

Reflective Embroidered Emblems

TekSpec®
Product technical details



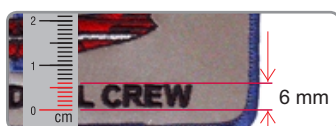
PRODUCT DETAILS

Emblem Dimensions:

- **Minimum** emblem size is **1.0" x 1.75"** (2.5cm x 4.5cm).
- **Maximum** emblem size is **11.5" x 14.0"** (29.2cm x 35.5cm).

Design Lettering Dimensions:

The text within a design should not be less than 6mm (0.24") in height. Smaller text may need to be altered to embroider slightly larger. For designs requiring a lot of small text, Woven Emblems or printed emblems may be a viable alternative.



Fabric Type & Colours:

Emblemtek currently uses **3M™ ScotchLite™** reflective material.

- 8965** white fabric (65% polyester / 35% cotton)
- 9920** silver industrial wash fabric (100% polyester)
- 8935** silver industrial wash flame resistant fabric (100% FR treated cotton)

Please refer to the Emblemtek Reflective Fabric Chart for material options; the 3M™ ScotchLite™ Technical Data sheets are available on our web site for more specific information.

Thread Type & Colours:

100% polyester. 120+ colours to choose from. 15 colours per design maximum. Emblemtek uses 100% polyester Madeira Polyneon™ thread. Choose from over 120 standard colours, which can be found on the Emblemtek Embroidered Emblem Thread Chart. A maximum of 15 thread colours can be chosen per design. Extra charges are applicable when using metallic or glow-in-the-dark threads. Please note that these **threads are not reflective**.

Custom Fabrics & Threads:

Not applicable.

Backing Types:

5 options. Hi-melt glue • low-melt glue • Velcro® • non-woven material (no-glue) • no backing

Border / Edge Styles:

3 options. Merrowed border • fabric edge • no border

Embroidered Reflective Emblems can be manufactured with merrowed borders, a separately stitched over-lock edge. The ability to sew a merrowed border onto an emblem is directly related to the emblem shape. Odd, intricate shapes may not be suitable for merrow application. Choose one colour of thread for the merrowed border from the Emblemtek Embroidered Emblem Thread Chart.

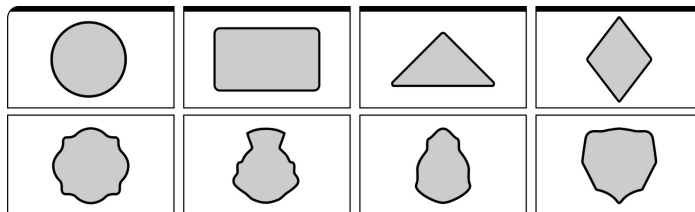


Merrow Border Limitations

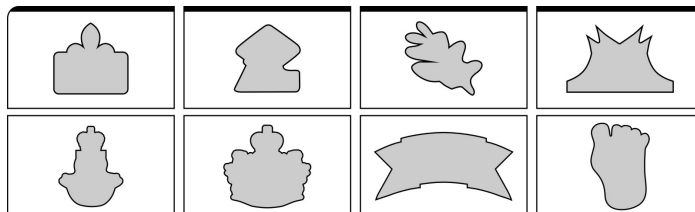
As noted above, Embroidered Reflective Emblems are manufactured with merrowed borders. The edges of the emblem are guided through a surging, over-lock sewing machine by hand, and a heavy stitching is applied.

Shapes with edges that are completely open and "exterior" are more easily merrowed. However, odd, intricate shapes with edges that angle back towards the interior of the emblem, generally cannot be merrowed.

Shapes that can be merrowed



Shapes that cannot be merrowed



Images are not to size.

Design / Emblem Treatment Options

Emblem treatment options such as **3D-puff** embroidery stitching or **double-sided** emblem are not available for this emblem type.

Accessory Attachment Options:

Accessory options, such as button loops, snaps, rings, etc..., are **not available** for this emblem type.

APPLICATION & WASH GUIDELINES

Application Methods







Sew-on or heat seal. The manner in which embroidered emblems can be attached to garments or other textile products relates directly to the type of backing used in the manufacturing process, the size of the emblems and the types of materials that the emblems will be attached to. Almost all emblems can be sewn on, and when it comes to heat seal application, smaller emblems are easier to work with. The chart below outlines the application options relative to backing types.

BACKING TYPE	HEAT SEAL APPLICATION			SEW ON	BY HAND
Hi-Melt Glue	385°F - 405°F (196°C - 207°C)	80 PSI (5.5 Bar)	15 - 20 seconds	✓	✗
Low-Melt Glue	365°F - 385°F (185°C - 196°C)	80 PSI (5.5 Bar)	15 - 20 seconds	✓	✗
Velcro®		✗		✗	✓
Non-Woven Material (No Glue)		✗		✓	✗

Heat Seal Notes & Tips

- Emblems should be heat sealed to the garment using a complete cycle time on both the front side and the back side of the garment and emblem. Emblems with heavier embroidery may require longer heat seal application cycle times beyond the ranges noted above.
- Thicker fabrics may require longer cycle times beyond the ranges noted above.
- Covering the emblem with a sheet of Teflon® or paper towel prior to the heat seal cycle may help to reduce a “crushing” affect, and may help to protect the garment from scorching.
- White materials (knits or blends) may scorch if heat seal temperatures are too high. It is recommended that fabrics be tested first.
- Pique knit and fleece materials may be sensitive to heat and pressure, with the possibility of being crushed.
- Rib-knit and stretch fabrics may pucker or distort when emblems are heat sealed to them. It is recommended that these fabrics be tested first. For items such as toques and scarves, it is recommended to have emblems sewn on rather than heat sealed.
- Treated fabrics finished with coatings, sizing or repellants may not allow for proper heat seal bonding.
- Items made with leather, suede, nylon, synthetics, nylon-shell, interlinings, rubberized coatings and reflective fabrics, such as jackets and luggage, may react poorly to heat seal temperatures depending on thickness, weave, texture and weight. It is recommended that these fabrics be tested first, with possible heat seal time and temperature adjustments. In many cases, it may be better to have emblems sewn on to these materials.
- Caps can sometimes be difficult to work with for heat seal applications. To achieve a higher potential for heat seal application success on caps, it is recommended that emblems not be greater than 2-1/4” in height and 4” in width.

Washing & Drying Guidelines

FABRIC TYPE	WASH TYPE	WASH TEMPERATURE	DRY TYPE
8965 white fabric	Commercial	Wash in domestic or commercial machine in water not exceeding 140°F (60°C) 	Tumble dry at low heat not exceeding 130°F (55°C) 
9920 silver	Industrial (Do not use detergents that contain free sodium hydroxide or potassium hydroxide)	Wash in commercial machine in water not exceeding 165°F (75°C) 	Tunnel dry: Maximum inlet temperature 250°F (120°C) Tumble dry: Maximum exhaust temperature 195°F (90°C) 
8935 silver flame resistant fabric	Industrial (Do not use detergents that contain free sodium hydroxide or potassium hydroxide)	Wash in commercial machine in water not exceeding 165°F (75°C) 	Tunnel dry: Maximum inlet temperature 320°F (160°C) Drying time not to exceed 7 minutes. Fabric temperature not to exceed 275°F (135°C) Tumble dry: Maximum exhaust temperature 195°F (90°C) 

Please refer to the 3M™ ScotchLite™ Technical Data sheets available on our web site for more specific information.

It is recommended not to expose heat sealed emblems to wash or drying conditions exceeding 185°F (85°C).

ORDERING GUIDELINES

Artwork & Set-up Fees

No fees*. Emblemtek will provide artwork on new emblem orders for customer Approval prior to production. There are no artwork or set-up fees when existing, electronic or physical designs or samples are provided to Emblemtek. Artwork fees may apply when designs are created from scratch.

Order Quantities

Minimum 25. The minimum order quantity is 25 pieces

Pre-production Samples

Available \$. Electronic (scan) or physical pre-production samples (single unit) are available for approved designs. Samples fees are applicable, relative to design detail and emblem size. See price guide for more information.

Pricing

Charted & quoted. Charted pricing is available up to a certain size threshold, with larger quantities and larger emblem sizes custom quoted. See price guide for more information.

Delivery Times

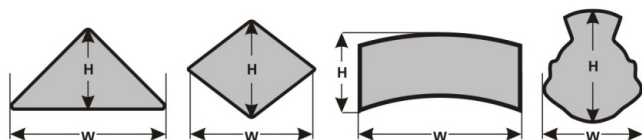
Delivery times are relative to order quantity and accessory options if chosen. Emblems greater than 6.00" x 6.00" (15.24cm x 15.24cm) may take longer to manufacture. See price guide for more information.

Ordering Guidelines

Order specifics. During the design, artwork and ordering processes, there are specific details that we require in order to proceed with your request, such as:

Emblem Type • Design Colours • Fabric Colour • Border Colour • Dimensions
• Backing Type • Quantity • Special Delivery Needs

Emblem sizes are calculated by adding the height (h) and the width (w), then dividing by two. Example 2" (h) + 4" (w) = 6 divided by 2 = 3.



Accepted Design / Artwork File Types

The chart below lists the various graphic and design file types that Emblemtek will accept for artwork and production purposes. Certain file types are preferred as noted.

Graphic File Types:

- CorelDraw ver.13 / ver.X3 (.cdr) *pref*
- Adobe Illustrator ver.CS3 (.ai) *pref*
- Encapsulated PostScript (.eps) *pref*
- Adobe Portable Document File (.pdf) *pref*
- Joint Photographic Experts Group (.jpg) *pref*
- Portable Network Graphics (.png) *pref*
- Adobe Photoshop ver.CS3 (.psd)
- Corel Photo-Paint ver.13 / ver.X3 (.cpt)
- Targa Bitmap (.tga)
- Tagged Image File Format (.tiff)
- Windows Bitmap (.bmp)
- CompuServe Bitmap (.gif)

Embroidery File Types:

- Tajima Stitch File (.dst) *pref*
- Wilcom EMB File (.emb) *pref*
- Pulse Embroidery File (.pxf)
- Tajima TBF File (.tbf)
- Barudan Stitch File (.dsb)
- Melco Expanded File (.exp)



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To request literature and samples,
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tel: 800 267 9385
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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						
3M™ Scotchlite™ Reflective Material	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	50	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 and product number
9920 Silver Industrial Wash Fabric	500	330	50	50	Yes	100% polyester printed with 3M trademarks and product number
9945 Silver Industrial Wash Flame Resistant Fabric	500	330	100	50	Yes	100% Aramid printed with 3M trademarks and product number

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 is available with and without a "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](https://www.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)
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](https://www.3m.com/scotchlite) 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 ^a : <4" char length, <2 second after flame	ASTM D6413-15, CAN/CGSB-4.2 No.27-10
Heat Resistance ^a : $R_A \geq 350$	ISO 17493, 5 minutes @ 260°C (500 °F)
Convection Heat ^a : $R_A \geq 350$	After 10 minutes @ 140 °C (285 °F)

a. Only applies to the retroreflective products compliant to NFPA or CGSB standards (listed under Certifications).

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. Exposure to contaminants (i.e. corrosive) may decrease the retroreflectivity. For optimal retroreflectivity,

reflective apparel exposed to contaminants should be promptly clean and laundered in accordance with its care instructions. 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.

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 dry-clean	 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

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 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 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)

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](https://www.scotchlite.com), or call Customer Service at 800-328-7098. To purchase, go to [Scotchlite.com](https://www.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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Personal Safety Division

3M Center, Building 235-2F-06
St. Paul, MN 55144-1000
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3M Canada

P.O. Box 5757
London, Ontario N6A 4T1
800-267-4414 Technical Service
800-364-3577 3M HELPS
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