



Controltac™ Graphic Film

- IJ180-10 and RG180-10
- With Comply™ Adhesive IJ180C-10, RG180C-10, FN180C-10
- With Comply™ v3 Adhesive IJ180Cv3-10, RG180Cv3-10, FN180Cv3-10

For Solvent and UV Inkjet Printing Only

Product Description

These 2-mil films offer versatility along with slideable, repositionable, pressure-activated adhesive. These long-term durable and removable films have excellent hiding power and stability, making them perfect for signs and fleet graphics and watercraft, including surfaces with corrugations and rivets.

Films with Comply adhesive IJ180C and IJ180Cv3 (all versions) have air release channels for fast and easy, bubble-free graphic installations. In addition, the air release channels for films with Comply v3 adhesive are non-visible and have improved air release.

Use these films for solvent and UV inkjet printing.

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 additional details.

- Indoor and outdoor graphics and signs, including point-of-purchase and displays
- Commercial vehicle and fleet graphics, emblems or striping
- Bus graphics
- Standard vehicle graphics
- Watercraft graphics (above the static water line only)
- Small format original equipment manufacturer's (OEM) decorative and identification graphics, cautionary and safety labeling

Limitations of End Uses

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs or recommend other products.

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)
- **For film with Comply v3 adhesive only:** Do not use prespacing tape in cut and weeded applications where the tape must adhere to the exposed liner.
- Film without graphic protection under these conditions:
 - printed vehicle graphics
 - watercraft graphics
 - exposure to abrasive conditions, harsh cleaners or chemicals

- Graphic removal from:
 - applications with poor paint-to-substrate adhesion
 - existing graphics that must remain intact; damage may occur during removal of film
 - watercraft
- Graphics subjected to gasoline vapors or spills, including those at or on gas pumps, automobile fuel-tank ports, watercraft or top-feeding, petroleum tankers
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684 for alternatives.

Wall Graphics

Two-mil cast films are typically the best choice for indoor smooth surface wall graphics. However, the user is responsible for determining the product's suitability, including adhesion and, if required, removal characteristics. Due to the wide variability of smooth indoor walls, neither finished graphics nor removal is warranted, even for removable or changeable films. Instruction Bulletin 5.37 provides comprehensive information for the most successful wall graphics film selection and application.

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.

Compatible Products

3M Graphic Materials

This Bulletin provides details about the base film and construction options and warranty. 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.

Solvent Inkjet Inks and Printers

See the Warranty Matrix, page 5, to determine if you need an IJ, FN or RG prefix film

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 XLJet 1200 and 1500 Printers
• 3M™ Piezo Inkjet Ink Series 4600	HP Scitex Pressjet-W™ Printer
• 3M™ Piezo Inkjet Ink Series 4800	HP Scitex TJ8300, TJ8350 Series Digital Press
• 3M™ Piezo Inkjet Ink Series 5500	Océ Arizona 600 Printer
• 3M™ Piezo Inkjet Ink Series 6000	Océ Arizona 30s Printer
• 3M™ Piezo Inkjet Ink Series 6800	Océ Arizona 180 and 90 Printers

UV Inkjet Inks and Printers

Uses IJ prefix film only

Ink Series	Printer
• 3M™ Piezo Inkjet Ink Series 2200UV	EFI™ VUTEk® PV 200 Printer
• 3M™ Piezo Inkjet Ink Series 2600UVv2	3M™ Printer 2500UV
• 3M™ Piezo Inkjet Ink Series 2700UV	Durst Rho 160R and 351R Printers
• 3M™ Piezo Inkjet Ink Series 2800UV	EFI™ VUTEk® QS2000/QS3200 Printers
• 3M™ Piezo Inkjet Ink Series 5400UV	HP Designjet 788 Printer
• Mimaki LF-200 Ink Series	Mimaki UJV-160 Printer
• Mimaki F-200 Ink Series	Mimaki JF-1610, 1631 Printers

Graphic Protection

- 3M™ Scotchcal™ Gloss Overlamine 8518
- 3M™ Scotchcal™ Luster Overlamine 8519
- 3M™ Scotchcal™ Matte Overlamine 8520
- 3M™ Scotchcal™ Luster Overlamine 8908
- 3M™ Scotchcal™ Matte Overlamine 8909
- 3M™ Scotchcal™ Ultra Matte Overlamine 8915

Continued on the next page

Other Products

- 3M™ Piezo Inkjet Protective Clear 8530
- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print UV Gloss Clear 9720i
- 3M™ Screen Print Clear 9720UV
- 3M™ Premasking Tape SCPM-3
- 3M™ Premasking Tape SCPM-44X
- 3M™ Prespacing Tape SCPS-2
- 3M™ Prespacing Tape SCPS-55
- 3M™ Prespacing Tape SCPS-53X
- 3M™ Edge Sealer 3950
- 3M™ Edge Tape 8914

Characteristics

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

Physical Characteristics

Characteristic	Value	
Film	Vinyl, cast	
Film color	White, opaque	
Thickness	Without adhesive: 2 mil (0.05 mm) With adhesive: 3-4 mil (0.08-0.10 mm)	
Adhesive	Films IJ180 (all versions): Pressure-activated, slideable, repositionable Films IJ180C, IJ180Cv3 (all versions): Pressure-activated, slideable, repositionable, air release channels	
Adhesive color	Gray	
Liner	Polyethylene-coated paper	
Adhesion, Typical 24 hours after application	Substrate	Adhesion
	ABS	4.2 pounds/inch (0.75 kg/cm)
	Acrylic enamel	3.5 pounds/inch (0.63 kg/cm)
	Aluminum, anodized	7.9 pounds/inch (1.42 kg/cm)
	Aluminum, etched	5.2 pounds/inch (0.93 kg/cm)
	Chrome	4.8 pounds/inch (0.87 kg/cm)
	Fruehauf pre-painted panels	4.0 pounds/inch (0.7 kg/cm)
Tensile strength	5 pounds/inch at 73°F (0.9 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 information	

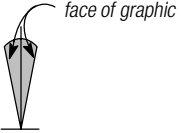
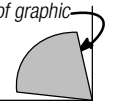
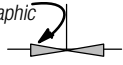
Application Characteristics

Characteristic	Value
Finished graphic application recommendation	<p>Surface type: Flat, with and without rivets, simple curves, moderate compound curves, and corrugations</p> <p>Substrate type: ABS resins, aluminum, chrome, glass, fiberglass reinforced plastics, paint (check adhesion to powder-coated or water-based paints) fiberglass with gel coat</p> <p>Application temperature:</p> <ul style="list-style-type: none"> • Flat without rivets: 40°-100°F (4°-38°C) • Curves or corrugations with rivets: 50°-100°F (10°-38°C) • Compound curves and/or watercraft: 60°-90°F (16°-32°C) <p>Application method: Dry</p>

Continued on the next page

Characteristic	Value
Applied shrinkage	0.015 inches (0.4 mm)
Temperature range after application	-65° to +225°F (-60° to +107°C)
Graphic removal	Removable with heat and/or chemicals from most substrates within the warranty period at 50°F (10°C) minimum (air and substrate)

Definitions

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. A detailed map is available at 3Mgraphics.com under Warranties.
Graphic Types	Indoor Signs		Stationary graphics applied indoors and <i>not</i> 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.
Graphic Construction		The products used to make a graphic, which may include film and/or flexible substrate, graphic protection, ink, printer and application tape.	
Graphic Protection		Overlaminated films or clear coats used to protect the graphic and/or change gloss.	
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.
	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.

Warranty Information

Warranty and Limited Remedy

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: 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. 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.

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.

3M™ MCS™ Warranty

Warranted Durability Table
for Finished Graphics
in a Standard U.S. Vertical Exposure

Finished graphics constructed as shown in the tables below are eligible for the MCS Warranty. For warranties for other exposures, see page 7.

Veh = Fleet, Standard and Recreational Vehicle Graphics
Out = Outdoor Signs
Water = Watercraft Graphics
In = Indoor Signs

Values given in Years

Graphic Protection	EFI™				HP				HP Scitex				HP Scitex			
	VUTEk® 150, 2360/3360, 3300/5300, 3000/5000				XLJet Series 1200, 1500				Pressjet™ -W				TJ8300, TJ8350 Series Digital Press			
	Ink Series 1500v2				Ink Series 4400				Ink Series 4600				Ink Series 4800			
Graphic Protection	Use IJ Films				Use IJ Films				Use IJ Films				Use IJ Films			
	Veh	Out	Water	In	Veh	Out	Water	In	Veh	Out	Water	In	Veh	Out	Water	In
8519, 8520	5	4	2	8	5	4	2	8	5	4	2	8	5	4	2	8
8908, 8909	—	1	—	3	—	1	—	3	—	1	—	3	—	1	—	3
8915	5	4	2	8	5	4	2	8	5	4	2	8	5	4	2	8
1920DR	—	—	—	—	—	—	—	—	5	4	2	8	3	3	2	8
9720UV	—	—	—	—	—	—	—	—	5	4	2	8	3	3	2	8
9720i	5	4	2	8	5	4	2	8	5	4	2	8	5	4	2	8
8530	2	2	—	3	2	2	—	3	—	—	—	—	2	2	—	3
none	—	2	—	2	—	2	—	3	—	3	—	3	—	2	—	3

Graphic Protection	Océ				Océ				Océ			
	Arizona 30s				Arizona 600				Arizona 180 and 90			
	Ink Series 6000				Ink Series 5500				Ink Series 6800			
Graphic Protection	Use IJ Films				Use FN films				Use RG films			
	Veh	Out	Water	In	Veh	Out	Water	In	Veh	Out	Water	In
8519, 8520	5	4	2	8	5	4	2	8	5	4	2	8
8908, 8909	—	1	—	3	—	1	—	3	—	1	—	3
8915	5	4	2	8	5	4	2	8	5	4	2	8
1920DR	5	4	2	8	5	4	2	8	5	4	2	8
9720UV	5	4	2	8	5	4	2	8	5	4	2	8
9720i	5	4	2	8	5	4	2	8	5	4	2	8
8530	2	2	—	3	2	2	—	3	2	2	—	3
none	—	3	—	3	—	3	—	3	—	3	—	3

NOTE: We do not offer film FN180-10

Values given in Years

Graphic Protection	EFI™				3M				Durst				EFI™			
	VUTEk® PV200				Printer 2500UV				Rho 160R and 351R				VUTEk® QS2000, QS3200			
	Ink Series 2200UV				Ink Series 2600UVv2				Ink Series 2700UV				Ink Series 2800UV			
Graphic Protection	Use IJ Films				Use IJ Films				Use IJ Films				Use IJ Films			
	Veh	Out	Water	In	Veh	Out	Water	In	Veh	Out	Water	In	Veh	Out	Water	In
8519, 8520	5	4	2	8	5	4	2	8	5	4	2	8	5	4	2	8
8915	5	4	2	8	5	4	2	8	5	4	2	8	5	4	2	8
1920DR	—	—	—	—	5	4	2	8	—	—	—	—	—	—	—	—
9720UV	5	4	2	8	5	4	2	8	5	4	2	8	5	4	2	8
9720i	5	4	2	8	5	4	2	8	5	4	2	8	5	4	2	8
none	—	3	—	3	—	3	—	3	—	3	—	3	—	3	—	3

Graphic Protection	HP				Mimaki			Mimaki		
	Designjet H35000/H45000				UJV-160			JF-1610, 1631		
	Ink Series 5400UV				Ink Series LF-200			Ink Series F-200		
Graphic Protection	Use IJ Films				Use IJ Films			Use IJ Films		
	Veh	Out	Water	In	Veh	Out	In	Veh	Out	In
8519, 8520	5	4	2	8	5	4	8	5	4	8
8915	5	4	2	8	5	4	8	5	4	8
1920DR	—	—	—	—	—	—	—	—	—	—
9720UV	5	4	2	8	—	—	—	—	—	—
9720i	5	4	2	8	—	—	—	—	—	—
none	—	3	—	3	—	2	3	—	2	3

Removal Warranty

For Films that Are Removable with Heat and/or Chemicals

Within the stated warranted durability period of each graphic construction in this Bulletin, 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.

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
 - 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 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

3M Performance Guarantee

Warranted Durability Table for 3M Product Performance Only in a Standard U.S. Vertical Exposure

Graphics constructed as described in the table below 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 page 7.

Values given in Years

Film	Graphic Protection	Vehicles, Outdoor and Indoor Signs	Watercraft	Inks and Printers
IJ180-10 IJ180C-10 IJ180Cv3-10	1920DR 8518 8519 8520 9720UV 9720i	3	2	See the 3M Performance Guarantee Printer and Ink Matrix at 3Mgraphics.com, under Warranties

General Warranty Stipulations

These stipulations apply to both the 3M™ MCS™ Warranty and 3M Performance Guarantee unless otherwise noted. Specific provisions of these stipulations are covered in the 3M Graphics Market Center Warranty Brochure at 3Mgraphics.com.

Reduced Warranted Durability

For Graphics NOT in a U.S. Vertical Exposure

Use the years indicated in the applicable Warranted Durability Table, page 5, for your graphic construction and these formulas to determine reduced durabilities for the following graphic exposures.

If the Graphic Exposure is:	Use this Percentage of U.S. Vertical Exposure, Warranted Durability	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
U.S. Horizontal	0%	0 years

Paint Refurbishing Reimbursement

For Graphics Covered by the 3M™ MCS™ Warranty Only

This applies to automobiles, vans, buses, and recreational vehicles only, and specifically does not include Watercraft. Refer to Instruction Bulletin 5.36 for complete details.

- A *Pre-Installation and Inspection Report* (in 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.

Watercraft Stipulation

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 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 must be sealed.

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.

Application Outside the U.S.

Contact the 3M organization for that country.

Application to Glass

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

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.

The 3M Performance Guarantee covers selected 3M branded graphics products when used with qualified printers and inks. See the *3M Performance Guarantee Printer and Ink Matrix* at www.3Mgraphics.com.

Printed Vehicle Graphics

Any printed graphic applied to vehicles that are exposed to abrasive conditions, harsh cleaners or chemicals must include graphic protection in order to be warranted.

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

Printer Support Information

Ink

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

Total Ink Coverage

For 3M™ MCS™ Warranty and Performance Guarantee Constructions

The maximum recommended total ink coverage for this film is:

270% when printed with all approved 3M solvent inkjet inks.

280% when printed with all approved 3M UV 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, inadequate drying, overlamine lifting, and/or poor graphic performance. Refer to the Product & Instruction Bulletin for the ink system being used for additional details about total ink coverage.

Graphics Manufacturing

Important Note!

Adequately Dry Graphics

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 overlamine, rolling or applying the graphic. See the ink's Instruction Bulletin for more details.



CAUTION

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

Cutting

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

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

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)

Graphic Protection

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

- Clear 8530 must be applied with a liquid laminator.
- Overlaminates must be cold roll applied.

Application Tapes

When to Use Premasking Tape

- As an application aid to increase stiffness, and prevent stretching and damage during application.
- When little or no liner is exposed.

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.

Note: Prespacing tape does not adhere to the exposed liner of film IJ180Cv3, but it does adhere to the top of the film. Therefore, prespacing tape may still be useful when applying large graphics—even large cut graphics—with some smaller cut and weeded graphics to hold the elements in alignment. Use film IJ180 or IJ180C for more intricately cut and weeded graphics.

How to Select a Tape

Determine whether you want to premask the graphic or prespace cut pieces of film such as letters. Then locate the graphic protection used on your graphic in the table below, and use the corresponding tape. See Instruction Bulletin 4.3 for complete details.

EXAMPLE: To premask a film includes overlaminate 8519, use premasking tape SCPM-3.

See the Table on the next page.

Tape	Graphic Protection						
	None	8519 8520	8908 8909	8530	1920DR	9720i 9720UV	8518
Premasking SCPM-3	■	■	■	■	■	—	NR
Prespacing SCPS-2 <i>IJ180, RG180 only</i>	■	■	■	NR	■	—	—
Premasking SCPM-44X	—	—	—	—	—	■	—
Prespacing SCPS-55 <i>films with any Comply Adhesive only</i>	■	■	NR	NR	■	■	NR
Prespacing SCPS-53X	—	—	—	—	—	■	—

NR = The use of an application tape is not recommended in this construction.

Application and Installation

Adhesive

All Films in this Bulletin

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.

This film has a pressure-activated adhesive that allows the film to slide easily on the substrate, be positioned with light finger pressure, and repositioned if it is not in the right place. However, by design so that a good adhesive bond is established, the positionability feature is lost:

- when firm pressure is applied with a squeegee or other application tool
- at application temperatures above 100°F (38°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 piezo inkjet ink that has not completely dried and is retained by the film also affects slideability and positionability.

These films also have air release channels, a characteristic of Comply adhesive. Removing and attempting to change liners or reapply the same liner damages air release channels.

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.

Films IJ180C, IJ180Cv3 (all versions) with Comply™ Adhesive

Graphics Printed with UV Piezo Inkjet Inks are Heat Sensitive!

UV piezo 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 also cause UV piezo inkjet ink to crack.

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

Application to Vehicles

Read and follow all instructions, and complete the *3M Automobiles, Vans and Buses Pre-installation Inspection Record* in Instruction Bulletin 5.36 prior to manufacturing or applying any graphic to a standard vehicle, van or bus.

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.)

Removal

Removal requires heat and/or chemicals. A chemical remover system is available for graphics printed with solvent-based ink. Follow the procedures in Instruction Bulletin 6.5 for using film remover R-221 and adhesive remover R-231 and for additional removal details.

Shelf Life, Storage and Shipping

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.

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

Shipping Finished Graphics

Flat, or rolled printed side out on 5 inch (13 cm) or larger core. This helps prevent the application tape, if used, from popping off.



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.

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™ Trident Transfer Paper	PB	Trident
3M™ Piezo Inkjet Ink Series 2200UV	PB-IB	2200UV
3M™ Piezo Inkjet Ink Series 2600UVv2	PB-IB	2600UVv2
3M™ Piezo Inkjet Ink Series 2700UV	PB-IB	2700UV
3M™ Piezo Inkjet Ink Series 2800UV	PB-IB	2800UV
3M™ Piezo Inkjet Ink Series 5400UV	PB-IB	5400UV
Mimaki Ink Series LF-200	PB-IB	LF-200
Mimaki Ink Series F-200	PB-IB	F-200
3M™ Piezo Inkjet Ink Series 1500v2	PB-IB	1500
3M™ Piezo Inkjet Ink Series 4400	PB-IB	4400
3M™ Piezo Inkjet Ink Series 4600	PB-IB	4600
3M™ Piezo Inkjet Ink Series 4800	PB-IB	4800
3M™ Piezo Inkjet Ink Series 5500	PB-IB	5500
3M™ Piezo Inkjet Ink Series 6000	PB-IB	6000
3M™ Piezo Inkjet Ink Series 6800	PB-IB	6800
3M Graphic Protection Products <i>overview of all graphic protection products and specific information on most overlaminates</i>	PB	GP-1
3M™ Piezo Inkjet Protective Clear 8530	PB	8530
3M™ Screen Print Clear 8920 ES	PB	8920
3M™ Screen Print Gloss Clear 1920DR - Applying screen printing clear 1920DR	PB IB	1900 3.12
3M™ Screen Print UV Gloss Clear 9720i, 9720UV, 9730UV	PB-IB	Clears 9720
Design of graphics	IB	2.1
Scoring and cutting	IB	4.1
Transferring and laminating electrostatically printed images	IB	4.7
Using 3M application tapes; premasking and prespacing for films	IB	4.3
Cold roll lamination	IB	4.22
Application, substrate selection, preparation and substrate-specific application techniques	IB	5.1

Subject	Type	Bulletin No.
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
Application techniques for automobiles, vans and buses, and inspection forms	IB	5.36
A guide to understanding and applying graphics to common indoor and outdoor wall surfaces	IB	5.37
Application: special considerations for watercraft	IB	5.42
Storage, handling, maintenance, removal	IB	6.5
3M Graphics Market Center Warranty Brochure 3M™ MCS™ Warranty matrices Performance Guarantee Printer, Ink, Film and Graphic Protection Matrices	www.3Mgraphics.com,	Warranties
3M Graphics Center Warranty Brochure	www.3Mgraphics.com,	Warranties

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Bulletin Change Summary

Film IJ180Cv2 has been discontinued. Changed limitation on page 1 to read “printed” vehicle graphics. Added printer TJ8350 as an approved printer for ink series 4800. Up-graded the warranty section to enhance understanding. Added clear 9720i as an approved graphic protection in the Performance Guarantee program. Readded Application, Maintenance and Shelf Life information that was accidentally omitted from the last version of this bulletin. Increase Shelf Life from 2 years to 3 years from the date of manufacture on the box.



Commercial Graphics Division
3M Center, Building 220-12E-04
PO Box 33220
St. Paul, MN 55144-3220 USA
General Info. 1-800-374-6772
Technical Info. 1-800-328-3908
Fax 1-651-736-4233

3M Canada
P.O. Box 5757
London, Ontario
Canada N6A 4T1
1-800-265-1840
Fax 519-452-6245

3M México, S.A. de C.V
Av. Santa Fe No. 55
Col. Santa Fe, Del. Alvaro Obregón
México, D.F. 01210
52-55-52-70-04-00
Fax 52-55-52-70-22-77

3M Puerto Rico, Inc.
Puerto Rico Industrial Park
350 Chardon Avenue, Suite 1100
San Juan PR 00918
787-620-3000
Fax 787-620-3018

www.3Mgraphics.com

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