



Controltac™ Plus

Graphic Film with Comply™ Performance Series 250C

Description

3M™ Controltac™ Plus Graphic Film with Comply™ Performance Series 250C has been specially formulated by 3M for Gerber Scientific Products, Inc. and is available exclusively from an authorized Gerber distributor. To find a Gerber distributor near you, contact Gerber at 1-800-222-7446 or visit their website at www.gspinc.com.

Advantages

- New Comply™ Performance feature for easier, high quality installations
- Optimized for printing on the GERBER EDGE®, EDGE 2 and GERBER MAXX™ 2 thermal printing systems
- Screen printable
- Long term durability
- Suitable for large exterior and interior graphics
- Easy to temporarily position during application
- For flat and corrugated surfaces with and without rivets
- Removable adhesive, with heat or a chemical system
- Wide application and removal temperature range

Application and End Uses

Film series 250C is intended for making removable, durable graphics when used with the listed Compatible Products in the following applications. These applications are warranted by the 3M™ MCS™ Warranty.

- Interior and exterior graphics and signs
- Commercial vehicle and fleet graphics, emblems or striping
- Bus graphics

Limitations of End Uses

We do not normally warrant other applications, but please contact GSP to discuss your needs and other options.

Specifically, we do not warrant this film for the following:

- Graphics applied to:
 - Stainless steel.
 - Non-3M films (also see Removal on page 8).
 - Substrates that do not have a clean, smooth surface or have poor paint-to-substrate adhesion.
- Graphic removal from:
 - Applications with poor paint-to-substrate adhesion.
 - Existing graphics that must remain intact. Damage may occur during removal of film 250C.

- 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.

NOTE: Film used on buses must not be applied so as to restrict the safe use of emergency window exits. See Instruction Bulletin 5.4, Release G, July 2003 or later for details.

Compatible Products

- 3M™ Screen Printing Ink Series 1900 (line color and four color)
- 3M™ Screen Printing Ink Series 9700UV (line color and four color)
- 3M™ Edge Sealer 3950
- 3M™ Prespacing Tape SCPS-55
- 3M™ Premasking Tape SCPM-3 and SCPM-44X

Characteristics

This information is subject to change. Refer to the Fax-on-Demand Index to make sure this is the most current Product Bulletin. See 3M Related Literature for bulletin ordering information.

Characteristic	Description
Color	250C-10 white
Film	cast opaque vinyl
Thickness	2 mils (0.05 mm) <i>without adhesive</i> 3-4 mils (0.08-0.10 mm) <i>with adhesive</i>
Adhesive type	Positionable, pressure activated with Comply performance feature
Adhesive color	Gray-pigmented
Liner	Polyethylene-coated layflat paper
Application surface	Flat, with and without rivets, corrugated, simple curves, moderate compound curves
Application substrates	ABS resins, aluminum, chrome, glass, fiberglass reinforced plastics, paint (check adhesion to powder-coated or water-based paints)

Characteristics continued on the next page.

Characteristics continued from the previous page.



Property	Description
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 7 years
Removal temperature	50° F (10°C) minimum (air and substrate)

Effective Performance Life



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 in the next column. The actual performance depends on the:

- Use of 3M compatible products.
- Correct combination of film, ink, and clear coat.
- Ink formulation.
- Ink drying methods.
- Selection and preparation of the substrate.
- Application methods.
- Cleaning and maintenance methods.
- Exposure conditions.



Warranted Durability

Vehicle Graphics										
Clear Coat	 Vertical Exposure face of graphic is $\pm 10^\circ$ from vertical				 Non-Vertical Exposure face of graphic is $>10^\circ$ from vertical				Horizontal Exposure for legibility only	
	U.S. ¹ years		S.W. ² years		U.S. ¹ years		S.W. ² years		U.S. ¹ years	S.W. ² years
	Trailers	Other Vehicles	Trailers	Other Vehicles	Trailers	Other Vehicles	Trailers	Other Vehicles		
Unprinted 3M™ Controltac™ Plus Graphic Film with Comply™ Performance Series 250C										
None	Lifetime ³	7	Lifetime ³	5	4	4	3	3	5	3

Sign Graphics										
Unprinted 3M™ Controltac™ Plus Graphic Film with Comply™ Performance Series 250C										
None	n/a	7	n/a	4	n/a	4	n/a	3	0	0

Railroad Graphics				
clear coat	 Vertical Exposure face of graphic is $\pm 10^\circ$ from vertical		 Non-Vertical Exposure face of graphic is $>10^\circ$ from vertical	
	U.S. ¹ years	S.W. ² years	U.S. ¹ years	S.W. ² years
Unprinted film				
None	8 plus 2 more, legibility only	6	6	6
3M™ Screen Printing Ink Series 1900				
1920DR Air dry	5	3	3	2
1920DR Oven dry	6	4	4	2
1920	2, may haze	1, may haze	1, may haze	1
9720UV	6	4	4	2
9730UV	3	2	2	1
3M™ Screen Printing Ink Series 9700UV (does not include metallic or 4-color)				
None	2	1	1	1
9720UV	7	4	4	2
9730UV	3	2	2	1

^{1,2,3} See the notes following the tables on page 3.

	 Vertical Exposure face of graphic is $\pm 10^\circ$ from vertical	 Non-Vertical Exposure face of graphic is $>10^\circ$ from vertical	Horizontal Exposure for legibility only			
Clear Coat	U.S.¹ years	S.W.² years	U.S.¹ years	S.W.² years	U.S.¹ years	S.W.² years
Vehicle						
3M™ Screen Printing Ink Series 1900 (line color and four color)						
1920DR Air dry	5	3	4	2	0	0
1920DR Oven dry	6	4	4	2	5	3
1930	2, may haze	1, may haze	1, may haze	1, may haze	0	0
9720UV	6	4	4	2	5	3
9730UV	3	2	2	1	0	0
3M™ Screen Printing Ink Series 9700UV						
None	2	1	1	1	0	0
9720UV	7	4	4	2	5	3
9730UV	3	2	2	1	0	0
3M™ Screen Printing Ink Series 9700UV metallic inks						
9720UV	5	3	3	2	5	3
3M™ Four Color Screen Printing Ink Series 9700UV						
9720UV	7	4	4	2	5	3
9730UV	3	2	2	1	0	0

¹ For warranty periods outside the United States, contact the 3M sales organization for that country.

² 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.

³ For vehicle graphics only, refer to the Lifetime Warranty information, below.

3M™ MCS™ Warranty

3M warrants the performance of the Product from the date of installation for the number of years stated in the Warranted Durability chart. In the event that the Product does not perform as stated within the warranted time, and the graphics are fabricated as specified by the 3M MCS Warranty, then 3M shall at 3M's option either (a) refund the entire purchase price of the material, or (b) replace all 3M materials consumed in the manufacture of the graphics. In addition, **for fleet applications only**, 3M will reimburse 100% of the labor costs associated with the removal, remanufacture, and reapplication of the graphic 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.

Lifetime Warranty

3M warrants the performance of film 250C-10 for as long as the original graphics purchaser owns the vehicle. If the film fails, the following reimbursement schedule applies.

U.S. Failure occurs during year:	Desert Southwest Failure occurs during year:	Replace Material: %	Labor %
8	5	100	100
9	6	80	50
10	7	60	25
11	8	40	10
12	9	20	0
13	10	10	0
14	-	10	0
15	-	10	0
16 plus	-	10	0

Warranty Exceptions

- Unprinted film series 250C has a tendency to chalk in exterior applications. Film that cannot be cleaned must be printed with clear coat 1920DR, 9720UV or 9730UV. The warranty is the same as for the ink series being used.

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

Horizontal Exposure Warranty for Vehicle Graphics Requiring Legibility Only

Horizontal applications can be used on the rooftops of commercially owned vehicles where identification from the air is needed. Horizontal applications are subjected to the maximum sunlight and environmental conditions. The graphic will change color, lose gloss, and chalk. The following ink restrictions apply.

Screen Printing Ink Series 1900

- Use ink series 1900 and clear coat 1920DR or 9720UV.
- Oven dry the last color and clear coat 1920DR for 2 hours at 150°F (65°).

Screen Printing Ink Series 9700UV

- Use clear coat 9720UV.

Thermal Mass Transfer Printing

Film series 250C has been optimized for use with the GERBER EDGE, EDGE 2 and GERBER MAXX 2 thermal transfer systems.

Screen Printing

To get the durability given in the **Effective Performance Life** section for film series 250C, use the correct combination of ink and clear coat. Check the appropriate Product Bulletins and Instruction Bulletins for the limitations of each particular ink.

The compatible screen printing ink series are listed in the Compatible Products section on page 1.

If ink series 1900 is used and the graphic is being applied to a corrugated surface, then the last color and the clear coat must be oven dried.

Cutting

The following are common cutting methods for this film. See Instruction Bulletin 4.1 for details.

- Bandsawing
- Hot kiss cutting
- Guillotine
- Hand cut
- Cold and hot steel-rule die cutting

Film series 250C can be cut on any 15 inch Gerber sprocketed plotter or Gerber ODYSSEY™ plotter. A 30 degree Super-Sharp blade is recommended. Though plotters can be set to full speed for simple geometric shapes and panels over 6 inches high, slowing the speed of the plotter is found to optimize cut performance. User is advised to test cut before running the entire job. This product is not recommended for complex contour cutting.

Application Tape

The type of application ape to use depends on the type of graphic produced and the ink 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 the liner exposed.
- Use a premasking tape if very little of the liner is exposed.

Clear Coat	Prespacing Tape	Premasking Tape
Unprinted	SCPS-55	SCPM-3
1920DR 1930	SCPS-55	SCPM-3
9720UV 9730UV 9700UV (no clear coat)	SCPS-55	SCPM-44X

Application

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

The following application details are for film series 250C.

Temperature

The application temperature range is:

- Flat surfaces with and without rivets is 40° to 100°F (4° to 38°C).
- 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.

Method

Film series 250C has the Comply performance feature. This 3M technology is a mechanical feature, not an adhesive property. This feature allows air to travel through the adhesive. The film can be applied with time saving techniques such as larger squeegees. In addition, applications usually have fewer air bubbles. Refer to Instruction Bulletin 5.31 for additional information on the application of Comply performance products.

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.

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

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.)

Removability

Film series 250C is warranted to be removable using heat, accessories, and/or chemicals. Removing this film from a pre-existing graphic will damage that graphic. Refer to the Instruction Bulletin 6.5 for removal details.

A chemical remover system is available for graphics printed with solvent-based ink. Follow the procedures in Instruction Bulletin 6.5 for using Film Remover R221 and Adhesive remover R231.

Removal Warranty

The ease and rate of removal depends on a number of factors. See Instruction Bulletin 6.5 for details.

- Substrate type and condition
- Screen printing ink, amount and type
- Graphic age and weathering conditions
- Pull-off angle, which should be less than 90 degrees

The removal warranty for standard vehicle and sign substrates is:

- **Vertical:** 7 years or the Warranted Durability, whichever comes first.
- **Non-vertical:** 50% of the vertical Warranted Durability, not to exceed 3-1/2 years.

Removability Exceptions

- A signed Pre-installation Review is required as a condition for warranty on buses. See 3M Bus Graphics Policy and Warranty Statement in the Related 3M Literature section.

Note: This film is not designed for short-term graphics and may cause damage upon removal from painted surfaces.

- Exterior, horizontal applications.
- 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.

Shelf Life, Shipping, and Storage

- Unprocessed film has a shelf life of 2 years after receipt. Processed film has a shelf life of 1 year. However, the total shelf life of a graphic before and after processing cannot exceed 2 years.
- Store the film in a clean, dry area in the original container.
- Store the film out of the direct sunlight and at less than 100°F (38°C).
- Ship the finished graphic lying flat or in a roll. To roll the graphic, roll it film side out onto a core that is 5 inches (13 cm) or larger in diameter. These methods help prevent the film and premasking from wrinkling or popping off the liner.
- 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 <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 film series 250C and are not for use in specifications. The data given below is for unprinted film as purchased from 3M.

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

Final adhesion value is 24 hours after application.

Substrate	Value
ABS	4.2 pounds/inch (0.75 kg/cm)
Acrylic enamel	3.5 pounds/inch (0.63 kg/cm)
Aluminum, anodized	7.9 pounds/inch (1.42 kg/cm)
Aluminum, etched	5.2 pounds/inch (0.93 kg/cm)
Chrome	4.8 pounds/inch (0.87 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:* Film series 250C 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.

3M Related Literature

Before starting any job, be sure you have the most recent product and instruction bulletins.

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.

United States or Canada: 1-800-364-0768
International: 1-651-732-6506



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: 3034
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

Subject	Bulletin No.	FOD No.
Product Bulletins		
3M™ Screen Printing Ink Series 1900 and Overprint Clear VI0402	1900	2501
3M™ Screen Printing Ink Series 9700UV	9700	2507
Instruction Bulletins		
Design of graphics	2.1	5501
Screen printing with ink series 1900 - line color - 4-color	3.12 3.11	6012 6011
Screen printing with ink 9700UV - line color - 4-color	3.4 3.13	6004 6013
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
Applying 3M Graphic Films with Comply™ Performance	5.31	7031
Storage, handling, maintenance, removal	6.5	8505
3M Bus Graphics Policy and Warranty Statement	75-5100-1315-6	

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MAXX and ODYSSEY are trademarks of Gerber Scientific Products, Inc.

Bulletin Change Summary

Added important note on page 1 about how to use this film on emergency window exits.