

3M™ Scotchcal™ Opaque Graphic Film

Series 100

Product Bulletin

Product Description

These high performance premium cast films are a range of coloured films that have been specially developed to be knife cut on electronic systems.

Scotchcal Opaque Graphic Film Series 100 films have very good conformability for application on flat or moderate curved surfaces, with or without rivets.

They are outstanding for easy cutting of small letters or complex graphics. The colourless adhesive makes this material ideal for use on windows or other transparent substrates.

Product Line

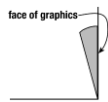
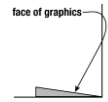
Electrocut	See 3M™ Premium Films Colour Range for full colour range information and our website for colour images: Series 100 colours	opaque, permanent adhesive, including gloss, matte and metallic finishes. Wide selection out of large colour range. Special colours available on request.
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Product Characteristics

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

Physical & Application

Material	cast vinyl	
Surface finish	gloss and matte (see product line)	
Thickness (film)	50 µm (0.05 mm)	
Adhesive type	solvent acrylic; pressure-sensitive	
Adhesive appearance	clear	
Liner	Kraft paper	
Notice!	weight of Kraft paper is 120 g/m².	
Adhesion	approx. 25 N/25 mm FTM 1: 180° peel, substrate: glass; cond: 24 h 23°C/50%RH	
Application method	wet or dry	
Applied shrinkage	< 0.15 mm	FTM 14
Application temperature	+4°C	(air and substrate)
Service temperature	-40°C to +110°C	
Surface type	flat to curved, incl. rivets	
Substrate type	aluminium, glass, PMMA, PC*, ABS, paint	
	*: Might require drying with heat before use	
Graphic removal	Removable with heat and or chemicals. Use a removal angle of <90° for optimal results. No liability is given for ease or speed of removal of any graphic.	

Storage	Shelf life	The shelf life for unprocessed film is 2 years from the date of manufacture (i.e. the date marked on the original packaging). Process within 1 year of manufacture and apply within 1 year of processing.			
	Storage conditions!	Store in the original container at temperatures of +4°C to +40°C, out of sunlight, in a clean and dry area. Bring the film to room temperature before use.			
Flammability	Flammability standards are different from country to country. Please contact your local 3M representative for details.				
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 programme.			
	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 Mediterranean area without North Africa, South Africa			
	Zone 2	Africa			
	Zone 3	Gulf area, Africa			
Exposure types	Vertical:		The face of the graphic is ±10° from vertical.		
	Horizontal:		The face of the graphic is ±5° from horizontal.		
	Interior:	Interior means an application inside a building without direct exposure to elements.			
Vertical outdoor exposure	Zone 1	Zone 2	Zone 3		
	white/black colours	12 years	10 years	8 years	
	transparent	8 years	8 years	6 years	
	metallics	5 years	8 years	6 years	
Horizontal outdoor exposure	Zone 1	Zone 2	Zone 3		
	white/black colours	5 years	4 years	3 years	
		5 years	4 years	3 years	
	The following films are suitable for horizontal applications:				
	<ul style="list-style-type: none"> • white 100-10 • black 100-12 • tomato red 100-13 				
Interior application	Zone 1	Zone 2	Zone 3		
	interior	12 years	12 years	12 years	

Limitations of End Uses

Graphics applied to

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

- Flexible substrates incl. 3M™ Panagraphics™ III Wide Width Flexible Substrate and 3M™ Envision™ FS1.
- Low surface energy substrates or substrates with low surface energy coating.
- Other than flat or moderate curved/corrugated surfaces.
- painted or unpainted wallboards, gypsum boards and wallpapers.
- Stainless steel.
- Surfaces that are not clean or more than moderately textured.
- Surfaces with poor paint to substrate adhesion.
- Signs or existing graphics that must remain intact.
- Petroleum vapours or spills.
- 3M Commercial Graphics Division products are not tested against automotive manufacturer specifications!
- Non vertical applications will have a significant decrease in durability.
- Thermoforming of applied film is not recommended!
- 3M accepts no liability for glass breakage when using this film for window graphics (see Important Safety Remark at the end of this document).
- To avoid colour variations all pieces of applied film of one coloured area should be processed out of one lot of material.
- Metallic films have a directional characteristic in their appearance. For the best overall results, do not alternate between lengthwise and width-wise graphic panels. NB: film colours can vary slightly from lot to lot. For the most consistent looking wraps, use film from the same roll, or manufacturing lot number on adjoining panels.

Graphic removal from Graphics subjected to Important Notice

Graphics Manufacturing

Shipping finished graphics

It is recommended that graphics be shipped 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

Based upon cutting evaluations the minimum height for text is 10 mm using upper and lowercase Helvetica Medium. The stroke width should not be lower than 1 mm.

Electronic Cutting

The variable characteristics of electronically controlled cutting equipment require users to verify their specific requirements.

Sharpness of knife blade

Dull blades impart a serrated look to the edge of the cut film.

Weight of knife blade

The ideal weight slightly scores the liner. Too little weight does not cut completely through the film and the adhesive. Excessive weight cuts the liner and causes the blade to drag, accelerating wear and creating a serrated cut edge on the film.

Weeding

The excess film should be weeded (removed) as soon after cutting as practical, in order to minimise the effect of possible adhesive flow.

Temperature and relative humidity

Temperature and relative humidity are minor considerations, but it is advisable to avoid extreme or rapid fluctuating conditions.

Roll storage

Store the film in the same environment as the cutting equipment.

Further information

For more details please refer to our instruction bulletin 4.1 [Scoring and Cutting of Films](#).

Application

See product bulletin: [Application Tapes](#) for information about selection and use of suitable application tapes for this product, please.

Refer to Instruction Bulletin 5.1 [Substrate Selection, Preparation and Substrate-specific Application Techniques](#) for general application information.

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.

Important Safety Remark

Application to Glass

The application of coloured film onto glass can lead to glass breakage through thermal expansion of the glass. The local conditions must be examined for the danger of glass breakage caused by uneven heat absorption through sun exposure. Type of glass (insulation glass, float glass, VSG, ESG, etc.), glass dimension, joint condition, flexibility of the sealant, quality of the edge finishing, geographical orientation and partial shadow during sun exposure are all determining factors.

Light colour designs and application to the external surface of the window are preferable. Allow a 4mm gap between the graphic and the window frame can also help to dissipate heat.

It is generally recognised that a thermal crack can occur at temperature differences of approx. 130°C (ESG), approx. 40°C (float glass) or 110°C (TVG) and that those areas of glass imbedded in the frame work absorb the least heat, whilst the darkest part of an exposed graphic absorbs the most heat.

Because of the many above mentioned factors, glass breakage cannot be fully predicted, therefore 3M does not accept liability for glass breakage when using this film for window graphics.

Remarks

This bulletin provides technical information only.

Important Notice to Purchaser

The 3M products described in this publication are covered by a 3M warranty and limitation of liability.

3M's warranty provides that if 3M finds that goods are defective in material or workmanship they will be replaced or the price refunded at 3M's option but note that 3M does not accept liability for other direct losses (except for personal injury or death) or consequential losses relating to defective products or from information supplied by 3M.

Purchasers and users of 3M products, and not 3M supplying companies, are always solely responsible for deciding on the suitability of the 3M product for their required or intended use.

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.3M.co.uk/graphicsolutions for further information:

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

Health & Safety

Refer to the package label and the Material Safety Data Sheet for health, safety, and handling information on the products referenced in this bulletin. For 3M products, if necessary, you may contact our Toxicology/Product Responsibility Department on 01344 858000.

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