3M™ Scotchlite™ Reflective Material – Series 8300 Custom Color Transfer Film is designed to help enhance the visibility of the wearer in nighttime and low-light conditions while also providing fashionable color options for the product designer. The enhanced visibility is achieved by employing the principle of retroreflection. The retroreflective surface contains exposed, wide-angle lenses that when illuminated by a light source, such as automobile headlights, return the light back toward the original source reaching the automobile driver’s eye. These products are designed for use in footwear.

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 and E810 ($R_a$)
- CIE 54: 1982 ($R'$)

The $R_a$ values were measured at the listed specific entrance and observation angles.

<table>
<thead>
<tr>
<th>Entrance Angle</th>
<th>Observation Angle</th>
<th>Typical $R_a$</th>
<th>Minimum $R_a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4.0°</td>
<td>0.2°</td>
<td>50</td>
<td>35</td>
</tr>
</tbody>
</table>

Color

The color of the Scotchlite reflective material – series 8300 custom color transfer film is determined by the purchasing designer and/or component specifier. Due to opacity considerations, lighter colors may require that the reflective material be placed onto a white background material.

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Daytime Color</th>
<th>Reflected Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>8300</td>
<td>Custom †</td>
<td>White ‡</td>
</tr>
</tbody>
</table>

† The customer determines the color of the product. Due to the reflector layer, a slightly frosted appearance occurs.

‡ The color of the retroreflected light is the same as the color of the light source illuminating the material. Typically this source is white light.

Physical Performance

Scotchlite reflective material – series 8300 custom color transfer film meets or exceeds the following performance tests:

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrasion</td>
<td>EN530 Method 1, 12kPa, SDL 235B Abradant 25,000 cycles min.</td>
<td>Minimum $R_a$: 35 Color: Uniform</td>
</tr>
</tbody>
</table>
Performance

While use of 3M™ Scotchlite™ Reflective Material helps enhance visibility, no reflective material can guarantee absolute visibility, particularly in adverse weather conditions. Performance will vary depending upon actual use, product placement, exposure conditions, and product maintenance. Users should test reflective material to satisfy conformance to their own requirements.

Application Instructions

Color Matching: This is a custom product in which the color may vary significantly lot to lot. Thus, 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.

Application Methods: 3M™ Scotchlite™ Reflective Material – Series 8300 Custom Color Transfer Film is designed to work with a variety of application methods, including...

Cutting: These films can be hand-cut, die-cut, or guillotined.

Screen Printing (After lamination): These products may be screen printed. The choice of ink will depend upon application and care instructions. Prior to production, test each screen printed application according to care instructions appropriate to the finished product.

Sublimation Printing (After lamination): Scotchlite reflective material – series 8300 custom color transfer film offers good ink adhesion and durability for sublimated colors and images. For further information contact your local Technical Service Representative.

Heat Transfers: The material is easily transferred to a wide variety of backing materials using a heat transfer process. Users should test the compatibility of each backing material with the Scotchlite reflective material – series 8300 custom color transfer film to satisfy conformance to their own requirements.

Application to Substrate: Work on a flat surface where uniform heat and pressure can be applied. Avoid applying film over seams and stitches.

1. Remove the plastic liner, exposing the dry adhesive. (Do not remove the paper carrier).
2. Place the Scotchlite reflective material – series 8300 custom color transfer film onto the substrate with adhesive side towards the substrate (the paper side should face away from the substrate).
3. Apply heat and pressure as described below. Use a non-stick slip-sheet between the platen and laminating surface to prevent any excess adhesive transfer contamination.
4. Allow the application to cool to room temperature.
5. Remove the paper carrier liner. Place the application on a flat surface and remove the paper liner by lifting one corner and pulling (at ~45° angle) in a continuous smooth manner.
6. For best performance, do not subject the application to any durability testing until at least 24 hours after heat application.

Lamination Conditions: The following recommendation is a general guideline for heat press lamination. Other lamination methods such as roll-to-roll, HF/RF welding, and heat fusing can also be used. The proper temperature, pressure, and time conditions must be tested by the user for each substrate to ensure adequate adhesion.

Many fabrics can be used as a lamination substrate; however, nyons and fabrics treated with a durable water repellent (DWR) finish are difficult to adhere to and are not recommended.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Dwell Time</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>163-190 °C (325-375 °F)</td>
<td>10-20 seconds</td>
<td>Firm (30-40 psi)</td>
</tr>
</tbody>
</table>

† Do not exceed lamination temperatures of 190 °C (375 °F) because the paper carrier may become difficult to remove. If higher temperatures are required to adequately bond to the substrate, first laminate the film at a lower temperature, strip off the paper liner, then relaminate the film at the higher temperature using a non-stick slip sheet to protect the application.
Application Instructions, continued

Welding (High Frequency/Radio Frequency/Ultrasonic): The material may be welded using HF, RF, or ultrasonic methods without loss of its retroreflective properties. For these methods the 3M™ Scotchlite™ Reflective Material – Series 8300 Custom Color Transfer Film must first be laminated to another backing (using the heat transfer methods described above), then stripped prior to it being welded. The welding conditions necessary to obtain the desired effect are then dependent upon the backing material and the welding tool design, and not the Scotchlite reflective material – series 8300 custom color transfer film.

Care and Maintenance Instructions

Important: Test each application according to appropriate care instructions required for the finished product. The actual life of Scotchlite reflective material – series 8300 custom color transfer film will depend upon choice of backing material, application method, cleaning method, and wear conditions.

Wash: Wipe clean with water. Do not wash.
Bleach: Do not bleach.
Iron: Use cool iron, 110 °C (230 °F)
Dry-clean: Do not dry-clean.

Product Availability

Scotchlite reflective material – series 8300 custom color transfer film is available in rolls with the following standard widths and roll lengths:

<table>
<thead>
<tr>
<th>Units</th>
<th>Width</th>
<th>Width Tolerance</th>
<th>Standard Roll Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches</td>
<td>24”</td>
<td>± 1/8”</td>
<td>100 yd.</td>
</tr>
<tr>
<td>mm</td>
<td>1220 mm</td>
<td>± 3 mm</td>
<td>100 m</td>
</tr>
</tbody>
</table>

Order and Product Information

To order Scotchlite reflective material – series 8300 custom color transfer film, please contact your local 3M™ Scotchlite™ Reflective Material sales representative to submit a color-matching request.

After receiving the color-match request, a set of color-matched samples will be generated for the customer’s approval. Once the customer approves the color-matched samples, an order may be entered.

To order other Scotchlite reflective material products contact 3M Personal Safety Products Department Customer Service at 800-328-7098 Ext. 2.

Storage and Shelf Life

Store in a cool, dry area and use within one year after date of receipt. Store rolls in original shipping cartons. Return partially used rolls to the original shipping carton or suspend horizontally through the core. Cut sheets should be stored flat.
LIMITED WARRANTY: In the event any 3M™ Scotchlite™ Reflective Material is found to be defective in material, workmanship, or not in conformation with any express warranty, 3M’s only obligation and your exclusive remedy shall be to replace or refund the purchase price, at 3M’s option, of such product upon timely notification thereof and substantiation that the product has been stored, maintained and used in accordance with 3M’s written instructions.

EXCLUSIONS TO WARRANTY: THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY OF QUALITY, EXCEPT OF TITLE AND AGAINST PATENT INFRINGEMENT.

LIMITATION OF LIABILITY: Except as provided above, 3M shall not be liable in contract or tort for any loss or damage, whether direct, indirect, incidental, special or consequential, (including, without limitation, lost profits, goodwill and business opportunity) arising out of the sale, use or misuse of the product, or the user’s inability to use the product. THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE.

Because of the unlimited variety of potential applications for these products, BEFORE production use, the user (which may be a product designer, product specifier, converter or end product manufacturer or others) must determine that the Products are suitable for the intended use and are compatible with other component materials. User is solely responsible for determining the proper amount and placement of Products. While reflective products help enhance visibility, no reflective product can ensure visibility or safety under all possible conditions.

3M may change the product, specifications and availability of the product as improvements are made; therefore, user should contact 3M for latest information before specifying the product.