



3M™ Scotchlite™ Reflective Material - Fabric

Description

3M™ Scotchlite™ Reflective Material - Fabrics are designed for use on safety, athletic and casual garments. They are composed of wide-angle, exposed, retroreflective lenses bonded to a durable fabric backing. 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						
Product Number and Name	Initial Average Brightness (R _A) ^d	Minimum Average Brightness (R _A) ^d	Wash ^a			Fabric Backing
			Home ^b Cycles	Dryclean ^c Cycles	Industrial Washable	
8906 Silver Fabric Trim	500	330	30	0		70% polyester / 30% cotton printed with 3M trademarks
8910 Silver Fabric	500	330	25	20		65% polyester / 35% cotton printed with 3M trademarks
8912 Silver Fabric ^e	500	330	50	0		65% polyester / 35% cotton printed with 3M trademarks
8925 Silver Fabric	500	330	75	25		65% polyester / 35% cotton
8932 Silver Flame Resistant Fabric	500	330	50	15		100% FR treated cotton
8935 Silver Industrial Wash Flame Resistant Fabric	500	330	50	30	Yes	100% FR treated cotton
8940 Silver Industrial Wash Flame Resistant Fabric	500	330	50	30	Yes	100% Aramid printed with 3M trademarks
8965 White Fabric	90	None	Not Applicable	Not Applicable		65% polyester / 35% cotton
8986 Fluorescent red-orange Flame Resistant Fabric	175	None	0	0		94% polyester / 6% nylon tricot knit
8987 Fluorescent lime-yellow Flame Resistant Fabric	175	None	0	0		94% polyester / 6% nylon tricot knit
8986NFPA Fluorescent red-orange Flame Resistant Fabric	175	100	Not Applicable	Not Applicable		100% FR treated cotton
8987NFPA Fluorescent lime-yellow Flame Resistant Fabric	175	100	Not Applicable	Not Applicable		100% FR treated cotton
9910 Silver Industrial Wash Fabric	500	330	100	50	Yes	100% polyester printed with 3M trademarks
9920 Silver Industrial Wash Fabric	500	330	50	50	Yes	100% polyester printed with 3M trademarks
9945 Silver Industrial Wash Flame Resistant Fabric	500	330	100	50	Yes	100% polyester printed with 3M trademarks

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

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 measure in R_A (cd/lux/m²)

e. 3M™ Scotchlite™ Reflective Material- 8912 Silver Fabric has "3M" imaged on the silver surface.

Product Certification

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

Certifications									
Product Number	Visibility Standards		NFPA					CGSB	
	ANSI 107-2020	CSA Z96-15 (R2020)	1951	1971	1975	1977	2112	155.2	155.22
Edition Year	2020	2020	2020	2018	2019	2016	2018	2017	2014 (R2019)
8906	x	x							
8910	x	x							
8912	x	x							
8925	x	x							
8932	x	x			x		x		
8935	x	x	x	x	x	x	x	x	x
8940	x	x	x	x		x	x	x	
8965									
8986									
8987 ^a									
8986NFPA			x	x		x			
8987NFPA			x	x		x			
9910	x	x							
9920	x	x							
9945	x	x	x	x		x	x	x	x

a. 8987 is not certified to a standard but does meet the fluorescent requirement per NFPA 1971 Sec 8.45.4.2.

Full name of standards listed above:

- ANSI/ISEA 107-2020 American National Standard for High-Visibility Safety Apparel
- CSA Z96-15 (R2020) High-Visibility Safety Apparel
- 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 1975-2019 Standard on Emergency Services Work Clothing Elements
- 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 (R2019) Fireline Workwear for Wildland Firefighter

3M™ Scotchlite™ Reflective Material products are used globally. Please contact your local 3M representative for more information on certification 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): $R_A \geq$ requirement listed in ANSI 107-2020 or CSA Z96-15 (R2020)	ASTM E808-01 (2016) and ASTM E809-08 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 number of cycles listed on page 1
Wet Reflectivity: $R_A \geq 100$	ANSI/ISEA 107-2020, Appendix B; CSA Z96-15 Clause 7.4.8; NFPA Section 8.45.4.3
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)
Convection Heat: $R_A \geq 350$	After 10 minutes @ 140 °C (285 °F)

Application Instructions

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 reflectivity.

Cutting

The material can be cut in various ways including die-cut, 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 5/64 inch (2 mm) from the edge of the reflective fabric. Use appropriate thread for flame resistant applications.

Printing

Screen Printing – Images maybe printed on the surface of some 3M™ Scotchlite™ Reflective Material. 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 3M™ Scotchlite™ Reflective Material product portfolio that

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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 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.

Fabrics finished with dyes containing sulfur compounds should not be used with 3M™ Scotchlite™ Reflective Material- 9920 Silver Industrial Wash Fabric. 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 Material are not certified for marine safety applications requiring IMO type approval.

Fabrics, containing an acidic dye, may discolor if used with the following products: 8906, 8910, 8912. Every substrate should be tested for compatibility to these products.

Most substrates are suitable for the application of reflective materials. There are designs that should be avoided to prevent premature abrasion. For example, when using seam sealing tapes on reflective trim, disproportionate flexing will occur on the reflective material located between the sealing tapes. This may result in increased abrasion of the unsupported center section. Adding a stiffer fabric to re-enforce the center section will reduce this abrasion.

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 3M™ Scotchlite™ Reflective Material are below:

Care Label Recommendations										
Product	Wash		Dry		Iron		Dry-Cleaning		Bleach	
8906 8912		Machine wash warm, 40 °C (105 °F)		Tumble dry low		Cool iron, 110° C (230° F)		Do not wash		Non-chlorine bleach when needed
8910		Machine wash warm, 40 °C (105 °F)		Tumble dry low		Medium iron, 150 °C (300 ° F)		Dry-clean, normal cycle		Non-chlorine bleach when needed

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Care Label Recommendations										
Product	Wash		Dry		Iron		Dry-Cleaning		Bleach	
8925 8932 8932 8935 8940 9910 9920 9945		Machine wash hot, 60 °C (140 °F)		Tumble dry low		Medium iron, 150 °C (300 °F)		Dry-clean, normal cycle		Non-chlorine bleach when needed
8986NFPA 8987NFPA		Machine wash warm, 40 °C (105 °F)		Tumble dry low		Cool iron, 110 °C (230 °F)		Dry-clean, normal cycle		Non-chlorine bleach when needed
8986 8987		Do not wash		Tumble dry low		Cool iron, 110 °C (230 °F)		Do not wash		Non-chlorine bleach when needed

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 3M™ Scotchlite™ Reflective Material.
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 solvenated 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	
Tunnel dry:	Maximum inlet temperature of 120 °C (250 °F)
Tunnel dry for 9920 only:	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)

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Product Availability

3M™ Scotchlite™ Reflective Material – Fabrics are available in rolls with the following standard width and lengths:

Product Number	Roll Width	Standard Roll Length
8906	50.8 mm (2 in.)	200 m (218 yd)
All Others	50.8 mm (2 in.)	100 m (109 yd) 200 m (218 yd)
	150 mm ≤ w < 900 mm (6 in. ≤ w < 36 in.)	50 m (55 yd) 100 m (109 yd)
	≥ 900 mm (≥ 36 in.)	50 m (55 yd) 100 m (109 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 two years of date of receipt from 3M. 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

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 two (2) years from the date of 3M's shipment.

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Personal Safety Division

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3M PSD products are occupational use only.

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