



Controltac™ Plus

Graphic Film with Comply™ Adhesive

IJ160C-10, RG160C-10 and FN160C-10

For Piezo Ink Jet Printing Only

Description

Films IJ160C-10, RG160C-10 and FN160C-10, designed for piezo ink jet printing, are 4-mil films that are removable with heat. The combined features found in Controltac and Comply adhesive technologies, including pressure activation, slideability, repositionability and air release channels, allow for fast and easy, bubble-free graphic installations. These films are ideal for long-term graphics for fleet or commercial vehicles, and indoor or outdoor graphics and signs.

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. Please read the entire bulletin for details. A Performance Guarantee is also offered for film IJ160C-10; see page 4 for details.

- Commercial vehicle, transit or fleet graphics, emblems or striping
- Outdoor and indoor graphics and signs
- Vending or dispensing machine and cooler graphics

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.

Wall Graphics

Two mil cast films are typically the best choice for indoor smooth surface wall graphics, although four mil films may be suitable for shorter term applications. In either case, 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.

Unsuitable End Uses for This Film

- Graphics applied to:
 - Corrugated or highly-irregular surfaces or sharply raised areas

- Flexible substrates
- Non-3M films
- Substrate surfaces that are not clean and smooth (little or no variation in texture)
- Paint that is not thoroughly cured or dried
- Rivets (graphics printed with ink series 2500UV)
- Film without graphic protection under these conditions:
 - Vehicle graphics
 - Exposure to abrasive conditions, harsh cleaners or chemicals
- Graphic removal from:
 - Applications with poor paint-to-substrate adhesion
 - Wallboard
 - Existing graphics that must remain intact; damage may occur during removal of film
 - Aged paint or metal that may have surface oxidation or chalking
 - Outdoor, horizontal surfaces
- Graphic subjected to gasoline vapors or spills at 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 for alternatives.

Important Information About Bus Applications

Film used on buses must not be applied in a way that restricts the safe use of emergency window exits. See the most recent version of Instruction Bulletin 5.4.

Compatible Products

Inks and Printers for Film IJ160C-10

This film is forward wound on a 3-inch unnotched core.

- 3M™ Piezo Ink Jet Ink Series 2200UV
 - VUTEk PressVu® UV 200/600 printer
- 3M™ Piezo Ink Jet Ink Series 2500UV or
- 3M™ Piezo Ink Jet Ink Series 2600UV
 - 3M™ Printer 2500UV
- 3M™ Piezo Ink Jet Ink Series 2700UV
 - Durst Rho 160R Printer

- 3M™ Piezo Ink Jet Ink Series 1500
 - VUTEk UltraVu™ 150 Printer
 - VUTEk UltraVu™ 2360/3360 Printers
 - VUTEk UltraVu™ 3300 and 5300 Printers
 - VUTEk UltraVu™ 3000 and 5000 Printers
- 3M™ Piezo Ink Jet Ink Series 6000
 - Océ Arizona 30s Printer
- 3M™ Piezo Ink Jet Ink Series 4600
 - HP Scitex Pressjet-W™ Series Digital Press*
- 3M™ Piezo Ink Jet Ink Series 4800
 - HP Scitex TJ8300 Series Digital Press*

*For the HP Scitex printers, order film forward wound on a 6-inch unnotched core. This is required for a warranty.

Inks and Printers for Film RG160C-10

This film is reverse wound on a 3-inch, 4-notch core.

- 3M™ Piezo Ink Jet Ink Series 6800*
 - Océ Arizona 180 Printer
 - Océ Arizona 90 Printer

*May use Océ Piezo Ink Jet Ink Series 1700 for non-warranted finished graphics.

Inks and Printers for Film FN160C-10

This film is forward wound on a 3-inch, 4-notch core.

- 3M™ Piezo Ink Jet Ink Series 5500
 - Océ Arizona 600 Printer

3M Graphic Protection Options

- 3M™ Scotchcal™ Gloss Overlamine 8518
only for Performance Guarantee constructions
- 3M™ Scotchcal™ Luster Overlamine 8519
- 3M™ Scotchcal™ Matte Overlamine 8520
- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print Gloss Clear 9720UV
- 3M™ Piezo Ink Jet Protective Clear 8530

Other Products

- 3M™ Edge Sealer 3950
- 3M™ Prespacing Tape SCPS-2
- 3M™ Prespacing Tape SCPS-55
- 3M™ Prespacing Tape SCPS-53X

Characteristics

All values given are typical for unprocessed film unless noted otherwise and are not for use in specifications. Processing film may change certain values. If you have questions about your construction, contact the Technical Service helpline at 1-800-328-3908.

Physical Characteristics

Characteristic	Description
Material	Vinyl
Color	White, opaque
Gloss	Matte
Thickness	Without adhesive: 4 mils (0.10 mm) With adhesive: 4.5 –5 mils (0.11-0.13 mm)
Adhesive type	Pressure-activated with air release channels
Adhesive color	Gray
Liner	Polyethylene-coated paper
Tensile strength <i>minimum</i>	13 pounds/inch at 73°F (2.3 kg/cm at 23°C)
Adhesion <i>24 hours after application</i>	Aluminum, anodized: 4.4 pounds/inch (0.78 kg/cm) Fruehauf pre-painted panels: 1.2 pounds/inch (0.21 kg/cm)
Chemical resistance	Resists mild alkalis, mild acids, and salt Excellent resistance to water <i>(this does not include immersion)</i>
Flammability	Call 1-800-328-3908 for information

Application Characteristics

Characteristic	Description
Finished graphic application recommendation	Surface type: Flat, with and without rivets Flat without rivets only with ink series 2500UV Substrate type: Acrylic, aluminum, glass (uncoated), painted metal, polycarbonate, and painted wood (smooth) Application temperature: 40° to 100°F (4° to 38°C) <i>air and substrate</i> Application method: Dry
Applied film shrinkage	0.032 inch (0.8 mm)
Finished graphic exposure temperature	-30° - +200°F (-34° - +93°C)
Graphic removal	Removable with heat Removal temperature: Minimum ambient and substrate temperature 40°F (4°C)

Warranty Information

See the 3M Graphics Center Warranty Brochure for the complete warranty and remedy details. The warranty given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honor.

3M™ MCS™ Warranty

for Finished Graphics

3M MCS Warranty Finished Graphic Constructions and Durability

U.S. Vertical Exposure <i>ONLY</i> (in years)												
Graphic Type	Vehicle			Outdoor			Indoor			Indoor		
	Vehicle	Outdoor	Indoor	Vehicle	Outdoor	Indoor	Vehicle	Outdoor	Indoor	Vehicle	Outdoor	Indoor
Ink Series	1500			4600			4800			6000		
Graphic Protection	Film IJ160C											
8519	3	3	5	3	3	5	3	3	5	3	3	5
8520	3	3	5	3	3	5	3	3	5	3	3	5
1920DR	3	3	5	3	3	5	3	3	5	3	3	5
9720UV	3	3	5	3	3	5	3	3	5	3	3	5
8530	2	2	3	—	—	—	2	2	3	2	2	3
none	0	1	3	0	3	3	0	2	3	0	3	3
Ink Series	2200UV			2500UV flat only			2600UV			2700UV		
8519	3	3	5	2	2	5	3	3	5	3	3	5
8520	3	3	5	2	2	5	3	3	5	3	3	5
1920DR	—	—	—	—	—	—	3	3	5	—	—	—
9720UV	3	3	5	—	—	5	3	3	5	3	3	5
none	0	3	3	0	3	3	0	3	3	0	3	3
Ink Series	5500			6800								
	Film FN160C			Film RG160C								
8519	3	3	5	3	3	5						
8520	3	3	5	3	3	5						
1920DR	3	3	5	3	3	5						
9720UV	3	3	5	—	—	5						
8530	2	2	3	2	2	3						
none	0	3	3	0	3	3						

How to Determine Other MCS Warranty Durabilities

Use the warranted durability for your construction if exposed in a U.S. vertical orientation and use the following formulas to determine other durabilities.

Formulas for Other 3M MCS Warranty Finished Graphic Durabilities

	Exposure		
	U.S. Non-Vertical	U.S. Vertical Desert Southwest	U.S. Non-Vertical Desert Southwest
Percentage of U.S. Vertical Exposure	50% (0.5)	70% (0.7)	35% (0.35)
Example	0.5 x 3 years = 1.5 years	0.7 x 3 years = 2.1 years	0.35 x 3 years = 1.05 years

3M Performance Guarantee

for Product Performance Only

3M Performance Guarantee Graphic Constructions and Durability

Graphics constructed as described in the table below are eligible for the 3M Performance Guarantee warranty. This is not a finished graphics warranty; it covers product performance *only* for the 3M specified products 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 this film.

U.S. Vertical Exposure (in years)			
Film	Graphic Protection	Vehicle Outdoor Indoor	Inks and Printers
IJ160C-10	8518 8519 8520 1920DR 9720UV	2	See Product Bulletin PG Matrix

Other Warranties

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

A Pre-Installation and Inspection Report (see Instruction Bulletin 5.36), completed prior to graphic installation, must be 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. A claim cannot be authorized without these reports.

Removal Warranty for 3M MCS Warranty and 3M Performance Guarantee
from Standard Vehicle and Sign Substrates

Removal requires heat. The ease and rate of removal depends on a number of factors. See Instruction Bulletin 6.5 for details. Refer to page 1, *Limitations of End Uses, Graphic removal from*, for restrictions.

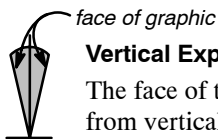
Orientation	Remedy
Vertical	Same as the Warranted Durability
Non-vertical	50% of the U.S. Vertical Warranted Durability

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.

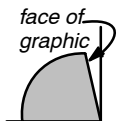
Warranty Notes

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° from vertical.

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 upon request.

Vehicles. Refers to commercial fleet, buses, vans and automobiles unless otherwise noted.

Outdoor. Graphics applied outdoors and exposed to the elements.

Indoor. Graphics applied indoors without direct UV exposure.

Graphic Performance Life

The actual performance depends on the:

- Correct combination of 3M-recommended graphics products
- Adequate ink drying and/or UV curing
- Selection and preparation of the substrate
- Surface texture
- Application methods
- Angle and direction of sun exposure
- Environmental conditions
- Cleaning or maintenance methods
- Adequate ink drying

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.

Rivets

The film will tent around rivets, which is not covered by any warranty.

Graphic Protection

Any graphic exposed to abrasive conditions (including vehicles), harsh cleaners or chemicals must include graphic protection in order to be warranted.

Application to Glass

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

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 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 system's written instructions on usage.

Total Ink Coverage for 3M MCS Warranty Constructions

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 Instruction Bulletin for the ink system being used for additional details about total ink coverage.

Ink Series	Maximum Total Ink Coverage	Ink Series	Maximum Total Ink Coverage
1500	270%	6800	300%
4600	300%	2200UV	300%
4800	270%	2500UV	300%
5500	300%	2600UV	300%
6000	380%	2700UV	300%

Total Ink Coverage for 3M Performance Guarantee Constructions

We recommend a maximum total ink coverage of 270%. Make sure that the ink lay down is within the limits of what the drier can handle to prevent ink smearing.

Application Tapes

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

IJ160C-10	Graphic Protection								
	To determine which of these graphic protection options is approved for your construction, refer to the constructions shown in the 3M MCS Warranty table on page 3 or the Product Bulletin PG Matrix for Performance Guarantee, whichever applies.								
	None	8519	8520	8908	8909	8530	1920DR	9720UV	8518 & All Other Performance Guarantee Constructions
Premasking Tape SCPM-3	■	■	■	■	■	■	■		■
Premasking Tape SCPM-44X								■	
Prespacing Tape SCPS-55	■	■	■	NR	NR	NR	■	■	■

Application and Installation

Install the film using the dry application method.

Refer to the **3M Related Literature** section, located at the end of this bulletin, for a list of the Instruction Bulletins that may be needed to apply or install this film.

Color Profiles

Many color profiles are available on our website at www.scotchprint.com.

Drying

Caution

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 the graphic, and applying the film. See the ink's Instruction Bulletin for more details.

Graphic Protection

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

Screen print clears should be applied by standard screen printing methods.

Adhesive

This film has a pressure-activated adhesive which allows the film to be positioned, slid into place and repositioned easily when only light finger pressure is used. Applying firm pressure, such as with a squeegee, bonds the adhesive to the substrate, and by design, destroys the positionability feature.

The combined features found in Controltac and Comply adhesive technologies, including pressure activation, slide-ability, repositionability and air release channels in the adhesive, allow for fast and easy bubble-free graphic installations. An air bubble trapped under the film can be rubbed out easily and usually does not require making an air release hole. Applying firm pressure bonds the adhesive to the substrate, and by design, destroys the repositionability feature.

The adhesive characteristics may be reduced under these conditions:

- The film has been removed, even partially, from the original liner and reapplied to the same liner or another liner.
- Application at higher than 100°F (38°C) causes the film to lose its repositionability even with only light hand pressure.

Rivets

This film will tent when applied over rivets. If the rivets are closely spaced, the film will bridge between rivets. Tented or bridged film may fail prematurely, which is not covered by any 3M warranty. For the best appearance and durability, 3M recommends cutting around the rivet, removing the circle of film, and then re-squeegeeing around the rivet.

Maintenance and Cleaning

Use cleaning products designed for high-quality painted surfaces. It must be wet, non-abrasive, without strong solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline).

Refer to Instruction Bulletin 6.5 for general maintenance and cleaning information.

Removal


This film can be removed with heat only. No other accessories or chemicals are needed. Most graphics can be removed and leave little or no adhesive residue on the substrate. The ease and rate of removal depends on several factors. See Instruction Bulletin 6.5 for details.

Shelf Life, Storage and Shipping

Activity	Recommendation
Shelf life	Total shelf life: 2 years Up to 2 years unprocessed, <i>OR</i> process within 1 year <i>and</i> apply within 1 year of processing
Storage conditions	<ul style="list-style-type: none"> • 100°F (38°C) maximum • 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; processed film may block if wound too tightly. These methods help to prevent the liner from wrinkling or popping off the liner.

See Instruction Bulletin 6.5 for details.

Health and Safety

 Caution
<p>When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information.</p> <p>To obtain MSDS sheets for 3M products:</p> <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 www.3M.com/MSDS. • By mail, or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501. <p>When using any equipment, always follow the manufacturers' instructions for safe operation.</p>

Attention:
Authorized Graphics Manufacturers

Visit our password-protected website for exclusive product information and services. Certain restrictions apply.

1. Go to www.scotchprint.com.
2. Select a country.
3. Click *Login* on upper left side of screen.
4. Click Register.
5. Enter authorization code: **CGD_SGN**.
6. Complete the information and submit.
An e-mail will be sent when your authorization is completed.

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, as well as a list of all Bulletins updated within the last three months, are available at www.scotchprint.com or through our Fax-on-Demand system. Any warranty, if offered, is based on information in the appropriate Bulletin(s) that was current at the time you purchased the 3M products. The following Product and/or Instruction Bulletins provide the information and processes you need to properly make the graphics described in this Bulletin.

Fax-on-Demand phone numbers:
United States or Canada: 1-800-364-0768
International: 1-651-732-6506

Subject	Bulletin No.	FOD No.
Product Bulletins		
3M™ Piezo Ink Jet Ink Series 2200UV	2200UV	4597
3M™ Piezo Ink Jet Ink Series 2500UV	2500UV	4575
3M™ Piezo Ink Jet Ink Series 2600UV	2600UV	4594
3M™ Piezo Ink Jet Ink Series 2700UV	2700UV	4598
3M™ Piezo Ink Jet Ink Series 1500	1500	4578
3M™ Piezo Ink Jet Ink Series 4600	4600	4582
3M™ Piezo Ink Jet Ink Series 4800	4800	4602
3M™ Piezo Ink Jet Ink Series 5500	5500	4592
3M™ Piezo Ink Jet Ink Series 6000	6000	4560
3M™ Piezo Ink Jet Ink Series 6800	6800	4574

Subject	Bulletin No.	FOD No.
3M™ Screen Printing Ink Series 1900 and Overprint Clear VI0402	1900	2501
3M™ Screen Printing Ink Series 9700UV	9700	2507
3M™ Piezo Ink Jet Protective Clear 8530	8530	4565
3M™ Scotchcal™ Overlamine 8518	8518	4600
3M™ Scotchcal™ Overlamine 8519 and 8520	8519/8520	4524
3M Performance Guarantee Printer Matrix	PG Matrix	4599
Instruction Bulletins		
Printing with piezo ink series 2200UV	4.52	6552
Printing with piezo ink series 2500UV	4.41	6541
Printing with piezo ink series 2600UV	4.50	6550
Printing with piezo ink series 2700UV	4.53	6553
Printing with piezo ink series 1500	4.45	6545
Printing with piezo ink series 4600	4.43	6543
Printing with piezo ink series 4800	4.51	6551
Printing with piezo ink series 5500	4.47	6547
Printing with piezo ink series 6000	4.39	6539
Printing with piezo ink series 6800	4.40	6540
Screen printing with ink series 9700UV	3.4	6004
Screen printing with ink series 1900 - line color - 4-color	3.12 3.11	6012 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
Application, special applications and vehicles	5.4	7004
Application, general procedures for interior and exterior dry applications	5.5	7005
Application: special considerations for complex contours of automobiles, vans and buses and inspection forms	5.36	7036
Applying 3M graphic films with Comply adhesive	5.31	7031
A guide to understanding and applying graphics to common indoor and outdoor wall surfaces	5.37	7037
Storage, handling, maintenance, removal	6.5	7505
Warranties		
3M Graphics Market Center Warranty Brochure		9503

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Bulletin Change Summary

NOTE: Changes made to Release C of this bulletin are shown here as well as Release D changes, which are only to clarify the Warranty Stipulations for removal of graphics from vehicles (see page 3) and to remove an incorrect removeability warranty limitation about horizontal applications.

Changes to the 3M Performance Guarantee program Overlaminate 8518 has been added as a compatible product. Because we are continually testing and approving more platforms, the specific 3M-qualified printers and OEM inks are now listed only the Product Bulletin PG Matrix. To obtain this bulletin from the web, go to www.scotchprint.com, select Technical Bulletins, select Product Bulletins, select Piezo Ink Jet Films, select Films for other printers. The Product Bulletin PG Matrix appears at the top of the page.

Other New Products. Added ink series 4800, 2200UV and 2700UV.

Warranty information. The bulletin has been updated to better show the differences between the 3M MCS Warranty and 3M Performance Guarantee durabilities. Clarified when graphics require graphic protection to be warranted. See Limitations of End Uses on page 1 and Graphic Protection on page 4.

Change to end use recommendation Cautionary, safety and vandal-resistant labeling was removed as a recommended or warranted usage.

Updated information about wall graphics See statement on page 1.

Other changes Added ink series-specific total maximum ink coverage values (page 5).

Other changes that do not affect form, fit or function are marked with a black bar in the margin.



Regional Phone Numbers:
North East: 1-800-257-8226
South East: 1-800-537-4606
Great Lakes: 1-800-733-9942

Midwest: 1-800-736-7636
West: 1-800-252-7767
Mexico: 011-525-55-576-6667
www.sourceoneonline.com

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Fax 519-452-6245

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52-55-52-70-04-00
Fax 52-55-52-70-22-77

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787-620-3000
Fax 787-750-3035

Fax-on-Demand ordering: 1-800-364-0768 US/Canada; 1-651-732-6506 International
Fax-on-Demand document: 4581
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