



Controltac™ Plus

Curtain-Sided Vehicle Film 190

For Screen Printing and Piezo Ink Jet Printing

Note: This bulletin has been thoroughly revised; therefore black bars have not been used to indicate changes. Please read the entire bulletin thoroughly.

- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684, Ext. 444, for alternatives.

Note: Applicators should receive training from 3M on applying film 190 to curtain material.

Description

Advantages

- Versatile printing options
 - Traditional screen printing
 - Scitex Pressjet-W™ Digital Press
- Superior flexibility
- For use with 3M approved PVC curtain materials*
- Positionable and repositionable adhesive, making it an excellent choice for larger graphics
- Pressure-activated adhesive (This 3M technology is a mechanical feature, not an adhesive property. Pressure on the film surface bonds the adhesive to the substrate.)
- Glossy
- Conformable
- Dirt resistant

*To get your PVC curtain material approved by 3M, contact your 3M sales representative.

Applications and Uses

3M™ Controltac™ Plus Curtain-Sided Vehicle Film 190 is intended for making durable graphics when used with the listed Compatible Products in the following applications. These types of applications are warranted by the 3M™ MCS™ Warranty.

- Commercial vehicle and fleet graphics, emblems or striping when used with an approved clear coat

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.

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

- Graphics without an overlamine or overprint clear
- Awning, banner or flexible sign applications.

Compatible Products

Inks

- 3M™ Piezo Ink Jet Ink Series 1600 for the Scitex Pressjet-W™ Digital Press
- 3M™ Screen Printing Ink Series 1900

Overlamine or Overprint Clear (required)

- 3M™ Screen Printing Overprint Clear 1920DR
- 3M™ Scotchcal™ High Gloss Hot Transfer Flexible Overlamine 8921 ES

Application Tape

- 3M™ Premask Tape SCPM-19

Characteristics

Characteristic	Description
Film	2 mil (0.05 mm), opaque vinyl
Number / Color	190-10 white
Thickness (film and adhesive)	3 to 4 mils 0.08 to 0.10 mm
Adhesive	Positionable, permanent, pressure activated adhesive Note: This product has an adhesive that appears to be non-tacky. It is substrate specific and adheres well to PVC curtain material. It is not intended for use on other surfaces.
Liner	94 pound, polyethylene-coated paper
Removal	Permanent
Recommended substrates	3M-approved PVC curtain material
Application temperature range	40° to 100°F (4° to 38° C)

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

Note: Obtain copies of the most recent product and instruction bulletins as listed in **3M Related Literature** at the end of this bulletin. Read all recommended bulletins before making a graphic.

Effective Performance Life

Only a Scotchprint® Graphics Authorized Manufacturer (and/or 3M Piezo Ink Jet Registered Fabricator when using piezo inks) can produce 3M™ MCS™ Warranted Graphics. 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 below. The actual performance depends on the:

- Correct combination of film, ink and a required overprint clear or overlaminate
- Adequate drying
- Selection and preparation of the substrate
- Application methods
- Exposure conditions
- Cleaning methods

Warranted Durability: Five years; exterior, vertical

This warranty covers failures due to edge lifting, peeling, swelling, wrinkling or cracking caused by plasticizer migration or severe flexing.

Changes in appearance caused by bird deposits, insect secretions, and dirt are not covered under this warranty. Horizontal application is not recommended or warranted.

Printing with Screen Printing Ink

To get the durability given in the **Effective Performance Life**, use screen printing ink series 1900 and overprint clear 1920DR.

This bulletin does not contain detailed printing, processing or application procedures for the subject products. Refer to the 3M Related Literature on page 4 for the appropriate Product and Instruction Bulletins.

Printing with Solvent-Based Piezo Ink Jet Inks

The ink Instruction Bulletin provides detailed information for successful printing and graphic application. You must follow these instructions to get the durability given in the Effective Performance Life. See **3M Related Literature** on page 6.

The operator who has an excellent understanding of pre-press operations, including color management and using software profiles, and who understands the relationship between film characteristics, printer setup, total ink coverage and drying time can produce graphics that achieve the performance expectations of the film and the customer.

The operator should work with the graphic designer and/or color conversion operator so there is a common understanding of print and media parameters.

The operator should also work with the film applicator so you are both aware of any special handling or application techniques that may be needed for the selected film construction.

Total Ink Coverage

Do not exceed 300% total ink coverage for film 190. Too high a total physical ink amount on the film results in media characteristic changes, inadequate drying, overlaminate lifting, and/or poor graphic performance.

Special Considerations

This film may show streaks in one color black solids and marginal streaks in other solid colors. You may use four-color black for one color black, however, expect streaks in other solid colors.

Colors with low dot fill percentage or busy halftones should print without streaks.

Drying

Caution

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 overlaminate, rolling the graphic, and applying the film. See Instruction Bulletin 4.30 for more details.

Application

Note: Applicators should receive training from 3M on applying film 190 to curtain material.

Refer to the Instruction Bulletin 5.12 for more information on cutting and applying film 190.

Temperature

The application temperature range is 40° to 100°F (4° 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.

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.

Application Tape

Premask tape SCPM-19 may be used for both prespacing and premasking film 190. Do not use a heat lamp vacuum applicator. See Instruction Bulletin 4.3 for details.

Shipping

When shipping film 190, the material should be rolled printed-side-out on a minimum 3 inch (7.5 cm) diameter core.

Removal

This is a permanent product. Attempting to remove it may be difficult and time consuming and will likely damage the substrate.

Maintenance

Note: Graphics damaged by improper cleaning are not covered by 3M warranty.


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 4 and 10 (neither strongly acidic nor strongly alkaline.)

Monthly cleaning is recommended to maximize the dirt resistant properties of film 190. More frequent cleaning may be required where dictated by local conditions. See Instruction Bulletin 5.12 for details.

Shelf Life, Shipping, and Storage

- Unprocessed film has a shelf life of two years after receipt from 3M. Processed film has a shelf life of one year. However, the total shelf life of a graphic before and after processing cannot exceed two 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 print side out onto a core that is 5 inches (13 cm) or larger in diameter. These methods help prevent the film and premask tape 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:	
<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 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

The values given are typical for processed film 190. Contact your 3M representative to request a custom specification.

Physical Characteristics

Property	English Units	Metric Units
Service temperature range	-22°F to +194°F	-30°C to +90°C
Impact Resistance	-22°F No effect	-30°F No effect

Adhesion*

Adhesion to cleaned PVC coated canvas

	English	Metric
After 24 hours at 73°F (23°C)	2.0 lb/in	0.35 kg/cm
After 168 hours at 73°F (23°C)	2.2 lb/in	0.39 kg/cm

*Adhesion testing to flexible substrates differs significantly from that done on rigid surfaces.

Chemical Resistance

- 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: 3M™ Controltac™ Plus Graphic Film 190 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.

Scotchprint® Graphics Network

There's a whole other world behind the Scotchprint® Graphics Internet site (www.scotchprint.com) and you can travel there with the Scotchprint® Graphics Network. This password-protected Web site opens the door to exclusive Scotchprint® Graphics product information, services and e-deals (product promotions) that are not available on our regular Internet site.

There's no charge and you can sign up today. Just ask your Commercial Graphics Division sales representative, or contact Lisa Burns (ljburns3@mmm.com or 651-736-9719).

3M Related Literature

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

Subject	Bulletin No.	FOD No.
Product Bulletins		
3M™ Screen Printing Ink Series 1900	1900	2501
3M™ Piezo Ink Jet Ink Series 1600	1600	4526
3M™ Scotchcal™ High Gloss Hot Transfer Flexible Overlamine 8921 ES	8921	3530
Instruction Bulletins		
Design of graphics	2.1	5501
Screen printing with ink series 1900	3.11	6011
Printing with piezo ink jet ink series 1600	4.30	6530
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
Cutting and applying curtain sided vehicle film	5.12	7012
Storage, handling, maintenance, removal	6.5	8505
Warranties		
Worldwide 3M™ MCS™ Warranty Packet (includes all Commercial Graphics MCS Warranties)		9503
Worldwide 3M™ MCS™ Warranty Overview-Folder		9504
3M™ MCS™ Graphics Warranty for Fleet Vehicle Applications (includes overview)		9506

*Scotchprint is a registered trademark and 3M is a trademark of 3M in the U.S. and other countries.
Pressjet-W is a trademark of Scitex.*

3M

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