



3M™ Scotchlite™ Reflective Material - Fire Coat Trims

Description

3M™ Scotchlite™ Reflective Material - Fire Coat Trims are designed to be used on firefighter and other flame-resistant garments. They are composed of a silver stripe of wide angle, exposed retroreflective lenses integrally centered on a fluorescent background, bonded to either a fabric or a heat-activated adhesive. When properly used, these materials help 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.

Summary of Product Details			
3M™ Scotchlite™ Reflective Material ^a	Initial Average Brightness (R _A ^b)	Home Wash Cycles	Backing
5686 Fluorescent Red-orange Fire Coat Comfort Trim	>400	50 ^c	Heat-activated Adhesive
5687 Fluorescent Lime-yellow Fire Coat Comfort Trim		50 ^d	
5696 Fluorescent Red-orange Fire Coat Comfort Trim			
5697 Fluorescent Lime-yellow Fire Coat Comfort Trim			
9586 Fluorescent Red-orange Fire Coat Trim ^e	500	50 ^c	100% Aramid Fabric
9587 Fluorescent Lime-yellow Fire Coat Trim ^e			
5616 Fluorescent Red-orange Fire Coat Lettering Transfer Film	>400	n/a	Heat-activated Adhesive
5617 Fluorescent Lime-yellow Fire Coat Lettering Transfer Film			

- 3M™ Scotchlite™ Reflective Material – Series 5680 and 5690 fire coat trims can meet the NFPA and CGSB color spaces when applied to tan, black or navy outer shells. Contact 3M Technical Service to verify the color space is met on other fabrics.
- R_A measured by 3M on new product at +5.0° entrance and 0.2° observation angles.
- Per ISO 6330, Method 2A
- Per ISO 6330, Method 6N
- 3M™ Scotchlite™ Reflective Material – Series 9500 Fire Coat Trim has “3M” imaged on its silver surface.

Certifications

The following 3M™ Scotchlite™ Reflective Materials, as listed in the table below, meet the requirements of the listed standards. Current certificates are available at Scotchlite.com or by request.

Product Number	NFPA				CGSB	
	1951	1971	1977	2112	155.20	155.22
Edition Year	2020	2018	2016	2018	2017	2014
5686	x	x	x	x	x	
5687	x	x	x	x	x	
5696					x	
5697					x	x ^b
9586	x	x	x	x	x	
9587	x	x	x	x	x	
5616 ^a	x	x	x	x		
5617 ^a	x	x	x	x		

- IMPORTANT NOTE:** Series 5610 is not certified to meet the trim requirements on firefighting and other garments. It is certified as an accessory only and is designed to be die-cut into letters for decorative use on flame-resistant garments.
- 3" width only.

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- NFPA 1951-2020 Standard on Protective Ensembles for Technical Rescue Incidents
- NFPA 1971-2018 Standard on Protective Clothing and Equipment for Structural Fire Fighting and Proximity Fire Fighting
- NFPA 1977-2016 Standard on Protective Clothing and Equipment for Wildland Fire Fighting
- NFPA 2112-2018 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 and Optionally Steam and Hot Fluids
- 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.

Note: Series 5680 meets the requirements of the Transmitted and Stored Thermal Energy Test in Section 8.71 of NFPA 1971.

Physical Performance

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.

Minimum Physical Performance	Test Method
Fluorescence: Cap Y \geq 40 for red-orange and \geq 70 for lime-yellow	ASTM E1164-12
Retroreflectivity (initial): $R_A \geq$ requirements in NFPA standards	ASTM E809-08(2013), ASTM E810-03(2013) (RA); 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, 60°C (140°F), methods and number of cycles listed on page 1
Wet Reflectivity: $R_A \geq$ 100	NFPA 1971, Section 8.45.4.3: 4.3 in/hr (110 mm/hr)
Flame Resistance: <4" char length, <2 second after flame	ASTM D6413-15, CAN/CGSB-4.2 No. 27-10
Heat Resistance: $R_A \geq$ 350	ISO 17493, 5 minutes @ 260 °C (500 °F)
Convective Heat: $R_A \geq$ 350	After 10 minutes @ 140 °C (285 °F)

Application Instructions

Whenever two or more pieces of 3M™ 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 reflectivity.

Cutting

The material can be cut in various ways including die-cut, hand-cut or guillotined.

Application of Fabric Backed Materials

For best results, sew in place using a lockstitch with no more than 12 stitches per inch (2.54 cm) and not less than 5/64" (2 mm) from the edge of the reflective trim. Use appropriate thread for flame resistant applications.

Application of Heat-Activated 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 3M™ 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 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. Laminating 3M™ Scotchlite™ Reflective Material to the surface of other 3M™ Scotchlite™ Reflective Material can be difficult and caution is required when applying other materials to it.
4. 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.

Temperature	Dwell Time (seconds)	Line Pressure
163 °C (325 °F)	20	Firm (30-40 psi)

To ensure you have good adhesion, wait 24 hours and wash the applied material multiple times under normal conditions. Check for lifting or delamination and if present, you must re-evaluate your application process until the desired performance is achieved. The lamination temperature, time and pressure listed should be used as a guideline. Each substrate should be tested to determine the optimal conditions that will meet customer requirements.

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 ensure adequate adhesion and physical performance. Contact your local Technical Service for assistance with all application methods.

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 3M™ 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 Material –Fire Coat Trims 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, greater than 26.7° C (80° F) and greater than 70% relative humidity, for a period of weeks. These blemishes do not affect performance. Please see the [3M Technical Bulletin Fire Coat Trim Care Guidelines to Help Reduce Silver Stripe Fading](#) for more information.

After fighting fires with dry chemicals or fires that involve burning chlorine or PVC, it is important to thoroughly clean and dry the turnout gear to prevent the effects of corrosion on the trim. If not cleaned thoroughly, residues from dry chemicals and burning PVC may cause fading over time. The cumulative effects of long term exposure to corrosive contaminants may not show up until after the garment is laundered or is exposed to high humidity environments. For more information, please see [3M Technical Bulletin Fire Coat Trim Care Guidelines to Help Reduce Silver Stripe Fading](#).

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.

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These 3M™ Scotchlite™ Reflective Materials are not certified for marine safety applications requiring IMO type approval.

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, wear conditions, and maintenance.

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 3M™ Scotchlite™ Reflective Material are below:

Care Label Recommendations					
Wash		Dry		Iron	
	Do no presoak Machine wash warm, 60° C (140° F), pH between 6 and 10.5		Tumble dry low. On fire garments, air dry away from direct sunlight		Use cool iron, 110° C (230° F)
	Do not bleach				
	Do not dry-clean				

Product Availability

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

Product Series	Approx. Trim Width	Approx. Reflective Stripe Width	Standard Roll Length
5616 5617	57.1 mm (2.25 in) 82.5 mm (3.25 in)	19 mm (0.75 in) 25.4 (1.0 in)	100 m (109.4 yd)
5686 5687 5696 5697 9586 9587	50.8 mm (2.0 in) 76.2 mm (3.0 in)	19 mm (0.75 in) 25.4 (1.0 in)	

Storage and Shelf Life

Store in a cool, (4 to 32 °C, 40 to 80°F), dry area (less than 70% relative humidity) and use within the time stated below. Time starts from date of receipt from 3M. Store rolls in original shipping cartons. Return partially used rolls to the carton or suspend

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horizontally through the core. Cut pieces should be stored flat. Ensure that the lot/roll identification remains with product rolls and cut pieces.

Product Series	Shelf Life
9586, 9587	2 years
5616, 5617, 5686, 5687, 5696, 5697	1 year

Contact Us

For current technical literature and technical support, go to Scotchlite.com, or call Customer Service at 1-800-328-7098. To purchase, go to Scotchlite.com and click on Support for a list of our distributors.

Important Notice

Product Selection and Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of reflective material in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.), as well as determining the proper amount and placement of reflective material. While reflective material can enhance visibility, no reflective product can ensure visibility or safety under all possible conditions. Failure to properly evaluate, select, and use a 3M product in accordance with all applicable instructions and with appropriate safety equipment, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property. 3M may change the product, specification, and availability; therefore, customer should contact 3M for latest information before specifying the product.

Warranty, Limited Remedy, and Disclaimer: Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement or repair of the 3M product or refund of the purchase price. Warranty claims must be made within one (1) year from the date of 3M's shipment.

Limitation of Liability: Except for the limited remedy stated above, and except to the extent prohibited by applicable law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.

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