

# Technical Data Sheet January 2016

## 3M™ Scotchlite™ Reflective Material Series 5600 Fire Coat Comfort Trim

### Description

3M™ Scotchlite™ Reflective Material – Series 5600 Fire Coat Comfort Trim is designed to enhance the visibility of the wearer in low-light conditions, especially at nighttime, when illuminated by a light source such as automobile headlights. The reflective surface is composed of wide angle, exposed retroreflective lenses integrally centered on a fluorescent background color bonded to a heat-activated adhesive. The trim is 2 or 3 inches wide and comprised of reflective patterned segments on a clear plastic liner.

### Retroreflective Performance

The coefficient of retroreflection ( $R_A$ , in  $cd/lux/m^2$ ) is measured by methods traceable to either of the following retroreflective intensity testing procedures:

ASTM E809-02(2013) and E810-03(2013) ( $R_A$ )

CIE 54.2: 2001 ( $R'$ )

The  $R_A$  values were measured at the listed specific entrance and observation angles. Retroreflective performance data was generated by 3M and is based on testing new product. Use, wear, laundering, and environmental conditions will affect performance. Please contact your 3M representative for proposed product specifications.

3M™ Scotchlite™ Reflective Material		
Entrance Angle	Observation Angle	Initial Average $R_A$
+5.0°	0.2°	>400

### Color

3M™ Scotchlite™ Reflective Material – Series 5600 Fire Coat Comfort Trim		
Product Number	Daytime Color*	Reflected Color
5686	Fluorescent red-orange with silver stripe	White
5687	Fluorescent lime-yellow with silver stripe	White

\*3M™ Scotchlite™ Reflective Material – Series 5600 Fire Coat Comfort Trim can meet the NFPA color space when applied to tan, black or navy outer shells. Contact 3M Technical Service to verify the color space is met on other fabrics.

### Certifications: NFPA and CAN/CGSB

Scotchlite reflective material – series 5600 fire coat comfort trim is certified to the listed edition of the following NFPA and CGSB standards. See the Physical Performance section for specific test methods used to evaluate heat and flame resistance:

- 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 1977-2011 Standard on Protective Clothing and Equipment for Wildland Fire Fighting;
- NFPA 2112-2012 Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire;
- CAN/CGSB 155.20-2000 Workwear for Protection Against Hydrocarbon Flash Fire.

### 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, [3M.com/Scotchlite](http://3M.com/Scotchlite) for new or updated technical literature as well as contacting your local 3M Personal Safety Division Technical Service.

## Physical Performance<sup>1</sup>

3M™ Scotchlite™ Reflective Material – Series 5600 Fire Coat Comfort Trim will meet or exceed the following performance specifications<sup>2</sup>:

3M™ Scotchlite™ Reflective Material	
Minimum Physical Performance	Test Method
Retroreflectivity: Initial $R_A > 400$	ASTM E809-08
Fluorescence, Cap Y: $\geq 40$ for 5686 and $\geq 70$ for 5687	ASTM E1164-09a
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 2A, 50 cycles @ 60° C (140° F)
Wet Reflectivity: $R_A \geq 100$	NFPA 1971, Section 8.45.4.3
MVTR: Typically 650 g/m <sup>2</sup> /24 hrs.	ASTM E96
Drape: <170 g <sup>3</sup>	ASTM 6828-02
Approximate Weight: < 650 g (trim only)	g/m <sup>2</sup>
Stored Energy: >130 s to second degree burn	ASTM F2731-11
Flame Resistance: <4" char length, <2 second after flame	ASTM D 6413-11
Heat Resistance: $R_A \geq 350$	ISO 17493, 5 minutes @ 260° C (500° F)
Convective Heat: $R_A \geq 350$	10 minutes @ 140° C (285° F)

1. All data was obtained after lamination to Gemini XT fabric. Results may vary depending upon the fabric used.

2. While some standards do not specify or establish requirements for the use of high visibility materials, the authority having jurisdiction should conduct a risk assessment and determine the level of visibility required based on the anticipated use of such garments.

3. 3" x 3" sample on Geminin XT fabric using a 10 mm slot and 1000g beam.

## Application Instructions

Transfer films require special attention for robust performance. Therefore, training is required prior to purchase. Contact 3M Technical Service for training.

**Note:** Whenever two or more pieces of Scotchlite reflective material – series 5600 fire coat comfort trim 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 reflectivity. These products are designed for use on medium to heavy weight fabrics. Stretchable materials are not recommended.

**Cutting:** Scotchlite reflective material – series 5600 fire coat comfort trim can be die-cut, hand-cut or guillotined.

### Heat Lamination

1. Work on a flat surface where uniform heat and pressure can be applied. Avoid applying film over seams and stitches.
2. Place trim on fabric substrate with the adhesive side down and apply heat and pressure as described in the table below.
3. 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.
4. 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.

3M™ Scotchlite™ Reflective Material			
Product Number	Temperature	Dwell Time	Line Pressure
Series 5600 Fire Coat Comfort Trim	163° C (325° F)	20 seconds	Firm (30-40 psi)

**Handling Precautions:** Scotchlite reflective material – series 5600 fire coat comfort trim contains 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 of the product.

## Care and Maintenance Instructions

**Important:** It is critical to follow appropriate cleaning procedures when the trim is applied to firefighting turnout clothing. Failure to follow care instructions will shorten the useful life of the trim. Refer to NFPA 1851 Standard on Selection, Care and maintenance of Structural Fire Fighting Protective Ensembles.

### Care label recommendations:

Do not presoak.



**Wash:** Machine wash warm, 40° C (104° F), pH between 6 and 10.5



**Bleach:** Do not bleach



**Dry:** Tumble dry low. On fire garments, air dry away from direct sunlight.



**Iron:** Use cool iron, 110° C (230° F)



**Dry-clean:** Do not dry-clean

**Additional guidelines to reduce the possibility of silver stripe fading:** 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 trim 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.

## Product Availability

3M™ Scotchlite™ Reflective Material – Series 5600 Fire Coat Comfort Trim is available in rolls with the following standard widths and roll lengths:

3M™ Scotchlite™ Reflective Material			
Trim Width	Reflective Strip Width	Centering Tolerance	Standard Roll Length
50.8 mm ± 0.8 mm (2.0 ± 0.03 in.)	19 mm (0.75 in.)	± 1.6 mm (± 0.0625 in.)	100 m (109.4 yd.)
76.2 mm ± 0.8 mm (3.0 ± 0.03 in.)	25.4 mm (1.0 in.)	± 1.6 mm (± 0.0625 in.)	100 m (109.4 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, dry area and use within one year after date of receipt. Store rolls in original shipping cartons and maintain lot/roll identification throughout the garment production process. Return partially used rolls to the carton or suspend horizontally through the core. Cut sheets 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](http://Scotchlite.com) for the latest information before specifying the product.



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