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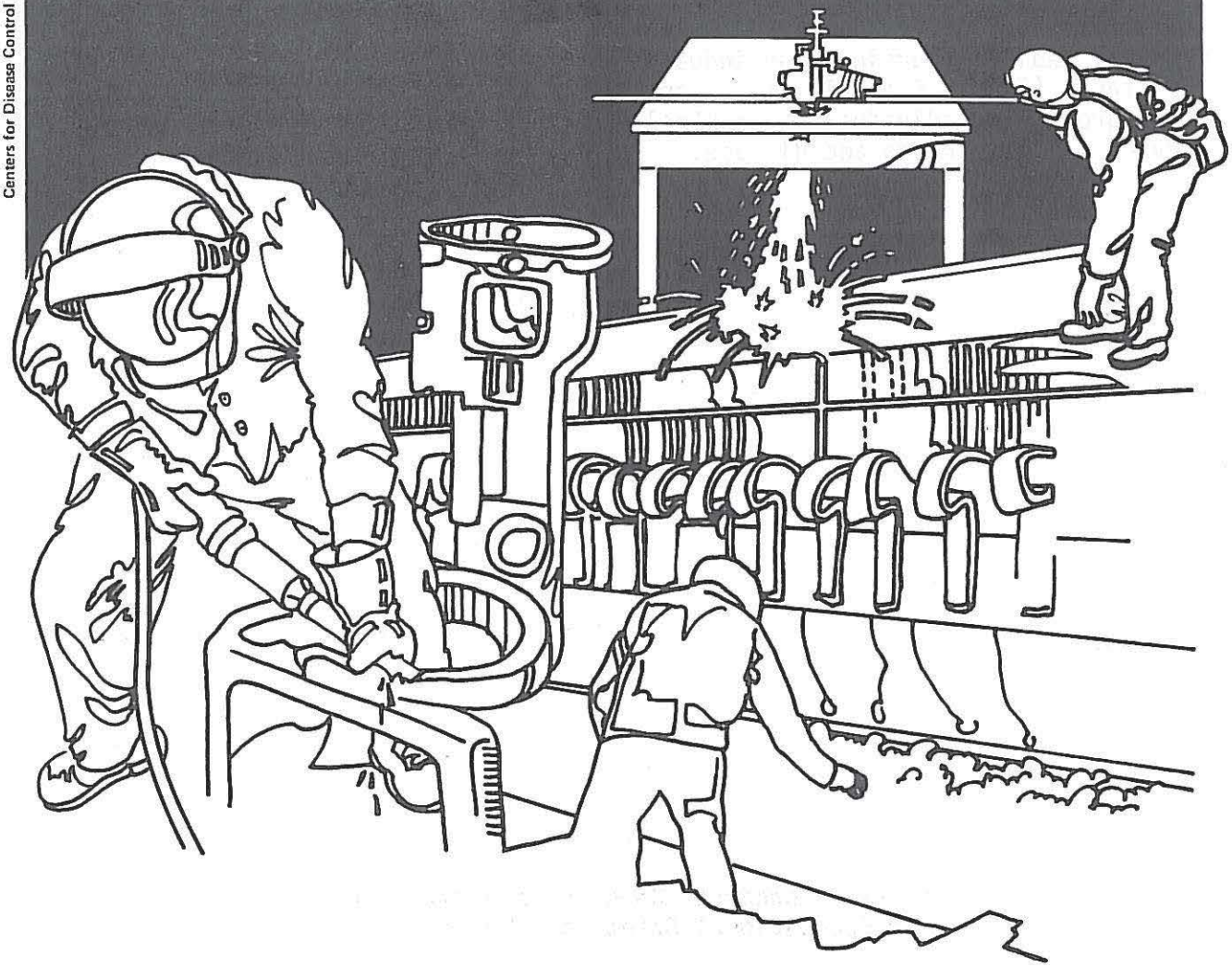

Health Hazard Evaluation Report

HETA 81-209-891
PILGRIM GLASS COMPANY
CEREDO, WEST VIRGINIA

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

HETA 81-209-891
June 1981
Pilgrim Glass Company
Ceredo, West Virginia

NIOSH INVESTIGATOR:
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I. SUMMARY

On March 2, 1981, the National Institute for Occupational Safety and Health (NIOSH) received a request for a health hazard evaluation from the American Flint Glass Workers' (AFGW) Local Union 708 to investigate exposures of employees working on the plate line in the Hot Metal Shop at the Pilgrim Glass Company. The workers were concerned about asbestos fiber exposure in this area.

NIOSH conducted a site visit on March 19, 1981, to conduct an opening conference, a walk-through survey, and an industrial hygiene evaluation. Personal breathing zone air sampling for asbestos fibers and a review of work practices and working conditions were performed. Analysis of environmental samples showed that time weighted average (TWA) asbestos exposure concentrations of the seven workers NIOSH monitored ranged from 0.02 to 1.13 fibers per cubic centimeter of air (fibers/cc), based on a count of fibers greater than 5 micrometers in length which exceed current NIOSH criteria. All TWA exposures were, however, below the current OSHA standard of 2.0 fibers/cc.

Worker exposure to airborne concentrations of asbestos, a recognized carcinogen, were measured at the Pilgrim Glass Company during the March 19th survey. Recommendations to eliminate this recognized health hazard include limiting employee exposure to asbestos and developing an environmental and medical surveillance program.

KEYWORDS: SIC 3559 (Glass making machinery), Pilgrim Glass Company, asbestos, carcinogen

II. INTRODUCTION

On March 2, 1981, the National Institute for Occupational Safety and Health (NIOSH) received a request for a health hazard evaluation from the American Flint Glass Workers' (AFGW) Local Union 708 to investigate exposures of employees working on the plate line in the Hot Metal Shop at the Pilgrim Glass Company. The workers were concerned about asbestos fiber exposure in this area.

An interim report dated February 1981 covering the findings of the initial survey, and future actions needed to complete the evaluation was provided to the company and union. Interim environmental sampling results of the initial survey were submitted to the company and union in a letter dated April 14, 1981.

III. BACKGROUND

A. Description of Process and Workforce

Pilgrim Glass Company's plate press line in the Hot Metal Shop employs 6 workers to press out about 900 thirteen inch plates in one 8-hour shift per day. The workers on this line include a gatherer, a presser, two carry-in people, a foreman's helper, and a separator. The gatherer uses a long-handled rod to extract about 4 lbs of molten glass from the continuous tank furnace and drops it on to a press. The presser forms the plate. Next carry-in person #1 transfers the plate to a carbon holder using a scoop. Carry-in #2, using asbestos gloves, stacks the plates in columns of 3 with 4 small irregular shaped pieces of 1/4 inch asbestos mill board separating each plate. Carry-in #2 removes his gloves to transfer the column of 3 plates to the hot end of the #2 lehr using a long-handled paddle. The lehr is a temperature controlled enclosed conveyor belt used to slow the cooling of newly formed glassware. This slow cool process prevents the glass from cracking. The lehr's inlet temperature of 900°F drops 50°F for every 6 feet the belt moves. Resident time in the lehr is 2 hour and 45 minutes. At the cold end of the lehr (80°F) a separator removes and prepares the plate for shipping. The small 2 to 5 inch irregular shaped pieces of asbestos mill board are dropped into a 3 foot square cardboard box. When the box is full it is returned to the beginning of the plate press line to be reused in the plate stacking process. These asbestos pieces are used until they deteriorate or are lost. About once a month the foreman's helper must break new pieces of asbestos mill board by hand. He performs this task outside in open air. The mill board is received in 42 x 48 inch sheets.

The employees in the Hot Metal Shop are potentially exposed to airborne asbestos. Employees on the plate press line are most likely to receive the highest exposures since they are directly involved with the asbestos gloves and mill board which are the primary sources of airborne asbestos in the Hot Metal Shop.

Management indicated that dry sweeping was used to clean the Hot Metal Shop. This would increase airborne asbestos fiber concentrations, thus increasing worker exposures.

B. Environmental Controls

In the roof of the Hot Metal Shop there were four 42-inch general exhaust fans each with capacity ratings of 14,780 CFM. One was not in operation during the survey. Two garage sized doors and three standard sized doors are open to the outside in the Hot Metal Shop. Also there is an air intake port outside the building that supplies a manifold which circles the continuous tank furnace. The manifold delivers air primarily for cooling purposes. This along with the open doors and exhaust fans insure that air changes in the building are frequent. A floor fan is used to provide air movement on the plate press line. This probably increases asbestos exposures by blowing free fibers into the air that workers breath.

IV. EVALUATION DESIGN AND METHODS

An opening meeting was conducted with labor and management representatives on March 19 to discuss the nature and scope of the evaluation. A walk-through survey was carried out on the Hot Metal Shop. Information concerning (1) process; (2) materials handled; (3) work schedules; (4) environmental controls; and (5) basic demographic data was obtained.

Personal breathing zone samples were taken for asbestos during the second shift on March 19. The samples were collected on 37mm cellulose ester membrane AA filters using MSA personal sampling pumps operating at 2.0 Lpm following the NIOSH recommended method. The samples were analyzed according to NIOSH Method P & CAM 239 utilizing Phase Contrast Microscopy, and are reported in fibers per cubic centimeter of air (fibers/cc). The limit of detection for this method as used in the NIOSH laboratory is 4500 fibers per filter.

V. EVALUATION CRITERIA

Available studies provide conclusive evidence that exposure to asbestos fibers causes cancer and asbestosis in man.[2]

NIOSH believes that the OSHA standard of 2.0 fibers/cc (8 hour time weighted average, TWA) does not provide adequate protection for workers against cancer. NIOSH based this position primarily on two reasons: (1) the OSHA standard of 2 fibers/cc was established in 1969 by the British Occupational Hygiene Society for the limited purpose of minimizing asbestosis; and (2) no scientific data exist to date supporting any safe level of asbestos exposure. In view of the above, the standard should be set at the lowest level detectable by available analytical techniques which is NIOSH Method P & CAM 239 Phase Contrast Microscopy.

VI. RESULTS

Asbestos air sampling results are presented in Table I. All samples except three showed detectable airborne concentrations of asbestos. Measured TWA exposures ranged from 0.01 to 1.13 fibers/cc. Some of the sample duration did not extend through the entire 8 hour workday. However, since the work procedures followed by employees were constant, it can be assumed that the TWA exposures in Table I are representative of 8 hour exposures. All TWA exposures were below the current OSHA standard of 2.0 fibers/cc.

Note that the lowest exposure measured was a gatherer for a glass blowing operation which was adjacent to the plate press operation. This gatherer was sampled to determine if significant levels of asbestos are transfered to other areas of the plant due to the existing excessive air movement necessary for cooling purposes.

VII. RECOMMENDATIONS

Since a health hazard does exist at Pilgrim Glass Company due to asbestos exposures, action should be taken which will prevent future potential impairment of workers' health.

1. Every effort possible should be made to find a replacement material to substitute for the asbestos mill board and gloves. However, if this is not possible, Recommendations 2 through 6 should be followed.

2. Action should be taken to up-grade housekeeping techniques. For example, vacuum cleaning should be used rather than sweeping to clean floors. This vacuuming could be carried out on the 3rd shift when no glassblowing is in process. Also, the used asbestos gloves and mill board should be disposed of in lined garbage cans, so they can be contained. Gloves and mill board should be disposed of before significant deterioration occurs. The asbestos mill board should be ordered in pre-cut squares to eliminate the loss of asbestos fibers from torn edges. Also there are asbestos glove coating materials on the market today which can be used to cut down on glove fiber loss.

3. Employees should be educated about the health hazards of asbestos, and the fact that tobacco smoking enhances the carcinogenic effect of asbestos.

4. The high volume exhaust ventilation in the ceiling of the Hot Metal Shop should be checked periodically, and maintained in its proper working condition.

5. An air sampling program should be carried out subsequent to implementation of control recommendations and periodically thereafter. If after implementation of the control recommendations, asbestos levels are still detectable, other corrective measures will be necessary. Work schedules and records of environmental sampling should be maintained in a manner that will allow the construction of exposure histories for all exposed workers.

6. A medical surveillance program should be adapted which includes: (1) a postero-anterior chest X-ray; (2) spirometry including forced vital capacity (FVC), and forced expiratory volume in one second (FEV); (3) a physical examination of the chest including auscultation for the presence or absence of roles, rhonchi, and wheezing; (4) an assessment of the presence or absence of finger clubbing; a history of respiratory system and conditions including tobacco smoking.[1] The medical record generated should be maintained for 40 years or 20 years after termination of employment.

VIII. REFERENCES

1. Workplace Exposure to Asbestos. DHEW (NIOSH) Pub. No. 81-103. 1980.

2. Revised Recommended Asbestos Standard. DHEW (NIOSH) Pub. No. 77-169, 1976.

3. Occupational Safety and Health Standards for General Industry. U.S. Dept of Labor (OSHA) Sec. 1910.1000 (Jan 1978). Pg 545

4. NIOSH Manual of Analytical Methods, 2nd Ed. Volume 1. DHEW (NIOSH) Pub. No. 77-157A. April 1977.

IX. AUTHORSHIP AND ACKNOWLEDGEMENTS

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X. DISTRIBUTION AND AVAILABILITY

Copies of this Determination Report are currently available upon request from NIOSH, Division of Technical Services, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22151. Information regarding its availability through NTIS can be obtained from the NIOSH Publications Office at the Cincinnati address.

Copies of this report have been sent to:

1. Pilgrim Glass Company, Ceredo, West Virginia
2. Local Union 708, American Flint Glass Workers' Union, Ceredo, W. Va.
3. NIOSH Region
4. OSHA Region

For the purposes of informing the affected employees, copies of the report shall be posted by the employer in a prominent place accessible to the employees, for a period of 30 calendar days.

Table I

Personal Samples for Asbestos Fibers
March 19, 1981

Pilgrim Glass Company
Ceredo, West Virginia
HE 81-209

Job Sampled	Sample Times	Asbestos Fibers/Filter	Asbestos Fibers/cc	TWA Asbestos Exposures Fibers/cc
Carry in #2	3:00p-4:35p	215,000	1.13	
Carry in #2	4:35p-9:05p	327,000	0.61	
Carry in #2	9:05p-11:15p	301,000	1.2	0.86
Carry in #1	3:00p-4:35p	24,000	0.13	
Carry in #1	4:35p-9:05p	32,000	0.06	
Carry in #1	9:05p-11:15p	10,000	0.40	0.16
Foreman	3:00p-4:40p	13,000	0.07	
Foreman	4:40p-6:05p	< 4,500*	< 0.02	0.04
Foreman's Helper	4:05p-7:15p	104,000	0.27	
Foreman's Helper	7:15p-9:25p	37,000	0.14	
Foreman's Helper	9:25p-11:15p	831,000	3.8	1.13
Gatherer for plate operation	4:06p-7:00p	18,000	0.05	
Gatherer for plate operation	7:00p-9:20p	10,000	0.04	
Gatherer for plate operation	9:20p-11:20p	10,000	0.04	0.05
Gatherer for blowing operation	4:40p-7:00p	11,000	0.03	
Gatherer for blowing operation	7:00p-9:20p	< 4,500*	< 0.02	
Gatherer for blowing operation	9:20p-11:20p	< 4,500*	< 0.02	0.02
Selector Cold End #2 Lehr	6:00p-7:50p	76,000	0.35	
Selector Cold End #2 Lehr	7:50p-10:55p	47,000	0.08	0.16

* 4,500 fibers per filter is the lower limit of detection for the analytical method