

Technical Data Sheet

3M™ Scotchlite™ Reflective Material 6192R Fluorescent Yellow High Gloss Trim

Description

3M™ Scotchlite™ Reflective Material – High Gloss Products are designed for use on safety garments and, when properly used, help enhance the visibility of the wearer in nighttime or low-light conditions when illuminated by headlights. Scotchlite reflective material – high gloss products consist of highly retroreflective microprisms formed on flexible, glossy and UV-stabilized polymeric film. A flexible vinyl film sealed on the backside of the 3M™ Scotchlite™ Reflective Material – High Gloss Trim encapsulates the microprisms and protects the reflective product from dirt and moisture penetration. The fluorescent yellow high gloss color enhances conspicuity under daytime conditions, particularly at dawn or dusk or on cloudy days.

3M™ Scotchlite™ Reflective Material				
Product Number	Sealed Edges	Sealing Pattern	Sewing Channels	Recommended for Occupational Use
6192R Fluorescent yellow ¹ High Gloss Trim	X	X	X	X

¹3M™ Scotchlite™ Reflective Material – 6192R Fluorescent yellow High Gloss Trim incorporates a coating to help resist dye migration for applications requiring this protection.

Retroreflective Performance

The coefficient of retroreflection (R_A , in cd/lux/m²) is measured by methods traceable to either of the following retroreflective intensity testing procedures:

ASTM E809-08 and E810-03 (R_A)

CIE 54.2:2001 (R')

The R_A values were measured at 5.0° entrance and 0.2° observation angles. All average R_A values were measured using unsealed film.

The R_A values are averages of readings taken from rotation angles that are 90 degrees apart unless stated differently. The 0° rotation angle is to be taken as the down web direction of 3M supplied rolls. These data were generated by 3M and are based on testing new product. Use, wear, laundering, and environmental conditions will affect performance. Please contact your 3M representative for product specifications.

3M™ Scotchlite™ Reflective Material				
Product Number	Daytime Color	Reflected Color	Average R_A	Minimum R_A ²
6192R Fluorescent yellow High Gloss Trim	Fluorescent yellow	yellow	700	330

²ANSI/ISEA 107 minimum coefficient of retroreflection for Level 2 retroreflective material.

ANSI/ISEA 107 Certified Products

3M™ Scotchlite™ Reflective Material – 6192R Fluorescent yellow High Gloss Trim is certified to meet ANSI/ISEA 107 Level 2 retroreflective and combined-performance material specifications.

3M™ Scotchlite™ Reflective Material – High Gloss Products			
Product Number	Retroreflective Level	Combined-Performance Retroreflective	Washing Cycles
6192R Trim	2	Yes	75

Please contact your 3M representative or visit our website at Scotchlite.com.

3M™ Scotchlite™ Reflective Material – High Gloss Products are not certified for marine safety applications requiring IMO type approval.

3M™ Scotchlite™ Reflective Materials – SOLAS Grade Products have this type of certificate.

Physical Performance

Scotchlite reflective material – 6192R fluorescent yellow high gloss trim will meet or exceed the following specifications as noted. All R_A values are at 0° orientation, 5° entrance angle and 0.2° observation angle, unless stated differently (see product certificate on our website for third party testing laboratory and test date).

3M™ Scotchlite™ Reflective Material	
Physical Performance	Test Method
Retroreflectivity: (Initial)	ANSI/ISEA 107, Level 2 (Table 4)
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)
Cold Fold: (Initial)	ISO 4675, -15 °C (+5 °F); Will not crack when flexed over a 3 mm mandrel
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, 10 cycles @ 60 °C (140 °F) or 75 cycles @ 60 °C (140 °F)
Wet Reflectivity: $R_A \geq 100$	ANSI/ISEA 107 Appendix A

Solvent Resistance: During 3M laboratory testing, Scotchlite reflective material high gloss products did not dissolve or pucker when wiped several times with a soft cloth containing mineral spirits, kerosene, unleaded gasoline, methanol or VM&P Naphtha.

UV Stability: Scotchlite reflective material – 6192R fluorescent yellow high gloss trim has superior color and brightness retention after UV exposure compared to other high gloss products. However, fluorescent colors may show fading in extreme UV light exposures.

Color Specifications

The initial color for Scotchlite reflective material – 6192R fluorescent yellow high gloss trim, as measured in accordance with ASTM E1164-09a (45/0 or 0/45 geometry, illuminant D65, 2° standard observer) is within the color box defined below:

3M™ Scotchlite™ Reflective Material		
Fluorescent yellow	$Y(\%) \geq 70.0$	x 0.387 0.356 0.398 0.460 y 0.610 0.494 0.452 0.540

Performance

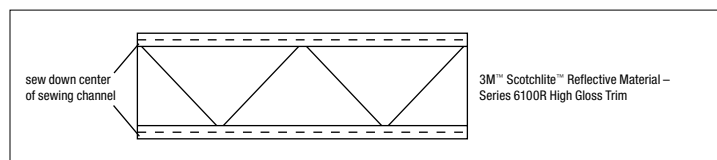
While use of 3M™ Scotchlite™ Reflective Material enhances visibility, no reflective material can guarantee absolute visibility, particularly in adverse weather conditions or unusually harsh wear conditions. Performance will vary depending upon actual use, exposure conditions, and proper cleaning/maintenance. The Scotchlite reflective material product portfolio 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. Customers should implement continuous testing throughout their production and on their finished garments that reflects their garment needs.

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 ANSI/ISEA 107 or other prevailing standard.

Sewing to Fabrics: Sew in place with no more than 8 stitches per inch (2.54 cm), and not less than 1/8" (3 mm) from the edge of the material. Thread recommendation: 100% polyester. To reduce sticking, apply a non-stick material (e.g., silicone or nylon) to the bottom of the presser foot. Sewing channels along the edge are provided to protect against water penetration. Sew down the center of the 1/4" wide sewing channels.



Welding to Fabrics: 3M™ Scotchlite™ Reflective Material – High Gloss Products are composed primarily of vinyl materials and will weld suitably to most PVC films with any of the following methods: radio frequency (RF), high frequency (HF), dielectric or ultrasonic. Adhesion to specific films will vary with the lubricants, pigments, plasticizers and fillers used to make the PVC film. It is important to test weld strength with each new lot and new vendor.

RF Sealing: Radio Frequency is a widely used method of sealing vinyl films. It has the advantage of handling patches and trims using a step-and-repeat process. For more information, please refer to our 3M™ Scotchlite™ Reflective Material High Gloss Film Application Guide for Welding.

Screen Printing: Below are inks that can be used for printing on the surface of Scotchlite reflective material – high gloss products. 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.

3M™ Scotchlite™ Reflective Material		
Ink	Ink Type	Manufacturer
PP Series Plastic Plus Gloss Vinyl Screen Ink ³	Opaque	Nazdar 1-800-767-9942 Fax: 1-913-422-2296 International: 1-913-422-1888
3M™ Scotchlite™ Transparent Screen Printing Ink Series 2900 ³	Transparent	3M Commercial Graphics Division 1-800-374-6772 Fax: 1-651-736-4233 International: 1-651-737-3136

³Up to 10% by weight Nazdar NB80 Adhesion Promoter can be added to improve adhesion and/or blocking resistance. Be sure to read and follow manufacturer's handling recommendations for NB80.

NOTE: Dyes may migrate when placed in direct contact with vinyl and some fabrics. Prior to application, Scotchlite reflective material – high gloss products must be kept separate and should be tested for dye migration. 3M™ Scotchlite™ Reflective Material – Series 6100R High Gloss Trim has a special coating to help resist dye migration.

Care and Maintenance Instructions

Important: Test each application according to appropriate care instructions required for the finished product. Actual life of Scotchlite reflective material high gloss products depends on cleaning methods and wear conditions. Care label recommendations:

Wash:  Machine wash hot, 60 °C (140 °F) **Bleach:**  Do not bleach **Dry:**  Tumble dry medium, 50 °C (122 °F)

Iron:  Do not iron

Dry-clean:  Do not dry-clean

Product Availability

3M™ Scotchlite™ Reflective Material – High Gloss Trim is available in the following standard widths and length:

3M™ Scotchlite™ Reflective Material				
Product Number	Roll Width	Width Tolerance	Splices Allowed	Standard Roll Length
6192R Trim	2" (50.8 mm)	± 1/32" (± 0.8 mm)	2 per roll	100 m

Order and Product Information

To order 3M™ Scotchlite™ Reflective Material Products, contact 3M Protective Apparel and Footwear Market Center 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.



**Occupational Health and
Environmental Safety Division
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Footwear Market Center**

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