

3M™ Scotchlite™ Reflective Material – Product Bulletin

8711 Silver Graphic Ready Transfer Film

1. Product Description

3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film is intended for the application on high visibility warning clothing such as occupational workwear, consumer garments and accessories to enhance the visibility of the wearer during darkness and low light conditions. The product will appear brilliant white, when illuminated by vehicle headlights, even when the wearer is situated at the side of the road.

When converting/storing the reflective material, certain circumstances (see e.g. 6.2) may change the uniform appearance of the reflective material; the reflective properties – and hence the defined functionality – will not be affected by this.

2. Product Features

2.1 Product Design

3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film consists of exposed high performance glass lenses bonded to a durable polymer layer, which is coated with a heat activated adhesive.

2.2 High Performance according to ISO 20471

3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film:

- Exceeds the highest brightness requirements for retroreflective material.
- Is non-orientation sensitive.
- Offers 60°C domestic wash durability per ISO 20471, 25 cycles per ISO 6330 6N.
- Offers good dry cleaning durability per ISO 20471, 25 cycles per ISO 3175-2, 8.1.
- Offers good fabric compatibility and drape

2.3 Special Feature

To ensure consistency of performance, 3M™ Scotchlite™ Reflective Materials are manufactured within an ISO 9001 controlled manufacturing environment.

3. General Safety Information

Read 3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film Product Bulletin carefully. The wearer is ultimately responsible for his/her own safety.

- Verify the suitability of 3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film for the intended use of the PPE. (EC Directive 89/656/EEC Art. 4 and Art 5; EC Communication 89/C328/EEC Annex §7).
- No reflective material can guarantee absolute visibility.
- Various factors (e.g. environmental) can influence visibility. For further details, see chapter 9 – “Specific Safety Information”.
- Field test the finished garment to verify its suitability for intended use and to select appropriate care conditions.

4. Product Application

Retroreflective materials are important in applications where being visible can reduce the risk of an accident. Example of environments where high-visibility garments should be worn include applications of vehicular hazard such as motorways, rural and urban roads, railway environments, airports and docks.

3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film is recommended for garments not suffering from harsh wear impact and being subjected to domestic wash care procedures.

Occupational Application

Clothing for road works, track maintenance, sanitation, transportation, postal service, armed forces and police.

Non-Occupational Application

Clothing for pedestrians, joggers, cyclists and children.

Accessories

Head-, arm-, legbands, gloves, footwear, belts, back-packs, emblems and logos.

5. Product Converting

5.1 Cutting

3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film can be handcut, die-cut or guillotined (max. 5 cm stack height).

Note: Use very sharp cutting knives only and cut from the reflective side.

5.2 Lamination onto substrates

3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film can be applied as trims, emblems or logos to many different types of substrates.

Prior to lamination, an application tape should be applied onto the reflective side.

A removable paper liner protects the heat-activatable adhesive and needs to be removed before lamination.

5.3 Lamination process

Use lamination equipment, which provides uniform heat and pressure.

The following recommendations are general guidelines for heat press lamination. Other lamination methods can also be used. Proper lamination parameters must be determined for each substrate to assure adequate adhesion.

Substrate	Time (sec)	Temperature (°C)	Pressure (kg/cm ²)
100% Cotton	15	175	1.5
Polyester/Cotton	15	175	1.5
Vinyl	10	150	1.5
Urethane	10 - 12	150	1.5

- Preheat the press.
- Apply application tape on the converted (e.g. printed) material.
- Remove paper liner from adhesive side.
- Place transfer film on substrate with adhesive side facing the substrate. Apply heat and pressure as described. It is not recommended to apply film over seams and stitches.
- Allow the material to cool to room temperature before stripping. To remove the application tape, lift the liner from one corner and pull gently with a single motion while holding the substrate flat.

Note:

- In general, 3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film is not recommended for use on polyamide fabrics. The adhesion on polyamides such as Nylon is often not satisfactory.
- Lamination on coated substrates might require reduced lamination temperature and time to prevent surface damage. Appropriate lamination parameters have to be determined accordingly. Care must be taken to avoid air blisters.
- Substrate finishes such as silicone, parafin, fluorocarbon resin or flame retardant coating could significantly affect the level of adhesion to the substrate.
- To ensure adequate adhesion to substrate, it is strongly recommended to test the application in the intended care procedure for the finished product.

Prior to production, it is essential to test the actual product and substrate being used.

- Production dependent colour deviations of new retroreflective material do not affect the suitability of 3M™ Scotchlite™ Reflective Materials according to the performance requirements laid down in ISO 20471 for retroreflective material.

5.4 Silk Screen Printing

3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film can be printed directly.

Due to the product construction, durable prints on glass bead products are difficult to obtain.

Choice of ink will depend upon usage condition and care procedure. User should make test applications and select the appropriate care instruction for the finished product to ensure adequate adhesion of the ink. It is recommended to test the ink adhesion on the actual batch of 3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film being used before production.

Opaque silk screen printing inks will appear black, transparent inks will reduce brightness when viewed as retroreflected light under low light conditions.

For more information please refer to 3M Technical Information “**Printing Guidelines for Glass Bead Products**”. For further information contact your 3M representative.

6. Handling and Storage

6.1 Product Storage

Store in a cool, dry area and use within 1 year of receipt.

Rolls should be stored in their original cartons, whilst partially used rolls should be returned to their carton or suspended horizontally from the core via a rod or pipe. Cut sheets should be stored flat.

6.2 Handling and Storage Precautions

Aggressive chemicals, e.g. sulphur- or chlorine- containing compounds, perspiration, strong acids or bases may affect the aesthetic appearance of 3M™ Scotchlite™ Silver Reflective Materials. When exposed to excessive heat and more than 70% relative humidity conditions these products have the potential to become stained. These stains do not affect the retroreflective performance of the material and do not indicate that the input product was defective.

Care must be taken by the user when handling 3M™ Scotchlite™ Silver Reflective Material in hot and humid environments. During application, storage and shipping ambient conditions should be kept. Measures like cooling, dehumidifying the manufacturing area and specific handling precautions should be taken. Appropriate specific storekeeping is essential.

Knowing the individual situation, the user may contact 3M for further advice if needed.

7. Product Cleaning

Reflective fabrics and films naturally age. Ageing depends upon material type, conditions of use, environment and maintenance procedures.

The retroreflective performance of all reflective materials is affected by soiling. Any kind of dirt, liquid chemicals, grease and alike will reduce the brightness in the area of contamination.



7.1 Caution

Washing/cleaning conditions harsher than those recommended below could diminish the brilliance of the material and shorten the product's lifetime significantly. Therefore, the instructions must be strictly followed.

- No presoaking.
- No application of high alkaline products (e.g. heavy duty products or stain removal products).
- No application of solvenated detergents or micro-emulsions.
- No additional bleaches.
- Do not overdry.

Before use, the suitability of the intended care process for 3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film must be determined. Test duration should mirror the anticipated maximum number of care cycles in use.



7.2 Homewash

7.2.1 Washing Conditions

A colored clothing wash program without pre-wash should be used.

Recommendation:

Wash temperature range:	30°C to 60°C
Max. wash time at highest wash temperature:	12 minutes
Max. program time:	50 minutes

Detergent: Brand powdered household detergents should be used. Recommended are detergents for delicate or coloured laundry. Refer to the detergent manufacturer's recommendations for dosage in areas of high water hardness and for various degrees of garment soiling.

Wash temperatures higher than 60°C and industrial laundering processes should not be used.

The use of bleach or detergents containing organic solvent will result in a reduction in retroreflective performance.

Use of temperatures lower than 40°C can increase the lifetime of the reflective fabric, dependent on the detergent system and its dosage level.



7.2.2 Do not use additional bleach.

- No chlorine bleach.
- Bo bleaches on oxygen basis (e.g. sodium perborate bleaches).
- Do not pre-soak laundry even in a low concentration of bleach.



7.2.3 Drying conditions

Tumble Dryer: Tumble drying should be performed in a commercially available household dryer using the medium dry setting.

Exhaust temperature should **not** exceed 70°C.

Do **not** overdry. Damp dry only.

Air Drying: Line drying is recommended where possible



7.3 Dry Cleaning Conditions

Cleaning process should be based on a pre- and main-bath only. For P it is recommended to only use **pure** perchloroethylene. Adjust load and solvent level to give a moderate mechanical action.

Max. solvent temperature:	30°C
Recommended drying temperature:	48°C
Max. inlet temperature:	80°C
Max. exhaust temperature:	60°C
Max. drying time:	15 minutes
Max. program time:	60 minutes

If stain removing substances (e.g. surfactant-based cleaning booster) need to be used, their compatibility with the reflective material should be determined prior to the application.

Note: High number of dry cleaning cycles may stiffen the product and thus lead to increased abrasion.



7.4 Ironing Conditions

- Use cool setting, use press cloth.
- Do not apply steam.

8. Product Maintenance

8.1 Maintenance Misuse

3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film is an optical system. Coating of the product with material of high refractive index such as oil will greatly diminish reflective performance.

- No harsh mechanical treatment, e.g. abrasion with wire brushes or sand paper.
- No uniform coating or spraying of oils, protective waxes, inks or paint.
- No application of products such as leather spray or shoe shine.

8.2 Inspection

High-visibility warning clothing should be maintained in good condition and inspected regularly for signs of damage or deterioration.

Where frequent care cycles are performed, inspection should be pursued after every cleaning cycle. Records of test results should be kept for reference.

Replacement of the reflective material must be considered, if the retroreflective performance is below $R' = 100 \text{ cd/lx/m}^2$ (refer to ISO 20471).

For specific guidance contact your 3M representative.

8.3 Product Disposal

Product can be recycled attached to the garment. The product can be incinerated in a commercial or industrial facility or disposed in a sanitary landfill. Before recycling, the compatibility shall be determined with the intended recycling process.

9. Specific Safety Information

Visibility Limits see chapter 3 “General Safety Information”

Various environmental factors like line of sight, rain, fog, smoke, dust and visual noise can influence visibility.

Recognition of the wearer can also be significantly reduced, if the reflective material is covered, e.g. by simultaneously wearing other personal protective equipment or by obstacles in the working zone.

In such instances the wearer should be aware of these limitations.

The brightness of 3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film can also be diminished in extreme weather conditions.

- Test results show, that 3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film exceeds the retroreflective performance requirements in rainfall conditions as defined in ISO 20471. Initial brightness levels return as the material dries.
- Fog, mist, smoke and dust can scatter the light from headlights. Wearer must be aware that detection distances will be severely reduced.
- Visual noise (contrast variations in the visual field) decreases the contrast of the reflective material with the background and affects the visibility in low-light conditions.

Important Notice to Purchaser / Converter / Wearer:

All statements, technical information and recommendations herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. We shall not be liable and no warranty shall apply for products not applied according to our published information folder. Before using / converting, the user / converter must determine the suitability of the product for its intended use / converting, and the user / converter assumes all risk and liability whatsoever in connection therewith. All questions of warranty and liability relating to this product are governed by the terms of the sale subject where applicable to the prevailing law. No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by officers of us.



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