



# Controltac™ Plus Graphic Film RG180-10

**For Piezo Ink Jet Printing Only**

## Description

3M™ Controltac™ Plus Graphic Film RG180-10 designed for the production of removable piezo ink jet graphics on the Océ Arizona 180 Printer. It offers long term exterior durability. Application is easy thanks to 3M's repositionable adhesive.

## Advantages

- Medium to long term exterior durability
- Excellent hiding power
- Removable adhesive, with heat or a chemical system

## Applications and Uses

Film RG180-10 is intended for making graphics when used with the listed Compatible Products and in the following applications. These types of applications are warranted by the 3M™ MCS™ Warranty with the Special Warranty Stipulations when used for automobile or vehicle graphics. See page 3.

- For interior and exterior applications including opaque commercial signs, emblems, labels, graphics, striping, and graphics for fleet and vehicle, rail cars, and recreational equipment

## Limitations of End Uses

We do not normally warrant other applications, but please contact us to discuss your needs or let us suggest other 3M products.

Specifically, we do not warrant this film for the following:

- Graphics applied to:
  - Non-3M films.
  - Substrates that do not have a clean, smooth surface or have poor paint-to-substrate adhesion.
  - Stainless steel on vehicles.
  - Substrates with valleys into which the film would have to be stretched to conform it.
- Graphics subjected to gasoline vapors or spills such as gas pumps, automobile fuel-tank ports or top-feeding petroleum tankers.
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684, Ext. 444, for alternatives.

NOTE: Film used on buses must not be applied so as to restrict the safe use of emergency window exits. See Instruction Bulletin 5.4, Release G, July 2003 or later for details.

## Compatible Products

### Inks

- 3M™ Piezo Ink Jet Ink Series 6800

Note: Ink series 6800 replaces both ink series 6700 and ink series 3700. There is no change in warranty. Use up existing inventory of old inks but do not mix the ink series.

### Overprint Clears and Overlaminates

- 3M™ Screen Printing Gloss Clear 1920DR
- 3M™ Screen Printing Gloss Clear 9720UV
- 3M™ Scotchcal™ Luster Overlamine 8519
- 3M™ Scotchcal™ Matte Overlamine 8520
- 3M™ Scotchcal™ Luster Overlamine 8908 ES
- 3M™ Scotchcal™ Matte Overlamine 8909 ES

### Application Tapes and Edge Sealer

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


## Characteristics

Characteristic	Description
Film	Cast vinyl
Film color	White, opaque
Film thickness	2 mils (0.005 mm) <i>without adhesive</i> 3 to 4 mils (0.008 to 0.010 mm) <i>with adhesive</i>
Adhesive type and color	Positionable, pressure activated, gray
Liner	94 pound, polyethylene-coated paper
Application surfaces	Flat, with and without rivets, corrugated, simple curves, moderate compound curves

Note: For the full product names of the 3M products listed on this page, please see page 1.

Characteristic	Description
Recommended substrates	ABS resins, aluminum, chrome, glass fiberglass-reinforced plastic, paint (check adhesion to powder or water-base paints)
Application temperature range	Flat surfaces with and without rivets: 40° to 100°F (4° to 38°C) Corrugated surfaces with rivets: 50° to 100°F (10° to 38°C)
Removal	Removable with heat or chemicals within warranted life of product
Removal temperature	50°F (10°C) minimum

### Warranted Durability

Construction and Usage	 <b>Vertical Exposure</b> <i>face of graphic is ± 10° from vertical</i>										See Product Bulletin 8530	
	<b>Overlamine or Screen Print Clear<sup>1</sup></b>											
	<b>8519 8520</b>		<b>1920DR<sup>3</sup></b>		<b>IJ9720UV<sup>3, 4</sup></b>		<b>8908<sup>2</sup> 8909<sup>2</sup></b>		<b>None</b>			<b>8530</b>
	US <sup>2</sup> years	SW <sup>6</sup> years	US <sup>2</sup> years	SW <sup>6</sup> years	US <sup>2</sup> years	SW <sup>6</sup> years	US <sup>2</sup> years	SW <sup>6</sup> years	US <sup>2</sup> years	SW <sup>6</sup> years		
<b>Fleet<sup>2</sup></b>	5	3	5	3	3	2	0	0	0	0		
<b>Exterior Signs</b>	4	2.5	4	2.5	3	2	1	1	3	2		
<b>Interior Signs</b>	8	8	NR	NR	NR	NR	3	3	3	3		

NR = not recommended or warranted  
 SW = U.S. Desert Southwest  
 US = United States

- See **When to Use an Overlamine or Clear Coat** and **How to Select an Overlamine or Clear Coat**.
- Overlaminates 8908 and 8909 are not warranted or recommended for use on fleet graphics.
- Clear 1920DR and IJ9720UV must be screen printed in order to be warranted.
- IJ9720UV must be UV cured.
- For warranty periods outside the United States, contact the 3M sales organization for that country.
- The U.S. Desert Southwest includes Arizona, New Mexico, and the desert areas of California, Nevada, Utah and Texas. A detailed map is available by request. The warranty for this area is reduced because there is more solar energy. This warranty applies to graphics exposed to solar energy in the U.S. Desert Southwest more than 50% of the time.

## Effective Performance Life

Only a Scotchprint® Graphics Authorized Manufacturer or 3M Piezo Ink Jet Registered Fabricator can produce 3M™ MCS™ Warranted Graphics. The effective performance life is based on field experience and exposure tests conducted throughout the United States. When the graphics are processed and used according to the 3M recommendations, they should have the performance life shown in the table below. The actual performance depends on the:

- Correct combination of film, ink, and overlamine or clear coat
- Adequate drying
- Selection and preparation of the substrate
- Application methods
- Exposure conditions
- Cleaning or maintenance methods

## When to Use an Overlamine or Clear Coat

An overlamine or clear coat provides protection to a graphic as well as changing gloss. Typically, only graphics that are subjected to harsh conditions require this protection in order to be warranted. They include:

- Vehicle and fleet graphics; such graphics are subjected to abrasion such as road debris and automatic/power washing.
- Any graphic exposed to abrasive washing conditions, including automatic/power washing, harsh cleaners or chemicals.

Note: For the full product names of the 3M products listed on this page, please see page 1.

## Printing with Solvent-Based Piezo Ink Jet Inks


Be sure the operator reads and follows “Understanding Printing with Solvent-Based Piezo Ink Jet Inks,” also in Instruction Bulletin 4.40. An operator who understands pre-press operations and the relationship between film characteristics, printer setup, total ink coverage and drying time can produce graphics that achieve the performance expectations of the film and the customer. The operator should also work with the graphic designer and/or color conversion operator so there is a common understanding of print and media parameters.

To get the durability given in the Effective Performance Life, follow the guidelines and procedures in Instruction Bulletin 4.40 for printing with piezo ink jet ink series 6800.

### Total Ink Coverage

Do not exceed a total ink coverage of 300% for film RG180-10. Too high a total physical ink amount on the film results in media characteristic changes, inadequate drying, overlamine lifting, and/or poor graphic performance. Lifting on corrugations and tenting on rivets is possible with higher ink coverage.

## Drying

 <b>Caution</b>
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 the graphic, and applying the film. See Instruction Bulletin 4.40 for more details.

## Cutting

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

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

The following are minimum values for electronically cutting text from film RG180-10. They 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)

## Application Tapes

The type of application tape to use depends on the type of graphic produced and the ink, overlamine or overprint that was applied last. See Instruction Bulletin 4.3 for details.

- Use a prespacing tape if the graphic has large amounts of liner exposed.
- Use a premasking tape if there is very little of the liner exposed.

Clear Coat	Prespacing Tape	Premasking Tape
Printed, uncleared 1920DR 8519 8520	SCPS-2	SCPM-3
8908 8909	None	SCPM-3

## Special Warranty Stipulations for Automobile and Bus Graphics

When applied to an automobile, an Auto Graphics Pre-installation And Inspection Record (Instruction Bulletin 5.36) must be completed for each vehicle and readily available if a warranty claim is made.

When applied to a bus, a Bus Graphics Pre-installation And Inspection Record (Instruction Bulletin 5.36) must be completed for each vehicle and readily available if a warranty claim is made.

## Application

Refer to the Instruction Bulletins listed in the 3M Related Literature section, located at the end of this Bulletin, for more complete information.

The following application details are specific to film RG180-10.

### Application Temperature Range

- The application temperature range for flat surfaces with and without rivets is 40° to 100°F (4° to 38°C).
- The application temperature range for corrugated surfaces with rivets is 50° to 100°F (10° to 38°C).

### Positioning

This film has a positionable adhesive. Application pressure bonds the adhesive to the substrate and destroys the positionability feature. The film loses its positionability feature at application temperatures above 100°F (38°C).

Do not use detergent and water or a commercial application liquid to position the graphic on a vehicle.

Note: For the full product names of the 3M products listed on this page, please see page 1.

## Finishing

This film does not require an edge sealer. However, certain applications such as cut graphics may benefit from using it. If needed, use edge sealer 3950.

## Maintenance and Cleaning

Use a cleaner such as the kind used 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

Film RG180-10 is warranted to be removable for up to the warranted life. Film remover R-221 and adhesive remover R-231 are available. Refer to Instruction Bulletin 6.5, *Storage, Handling, Maintenance and Removal*.

### Removability Exceptions

- A signed Pre-installation Review is required as a condition for warranty on buses. See *Instruction Bulletin 5.36* and *Vehicle Graphics Warranty*.

Note: This film is not designed for short-term graphics and may cause damage upon removal from painted surfaces.

- Removal from exterior, horizontal applications is not warranted.
- 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.
- Paints that are not properly cured may prevent the film from being removed.

## Shelf Life, Storage, and Shipping

Follow these guidelines to store and ship this film and the processed graphics.

- Unprocessed film has a shelf life of two years after receipt from 3M. Processed film has a shelf life of one year. However, the total shelf life of a graphic before and after processing cannot exceed two years.
- Store the film in a clean, dry area, out of the direct sunlight, and at less than 100°F (38°C).
- Ship the finished graphic lying flat or roll the graphic. To roll the graphic, wrap it film side out onto a core that is 5 inches (13 cm) or larger in diameter. These methods prevent the liner from wrinkling or popping off.

## 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:

- By fax, call 1-800-364-0768 in the US and Canada or 1-650-556-8417 for all other locations.
- Electronically, visit us at <http://www.3M.com/MSDS>.
- 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.

## Product Data

Values given are typical for film RG180-10 and are not for use in specifications. For a custom specification, submit a request to your 3M sales representative. The data given below are for unprinted film.

### Physical Characteristics

Property	Value
Tensile strength (minimum)	5 pounds/inch at 73°F (0.9 kg/cm at 23°C)
Applied shrinkage	0.015 inch (0.4 mm)
Service temperature range	-65° to +225°F (-60° to +107°C)

### Typical Adhesion Characteristics

This adhesion value is 24 hours after application.

Substrate	Value
ABS	3.9 pounds/inch (0.7 kg/cm)
Acrylic enamel	3.2 pounds/inch (0.6 kg/cm)
Aluminum, etched	5 pounds/inch (0.9 kg/cm)
Chrome	4.5 pounds/inch (0.8 kg/cm)

### Chemical Resistance Characteristics

- Resists mild alkalis, mild acids, and salt.
- Excellent resistance to water.

Note: For the full product names of the 3M products listed on this page, please see page 1.

## Warranty and Limited Warranty

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: Film RG180-10 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. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. See the worldwide 3M™ MCS™ Warranty bulletin, which gives the terms and limitations of the warranty.

**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.**

### Attention:

#### Scotchprint® Graphics Authorized Manufacturers

Visit our password-protected website ([www.scotchprint.com](http://www.scotchprint.com), then *Login*) for exclusive product information, services and product promotions for 3M's Scotchprint® Graphics Authorized Manufacturers.

Ask your Commercial Graphics Division sales representative to sign you up today!

## 3M Related Literature

**Before starting any job, be sure you have the most recent product and instruction bulletins.**

Listed below is related 3M technical literature that may be of interest. You may view and print these Bulletins from our Web site at [www.scotchprint.com](http://www.scotchprint.com), or order them via our Fax-on-Demand (FOD) system. Call one of these phone numbers to order the desired bulletins, and specify the FOD document number provided in the chart.

United States or Canada: 1-800-364-0768

International: 1-651-732-6506

Subject	Bulletin No.	FOD No.
<b>Product Bulletins</b>		
3M™ Piezo Ink Jet Ink Series 6800	6800	4574
3M™ Screen Printing Ink Series 1900	1900	2501
Screen printing ink series 9700UV For IJ9720UV	9700	2507
3M™ Scotchcal™ Overlamine 8519 and 8520	8519/ 8520	4524
3M™ Scotchcal™ Luster Overlamine 8908 ES	8908	3554
3M™ Scotchcal™ Matte Overlamine 8909 ES	8909	3565
<b>Instruction Bulletins</b>		
Printing with piezo ink series 6800	4.40	6540
Screen printing with ink 1900	3.11	6011
Screen printing with ink series 9700 UV	3.4	6004
Cold roll lamination	4.22	6522
Scoring and cutting	4.1	6501
Using 3M application tapes; premasking and prespacing for films	4.3	6503
Application, substrate selection, preparation and substrate-specific application techniques	5.1	7001
Application, special applications and vehicles	5.4	7004
Application:Special Considerations for Complex Contours of Automobiles, Vans and Buses and Inspection Forms	5.36	7036
Application, general procedures for interior and exterior dry applications	5.5	7005
Storage, handling, maintenance, removal	6.5	8505
<b>Other Documents</b>		
Vehicle Graphics Warranty		9509

Scotchprint is a registered trademark of 3M in the US and other countries. 3M, MCS and Scotchcal are trademarks of 3M.

### Bulletin Change Summary

Added information about using this film for Vehicle and Bus graphics, including Special Warranty Stipulations on page 5 and two bulletins on this page. Added IJ9720UV as an approved clear coat. Other changes as marked by black bar in margin.



#### Commercial Graphics Division

3M Center, Building 220-6W-06  
PO Box 33220  
St. Paul, MN 55133-3220 USA  
General Info. 1-800-374-6772  
Technical Info. 1-800-328-3908  
Fax 1-651-736-4233

Fax-on-Demand 1-800-364-0768 US/Canada or 1-651-732-6506 International  
Fax-on-Demand document: 4518  
[www.scotchprint.com](http://www.scotchprint.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

©3M 2004. All rights reserved.