



Controltac™ Plus

Conformable Graphic Film with Comply™ Adhesive

8620C ES and 8620Cv2 ES

For Electrostatic Printing Only

Description

Film 8620C ES and film 8620Cv2 ES are 2-mil films. They combine the features found in Controltac and Comply adhesive technologies, including pressure activation, slideability, repositionability and air release channels, which allow for fast and easy bubble-free graphic installations. The films with the new Comply v2 adhesive also have non-visible air release channels and a higher gloss. These long-term durable and removable films have excellent hiding power and stability, making them perfect for indoor and outdoor signs and fleet graphics, including surfaces with corrugations and rivets. They are designed for electrostatic imaging.

Recommended Types of Graphics and End Uses

These end uses are recommended for this film and may be covered by the 3M™ MCS™ Warranty. Certain restrictions may apply; please read the entire bulletin for details.

- Indoor and outdoor graphics and signs
- Fleet vehicle graphics, emblems or striping
- Standard vehicle graphics
- Mass-transit, interior graphics
- Point-of-purchase or trade show displays
- Vending/dispensing machine and cooler graphics
- Architectural walls

Limitations of End Uses

We do not normally warrant other end uses, 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; however, 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:
 - Stainless steel (see film 181-10)
 - Non-3M films (also see Removability on page 3)
 - Substrates that do not have a clean, smooth surface
 - Flexible substrates
 - Inadequately cured paint
- Graphic removal from:
 - Applications with poor paint-to-substrate adhesion
 - Painted wallboard
 - Existing graphics that must remain intact; damage may occur during the removal of film 8620C ES or 8620Cv2 ES.
- Graphics 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, Ext. 444, for alternatives

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.

Compatible Products

Refer to the warranty durability tables for the proper combination of films and graphic protection.

Imaging Materials

- Scotchprint® Electronic Graphics System
- Scotchprint® Toner Series 8700/8800
- 3M™ Trident Transfer Media ES

Graphic Protection Options

- 3M™ Scotchcal™ Luster Overlamine 8908
- 3M™ Scotchcal™ Matte Overlamine 8909
- 3M™ Scotchcal™ Luster Overlamine 8519
- 3M™ Scotchcal™ Matte Overlamine 8520
- 3M™ Scotchcal™ High Gloss Graffiti Resistant Overlamine 8912 ES
not for use on rivets or corrugations
- 3M™ Scotchcal™ Ultra Matte Overlamine 8915 ES
for interior use to reduce glare from light sources
- 3M™ Screen Print Clear 8920 ES
- 3M™ Screen Print Gloss Clear 1920DR
- 3M™ Screen Print Matte Clear 1930

Other Products

- 3M™ Edge Sealer 3950
- 3M™ Premasking Tape SCPM-3 or SCPM-44X
- 3M™ Prespacing Tape SCPS-55

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.

Characteristic	Description
Film	Cast vinyl
Film color	White, opaque
Thickness	Without adhesive: 2 mils (0.05 mm) With adhesive: 3–4 mils (0.08–0.10 mm)
Adhesive type	Pressure activated, repositionable, with air release channels
Adhesive color	Gray
Liner	Polyethylene-coated layflat paper

Characteristic	Description
Adhesion <i>24 hours after application</i>	ABS: 3.8 pounds/inch (0.68 kg/cm) Acrylic enamel: 3.4 pounds/inch (0.61 kg/cm) Aluminum, anodized: 7.8 pounds/inch (1.40 kg/cm) Aluminum, etched: 5.1 pounds/inch (0.91 kg/cm) Chrome: 4.1 pounds/inch (0.73 kg/cm)
Chemical resistance	Resists mild alkalis, mild acids, and salt Excellent resistance to water <i>(this does not include immersion)</i>

Application Characteristics

Characteristic	Description
Finished graphic application recommendation	Surface type: Flat, with and without rivets, simple curves, moderate compound curves, and corrugations Substrate type: ABS resins, aluminum, chrome, glass, fiberglass reinforced plastics, paint (check adhesion to powder-coated or water-based paints) Application temperature: - 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)
Applied film shrinkage	0.015 inches (0.4 mm)
Finished graphic exposure temperature	-65° to +225°F (-60° to +107°C)
Graphic removal	Removable with heat and/or chemicals from most substrates within the warranty period at 50°F (10°C) minimum (air and substrate)

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

Warranted Durability for Graphic Constructions in a Vertical Exposure

Warranties shown in years	Imaged with Toner Series 8700/8800 on Trident Paper and transferred to film 8620C		
	Vehicle	Outdoor	Indoor
Graphic Protection			
8519	7	4	8
8520	7	4	8
8908	-	1	3
8909	-	1	3
8912	5	4	8
8915	-	-	8
8920	5	4	8
1920DR	5	4	8
1930	5	4	8

Formulas for Other U.S. Warranted 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.

Exposure	Percentage of U.S. Vertical Exposure	Example
U.S. Non-vertical	50% (0.5)	0.5 x 5 years = 2.5 years
Desert Southwest Vertical	70% (0.7)	0.7 x 5 years = 3.5 years
Desert Southwest Non-vertical	35% (0.35)	0.35 x 5 years = 1.75 years
Horizontal, Vehicle only	Warranted for legibility only for the stated durability.	

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.

Fleet Labor Reimbursement

3M will reimburse 100% of the labor costs associated with the removal, remanufacture and reapplication of a **commercial fleet graphic only** to the extent that 3M determines such amount is reasonable and necessary in the circumstances. This labor cost reimbursement will be determined by 3M on a case-by-case basis taking into account the expected amount of labor needed to make such repairs and other considerations.

Labor Reimbursement Remedy for Removable and Changeable Films

If the film cannot be successfully removed or an excessive amount of adhesive residue remains on the surface, 3M will reimburse a portion of extra removal costs.

Removal requires heat and/or chemicals. The ease and rate of removal depends on a number of factors. See Instruction Bulletin 6.5 for details.

See warranty removal limitations on page 1.

Orientation	Remedy
Vertical	Same as Warranted Durability
Non-vertical	50% of the U.S. vertical Warranted Durability, not to exceed 3.5 years

Warranty Notes

Terms



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: Exposure. 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.

Fleet Vehicle. Refers to commercial straight trucks and trailers but not buses, vans or automobiles.

Signs. Graphics applied outdoors and exposed to the elements.

Graphic Performance Life

The actual performance life of a graphic depends on the:

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

Removal Warranty Exceptions

Removal is not warranted under these conditions. Attempting to remove the graphic may result in damage to the substrate.

- Removal of graphics from automobiles, vans or buses that do not have Pre-installation Review, which is required as a condition for the warranty. See Instruction Bulletin 5.36.
- Removal from any painted surface if the paint is not well bonded and/or properly cured.
- Removal from painted wallboard, which may damage cause the paper to separate from the board.
- Removability from outdoor, horizontal applications
- Removal from a pre-existing graphic will damage that graphic.
- Removal from substrates that have aged paint or metal due to surface oxidation or chalking. Such conditions may result in adhesive residue upon removal. Test and approve before using.

Application Outside the U.S.

Contact the 3M organization for that country.

Application to Glass

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

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, except as noted in this Bulletin. The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include non-3M graphic products.

Warranty and Limited Remedies

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.

Fabrication

You cannot print directly onto this film. First, the image is electrostatically printed onto a transfer media and then heat transferred onto this film. Refer to the Instruction Bulletin 4.7 for details.

Graphic Protection

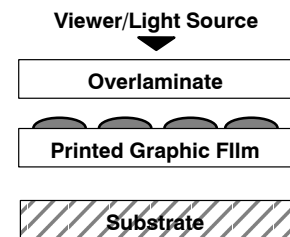
Graphic protection can improve the appearance, performance and durability of your graphic.

- Clears 1920DR and 1930 should be applied by screen printing.
- Overlaminates must be cold roll applied.

Graphic Construction

Opaque Graphics

Opaque graphics are electrostatically printed on Trident transfer paper and then transferred by heat and pressure as a first surface image onto opaque graphic film 8620C ES.



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 minimum values for electronic cutting text from this film 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)

Note: Weeding must be done carefully. Cut graphics are difficult to re-adhere to the liner if mistakenly pulled off.

Application Tape

Generally, it is not necessary to premask this film when it has a screen print clear. However, graphics with screen print clear, or graphics that are 4 square feet (0.36 m²) or larger and intricately-shaped graphics should be premasked to prevent stretching and for easier application.

The type of application tape to use depends on the type of graphic produced and screen print clear that was used. See Instruction Bulletin 4.3 for details.

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

Graphic Protection	Premasking Tape	Prespacing Tape
8519	SCPM-3, if needed	SCPS-55
8520	SCPM-3, if needed	SCPS-55
8908	SCPM-3, if needed	Not recommended
8909	SCPM-3, if needed	Not recommended
8912	SCPM-3, if needed	SCPS-55
8915	SCPM-3, if needed	SCPS-55
8920	SCPM-3 or TPM-3	SCPS-55
1920DR	SCPM-44X	SCPS-55
1930	SCPM-44X	SCPS-55

Application

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

Adhesive

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 positionability 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 positionability even with light hand pressure.

Method

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

Finishing

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

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.)

Note: Do not use alcohol to clean graphics protected by clear 8920 ES or 1920DR.

Removal

This film is warranted to be removable using chemicals or heat. 3M™ Controltac™ Film Remover R221 and 3M™ Controltac™ Adhesive Remover R231, are available. Removing the film from a pre-existing graphic will damage that graphic. Refer to the Instruction Bulletin 6.5 for removal details.

Shelf Life, Storage, and Shipping

Activity	Recommendation
Shelf life	Total shelf life: 2 years Up to 2 years unprocessed, OR process within 1 year and 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 6 inch (15 cm) or larger core; this helps prevent the liner and premasking tape from wrinkling or popping off

See Instruction Bulletin 6.5 for details.

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 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.

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 8620C ES 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 material charges.

Attention: Authorized Graphics Manufacturers

Visit our password-protected website for exclusive product information, profiles 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™ Trident Transfer Paper	Trident	3567
Scotchprint® Exterior Toner Series 8700/8800	8700/ 8800	3514
3M™ Scotchcal™ Overlaminates 8519 and 8520	8519/ 8520	4524
3M™ Scotchcal™ Luster Overlaminates 8908	8908	3554
3M™ Scotchcal™ Matte Overlaminates 8909	8909	3565
3M™ Scotchcal™ High Gloss Graffiti Resistant Overlaminates 8912 ES	8912	3521
3M™ Scotchcal™ Ultra-Matte Overlaminates 8915 ES	8915	3522
3M™ Screen Print Clear 8920 ES	8920	2510
3M™ Screen Print Clear 8920 ES	8920	2510
3M™ Screen Printing Ink Series 1900 and Screen Print Clear V10402	1900	2501
Instruction Bulletins		
Design of markings	2.1	5501
Scoring and cutting	4.1	6501
Using Scotchprint toner series 8700/8800	4.12	6512
Transferring and laminating electrostatically printed images	4.7	6507
Screen printing with clear 8920 ES	3.15	6015
Screen printing with ink series 1900	3.11	6011

Subject	Bulletin No.	FOD No.
Cold roll lamination	4.22	6522
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
A guide to understanding and applying graphics to common indoor and outdoor wall surfaces	5.37	7037
Applying 3M graphic films with Comply adhesive	5.31	7031
Application: special considerations for complex contours of automobiles, vans and buses and inspection forms	5.36	7036
Storage, handling, maintenance, removal	6.5	8505
Other Documents		
3M Graphics Center Warranty Brochure		9503

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Bulletin Change Summary

New Product. 3M™ Controltac™ Plus Conformable Graphic Film with Comply™ v2 Adhesive 8620Cv2 ES has been added. It carries the same warranty as film 8620C-10 ES.

General. This warranty information has been reorganized but no values have changed.



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Fax-on-Demand document: 3555
www.3M.com/graphics

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