



University of Cincinnati Medical Center

3223 Eden Avenue  
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DEPARTMENT OF ENVIRONMENTAL HEALTH  
KETTERING LABORATORY  
(513) 872-3700

September 5, 1973

Mr. Richard Sager  
The Sager Glove Corporation  
4030 North Nashville  
Chicago, Illinois 60634

Dear Mr. Sager:

Enclosed is a report of the survey conducted on August 28, 1973 in your Murray, Kentucky Plant.

In the course of the survey, your MSA Model G personal sampling pump was flow calibrated, and the simple sampling procedure was demonstrated. A draft copy of the procedure was left at Murray, and another copy is enclosed. We anticipate that your staff will be able to conduct all the air sampling called for by OSHA on your own from now on. We will, of course, be glad to advise you as necessary, and perform the dust counts by the standard method. It was a pleasure to work with the people at Murray, and I appreciate their courtesy to my son and me.

An invoice is also enclosed.

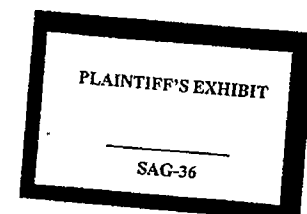
Sincerely,

Howard Ayer  
Associate Professor

cc: D. Yeager  
Frank Pear

HA:bh

Enclosures (3)



DKS 125

AIR SAMPLING FOR ASBESTOS DUST

Report of a Survey on Aug. 28, 1973

by

Howard Ayer  
Certified Industrial Hygienist

at

Sager Glove Corporation  
Murray, Kentucky

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### SUMMARY AND RECOMMENDATIONS

The Murray, Kentucky Plant of the Sager Glove Corporation was surveyed for asbestos dust concentration on August 28, 1973. All samples were within the present OSHA limit of 5.0 fibers longer than 5 micrometers per cubic centimeter (fibers/cc).

Personnel of the Sager Glove Corporation were instructed in the use of air sampling equipment for future monitoring. It is recommended that a series of air samples be taken during cold weather with windows closed.

On the basis of present knowledge, no operations are believed to present a health hazard. However, both good occupational health practice and OSHA regulations require periodic physical examinations of people working with asbestos, and periodic monitoring of asbestos dust in workroom air.

Several individual samples were slightly above the 1976 average limit of 2.0 fibers/cc, and to meet these more stringent standards, control measures will probably be required. Before the 1976 standards take effect, it is recommended that:

1. The asbestos operations be located in a separate room or building,
2. Sewing and turning operations be provided with local exhaust ventilation, and
3. Cloth cutting be provided with local exhaust ventilation unless asbestos cutting operations are conducted for no more than one-half of each workday.

### INTRODUCTION:

The Murray, Kentucky Plant of the Sager Glove Corporation manufactures a wide variety of safety clothing. Several types of asbestos gloves are included in the product line. At the time of the survey on August 28, 1973, asbestos gloves were the only product using asbestos. To make the gloves, asbestos cloth is laid out on a cutting table, eight high, and cut into rectangular strips with a knife. The glove pieces are cut from the strip by a stamping press with appropriate dies. The pieces are taken to a group of women who sew them into gloves and sew on wool or cotton liners. The gloves are turned right-side-out by a man at the turning operation, and pressed and inspected at another operation. Asbestos dust may be generated at any of the operations.

The asbestos glove operations are conducted in a large room in which a variety of non-asbestos safety clothing is made. In addition to the 9 or 10 people working with asbestos-containing products, the other workers at the process would be exposed to some dust being blown about. During the summer months, all windows are open and a number of man-cooling fans are in use. This would have the tendency to reduce average dust concentrations, but distribute the dust more about the workroom.

### PROCEDURE:

Personal samples were taken on exposed workers using Mine Safety Appliances Company Monitaire or Model G sampling pumps and Millipore Aerosol Analysis Monitors. The Monitors were loaded with type AA, nominal 0.8  $\mu$ m pore size membrane filters.

The filter holders were fastened to the worker's shirt or blouse within 30 centimeters (12 inches) of the worker's nose. In use, the front cap was removed and the filters were used open face, with the face down. The flow was adjusted to a reading of 8 on the pump rotameter, which gave a flow rate of 2.10 to 2.22, depending on which pump was used. Each pump was individually calibrated by the bubble meter method prior to sampling.

Sampling periods of one hour or more were used for each sample. All samples were taken for determination of average exposure.

No operations were observed which might generate peak concentrations for which the ceiling limit would be applicable.

Samples were returned to the Kettering Laboratory, and counted by the standard NIOSH procedure. The filters were rendered transparent by a mixture of dimethyl phthalate and diethyl oxalate and fibers longer than 5  $\mu$ m were counted at 400X using phase contrast illumination.

#### RESULTS:

Results of air samples are presented in the attached table. The weighted average fiber concentration at the asbestos glove sewing operation was 1.8 fibers longer than 5 micrometers per cubic centimeter (fibers/cc). At the asbestos cloth cutting it was 2.0 fibers/cc. Other concentrations were less than 1.0 fibers/cc. All these concentrations are within the present Occupational Safety and Health Administration standard of 5.0 fibers/cc.

## DISCUSSION:

The Occupational Safety and Health Administration has adopted a limit for asbestos dust in workroom air of 5.0 fibers per cubic centimeter until July 1, 1976, as counted by a specified procedure. This limit is for an average over an eight-hour workday. Workers may be exposed at or above this level for a portion of a workday provided that at no time they are exposed to as much as 10.0 fibers/cc. Effective July 1, 1976, the 8-hour limit is to be reduced to 2.0 fibers/cc, with the same maximum allowable concentration of 10.0 fibers/cc. In interpreting measurements of asbestos dust it is necessary to consider the present limit of 5.0 fibers/cc for eight hour average exposures, the scheduled reduction to 2.0 fibers/cc for eight hour average exposure, and the maximum limit of 10.0 fibers/cc.

As noted above, all concentrations were well within the present limit for average exposures, and no operations were observed which seemed likely to exceed the maximum limit.

For all workers to be within the limit every day, it is necessary to keep the usual concentrations well under the limit, or violations will occur. With the open windows, concentrations at the asbestos glove sewing may have been lower than they would be in winter with windows closed. This is also true of glove turning, and possibly inspection. On the other hand, the general workroom air had readily measurable concentrations of asbestos dust although only the asbestos glove operations generated the dust. To assure that concentrations are within

present OSHA limits when windows are closed, another series of samples should be taken during the winter.

To meet the 1976 limit, additional controls will probably be required. In planning for this reduction in allowable dustiness, the following actions could be considered:

1. The operations using asbestos should be conducted in a separate room with its own ventilation system. This would limit the number of workers exposed to asbestos and make dust control measures simpler.
2. A local exhaust system at sewing, turning, and possibly pressing and inspection can be installed. A lateral or downdraft exhaust using a control velocity of 100 linear feet per minute would be suitable. For sewing, an exhaust volume of about 400 cubic feet per minute (cfm) per machine will probably be necessary to achieve the control velocity. This assumes that a nine inch clearance is necessary between the needle and an exhaust hood. A similar volume should control the turning operation.
3. At the cutting table, a slot along one side with an exhaust volume of 100 cfm per square foot of table should provide control to the OSHA average limit of 1976. However, if the asbestos dust concentration determined during this survey at cutting is typical, and the operation is conducted for no more than four hours per day, additional controls would not be required, because the daily average would be well within the reduced limit.

# RESULTS OF AIR SAMPLES AT SAGER GLOVE CO.

Murray, Kentucky Plant

August 28, 1973

| Sample No.                                   | Operation                       | Worker    | Sampling Time (min.) | Fiber Concentration (fibers longer than 5µm per cc) |
|----------------------------------------------|---------------------------------|-----------|----------------------|-----------------------------------------------------|
| S-1                                          | Sewing glove liners             | Nell      | 77                   | 0.2                                                 |
| S-2                                          | Sewing asbestos gloves          | Christine | 73                   | 1.1                                                 |
| S-3                                          | Sewing asbestos gloves          | Juanita   | 69                   | 2.2                                                 |
| S-4                                          | Sewing asbestos gloves          | Hazel     | 64                   | 2.8                                                 |
| S-5                                          | Sewing asbestos gloves          | Sue       | 60                   | 1.1                                                 |
| S-10                                         | Sewing asbestos gloves          | Patricia  | 64                   | 2.8                                                 |
| S-11                                         | Sewing asbestos gloves          | June      | 62                   | 0.9                                                 |
| WEIGHTED AVERAGE CONCENTRATION SEWING GLOVES |                                 |           |                      |                                                     |
| S-7                                          | Turning gloves                  | Charlie   | 75                   | 0.6                                                 |
| S-8                                          | Press and Inspect gloves        | Barbara   | 63                   | 0.4                                                 |
| S-9                                          | Cutting asbestos cloth          | Randy     | 61                   | 2.0                                                 |
| S-6                                          | Workroom air, sewing cotton --- |           | 84                   | 0.3                                                 |