



Controltac™ Plus Graphic Film with Comply™ Performance RG180C-10

Description

3M™ Controltac™ Plus Graphic Film with Comply™ Performance RG180C-10 is a versatile 2-mil film. It is durable, flexible, repositionable, removable and has the Comply feature, which makes application faster and easier. It is well suited for large format graphics on flat or corrugated substrates.

Advantages

- Approved for use with Océ Arizona 180 Printer
- Includes Comply™ Performance feature for easier, high quality installations.
- Suitable for large exterior and interior graphics
- Medium to long term exterior durability
- Easy to temporarily position during application
- For flat and corrugated surfaces with and without rivets
- Excellent hiding power
- Removable adhesive, with heat or a chemical system
- Wide application and removal temperature

Applications and Uses

Film RG180C-10 is intended for making removable, durable graphics when used with the listed Compatible Products and in the following applications. Any other application is NOT warranted by 3M or covered by the worldwide 3M™ MCS™ Warranty unless 3M gives its prior written approval for the application.

- 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.

Compatible Products for Warranted Graphics

Inks and Printers

- 3M™ Piezo Ink Jet Ink Series 6700
 - Océ Arizona 180 Printer

Overlaminates and Clear Coats

- 3M™ Screen Printing Gloss Clear 1920DR
- 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-55
- 3M™ Premasking Tape SCPM-3
- 3M™ Edge Sealer 3950

Note: All Product and Instruction Bulletins mentioned in this bulletin can be ordered through our Fax-on-Demand system. See 3M Related Literature near the end of this bulletin for details.

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

Characteristics

Characteristic	Description
Film	2 mil (0.005 mm) opaque vinyl, white
Film thickness with adhesive	3 to 4 mil (0.008 to 0.010 mm)
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
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

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

Warranted Durability

Type of Graphic	Vertical Exposure face of graphic is $\pm 10^\circ$ from vertical							
	Overlamine or Clear Coat ¹							
	8519 8520		1920DR		8908 ES 8909 ES		None	
	US ² years	SW ⁵ years	US ² years	SW ⁵ years	US ² years	SW ⁵ years	US ² years	SW ⁵ years
Fleet ⁴	5	3	5	3	NR	NR	NR	NR
Exterior Signs	4	2.5	4	2.5	1	1	3	2
Interior Signs	8	8	NR	NR	3	3	3	3

NR = not recommended or warranted

SW = U.S. Desert Southwest

US = United States

- ¹ See **When to Use an Overlamine or Clear Coat** and **How to Use an Overlamine or Clear Coat**.
- ² For warranty periods outside the United States, contact the 3M sales organization for that country.
- ³ 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.
- ⁴ The film will tent around rivets and will lift from corrugations.

When to Use an Overlamine or Clear Coat

An overprint clear or overlamine 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.

How to Select an Overlamine or Clear Coat

Typically, an overlamine or Clear Coat is selected based on the following criteria. Refer to the product's Product Bulletin for details.

1. Intended application
2. Type of available equipment (screen printing or laminator)
3. Desired durability
4. Gloss
5. Cost

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 4.25. 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 4.25 for printing with piezo ink jet ink series 6700.

Total Ink Coverage

Do not exceed a total ink coverage of 300% for film RG180C-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

Caution

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 4.25 for more details.

Cutting

Caution

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

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 RG180C-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 clear coat 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-55	SCPM-3
8908 ES 8909 ES	None	SCPM-3

Application

Instruction Bulletin 5.31 discusses the application of films with Comply performance. Refer 3M Related Literature, located at the end of this bulletin, for how to obtain this bulletin and others.

The following application details are specific to film RG180C-10.

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

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.

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 RG180C-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


- 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 five 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:	
<ul style="list-style-type: none">• 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 unprocessed film RG180C-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)

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

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.

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: 3M™ Controltac™ Plus Graphic Film with Comply™ Performance RG180C-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.

Scotchprint® Graphics Network

There's a whole other world behind the Scotchprint® Graphics Internet site (www.scotchprint.com) and you can travel there with the Scotchprint® Graphics Network. This password-protected Web site opens the door to exclusive Scotchprint® Graphics product information, services and e-deals (product promotions) that are not available on our regular Internet site.

There's no charge and you can sign up today. Just ask your Commercial Graphics Division sales representative, or contact Lisa Burns (ljburns3@mmm.com or 651-736-9719).

3M Related Literature

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, 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.

Subject	Bulletin No.	FOD No.
Product Bulletins		
3M™ Piezo Ink Jet Ink Series 6700	6700	4559
3M™ Screen Printing Ink Series 1900	1900	2501
3M™ Scotchcal™ Overlaminates 8519/8519CP and 8520/8520CP	8519/8520	4524
3M™ Scotchcal™ Luster Overlaminates 8908 ES	8908	3554
3M™ Scotchcal™ Matte Overlaminates 8909 ES	8909	3565
Instruction Bulletins		
Piezo ink jet printing with ink series 6700	4.38	6538
Screen printing with ink 1900	3.11	6011
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
Applying 3M graphic films with Comply™ Performance	5.31	7031
Storage, handling, maintenance, removal	6.5	8505
Warranties		
Worldwide 3M™ MCS™ Warranty Packet (includes all Commercial Graphics MCS Warranties)		9503
Worldwide 3M™ MCS™ Warranty Overview-Folder		9504
3M™ MCS™ Graphics Warranty for Fleet Vehicle Applications (includes overview)		9506

3M, MCS and Scotchcal are trademarks of 3M.

Scotchprint is a registered trademark of 3M in the US and other countries.

Bulletin Change Summary

Ink series 6700 replaces ink series 3700. Screen print clear 9720UV is no longer recommended or warranted for piezo ink jet graphics. Other changes or additions marked with a black bar in the 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: 4555
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