



3M™ Scotchlite™ Reflective Material - Comfort Trims

Description

3M™ Scotchlite™ Reflective Material is designed for use on safety garments and on athletic and casual wear. When properly used, Scotchlite reflective material 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. Scotchlite reflective material – comfort trims is composed of wide-angle, exposed, retroreflective lenses bonded to a heat-activated adhesive. Daytime color of Scotchlite reflective material – comfort trims is silver and the reflected color is white.

Summary of Product Details						
Product Number and Name	Initial Average Brightness (R _A) ^a	Wash ^b			Liner	
		Home ^c Cycles	Dryclean ^d Cycles	Industrial Washable	Adhesive Side	Retroreflective Side
5410 Diamond Mesh Trim	>330	75	30		None	Green Polyester
5430 Diamond Mesh Industrial Wash Trim	>330	50	50	Yes	None	Green Polyester
5435 Diamond Mesh Flame Resistant Trim	>330	65	50		None	Green Polyester
5440 Diamond Mesh Industrial Wash Flame Resistant Trim	>330	75	50	Yes	None	Green Polyester
5510 Segmented Home Wash Trim	>330	75	30		None	Blue Polyester
5510M Segmented Home Wash Trim	>330	75	30		None	Blue Polyester
5530 Segmented Industrial Wash Trim	>330	50	50	Yes	None	Green Polyester
5535 Segmented Flame Resistance Wash Trim	>330	65	50		None	Blue Polyester
5540 Segmented Industrial Wash Flame Resistant Trim	>330	75	50	Yes	None	Blue Polyester

a. See Care Instructions section for Home Wash and Industrial Wash conditions.

b. ISO 6330 Method 6N at 60 °C (140 °F) and R_A ≥ 100 (home wash).

c. ISO 3175-2 and R_A ≥ 100.

d. Measured by 3M on new product at +5.0° entrance and 0.2° observation angles. Results are measured in R_A (cd/lux/m²).

Certifications

The following Scotchlite reflective materials, as listed in the table below, meet the requirements of the listed standards. Current Certificates of Compliance are available at Scotchlite.com or by request.

Certifications									
Product Number	Visibility Standards		NFPA					CGSB	
	ANSI 107-2015	CSA Z96-15	1951	1971	1975	1977	2112	155.2	155.22
Edition Year	2015	2015	2013	2018	2014	2016	2018	2000	2014
5410	x	x							
5430	x	x							
5435	x	x	x	x		x	x	x	x
5440	x	x	x	x		x	x	x	x
5510	x	x							
5510M	x	x							
5530	x	x							
5535	x	x	x	x	x	x	x	x	x
5540	x	x	x	x		x	x	x	x

3M™ Scotchlite™ Reflective Material

Full name of standards listed above:

- ANSI/ISEA 107-2015 American National Standard for High-Visibility Safety Apparel and Accessories
- CSA Z96-15 High-Visibility Safety Apparel
- NFPA 1951-2013 Standard on Protective Ensembles for Technical Rescue Incidents
- NFPA 1971-2013 Standard on Protective Clothing and Equipment for Structural Fire Fighting and Proximity Fire Fighting
- NFPA 1975-2014 Standard on Emergency Services Work Clothing Elements
- NFPA 1977-2011 Standard on Protective Clothing and Equipment for Wildland Fire Fighting
- NFPA 2112-2016 Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire
- CAN/CGSB 155.20-2017 Workwear for Protection Against Hydrocarbon Flash Fire
- CAN/CGSB 155.22-2014 Fireline Workwear for Wildland Firefighters

3M™ Scotchlite™ Reflective Material products are used globally. Please contact your local 3M representative for more information on certifications to other high-visibility apparel and flame resistant standards.

Physical Performance

These 3M™ Scotchlite™ Reflective Materials will meet or exceed the following performance specifications as noted. It is important to note that use, wear, and environmental conditions will affect performance. See product certificates on Scotchlite.com for testing laboratory and test date information.

Physical Performance	Test Method
Retroreflectivity (initial): $R_A \geq$ requirements listed in ANSI 107-2015 or CSA Z96-15	ASTM E808-01 (2009) and ASTM E809-08 (2013) or CIE 54.2:2001 (R')
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) number of cycles listed on page 1
Dry Clean: $R_A \geq 100$	ISO 3175-2 as noted in ISO 3759
Wet Retroreflectivity: $R_A \geq 100$	ANSI/ISEA 107-2015, Appendix A; CSA Z96-15 Clause 7.4.8; Section 8.45.4.3: 4.3 in/hr (110 mm/hr)
Flame Resistance ^a : <4" char length, <2 second after flame	ASTM D6413-15, CAN/CGSB-4.2 No.27-10
Heat Resistance ^a : $R_A \geq 350$	ISO 17493, 5 minutes @ 260°C (500 °F)
Convective Heat ^a : $R_A \geq 350$	After 10 minutes @ 140 °C (285 °F)

a. Only when retroreflective products compliant to NFPA or CGSB standards (listed under Certifications) are applied to compliant fabrics such as certain aramids, modacrylics, and FR treated cottons.

Application Instructions

Whenever two or more pieces of Scotchlite reflective materials are used together on a single surface or as a set, they should be matched to ensure uniform daytime color and nighttime retroreflectivity.

Cutting

The material can be die-cut, hand-cut or guillotined.

Application of Heat Transfer Adhesive Backed Materials Using a Heat Press

1. Work on a flat surface where uniform heat and pressure can be applied. Avoid applying film over seams and stitches. Do not remove retroreflective side liner until after heat lamination process.
2. Place Scotchlite™ reflective material on substrate with the adhesive side down and apply heat and pressure as described in the table below.
3. Allow application to cool to room temperature before removing the liner covering the retroreflective side. Place application on a flat surface and remove the paper liner by lifting one corner and pulling (about 45° angle) in a continuous, smooth manner. Optional: To prevent any excess adhesive transfer contamination, a non-stick slip sheet can be placed between the platen and laminating surface.

Additional Precautions for Heat Lamination

1. The lamination temperature, time, and pressure listed below should be used as a guide. Each substrate and retroreflective film combination should be tested to determine the best set of conditions that will meet customer requirements.
2. 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.
3. 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. Scotchlite reflective material – fabric is recommended for these applications.
4. Laminating Scotchlite reflective material to the surface of other Scotchlite reflective material can be difficult and caution is required when applying other materials to it.
5. It is recommended that initial and continuous testing be done on all heat lamination methods, retroreflective materials and fabrics to ensure that acceptable adhesion and physical performance is maintained, as input materials may vary. For specific application assistance, contact your local 3M Application Engineer.

Application Instructions			
Product Number	Temperature	Dwell Time (seconds)	Line Pressure
5410 5430 5435 5510 5510M 5530 5535	175-190 °C (350-375 °F)	10-20	Firm (30-40 psi)
5440 5540	175-190 °C (350-375 °F)	15-20	Firm (30-40 psi)

Printing

Screen Printing – Images may be printed on the surface of some Scotchlite reflective material – comfort trims. 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.

Essential Information

While the use of 3M™ Scotchlite™ Reflective Material enhances visibility, no retroreflective 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 retroreflective material on their finished garments to satisfy conformance to their own requirements. All high visibility safety apparel items should be constructed in accordance with the appropriate standard(s).

3M Scotchlite reflective materials can contain an aluminum layer as part of its construction. Blemishing of this aluminum layer can occur if the front surface of the product has direct contact from hands during application and is then exposed to hot and humid conditions for a period of weeks (greater than 26.7° C (80° F) and greater than 70% relative humidity). These blemishes do not affect performance. Please see the [3M Technical Bulletin Care Guidelines to Reduce Staining of 3M™ Scotchlite™ Reflective Material](#) for more information.

Scotchlite reflective material – comfort trims 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 retroreflective material, making the retroreflective 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](#).

Fabrics finished with dyes containing sulfur compounds should not be used with the following trims: 5430, 5440, 5530, and 5540. Exposure to sulfur compounds in dyes or in the environment will darken the retroreflective material and may affect retroreflectivity.

3M recommends that all customers, in accordance with good manufacturing practices, establish an ongoing quality system which includes maintaining lot/roll identification, and implementing continuous testing that reflects their garment needs throughout their production process. For lamination operations, to periodically check their equipment to ensure that the temperature set point matches the platen or roll temperature and that the temperature is uniform across the lamination area.

These 3M™ Scotchlite™ Reflective Materials are not certified for marine safety applications requiring IMO type approval. Scotchlite reflective materials – SOLAS grade products have this type of certificate.

Care 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). Drying methods, 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.

Care label recommendations for Scotchlite reflective material – comfort trims are below:

Care Label Recommendations									
All Comfort Trims									
	Machine wash warm, 60° C (140° F)		Tumble dry low		Cool iron, 110° C (230° F)		Dry-clean, normal cycle		Non-chlorine

Industrial Wash Guidelines

Industrial laundering means regularly washing large amounts of clothing in a relatively short amount of time, with large machines (> 25 kg loads), aggressive detergent chemistry (pH 10.5 – 12), and high wash temperatures (up to 85 °C, 185 °F). Drying methods (tumble dry or tunnel finish) can limit garment life and should be considered as part of the cleaning process. Using harsher cleaning conditions than those recommended may significantly reduce product performance.

Refer to the table on page one for the retroreflective materials suitable for applications that will be exposed to industrial laundering.

Industrial wash guidelines for these products are below:

Industrial Wash Guidelines	
Washing	
Special Instructions:	Stain treatment wash processing may reduce life of Scotchlite reflective material – comfort trims.
Wash Chemistry:	Lower pH (nearer to neutral) and lower active alkalinity will increase the lifetime performance of the retroreflective material. Actual lifetime will be dependent upon the detergent system and dosage level. Do not use solvated surfactants. Do not use chlorine or perborate bleach. Low to medium alkaline, high surfactant detergents are preferred.
Maximum wash temperature:	75 °C (165 °F)
Break/suds cycles:	Less than 20 minutes total
Drying/Pressing	
Tunnel Dry:	Maximum inlet temperature of 160 °C (320 °F) Drying time not to exceed 7 minutes. Fabric temperature not to exceed 135 °C (275 °F)
Tumble Dry:	Maximum exhaust temperature 90 °C (195 °F)
Pressing:	Do not exceed 150 °C (300 °F)

Product Availability

These 3M™ Scotchlite™ Reflective Materials are available in rolls with the following standard widths and lengths:

Product Number	Roll Width	Standard Roll Length
5510	50.8 mm (2 in) 60 mm (2.36 in) 70 mm (2.76 in)	100 m (109 yd) 200 m (218 yd)
5410 5510M 5430 5530 5435 5535 5440 5540	50.8 mm (2 in)	100 m (109 yd) 200 m (218 yd)

Storage and Shelf Life

Store in a cool, (4 to 27°C, 40 to 80°F); dry area (less than 70% relative humidity) and use within one year of date of receipt. Store rolls in original shipping cartons. Return partially used rolls to the carton or suspend horizontally through the core. Cut pieces should be stored flat. Ensure that the lot/roll identification remains with product rolls and cut pieces.

Contact Us

For current technical literature and technical support, go to Scotchlite.com, or call Customer Service at 800-328-7098. To purchase, go to Scotchlite.com and click on Support for a list of our distributors.

Important Notice

WARRANTY, LIMITED REMEDY AND DISCLAIMER

3M warrants that 3M™ Reflective Material that is stored, maintained and used in accordance with 3M's written instructions will meet the applicable 3M product specifications. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. If any reflective material does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

LIMITATION OF LIABILITY

Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract or strict liability.

PRODUCT USE

Because of the variety of factors that can affect the use and performance of reflective material, user is solely responsible for evaluating the product and determining whether it is fit for a particular purpose and suitable for user's method of application. User is solely responsible for determining the proper amount and placement of the product. While reflective products enhance visibility, no reflective product can ensure visibility or safety under all possible conditions. 3M may change the product, specification and availability of the product as improvements are made; therefore, user should contact 3M for latest information before specifying the product.

3M™ Scotchlite™ Reflective Material - Series 5500 Comfort Trim is converted by Safe Reflections, Inc.

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