inkjet inks will crack if too much heat is used during graphic application, **especially when the film is stretched** into complex curves and deep contours and around rivets. This will limit the amount of stretching you can do when applying this film. 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 also cause UV inkjet ink to crack.

For the best results, **always do a test application** of a UV printed graphic to determine how much heat can be used without damaging the image. Also see [Instruction Bulletin 5.36](#).

D. 3M™ Tape Primer 94

Although this product does not require the use of primer 94, it is good practice to use this primer to maximize adhesion on any area where the film will be stretched or stressed.

E. Squeegee Technique

Using a gold PA-1 squeegee with the appropriate sleeve/protection, always work from the center out to the edges of the graphic to minimize trapped air. Use an air release tool to aid in removing air bubbles. See [Instruction Bulletin 5.4](#) for details.

F. Use Heat in Post-Application

After the film has been applied, apply heat to the graphic to reduce the internal stress in the vinyl film.

1. Adjust the heat source so that the film temperature is too hot to touch—about 200 to 225°F (94 to 107°C).
2. Move the heat source slowly across the stretched film surface.
3. For best performance, press the stretched areas of film with 3M roller S while the vinyl is still hot. This helps fully wet-out the adhesive onto the substrate and reduces the risk of lifting. See FIGURE 3.

Note: If the graphics are printed with UV ink, please see Section C.

FIGURE 3
Use Roller S for Post-Application Finishing to Help Prevent Lifting



G. Application to Watercraft

Read and follow all instructions, and complete the 3M Watercraft Graphics Pre-installation Inspection Record in [Instruction Bulletin 5.42](#) before manufacturing or applying any graphic to a watercraft.

Graphics applied to watercraft require edge sealing. Refer to Instruction Bulletin 5.42 for details.

H. Edge Sealing (*except Watercraft*)

These films do not require edge sealing. However, applications such as cut graphics may benefit from using edge sealer 3950 when subject to external forces such as abrasion and/or power-washing.

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.)

10. Removal

Removal requires heat and/or chemicals. The ease and rate of removal depends on a number of factors. See [Instruction Bulletin 6.5](#) for details. A chemical remover system is available for graphics printed with solvent-based ink. Follow the procedures for using film remover R-221 and adhesive remover R-231 and for additional removal details.

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

- 40° to 100°F (4° to 38°C)
- Out of sunlight
- Clean dry area
- Original container
- 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.

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.

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 2200UV | PB-IB | 2200UV |
| 3M™ Piezo Inkjet Ink Series 2700UV | PB-IB | 2700UV |
| 3M™ Piezo Inkjet Ink Series 2800UV | PB-IB | 2800UV |
| 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 |
| EFI™ VUTEK® GS 3M™ Premium UV Inks | PB-IB | GS |
| EFI™ VUTEK® GSr 3M™ Premium UV Inks | PB-IB | GSr |
| EFI™ R3225 3M™ UV Ink | PB-IB | R3225 |
| HP 3M LX600 Specialty Latex Ink | PB-IB | LX600 |
| HP LX610 Latex Ink, a 3M™ MCST™ Warranty Component | PB-IB | LX610 |
| HP 792 Latex Ink, a 3M™ MCST™ Warranty Component | PB-IB | 792 |
| HP 881 Latex Ink, a 3M™ MCST™ Warranty Component | PB-IB | 881 |
| Mimaki Ink Series LF-200, manufactured by 3M | PB-IB | LF-200 |
| Mimaki UV Ink LUS-200, manufactured by 3M | PB-IB | LUS-200 |
| SIIT GX 3M Ink Series | PB-IB | GX |

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

| Subject | Type | Bulletin No. |
|--|----------|---|
| 3M Graphic Protection Products <i>overview of all graphic protection products and specific information on most overlaminates</i> | PB | GP-1 |
| 3M™ Screen Print Gloss Clear 1920DR and Low Gloss 1930 - Applying screen printing clear 1920DR and 1930 | PB IB | 1900 3.12 |
| Design of graphics | IB | 2.1 |
| Hot and cold roll lamination | IB | 4.22 |
| Scoring and cutting | IB | 4.1 |
| Using 3M application tapes; premasking and prespacing for films | IB | 4.3 |
| Application, substrate selection, preparation and substrate-specific application techniques | IB | 5.1 |
| Application, general procedures for indoor and outdoor dry applications | IB | 5.5 |
| Application, special applications and vehicles | IB | 5.4 |
| Applicator's quick reference guide for vehicle film | IB | 5.35 |
| Application: Special considerations for automobiles, vans and buses and inspection forms | IB | 5.36 |
| Application: special considerations for watercraft | IB | 5.42 |
| Storage, handling, maintenance, removal | IB | 6.5 |
| 3M Commercial Graphics Warranty Brochure | | www.3Mgraphics.com, Warranties |

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14. Bulletin Change Summary

Modified and new content is marked with a black bar in the margin. Added HP 881 Latex Ink and Mimaki UV Ink LUS-200 as compatible inks. Removed Warranty Period for ink series 4400 with clear 1920DR and watercraft applications using latex inks and clear 1920DR which were listed in error. Added the new HP Latex printer product names; HP renamed the Scitex LX820 and LX850 to HP Latex 820 and 850 Printers and HP Designjet L26100, L26500 and L28500 to Latex 210, 260 and 280 Printers.



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