



Controltac™ Changeable Graphic Film with Comply™ Adhesive 3500C

For Solvent and UV Screen Printing Only

1. Product Description

A. Product Features

- 4-mil, opaque white vinyl film with a matte finish
- Excellent hiding power
- Pressure-activated adhesive for easy sliding, tacking, snap up and repositioning
- Air release channels for fast, easy, bubble-free graphic installation
- Changeable for clean removable without heat or chemicals

B. 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.

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

C. Performance Overview

3M tests the performance of both individual products and finished graphic constructions. This table shows the best performance expected from this product both without a Warranty Period and with a Warranty Period.

For detailed graphic construction and application options along with specific Warranty Periods, please see the Warranty Information, Section 5.

Expected Performance Life. This is the estimated period of time the product should perform satisfactorily.	
Unprinted film with no graphic protection, applied to a flat vertical outdoor surface.	2 years Unwarranted Period
3M™ MCS™ Warranty. This is the maximum period of time 3M will warrant the finished graphic performance.	
Printed film with the best 3M ink and graphic protection option, applied to a flat, vertical, vehicle surface.	2 years Warranty Period

D. Limitations of End Uses

This 3M product is not designed or recommended for the following uses. Please contact us to discuss other options.

(1) Unsuitable End Uses for This Film

- Graphics applied to:
 - corrugated, channels, complex curves, or highly-irregular surfaces or sharply raised areas.
 - stainless steel.
 - graphics printed with 3M four-color UV screen printing inks.
 - non-3M films.
 - paint that is not thoroughly cured or dried.
 - substrate surfaces that are not clean and smooth (little or no variation in texture).

- Film without graphic protection when:
 - used for vehicle graphics.
 - exposed to abrasive conditions, harsh cleaners or chemicals.
 - where warranty table does not indicate a construction option.
- Graphic removal from:
 - applications with poor paint-to-substrate adhesion.
 - painted wallboard.
 - existing graphics on flexible substrates that must remain intact.
 - aged paint or metal that may have surface oxidation or chalking.
 - outdoor, horizontal applications.
- Prespaced letters or emblems.
- Graphic subjected to gasoline vapors or spills at gas pumps, automobile fuel-tank ports, or top-feeding petroleum tankers.

(2) Wall Graphics

Two-mil cast films are typically the best choice for indoor smooth surface wall graphics, although thicker films may be suitable for intermediate or short term applications. In any 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.

(3) 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.

2. Compatible Products

This section provides a list of products that are approved by 3M for use with the base film covered in this Bulletin, and used for the creation of a graphic that is covered by the 3M™ MCS™ Warranty. Refer to the Product and Instruction Bulletins listed in 3M Related Literature at the end of this Bulletin for more information about the compatible products.

This section provides a list of products that are approved by 3M for use with the base film covered in this Bulletin, and used for the creation of a graphic that is covered by the 3M™ MCS™ Warranty or 3M Performance Guarantee. Refer to the Product and Instruction Bulletins listed in 3M Related Literature at the end of this Bulletin for more information about the compatible products.

See the **Warranty Information** section to determine which compatible products are approved for your graphic construction.

A. Screen Printing

- 3M™ Screen Printing Ink Series 1900 *line color and 4-color*
- 3M™ Screen Printing UV Ink Series 9800 *line color and 4-color*

B. OEM Inkjet Printers and Inks for the 3M Performance Guarantee

- For the most current information, please click here: [3M Performance Guarantee Matrix](#).

C. Graphic Protection

- 3M™ Screen Printing Gloss Clear 1920DR
- 3M™ Screen Printing Matte Clear 1930
- 3M™ Screen Printing Gloss UV Clear 9740i
- 3M™ Screen Printing Gloss UV Clear 99800CL

D. Application Tapes

- 3M™ Premasking Tape SCPM-44X
- 3M™ Premasking Tape SCPM-3

3. Characteristics

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

A. Physical Characteristics

Characteristic	Value
Material	Vinyl
Color	White, opaque
Gloss	Matte
Thickness	Without adhesive: 4-mil (0.10 mm) With adhesive: 4.5 to 5-mil (0.11-0.13 mm)
Adhesive type	Pressure activated with air release channels
Adhesive color	Gray
Liner	Polyethylene-coated paper
Tensile strength	13.5 pounds/inch at 73°F (2.3 kg/cm at 23°C) (minimum)
Adhesion <i>24 hours after application</i>	Aluminum, anodized: 1.8 pounds/inch (0.32 kg/cm) Fruehauf pre-painted panels: 0.6 pounds/inch (0.12 kg/cm)
Chemical resistance	Resists mild alkalis, mild acids, and salt
Flammability	Call 1-800-328-3908

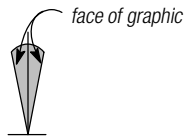
B. Application Characteristics

Characteristic	Value
Finished graphic application recommendation	Surface type: Flat, with and without rivets Substrate type: Acrylic, aluminum, glass (uncoated), painted metal, polycarbonate, rigid vinyl, and painted wood (smooth) Application temperature: 28° – 100°F (-2° – 38°C) <i>air and substrate</i> Application method: Dry
Applied film shrinkage	0.015 inch (0.4 mm)
Finished graphic exposure temperature	-40° – +150°F (-40° – +66°C)
Graphic removal	Removable without heat and chemicals when ambient and substrate temperature are greater than 28°F (-2°C)

4. Definitions

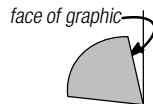
A. Exposure

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. 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. Click here for a [detailed map](#).

- B. Changeable** The film is easily removable with no adhesive residue.
- C. Graphic Construction** The products used to make a graphic, which may include film and/or flexible substrate, graphic protection, ink, printer and application tape.
- D. Graphic Protection** Overlamine films or clear coats used to protect the graphic and/or change gloss.
- E. Graphic Types**
 - Indoor Signs** Stationary graphics applied indoors and *not* exposed to the elements.
 - Outdoor Signs** Stationary graphics applied outdoors and exposed to the elements.
 - Vehicles** **Straight Trucks. Semi-Tractors and Semi-Trailers.** Straight trucks, semi-tractors and semi-trailers used for commercial business purposes. Excludes air shields.

As identified in Product Durability Tables

5. Warranty Information

- A. Warranty Coverage Overview**

The warranty coverage for each graphic is based on the user(s) both reading and following all applicable and current 3M Product and Instruction Bulletins. 3M will honor the Warranty Period stated in the base film's Product Bulletin that is current when the film was purchased. The Warranty Period may be reduced and stipulations may apply for certain constructions and applications, as covered in this Bulletin.

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.
- B. 3M Basic Product Warranty**

This product 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 and as further set forth in the [3M Commercial Graphics Warranty Brochure](#).
- C. Limited Remedy**

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.
- D. Limitation of Liability**

Except where prohibited by law, 3M SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO PURCHASER OR USER FOR ANY DIRECT (EXCEPT FOR THE LIMITED REMEDY PROVIDED ABOVE), INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, LABOR, NON-3M MATERIAL CHARGES, LOSS OF PROFITS, REVENUE, BUSINESS, OPPORTUNITY, OR GOODWILL) RESULTING FROM OR IN ANY WAY RELATED TO SELLER'S PRODUCTS, SERVICES or THIS BULLETIN. This limitation of liability applies regardless of the legal or equitable theory under which such losses or damages are sought including breach of contract, breach of warranty, negligence, strict liability, or any other legal or equitable theory.
- E. Additional Limitations**

See the [3M Commercial Graphics Warranty Brochure](#), which gives the terms, additional limitations of the warranty, if any, and limitations of liability.
- F. 3M™ MCS™ Warranty**

Finished graphics constructed with the materials specified and the exposure specified in the Warranty Period tables, Section F.(1), is eligible for the 3M™ MCS™ Warranty. For warranties for other exposures, see Section G.

Subject to Stipulations set forth in Section G.

 - (1) Warranty Period Table for Finished Graphics in a Standard U.S. Vertical Exposure**
 - VEH = Fleet and Standard Vehicle Graphics
 - OUT = General Outdoor Sign
 - IN = General Indoor Signs

Warranty Period for Finished Graphics, In Years

Graphic Protection	No Printing			Ink Series 1900			Ink Series 9800 Most Colors			Ink Series 9800 Metallic		
	VEH	OUT	IN	VEH	OUT	IN	VEH	OUT	IN	VEH	OUT	IN
1920DR	—	—	—	2	2	2	—	—	—	—	—	—
1930	—	—	—	2	2	2	—	—	—	—	—	—
9740i	—	—	—	2	2	2	2	2	2	2	2	2
9800CL	—	—	—	—	—	—	2	2	2	2	2	2
None	—	2	2	—	—	—	—	2	2	—	—	—

G. General Warranty Stipulations for 3M™ MCS™ Warranty

These stipulations apply to both the 3M™ MCS™ Warranty. General provisions for these stipulations are covered in the [3M Commercial Graphics Warranty Brochure](#).

(1) Reduced Warranty Period for Other Graphic Exposures

For other graphic exposures, multiply the Warranty Period (in years) for your graphic construction as shown in the applicable Warranty Period tables, Section F. (1) and G.(1), by the percentage shown for the intended graphic exposure.

If the Graphic Exposure is:	Use this Percentage of U.S. Vertical Exposure, Warranty Period	Calculation Examples
U.S. Non-vertical	50% (0.5)	0.5 x 2 years = 1 year
Desert Southwest Vertical	70% (0.7)	0.7 x 2 years = 1.4 years
Desert Southwest Non-vertical	35% (0.35)	0.35 x 2 years = 0.7 years
Horizontal	0%	0

(2) Removal Warranty without Heat or Chemicals

a. For the 3M™ MCS™ Warranty Only

Within the stated Warranty Period, if this film cannot be removed without heat or chemicals, or more than 10% of the adhesive residue remains on the substrate, 3M will reimburse a reasonable portion of extra removal costs.

a. 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 or unapproved substrates.
 - removing film from paint that is not firmly bonded to the substrate.
- No guarantee is made for:
 - paint staining. 3M does not warrant vehicle paint staining that may be visible after removing an inkjet printed graphic with an overlamine. To reduce the risk of this problem, always remove the graphic by the end of the Warranty Period.
 - 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.

(3) Paint Refurbishing Reimbursement Policy for Automobiles, Vans, Buses, Recreational Vehicles

This Policy 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.

(4) Rivets

Tented or bridged film that fails prematurely, which is not covered by any 3M warranty.

(5) Application Outside the U.S.

Contact the 3M organization for that country.

(6) Application to Glass

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

(7) 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. However, to help maintain the appearance of your graphic, use the recommended graphic protection whenever:

- it is required for the construction and end use as shown in the Warranty Period tables.
- whenever the graphic, **including printed vehicle graphics**, is exposed to abrasive conditions, harsh cleaners or chemicals.

(8) Chalking

Unprinted film, which tends to chalk outdoors, is warranted against chalking only when graphic protection is applied. However, chalking may be removed with normal graphic cleaning procedures.

(9) Graphics Made with Components Not Sold or Recommended by 3M

The 3M™ MCS™ Warranty does not, under any circumstances, cover 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 non recommended or qualified products.

6. 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.
- Ink formulation.
- complete 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.

7. Graphics Manufacturing



CAUTION

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

A. Screen Printing

Formulations and processing conditions can affect ink durability. Refer to the Product and Instruction Bulletins for your ink for limitations and proper usage.

B. 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

C. Application Tapes

(1) When to Use Premasking Tape

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

(2) How to Select a Tape

Locate the graphic protection on your graphic in the table below and use the corresponding tape. See [Instruction Bulletin 4.3](#) for complete details.

Application Tape	Select the tape based on what is on top of the graphic			
	Unprinted Film	1920DR 1930	Ink Series 9800, no clear	9740i 9800CL
Premasking Tape SCPM-3	■	■	—	—
Premasking Tape SCPM-44X	—	—	■	■
Prespacing Tape	—	—	—	—

— = No tape is recommended for this construction.

8. 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.

A. Adhesive

- The pressure-activated adhesive on this film offers:
 - smooth sliding into position on a substrate;
 - fast finger tacking to check position; and
 - Easy snap up and repositioning when it is needed.
- 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.
 - if any part of the film is removed from the original liner and reapplied to the same or another liner.

B. Rivets

For the best appearance and durability, 3M recommends cutting around the rivet and then re-squeegeeing around the rivet.

9. 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.)

Refer to [Instruction Bulletin 6.5](#) for general maintenance and cleaning information.

10. Removal

This film can be easily removed without heat or chemicals. Most graphics can be removed and leave little or no adhesive residue on the substrate. The ease and rate of removal depends on a number of factors. See [Instruction Bulletin 6.5](#) for details.

11. Shelf Life, Storage and Shipping

A. Shelf Life

Total shelf life: 2 years from the date on the original box

Up to 2 years unprocessed, **OR** process within 1 year **and** apply within 1 year of processing

B. 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

C. Shipping Finished Graphics

Flat or rolled printed side out on 6 inch (15 cm) or larger core. This helps prevent the liner and, if used, the application tape from popping off.

12. 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 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.

13. 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](#) 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.
EFI™ R3225 3M™ UV Ink	PB-IB	R3225
3M™ Screen Printing Ink Series 1900 and Overprint Clear V10402	PB	1900
- Screen printing with ink series 1900	IB	3.12
- line color	IB	3.11
- 4-color		
3M™ Screen Print Gloss Clear 1920DR and Low Gloss 1930	PB	1900
- Applying screen printing clear 1920DR and 1930	IB	3.12
3M™ Screen Printing UV Ink Series 9800 and Clear 9800CL	PB	9800
- Screen printing with UV ink series 9800	IB	3.20
- line color	IB	3.21
- 4-color		
3M™ Screen Print Gloss Clear 9740i	PB-IB	UV Clears
Scoring and cutting	IB	4.1
Using 3M Application Tapes; Premasking and Prespacing for Films	IB	4.3
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
Application: Guidelines for Auto, Van, Bus and Inspection Forms	IB	5.36
Storage, Handling, Maintenance, Removal	IB	6.5

[3M Commercial Graphics Warranty Brochure](#)

14. Bulletin Change Summary

Modified and new content is marked with a black bar in the margin. Clear 9740i replaces Clear 9720UV. Added a warranty limitation regarding vehicle paint staining that may be visible after removing an inkjet printed graphic with an overlamine. Added a Performance Overview, which includes an Effective Performance Life value of 2 years. Reformatted the Warranty Information and Stipulations sections for better understanding and alignment of the warranty terms in 3M Commercial Graphics Warranty Brochure.



Commercial Graphics

3M Center, Building 220-12E-04
St. Paul, MN 55144 USA
General & Technical 1-800-328-3908
Fax 1-651-736-4233

3M Canada

PO Box 5757
London, Ontario
Canada N6A 4T1
General 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
General 5255-5270-0400
Fax 5255-5270-2277

3M Puerto Rico, Inc.

350 Chardon Avenue
Suite 1100
San Juan, PR 00918
General 787-620-3000
Fax 787-620-3018

3M and Controltac, Comply, MCS are trademarks of 3M Company. All other trademarks are the property of their respective owners.

©3M 2013. All rights reserved.
www.3Mgraphics.com