



3M™ Scotchlite™ Reflective Material - Transfer Films

Description

3M™ Scotchlite™ Reflective Material - Transfer Films are designed for use on safety, athletic and casual garments. They are composed of wide-angle, exposed, retroreflective lenses bonded to 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	Initial Average Brightness (R _A) ^d	Minimum Initial Brightness Film ^e (R _A) ^d	Wash ^a			Liner	
			Home Cycles ^b	Dryclean Cycles ^c	Industrial Washable	Adhesive Side	Retroreflective Side
5807 Custom Cuttable Transfer Film	500	330	50	30		None	Clear Polyester Film
8711 Silver Graphic-Ready Transfer Film	500	330	25	25		Paper	None
8712 Silver Transfer Film ^e	500	330	25	25		Pink polyurethane	Paper
8725 Silver Transfer Film ^e	500	330	50	30		None	Paper
8725LL Linerless Silver Transfer Film ^e	500	330	50	30		None	None
8735 Flame Resistant Transfer Film	500	330	50	50		None	None
8787 Fluorescent lime-yellow Transfer Film	175	65	0	0		None	Paper
9720 Silver Industrial Wash Transfer Film	500	330	50	50	Yes	None	None ^f
9725 Silver Industrial Wash Transfer Film	500	330	100	50	Yes	None	None
9740 Industrial Wash Flame Resistant Transfer Film	500	330	50	50	Yes	None	None
9745 Silver Industrial Wash Flame Resistant Transfer Film	500	330	100	0	Yes	None	None

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 measured in R_A (cd/lux/m²).

e. 3M™ Scotchlite™ Reflective Material- 8712 Silver Transfer Film and 3M™ Scotchlite™ Reflective Material-8725 Silver Transfer Film has "3M" imaged on their silver surface.

f. Roll widths 1" or less come with a paper liner.

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. Some products have Oeko-tex certification as well.

Certifications									
Product Number	Visibility Standards		NFPA					CGSB	
	ANSI 107-2020	CSA Z96-15 (R2020)	1951	1971	1975	1977	2112	155.20	155.22
Edition Year	2020	2020	2020	2018	2019	2016	2018	2017	2014 (R2019)
5807	x	x							
8711	x	x							
8712	x	x							
8725 and 8725LL	x	x							
8735	x	x	x	x	x	x	x	x	x
9720	x	x							
9725	x	x							
9740	x	x	x	x		x	x	x	x
9745	x	x	x	x		x	x	x	x

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)

Physical Performance	Test Method
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 ^a : <4" char length, <2 second after flame	ASTM D6413-15, CAN/CGSB-4.2 No. 27-10
Heat Resistance ^a : Cannot melt, drip, separate or ignite	ISO 17493, 5 minutes @ 260°C (500 °F)
Convection Heat ^a : $R_A \geq 100$	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 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 retroreflectivity.

Cutting

The material can be cut in various ways including die-cut, hand-cut or guillotined. Do not use 3M™ Scotchlite™ Reflective Material-Transfer Films that incorporate a liner in plotter cutting. After weeding, the exposed liner may adhere to the fabric during lamination. 3M™ Scotchlite™ Reflective Material – 5807 Custom Cuttable Transfer Film is recommended for these applications.

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. If the product has an adhesive side liner, remove it to expose the dry adhesive.
3. Place 3M™ Scotchlite™ Reflective Material on substrate with the adhesive side down and apply heat and pressure as described in the table below.
4. 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. 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. 3M™ Scotchlite™ Reflective Material-Fabric is recommended for these applications.
4. 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.
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.
6. Do not exceed lamination temperature listed below as the paper liner may become difficult to remove. If high temperatures are required for bond durability, follow the lamination steps 1-3 using the recommend temperature,

removed paper liner and then laminate again at the higher temperature (using a non-stick sheet to protect the reflective surface).

3M™ Scotchlite™ Reflective Material			
Product Number	Temperature	Dwell Time (seconds)	Line Pressure
5807	165-177 °C (325-350 °F)	10-20	Firm (30-40 psi)
8711 8712	165-190 °C (325-375 °F)	10-20	Firm (30-40 psi)
8725 8725LL	165-177 °C (325-350 °F)	10-20	Firm (30-40 psi)
8735	175-190 °C (350-375 °F)	15-10	Firm (30-40 psi)
8787 9720 9725 9745	165-177 °C (325-350 °F)	10-20	Firm (30-40 psi)
9740	175-190 °C (350-375 °F)	15-20	Firm (30-40 psi)

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 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.

3M™ Scotchlite™ Reflective Material-Transfer Films 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](#).

Exposure to sulfur compounds in dyes or in the environment will darken some retroreflective materials and may affect retroreflectivity. Fabrics finished with dyes containing sulfur compounds should not be used with the following trims:

- 3M™ Scotchlite™ Reflective Material - 9720 Silver Industrial Wash Transfer Film
- 3M™ Scotchlite™ Reflective Material - 9740 Silver Industrial Wash Flame Resistant Transfer Film

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 application requiring IMO type approval.

3M™ Scotchlite™ Reflective Material- 8711 Silver Graphic-Ready Transfer Film and 3M™ Scotchlite™ Reflective Material- 8712 Silver Transfer Film performs best when laminated to polyester and polyester blend fabrics. They should not be used on knitted T-shirts or 100% cotton fabrics where good adhesion is required for extended use.

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	
8711 8712		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
5807 8725 8725LL 8735 9720 9725 9740		Machine wash hot, 60 °C (140 °F)		Tumble dry low		Cool iron, 110° C (230° F)		Dry-clean, normal cycle		Non-chlorine bleach when needed
9745		Machine wash hot, 60 °C (140 °F)		Tumble dry low		Cool iron, 110° C (230° F)		Do not dry clean		Non-chlorine bleach when needed
8787		Do not wash		Tumble dry low		Cool iron, 110° C (230° F)		Do not dry clean		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 Scotchlite reflective material – transfer films are:

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/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

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

Product Number	Roll Width	Standard Roll Length
5807 Custom Cuttable Transfer Film	304.8 mm (12 in.) 482.6 mm (19 in.) 609.6 mm (24 in.)	5 m (5.47 yd) 25 m (27.34 yd) 50 m (55 yd)
All Others	< 150 mm (< 6 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)

Storage and Shelf Life

Store in a cool (4 to 32 °C, 40 to 90 °F), dry area (less than 70% relative humidity) and use within one year 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.

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3M PSD products are
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