



3M™ Scotchcal™ Graffiti Resistant Film Series 639

Product Description

3M™ Scotchcal™ Graphic Film 639 is tough, dimensionally stable transparent polyester film intended for the protection of graphics used on public transport vehicles, high quality advertising and signage. These films are intended for exterior or interior use on flat or simple curved surfaces without rivets.

Key Features

- Superior resistance against harsh solvents
- Dimensionally stable
- Very high transparency
- Excellent fastness to light
- Up to 6 years warranty

Applications and End Uses

- Protection of vehicle graphics
- Protection of graphics and signage

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 recommend or warrant this film for the following:

- Application on corrugated, and irregular surfaces with and without rivets.
- Application onto Non-3M films
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division for alternatives.

Compatible Products

- 3M™ Graphic Marking Films
(for details and compatibility please refer to the corresponding Product Bulletin)
- Selected 3M application tapes

Product Line

This product is available in the following dimensions:

- 0.610m x 45.72m
- 1.219m x 45.72m

Please contact the 3M Sales Office for stock available and lead times.

Main Characteristics

Property	Description
Colour	Transparent
Film	0.025 mm clear film
Thickness (film plus adhesive)	0.035 to 0.055 mm
Adhesive type 639	Permanent, pressure sensitive
Adhesive colour	Clear
Liner 639	120g/m ² kraft paper
Application surface	Flat
Application substrates	Glass, metal, painted substrates, rigid plastic
Application temperature range	10° to 38°C <i>Note: For applications nearing the minimum temperature range, please contact your local technical service representative to confirm suitability of application</i>

Chemical and Physical Properties

Values given are typical and are not for use in specifications. If not specified otherwise, the data below is valid for the three product versions.

Physical Properties

Property	Metric Units
Thickness (ISO 4593)	0.025mm
Tensile Strength (ISO 1184-1983)	55 N/25mm min at 23°C
Dimensional Stability (FTM 14)	no detectable shrinkage
Temperature Range	-54°C to +93°C

Adhesion (FTM1)

Scotchcal Film 639

Substrate	Metric Units (N/25mm)
Alodine Aluminium	39
Stainless steel	22
3M™ Controltac™ Plus Graphic Film Series 180	27
PMMA	20
Fruehauf Prepainted Panels	21

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	14 days	No effect
Reference Fuel (85% Mineral Spirits/15% Xylol)	1 hour	No effect
SAE 20 Motor Oil	24 hours	No effect
#1 Diesel Fuel	1 hour	No effect
10% Hydrochloric Acid	10 min	No effect
10% Ammonium Hydroxide	10 min	No effect
Texaco A Jet A Fuel	1 hour	No effect

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:

- Use of 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

Product	Zone 1	Zone 2	Zone 3
639	6 years	4 years	3 years

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.

Commercial Graphics Division products are not tested against automotive manufacturer's specifications and are, therefore, not warranted for use in fabricating graphics for automotive OEM's.

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

Overlamine 639 is compatible with most roll laminators. No heat is required. Refer to Instruction Bulletin 4.22 for how to apply this laminate.

Roll Lamination

Scotchcal Graffiti Resistant Film Series 639 can be roll laminated onto other films or substrates using the standard laminator set-up.

Hot Stamping

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

Premasking / Prespacing

Conditions	3M Application Tapes
General Premasking	SCPM-19
General Prespacing	SCPS-100 or SCPM-19 with HVA

Edge Sealing

Graphics on rail rolling stock protected with Scotchcal 639 must be edge sealed. Refer to Instruction Bulletin 5.1.1

Shelf Life, Shipping and Storage

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.

Film, sheeting and markings must be stored in a clean area, free from excessive moisture and direct sunlight, with ambient temperatures below 38°C.

Related 3M Literature

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

Subject	Bulletin No.
Instruction Bulletins	
Design of Markings	2.1
Scoring and Cutting	4.1
Premasking and Prespacing	4.3
Cold roll lamination	4.22
Surface Preparation	5.1
Application on Rail Vehicles	5.1.1
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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The use of trademark signs and brand names in this bulletin is based upon US standards. These standards may vary from country to country outside the USA.

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