

3M™ Scotchlite™ Reflective Material – Product Bulletin

8712 Silver Transfer Film

1. Product Description

3M™ Scotchlite™ Reflective Material – 8712 Silver Fabric is intended for the application on high-visibility warning clothing such as occupational work wear, consumer garments and accessories to enhance the visibility of the wearer during darkness and low light conditions. The fabric 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 – 8712 Silver Transfer Film consists of exposed, high performance glass lenses bonded to a durable polymer layer, which is coated with a heat-activated adhesive. 3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film comes with a protective paper liner on the reflective side and a polyester liner on the adhesive side, which must be removed before lamination.

2.2 High Performance according to ISO 20471 and EN 1150

3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film:

- Exceeds the highest brightness requirements for a level 2 separate performance retroreflective material.
- Is non-orientation sensitive.
- Offers 60°C home wash durability, 25 cycles per ISO 20471.
- Offers good dry cleaning durability, 25 cycles per ISO 20471.
- Offers excellent drapability and fabric conformity.

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 the 3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film Product Bulletin carefully.

The wearer is ultimately responsible for his/her own safety.

- Verify the suitability of 3M™ Scotchlite™ Reflective Material – 8712 Silver 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 Section 9 – “Specific Safety Information”.
- Field test the finished garment to verify its suitability for its intended use and to determine appropriate care conditions.

4. Product Application

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

3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film is recommended for garments not suffering from harsh wear impact and being subjected to domestic-wash care procedures.

Occupational Application

Clothing intended for low to medium wash- and wear-impact, e.g. vests.

Non-Occupational Application

Clothing for pedestrians, joggers, cyclists and children.

Accessories

Gloves, footwear, head-, arm-, leg-bands, webbing, pipings, belts, back packs, emblems and logos.

5. Product Converting

5.1 Cutting

3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film can be hand cut, die cut or guillotined (max. 5cm stack height).

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

5.2 Lamination onto substrates

3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film can be applied directly as trims, emblems or logos to many different types of substrates. The reflective surface of the film is protected by a paper liner which facilitates handling and application. A plastic liner protects the heat-activated adhesive and needs to be removed prior to 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 (roll-to-roll, highfrequency welding, etc.) 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
Urethane	10-12	150	1.5

- Preheat the press.
- Remove plastic liner from adhesive side. Do not remove the paper carrier.
- 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.
- A press cloth or a siliconised slip-sheet for delicate or coated substrates may be used to cover the transfer film and substrate during lamination.
- Allow the paper liner to cool to room temperature before stripping. To remove the paper liner, 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 – 8712 Silver 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 coatings could significantly affect the level of adhesion to the substrate.
- To ensure adequate adhesion to a 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 variations which may occur in new retroreflective material do not affect the suitability of 3M™ Scotchlite™ Reflective Material according to the performance requirements of a separate performance retroreflective material laid down in ISO 20471.

5.4 Lamination of plotter or kiss-cut material

Plotter-cut or kiss-cut transfers require special procedures for lamination. A typical procedure for 3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film would be a two-step lamination process.

For detailed information please refer to Application Guideline “Plotter-Cutting Guideline for Glassbead Products” (January 2009).

5.5 Silk Screen Printing

3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film should not be silk screen printed before the application. For applications requiring direct screen printing it is recommended to use 3M™ Scotchlite™ Reflective Material – 8711 Silver Graphic Ready Transfer Film.

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 Material.

When exposed to conditions of excessive heat and more than 70% relative humidity, 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 store keeping is essential.

In conditions of excessive heat and humidity, it is recommended to leave the paper liner on the applied transfer film as long as possible.

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

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 – 8712 Silver 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 50°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 – 8712 Silver 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 applications 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 carried out 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

The product can be incinerated in a commercial or industrial facility or disposed in a sanitary landfill. Observe the applicable mandatory laws & rules.

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 – 8712 Silver Transfer Film can also be diminished in extreme weather conditions.

- Test results show, that 3M™ Scotchlite™ Reflective Material – 8712 Silver Transfer Film exceeds the retro-reflective 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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