



3M™ Scotchcal™ Film Series 70

Product Description

3M™ Scotchcal™ Film Series 70 are opaque cast vinyl films. They are durable, dimensionally stable and were specifically developed to be converted on computer controlled cutting systems.

Key Features

- Easy cutting of small letters or complex graphics
- Good lay-flat and weeding performance
- Available in 60 standard colours
- Resistance to humidity and water
- Good lay-flat performance on flat bed plotters
- Film and adhesive can be easily removed even after years, with 3M™ Scotchcal™ Remover System

Applications and Uses

- Electronically-cut graphics, emblems and labels
- Commercial vehicle graphics
- Interior and exterior graphics and signs
- Application on flat or simple curved surfaces with or without rivets
- Application on substrates like glass, metals, acrylics, polycarbonates, fiberglass and painted surfaces

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:

- Application to corrugated surfaces (with and without rivets)
- Application to compound curved surfaces (A compound curve is one in which the film is stretched in two directions over a sharp angle.)
- Exposure to petroleum products or solvents
- Scotchcal 70-11 Transparent film is not recommended to be used as a top film laminate for any applications

- Graphics for automotive Original Equipment Manufacturers (OEM): 3M Commercial Graphics Division products are not tested against automotive manufacturers' specifications.

Product Line

Number	Colour	Number	Colour
70-10	White	70-97	Nimbus Grey
70-11	Transparent	70-100	Matt White
70-12	Black	70-120	Matt Black
70-24	Lemon Yellow	70-275	Corn Yellow
70-25	Bright Yellow	70-475	Medium Red
70-27	Sunflower	70-478	Geranium Red
70-32	Orange	70-485	Intense Red
70-34	Bright Orange	70-488	Dark Red
70-41	Warm Red	70-489	Burgundy
70-44	Light Red	70-545	Gold
70-46	Tomato Red	70-585	Anthracite
70-48	Red	70-625	Magenta
70-58	Aluminum	70-645	Pink
70-62	Light Magenta	70-785	Deep Green
70-65	Lavender	70-792	Aqua
70-66	Purple	70-795	Dark Aqua
70-72	Light Green	70-815	Bright Blue
70-73	Grass Green	70-825	Olympic Blue
70-74	Green	70-837	Intense Blue
70-75	Soft Green	70-862	Vivid Blue
70-76	Med. Green	70-878	Brilliant Blue
70-77	Leaf Green	70-882	Sapphire Blue
70-78	Dark Green	70-903	Dark Blue
70-79	Teal	70-905	Insignia Blue
70-81	Soft Blue	70-912	Cream
70-89	Navy Blue	70-914	Beige
70-92	Brown	70-915	Tan
70-93	Grey White	70-916	Hazelnut Brown
70-95	Traffic Grey	70-919	Chestnut Brown
70-96	Grey	70-965	Dark Grey

Compatible Products

- Selected 3M Premasking and Prespacing Tapes
- 3M™ Screen Printing Ink Series 1900
- 3M™ Screen Printing Ink Series 9700UV

Main Characteristics

Property	Description
Adhesive	Permanent pressure sensitive, solvent based
Adhesive colour	Clear
Liner	White paper: 120 g/m ²
Application substrate	Automotive paints, glass, acrylic, metal, painted steel
Minimum application temperature (air, film, substrate)*	+10 °C

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

Note: The ISO number refers to standards of the International Standards Organization.

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

Property	Metric Units
Thickness (film and adhesive) (ISO 4593)	0.08 mm
Thickness (film only)	0.065 mm
Elongation (ISO 1184)	> 50%
Temperature range after application	-40 to + 80°C

Adhesion

Good adhesion to typical substrates like etched or anodized aluminium, stainless steel, ABS, acrylic enamel, urethane paints and glass.

Chemical Resistance

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

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

Warranted Durability

The following tables show the warranties, in years, for exposure where the face of the graphic is vertical at 90° ±10°.

Colour	Fleet			Exterior Sign 1st Surface			Exterior Sign 2nd Surface			Interior		
	1	2	3	1	2	3	1	2	3	1	2	3
Black/White	8	6	3	8	6	3	8	6	3	8	8	8
Colours	6	5	3	6	5	3	6	5	3	6	6	6
Metallic	5	3	2	5	3	2	5	3	2	5	5	5
Transparent	5	3	2	5	3	2	5	3	2	5	5	5

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

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.

Cutting

When using any equipment, always follow the manufacturer's instructions for safe operation.

Based on the differences in electronically controlled cutting equipment and font characteristics, users should determine their own cutting and weeding capability.

These factors can affect cutting quality and ability:

- **Sharpness of the knife blade.** Dull blades create a serrated look to the cut edge of the film.
- **Weight on the 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. It also causes the blade to drag, accelerating wear and eventually creating a serrated cut edge on the film.
- Temperature and relative humidity are minor considerations, but extremes in high and low levels, as well as rapid fluctuations are to be avoided.
- Storage of stock film is recommended to be in the same environment as the cutting equipment.

Weeding

It is recommended that film 3M™ Scotchcal™ Film Series 70 has the excess film weeded (removed) as soon after cutting is practical. This is to minimise the effect of possible adhesive flow 24 or more hours after cutting.

Screen Printing

Whilst 3M™ Scotchcal™ Film Series 70 can be screen printed, other products such as the 3M™ Controltac™ Plus Film Series, for example, are more suitable for this process. If screen printing is necessary, then 3M™ Screen Printing Ink Series 1900 or 3M™ Screen Printing Ink Series 9700 must be employed. It would be prudent for converters to evaluate the optimum printing and drying conditions for themselves.

Application Tapes

The 3M Prespace Tape or Premask Tape you use depends on the type of graphic produced and the overprint clear system. For graphics that have large amounts of exposed liner, use a prespacing application tape. If there is very little exposed liner, use a premasking application tape.

Conditions	3M Brand Prespace Tapes	3M Brand Premask Tape
Unprinted	SCPS-100	SCPM-19
Series 1900 Inks	SCPS-100	SCPM-19
Series 9700 UV	SCPS-44X	SCPS-44X

Application

Refer to the Instruction Bulletin 5.5 for application details.

Temperature

The minimum application temperature is 10°C

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 the Instruction Bulletin 6.5 for maintenance and cleaning details.

Removal

3M™ Scotchcal™ Film Series 70 is removable with 3M™ Graphic Remover System.

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
Premasking and prespacing		4.3
Surface preparation		5.1
Application		5.5
Storage, maintenance and removal		6.5

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.

Permanent Adhesive

Films with a permanent adhesive can be difficult to remove and will often require heat and/or chemicals for effective removal.

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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