

We make people visible

Technical Data Sheet

August 2003

Description

3M™ Scotchlite™ Reflective Material – SOLAS (Safety of Life at Sea) Grade Products are intended for reflectorizing 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) Resolution A.658(16) Annex 2. It is approved by the U.S. Coast Guard to meet 46 CFR part 164, Subpart 164.018 for Type I and II retroreflective material used to enhance visibility of life-saving equipment in nighttime, or low-light conditions.

3M™ Scotchlite™ Reflective Material – SOLAS Grade Series 3100 products are silver, flexible reflective material with an aggressive pressure sensitive adhesive. 3M™ Scotchlite™ Reflective Material – SOLAS Grade 6755 is a silver, flexible reflective material with a sewable fabric backing while 3M™ Scotchlite™ Reflective Material – SOLAS Grade 6750-I has a sewable 4 mil polyester film backing.

All products are comprised of an encapsulated lens optical design that provides high reflectivity over a wide range of entrance angles, whether dry or wet. Scotchlite reflective material – SOLAS grade products have a European mark of conformance. All products are silver in color under daytime viewing conditions and reflect a bright white.

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 following table contains the minimum R_A values as measured at the listed specific entrances and observations angles. Based on tests performed by 3M in accordance with IMO procedures and verified by an outside third party, Scotchlite reflective material – SOLAS grade products meet or exceed these values.

Entrance Angle	Observation Angle			
	0.1	0.2	0.5	1.0
5	180	175	72	14
30	140	135	70	12
45	85	85	48	9.4

Color

3M™ Scotchlite™ Reflective Material		
Product Number	Daytime Color	Reflected Color
3150-A, 3155, 6750-I, 6755	Silver	White



Performance

While the use of 3M™ Scotchlite™ Reflective Material – SOLAS Grade Products 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 Scotchlite reflective material – SOLAS grade products to satisfy conformance to their own requirements.

Reduction in durability will occur when 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 decks; life-saving appliances with continuous outdoor exposure; heavy wear and tear; and chemical exposure and washing.

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 color and reflectivity.

NOTE: Do not attach to highly elastic materials.

Applying 3M™ Scotchlite™ Reflective Material – SOLAS Grade Series 3100 products:

The application of Scotchlite reflective material – SOLAS grade series 3100 products should be carefully evaluated for adhesion by the user to assure suitability for the intended use.

3M™ Scotchlite™ Reflective Material – SOLAS Grade 3150-A has been shown to perform satisfactorily and is recommended on the following marine market substrates:

Smooth surfaces	Glass reinforced polyester
Rubber film	Vinyl or PVC films
Polyurethane film (varies with treatment)	Aluminum

3M™ Scotchlite™ Reflective Material – SOLAS Grade 3155 has been shown to perform satisfactorily and is recommended on the following marine substrates:

Rough surfaces	Glass reinforced polyester
Aluminum	Rubber coated cloth
Rubber film	Vinyl or PVC films
Polyurethane film (varies with treatment)	Polyester fabric
Nylon fabric (thicker weave)	Cotton drill

The 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 fabric to make sure the surface is not damaged).

The minimum application temperature is 60°F (15°C). Whenever possible, remove flotation material or deflate equipment, and smooth out wrinkles.

1. Cut the reflective material to proper size.
2. Separate approximately 1" of liner paper from reflective material. Bend liner back onto itself.
3. When everything is properly aligned, press down the exposed adhesive area by using a squeegee starting from the inside and working towards end.
4. Slowly remove the rest of the liner as the squeegee application is made, keeping material away from fabric until pressure is applied. Squeegee down entire reflective area in this manner.
5. On all vinyl applications, use talcum powder around edges after material application to prevent tackiness.

It is recommended, to achieve maximum adhesion, to allow up to 48 hours (above 60°F) before handling, inflating, or packaging.

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

Commercial users have made successful applications; 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 materials. Applications should be carefully evaluated by the user to assure that they are acceptable for intended use.

The use of heat and pressure to aid in adhesion must be evaluated to ensure the material is not damaged. For silicone based fabrics use 3M™ Scotchlite™ Reflective Material – SOLAS Grade Series 6700 products.

Application Instructions, continued

Sewing 3M™ Scotchlite™ Reflective Material – SOLAS Grade 6755 and 3M™ Scotchlite™ Reflective Material – SOLAS Grade 6750-I:

1. Hand cut, die-cut, or guillotine reflective material to desired size. Use sharp dies or blades made of steel or magnesium. To ensure smooth edges, limit the layers of SOLAS while cutting.
2. Sew in place with 7-9 stitches per inch and not less than 5/64" from the edge of the material. Thread recommendation: #69 nylon (Quality Thread & Notions 1-800-521-4308) or other UL approved threads. Stitch: 3/16" (4.75 mm) lockstitch.


Screen Printing: Below are inks that can be used for printing on the surface of 3M™ Scotchlite™ Reflective Material – SOLAS Grade 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. Prior to printing, wiping the surface with a soft cloth lightly dampened with alcohol may help ink adhesion.


Ink	Ink Type	Manufacturer
3M™ Scotchlite™ Process Color Series 990	Transparent (990-05 Black is opaque)	3M Traffic Control Materials Division 1-800-553-1380
3M™ Scotchlite™ Process Color Series 700	Transparent	3M Traffic Control Materials Division 1-800-553-1380


Care and Maintenance Instructions


Wash by hand with a sponge or soft cloth using warm water and detergent. Rinse thoroughly. Remove oil and tar with a mild solvent, such as VM & P Naphtha or mineral spirits, followed by warm water and detergent. Rinse thoroughly.


Important: Test each application according to appropriate care instructions required for the finished product. Actual life of Scotchlite reflective material – SOLAS grade products depends on cleaning methods and wear conditions.

 **Wash:**
Do not machine wash

 **Dry:**
Do not tumble dry

 **Dry-clean:**
Do not dry-clean

 **Bleach:**
Do not bleach

 **Iron:**
Do not iron

Product Availability

Scotchlite reflective material – SOLAS grade products are available in rolls with the following standard widths and lengths:

3M™ Scotchlite™ Reflective Material				
Product Number	Roll Width Unless Noted	Width Tolerance	Splices Allowed	Standard Roll Length
3150-A, 3155, 6750-I, & 6755	13 mm < X < 150mm	+/- 1 mm	4 per 50m roll	50 m
3150-A, 3155, 6750-I, & 6755	150 mm ≤ X ≤ 1220 mm	+/- 2 mm	4 per 50m roll	50 m

Order and Product Information

To order 3M™ Scotchlite™ Reflective Material, 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 or panels in original shipping cartons. Return partially used rolls to the carton or suspend horizontally through the core.

Important Notice to User

LIMITED WARRANTY: In the event any Thinsulate™ Insulation or 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 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. Thinsulate insulation is made within strict dimensional specifications. However, it is possible for the rolls to shift, shrink, or otherwise change dimensions to a maximum of $\pm 4\%$ during handling or shipment.



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