



Scotchcal™ Second Surface Perforated Window Graphic Film

8176 for UV

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8176

Product Bulletin

Product Description This transparent perforated film allows printing graphics to be seen on one side and still allows viewing through the window from the other side. It can be used for interior behind glass installations reducing the exposure to vandalism.

3M™ Scotchcal™ Second Surface Perforated Window Graphic Film 8176 is using an unperforated liner with good layflat performance designed for use with solvent inkjet printing.

8176 for UV is using a perforated paper liner backed with a transparent film designed for use with UV inkjet printing.

Product Line	Screen and inkjet printing	8176	transparent, perforated, glossy, removable adhesive.
		8176 for UV	transparent, perforated, glossy, removable adhesive.

Product Characteristics These are typical values for unprocessed products. Contact your 3M representative for a custom specification.

Physical & Application	Material	calendered vinyl (polymeric)		
	Surface finish	glossy		
	Thickness (film)	180 µm (0.180 mm)		
	Adhesive type	solvent acrylic; pressure-sensitive		
	Adhesive appearance	clear		
	Liner	double-sided Polyethylene coated paper	version for UV printing:	perforated paper backed with transparent film
	Adhesion	approx. 6 N/25 mm	FTM 1: 180° peel, substrate: glass; cond: 24 h 23°C/50%RH	
	Application method	dry only!		
	Applied shrinkage	< 0.3 mm	FTM 14	
	Application temperature	+12°C	minimum (air and substrate)	
Service temperature	-34°C to +65°C			
Surface type	flat			
Substrate type	glass, PMMA, PC*, PETG*, ABS			
	PC*, PETG*: Might require drying with heat before use			
Graphic removal	Removable without heat and/or chemicals from supported substrates.			
	No liability is given for ease or speed of removal of any graphic. Pay attention to adequate air and substrate temperature.			

Storage	Shelf life	Use within 2 years from the date of manufacture on the sealed original box. Use within 1 year after opening the box.
	Storage conditions	+4°C to +40°C, out of sunlight, original container in clean and dry area.

Flammability Flammability standards are different from country to country. Ask your local 3M contact for details, please.

Durability	Unprocessed film	The following durability data are given for unprocessed film only!		
	3M™ MCS™ Warranty	In addition, 3M provides a warranty on a finished applied graphic within the framework of 3M™ MCS™ warranty program.		
	Climatic zones	Graphic durability is largely determined by the climate and the angle of exposure. Find below a table showing the durability of a product according to the angle of exposure and the geographical location of the application.		
		Zone 1	Northern Europe, Italy (north of Rome), Russia	
	Zone 2	Mediterranean area without North Africa, South Africa		
	Zone 3	Gulf area, Africa		
	Interior:	Interior means an application inside a building without direct exposure to elements.		
	Interior application	Zone 1	Zone 2	Zone 3
	interior	8 years	8 years	8 years

Limitations of End Uses

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

Graphics applied to

- applications other than window surfaces.
- exterior applications.
- low surface energy substrates or substrates with low surface energy coating.
- other than flat surfaces.
- non-vertical applications.

Graphic removal from

- substrates with coatings (i.e.: anti-reflection, anti-scratch); coatings may be damaged during film removal.

Graphics subjected to

- gasoline vapors or spills.

Important Notice

- The user is responsible for determining and complying to laws and standards!

Graphics Manufacturing

Graphic protection can improve the appearance, performance and durability of printed graphics. Any printed graphic exposed to abrasive conditions (including vehicles), harsh cleaners or chemicals must include graphic protection in order to be warranted.

When to use an overprint clear or overlaminate

See instruction bulletin GPO 'graphic protection options' for further information about selection and use of protective overlaminates and printable clears.

[> Product Bulletin Graphic Protection Options <](#)

Shipping finished graphics

Flat, or rolled film side out on 130 mm (5 inch) or larger core. These methods help to prevent the liner from wrinkling or application tape, if used, from popping off.

Converting Information Inkjet Printing

Adequately Dry Graphics

A too high total physical ink amount on the film results in media characteristic changes, inadequate drying, overlaminate lifting, and/or poor graphic performance. The maximum recommended total ink coverage for this film is 270%.

Inadequate drying can result in graphic failure including curling, increased shrinkage and adhesion failure, which are not covered under warranty. Build enough time into your process to ensure adequate drying of the graphic.

Poorly dried film becomes soft and stretchy, and the adhesive becomes too aggressive. 3M recommends at least a minimum drying time of 24 hrs before further processing. Dry the graphic unrolled or at least as a loose wound roll standing upright.

Converting Information Screen Printing

Formulations and processing conditions can affect ink durability. Refer to the 3M Product and Instruction Bulletins for your ink for limitations and proper usage. Graphic protection can improve the appearance, performance and durability of your graphic.

A clear coat also prevents chalking on unprinted films. Use equipment designed to handle high viscosity materials and make sure the coating is evenly applied to the specifications given in the clear's Instruction Bulletin.

Screen Mesh The only acceptable mesh screens for this process are the following
 - 390s or "s" plain weave
 - 390 calender or finer

If a coarser screen is used for the flood coating or mass tone printing, the ink may not completely cure or the holes may not be completely filled. This causes a "ghost image" on the back of the graphic.
 Use standard mesh screens for ink series 1900.

Printing Order

Ink Series	Printed Image	First Flood Coat (White)	Second Flood Coat (White)	Third Flood Coat (Black)
9700 UV	Image printed in reverse order	9704	Optional	9705
1900		1903	1903	1905

If the image reflects well after the first flood coat and you have used a high opacity white (9704), a second pass of white may not be required.

Application

The use of an application tape is neither recommended nor needed.

Graphics Printed with UV Inks are Heat Sensitive! UV piezo inkjet inks may crack if too much heat is used during graphic application. When using a heat gun or other heat source during application, make sure the film surface temperature does not exceed 100°C.

Using additional heat in the post-application process may also cause UV piezo inkjet ink to crack.

Perforated Window Graphics Multipanel If two graphic panels meet side by side on a window, carefully trim the film that the panels meet and form a butt seam.
 Do not overlap the panels!

Avoid Lifting The film must not touch the window molding. It does not stick on the molding so that lifting will occur. Keep a small distance of a few mm, the small distance minimizes the chance of the graphic absorbing water that may collect at the window edge.

Refer to Instruction Bulletin 5.1 'select and prepare substrates for graphic application', for general application information.

[>Instruction Bulletin 5.1 'select and prepare substrates for graphic application'<](#)

Maintenance and Cleaning

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 'storage, handling, maintenance and removal of films and sheetings', for general maintenance and cleaning information.

[>Instruction Bulletin 6.5 'Storage, Handling, Maintenance and Removal of Films and Sheetings'<](#)

Remarks

This bulletin provides technical information only.

Important notice All questions of warranty and liability relating to this product are governed by the terms and conditions of the sale, subject, where applicable, to the prevailing law.
 Before using, the user must determine the suitability of the product for its required or intended use, and the user assumes all risk and liability whatsoever in connection therewith.

Additional Information

Visit the web site of your local subsidiary at www.3Mgraphics.com for getting more:

- details about 3M™ MCS™ Warranty and 3M Performance Guarantee
- additional instruction bulletins
- a complete product overview about materials 3M is offering



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