

# 3M™ Scotchlite™ Reflective Material – Product Bulletin

## High Gloss Series 7100

### 1. Product Description

3M™ Scotchlite™ Reflective Material – 7160 White and 7187 Fluorescent lime-yellow High Gloss Trims are intended for use on occupational workwear, consumer garments and accessories to enhance the visibility of the wearer during darkness and low light conditions (functionality). The trims will appear brilliant white (3M™ Scotchlite™ Reflective Material – 7160 High Gloss Trim) and brilliant yellow (3M™ Scotchlite™ Reflective Material – 7187 High Gloss Trim), 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 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 – 7160 and 7187 High Gloss Trims consist of highly retroreflective microprisms formed on flexible, glossy and UV-stabilised polymeric film. A white flexible film sealed on the backside of the trim encapsulates the microprisms and protects the reflective product from dirt and moisture penetration.

#### 2.2 High Performance according to ISO 20471

3M™ Scotchlite™ Reflective Material – 7160 and 7187 High Gloss Trims:

- Exceeds the highest brightness requirements for retroreflective material.
- Is non-orientation sensitive.
- Offers 60°C domestic wash durability per ISO 20471, 75 cycles per ISO 6330 6N.

### 3. General Safety Information

**Read 3M™ Scotchlite™ Reflective Material – Series 7100 High Gloss Product Bulletin carefully. The wearer is ultimately responsible for his/her own safety.**

- Verify the suitability of 3M™ Scotchlite™ Reflective Material – 7160 and 7187 High Gloss Trims 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 suitability for intended use and for the selection of 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 applications of vehicular hazard such as motorways, rural and urban roads, railway environments, airports and docks.

3M™ Scotchlite™ Reflective Material – Series 7100 High Gloss Trims are durable materials for garments not suffering from harsh wear impact and being intended for 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

The 3M™ Scotchlite™ Reflective Material – 7160 and 7187 High Gloss Trims can be handcut, die-cut or guillotined.

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

### 5.2 Sewing

3M™ Scotchlite™ Reflective Material – 7160 and 7187 High Gloss Trims can be applied directly to a substrate. Sewing should be done in the “sewing channels” (between the outer welding lines) to avoid puncturing of the centre part. The reflective trim should be sewn with a coated brand circular top needle, using a polyester thread. It is essential to sew in the sewing channel to avoid damaging of the reflective area by needle punching. Sew in place using a lockstitch of 3mm stitch length. Speed of feed gripper needs to be adjusted.

**Note:** Cells with holes from stitching for example, might collect liquid/water during washes. In these areas, the retroreflective properties might be diminished until the liquid is removed.

Whenever two or more pieces of reflective trim are used together on a single surface or as a set, they should be matched to ensure uniform day time appearance. **For detailed sewing information, contact your 3M local representative.**

### 5.3 Printing

3M™ Scotchlite™ Reflective Material – 7160 and 7187 High Gloss Trims are coated with a special polyurethane coating.

Choice of ink will depend upon printing conditions and care procedures. We recommend the use of e.g. 3M™ 990 inks or an ink suitable for PU surfaces.

User should make test applications and select the appropriate care instruction for the finished product to ensure adequate adhesion of the ink, because the adhesion to the reflective material may be affected by repeated machine laundering/cleaning.

It is always important to test the ink adhesion on the actual product being used before production.

When illuminated by e.g. vehicle headlights, opaque silk screen printing inks will appear black and greatly diminishes the brightness in the printed areas, transparent inks will reduce brightness when viewed as retroreflected light at low light conditions.

For more information please refer to 3M Technical Information “**Screenprinting guideline for 3M™ Scotchlite™ Reflective Material – High Gloss Films**”.

## 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 shipping cartons, whilst partially used rolls should be returned to their carton or suspended horizontally from the core via a rod or pipe.

### 6.2 Colour fading due to UV light exposure

3M™ Scotchlite™ Reflective Material – 7187 Fluorescent lime yellow High Gloss Trim might show colour fading in extreme UV light exposures.

## 7. Product Cleaning and Maintenance

High Gloss materials 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 product and shorten its lifetime significantly. The following instructions therefore 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 – High Gloss products 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:** A recognised brand, powdered household detergent 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 are not recommended.**

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

**Use of temperatures lower than 40°C will increase the lifetime of the reflective fabric. Actual lifetime will be dependent upon the detergent system and its dosage level.**

 **7.2.2 Do not use additional bleach.**

- No chlorine bleach.
- 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.

**Air Drying:** Line drying is recommended where possible

 **7.3 Dry Cleaning Conditions**

Dry Cleaning is not recommended for any High Gloss product

 **7.4 Ironing Conditions**

Ironing is not recommended for any High Gloss product

## 8. Product Maintenance

### 8.1 Maintenance Misuse

3M™ Scotchlite™ Reflective Material – 7160 and 7187 High Gloss Trims are optical reflective systems. Please mind the following:

- 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 materials such as leather sprays 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. **For specific guidance contact your 3M representative**

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

### 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 should 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 – 7160 and 7187 High Gloss Trims can also be diminished in extreme weather conditions.

- Test results show, that 3M™ Scotchlite™ Reflective Material – 7160 and 7187 High Gloss Trims exceed the retroreflective performance requirements in rainfall conditions as defined in ISO 20471.
- Fog, mist, smoke and dust can scatter the light from headlights. The 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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