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## Treatment of Asbestos Cement Sheeting and Roof Products by Impregnation with Polyurethane Binder

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### Introduction

The original report showed that this process was possible but was difficult to demonstrate on a microscope cross section of the material because the polyurethane is a clear material.

### Approach

A large number of indicators were examined. The requirement was a small molecular mass dye with a single reactive site on every molecule. This was reacted with a prepolymer suitable for impregnation of the cement product. It was important to produce a prepolymer with very low free isocyanate content as this could preferentially react with the dye.

The prepolymer dye adduct was produced in MEK solvent. In order to prove that the dye was attached to the prepolymer, a filter paper was used for paper chromatography. The MEK separated cleanly from the dye adduct. This gave a definite line of colour showing the height of the impregnation.

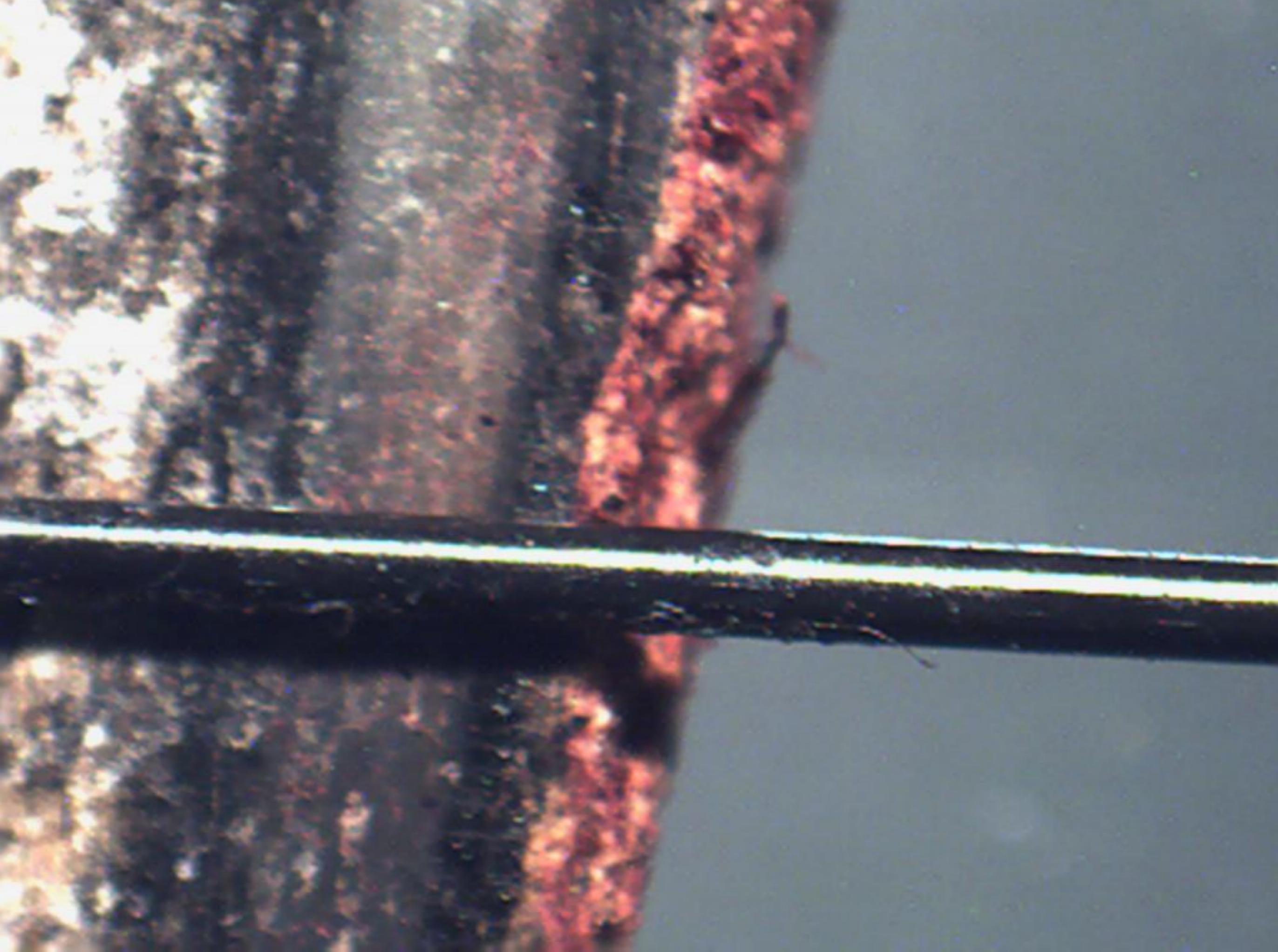
A separate dye line was not produced on well produced prepolymers. Following this four panels were produced with different quantities of MEK to optimise the impregnation of the panels.

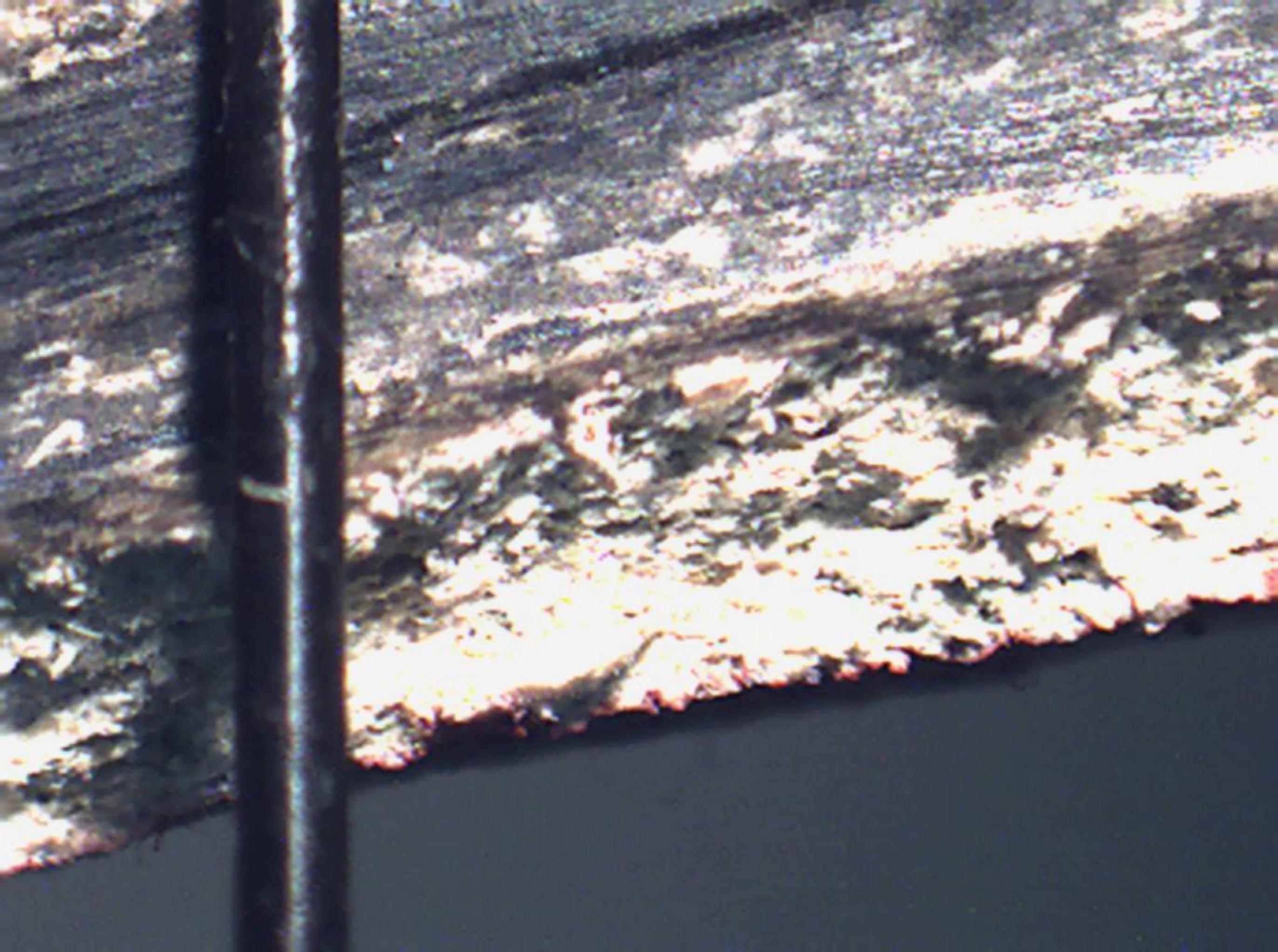
### Results

Panel 2 and 3 both produced good results of greater than 0.55mm impregnation as can be seen in the attached photos. The bristle in the photos is 0.55mm thick.

The asbestos acts as a wick allowing impregnation of the panel. The bonding agent does not impregnate the cement portions without exposed asbestos fibre. The product acts as a good bonding agent.







# Conclusion

Impregnation of the asbestos cement sheeting has been demonstrated, and exposed fibre has been impregnated and bonded.

## **Regulation 15: Asbestos cement sheeting and related products.**

Employers who work with asbestos cement products, especially roof sheets, must take steps to avoid general accidents and develop a work plan to prevent the release of asbestos into the environment.

Ideally asbestos cement materials should be painted or otherwise coated to prevent release of fibre and inhibit the growth of lichen or moss.

## **Introduction**

It was necessary to highlight the asbestos regulations so that attention may be drawn to certain issues.

The regulation did not specify or recommend effective measures as the responsibility for the actions remained with the employer and the owner of the asbestos cement sheeting or related product.

In practice this means that such parties would need to demonstrate compliance which would now be a very difficult task.

For this reason many parties replaced the product with other solutions at great inconvenience and cost.

We now have a product that can demonstrate that effective measures have been put into place.

# PREPOLYMER SPECIFICATION

APPEARANCE Red, low viscosity liquid

VISCOSITY 25°C cps < 200 (too low to measure)

DENSITY 25°C gm/cc 0.87 ( $\pm$  0.02)

FLASH POINT (°c; Open cup) 9°C

## PROCEDURE

As specified in regulation 15 the substrate is cleaned with high-pressure water jet to remove any loose dirt and fibre. Such wet fibre is to be filtered collected and correctly disposed of.

The substrate should be allowed to dry for a few days and then coated with this primer.

**ASBESTOS PRIME 520-004** is a red dye polymer. The dye is not a separate molecule.

Where the dye is visible is proof of the impregnation of the sheet. The depth of impregnation in our labs is in the order of 1-2 mm. This makes it simple to demonstrate that the product is impregnating the sheet and binding the asbestos to make it safe.

## SAFETY AND HANDLING

**ASBESTOS PRIME 520-004** contains flammable solvents and the vapours produced when applying the material present a hazard to the respiratory organs. Inhalation of fumes must be strictly avoided. A protective mask should be worn while applying, and efficient ventilation must be provided. Remove all sources of ignition and do not smoke when using the product.

**ASBESTOS PRIME 520-004** should be treated as diisocyanate and the usual precautions should be exercised when handling this family of chemicals. Protective clothing should be worn and contact with the body avoided. Use only in a well-ventilated area.

For further details, see Material Safety Data Sheet for the usual precautions (available in detail) to be followed when handling and applying isocyanates.

The information contained in this bulletin is to the best of our knowledge true and accurate but any recommendations or suggestions, which may be made, are without guarantee, since the conditions of use are beyond our control. Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing patents covering any material or its use.

## Encapsulation of Asbestos Cement Sheeting with Polyurethane SPF

Asbestos is a naturally occurring fibrous mineral that is highly toxic when inhaled. During the late 19th century, asbestos was widely used by building developers and manufacturers due to its incredible resistance to heat. Today, asbestos as a building material has been banned in almost every country, though some builders now use asbestos encapsulation in order to control harmful asbestos fumes.

Simply put, asbestos encapsulation refers to the actual sealing of asbestos within a protective shell. This is done for a number of reasons, but the main reason is that removing all asbestos materials from some structures is nearly impossible. Therefore, various manufacturers have devised capsules that are meant to contain all asbestos toxins without demolishing an entire structure.

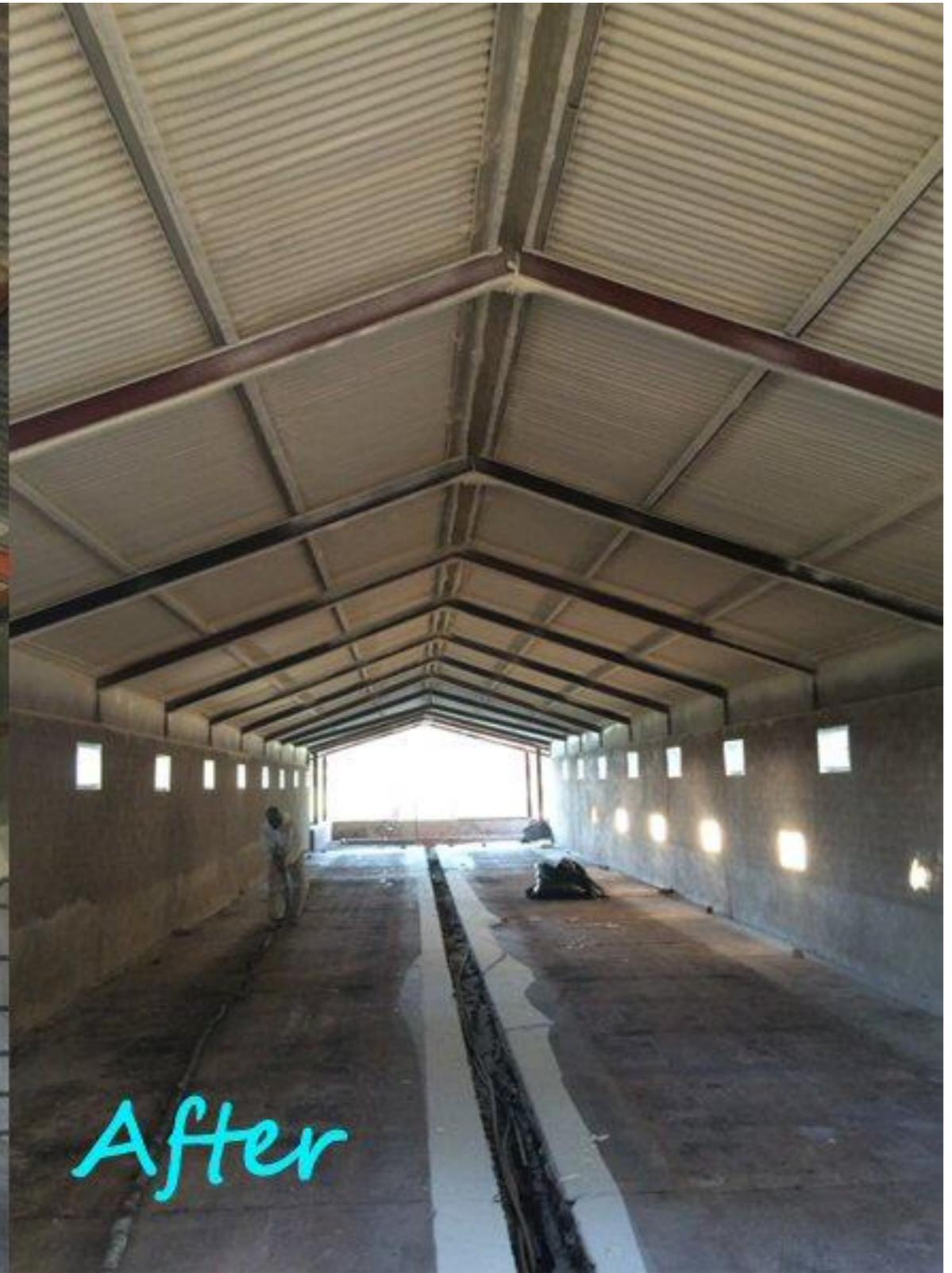
In fact, scientists have discovered that attempting to remove asbestos from a building is more harmful than simply covering it up. When asbestos has been disturbed, small particles of the toxin drift into the air. As a result, an air space can quickly become contaminated. Therefore, the best solution is to manage asbestos by containing it using asbestos encapsulation techniques.

Asbestos encapsulation is a lot more cost-effective than completely removing the asbestos. While asbestos removal is an expensive procedure, simply covering up an asbestos problem with encapsulation proves to be a much cheaper alternative.

In order to ensure that asbestos does not seep into the air, this toxin must be properly contained. Therefore, hiring a professional contractor to apply encapsulation materials is the best course of action.

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# ASBESTOS ROOF ENCAPSULATION



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