



3M™ Scotchcal™ Opaque Graphic Film

Series 100

Product Bulletin

Product Description

These high performance premium cast films are a range of colored films that have been specially developed to be knife cut on electronic systems. The film range is available in 170 colors including 50 metallic tones.

3M™ Scotchcal™ Opaque Graphic Film Series 100 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 colorless adhesive suits this material for use on windows or other transparent substrates.

Product Line	Electrocut	100-X	X = color code, opaque, glossy (and few matte), permanent adhesive. Wide selection out of large color range. Special colors 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	glossy 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/m ² .	
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	aluminum, glass, PMMA, PC*, ABS, paint	

*: Might require drying with heat before use

Graphic removal Good to remove without or little heat.

No liability is given for ease or speed of removal of any graphic. Pay attention to adequate air and substrate temperature.

Storage

Shelf life 2 years from the date on the original box.
Up to 2 years unprocessed, or processed within 1 year of processing.

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™ MCST™ Warranty

In addition, 3M provides a warranty on a finished applied graphic within the framework of 3M™ MCST™ 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.

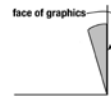
Zone 1 Northern Europe, Italy (north of Rome), Russia

Zone 2 Mediterranean area without North Africa, South Africa

Zone 3 Gulf area, Africa

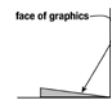
Exposure types

Vertical:



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

Horizontal:



The face of the graphic is $\pm 5^\circ$ from horizontal.

Interior: Interior means an application inside a building without direct exposure to elements.

Vertical outdoor exposure

white/black
colors
transparent
metallics

Zone 1

12 years
10 years
10 years
3 years

Zone 2

10 years
8 years
8 years
3 years

Zone 3

8 years
6 years
6 years
3 years

Horizontal outdoor exposure

white/black
colors
The following films are
suitable for horizontal
applications:

Zone 1

5 years
5 years
white -10, black -12, tomato red -13

Zone 2

4 years
4 years

Zone 3

3 years
3 years

Interior application

interior

Zone 1

12 years

Zone 2

12 years

Zone 3

12 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

- flexible substrates incl. 3M™ Panagraphics™ III Wide Width Flexible Substrate.
- 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 not clean and more than moderate textured.
- surfaces with poor paint to substrate adhesion.

Graphic removal from

- signs or existing graphics that must remain intact.

Graphics subjected to

- gasoline vapors or spills.

Important Notice

- 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 color variations all pieces of applied film of one colored area should be processed out of one lot of material.
- The color appearance of metallic film is dependent on the viewing angle to the product! Therefore the job design should be done that all parts of metallic film are applied the same orientation.

Graphics Manufacturing

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

Electronic Cutting

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.

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. This is to minimize the effect of possible adhesive flow.

Temperature and relative humidity

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

Roll storage

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

Further information

For more details refer to our instruction bulletin 4.1 'Sheeting, Scoring, Film Cutting', please.
>[Instruction Bulletin 4.1 'Sheeting, Scoring, Film cutting'](#)<

Application

See product bulletin ATR 'application tape recommendations' for information about selection and use of suitable application tapes for this product, please.

> [Product Bulletin Application Tape Recommendations](#) <

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'<](#)

Important Safety Remark

Application to Glass

The application of colored 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 break 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 the determining factors.

Light color designs and application on the outside of the window are to be preferred. A free non-applied framework of 4 mm around the entire window front can help to dissipate the absorbed warmth.

According to common knowledge a thermal crack can occur at temperature differences of approx. 130°C (ESG), approx. 40°C (float glass) or 110°C (TVG).

Coldest place is usually under the framework in the embedded joined window part, the warmest place is typically on the darkest place in the format.

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

Important Notice

This bulletin provides technical information only.

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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