

3M™ Diamond Grade™ Vehicle Marking Film Series 983

Description

3M™ Scotchlite™ Diamond Grade™ Vehicle Marking Film Series 983 is a highly retroreflective sheeting consists of prismatic lenses formed in a durable transparent resin, sealed in a synthetic film and backed with an aggressive pressure sensitive adhesive with a protective liner.

Key Features

- Durable, microprismatic, retroreflective sheeting
- Available in rolls of 55mm widths, homologated according to UN/ECE Regulation 104
- E Mark 104 R-00821
- For applications rigid vehicles
- Excellent angularity in both horizontal and vertical
- Easy to apply
- Up to 8 years exterior durability
- Sheeting resists fuel vapors or occasional spills
- Additional roll widths available upon request
- Screen printable

Application and Uses

3M™ Scotchlite™ Diamond Grade™ Vehicle Marking Film Series 983 is designed to mark the side and rear perimeter rigid sided trucks and trailers for enhanced visibility and detection.

Series 983 can be screen-printed for ECE70.01 rear marker plate applications.

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.

Compatible Products

Screen Print Applications

- 3M™ Scotchlite™ Process Colour Series 880I

Product line

Property	Description
Number and colour	983 -10 White -71 Yellow -72 Red

Main Characteristics

Property	Description
Adhesive colour and type	Clear, Pressure Sensitive
Liner	Translucent
Application Surfaces	Flat without rivets
Application substrates	Aluminium, stainless steel and automotive paint
Application temperature range for air and substrate*	10°C to 30°C
Thickness without premask tape	0.36 – 0.4mm
Performance range	-34°C to +94°C

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

General Performance Characteristics

The durability of Marking Series 983 depends on the following:

- Selection, preparation and temperature of the substrate
- Ink formulation (screen printing)
- Drying methods (screen printing)
- Application methods
- Cleaning and maintenance methods
- Exposure conditions

Product Data

Retroreflection

At a 5° entrance angle and a 0.33° observation angle, Series 983 has the following typical coefficient of retroreflection. It is expressed in candlepower per lux per square meter [cd/(lx·m²)].

The entrance angle is formed by a light beam striking the surface at a point and at a line that is perpendicular to the surface at the same point.

An observation angle is formed by the light beam striking the reflective surface and returning to the observer.

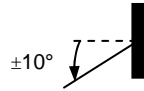
Sheeting and Colour	Typical Coefficient of Retroreflection
983 -10 White	650
-71 Yellow	550
-72 Red	150

Chemical Resistance

- Resists mild acids, mild alkalis and salts
- Excellent water resistance
- Resists occasional fuel spills

Warranted Durability

The sheeting is warranted for 96 months when used as vehicle marking and the exposure of the face is vertical at $90^\circ \pm 10^\circ$.



Application

- Check the proper temperature using an Infrared-Thermometer like 3M™ Scotchtrak™ IR-500.
- Do not overlap sheeting
- Application underneath belts or buckles is not recommended.
- Remove premask tape after application using a 180° pull off angle.
- Contact your 3M representative for detailed processing and application procedures

Maintenance and Cleaning

Hand wash with sponge, cloth, or soft brush using warm water and detergent. 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). Rinse thoroughly.

To remove grease, oil, or tar, use cloth moistened with heptane, VM&P naphtha or mineral spirits. Wash with detergent and water and rinse thoroughly.

Using high pressure cleaning equipment, the following conditions should be applied/ set up:

- Maximum pressure 80 bar
- Maximum temperature 60°C
- Minimum of 1 metre distance of cleaning jet from sheeting surface
- Cleaning wand to be held at no greater angle than 15 degree from perpendicular to the sheeting surface
- Wide spray pattern

Storage and Shelf Life

- The combined shelf life as processed and unprocessed marking series 983 cannot exceed 2 years from the date of receipt from 3M. However, the sheeting must be used within 1 year of processing even if the combined shelf life is less than 2 years.
- Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core.

- Store cut sheets lying flat.
- Ship the finished sheets lying flat.
- Store the sheeting in a clean, dry area and away from direct sunlight.

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. 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.

3M Related Literature

Listed below is related 3M technical literature that may be of interest.

Subject	Bulletin No.
Instruction Bulletins	
Application Instructions for Scotchlite™ Diamond Grade™ Vehicle Marking Film for Rigid Sided Vehicles Series 983	5.13.1
Product Bulletins	
3M™ Scotchlite™ Process Colour Series 880I	880I

Glossary of Terms

Retroreflectivity

A retroreflective material reflects the incoming light back to the light source. 3M reflective graphics reflect the car headlights back to the car driver.

Technical Assistance

For help on specific questions relating to 3M Traffic Safety Systems Division Products, contact your local Technical Service Representative.

Traffic Safety Systems Division
3M United Kingdom PLC
3M Centre, Cain Road
Bracknell
RG12 8HT
Tel: 01344 857950
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www.3M.co.uk/traffic/ECE104

3M™ Diamond Grade™ Vehicle Marking Film Series 987

Description

3M™ Diamond Grade™ Vehicle Marking Film Series 987 is a highly retroreflective sheeting consists of prismatic lenses formed in a durable transparent resin, sealed in a synthetic film and backed with an aggressive pressure sensitive adhesive with a protective liner.

Key Features

- Durable, microprismatic, retroreflective sheeting
- Available in rolls of 50mm widths, homologated according to UN/ECE Regulation 104. [104 R-001507]
- For applications on pvc curtain sided vehicles
- Excellent angularity in both horizontal and vertical
- Easy to apply
- Up to 3 years exterior durability
- Sheeting resists fuel vapors or occasional spills

Application and Uses

3M™ Diamond Grade™ Vehicle Marking Film Series 987 is designed to mark the side and rear perimeter of pvc curtain sided trucks and trailers for enhanced visibility and detection.

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.

Product line

Property	Description
Number and colour	987 -71 Yellow

Main Characteristics

Property	Description
Adhesive colour and type	Clear, Pressure Sensitive
Liner	Translucent
Premask tape	Translucent
Application substrates	3M approved curtains, not older than 6 months
Application temperature range for air and substrate	10°C to 30°C
Thickness without premask tape	0.36 – 0.4mm
Performance range	-34°C to +94°C

General Performance Characteristics

The durability of Marking Series 987 depends on the following:

- Selection, preparation and temperature of the substrate
- Application methods
- Cleaning and maintenance methods
- Exposure conditions

Product Data

Retroreflection

At a 5° entrance angle and a 0.33° observation angle, Series 987 has the following typical coefficient of retroreflection. It is expressed in candlepower per lux per square meter [cd/(lx·m²)].

The entrance angle is formed by a light beam striking the surface at a point and at a line that is perpendicular to the surface at the same point.

An observation angle is formed by the light beam striking the reflective surface and returning to the observer.

Sheeting and Colour	Typical Coefficient of Retroreflection
987 -71 Yellow	450

Chemical Resistance

- Resists mild acids, mild alkalis and salts
- Excellent water resistance
- Resists occasional fuel spills

Warranted Durability

The sheeting is warranted for 36 months when used as vehicle marking and the exposure of the face is vertical at $90^\circ \pm 10^\circ$.



Application

- Check the proper temperature using an Infrared-Thermometer like 3M™ Scotchtrak™ IR-500.
- Do not overlap sheeting
- Application underneath belts or buckles is not recommended.
- Remove premask tape after application using a 180° pull off angle.
- Allow the curtain to remain undisturbed for a minimum of 2 hrs after application
- Contact your 3M representative for detailed processing and application procedures

Maintenance and Cleaning

Hand wash with sponge, cloth, or soft brush using warm water and detergent. 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). Rinse thoroughly.

To remove grease, oil, or tar, use cloth moistened with heptane, VM&P naphtha or mineral spirits. Wash with detergent and water and rinse thoroughly.

Using high pressure cleaning equipment, the following conditions should be applied/ set up:

- Maximum pressure 80 bar
- Maximum temperature 60°C
- Minimum of 1 metre distance of cleaning jet from sheeting surface
- Cleaning wand to be held at no greater angle than 15° from perpendicular to the sheeting surface
- Wide spray pattern

Storage and Shelf Life

- Marking series 987 must be used within 1 year after date of receipt from 3M.
- Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core.
- Store the sheeting in a clean, dry area and away from direct sunlight.

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

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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.

3M Related Literature

Listed below is related 3M technical literature that may be of interest.

Subject	Bulletin No.
Instruction Bulletins	
Application Instructions for Diamond Grade™ Vehicle Marking Film for Soft Sided Vehicles Series 987	987

Glossary of Terms

Retroreflectivity

A retroreflective material reflects the incoming light back to the light source. 3M reflective graphics reflect the car headlights back to the car driver.

Technical Assistance

For help on specific questions relating to 3M Traffic Safety Systems Division Products, contact your local Technical Service Representative for the UK & Ireland.

Regulatory advice can be found at the website:

www.3M.co.uk/traffic/ECE104

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What is regulation ECE104?

- ECE104 is a regulation that establishes guidelines for the use of retro-reflective safety markings on heavy goods vehicles operating on our roads.
- ECE104 is already in force and mandatory in several countries e.g. Italy, Germany, Netherlands and South Africa.
- The markings need to be between 50mm to 60mm
- The reflective markings clearly outline the rear and sides of the vehicle, making the vehicle highly visible at up to 1000 metres at in low light conditions

Why is it being introduced?

Quite simply to save lives!

Research has demonstrated that outlining the contours of vehicles with high visibility safety marking tape significantly reduces the number of accidents involving long and heavy vehicles. The visibility of a vehicle is increased leading to a better safety record for vehicle operators and other road users.

A reduced accident rate means a reduced repair bill, which equally saves costs. It also improves corporate image by having a better safety reputation and safety record.

When is the regulation being introduced?

From July 2011 all newly registered vehicles which fall under certain vehicle categories operating in the UK will need to be equipped with side and rear reflective markings which meet the requirements of ECE104. Other European countries will also be introducing the regulation. Markings are encouraged to be applied as soon as possible to help reduce accidents save lives and show commitment to best practice.

Which vehicles will be affected?

The vehicle categories that will be affected are:

N2 - Vehicles designed and constructed for the carriage of goods and having a maximum weight exceeding 7.5 tonnes but not exceeding 12 tonnes.

N3 - Vehicles designed and constructed for the carriage of goods and having a maximum weight exceeding 12 tonnes.

O3 - Trailers with a maximum mass exceeding 3.5 tonnes but not exceeding 10 tonnes.

O4 - Trailers with a maximum mass exceeding 10 tonnes.

Where do you apply the marking tape?

Rear of the Vehicle

- A complete contour line marking (box) needs to be applied
- The conspicuity marking should be as close as practicable to the edge of the vehicle and should equate to at least 80% of the overall width of the vehicle
- Red and yellow marking tape only - red is the UK preference

Side of the Vehicle

- There are two options: a complete contour line marking (box) or a partial contour line marking (corner ticks)
- Partial contour markings are the minimum requirement
- The marking tape shall equate to at least 80%* of:
 - for motor vehicles, the length of the vehicle (excluding the cab)
 - for trailers, the length of the vehicle (excluding the drawbar)
- The length of the upper corner marking tape must be a minimum of 25cm in each direction
- Yellow and white marking tape only - yellow is the UK preference

*down to 60% or 40% for difficult or especially difficult applications

Front of the Vehicle

- It is optional but advisable to use white marking tape on the front of the vehicle

Complete Contour Markings



Partial Contour Markings





Why choose 3M reflective vehicle marking tape?

3M is a \$25 billion diversified technology company which, since 1902, has been creating innovative products that help make the world healthier, safer and more productive. 3M prides itself on the high quality of its products.

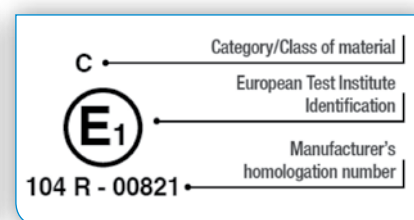
3M Diamond Grade Vehicle Marking Film Series:

- Conforms to regulation ECE104
- Offers excellent reflectivity – reflects at almost 90°
- Ease of application – easy to handle and does not require specialist applicators
- Daytime appearance – very vibrant
- Technical assistance – 3M provide excellent technical assistance
- Excellent adhesion to vehicle – products bond well to the selected substrates and endure after outdoor exposure and frequent power washing and cleaning
- Product warranty – 8 years for rigid sides and 3 years for 987 curtain sides
- High quality, durable, all plastic construction – not susceptible to corrosion
- Resists cracking – beyond area of impact
- Excellent chemical resistance - withstands exposure to a broad range of chemicals and cleaning solutions with no effect

What is the “E-mark”?

Look out for the E-Mark when you upgrade your vehicle to meet ECE104 requirements

- The E-mark is proof that the product has been extensively tested and certified by an independent and authorised centre. The E-mark will be granted only when the marking tape has met the requirements of ECE104.
- The E-mark is permanently printed within the approved marking tape at least every 50 cm (see image below)
- Without the E-Mark printed within the marking tape, the product is not compliant with the regulation.
- 3M™ Diamond Grade™ Vehicle Marking Film Series have met all the requirements of ECE104 and the E-Mark can be found printed on the material
- The E-mark gives you piece of mind that the product will perform to a high standard



What ECE104 compliant products do 3M manufacture?

Features	3M™ Diamond Grade™ Vehicle Marking Film Series 983	3M™ Diamond Grade™ Vehicle Marking Film Series 987
Typical Use	For application on rigid sided vehicles	For application on curtain-sides
Suitable application surfaces and substrates	Aluminium, Stainless Steel, Automotive Paint	3M approved coated curtains, not older than 6 months
Maximum Warranty	8 Years	3 Years
Standard Colour Range	White, Red and Yellow	White, Red and Yellow
Adhesive Tape	Clear, pressure sensitive, quickly and easily applied	Clear, pressure sensitive, quickly and easily applied
ECE104 Compliant	Yes	Yes
Product Construction	Highly reflective prismatic construction	Highly reflective prismatic construction
Roll Size	55mm x 50m	50mm x 50m
E-Mark	Yes (104 R – 00821)	Yes (104 R-001307)