



3M™ Scotchcal™ Graphic Film 3670

Description

3M™ Scotchcal™ Graphic Film is a premium cast white film for screen printing graphics used in a variety of applications. The extremely aggressive, pressure sensitive adhesive is well suited for graphics applied to flat or moderately curved, low surface energy substrates.

Key Features

- Extremely aggressive, pressure-sensitive adhesive
- Good adhesion to low surface energy substrates such as polyolefin
- Adheres well to flat surfaces or moderate compound curved surfaces
- Excellent hiding power
- Up to 3 years Warranty

Applications and Uses

Film 3670 is intended for making permanent graphics when used with the listed Compatible Products in the following applications. These types of applications are warranted by the 3M™ MCS™ Warranty.

- Multicolour graphics including labels, emblems, striping

Limitations of Uses

The following uses and applications are NOT warranted.

- Applications to corrugated or riveted surfaces
- Translucent or transparent substrates in outdoor applications; ultraviolet light can cause premature failure of the adhesive
- Graphics regularly subjected to gasoline vapors or spills
- Graphics for automotive Original Equipment Manufacturers (OEM); 3M Commercial Graphics Division products are not tested against automotive manufacturing specifications

Product Line

This product is available in the following dimensions:-

1.219m x 45.72m

Compatible Products

- 3M™ Screen Printing Ink Series 1900 (line colour)
- 3M™ Screen Printing Ink Series 9700UV (line colour)
- 3M Screen print clear coat
- Selected 3M application tapes

Characteristics

Characteristic	Description
Film	0.05 mm vinyl
Colour	3670 white
Film thickness with adhesive	0.08 to 0.10 mm
Adhesive type	Pressure sensitive
Adhesive colour	Black-pigmented adhesive
Liner	White kraft paper
Application surfaces	Flat or moderate compound curves, without rivets
Recommended application substrates	Polyolefin substrates; other plastic substrates may be used on a customer test-and-approve basis
Removal	Permanent
Application temperature range (air and substrate)*	4° to 27°C

**For applications nearing the minimum temperature range, please contact your local technical service representative to confirm suitability of application*

Chemical & Physical Properties

The values given are typical for film 3670. For a custom specification, submit a request to your 3M sales representative.

Physical Characteristics

Property	Value
Applied shrinkage	1.19 mm
Tensile strength (minimum)	24.5N/25mm at 23°C
Service temperature range	-54° to 70°C
Humidity resistance	No effect

Chemical Characteristics

- Resists mild acids, alkalis, and salts
- Excellent water resistance

Adhesion

Adhesion value measured 24 hours after application

Substrate	Value
Aluminum, anodized	22N/25mm
High density polyethylene	22N/25mm

Warranty

Only a Scotchprint® Graphics Authorised Manufacturer or 3M™ MCS™ Qualified Manufacturer can produce 3M™ MCS™ Warranted Graphics. The warranty period is based on field experience and exposure tests. When the graphics are processed and used according to the 3M recommendations, they should have the performance life shown in the table below. The actual performance depends on the:

- Correct combination of film and ink
- Ink formulation
- Drying methods
- Selection and preparation of the substrate
- Application methods
- Exposure conditions
- Cleaning methods

Colour	Ink Series	Protective Clears	Fleet			Exterior Sign 1st Surface			Interior		
			1	2	3	1	2	3	1	2	3
ZONE											
White	Unprinted	None	3	3	2	3	3	2	3	3	3
White	1900/9700 Halftone/Line	1920DR/9720/abc	3	3	2	3	3	2	3	3	3

Zone 1: Northern and Central Europe

Austria, Baltic States, Belgium, Bosnia, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greenland, Hungary, Iceland, Ireland, Italy (North of Rome), Liechtenstein, Luxembourg, Netherlands, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Sweden, Switzerland, UK

Zone 2: Mediterranean Europe

Albania, Bulgaria, Corsica, Crete, Greece, Italy (South of Rome), Macedonia, Malta, Portugal, Russia, Sardinia, Spain, Turkey

Zone 3: Middle East and Africa

Afghanistan, Bahrain, Cyprus, Dubai, Israel, Kuwait, Iran, Iraq, Jordan, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Syria, UAE, Yemen, Algeria, Angola, Benin, Botswana, Burkina, Burundi, Cameroon, CAR, Chad, Congo, Djibouti, Egypt, Eritrea, Gabon, Ghana, Guinea, Ivory Coast, Libya, Liberia, Madagascar, Mali, Mauritania, Morocco, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somali Republic, South Africa, Sudan, Togo, Tunisia, Uganda, Zaire, Zambia, Zimbabwe

Warranty Exceptions

- Film 3670 is not warranted for use in severe climates such as south-facing, desert-area exposures and other situations where ultraviolet light and heat are excessive.
- The maximum service temperature is 70°C.
- Screen print clears 9720UV and 9730UV cannot be used in ink formulations containing screen print clear 1920DR
- Unprinted film 3670 has a tendency to chalk in exterior applications. Film that cannot be cleaned must be printed with screen print clear 1920DR or 9720UV or 9730UV. The warranty is the same as in the table above for printed graphics.

Fabrication

This bulletin does not contain detailed printing, processing or application procedures for the subject products. The appropriate Instruction Bulletin(s) may be obtained by contacting your 3M sales representative or 3M Technical Service.

Hot Stamping

Film 3670 may be hot stamped using material available from several suppliers. An assurance of performance must be obtained from the foil manufacturer.

Cutting

These are the common cutting methods for this film.

- **Band sawing**
Number of sheets: 30 printed or 60 unprinted
Saw speed: 1000 to 1500 feet/minute
(304 to 456 metres/minute)
- **Hand cut**
Number of sheets: individual sheets only
- **Guillotine**
Number of sheets: maximum 7.5 cm
sheet stack
- **Cold and hot steel-rule die cutter**

Note: If adhesive flowback occurs where the film is cut, weeding may be difficult. Therefore, we do not recommend using cutters that do not cut the liner, such as electronic or hot kiss cutters.

Application Tapes

The type of application tape used depends on the type of graphic produced and the ink or screen print clear that was applied last.

- Use a premasking tape (SCPM) if very little of the liner is exposed.
- Use a prespacing tape (SCPS) if the graphic has large amounts of exposed liner.

Screen Print Clear	Premasking	Prespacing
Unprinted film	SCPM-19	SCPS-100
1920DR 1930	SCPS-100	SCPS-2
9720UV 9730UV	SCPM-44X	SCPS-44X

Application

Film 3670 is not positionable. Apply it like any other pressure-sensitive film. The minimum air and substrate application temperature is 4°C. Do not apply the film if the air or surface temperature is higher than 27°C. Refer to Instruction Bulletin 5.5 for more details.

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, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline.)

Removal

Film 3670 is not a removable product. A solvent-based remover system may be needed.

3M Related Literature

Listed below is related 3M technical literature that may be of interest. Subject	Product Bulletin	Instruction Bulletin
Design of graphics	2.1	
3M™ Screen Printing Ink Series 1900	1900	3.11, 3.12
3M™ Screen Printing Ink Series 9700UV	9700	3.4, 3.13
Scoring and cutting		4.1
Premasking, prespacing		4.3
Surface Preparation		5.1
Application		5.4, 5.5
Storage, handling, maintenance, removal		6.5

Scotchprint is a registered trademark of 3M in the US and other countries. 3M, MCS, and Scotchcal are trademarks of 3M Company.

Shelf Life

The shelf life of the film is 2 years and should be applied within 2 years of the receipt of film if unprocessed. Processed film should be applied within 1 year of processing and within 2 years of receipt of the film.

Glossary of Terms

Matched Component System™ or MCS™

The system pursuant to which Finished Graphics are produced by a Graphic Manufacturer using only 3M Products and components and manufactured in accordance with 3M's Product or Instruction Bulletins, 3M Specification Document and using 3M Approved Technologies.

3M™ Controltac™ Plus

A film with 3M™ Controltac™ Plus positionable adhesive system has million of precision-placed microscopic glass spheres embedded within its adhesive layer. These spheres help to prevent the adhesive from fully contacting the application surface until pressure is applied. This enables the graphic to be positioned, then re-positioned as many times as necessary, until it is in exactly the right place before final application.

3M™ Comply™ Performance

With its remarkable 'bubble and wrinkle free' application feature, 3M™ Comply™ Performance is the next step in speeding and easing graphic application. The adhesive layer has been developed to contain uniquely-configured channels which allow air to escape during application.

Removable Adhesive

Films with removable adhesive can be lifted easily from most suitable substrates and may require the application of heat to add the process.

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.

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.

Technical Assistance

For help on specific questions relating to 3M Commercial Graphics Division Products, contact your local Technical Service Representative.

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