

## 160 160C with Comply™ Adhesive

### Product Description

- For Screen Printing Only
- 4-mil, opaque white, vinyl film with a matte finish

### Product Features

- Pressure-activated adhesive for easy sliding, tacking, snap-up and repositioning
- Film 160C-10 also has Comply™ Adhesive air release channels for fast, easy, bubble-free graphic installations
- Excellent hiding power
- Removable with heat
- Outstanding resistance to dirt and other environmental factors and wear from high foot traffic when protected by the recommended overlaminates
- Expected Performance Life of 7 years (unwarranted period for unprinted film with no graphic protection, applied to a flat, vertical, outdoor surface)
  - **Indoor Floor Graphics:** 1 year when used in a horizontal indoor exposure with typical usage and protected by [3M™ Scotchcal™ Luster Overlaminates 3645](#)

### Recommended Types of Graphics and End Uses

- Floor graphics on most indoor hard surface flooring
- Commercial vehicle, transit or fleet graphics, emblems or striping
- Outdoor and indoor graphics and signs
- Vending or dispensing machine and cooler graphics
- Internally-illuminated graphics such as taxi toppers (160-60 only)
- Small format original equipment manufacturer's (OEM) decorative and identification graphics

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.

### Recommended Compatible Products

See [3M.com/graphicswarranties](http://3M.com/graphicswarranties) for a complete list of compatible 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 may be eligible for the 3M™ MCS™ Warranty.

### Certificate of 3M™ MCS™ Warranty

Graphics manufacturers who produce graphics made with all 3M Graphics Products, including 3M Ink purchased through a qualified 3M Distributor or 3M Printing Partner, may register to be recognized with a Certificate of 3M™ MCS™ Warranty. Only graphics manufacturers having a current Certificate of 3M™ MCS™ Warranty are eligible to extend this warranty to their customers.

### Screen Printing Inks

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

- 3M™ Screen Printing Ink Series 1900 line color and four color
- 3M™ Screen Printing UV Ink Series 9800 line color and four color
- Sericol™ Duracal™ UV Screen Printing Inks\*
- Sericol™ Duracal™ Overprint Clear\*

\*These products are warranted by 3M for use in OEM applications only. See Screen Printing section, page 7, for how to obtain Duracal inks.

#### Quick Links

- [3M Graphics Warranties](#)
- [Technical Information Selector](#)
- [Safety Data Sheets \(SDS\)](#)
- [Flammability \(ASTM E84 Reports\)](#)
- [Videos](#)

Some of these links lead to web-based resources that are not product-specific.



## Graphic Protection

Graphic protection can improve the appearance, performance and durability of your graphic. Always use only the graphic protection options recommended in this Bulletin for this film. See [3M Product Bulletin GP-1](#) for more details about these options.

- [3M™ Screen Print Gloss Clear 1920DR](#)
- [3M™ Screen Print Matte Clear 1930](#)
- [3M™ Screen Print UV Gloss Clear 9740i](#)
- [3M™ Screen Print UV Gloss Clear 9800CL](#)

## Indoor Floor Graphics

- [3M™ Scotchcal™ Luster Overlamine 3645](#)

## Application Tapes

See [3M Instruction Bulletin AT-1](#) to determine what application tape is recommended for your film or finished graphic.

## Other Products

- [3M™ Edge Sealer 3950](#)

## Characteristics

These are typical values for unprocessed product. Processing may change the values.

### Physical Characteristics

Characteristic	Value
<b>Material</b>	Vinyl
<b>Film Color</b>	<b>160-30, 160C-30:</b> White, opaque <b>160-32, 160C-32:</b> Black, opaque <b>160-60:</b> Frost, translucent
<b>Gloss</b>	Matte
<b>Thickness</b>	Without adhesive: 4 mils (0.10 mm) With adhesive: 4.5 – 5 mils (0.11 – 0.13 mm)
<b>Adhesive</b>	160C: Pressure-activated (slide, tack, snap-up, reposition) with air release channels 160: Pressure-activated (slide, tack, snap-up, reposition)
<b>Adhesive Color</b>	<b>160-60:</b> Clear <b>All others:</b> Gray
<b>Liner</b>	Polyethylene-coated paper
<b>Adhesion, Typical 24 hours after application</b>	<b>ABS:</b> <b>160:</b> 3.5 pounds/inch (0.65 kg/cm) <b>160C:</b> 3.3 pounds/inch (0.78 kg/cm) Fruehauf pre-painted panels: <b>160:</b> 1.0 pounds/inch (0.18 kg/cm) <b>160C:</b> 0.9 pounds/inch (0.16 kg/cm)
<b>Tensile Strength</b>	13 pounds/inch at 73 °F (2.3 kg/cm at 23 °C), minimum
<b>Chemical Resistance</b>	Resists mild alkalis, mild acids, and salt Excellent resistance to water (does not include immersion)
<b>Flammability</b>	Call 1-800-328-3908, Option 1, for information

## Application Characteristics

Characteristic	Value
<b>Finished Graphic Application Recommendation</b>	<p><b>Surface type:</b> Flat, with and without rivets</p> <p><b>Substrate type:</b> Acrylic, aluminum, glass (uncoated), painted metal, polycarbonate, and painted wood (smooth), most indoor floors, including sealed concrete, marble, terazzo, ceramic, finished wood</p> <p><b>Application temperature:</b> 40° – 100°F (4.4° – 38°C) air and substrate</p> <p><b>Application method:</b> Dry</p>
<b>Applied Shrinkage</b>	0.032 inch (0.8 mm)
<b>Temperature Range After Application</b>	-30 °F to +200 °F (-34 °C to +93 °C) (not for extended periods of time at the extremes)
<b>Graphic Removal</b>	Removable with heat at a minimum ambient and substrate temperature of 40°F (4°C)

## Warranty Information

### Warranty Coverage Overview

The warranty coverage for eligible graphics is based on the user both reading and following all applicable and current 3M Graphics Product and Instruction Bulletins. The warranty period for eligible graphics is as stated in the 3M Graphics Warranties Matrices at the time that the film was purchased. Information found at [3MGraphics.com/warranties](http://3MGraphics.com/warranties) includes:

- [3M Graphics Warranties Bulletin](#)
  - This bulletin contains information on limitations and exceptions, and warranty period reductions for 3M Graphics Warranties. The warranty period may be reduced and stipulations may apply for certain constructions, applications, and graphic exposures as covered in this Bulletin.
- [3M Graphics Warranties Selector](#)
  - Use this selector to search for your vertical warranty period by product type, ink type, film name, and/or ink/printer platform.
- [U.S. Desert Southwest Region Map](#)
  - Use this map of hot, arid desert areas to determine if you are subject to reduced warranted durabilities.

The warranties set forth in this Bulletin are made in lieu of all other express or implied warranties, including any implied warranty of merchantability, fitness for a particular purpose, or arising out of a course of dealing, custom, or usage of trade.

### 3M Basic Product Warranty

3M Graphics Products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in its applicable 3M Graphics Product Bulletin and as further set forth in the [3M Graphics Warranties Bulletin](#).

### Limited Remedy

The limited remedy applicable to each warranty is addressed in the 3M Graphics Warranties Bulletin found at [3MGraphics.com/warranties](http://3MGraphics.com/warranties).

### Limitation of Liability

Except to the extent prohibited by law, 3M SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO PURCHASER OR USER FOR ANY DIRECT (EXCEPT FOR THE LIMITED REMEDY PROVIDED HEREIN), 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 3M'S GRAPHICS 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.

### Warranty Period Matrices

See the 3M Graphics Warranties Matrices at [3MGraphics.com/warranties](http://3MGraphics.com/warranties), for vertical warranty period information specific to your film.

### Additional Limitations

# 3M™ Controltac™ Graphic Film

See the 3M Graphics Warranties Bulletin at [3MGraphics.com/warranties](http://3MGraphics.com/warranties), for terms, additional limitations of your warranty, if any, information on reduced warranties for different exposures, and limitations of liability.

## Factors that Affect Graphic Performance Life

The actual performance life of a graphic is affected by:

- the combinations of graphics materials used.
- 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.

## Graphics Manufacturing

### CAUTION

Before using any equipment, always read the manufacturer's instructions for safe operation.

## 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.

### **Sericol Inks**

Sericol's Duracal inks can be obtained through their distribution network. Please refer this website for details: <http://www.sericol.com/Distributors/distribFR.htm>. You can also contact Sericol at: Sericol Inc. Corporate Office, 1101 W. Cambridge Drive, Kansas City, KS 66103 Tel: 913-342-4060, Fax: 913-342-4752.

### **Printing with Enamel Inks**

This film can be printed with typical enamels used for letter press printing and hand brushing, and vinyl inks used in offset printing. The user has sole responsibility for determining the product's suitability and performance characteristics.

## Cutting

See [3M Instruction Bulletin 4.1](#) for Sheeting, Scoring and Film Cutting details.

## Graphic Protection

Graphic protection may improve the appearance, performance and durability of the graphic. Click on the graphic protection options listed in Product Bulletin or see the [3M Graphics Market Product Catalog](#), for more information.

### IMPORTANT NOTE

During installation, scratches may occur on films without graphic protection.

## Application Tapes

There are two types of application tapes. See [3M Instruction Bulletin AT-1](#) to determine what application tape is recommended for your film or finished graphic.

### Premasking Tape

Increases stiffness during application while preventing stretching and damage. Use when little or no liner is exposed. See [3M Instruction Bulletin 4.3](#) for complete details.

### Prespacing Tape

Holds cut and weeded letters or graphics in place during application and after removing the film liner, while preventing stretching and damage. Use when large amounts of liner are exposed. See [3M Instruction Bulletin 4.3](#) for complete details.

## Application and Installation

In addition to other 3M Bulletins specified in this document, the following Bulletins provide details that you may need to successfully apply a graphic.

- [3M Instruction Bulletin 5.36](#). Application Techniques for Automobiles, Vans and Buses. Complete the 3M Pre-Installation Inspection Record found in this Instruction Bulletin prior to manufacturing or applying a graphic to an automobile, van, or bus.
- [3M Instruction Bulletin 5.37](#). A Guide to Understanding and Applying Graphics to Common Smooth and Textured Wall Surfaces
- [3M Instruction Bulletin 5.4](#). Application, Fleet Trucks.
- [3M Instruction Bulletin 5.42](#). Application, Special Considerations for Watercraft. Complete the 3M Pre-Installation Inspection Record found in this Instruction Bulletin prior to manufacturing or applying a graphic to a watercraft.
- [3M Instruction Bulletin 5.5](#). Application, General Procedures for Interior and Exterior Dry Application
- [3M Product and Instruction Bulletin V-Tools](#). 3M™ Vehicle Channel Applicator Tools.

### CAUTION

UV 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 heat during application, make sure the film surface temperature does not exceed 212° F (100° C). For best results, **always do a test application** of a printed graphic to determine how much heat can be used without damaging the image.

## Pressure-activated 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 you need it.

The **snap-up and reposition 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.
- solvent from inkjet ink has not completely dried or cured, which affects both slideability and snap-up.

## Working with Air Release Channels

Air release channels are a characteristic of films with Comply™ adhesive that allow trapped air to exit through the edges of the graphic.

- The channels will be damaged and effective air removal affected if you remove and attempt to change liners or reapply the same liner.
- For the best results, 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 [3M Instruction Bulletin 5.4](#) for details.

### Video

Click [here](#) to see how 3M's Comply™ adhesive technology works.

## 3M™ Tape Primer 94

3M recommends that where the film will be stretched, particularly on the edges of the film, use primer to maximize a graphic's bond to its substrate.

## Maintenance and Cleaning

Use a cleaner designed for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline). See [3M Instruction Bulletin 6.5](#) for details.

## Removal

Removal requires heat and/or chemicals. 3M makes no claims as to the ease or speed of removal. This product may not remove similarly to other products in the same category. See [3M Instruction Bulletin 6.5](#) for details.

## Shelf Life, Storage and Shipping

### Shelf Life

The shelf life is **never more than 3 years** from the date of manufacture on the original box.

If you process the film, the shelf life is changed to **1 year** from the processing date, but not later than the 3 year maximum from the manufacturing date.

### Storage Conditions

- 40° to 100 °F (4° to 38 °C)
- Out of sunlight
- Clean, dry area
- Original container
- Bring the film to room temperature before use

### Shipping Finished Graphics

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

### Commercial Solutions

3M Center, Building 220-12E-04  
St. Paul, MN 55144

1-800-328-3908  
3M.com/Graphics

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## Health and Safety

### CAUTION

When handling any chemical products, read the manufacturer's container labels and the Safety Data Sheets (SDS) for important health, safety and environmental information. To obtain SDS sheets for 3M products go to [3M.com/SDS](http://3M.com/SDS), 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 manufacturer's instructions for safe operation.

## Bulletin Change Summary

For the most current 3M Technical Information available to successfully use this product, please view this Bulletin electronically and click on the blue underlined links to view the relevant documents. This Bulletin has been substantially changed to remove warranty information and replace it with references to the new Graphics Warranties Website. Please read the entire Bulletin thoroughly.