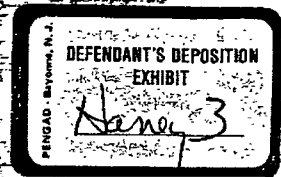


FILE NAME: Hercules Chemical (HERC)

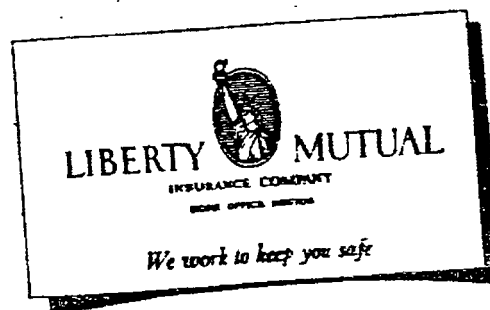
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INDUSTRIAL HYGIENE SURVEY
THE CONTINENTAL DIAMOND PIERRE COMPANY
HAVES DIVISION
MARSHALLTON, DELAWARE
SUBMITTED BY: E. E. MC KINLEY
DATE: FEBRUARY 4, 1955



LOSS PREVENTION DEPARTMENT

067064

THE CONFIDENTIAL BUREAU OF THE ARMY

BOYDING BUREAU

HYDROGEN CHLORIDE

Air samples for hydrogen chloride and dusts in air were collected during an Industrial Hygiene Survey on December 22, 1954. Sampling for the condensate hydrogen chloride was conducted in the asbestos treating department; samples for asbestos dusts were conducted in the treating, drying, storage and mixing room; and for general dusts, were collected in the mixing feeding area.

DISCUSSION

1. The employees treating the raw asbestos and handling it during the subsequent operations are not being exposed to continuously sustained concentrations of a magnitude considered to be a health hazard. In the handling of the dried material i.e., removing it from the dryers and dumping it in the storage bins the employees performing these operations are exposed to high concentrations of asbestos dusts. The practice of wearing respirators while performing this operation, then leaving the storage room after it is completed, provides sufficient control over this exposure.
2. The employees in the asbestos treating room are not being exposed to hazardous concentrations of hydrogen chloride during the dumping of the digester and the washing of the treated material. The respiratory protection in this department is necessary only to provide employees comfort during the dumping of the digester.

3. The employee performing the sanding is exposed to extremely high concentrations (see sample #7 - data sheet) of dusts from the finished product when beyond the full influence of the exhaust system. The employees in the general room area outside the sanding room were not exposed to hazardous dust concentrations.

The use of respirators is essential in controlling the exposure of the grinding employees to dust; however, proper work positioning will be instrumental in reducing the amount of material produced by sanding through better utilization of the exhaust booth.

RECOMMENDATIONS

1. Equipment should be provided so that objects taken into the booth could be placed at an elevation reasonably close to that of the exhaust fans. The grinding of material placed on the rear bench, during sampling contributed very little to the general dustiness of the booth. Even though it was shorter than the operation being sampled the exhaust system was much more effective in removing the material produced by grinding and in limiting its dispersal in the area.
2. The fitting of respirators should be reviewed with the employees and their supervisors. The fitting of respirators affects their ultimate control, therefore, of extreme importance. It was noticed that improper fitting permitted some employees to breathe through the bottom of the face piece.

DISCUSSION

Grinding - Work Positioning

There a factor of mobility enters into local exhaust ventilation, then the adoption of good work procedures are vital aspects of control. In the instance where various shapes are finished by grinding, those pieces having a size which permit moving, are placed in the exhausted grinding room. The positioning of the piece within the room is important. As indicated it should be at a work height close to the elevation of the exhaust outlets. The closer the positioning to the exhaust, at the same level, the more effective the control will be.

Proper relationship between the employee and the location of the work is also necessary. If the employee is between the work and the exhaust outlet, then all the contaminants will be toward him, if the employee is to the side or facing the exhaust outlet then the contaminant will be drawn either past him or directly away from him thus reducing his exposure to the airborne dusts.

In contrast, the job being performed during the survey was at the extreme end of the room away from the exhaust and the employee was standing with his back to the exhausted area, with much of the contaminant flowing upward toward him.

Respirators

The use of respirators for employee protection against continuously contained hazardous atmospheres is not considered a good control method. Since the operations surveyed were of the intermittent nature the types of controls as employed, are acceptable. Quite frequently even short exposures are difficult to control due to the fact that the employee either does not appreciate the hazard involved or else he is uncooperative and does not choose to wear the protection provided. This lack of regard for the use of the respirator was not evident during the survey. Poor fitting of respirators was noticed and as indicated in our recommendation, this condition should be corrected.

The Maximum Allowable Concentration

The maximum allowable concentration, as defined in our report on the Compound Department, is that amount of a contaminant which will not produce injury during intermittent or continuous daily exposures. The maximum allowable concentration for asbestos dust is 5.0 million particles per cubic foot of air; for hydrogen chloride, 10 parts of hydrogen chloride per million parts of air. Dusts in the welding area are considered to be less toxic with the suggested maximum allowable concentration of 30.0 million of particles per cubic foot of air.

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The concentration values for asbestos and hydrogen chloride are those adopted by the American Conference of Governmental Industrial Hygienists. The values for dusts of low toxic nature is the suggested Liberty Mutual MAC, based on experience with dusts in the broad category called nuisance dusts.

E. E. McKinlay
Industrial Hygienist

END:m

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DATA SHEET

ASBESTOS IN AIR

Sampling Method: Wilcoxon pump with sidget impingers.

Collecting Medium: Distilled water.

Method of Analysis: The dust was counted on a bonnarystanster counting cell, using the light field technique; only those considered respirable, 10 microns or less in diameter, are included.

Sample #	Time & Length	Location	Dust Concentrations
			In MPPCF*
1.	10:50 A.M. 15 min.	General room sample treated asbestos storage. Bldg. #27. No activity.	1.6
2.	11:15 A.M. 8 min.	General room sample. Beside #2 bin during dumping of drying pans. Bldg. #27.	34.6 Asbestos
3.	11:25 A.M. 20 min.	General room sample. Hovog mixing room. Mixer #2 loaded during sampling.	4.0
4.	1:45 P.M. 20 min.	General room digester, charging platform (Charging 3 minutes)	2.8
5.	2:30 P.M. 20 min.	20 minute general room sample, center of treating room. Bldg. #26	1.4
6.	3:00 P.M.	General room sample outside sanding room.	1.4
7.	3:30 P.M. 6.5 min.	Breathing zone sample of employee disc sanding large piece in sanding room.	190.0 Average

*MPPCF- Million of particles per cubic foot.

MAC - The maximum allowable concentration for asbestos dust is 5.0 million particles per cubic foot of air, as adopted by the American Conference of Governmental Industrial Hygienists.

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