



## Controltac™ Graphic Film

IJ180-10 and RG180-10

## Controltac™ Graphic Film with Comply™ Adhesive

IJ180C-10, RG180C-10 and FN180C-10

## Controltac™ Graphic Film with Comply™ v2 Adhesive

IJ180Cv2-10, RG180Cv2-10 and FN180Cv2-10

## Controltac™ Graphic Film with Comply™ v3 Adhesive

IJ180Cv3-10, RG180Cv3-10 and FN180Cv3-10

### For Piezo Inkjet Printing Only

### Product Description

These are 2 mil films that 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 IJ180C and IJ180Cv2 and IJ180Cv3 (all versions) with Comply adhesive have air release channels for fast and easy, bubble-free graphic installations.

The air release channels for films with Comply v2 and Comply v3 adhesive are not visible.

The channels in IJ180Cv3 also have improved air release.

Use these films for piezo 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 details.

- Indoor and outdoor graphics and signs
- 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)

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- **For film IJ180Cv3 (all versions) only:** Using prespacing tape in cut and weeded applications where the tape must adhere to the exposed liner
- Film without graphic protection under these conditions:
  - 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 this film
- 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.

### Piezo Inkjet Printers and Inks

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

#### Ink Series

- 3M™ Piezo Inkjet Ink Series 2200UV
- 3M™ Piezo Inkjet Ink Series 2600UVv2
- 3M™ Piezo Inkjet Ink Series 2700UV
- 3M™ Piezo Inkjet Ink Series 2800UV
- 3M™ Piezo Inkjet Ink Series 5400UV
- Mimaki LF-200 Ink Series *manufactured by 3M*
- Mimaki F-200 Ink Series *manufactured by 3M*
- 3M™ Piezo Inkjet Ink Series 1500v2
- 3M™ Piezo Inkjet Ink Series 4400
- 3M™ Piezo Inkjet Ink Series 4600
- 3M™ Piezo Inkjet Ink Series 4800
- 3M™ Piezo Inkjet Ink Series 5500
- 3M™ Piezo Inkjet Ink Series 6000
- 3M™ Piezo Inkjet Ink Series 6800

#### Printer

- EFI™ VUTEK® PV 200 Printer
- 3M™ Printer 2500UV
- Durst Rho 160R Printer
- EFI™ VUTEK® QS2000/QS3200 Printers
- HP Designjet 788 Printer
- Mimaki UJV-160 Printer
- Mimaki JF-1610, 1631 Printers
- EFI™ VUTEK® 150, 2360/3360, 3300/5300 and 3000/5000 Printers
- HP XLJet 1200 and 1500 Printers
- HP Scitex Pressjet-W™ Printer
- HP Scitex TJ8300 Series Digital Press
- Océ Arizona 600 Printer
- Océ Arizona 30s Printer
- Océ Arizona 180 and 90 Printers

### Graphic Protection Options

- 3M™ Scotchcal™ Gloss Overlamine 8518 *3M Performance Guarantee Only*
- 3M™ Scotchcal™ Luster Overlamine 8519
- 3M™ Scotchcal™ Matte Overlamine 8520
- 3M™ Scotchcal™ Luster Overlamine 8908
- 3M™ Scotchcal™ Matte Overlamine 8909

*Continued on the next page*

- 3M™ Piezo Inkjet Protective Clear 8530
- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print UV Gloss Clear 9720i
- 3M™ Screen Print Clear 9720UV

**Other Products**

- 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	
Film color	White, opaque	
Thickness	<b>Without adhesive:</b> 2 mil (0.05 mm) <b>With adhesive:</b> 3-4 mil (0.08-0.10 mm)	
Adhesive	<b>Films IJ180 (all versions):</b> Pressure-activated, slideable, repositionable <b>Films IJ180C, IJ180Cv2, IJ180Cv3 (all versions):</b> 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 Fruehauf pre-painted panels	4.8 pounds/inch (0.87 kg/cm) 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"> <li>• Resists mild alkalis, mild acids, and salt</li> <li>• Excellent resistance to water (<i>does not include immersion</i>)</li> <li>• Resists occasional fuel spills</li> </ul>	
Flammability	Call 1-800-328-3908 for information	

**Application Characteristics**

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

## Warranty Information

The warranted durability given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honor. **The warranties in the following table(s), given in years, are for finished graphics exposed in a vertical exposure in the United States except the Desert Southwest.** See the warranty sections following this table for additional information.

### 3M™ MCS™ Warranty for Finished Graphics

Veh = Vehicle Graphics  
 Water = Watercraft  
 Out = Outdoor Signage  
 In = Indoor Signage

Graphic Protection	EFI™				HP				HP Scitex				HP Scitex			
	VUTEk® 150, 2360/3360, 3300/5300, 3000/5000				XLJet Series 1200, 1500				Pressjet™ -W				TJ8300 Series Digital Press			
	Ink Series 1500v2				Ink Series 4400				Ink Series 4600				Ink Series 4800			
	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			
	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

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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			
	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		
	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

**3M™ MCS™ Warranty**  
for Graphics in a Non-Vertical or  
Desert Southwest Orientation

Use the years of warranted durability indicated in the tables, above, for your graphic construction and the following formulas to determine other durabilities.

Exposure	Percentage of U.S. Vertical Exposure	Example
U.S. Non-vertical	50% (0.5)	0.5 x 5 years = 2.5 years
Desert Southwest Vertical	70% (0.7)	0.7 x 5 years = 3.5 years
Desert Southwest Non-vertical	35% (0.35)	0.35 x 5 years = 1.75 years

**Paint Refurbishing  
Reimbursement Policy**  
for 3M™ MCS™ Warranty

Warranty Stipulations for  
Van, Bus, Recreational Vehicles  
or Automobile ("Vehicle")

Claims for paint damage for certain vehicle graphics will be considered only if a Pre-Installation and Inspection Report (see Instruction Bulletin 5.36) was completed prior to graphic installation and is 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 the claim is required.

This policy specifically does not include vehicles identified by 3M as watercraft.

**Watercraft Warranty  
Stipulations**

Refer to Instruction Bulletin 5.42 for complete details.

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

## Removal Warranty

If the film cannot be successfully removed or an excessive amount of adhesive residue remains on the surface, 3M will reimburse a portion of extra removal costs.

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.

### Removal Labor Reimbursement Remedy for Removable and Changeable Films

Orientation	Remedy
Vertical	Same as Warranted Durability
Non-vertical (for 3M™ MCST™ Warranty constructions only)	50% of the U.S. Vertical Warranted Durability, not to exceed 3.5 years

### Removal Warranty Exceptions

- This film is not designed for short-term graphics on painted wallboard and may cause damage upon removal from painted surfaces.
- Removal from a pre-existing graphic will damage that graphic.
- Aged paint and metals must be tested to ensure removability. Surface oxidation or chalking may result in adhesive residue upon removal.
- Paint that is not firmly bonded to the substrate may be damaged when removing the film.
- Paint that is not properly cured may prevent the film from being removed.
- Outdoor horizontal applications may not remove cleanly.

## 3M Performance Guarantee Graphic Constructions and Durability

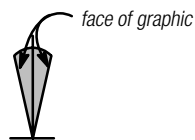
For 3M Product Performance Only

Graphics constructed as described in the table below are eligible for the 3M Performance Guarantee when exposed in a vertical exposure in the United States. This warranty covers the performance of only the recommended 3M products used in the graphic construction when imaged with the printers and OEM inks listed in the most current version of Product Bulletin PG Matrix. That Bulletin may also list certain restrictions for using the film covered in this Bulletin. 3M will honor the warranty given in the version of this Bulletin that was current at the time you purchased the film.

Film	Graphic Protection	Warranty		Inks and Printers
		Vehicle Outdoor, Indoor	Watercraft	
IJ180-10 IJ180C-10 IJ180Cv2-10 IJ180Cv3-10	1920DR 8518 8519 8520 9720UV	3	2	See Product Bulletin: PG Matrix

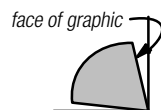
## Definitions

### Vertical Exposure



The face of the graphic is  $\pm 10^\circ$  from vertical.

### Non-vertical Exposure



The face of the graphic is greater than  $10^\circ$  from vertical and greater than  $5^\circ$  from horizontal.

### Desert Southwest

Graphics exposed to solar energy more than half of the time in Arizona, New Mexico and the desert areas of California, Nevada, Utah and Texas. A detailed map is available at 3Mgraphics.com under Warranties.

### OEM

Labels and decorative graphics produced for original equipment manufacturers.

### Signs

Graphics applied outdoors and exposed to the elements.

<b>Railroad</b>	Graphics applied on railroad cars but not railroad engines.
<b>Fleet vehicle</b>	Straight trucks and trailers used in commercial fleets.
<b>Recreational vehicle</b>	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.
<b>Watercraft</b>	Watercraft 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 other boats used in connection with commercial or business enterprise. 3M specifically excludes all other recreational vehicles from this definition.
<b>Standard vehicle</b>	Buses, vans, automobiles, recreational vehicles unless otherwise noted.
<b>Indoor and Outdoor</b>	Refers to graphics for signs used indoors or outdoors.
<b>Factors that Affect Graphic Performance Life</b>	<p>The actual performance life of a graphic is affected by all of the following.</p> <ul style="list-style-type: none"> <li>• Correct combination of 3M-recommended graphics products.</li> <li>• Ink formulation</li> <li>• Adequate ink drying or curing</li> <li>• Selection and preparation of the substrate</li> <li>• Surface texture</li> <li>• Application methods</li> <li>• Angle and direction of sun exposure</li> <li>• Environmental conditions</li> <li>• Cleaning or maintenance methods</li> </ul>

**Application Outside the U.S.** Contact the 3M organization for that country.

**Graphics Made with Components Not Sold or Recommended by 3M** The 3M™ MCS™ Warranty does not cover finished graphics made with other manufacturers' inks, film, graphic protection and/or application tapes. The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include non-3M graphic products.

The 3M Performance Guarantee covers selected 3M graphic products when used with qualified printers and OEM inks. See Product Bulletin: PG Matrix.

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

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

**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 Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

## Printer Support Information

### Ink

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

### Total Ink Coverage

The maximum recommended total ink coverage for this film is:

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

**280%** when printed with all approved 3M UV inks.

**250%** when printed on the Mimaki JV5 Series printer with HS ink series (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 overlaminate, rolling the graphic, and applying the film. See the ink's Instruction Bulletin for more details.



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

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### 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 can improve the appearance, performance and durability of your 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.

*Continued on the next page.*



## 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, it 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 on your graphic in the table below, and use the corresponding tape. See Instruction Bulletin 4.3 for complete details.

**EXAMPLE:** If the film is protected by overlamine 8519 and you want to premask the film, use premasking tape SCPM-3.

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 with a squeegee or other application tool is applied, at application temperatures above 100°F (38°C) even if only light finger pressure was used for tacking, and 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 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, IJ180Cv2, IJ180Cv3  
(all versions) with Comply™ Adhesive**

**Films IJ180, RG180**

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.

## 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 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.

## Finishing

**Vehicle, indoor and outdoor graphics.** These films may require edge sealing. Applications such as rail cars may benefit from using edge sealer 3950 when subject to external sources such as abrasion and/or power-washing.

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

## 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

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: 2 years from date of manufacture**

Up to 2 years unprocessed, **OR** process within 1 year **and** 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.

## Health and Safety



**CAUTION**

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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](http://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.

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## 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](http://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 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™ Scotchcal™ Gloss Overlaminates 8518	PB	8518
3M™ Scotchcal™ Luster Overlaminates 8519 and 8520	PB	8519/8520
3M™ Piezo Inkjet Protective Clear 8530	PB	8530
3M™ Scotchcal™ Luster Overlaminates 8908	PB	8908
3M™ Scotchcal™ Matte Overlaminates 8909	PB	8909
3M™ Screen Print Gloss Clear 1920DR	PB	1900
- Applying screen printing clear 1920DR	IB	3.12
3M™ Screen Print UV Gloss Clear 9720i	PB-IB	9720i
3M™ Screen Print Gloss Clear 9720UV and Matte Clear 9730UV	PB	9700
-Applying screen printing clear 9720UV or 9730UV	IB	3.4
Design of graphics	IB	2.1
Scoring and cutting	IB	4.1
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
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 Center Warranty Brochure	Go to <a href="http://www.3Mgraphics.com">www.3Mgraphics.com</a> , Warranties	

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## Bulletin Change Summary

Added new film IJ180Cv3-10 (all versions). This film has improved air release channels. Added 3M™ Piezo Inkjet Ink Series 4400 for HP XLJet 1200 and 1500 Printers. Added Mimaki LF-200 Ink Series for the Mimaki UJV-160 Printer and Mimaki L-200 Ink series for the Mimaki JF-1610, 1631 Printers. Corrected warranty matrix for Performance Guarantee: Overlamine 8518 on the listed films is warranted for two years for watercraft application. Refer to the black bars in the margin to identify areas where text may have been added or modified.



### 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

[www.3Mgraphics.com](http://www.3Mgraphics.com)

### 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  
P.O. Box 100  
Carolina, PR 00986-0100  
787-620-3000  
Fax 787-750-3035

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