

FILE - Summary - Env Hygiene

INTER OFFICE MEMO

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TO A. E. Ardis AT Assonet, Mass. DATE April 3, 1969

FROM Richard Henderson AT New Haven, Conn. COPY TO Mac Roy Casque, M.D.
W. W. Sears
H. H. Kaster
R. E. Lander
H. S. Gold
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File (2)

SUBJECT Environmental Hygiene -
Thompson Plastics, Assonet, Mass.

I. Introduction

This report covers only potential environmental hazards from physical or chemical agents in the work environment at Thompson Plastics that may not be recognized and are not readily evaluated by employees. There may be potential environmental hazards that were not noted during my visit March 27-28, 1969 and changes in operating procedures can introduce new hazards.

Safety aspects of the Thompson Plastics operation are covered in the report of W. W. Sears, whom I accompanied during my visit.

II. Summary

The possibility of potentially hazardous exposures to the following were noted in the Thompson Plastics operations:

- A. Nitrobenzene
- B. Vinyl chloride
- C. Noise

Trichloroethylene, perchloroethylene, vinyl acetate, surfactants, catalysts, caustic and small quantities of other chemicals are handled in the reactor buildings. Many other chemicals are handled in the laboratories. These do not appear to pose potential hazards from long-term, low level, chronic exposure.

III. Recommended Actions

- A. Environmental Hygiene Services personnel will work with Thompson Plastics personnel to develop procedures for periodic monitoring of exposure to nitrobenzene and vinyl chloride.
- B. Environmental Hygiene Services personnel will conduct an evaluation of the noise exposure in the boiler house and the polymer drying and packaging operations. A program of hearing conservation will be recommended on the basis of the evaluation.
- C. The adequacy of air flow in laboratory hoods should be determined. Hoods should have an air velocity at the face of at least 100 feet per minute in order to capture chemical vapors and keep them from spilling out of the hood. Environmental Hygiene Services personnel can assist in this.

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IV. Discussion

A. Nitrobenzene

One person in the laboratory routinely handles nitrobenzene. Nitrobenzene can be absorbed through the skin as well as by inhalation of vapor. When absorbed, it causes conversion of hemoglobin to methemoglobin, reducing the oxygen carrying capacity of the blood. A single exposure to a large amount from a spill or splash can rapidly deplete the oxygen carrying capacity of the blood and endanger life. Daily exposure to concentrations not immediately hazardous to life can cause a depletion in hemoglobin and resultant anemia.

Enclosed is a copy of a Health Safety Data Sheet used in New Haven to familiarize persons with potential hazards and control procedures when working with nitrobenzene. I recommend that the procedure of periodic hemoglobin and methemoglobin determinations be used for the person working routinely with nitrobenzene. Environmental Hygiene Services personnel can do initial hemoglobin and methemoglobin determinations at the beginning and end of a work day to establish the procedure.

B. Vinyl chloride

The American Conference of Governmental Industrial Hygienists has established a Threshold Limit Value of 500 parts per million (1300 mg per cubic meter) of vinyl chloride vapor in air for continuous eight-hour per day/five days per work week exposure. This is a ceiling value, not a time weighted average value. Dr. Don Irish, Dow Chemical Company, has reported that vinyl chloride can be detected by odor at 4,000 parts per million - eight times the Threshold Limit Value. Persons cannot detect by odor or by other senses when they are being overexposed to vinyl chloride unless the overexposure is at least eight times the allowable level.

Chronic overexposure to vinyl chloride can cause changes in the liver and eventual liver damage. Persons with a history of liver damage or who have recently recovered from infectious hepatitis should not work in areas where potential exposure to vinyl chloride exists.

The automatic detection system in the reactor buildings increases air flow when the vinyl chloride concentration reaches 1 percent (10,000 parts per million). This system is designed for explosion prevention, not for exposure control for personnel.

I have discussed with Dr. Lapkin the possibility of obtaining air samples from the work environment of the reactor building and determining the vinyl chloride concentration in the samples by use of the vapor phase chromatographic equipment in the laboratory at Thompson Plastics. We can work together in obtaining data he wants on atmospheric losses of vinyl chloride that also will provide data on exposure of personnel. We also may be able to analyze

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exhaled breath for vinyl chloride as a measure of exposure; Dr. Don Irish, Director of Biochemical Research Laboratories, Dow Chemical Company, has reported that when vinyl chloride is absorbed by inhalation, the body burden is reduced in part through exhalation of vinyl chloride.

C. Noise

1. Boiler House

The noise level around the furnaces is high enough to require shouting in order to communicate. We can evaluate the noise levels to determine the best method of reducing noise exposure to prevent hearing loss.

2. Polymer Drying Building

This is another high noise level area. Part of the noise appeared to be from a steam leak. We can evaluate noise levels and make recommendations for a hearing conservation program.

D. General

The concept of disease one, five, or ten years from now as a result of exposures that are occurring now and can continue is often difficult for employees to envision. Mr. Lander has done a good job in terms of controls for acute hazards. I am sure that Mr. Gold will continue to do a good job both in control of acute and long-term hazards.

Mr. Sears has mentioned the desirability of regular plant safety meetings. Dr. Leonard Krause and I have participated in a number of plant safety meetings at many plant locations. We have even had meetings extending over two days so that we could describe potential hazards and control procedures to the total work force in a plant. Once you have your plant safety meetings organized I would be happy to attend a meeting to discuss environmental hygiene and health.

RH:aph
Encl.-"Nitrobenzene Health
Safety Data Sheet"


Richard Henderson