



# Scotchcal™ Perforated Window Graphic Film

IJ8171 and RG8171

**For Piezo Ink Jet Printing Only**

## Description

Films IJ8171 and RG8171 allow a full image to be seen on the outside of a window while allowing viewing through architectural and non-regulated windows from the inside. A 50 percent perforation pattern enhances light transmission. These short-term, removable, first surface films are designed for piezo ink jet printing.

## 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.

- Overlaminated graphics for transparent substrates such as bus windows and store 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 end uses, but please contact us to discuss your needs or let us suggest other 3M products.

### Unsuitable End Uses for This Film

- Applications that in any way restrict the safe operation of emergency window exits.
- Wet application of graphic to substrate
- Graphics applied to:
  - Surfaces other than vertical window surfaces
  - Windows that have built-in heating or defrosting elements or windshield wipers
  - Substrates with coatings such as anti-reflection and scratch resistance; such coatings may be damaged during film removal

- Application to the inside of an exterior facing window
- 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 that have not been laminated with 3M™ Scotchcal™ Optically Clear 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.

- 3M Commercial Graphics Division policy is not to support applications of perforated window graphic film when a driver's view is obstructed 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.

- 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 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

Refer to the durability tables for 3M™ MCS™ Warranty for the proper combination of printers, inks, films and graphic protection.

#### Inks and Printers for Film IJ8171

This film is forward wound on a 3-inch unnotched core.

- 3M™ Piezo Ink Jet Ink Series 1500
  - VUTEk UltraVu™ 150 Printer
  - VUTEk UltraVu™ 2360/3360 Printers
  - VUTEk UltraVu™ 3000/5000 Printers
  - VUTEk UltraVu™ 3300/5300 Printers
- 3M™ Piezo Ink Jet Ink Series 6000
  - Océ Arizona 30s Printer

#### Inks and Printers for Film RG8171

This film is reverse wound on a 3-inch, 4-notch core.

- 3M™ Piezo Ink Jet Ink Series 6800\*
  - Océ Arizona 180 Printer
  - Océ Arizona 90 Printer

\*May use Océ Piezo Ink Jet Ink Series 1700 for non-warranted graphics.

#### Graphic Protection (required for warranty)

- 3M™ Scotchcal™ Optically Clear Overlaminates 8914

### 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 help line at 1-800-328-3908.

### Physical Characteristics

Characteristic	Description
Material	Cast vinyl, 50% perforation pattern
Color	White on the image side, black on the reverse side
Thickness	<b>Without adhesive:</b> 4 mils (0.10 mm) <b>With adhesive:</b> 5-6 mils (0.13-0.15 mm)
Adhesive type	Pressure sensitive, removable
Adhesive color	Clear
Liner	Polyethylene-coated paper with a clear film backing
Tensile strength	4.2 pounds/inch (0.7 kg/cm) <i>minimum</i>
Flammability	Unprocessed film IJ8171 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	<b>Surface type:</b> Flat or simple curves <b>Substrate type:</b> Transparent acrylic, glass, polycarbonate, painted metal or 3M vinyl films between vehicle windows <b>Application temperature:</b> 40° to 100°F (4° to 38°C) <i>air and substrate</i> <b>Application method:</b> Dry
Removal	Removable with heat for up to 1 year on glass, acrylic, polycarbonate <b>Removal temperature:</b> <u>Glass:</u> 60° to 100°F (16° to 38°C) <u>Acrylic, polycarbonate:</u> 70° to 100°F (21° to 38°C)
Temperature range after application	-30° to 150°F (-34° to 65°C)

## 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

#### 3M MCS Warranty Finished Graphic Constructions and Durability

Graphic Type	U.S. Vertical Exposure ONLY (in years)			U.S. Vertical Exposure ONLY (in years)			U.S. Vertical Exposure ONLY (in years)		
	Vehicle	Outdoor	Indoor	Vehicle	Outdoor	Indoor	Vehicle	Outdoor	Indoor
Ink Series	1500			6000			6800		
Graphic Protection	Film IJ8171-10						Film RG8171-10		
8914	1	2	5	1	2	5	1	2	5

#### Formulas for Other 3M MCS Warranty Finished Graphic Durabilities

Use the 3M MCS warranted durability for your construction if exposed in a U.S. vertical orientation and use the following formulas to determine other durabilities.

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

## 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.

#### 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.

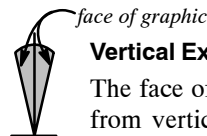
See graphic removal limitations on page 1.

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

Note: This warranty does not cover breakage of glass to which film has been applied or removal attempted.

## Warranty Notes

### Terms



#### 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.

**Outdoor and Indoor.** Indicates warranties for signs.

### Graphic Performance Life

The actual performance depends on the:

- Use of 3M compatible products and recommended printers
- Correct combination of film, ink and graphic protection (if required)
- Adequate ink drying
- 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.

### Graphic Protection

Overlamine 8914 is required to protect the graphic from environmental factors such as dust, dirt and water that may collect in perforated areas. This overlaminate also provides the optical clarity needed for certain vehicle graphics.

### Application to Glass

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

### Warranty and Limited Liability

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.

## Printer Support Information

### Ink

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

### Total Ink Coverage

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, overlaminate 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
1500	260%
6000	380%
6800	300%

## Drying

### Caution

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

## Fabrication

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.

## Lamination

Apply with a cold roll laminator. See Instruction Bulletin 4.22.

Note: Before laminating, read the section *Edge Sealing Recommendations*.

## Cutting

### Caution

When using any equipment, always follow the manufacturers' instructions for safe operation.

Common cutting methods are:

- Cold steel rule die
- Razor blade
- Sharp knife

## Application Tape

Do not use an application tape.

## Application

This film has a pressure-sensitive adhesive. Although the film is removable, it is not slideable or repositionable during application.

1. Undried solvent can cause the film to lift from substrate after application.
2. If the perforated film is applied to narrow (2 inches/50 mm wide) 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 most current release of the following 3M Instruction Bulletins. Refer to [www.scotchprint.com](http://www.scotchprint.com) to obtain these.
  - 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.

### 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.

You may cut 1/2 inch (13 mm) rolls from your inventory of overlamine 8914, or order precut rolls from [www.USAG.org](http://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 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.

#### **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.

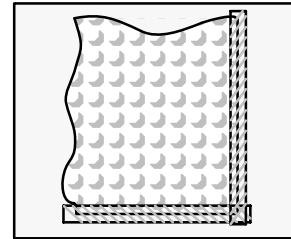
## Removal

### **Caution**

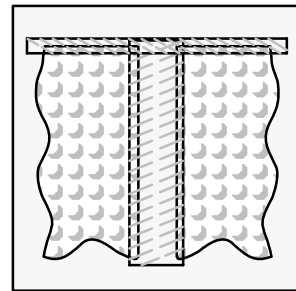
Heat may be used to assist in removing the film. However, use caution to avoid breaking the glass. 3M does not warrant glass breakage.

Although graphics made with a clear coat are not warranty, you should be aware that such constructions may be more difficult to remove than graphics protected by overlamine 8914.

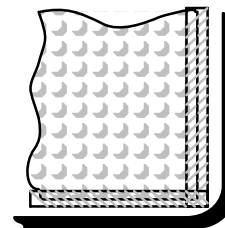
Refer to Instruction Bulletin 6.5 for more removal details.



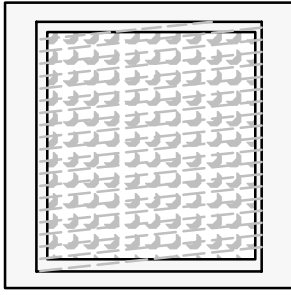
**Figure 1.** With strips of 8914, overlap glass by about 1/4 inch (7 mm). Also overlap corners.



**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.




**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.

## Shelf Life, Storage, and Shipping

Activity	Recommendation
Shelf life	<b>Total shelf life: 2 years</b> Up to 2 years unprocessed, <b>OR</b> process within 1 year <b>and</b> apply within 1 year of processing
Storage conditions	<ul style="list-style-type: none"> <li>• 100°F (38°C) maximum</li> <li>• Out of sunlight</li> <li>• Clean dry area</li> <li>• Original container</li> <li>• Bring the film to print room temperature before using</li> </ul>
Shipping finished graphics	Flat, or rolled printed side out on 5 inch (13 cm) or larger core; processed film may block if wound too tightly

See Instruction Bulletin 6.5 for details.

## Health and Safety

 <b>Caution</b>
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"> <li>• By fax, call 1-800-364-0768 in the US and Canada or 1-650-556-8417 for all other locations.</li> <li>• Electronically, visit us at <a href="http://www.3M.com/MSDS">www.3M.com/MSDS</a>.</li> <li>• By mail, or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.</li> </ul>
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 and services. Certain restrictions apply.

1. Go to [www.scotchprint.com](http://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](http://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.
<b>Product Bulletins</b>		
3M™ Piezo Ink Jet Ink Series 1500	1500	4578
3M™ Piezo Ink Jet Ink Series 6000	6000	4560
3M™ Piezo Ink Jet Ink Series 6800	6800	4574
3M™ Scotchcal™ Optically Clear Overlaminates 8914	8914	3542
<b>Instruction Bulletins</b>		
Design of graphics	2.1	5501
Printing with piezo ink jet series 1500	4.45	6545
Printing with piezo ink jet ink series 6000	4.39	6539
Printing with piezo ink series 6800	4.40	6540
Scoring and cutting	4.1	6501
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
Application: Special Considerations for Complex Contours of Automobiles, Vans and Buses and Inspection Forms	5.36	7036
Storage, handling, maintenance, removal	6.5	8505

## Warranties

3M Graphics Market Center Warranty Brochure

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*Scotchprint is a registered trademark of 3M in the US and other countries.*

*PressVu is a registered trademark and UltraVu is a trademark of VUTEK Inc.*

*Pressjet-W is a trademark of Scitex Corporation Ltd.*

### Bulletin Change Summary

Ink series 4600 has been removed from the Compatible Products as this film is not currently available on the 6 inch cores required for the HP Scitex Pressjet-W Printer.

The warranty information has been reorganized for more clarity. Specific maximum total ink coverage values, by ink series, have been added (page 5). All additions or changes to text are marked with a black bar in the margin.

Please note that 1/2" rolls of overlamine are not available directly from 3M.

### Patent Acknowledgement

3M™ Scotchcal™ Perforated Window Graphic Film IJ8171 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.).



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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: 4545  
[www.3M.com/graphics](http://www.3M.com/graphics)

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London, Ontario  
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