



3M™ Scotchlite™ Reflective Material - 5410 Diamond Mesh Trim

Description

This retroreflective trim is designed for use on safety garments and in athletic and casual wear. When properly used, this product helps enhance the visibility of the wearer in nighttime or low-light conditions when illuminated by a light source such as headlights, by returning the light back toward the original source and reaching the automobile driver's eye. This retroreflective trim is a single strip of material composed of wide angle, exposed retroreflective lenses bonded to a heat activated adhesive.

3M™ Scotchlite™ Reflective Material - 5410 Diamond Mesh Trim	
Daytime Color	Silver
Reflected Color	White
Minimum R_A ¹	330
Wash Type ²	Home Wash
Wash Cycles ³	75 Cycles
Dry Cleaning ⁴	30 Cycles
Adhesive (Heat Activated)	Polyester
Occupational Apparel ⁵	Recommended for Occupational Apparel
ANSI 107-2015 Certified	Yes
CAN/CSA Z96-15 Certified	Yes

- 1 ANSI/ISEA 107-2015 minimum coefficient of retroreflection for retroreflective material
- 2 See Care and Maintenance Instructions section for Home Wash conditions
- 3 ISO 6330 Method 6N at 60 °C (140 °F) and $R_A \geq 100$ cd/lux/m² (home wash)
- 4 ISO 3175-2 Method 9.1 and $R_A \geq 100$ cd/lux/m²
- 5 Certified to an occupational or industrial clothing standard such as ANSI/ISEA 107-2015 American National Standard for High Visibility Safety Apparel and Accessories or CAN/CSA Z96-15 High Visibility Safety Apparel. Customers should contact 3M Technical Service regarding certifications to specific standards.

Retroreflective and Physical Performance

The coefficient of retroreflection (R_A , in cd/lux/m²) is measured by methods traceable to any of the following retroreflective intensity testing procedures:

- ASTM E809-08(13) and E810-03(13) (R_A)
- CIE 54.2: 2001 (R')

Retroreflective performance data were generated by 3M and are based on testing new product. The R_A values listed in the following tables were measured at +5.0° entrance and 0.2° observation angles.

It is important to note that use, wear, laundering, and environmental conditions will affect performance. Please contact your 3M representative for proposed product specifications.

Product Certification

ANSI/ISEA 107-2015 and CAN/CSA Z96-15

This retroreflective trim has certificates available for the ANSI/ISEA 107-2015 American National Standard for High-Visibility Safety Apparel and Accessories and CAN/CSA Z96-15 High Visibility Safety Apparel for Level 2.

Other Standards

Scotchlite reflective material products are used globally. Please contact your local 3M representative for more information on certification to other high visibility standards such as ISO 20471 and AS/NZS 1906.

Physical Performance

This retroreflective trim will meet or exceed the following specifications as noted. All RA values are at +5.0° entrance angle and 0.2° observation angle. (See product certificates on website for testing laboratory and test date.)

Physical Performance	Test Method
Retroreflectivity: (Initial)	ANSI/ISEA 107-2015 (Table 5)
Abrasion ($R_A \geq 100$):	EN 530 Method 2, 5000 cycles
Flexing ($R_A \geq 100$):	ISO 7854 Method A, 7500 cycles
Cold Fold ($R_A \geq 100$):	ISO 4675, -20 °C (-4 °F)
Temperature Cycle ($R_A \geq 100$):	12 hours @ 50 °C (122 °F) 20 hours @ -30 °C (-22 °F)
Wash ($R_A \geq 100$):	ISO 6330 Method 6N @ 60 °C (140 °F)
Dry Clean ($R_A \geq 100$):	ISO 3175-2 Method 9.1
Wet Reflectivity ($R_A \geq 100$):	ANSI/ISEA 107-2015, Appendix A

Performance

While the use of 3M™ Scotchlite™ Reflective Material enhances visibility, no reflective material can guarantee absolute visibility, particularly in adverse weather conditions. Performance will vary depending upon actual use, exposure conditions, and maintenance. Customers should be aware that 3M presents a Scotchlite reflective material product portfolio that offers a range of product attributes, and users should test the reflective material on their finished garments to satisfy conformance to their own requirements.

3M recommends that all customers, in accordance with good manufacturing practices, establish an ongoing quality system which includes maintaining lot/roll identification throughout the garment production process. Customers should implement continuous testing throughout their production and on their finished garments that reflects their garment needs.

Please visit our website, Scotchlite.com, for new or updated technical literature as well as contacting your local 3M Personal Safety Division Technical Service for more information

Application Instructions

IMPORTANT NOTE

Whenever two or more pieces of 3M™ Scotchlite™ Reflective Material are used together on a single surface or as a set, they should be matched to ensure uniform daytime color and nighttime or low light retroreflectivity. All high visibility safety garments should be constructed in accordance with the appropriate standard(s).

Cutting

Die-cutting is recommended, although it can also be hand-cut or guillotined.

Heat Lamination

1. Work on a flat surface where uniform heat and pressure can be applied. Avoid applying retroreflective trim over seams and stitches.
2. Place retroreflective trim on substrate with the adhesive side down and apply heat and pressure as described in the table below. Place a non-stick slip sheet between the platen and laminating surface to prevent any excess adhesive transfer contamination.
3. Allow application to cool to room temperature before removing the liner covering the reflective side. Place application on a flat surface and remove the liner by lifting one corner and pulling (about 45° angle) in a continuous, smooth manner.

Additional Precautions for Heat Lamination

1. Do not exceed lamination temperatures listed below as the liner may become difficult to remove. If high temperatures are required for bond durability, follow lamination steps 1-3 using recommended temperature, remove liner, and then laminate again at the higher temperature (using a non-stick slip sheet to protect reflective surface).
2. The lamination temperature, time, and pressure listed below should be used as a guide. Each substrate should be tested to determine the best set of conditions that will meet customer requirements.
3. Other lamination methods, such as roll to roll, heat fusing, and HF welding can also be used. The proper temperature, time, and pressure conditions must be tested for each fabric to assure adequate adhesion and physical performance.
4. Many fabrics can be used as lamination substrates; however, some substrates such as nylons and fabrics treated with a durable water repellent (DWR) finish are difficult to adhere to. 3M™ Scotchlite™ Reflective Material – Fabric is recommended for the best adhesion. If this retroreflective trim is desired, then continuous testing should be done to ensure acceptable adhesion is maintained as input materials may vary. For specific application assistance, contact 3M Technical Service.
5. The reflective surface of Scotchlite reflective materials can be difficult to adhere to and caution is required when applying other materials to it. If you are laminating this retroreflective trim to the surface of Scotchlite reflective material, then testing is recommended to ensure the adhesion meets the customer's specifications. It is also recommended that continuous testing should be done to ensure acceptable adhesion is maintained throughout the manufacturing process. If acceptable adhesion cannot be achieved, then contact your local Technical Service for assistance.

Heat Lamination Settings

Temperature	Dwell Time (seconds)	Line Pressure
175-190° C (350-375° F)	10-20	Firm (30-40 psi)

Printing

Screen Printing – Images may be printed on the surface of some Scotchlite reflective material – transfer films. All inks should be continuously tested to ensure acceptable adhesion in the event of changes occurring in the manufacturing process or composition of the ink. Prior to printing, wiping the surface with a soft cloth lightly dampened with isopropyl alcohol may help ink adhesion. Printed areas will not be retroreflective. Please refer to [3M Technical Bulletin: Recommendations for Screen Printing Inks for 3M™ Scotchlite™ Reflective Material - Transfer Films, Pressure Sensitive Adhesive Films, Fabrics and Trims](#) for ink and application recommendations.

Handling Precautions

1. This retroreflective trim contains an aluminum layer as part of the construction. Blemishing of this aluminum layer can occur if the reflective surface of the product has direct contact from hands during application and is then exposed to hot and humid conditions, greater than 26.7 °C (80 °F) and greater than 70% relative humidity, for a period of weeks. These blemishes do not affect performance of the product. Please refer to [3M Technical Bulletin: Care Guidelines to Reduce Staining on 3M™ Scotchlite™ Reflective Material](#).
2. This retroreflective trim may not be compatible with some polyvinyl chloride (PVC, vinyl) films, especially those containing phosphate plasticizers. It is possible that some plasticizers might be able to migrate into the reflective material, making the reflective surface soft and sticky. We recommend that substrates always be tested prior to production to ensure that they meet your specific needs. For alternate products and additional information, please refer to [3M Technical Bulletin: Plasticizer Migration in 3M Scotchlite Reflective Material – 8712 Silver Transfer Film and Related Products](#).

Care and Maintenance Instructions

IMPORTANT NOTE






Test each application according to appropriate care instructions required for the finished product. Actual life of 3M™ Scotchlite™ Reflective Material depends on cleaning methods and wear conditions.

Home Wash Guidelines

Home laundering means using a top or front loading consumer type home washing machine with a consumer detergent at moderate water temperatures (up to 60 °C, 140 °F). Garment finishing such as tumble drying at high temperatures can limit garment life and should be considered as part of the cleaning process.

If bleach is needed, only non-chlorine bleach should be used. High alkaline treatments such as stain removal products should not be used. Garment care label guidelines need to consider the garment fabric as well as the recommendations for garment components such as retroreflective trim. This retroreflective trim may be home washed or dry-cleaned.

Care label recommendations for this retroreflective trim is below unless noted otherwise:

Maximum Wash Temperature		Dry		Iron		Dry-Clean		Bleach	
	Machine wash hot, 60 °C (140 °F)		Tumble dry low		Cool iron, 110° C (230° F)		Normal cycle		Non-chlorine bleach when needed

Product Availability

This retroreflective trim is available in rolls with the following standard width and lengths:

Roll Width	Standard Roll Length
50.8 mm (2.0 in)	200 m (218 yd)

Order and Product Information

To order 3M™ Scotchlite™ Reflective Material Products, contact Customer Service at 800-328-7098.

Storage and Shelf Life

Store in a cool (4 to 32 °C, 40 to 90 °F), dry area (less than 70% relative humidity) and use within one year after date of receipt. Store rolls in original shipping cartons. Ensure that the lot/roll identification remains with product rolls or cut pieces. Return partially used rolls to the carton or suspend horizontally through the core. Cut pieces should be stored flat.

Important Notice to User

Limited Warranty

In the event any 3M™ Scotchlite™ Reflective Material is found to be defective in material, workmanship, or not in conformance with any express warranty, 3M's only obligation and your exclusive remedy shall be to replace or refund the purchase price, at 3M's option, of such 3M™ Scotchlite™ Reflective Material upon timely notification thereof and substantiation that the product has been stored, maintained and used in accordance with 3M's written instructions.

Exclusions to Warranty

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY OR CONDITION OF QUALITY, EXCEPT OF TITLE AND AGAINST PATENT INFRINGEMENT.

Limitation of Liability

Except as provided above, 3M shall not be liable in contract or tort for any loss or damage, whether direct, indirect, incidental, special or consequential, (including, without limitation, lost profits, goodwill and business opportunity) arising out of the sale, use or misuse of the product, or the user's inability to use the product. THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE.

Because of the unlimited variety of potential applications for the Products, BEFORE production use, the user (which may be a product designer, product specifier, converter or end product manufacturer or others) must determine that the Products are suitable for the intended use and are compatible with other component materials. User is solely responsible for determining the proper amount and placement of Products. While reflective products enhance visibility, no reflective product can ensure visibility or safety under all possible conditions.

3M may change the product, specifications and availability of the product as improvements are made; therefore, the user should contact 3M or visit Scotchlite.com for latest information before specifying the product.

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