



Scotchcal™ Perforated Window Graphic Film

IJ8171 and RG8171

For Piezo Inkjet Printing Only

Product Description

This film 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 piezo inkjet printing.

Recommended Types of Graphics and End Uses

When constructed and used as described in this Bulletin, 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
- Graphics for architectural windows
- Graphics for non-regulated 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

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs or recommend other products.

Unsuitable End Uses for This Product

- Wet film application method
- Film is used without graphic protection and is:
 - Applied to a vehicle
 - Exposed to abrasive conditions, harsh cleaners or chemicals
- Graphics applied to:
 - Surfaces other than vertical windows
 - Windows that have built-in heating, defrosting elements or wipers
 - Windows with coatings such as anti-reflection and scratch resistance; such coatings may be damaged during film removal
 - Windows that crank or roll down.
 - Use on any regulated vehicle window
- Applications that in any way restrict the safe operation of emergency windows.
- Graphic removal
 - From substrates with coatings such as anti-reflection and scratch resistance; removal may damage such coatings
 - More than 1 year after application
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684 for alternatives.

Health and Safety



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 go to 3M.com/MSDS, 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 manufacturers' instructions for safe operation.

 **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.

 **WARNING**

Applications that require an optically-clear view, such as vehicle window exteriors, must be laminated with 3M™ Scotchcal™ Optically Clear Overlamine 8914. Failure to apply this overlamine could result in obstructed or impaired viewing when the product becomes wet.

Important Note!

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.

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.

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

3M Graphic Materials

For complete details about graphic construction options, recommended uses and durability, refer to the Product Bulletin for the base film or substrate (media) you are using. See **3M Related Literature** at the end of this Bulletin.

This Bulletin provides details about the base film and construction options and warranty. Additional specific information about compatible products can be found in the Product and Instruction Bulletins listed in **3M Related Literature** at the end of this bulletin.

Piezo Inkjet Printers and Inks

See the Warranty Matrix to determine if you need an IJ or RG prefix film.

Ink Series

Printer

- 3M™ Piezo Inkjet Ink Series 1500v2 EFI™ VUTEk® 150, 2360/3360, 3300/5300 and 3000/5000 Printers
- 3M™ Piezo Inkjet Ink Series 6000 Océ Arizona 30s Printer
- 3M™ Piezo Inkjet Ink Series 6800 Océ Arizona 180 and 90 Printers

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. Required on certain windows.

Characteristics

These are typical values for unprocessed product; processing may change the values. Contact your 3M representative for a custom specification.

Physical Characteristics

| Characteristic | Value |
|------------------|---|
| 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) |
| Liner | Polyethylene-coated paper with a clear film backing |
| Adhesive | Pressure sensitive, removable |
| Adhesive color | Clear |
| Tensile strength | 4.2 pounds/inch (0.74 kg/km) <i>minimum</i> |
| Flammability | Unprocessed film perforated window film 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 | Value |
|---|---|
| Finished graphic application recommendation | Surface type: Flat or simple curves Substrate type: Transparent substrates such as transparent acrylic, glass, polycarbonate; 3M vinyl films; painted metal between vehicle windows Application temperature: 40° to 100°F (4° to 38°C) Application method: Dry |
| Temperature range after application | -30° to 150°F (-34° to 65°C) |
| Removal | Removable with heat for up to 1 year on glass, acrylic, polycarbonate Removal temperature: <u>Glass:</u> 60° to 100°F (16° to 38°C) <u>Acrylic, polycarbonate:</u> 70° to 100°F (21° to 38°C) |

Warranty and Durability

3M™ MCS™ Warranty for Finished Graphics

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.

Veh = Vehicle Graphics
Out = Outdoor Signage
In = Indoor Signage

Vertical Exposure, In Years

| Ink Series | Ink Series 1500v2 | | | Ink Series 6000 | | | Ink Series 6800 | | |
|--------------------|---|-----|----|-----------------|-----|----|--------------------|-----|----|
| Printer | VUTEk 150, 2360/ 3360, 3300/5300, 3000/5000 | | | Arizona 30s | | | Arizona 180 and 90 | | |
| Film Prefix | Use IJ Films | | | Use IJ Films | | | Use RG Films | | |
| Graphic Protection | Veh | Out | In | Veh | Out | In | Veh | Out | In |
| 8914 | 1 | 2 | 5 | 1 | 2 | 5 | 1 | 2 | 5 |

3M™ MCS™ Warranty for Desert Southwest

Use the years of warranted durability indicated in the table on page 2 for your graphic construction and the following formulas to determine other durabilities.

| Exposure | Percentage of U.S. Vertical Exposure | Example |
|-----------------------------|--------------------------------------|--------------------------|
| Desert Southwest - Vertical | 70% (0.7) | 0.7 x 2 years= 1.4 years |

Paint Refurbishing Reimbursement Policy for 3M™ MCS™ Warranty

Warranty Stipulations for
Van, Bus, Recreational Vehicles
or Automobile ("Vehicle")

Claims for paint damage for certain vehicle graphics will be considered only if a Pre-Installation and Inspection Report (see Instruction Bulletin 5.36) was completed prior to graphic installation and is 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.

Removal Warranty for 3M™ MCS™ Warranty and Performance Guarantee Removal 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. The ease and rate of removal depends on a number of factors. See Instruction Bulletin 6.5 for details. No labor for removal is included in the warranty.

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

Removal Warranty Exceptions

- See Limitations of End Uses on page 2.
- Although graphics made with a clear coat are not warranted, you should be aware that such constructions may be more difficult to remove than graphics protected by overlaminates 8914.
- Removal requires heat, which may break glass. Glass breakage is not warranted.

Warranty Details and General Exceptions

Graphic Performance Life

The actual performance life of a graphic is affected by all of the following.

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

Application Outside the U.S.

Contact the 3M organization for that country.

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. The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include non-3M graphic products.

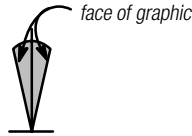
The 3M Performance Guarantee covers selected 3M graphic products when used with qualified printers and OEM inks. See Product Bulletin: PG Matrix.

Application to Glass

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

Definitions

Vertical Exposure



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

Desert Southwest

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.

Vehicles

Refers to commercial fleet, buses, vans and automobiles unless otherwise noted.

Piezo Inkjet Printing

Ink

Always read and follow the ink manufacturer's written instructions on usage.

Total Ink Coverage for 3M™ MCS™ Warranty Constructions

Do not exceed the recommended total ink coverage for the ink series used on this film. Too high a total physical ink amount on the film results in media characteristic changes, inadequate drying, overlamine lifting, and/or poor graphic performance. Refer to the Instruction Bulletin for the ink system being used for additional details about total ink coverage.

| Ink Series | Maximum Total Ink Coverage |
|------------|----------------------------|
| 1500v2 | 260% |
| 6000 | 30-0% |
| 6800 | 300% |

Important Note! *Adequately Dry Graphics*

Inadequate drying can result in graphic failure including curling, increased shrinkage and adhesion failure, which are not covered under warranty.

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 overlamine, rolling the graphic, and applying the film. See the ink's Instruction Bulletin for more details.

About Printing on Perforated Film

Due to the perforations in this film, it is harder to match the image quality of a solid film.

Higher total ink coverage increases drying issues; the film may lift from the liner, stick to the liner when rolled up, and/or wrinkle when being overlaminated.

Graphic Protection

Application of overlamine 8914 is required.

Before applying graphic protection, read the section *Edge Sealing*, page 6.

Cutting

Common cutting methods are:

- Cold steel rule die
- Razor blade
- Sharp knife

Application Tapes

Do not use an application tape with graphics protected by overlamine 8914.

Edge Sealing

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.

You may cut 1/2 inch (13 mm) rolls from your inventory of overlamine 8914, or order precut rolls from www.USAG.org, the United Applications Standards Organization

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 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.

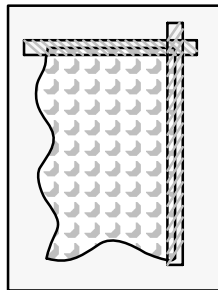
OPTION 2:
Apply an oversized piece of overlamine

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.

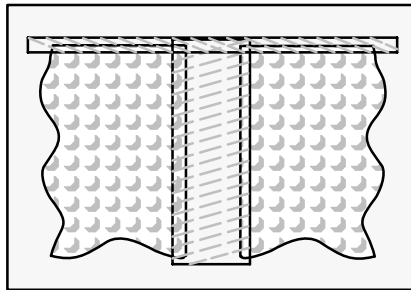
Note: Never allow film or overlamine to touch the rubber window molding.

FIGURE 1
Overlap Edges of Film



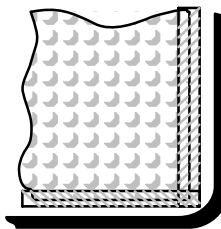
With strips of 8914, overlap glass by about 1/4 inch (7 mm). Also overlap corners.

FIGURE 2
Gaps Between Windows



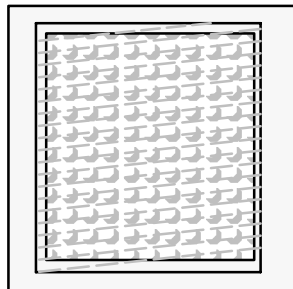
Where there is a small gap between windows, overlap entire gap with strips of 8914 so it extends about 1/4 inch (7 mm) onto perforated film.

FIGURE 3
Rubber Molding



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

FIGURE 4
Rubber Molding



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.

Cleaning Graphics

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.)

Refer to Instruction Bulletin 6.5 for general maintenance and cleaning information.

Removal

Review the Removal Warranty information on page 4 before removing this film.

See the removal temperatures on page 3.

Refer to Instruction Bulletin 6.5 for more removal details.



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.

Shelf Life, Storage and Shipping

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

- 40° to 100°F (4° to 38°C)
- 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 5 inch (13 cm) or larger core. This helps prevent the application tape, if used, from popping off.

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 are available at 3Mgraphics.com. The following applicable Bulletins provide information and processes you need to properly make the graphics described in this Bulletin. Additional Bulletins may be needed as indicated in the 3M Related Literature section of other 3M components you use.

Bulletin types: PB = Product Bulletin; PB-IB = Product & Instruction Bulletin; IB = Instruction Bulletin

| Subject | Type | Bulletin No. |
|---|---|--------------|
| 3M™ Piezo Inkjet Ink Series 1500v2 | PB-IB | 1500 |
| 3M™ Piezo Inkjet Ink Series 6000 | PB-IB | 6000 |
| 3M™ Piezo Inkjet Ink Series 6800 | PB-IB | 6800 |
| 3M™ Scotchcal™ Optically Clear Overlamine 8914 | PB | 8914 |
| Cold roll lamination | IB | 4.22 |
| Using 3M application tapes; premasking and prespacing for films | IB | 4.3 |
| Scoring and cutting | IB | 4.1 |
| Application, substrate selection, preparation and substrate-specific application techniques | IB | 5.1 |
| Application, special applications and vehicles | IB | 5.4 |
| Application, general procedures for indoor and outdoor dry applications | IB | 5.5 |
| Application: Special considerations for automobiles, vans and buses and inspection forms | IB | 5.36 |
| Storage, handling, maintenance, removal | IB | 6.5 |
| 3M Graphics Center Warranty Brochure | go to www.3Mgraphics.com , Warranties | |

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VUTEK is a trademark of EFI Inc.; Pressjet-W is a trademark of Hewlett Packard Co.

Bulletin Change Summary

Ink series 1500 has been changed and is now called ink series 1500v2. This bulletin has been reformatted but no other changes have been made.



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