

**SURVEY REPORT**

**PB84239573**

**SAFETY CLOTHING AND EQUIPMENT DIVISION  
SAFETY FIRST INDUSTRIES, INC.  
1990 EAST 69th STREET  
CLEVELAND, OHIO 44103**

**March 30, 1972**

**SURVEY REPORT: 72-4  
Date of Report: 6/30/72**

**SURVEY REQUESTED BY:**

**Exec. Vice Pres.  
Safety First Industries, McKees Rocks, Pa.**

**PERSONNEL CONTACTED:**

**Safety Clothing & Equip. Division  
Vice Pres. & Gen. Mgr.  
, Asst. Gen. Mgr.  
, Plant Superintendent**

**SURVEY CONDUCTED BY:**

**Mr. P.A. Froehlich, Chem. Engr.  
NIOSH**

## SUMMARY OF REPORT

On March 30, 1972 a survey was conducted by the Industrial Hygiene Services Branch of the National Institute for Occupational Safety and Health of the Safety Clothing and Equipment Company to determine possible excessive environmental contamination with asbestos. Only the turning operation was found to be out of compliance with respect to the emergency standard issued December 7, 1971.

## INTRODUCTION AND PURPOSE OF STUDY

Safety Clothing and Equipment Company, a Division of Safety First Industries, Inc., is a fabricator of personal protective clothing including asbestos gloves, mittens, hoods, pads, etc. The asbestos fabric is woven from yarn which is composed of approximately 80% asbestos and 20% cotton fibers. Numerous weights and types of fabrics are used; however, two general classes are the Underwriters grade and "wet brushed." The "wet brushed" fabric, is treated with an acrylic resin solution (containing softeners) to bind the fibers and make a "lint-free" cloth. The appearance of the fabric is more dense and, with normal handling, less visible dust is created. At present the gloves and mittens are packed loosely in cartons, but arrangements are being made to package these articles individually in polyethylene bags.

The study was conducted at the request of Executive Vice-President of Safety First Industries. The purpose of the study was to determine if their Cleveland, Ohio plant is in compliance with the OSHA emergency standard for asbestos.

#### ENVIRONMENTAL STUDY PROCEDURES AND INSTRUMENTATION

Atmospheric samples for dust count were collected on Millipore filters, Type AA\*, encased in three-piece plastic Millipore aerosol field monitors with face cap removed and filter completely exposed. The samples were taken in the operator's breathing zone using battery powered Mine Safety Appliance (MSA) gravimetric pumps, Type G. The pumps and samplers were worn by the employees. The pumps were calibrated to operate at 1.7 liters per minute. Due to a rather light production schedule, one hour samples were obtained when employees were doing specific asbestos dust producing operations. Results are shown in Table 1.

#### TOXICOLOGIC AND HYGIENIC STANDARDS

Asbestos is a general name given to a variety of fibrous minerals. The major asbestos minerals are chrysolite, crocidolite, amosite and anthophyllite. Asbestosis, lung cancer, and pleural and peritoneal mesotheliomas may follow exposure to asbestos. The risk is related to the length of exposure and the dust concentration.

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\*Registered trade name of the Millipore Corp., Bedford, Mass.

The Threshold Limit Values (TLV)\* for asbestos dust, as listed in the "Threshold Limit Values for 1970" of the American Conference of Governmental Industrial Hygienists is 5 million particles per cubic foot of air. On December 7, 1971, the U.S. Department of Labor established an "Emergency Standard for Asbestos Dust Exposure" of 5 fibers per milliliter greater than 5 microns in length for an eight-hour time weighted exposure. The ceiling exposure conditions shall not exceed 10 fibers per milliliter greater than 5 microns in length.

#### RESULTS OF STUDY

A total of eleven samples were taken and only one operation did not meet the Department of Labor standard for asbestos, that being the turning operation where mittens and gloves are turned inside out. The discrepancy between the concentration of dust in the morning (sample 118) and in the afternoon (sample 120) is correlated with that of the cuff sewer (samples 101 and 112 represent morning and afternoon environments, respectively) who works in the same room. Two possible explanations are that the work load may have

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\*Threshold limit values refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect. Because of wide variation in individual susceptibility, however, a small percentage of workers may experience discomfort from some substances at concentrations at or below the threshold limit, a smaller percentage may be affected more seriously by aggravation of a pre-existing condition or by development of an occupational illness.

been lighter in the morning and/or the concentration of fibers builds up during the shift. There is no mechanical ventilation in this area.

Sample 124 was taken while wet brushed asbestos fabric was being cut during the full hour. Sample 125 was taken when standard Underwriters fabric was being cut; however, it was noted that cutting was performed during only about 50-60% of the hour sampled, the remainder of the time being spent doing "clicking" and other miscellaneous jobs. Again, this work is performed in a room with no mechanical ventilation.

There is no significant difference between the three samples obtained from one sewer. Sample 116 was obtained in the afternoon when wet brushed asbestos was being sewn; samples 121 and 128 were obtained in the morning when regular Underwriters stock was processed.

#### DISCUSSION OF RESULTS AND CONCLUSIONS

Based on the data obtained on March 30, only one operation produces asbestos dust contamination which does not meet the Department of Labor standard of 5 fibers/ml. This is the glove and mitten turning operation. The tasks are performed in a relatively confined area and can very easily be done under a properly designed hood.

Although the resin treatment of the asbestos fabric appreciably reduces the visible dust, apparently the effect on non-visible particles is minimal. This is cause for concern since it is the invisible, respirable particles which cause disease. Lack of visible dust may

create a false sense of security resulting in disregard for the hazard.

Employees should be alerted against such complacency.

RECOMMENDATIONS

1. Install a properly designed hood to enclose the glove and mitten turning operations.
2. Instruct employees that "wet brushed" fabric may be as hazardous to health as the Underwriters material even though less visible dust is created when the former is processed.

REPORT PREPARED BY:



Phillip A. Froehlich

Industrial Hygiene Services Branch  
Division of Technical Services

TABLE 1: Concentration of Asbestos Fibers

(No. of fibers greater than 5 microns in length per milliliter)

| FILTER<br>NO. | POSITION        | CONCENTRATION<br>FIBERS/ML |
|---------------|-----------------|----------------------------|
| 101           | Sewer - Cuffs   | 0.6                        |
| 112           |                 | 2.3                        |
| 115           | Sewer           | 0.9                        |
| 116           | Sewer           | 2.1                        |
| 121           |                 | 2.0                        |
| 128           |                 | 2.0                        |
| 118           | Turner          | 3.3                        |
| 120           |                 | 7.1                        |
| 123           | Sewer (Tacking) | 1.6                        |
| 124           | Cutter          | 3.7                        |
| 125           | Cutter          | 2.1                        |



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| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | 1. REPORT NO. |  | 2.                               |  | PB8 4 23957 3                                      |  |
| 3. Title and Subtitle<br>Survey Report. Safety Clothing And Equipment Division, Safety First Industries, Inc., Cleveland, Ohio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |               |  |                                  |  | 4. Report Date                                     |  |
| 5. Author(s)<br>Froehlich, P. A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |               |  |                                  |  | 6.                                                 |  |
| 7. Performing Organization Name and Address<br>NIOSH, U.S. Department of Health, Education, and Welfare                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |               |  |                                  |  | 8. Performing Organization Rept. No.<br>HHE-72-004 |  |
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| 14. Supplementary Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |               |  |                                  |  |                                                    |  |
| 15. Abstract (Limit: 200 words)<br>A survey was conducted to determine possible environmental asbestos (1332214) contamination at the Safety Clothing and Equipment Division (SIC-3842) of Safety First Industries, Incorporated, in Cleveland, Ohio, on March 30, 1972. The study was requested by the executive vice president of the company. Atmospheric samples for dust were taken in employee breathing zones during dust producing operations. A total of 11 operations were sampled; only 1 did not meet the standard of five fibers greater than 5 microns in length per milliliter for an 8 hour time weighted exposure. The operation that did not meet the standard was the glove and mitten turning operation, which was performed within a confined area and could be enclosed under a ventilation hood. Resin treatment of the fabric used for the gloves reduced the visible dust considerably; however, there was a minimal effect on the nonvisible asbestos particles that cause diseases. The author recommends that a properly designed hood be installed to enclose the glove and mitten turning operations, and employees should be instructed that wet brushed fabric may be as hazardous to health as other methods, even though there is less visible dust. |  |               |  |                                  |  |                                                    |  |
| 16. Document Analysis a. Descriptors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |               |  |                                  |  |                                                    |  |
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| c. COSATI Field/Group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |               |  |                                  |  |                                                    |  |
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