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MANUFACTURING DIVISION
COUNTY LINE ROAD
VALLEY FORGE, PENNSYLVANIA



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PURPOSE:

This survey was made to evaluate the employee exposure to dust containing asbestos used in the manufacturing operations. The principal areas evaluated were the Batch Department and the Cutting Departments.

CONCLUSION:

The results of the dust samples sent into our laboratory at the first of the year indicated that this dust did not contain any free silica, It did have the amorphous silica dust which carries a Threshold Limit Value of 20 million particles per cubic foot of air, and found in this dust is fibrous asbestos material which constitutes the major hazard to employees working in these manufacturing operations. The results of the dust samples which were taken for asbestos indicated that the Asbestos Loading Station in the Batch Department exceeded the Threshold Limit Value for asbestos fibers and that areas in the Cutting Department approached this limit. Overall control at this Loading Station should be improved and there is no doubt that during certain times in the Cutting Department excessive dust exists and should be controlled through the use of a very good respirator program. In the case of the one station in the Batch Department, better enclosures and improved exhausting should be done.

CONTACTS:

Mr. E. R. Millham, Production Control Manager, was contacted during this visit. Mr. W. F. Heim, Engineering Representative from our Philadelphia Engineering Department, assisted in taking the samples and performing the survey.

PROCEDURES:

Two methods for collecting dust since an overall evaluation of the total dust is necessary from the standpoint of amorphous silica and an evaluation of the asbestos were both needed. The first method collects dust samples by means of midjet impingers utilizing distilled water as the collecting medium. The sampling rate was 0.1 cubic feet of air per minute. Ten minute intervals were used where the operations permitted. Dust counts were then made on a light field as recommended by the U.S. Public Health Service method for dust techniques.

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The second method including collecting airborne samples of dust on membrane filters in the the same locations. A sampling rate of 20 liters of air for a 20 minute interval was used. The asbestos fibers were then counted as determined by the Membrane Filter Method at 430 X phase contrast magnification. Also a recommended U.S. Public Health Service method for dust techniques.

RESULTS:

The results of the sampling for dust in air are given in Appendix A.

CRITERIA:

In the study of occupational health hazards, certain guides are used in evaluation of the exposures. These values refer to TLV's or Threshold Limit Values which have been adopted by the American Conference of Governmental and Industrial Hygienists. They represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect. These limits should be used as guides in the control of health hazards and should not be regarded as fine lines between safe and dangerous conditions.

In the case of dust containing asbestos, the present Threshold Limit Value is 5 million particles of dust per cubic feet of air, as counted by the standard impinger light field count technique. The new Threshold Limit Value is being developed and is presently recommended whereby 12 fibers greater than five microns in length per millimeter of air as determined by the membrane filter method of 430 X phase contrast magnification or two million particles per cubic foot of air as counted by the standard impinger light field count technique. In this survey, both methods were used since the latter method is a new method based only on asbestos fibers, however, does not presently have the data background necessary to fully evaluate its utilization.

DISCUSSION:

In the Batch Department, a very high concentration of asbestos fibers was found during the loading of asbestos at the Asbestos Loading Station. This is a short duration operation but due to the extremely high concentration of asbestos fibers found here, it is recommended that this Loading Station be controlled better. Enclosing the Station and actually providing an enclosure over the belt extending from the operator is needed. During the sample, it was noted that dust from the Lime Loading Station actually carried across the room into the Loading Station area. Better balancing of these systems should be done.

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In the Cutting Department, the highest fiber count determined was at the Block Sawing Operations. However, this was slightly below the Threshold Limit Value for asbestos fibers greater than five microns in length. There would most likely be times when excessively high dust concentration would be in this area as well as other sawing operations. For this reason, it is recommended that a strong respirator program be provided for the employees whereby employees would be issued respirators in closed containers to keep them clean until they are used. Their use should be where controls are presently not sufficient and where a short duration high concentration of dust exists. This respirator program should include washing the respirators at night and issuing clean respirators daily to each employee.

The total dust count which would be comparable to the amorphous silica having a Threshold Limit Value of 20 million particles per cubic foot did not in any of the sampling area exceed this limit. The main hazard is asbestos fibers and therefore the recommendations submitted are based on this material.

RECOMMENDATIONS:

- A. Batch Department - Asbestos Loading Station should have better control of dust at the source. Included in these improvements should be:
 - 1. Better enclosure of conveyor extending six feet or more up the belt from the operator.
 - 2. Balance of the exhaust system so dust is not pulled from the Lime Loading Station when loading the asbestos.
- B. Batch and Cutting Departments - A strong respirator program should be used in areas where engineering controls are not now effective and where there is short duration high airborne concentrations of dust. This program should include providing washed and clean respirators to the employees daily.


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