



# Scotchlite™

## Reflective Material

## Technical Bulletin

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**Topic: Care guidelines to reduce the possibility of silver stripe fading on 3M™ Scotchlite™ Reflective Material – Series 9400 Fire Coat Trim**

**Date: October 1999**

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**Background:** Recently samples of Scotchlite reflective material - 9486 and 9487 Fire Coat Trims (sometimes referred to as “triple trim”) have been received that exhibit a faded silver stripe. The amount of fading varied from a slight appearance of background fluorescent color showing through the silver stripe to a complete loss of the silver stripe.

Tests were conducted to determine the potential cause of the fading. Thirty-three chemicals recommended by fire service personnel were used to test the trim. The chemicals used consisted of AFFF foams, Class A foams, oils and fluids, solvents, petroleum distillate fuels, chlorine-containing compounds, acids, household detergents, professional cleaning agents, and fire-extinguishing dry chemicals.

Tests were performed by applying the recommended chemicals to the trim samples and storing them under the following set of conditions:

- in ambient temperature and humidity for 24 hours,
- in an oven at 285° F for 10 minutes, and
- in a room set at 90° F / 90% humidity for 30 days.

After the tests were completed, the trim was rinsed clean in tap water and then examined for fading.

Little effect was observed in samples stored in an ambient environment or after samples were in an oven at 285° F / for 10 minutes. The greatest effect was observed on samples stored in a 90° F / 90% humidity environment for 30 days and when samples were exposed to strong acids.

The following chemicals were observed to affect the silver stripe: battery acid (sulfuric acid), hydrochloric acid, chlorine-containing compounds (swimming pool chlorine), ABC Dry Chemical, Regular Dry Chemical, and Purple K Dry Chemical. Note: Strong acids or bases (low pH solutions or high alkaline/caustic solutions) may also cause fading.

Testing has shown that the fading is caused by the corrosion of the metal between and behind the glass beads. If the corrosion is slight the performance of the retroreflective material may not be affected even though the aesthetic appearance of the trim’s silver stripe may be affected.

## **Care Guidelines for Handling 3M™ Scotchlite™ Reflective Material – Series 9400 Fire Coat Trim**

After fighting fires with dry chemicals or fires that involve burning chlorine or PVC, it is important to thoroughly clean and dry the turnout gear to prevent the effects of corrosion on the trim. If not cleaned thoroughly, residues from dry chemicals and burning PVC may cause fading of the trim over time. The cumulative effects of long term exposure to corrosive contaminants may not show up until after the garment is laundered or is exposed to high humidity environments.

Consult NFPA care and use guidelines for additional information on the maintenance of firefighter turnout gear.

For more detail on corrosion from chemicals at a fire scene, see Fire Protection Handbook, Eighteenth Edition, Section 1/Chapter 8 and Section 4/Chapter 2 (NFPA Number FPH1897).

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