

# Technical Data Sheet March 2016

## 3M™ Scotchlite™ Reflective Material 8932 Silver Flame Resistant Fabric

### Description

3M™ Scotchlite™ Reflective Material – 8932 Silver Flame Resistant Fabric is designed for use on safety garments requiring flame resistance (FR) as defined by NFPA 2112. When properly used, Scotchlite reflective material – 8932 silver flame resistant fabric helps to enhance the conspicuity 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 – 8932 silver flame resistant fabric is composed of wide angle, exposed retroreflective lenses bonded to a 100% FR treated cotton fabric.

### 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 and E810-03 ( $R_A$ )

CIE 54.2: 2001 ( $R'$ )

Retroreflective performance data was generated by 3M and is 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

Scotchlite reflective material – 8932 silver flame resistant fabric is certified to ANSI/ISEA 107-2015 *American National Standard for High-Visibility Safety Apparel and Headwear* for retroreflective performance.

3M™ Scotchlite™ Reflective Material 8932 Silver Flame Resistant Fabric					
Daytime Color	Reflected Color	Initial Average $R_A^1$	Minimum $R_A^2$	Wash Cycles <sup>3</sup>	Dry-clean Cycles <sup>4</sup>
Silver	White	500	330	50	15

<sup>1</sup>Measured by 3M on new product at +5.0° entrance and 0.2° observation angles

<sup>2</sup>ANSI/ISEA 107 minimum coefficient of retroreflection for retroreflective material at +5° entrance angle and 0.2° observation angle

<sup>3</sup>ISO 6330 Method 6N at 60°C (140°F) and  $RA \geq 100 cd/lux/m^2$

<sup>4</sup>ISO 3175 Method 8.1 and  $RA \geq 100 cd/lux/m^2$

#### NFPA

Scotchlite reflective material – 8932 silver flame resistant fabric is certified to the current edition of NFPA 2112 *Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire*. See the Physical Performance section for specific test methods used to evaluate brightness and heat and flame resistance.

Scotchlite reflective material – 8932 silver flame resistant fabric is not certified for marine safety applications requiring IMO type approval. 3M™ Scotchlite™ Reflective Material – SOLAS Grade Products have this type of certificate.

## Performance

While use of 3M™ Scotchlite™ Reflective Material enhances wearer conspicuity, no reflective material can guarantee absolute visibility, particularly in adverse weather conditions or unusually harsh wear conditions. Performance will vary depending upon actual use, exposure conditions, and proper cleaning/maintenance. Users should test reflective material to satisfy conformance to their own requirements.

3M recommends that all customers, in accordance with good manufacturing practices, establish an ongoing quality management system. Customers should implement continuous testing throughout their production and on their finished garments that reflects their garment needs.

Please visit our website, [Scotchlite.com](http://Scotchlite.com), for new or updated technical literature, or contact your local 3M Personal Safety Division Technical Service Representative.

## Physical Performance

3M™ Scotchlite™ Reflective Material – 8932 Silver Flame Resistant Fabric will meet or exceed the following physical performance as noted. All  $R_A$  values are at +5° entrance angle and 0.2° observation angle. See product certificate on [Scotchlite.com](http://Scotchlite.com) website for testing laboratory and test date.

3M™ Scotchlite™ Reflective Material	
Physical Performance	Test Method
Retroreflectivity: Initial	ANSI/ISEA 107-2015, Table 5 NFPA 2112 minimum $R_A$ : $\geq 100$
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, 50 cycles @ 60 °C (140 °F)
Dry-clean: $R_A \geq 100$	ISO 3175 Method 8.1, 15 cycles
Wet Reflectivity: $R_A \geq 100$	ANSI/ISEA 107-2015, Appendix A; NFPA 2112
Flame Resistance: after flame $\leq 2$ seconds, char length $\leq 6$ inches	ASTM D6413
Heat Resistance: cannot melt, drip, separate or ignite after 5 minutes @ 260 °C (500 °F)	NFPA 2112
Convective Heat: $R_A \geq 100$ after 10 minutes @ 140 °C (285 °F)	NFPA 2112
Arc Thermal Performance Value: ATPV $\geq 5$ cal/cm <sup>2</sup>	ASTM F1959

## Application Instructions

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

**Sewing:** For the best results, sew in place using a lockstitch and with no more than 12 stitches per inch (2.54 cm) and not less than  $\frac{5}{64}$ " (2 mm) from the edge of the trim. For best results, apply to medium and heavy weight fabrics. Use appropriate thread for flame resistant applications.

**Handling Precautions:** This product contains an aluminum layer as part of the 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 27 °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".

## Care and Maintenance Instructions

**Important:** Test each application according to appropriate care instructions required for the finished product. Actual life of 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.

Scotchlite reflective material – 8932 silver flame resistant fabric may be home washed. Dry-cleaning may also be used. If bleach is needed, only non-chlorine bleach should be used. High alkaline treatments such as stain removal products should not be used.

### Care label recommendations:



**Wash:** Machine wash warm, 40 °C (105 °F).



**Dry:** Tumble dry low.



**Bleach:** Non-chlorine bleach when needed.



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



**Dry-clean:** Normal cycle.

## Product Availability

Scotchlite reflective material – 8932 silver flame resistant fabric is available in rolls with the following standard widths and lengths:

3M™ Scotchlite™ Reflective Material		
Roll Width	Width Tolerance	Standard Roll Length
≤ 50.8 mm ( < 2 in.)	Standard ± 1 mm (± 0.04 in.) Special ± 0.5 mm (± 0.02 in.)	200 m (218 yd)
50.8 mm < 150 mm (2 in. < 6 in.)	Standard ± 1 mm (± 0.04 in.) Special ± 0.5 mm (± 0.02 in.)	100 m (109 yd) 200 m (218 yd)
150 mm ≤ w < 900 mm (6 in. ≤ w < 36 in.)	0 mm to +4 mm (0 in. to 0.16 in.)	50 m (55 yd) 100 m (109 yd)
≥ 900 mm (≥ 36 in.)	+3 mm to +7 mm (+0.12 in. to +0.28 in.)	50 m (55 yd) 100 m (109 yd)

## Order and Product Information

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

## Storage and Shelf Life

In order to preserve performance, store in a cool, dry area and use within two years after 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.

## Important Notice

**WARRANTY, LIMITED REMEDY AND DISCLAIMER:** 3M warrants that 3M™ Scotchlite™ 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 Scotchlite 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 Scotchlite 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.



**Personal Safety Division**  
**3M Body Protection Solutions**  
3M Center, Building 0235-02-F-06  
St. Paul, MN 55144-1000  
800-328-7098  
Scotchlite.com

**3M Canada**  
P.O. Box 5757  
London, Ontario, Canada N6A 4T1  
800-267-4414

3M and Scotchlite are trademarks  
of 3M, used under license in Canada.  
Please recycle. Printed in the USA.  
© 3M 2016. All rights reserved.  
75-0501-0853-1