



Scotchcal™ Perforated Window Graphic Film 8171

For Screen Printing Only

Description

3M™ Scotchcal™ Perforated Window Graphic Film 8171 allows a full image to be seen on the outside while allowing viewing through windows from the inside. A 50 percent perforation pattern enhances light transmission. This short-term, removable, first surface film is designed for screen printing graphics.

Note: 3M™ Scotchcal™ Perforated Window Graphic Film 8174-10 has less light transmission than film 8171 and is an alternative for applications where the density of the outside image is more important than the viewability through the window.

Recommended Types of Graphics and End Uses

These types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty. Please read the entire bulletin for details.

- Store and vehicle windows
- Application to metal areas less than 2 inches wide between windows if they are covered with 3M brand vinyl graphic film or are painted

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.

Unsuitable End Uses for This Film

- Wet film application method
- Applications other than vertical window surfaces
- Application to windows that have built-in heating, defrosting elements or wipers
- Application to substrates with coatings such as anti-reflection and scratch resistance; such coatings may be damaged during film removal
- Applications that in any way restrict the safe operation of emergency window exits.
- Use on any regulated vehicle window

- Application to windows that crank or roll down.
- 3M Commercial Graphics Division policy is not to support applications of perforated window graphic film when a driver's view is obstructed, which may include non-vertical windows, and/or where local laws prohibit its use.

Caution

Some states have laws or regulations requiring minimum light transmission that may limit or preclude the use of this product on regulated vehicle windows, which may include passenger vehicles and vans. The user is responsible for determining and complying with all applicable standards.

- Applications that require an optically clear view but have not been laminated with overlamine 8914

Warning

Applications that require an optically-clear view, such as vehicle window exteriors, must be laminated with overlamine 8914. Failure to apply this overlamine could result in obstructed or impaired viewing when the product becomes wet.

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

Special Bus Application Safety Information

The Office of Vehicle Safety Compliance of the U.S. National Highway Traffic Safety Administration (NHTSA) has asked for 3M's assistance in communicating an important safety concern. NHTSA has observed that graphic films used for bus wraps could be, and in some cases have been, applied in such a way as to block or restrict emergency window exits. Specific instructions for graphic installers on how to avoid such problems are provided in the most current release of 3M Instruction Bulletin 5.4.

Continued on the next page.

Penalties For Non-compliance

Failure to trim film away from rubber gaskets surrounding emergency exit windows can render an emergency exit inoperable. This is a violation of Title 49 United States Code section 30122. Substantial civil penalties as set forth in Title 49 United States Code section 30165 may be incurred for such a violation.

Compatible Products for 3M™ MCS™ Warranted Graphics

Inks

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

Graphic Protection Options

- 3M™ Scotchcal™ Optically Clear Overlamine 8914
Provides optical clarity as well as graphic protection from environmental factors such as dust, water and dirt that may collect in the perforations.
- Screen print clears
Use these for ink protection only; they do not protect from dust, water or dirt
 - 3M™ Screen Print Gloss Clear 1920DR
 - 3M™ Screen Print Gloss Clear 9720UV
 - 3M™ Screen Print Gloss Clear 9800CL

Other Products

- 3M™ Premasking Tape SCPM-44X
- 3M™ Premasking Tape SCPM-3
- 3M™ Premasking Tape SCPM-19
- 3M™ Prespacing Tape SCPS-2
- 3M™ Prespacing Tape SCPS-53X

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.

Physical Characteristics

Characteristic	Description
Film	Cast vinyl, 50% perforation pattern
Color	White on the image side, black on the reverse side
Gloss	High gloss
Film thickness	Without adhesive: 4 mils (0.10 mm) With adhesive: 5-6 mils (0.13-0.15 mm)

Characteristic	Description
Liner	Polyethylene-coated paper with a clear film backing
Adhesive	Pressure sensitive
Adhesive color	Clear
Tensile strength	4.2 pounds/inch (0.74 kg/km) <i>minimum</i>
Flammability	Unprocessed film 8171 has been tested for flame spread per ASTM E84, "Surface Burning Characteristics of Building Materials," and the results show that the material meets the requirements of National Fire Protection Association Class A as defined in NFPA 101, "Life Safety Code."

Application Characteristics

Characteristic	Description
Finished graphic application recommendation	Surface type: Flat or simple curves Substrate type: Transparent substrates such as transparent acrylic, glass, 3M vinyl films, polycarbonate, painted metal between vehicle windows Application temperature: 40° to 100°F (4° to 38°C)
Service temperature range	-30° to 150°F (-34° to 65°C)
Removal	Up to 1 year, with heat, from glass, acrylic, polycarbonate
Removal temperature	Glass: 60° to 100°F (16° to 38°C) Acrylic, polycarbonate: 70° to 100°F (21° to 38°C)

Warranty Information

Graphic Performance Life

The actual performance depends on the:

- Use of 3M compatible products
- Ink formulation
- Adequate ink drying or UV curing (screen printing)
- Selection and preparation of the substrate
- Surface texture
- Application methods
- Environmental conditions
- Cleaning or maintenance methods
- Angle and direction of sun exposure

Continued on the next page.

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

3M™ MCS™ Warranted Graphic Constructions

The warranty given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honor.

The warranties in this table are for graphics exposed in the U.S. in a vertical orientation. See **Warranty Notes** for how to determine other warranty combinations.

Warranted Durability – Vertical Exposure				
Ink Series	Clear	U.S. Vertical Exposure (in years)		
		Fleet	Outdoor	Indoor
1900	8914 1920DR 9720UV	1	2	5
9800	None	0	0	2
	8914 9720UV 9800CL	1	2	5
9800 <i>metallic</i>	8914 9720UV 9800CL	1	2	5

Warranty Notes

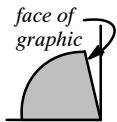
Graphic Exposure Definition



face of graphic

Vertical Exposure

The face of the graphic is $\pm 10^\circ$ from vertical.



face of graphic

Non-Vertical Exposure

The face of the graphic is greater than 10° from vertical.

U.S. Desert Southwest Warranties

All other outdoor warranties are based on a percentage of the vertical U.S. warranties given in the Warranted Durability Table. The calculation for determining these warranties is given below. A “construction” is the base film, ink and graphic protection. The examples are based on a vertical U.S. warranty of 2 years.

- **Warranty for U.S. Desert Southwest Exposure**

For 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.

- **Vertical U.S. Desert Southwest**

70% (0.7) of the U.S. vertical warranty for your construction

Example: $0.7 \times 2 \text{ years} = 1.4 \text{ years}$

Application Outside the U.S.

Contact the 3M organization for that country.

Overlamine 8914

This is required when an optically-clear application is needed. Apply with a cold roll laminator. See Instruction Bulletin 4.22.

Before laminating, read the section **Edge Sealing Requirements**.

Removal

Removability is warranted for 1 year.

Application to Glass

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

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.

Print a Test Sample

The image may appear lighter when it is printed on perforated film. Increasing the color density may make up for some image loss. Images printed on this film may not hold the same level of fine detail as on solid films.

Due to the perforations, some of the ink from the fill pass does not transfer to the film. To maintain a good image, it may be necessary to print a paper slip sheet after every 10 to 15 impressions. The clear film on the back of the liner helps maintain a vacuum and prevents the ink from getting onto the bed of the press.

Cutting

Common cutting methods are:

- Cold steel rule die
- Razor blade
- Sharp knife

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

Application Tapes

3M application tape may help with the application of a graphic. Graphics that have large amounts of exposed liner or are kiss cut use a prespacing application tape. If there is very little exposed liner, use a premasking application tape.

Graphic Protection	Premasking Tape	Prespacing Tape
Unprinted	SCPM-3	SCPS-2
1920DR	SCPM-19	SCPM-19
9720UV 9800 (no clear) 9800CL	SCPM-44X	SCPS-53X
8914	Do not use tape	

Application

1. The graphic image must be protected by an overlamine or screen print clear as specified in the **Warranted Durability** table on page 2.

For maximum protection, use overlamine 8914 over film 8171 to protect the graphic from environmental factors such as dust, water, and dirt that may collect in the perforated areas.

2. If the perforated film is applied to the painted metal surfaces between windows, the image may not look consistent. To maintain a consistent image, an opaque 3M vinyl film may be applied to the surfaces between windows before the perforated film is applied. The color of vinyl film used depends on the image you want.
3. For further application details, please refer to the following 3M Instruction Bulletins.
 - Always use a dry application method. Refer to Instruction Bulletin 5.5, *General Procedures for Interior and Exterior Dry Applications*.
 - Instruction Bulletin 5.4, *Application "Special Applications and Vehicles"*, specifically the "Vehicle and Store Windows" section. This bulletin contains **important details** about the Bus Safety Installation information.

Edge Sealing Recommendations

Edge sealing improves the resistance to environmental damage and enhances the durability of the graphics. We recommend using one of these easy options on graphic edges.

✓ Important Note

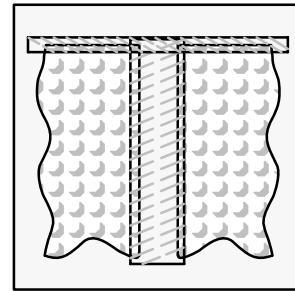
Never allow film or overlamine to touch the rubber window molding.

You can order narrow rolls of overlamine 8914 from 3M. Use part number 75-3469-0233-3 and specify 1/2 inch x 50 yard (13 mm x 43 m) rolls, or you may cut 1/2 inch (13 mm) rolls from your inventory of overlamine 8914.

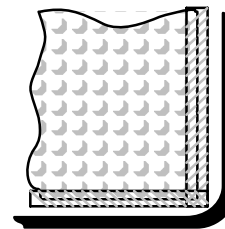
OPTION 1: Seal the edges with strips of overlamine. *This method can be used whether your graphic has overlamine 8914 or a screen printed clear coat applied.*

Apply a 1/2 inch (13 mm) strip of overlamine 8914 so each strip evenly straddles the perforated film and substrate. Overlap the corners. See Figures 1 to 3.

- Figure 1.** With strips of 8914, overlap glass by about 1/4 inch (7 mm). Also overlap corners.



- Figure 2.** Where there is a small gap between windows, overlap entire gap with strips of 8914 so it extends about 1/4 inch (7 mm) onto perforated film.



- Figure 3.** Where there is a rubber molding around windows, apply as in Figure 1, but not apply over any rubber molding.

Continued on the next page.

OPTION 2: Apply an oversized piece of overlamine.
This method is for use by experienced applicators and should be used only on graphics that cover just part of a window or have irregular shapes.

Cut overlamine 8914 so it is at least 1/4 inch (7 mm) larger than the graphic and apply so it overlaps all edges of the perforated film. Contact us for more details, if needed. See Figure 4.

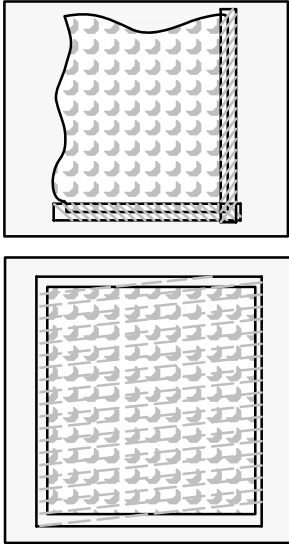


Figure 4. Overlap entire graphic with a single sheet of 8914 so it extends at least 1/4 inch (7 mm) beyond the edges of the graphic.

Removal

Caution

Heat may be used to assist in removing the film. However, use caution to avoid breaking the glass. 3M does not warrant glass breakage.

Substrates with coatings such as anti-reflection and scratch resistance may be damaged during removal, which is not warranted.

Graphics protected by a screen print clear may be more difficult to remove than graphics protected by overlamine 8914.

■ See the removal temperatures on page 2.

Refer to Instruction Bulletin 6.5 for more 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
Shipping finished graphics	Flat, or rolled printed side out on 6 inch (15 cm) or larger core; processed film may block if wound too tightly

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.

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 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.scotch-print.com or through our Fax-on-Demand system. Any warranty, if offered, is based on information in the bulletin that was current at the time you purchased the 3M products. The following 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™ Screen Printing Ink Series 1900	1900	2501
3M™ Screen Printing UV Ink Series 9800	9800	2513
3M™ Screen Printing Ink Series 9700UV	9700	2507
3M™ Scotchcal™ Optically Clear Overlaminates 8914	8914	3542
Instruction Bulletins		
Screen printing with ink series 1900	3.12	6012
Screen printing with UV ink series 9800 - line color	3.20	6020
- 4-color	3.21	6021
Screen printing with ink series 9700UV	3.4	6004
Cold roll lamination	4.22	6522
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
Storage, handling, maintenance, removal	6.5	8505
Warranties		
Worldwide 3M™ MCS™ Warranty		9503

Scotchprint is a registered trademark of 3M in the US and other countries. 3M, MCS and Scotchcal are trademarks of 3M.

3M

Graphics Market Center

3M Center, Building 220-12E-04
 PO Box 33220
 St. Paul, MN 55144-3220 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: 1516
www.3M.com/graphics

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

Bulletin Change Summary

Ink series 9700UV has been replaced by UV ink series 9800 with the same warranty. Other information in this bulletin has been reorganized; most changes or new information are marked with a black bar in the margin.

Patent Acknowledgement

Scotchcal perforated window graphic film 8171 is licensed from Contra Vision Group under U.S. Patent No. 4,673,609 (and 15 corresponding patents worldwide in the following countries: Australia, Austria, Bahrain, Belgium, Canada, Cyprus, France, Germany, Hong Kong, Italy, Liechtenstein, Malaysia, Netherlands, Singapore, Spain, Sweden, Switzerland, and U.K.).