



Scotchlite™

Reflective Material

SOLAS Grade Series 3150A

Technical Data Sheet

May 2000

Description

3M™ Scotchlite™ Reflective Material - SOLAS (Safety of Life at Sea) Grade Series 3150A is intended to reflectorize SOLAS life support equipment such as life vests, jackets and rafts. It conforms to Marine Equipment Directive 96/98/EC and International Maritime Organization (IMO) regulations. It is approved by the U.S. Coast Guard to meet 46CFR Part 164, Subpart 164.018/6/1 for Type 1 and Type II retroreflective material used to enhance nighttime visibility of life-saving equipment. It is not recommended for use on fabrics treated with fluoropolymer water repellent coatings.

Scotchlite reflective material - SOLAS grade 3150A is a silver flexible high intensity reflective material with an aggressive pressure sensitive adhesive. It has an encapsulated lens optical design that provides high retroreflectivity over a wide range of extreme angles, and performs well in marine applications whether wet or dry. Scotchlite reflective material - SOLAS grade 3150A material has an improved pressure sensitive adhesive that provides good adhesion without the use of a primer on a variety of substrates.

Note: Application should be carefully evaluated for adhesion by the user to assure suitability for the intended use. It has been found that Scotchlite reflective material - SOLAS grade 3150A will perform satisfactorily on aluminum, rubber coated cloth meeting MIL-C-17415, vinyl-nylon laminated cloth meeting MIL-C-43006 and cured polyester meeting MIL-R-21607.

Scotchlite reflective material - SOLAS grade 3150A has a SOLAS A print and a European mark of conformance, which consists of a ship's wheel and a certification number.

Retroreflective Performance

The values in the following table are the minimum coefficients of retroreflection (R_A) determined as the average of readings taken as the material is rotated about its reference axis. The coefficient of retroreflection is measured in accordance with CIE Publication No. 54 (TC-2.3), 1982, using CIE Standard Illuminant A. The entrance and observation angles are in the same plane. Scotchlite reflective material - SOLAS grade 3150A maintains at least 90% of values in table below when totally wet.

Entrance Angle ¹	Observation Angle ²				
	1.0	0.2	0.5	1.0	2.0
β_1 ($\beta_2=0$)	180	175	72	14	2.5
5	140	135	70	12	2.0
30	85	85	48	9.4	1.0
45					

¹Entrance (Incidence) Angle: The angle from the illumination axis to the reference axis. The reference axis is an axis perpendicular to the retroreflective surface.

²Observation (Divergence) Angle: The angle between the illumination axis and the observation axis.

Performance

The durability of Scotchlite reflective material - SOLAS grade 3150A will depend upon actual use, exposure conditions, and maintenance. Maximum durability can be obtained when applied to life saving equipment substrates in accordance with recommended application procedures and not subjected to continuous exterior exposure. Reduction in durability will occur where the usage requirements are particularly severe, such as work life jackets and rubber rafts that are used to maintain harbor facilities, coastal waterways and

industrial equipment in the water or on docks; life-saving appliances with continuous outdoor exposure; heavy wear and tear; and chemical exposure and washing. 3M™ Scotchlite™ Reflective Material - SOLAS Grade 3150A should be inspected on a regular basis to ensure adequate reflectivity and adhesion to the substrate.

Application Instructions

On some surfaces, satisfactory adhesion may require the use of a primer.

Equipment required: plastic squeegees, small paint brush.

Materials required:

1. Primer: Can of 3M™ Scotch-Grip™ Rubber and Gasket Adhesive - 2141 Primer
Coverage: 1 quart = 20 square feet
2. Thinner 50:50 blend of methyl ethyl ketone & toluene (flammable solvents) or 3M™ Scotch-Grip™ Solvent.

Procedure:

The application substrate (e.g., coated fabric) must be clean, dry, and substantially free of contamination. If necessary, wipe the substrate surface with a mild solvent, such as VM & P Naphtha or mineral spirits. (Test the solvent first on a small area of the application surface to make sure the surface is not damaged.)

Minimum application temperature 60°F (15°C). Whenever possible, remove flotation material or deflate equipment and place on hard flat surface and smooth out wrinkles. Do not make applications at temperatures below 60°F (15°C). See the following steps to apply Scotchlite reflective material - SOLAS grade 3150A using primer.

1. Cut reflective material to proper size.

2. Lay on substrate and draw around material, marking the area to be reflectorized.
3. Premix the Scotch-Grip rubber and gasket adhesive - 2141 primer well.
4. Brush on a uniform coat of primer on the inside of the marked area, allowing for a narrow (1/8" or 2mm) border of primer to extend beyond the edges of the marked area.
5. Let dry completely. Air drying time (10 minutes minimum) will depend on temperature and thickness of primer coat. To assure primer is completely dry, test by touching with finger. No adhesive "strings" should be noticeable. Primer may be applied well in advance of reflective material application.
6. Separate approximately 1/2" to 1" (12mm to 25mm) of liner paper from reflective material. Bend liner back onto itself.
7. Position reflective material with liner in place over marked area. Avoid exposed adhesive touching the primed area.
8. When everything is properly aligned, press down the exposed adhesive area by using a squeegee and starting from the inside and working towards the end.



9. Slowly remove the rest of the liner as the squeegee application is made, keeping material away from substrate until pressure is applied. Squeegee down entire reflective area in this manner.
10. On all vinyl applications, use talcum powder around edges after material application to prevent tackiness.

Dry for 24 to 48 hours before handling, inflating, or packaging equipment. Allow at least 4 days between application and water immersion to allow primer to develop maximum bond.

Note: Since plastics, including vinyl coated materials vary greatly in type, composition, and manufacture, a general recommendation cannot be given for their use as application surfaces.

Successful, durable applications have been made by commercial users; however, many plastics contain release agents, unreacted monomers, plasticizers, dyes, oils, gasses and other migrating constituents that contaminate the adhesive and result in premature failure. In addition, colorants may bleed to the surface and cause discoloration of the reflective material. Applications should be carefully evaluated by the user to assure that they are acceptable for the intended use.

The use of heat/pressure to aid in adhesion must be evaluated to ensure the material is not damaged. For silicone based substrates use 3M™ Scotchlite™ Reflective Material - SOLAS Grade 6750I for sew-in application.

Process Colors

3M™ Scotchlite™ Reflective Material - SOLAS Grade 3150A may be screen processed with 3M™ Scotchlite™ Process Colors 700 or 900.

Care and Maintenance Instructions

Reflective material may be hand washed with a sponge or soft cloth using cold or warm water, soap or detergent, followed by a clean water rinse. Grease, oil, and tar may be removed using a soft cloth moistened with VM & P Naphtha or mineral spirits, followed by hand washing, then a clean water rinse. Do not machine wash or dry-clean.

Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Material Safety Data Sheet, and/or product label of chemicals prior to handling or use.

Order and Product Information

To order Scotchlite reflective material - SOLAS grade 3150A, contact 3M Personal Safety Products Department Customer Service at 1-800-328-7098, 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 carton or suspend horizontally through the core. Cut sheets should be stored flat and wrapped in polyethylene film to prevent sheet curl.

Important Notice to Purchaser:

Except where prohibited by law, 3M makes the following limited warranty in place of any others, express or implied, including any implied warranties or conditions of MERCHANTABILITY or fitness for a particular purpose or any implied warranty or condition commonly found in the industry: 3M shall replace or, at its option, refund the price paid to 3M for any 3M™ Scotchlite™ Reflective Material or other 3M reflective products (“Products”) which at the time of shipment to 3M’s purchaser do not meet 3M’s published Product specifications.

Because of the unlimited variety of potential applications for Products, BEFORE production use, the User (which may be a 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 enhance visibility, no reflective product can ensure visibility or safety under all possible conditions. **3M shall not be liable in contract or in tort, for any indirect, incidental, special, or consequential damages (including, without limitation, lost profits, goodwill and business opportunity) relating to the use or inability to use the Products.**



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