



## Product Bulletin 3470

Release UKH, Effective Feb 2005  
Black bar in margin indicates a change

# Scotchcal™ Graphic Film Series 3470

## Description

3M™ Scotchcal™ Graphic Film Series 3470 is a versatile, medium-term, removable graphic film with excellent hiding power, good scuff resistance and a matte finish.

## Advantages

- Screen printable (film 3470 White only)
- For flat surface with and without rivets
- Excellent hiding power
- Scuff resistant
- Removable up to 3 years warranty

## Applications and Uses

Film series 3470 is intended for making removable, durable graphics when used with the listed Compatible Products in the following applications. These applications are warranted by the 3M™ MCS™ Warranty.

- Bus graphics
- Commercial vehicle or fleet graphics, emblems, striping
- Exterior graphics and signs
- Interior graphics and signs
- Point-of-purchase or trade show displays
- Vending or dispensing machine graphics

## 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 warrant this film for the following:

- Graphics applied to corrugated or highly irregular surfaces or to sharply raised areas like huck bolts
- Substrates that do not have a clean, smooth surface or have poor paint-to-substrate adhesion
- Graphics applied to stainless steel on vehicles

- Graphic removal from 3M™ Scotchlite™ Reflective Film or other 3M™ Scotchcal™ Graphic Films and 3M™ Controltac™ Plus Graphic Films.
- Graphic removal from exterior, horizontal applications.
- Graphics regularly subjected to gasoline vapors or spills such as petrol pumps, automobile fuel-tank ports or top-feeding petroleum tankers.
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division.

## Characteristics

Characteristic	Description
Film	Calendered vinyl
Product colours	3470: white, opaque <del>3475: black, opaque</del>
Gloss	Matte
Thickness	0.10 mm <i>without adhesive</i> 0.1 – 0.13mm <i>with adhesive</i>
Adhesive	Pressure sensitive
Adhesive colour	Grey
Liner	Polyethylene-coated paper 150g/m <sup>2</sup>
Application surface	Flat, with and without rivets
Application substrates	Glass, metals, paint, rigid plastic
Minimum Application Temp	4°C Note: <i>For applications nearing the minimum temperature range, please contact your local technical service representative to confirm suitability of application</i>
Service Temp Range	-30°C - +90°C
Tensile Strength	18N/ 25mm at 23°C
Applied Shrinkage	0.8mm
Removability	Up to 3 years with heat

## Compatible Products

Note: Only film 3470 White is screen printable.

- 3M™ Screen Printing Ink Series 1900

3M™ Screen Printing Ink Series 9700UV

## Effective Performance Life

When printed and applied in accordance with 3M recommended procedures, the following performance typically may be expected. Performance statements are based upon representative experience obtained from testing throughout Europe. Actual performance will be determined by substrate selection and preparation, maintenance of the marking and exposure conditions.

### Warranted Durability

	3470	3475
Unprinted	3 years	3 years
Printed with Ink Series 1900	3 years	not warranted
Printed with Ink Series 9700	3 years	not warranted

Exceptions to the above are:

The warranty applies to films that are exposed at a vertical angle (defined as 90°+/-10°). A significant decrease in durability may be experienced if films are exposed other than vertical. Such non-vertical applications must be on a test and approval basis to determine acceptability. 3M does not warrant non-vertical exposures.

## 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 Technical Department.

### Screen Printing Inks

1900 Series Inks  
9700 Series UV Inks

**Note:** Screen printing of Scotchcal 3475 Black is neither recommended nor warranted.

### Overprint Clear

For stated performance, screen printing inks must be printed with the following overprint clears:

- 1920DR Gloss clear
- 9720UV Gloss clear
- 1955ABC Gloss clear

## Cutting

When using any equipment, always follow the manufacturer's instructions for safe operation. Recommended cutting tools are:

- Hand cut
- Guillotine
- Die cut
- Electronic cutting

Hot kiss cutting is NOT recommended

## Premasking and Prespacing

Generally, it is not necessary to premask film series 3470. However, graphics 4 square feet (0.36 m<sup>2</sup>) or larger, and intricately-shaped graphics should be premasked to prevent stretching and for easier application.

The type of application tape to use depends on the type of graphic produced and the ink or overprint clear that was applied last. See Instruction Bulletin 4.3 for details.

Conditions	3M Brand Application Tapes
<b>Unprinted</b>	
General Premasking	SCPM-19
General Prespacing	SCPS-100
<b>Series 1900 Inks</b>	
General Premasking	SCPS-100
General Prespacing	SCPS-100
<b>Series 9700 UV</b>	
General Premasking (4-colour) (line)	SCPM-44X SCPM-44X
General Prespacing	SCPS-2

## Application

Refer to the Instruction Bulletins listed in the Related 3M Literature section, located at the end of this bulletin, for more complete information.

- The air and substrate application temperature range for flat surfaces with and without rivets is 40° to 100°F (4° to 38°C).
- This film has a pressure-sensitive adhesive.
- Tenting around rivets:
  - Because of its construction, film series 3470 tents around rivets. Although it is not required, cutting around the rivets improves the appearance of short term graphics.
  - Film that has tented may fail prematurely if the graphics are long term and will be exposed to cold weather or high pressure wash. Under these conditions, cut around the rivets.
  - If rivets are closely spaced, the film may bridge between the rivets and should also be cut. Closely spaced rivets may be defined as:
    - Single row less than 1.5 inches (38 mm) apart
    - Double row less than 3 inches (76 mm) apart

## Chemical and Physical Properties

Values given are typical and are not for use in specifications. If a custom specification is desired, a request should be submitted through your sales representative. The data given below is for unprinted film

### Physical Properties

\* Note: Paints, which have poor paint to substrate adhesion, may be pulled off during removal of film.

### Adhesion (FTM1)

Substrate	Metric Units (N/25mm)
Etched Aluminium	11
Anodised Aluminium	11
Stainless Steel	7
Chrome Plating	9
ABS	9
Fruehauf Prepainted Panels	9
FRP	9

**Note:** ISO refers to standards of the International Standards Organisation. FTM (Fimat Test Methods) refers to test methods listed by Fimat, the Association of European Tape Manufacturers.

### Chemical Resistance

Chemical Agent	Exposure Time	Results
Water	24 hours	No effect
50/50 Ethylene Glycol/Water	24 hours	Yellowing
Reference Fuel (85% Mineral Spirits/15% Xylol)	1 hour	Slight adhesive attack
SAE 20 Motor Oil	24 hours	No effect
#1 Diesel Fuel	1 hour	Edge puckering
10% Hydrochloric Acid	10 mins	No effect
10% Ammonium Hydroxide	10 mins	No effect
Mineral Spirits	10 mins	No effect
Methyl Alcohol	10 mins	No effect

## 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.

## Related 3M Literature

Listed below is related 3M Technical Literature which may be of interest:

Subject	Product Bulletin	Instruction Bulletin
Design of Markings		2.1
Scotchcal Ink Series 1900	1900	3.11, 3.12
Scotchcal Ink Series 9700 UV	9700	3.4, 3.13
Scoring and Cutting		4.1
Premasking and Prespacing		4.3
Surface Preparation		5.1
Application		5.5
Storage, Maintenance and Removal		6.5

## 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.

Commercial Graphics Department  
3M United Kingdom PLC  
3M Centre, Cain Road, Bracknell  
Berkshire, RG12 8HT  
Tel: 01344 857850  
Fax: 01344 857939  
e-mail: [commgraphics.uk@mmm.com](mailto:commgraphics.uk@mmm.com)  
[www.3m.com/uk/graphicsolutions](http://www.3m.com/uk/graphicsolutions)  
[www.scotchprint.com/uk](http://www.scotchprint.com/uk)

## Sales Assistance

Commercial Graphics Group  
3M United Kingdom PLC  
3M House, 28 Great Jackson Street  
Manchester, M15 4PA  
Tel: (0161) 237 6394  
Free Fax: (0800) 378127  
e-mail: [commgraphics.uk@mmm.com](mailto:commgraphics.uk@mmm.com)  
[www.3m.com/uk/graphicsolutions](http://www.3m.com/uk/graphicsolutions)  
[www.scotchprint.com/uk](http://www.scotchprint.com/uk)

---

3M United Kingdom PLC, Commercial Graphics Group  
3M House 28 Great Jackson Street Manchester M15 4PA  
Tel: (0161) 237 6394 Free Fax: (0800) 378127  
e-mail: [commgraphics.uk@mmm.com](mailto:commgraphics.uk@mmm.com)  
[www.3m.com/uk/graphicsolutions](http://www.3m.com/uk/graphicsolutions)  
[www.scotchprint.com/uk](http://www.scotchprint.com/uk)

3M Ireland, 3M House, Adelphi Centre,  
Upper Georges Street, Dun Laoghaire, Co. Dublin, Ireland  
Tel: 01 280 3555, Fax: 01 280 3509  
e-mail: [commgraphics.uk@mmm.com](mailto:commgraphics.uk@mmm.com)  
[www.3m.com/uk/graphicsolutions](http://www.3m.com/uk/graphicsolutions)  
[www.scotchprint.com/uk](http://www.scotchprint.com/uk)