



3M™ Scotchlite™ Reflective Material - 5721 Silver Graphic Transfer Film

Description

3M™ Scotchlite™ Reflective Material – 5721 Silver Graphic Transfer Film (with paper liner), when combined with 3M™ 571K Ink Kit, form a system to make silver reflective transfer graphics for screen printing and heat lamination.

The resulting transfer graphic is composed of wide angle, exposed retroreflective lenses bonded to a heat activated adhesive. When properly applied the resulting transfer graphic is designed to help enhance the visibility of the wearer in nighttime or low-light conditions. The retroreflective surface, when illuminated by a light source, such as automobile headlights, returns the light back toward the original source reaching the automobile driver’s eyes. The visibility of a person wearing garments incorporating Scotchlite reflective material can be optimized when the reflective material outlines the human form, is placed in movement locations, allows 360 degree visibility, and is present in sufficient amounts. Scotchlite reflective material – silver graphic transfer film system is designed for use on cotton, polyester, and cotton/ polyester blends.

Scotchlite reflective material – silver graphic transfer film system is not intended for making retroreflective trim certified to high visibility standards such as ANSI/ISEA 107 American National Standard for High Visibility Safety Apparel and Headwear.

Retroreflective Performance

The coefficient of retroreflection (R_A , in cd/lux/m²) of Scotchlite reflective material is measured by methods based on either of the following retroreflective intensity testing procedures:

- ASTM E809-02 and E810-03 (R_A)
- CIE 54.2:2001 (R')

Reflected color of Scotchlite reflective material – transfer films is white.

Retroreflective performance data was generated by 3M and is based on testing new product using the 3M 571K Ink Kit. The R_A values listed in the following tables were measured at +5.0° entrance and 0.2° observation angles. Use, wear, laundering, and environmental conditions will affect performance. Please contact your 3M representative for proposed product specifications.

3M™ Scotchlite™ Reflective Material				
Product Number	Daytime Color	Reflected Color	Initial Average R_A	Minimum R_A ¹
5721 Silver Graphic Transfer Film	Silver	White	500	330

1. ANSI/ISEA 107 minimum coefficient of retroreflection for retroreflective material (for comparison only; product is not certified to ANSI/ISEA 107).

Performance

While use of Scotchlite reflective material enhances visibility, no reflective material can guarantee absolute visibility, particularly in adverse weather conditions. Performance will vary depending upon actual use, exposure conditions and maintenance. Users should test reflective material to satisfy conformance to their own requirements.

Application Instructions

Preparation

Screen Fabric: Polyester monofilament, mesh count 110 – 157 threads per inch (43 – 62 threads per cm). Note: At greater mesh counts it is more difficult to achieve the recommended gelled ink thickness.

Blockout: Use an emulsion designed for plastisol ink.

Thinning: Ink mixed with the 3M™ 571K Ink Kit will thicken when not in use, but will regain printing viscosity when mixed or applied to the screen and printed.

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Clean-Up: Use mineral spirits or other recommended solvents for plastisol clean-up. Follow all manufacturers use recommendation.

Adhesive System Mixing Instructions for 3M 571K Ink Kit

Use plastic containers and mixing utensils. Thoroughly mix the adhesive components in the following ratio (by weight):

- 3M 571N coupler 1 part
- 3M 571P ink 25 parts

For optimum wash durability, 3M 571N coupler must be 3.8% to 6% of the total mixture. Coupler in the mixture at less than 1% and greater than 7% will result in poor wash performance.

For best results, use mixed adhesive within one hour of mixing (two hours maximum). When not in use, keep ink, coupler, and mixed adhesive in closed containers.

Coverage: One kit provides approximately 675 sq. feet of coverage

Printing

A semiautomatic flat bed press with a medium to hard square profile squeegee is recommended for uniform and consistent printing.

1. Position 3M™ Scotchlite™ Reflective Material – 5721 Silver Graphic Transfer Film on the vacuum printing station with the glass bead side up (liner side down).
2. Adjust the flood knife so it applies a thin, uniform layer of ink without damaging the emulsion.
3. Set equipment so that the fill pass takes place immediately before the printing pass.
4. For best results, apply ink such that gelled thickness is 3 mils, measured with a micrometer after drying.

Gelling

Mixed ink will not dry at room temperature. For best results and handling, the printed image must be gelled using an oven immediately after printing. A correctly gelled transfer will be smooth with a slightly rubbery feel.

1. Use a belt-type screen printing oven with either infrared (IR) or forced-air heat source.
2. Adjust belt speed and oven temperature so that the gelled image will not smear when touched and has a smooth, rubbery feel. The image should not look wet or have a halo around it, which would indicate it is under-gelled. Over-gelling may have an orange peel visual appearance.
3. As a guideline, oven conditions should be set with a belt temperature of 200 °F to 250 °F (90 °C to 120 °C) and dwell time of 30 to 45 seconds.
4. The gelled transfers may be stacked only after they have cooled to room temperature.

Note: If laminating graphic to 100% cotton, avoid over-gelling.

Lamination

Work on a flat surface where uniform heat and pressure can be applied. Avoid applying transfer over seams and stitches to improve wash durability.

1. Place ink side down on fabric (substrate) and apply heat and pressure.
2. Allow application to cool to room temperature before removing the transfer liner.
3. Place laminated fabric on a flat surface and remove the liner by lifting one corner and pulling at about a 45 degree angle in a continuous, smooth manner.

Note: Do not exceed lamination temperatures of 375 °F (190 °C) because the transfer liner may become difficult to remove. If high temperatures are required for bond durability, follow lamination steps at recommended conditions, and then remove the transfer liner and laminate again at the higher temperature, while using a non-stick slip sheet to protect the image.

The proper combination of temperature, pressure, and time must be tested for each fabric to assure adequate adhesion. The following recommendation is a general guideline for heat press lamination for graphics produced with 3M™ 571K Ink Kit, but

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actual conditions will depend upon the substrate used.

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Temperature	Dwell Time (seconds)	Line Pressure
330 – 350 °F (165 – 175 °C)	15-20	Firm (30-40 psi)

3M™ Scotchlite™ Reflective Material – Silver Graphic Transfer Film System is designed for use on cotton, polyester, and polyester/cotton blends. Many fabrics can be used as lamination substrates, however, nylons and fabrics treated with a durable water repellent (DWR) finish are difficult to adhere to and are not recommended for this product.

Care and Maintenance Instructions

IMPORTANT NOTE

Test each application according to appropriate care instructions required for the finished product. Actual life of the applied graphic transfer made with Scotchlite reflective material – silver graphic transfer film system and 3M 571 Ink Kit depends on cleaning methods and wear conditions.

	Machine wash warm, 40° C (105° F)		Tumble dry low		Cool iron, 110° C (230° F)
	Dry-clean. Normal cycle Note: repeated dry-cleaning will make transfer stiff		Only non-chlorine bleach, when needed		

Product Availability

3M™ Scotchlite™ Reflective Material – 5721 Silver Graphic Transfer Film is available in the following standard roll sizes:

Units	Size	Quantity	Standard Roll Length
Roll	12 in x 100 yd	1 roll	200 m
Roll	16 in x 100 yd	1 roll	200 m
Roll	24 in x 100 yd	1 roll	200 m

3M™ 571K Ink Kit contains 1 gallon 3M 571P Ink and two bottles (125 grams each) 3M 571 N Coupler. The kit provides coverage of approximately 675 sq. feet.

3M™ Scotchlite™ Reflective Material – Silver Graphic Transfer Film system components are all available separately.

Order and Product Information

To order 3M™ Scotchlite™ Reflective Material products, contact 3M Visibility and Insulation Solutions Customer Service at 800-328-7098.

Storage and Shelf Life

Store in a cool (4 to 32 °C, 40 to 90 °F), dry area. Use within one year after date of receipt. Store rolls in original shipping cartons. Return partially used rolls to the carton or suspend horizontally through the core.

Store unmixed 3M 571P Ink and 3M 571N coupler in original shipping container with airtight lid. 3M 571N coupler will start to degrade after original container is opened. Color will darken as it degrades. Evaluate darkened coupler separately from new or unopened coupler.

Important Notice to User

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, negligence 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

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3M PSD products are
occupational use only.

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