



# Scotchgard™ Graphic and Surface Protection Film 8991

# Scotchgard™ Removable Graphic and Surface Protection Film 8991R

## Description

Scotchgard™ Graphic and Surface Protection Film 8991 and the removable version, 8991R, are clear, tough, polyester overlaminates that provide resistance to many types of accidental and intentional stains, graffiti, and abrasion, gouging and UV light. They are also easier to clean than traditional overlaminates. Film 8991R is removable without heat from many surfaces.

## Recommended Applications and End Uses

- Provide graphic or substrate protection on smooth, flat or simple curved surfaces.
- Interior or exterior graphics and signs
- Commercial vehicle or fleet graphics and emblems
- Substrate and surface protection

## 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 these surface protection films for the following:

- Cut film graphics, which may show entrapped air under the protection film
- Banners or other flexible substrates
- Painted or unpainted gypsum wall board
- Painted surfaces with poor paint-to-substrate adhesion, or uncured paint
- Graphics printed with solvent-based inks including solvent-based piezo inkjet inks
- Substrates that outgas such as polycarbonates, fiberglass and fresh paint. (See 3M Instruction Bulletin 5.1 for an outgassing test.)
- Porous or unsealed surfaces such as concrete
- Vandalism or excessive product abuse such as cutting or gouging or resulting damage to the substrate
- Application over rivets: rivets must be cut around
- Using film 8991 (permanent version) where removability may be needed
- Using film 8991R (removable) where removability is needed from printed or unprinted graphic film (it will not remove)
- Gasoline vapors or spills if allowed to penetrate the edges of the graphic
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684 for alternatives.

## Compatible Substrates

Please refer to the Product Bulletin for the base film to determine compatibility.

- Most smooth graphic films, solid color or imaged, and without a clear coat applied
- Smooth, untextured surfaces such as plastics, painted metals, countertop laminate or laminated wallboard

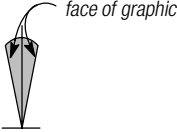
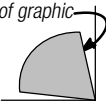
## Characteristics

Characteristic	Description
Film	Transparent polyester
Gloss	High gloss
Thickness	<b>Without adhesive:</b> 4 mil (0.10 mm) <b>With adhesive:</b> 5.3 to 5.7 mils (0.13 mm to 0.14 mm)
Adhesive type and color	<b>8991:</b> Permanent, pressure sensitive, clear <b>8991R:</b> Removable, pressure sensitive, clear
Liner	Polycoated paper
Recommended application surfaces	Flat, smooth, untextured; simple curves
Application temperature range	50° to 90°F (10° to 32°C)
Removal	<b>8991:</b> Permanent <b>8991R:</b> Removable without heat (most substrates); removal not warranted
Applied shrinkage	5 mil (0.13 mm)
In use temperature range	-65° to +225°F (-54° to +107°C)
Chemical resistance	Resists most organic solvents and fluids; mild alkalis, mild acids and salt.

## Flammability

Test Method	Film Tested	Results
ASTM E84	8991	Flame Spread Index = 5 Class 1 Rating Smoke Developed Index = 65
ASTM E-162	8991	Flame Spread Index = 0.0 Flame spread is non-existent Surface flammability of materials using a radiant heat source
ASTM E662	8991	Specific optical density of smoke generated by solid materials. Specific Optical Density (Ts) Time <u>                    </u> 1.5 min. 4.0 min. Flaming:                    0.08      0.28 Non-flaming:              0.03      0.03
NFPA259	8991R	Heat release per unit mass. Potential heat in BTU/LB is 24615 No Required Level
FMVSS302	8991R	Burn resistance of materials used in motor vehicles. Passed test on aluminum and glass; neither ignited.
SMP800-C	8991R	Bombardier test method for toxic gas generation by materials on combustion. Passed detected levels of the gases tested are less than the required limit or less than detectable.
BS476: Part 7	8991	Fire tests on building materials and structures; surface flame spread. Passed Category II Trains.

## Definitions

<b>Exposure</b>	<b>U.S. Vertical Exposure</b>		The face of the graphic is +/- 10° from vertical.
	<b>U.S. Non-vertical Exposure</b>		The face of the graphic is greater than 10° from vertical and greater than 5° from horizontal. This includes non-vertical surfaces of vehicle wraps or fleet graphics.
	<b>U.S. Desert Southwest Exposure</b>		Any outdoor graphic exposed to solar energy more than half of the daylight hours in Arizona, New Mexico and the desert areas of California, Nevada, Utah and Texas is subject to reduced warranties. A detailed map is available at <a href="http://3Mgraphics.com">3Mgraphics.com</a> under Warranties.

**Graphic Construction** The products used to make a graphic, which may include film and/or flexible substrate, graphic protection, ink, printer and application tape.

**Removable with Heat** Film is removable when heat is used within the specified time period and leaves no more than 10% adhesive residue on flat and simple curves without rivets, and no more than 30% adhesive residue on rivets and corrugations.

## Warranty Information

### Warranty and Limited Remedy

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 *3M Graphics Market Center Warranty Brochure* at [3Mgraphics.com](http://3Mgraphics.com), which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

### Warranty Coverage Overview

Both the warranty coverage and the durability for each graphic are based on the user(s) reading and following all applicable and current 3M Product and Instruction Bulletins. 3M will honor the Warranted Durability stated in the Warranted Durability Table in the base film or substrate Product Bulletin that is current when the film was purchased. Warranted durabilities may be reduced and stipulations may apply for certain constructions and applications, as covered in this Bulletin.

Usage	3M Graphic Constructions	Compatible Substrates (except films)	
		Most of U.S.	U.S. Desert Southwest
Indoor	up to 8 years <sup>1</sup>	8 years	n/a
Vertical Outdoor	up to 3 years <sup>1</sup>	3 years	2 years
Non-Vertical Outdoor	up to 2 years <sup>1</sup>	2 years	1 year
8991R only, removal	none	same as above	same as above

<sup>1</sup>. The warranted durability is equal to, but shall not exceed, the best warranty stated in the film's 3M Product Bulletin based on the construction you choose (unprinted film or imaged film) and the exposure in which the product will be used (vertical, non-vertical, Desert Southwest).

## General Warranty Stipulations

These stipulations apply to graphics covered by the 3M™ MCS™ Warranty. Specific provisions of these stipulations are found in the *3M Graphics Market Center Warranty Brochure* at 3Mgraphics.com.

### Abrasion and Loss of Gloss

Abrasion damage and loss of gloss are not covered by any 3M warranty. This is considered normal wear and tear.

### Application to Glass

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

### 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 inks, film, graphic protection and/or application tapes that are not sold or recommended by 3M. The user is solely responsible for the graphic appearance, performance and durability of graphic constructions that include any other products.

## Factors that Affect Graphic Performance Life

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

- The combination of graphics materials used
- Ink formulation
- Adequate ink drying or curing
- Selection, condition and preparation of the substrate
- Surface texture
- Application methods
- Angle and direction of sun exposure
- Environmental conditions
- Cleaning or maintenance methods

## Fabrication

### Application Using a Laminator

Films 8991 and 8991R are compatible with most squeeze roll laminators. No heat is required. Refer to Instruction Bulletin 4.22.

### Application in the Field, or When Not Using a Laminator

For wet application (recommended), refer to Instruction Bulletin 5.7.

For dry application, refer to Instruction Bulletin 5.5.

### Applying Multiple Panels of Pre-laminated Graphic Film

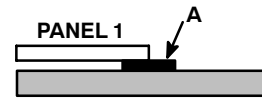
Edge-to-edge panel seaming is recommended (see the instructions below). For applications where overlaps are not subject to picking or environmental stresses, normal panel overlaps can be used.

- If the edges that meet are factory cut, align the edges of each panel and squeegee well. A wet or dry application can be used.
- If the edges are hand cut, it is unlikely that they are straight enough for good edge-to-edge fit. See *Making Perfect Fit Hand Cut Overlaps*. Only a dry application can be used.

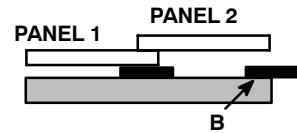
### Making Perfect Fit Hand Cut Overlaps for Dry Application

The tape referenced in this procedure is one inch wide 3M brand filament or masking tape. The panels are graphic film to which either film 8991 or 8991R has already been laminated.

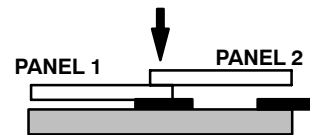
1. Apply panel 1.
  - a. Measure the width of panel 1.
  - b. Center and apply a strip of tape (A) to the substrate where the first panel overlap will occur. This protects the substrate when cut.
  - c. Apply the first panel as usual, except do not apply hard squeegee pressure on the edge where the substrate has been taped.



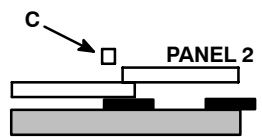
2. Apply panel 2.
  - a. Measure the width of panel 2.
  - b. Center and apply a strip of tape (B) to the substrate where the second panel overlap will occur.
  - c. Apply the second panel as usual, overlapping the previous panel where they meet, except do not apply hard squeegee pressure on the edges where the substrate has been taped.



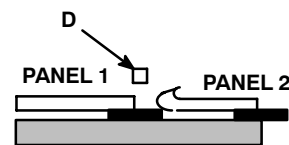
3. Continue with this process until all panels have been applied to the substrate.
4. With a sharp razor blade in a safety holder, cut down the center of the panel overlap, using just enough pressure to cut through both panels. Do not cut through the tape, which protects the substrate.



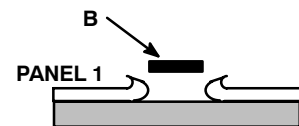
5. Remove the narrow piece (C) from the cut overlap from panel 2.



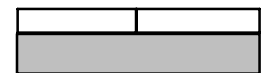
6. Lift the edge of panel 2 and remove the narrow piece (D) from panel 1.



7. Lift the edge of panel 1 and remove the remaining tape.



8. Inspect the substrate to make sure that it is clean and free from tape adhesive. Clean the area if necessary.
9. Press the cut edges together and re-squeegee the seams.



## Maintenance and Cleaning

Use a cleaner such as the kind used for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without strong solvents or alcohol, and have a pH value between 3.0 and 11.0 (neither strongly acidic nor strongly alkaline). A cloth or soft bristle brush can be used to apply or wipe the cleaner.

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

This table shows the recommended cleaning method for various stains on graphics protected by films 8991 and 8991R. Always use the least aggressive cleaning method that provides satisfactory results.

## Air Quality Regulations

State Volatile Organic Compound (VOC) regulations may prohibit the use of certain cleaning chemicals with VOC's in graphic arts coatings and printing operations. For example, the California South Coast Air Quality Management District prohibits use of certain solvent-based solutions without a permit and other California AQMD's prohibit use of certain solutions without a permit or a regulatory exemption. Check with your State environmental authorities to determine whether use of this solution may be restricted or prohibited.

## Stain and Cleaning Table

Stain	Cleaning Method			
	Dry Cloth	Detergent and Water	Isopropyl Alcohol or Household Cleaner	3M™ Citrus Based Cleaner
Ballpoint pen ink		●		●
Crayon			●	
Coffee/Tea	●			
Fruit Juice	●			
Grease			●	
Lipstick			●	
Ketchup			●	
Paint				●
Permanent marking pen			●	●
Shoe polish			●	

Note: Old and/or thicker stains may require longer soaking time or reapplication of the cleaner.

## Removal

Film 8991 is a permanent product; its adhesive is not intended to be removable.

## Shelf Life, Storage and Shipping

Shelf Life: One year from the date on the original shipping box when unused, plus one year after laminating. The total shelf life of a graphic before and after processing cannot exceed two years.

- Store the film in a clean, dry area, away from direct sunlight, and at an ambient temperature less than 86°F (30°C).
- Ship the finished graphic lying flat or in a roll. To roll the graphic, wrap it film-side out onto a core that is 6 inches (15 cm) or larger in diameter. These methods prevent the graphics and premask from wrinkling and popping off the liner.

## 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 go to [3M.com/MSDS](http://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.

## 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](http://3Mgraphics.com). The techniques described in these Bulletins are required when applying a 3M warranted graphic, but are also practical recommendations when using promotional materials for non-warranted graphics. 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.
Base Films and Substrates Please visit our website to identify and select the additional Product and Instruction Bulletins you need for a successful application.		
Cold roll lamination	IB	4.22
Application, general procedures for indoor and outdoor dry applications	IB	5.5
Application, wet method for translucent screen printed, thermal mass transfer and cut graphics	IB	5.7
Storage, handling, maintenance, removal	IB	6.5
3M Graphics Market Center Warranty Brochure	go to <a href="http://www.3Mgraphics.com">www.3Mgraphics.com</a> , Warranties	

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## Bulletin Change Summary

Added a limitation (page 1) regarding use on polycarbonate or any material that outgasses. Updated the warranty information, including a note of clarification regarding warranted durability.



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