



DOW CHEMICAL U.S.A.

PLAINTIFF'S EXHIBIT

DOW-2938

TEXAS DIVISION
FREEPORT, TEXAS 77541

ENVIRONMENTAL HEALTH REPORT

ASBESTOS MONITORING
MAGNESIUM III
B-800

FILE NO. B8-1702

DATE January 26, 1979

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CHECKER [Signature]

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Summary

A survey was conducted to evaluate employee exposures to asbestos fibers during a plant shut down at Magnesium III, B-800, on November 28, 1978. All potential employee exposures were well within the permissible exposure limit.

Monitoring should be repeated during the next plant shut-down.

Employees should be informed of the results of this survey, and the informing documented.

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AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

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INTRODUCTION

At the request of supervision, a survey was conducted at Magnesium III, B-800, on November 28, 1978, to evaluate employee exposures to asbestos fibers during a planned plant shut down for electrical repairs.

PROCESS DESCRIPTION

At Magnesium III, molten magnesium is produced electrolytically from magnesium chloride in a bath of mixed salts. By-products of the process are chlorine, hydrogen chloride (both are removed by a vacuum system), magnesium oxide, water vapor, and cell sludge. Magnesium chloride is fed to the cells via an automated conveyor system, and other salts are manually poured from bags into the cells. Vanadium pentoxide, an additive which increases cell efficiency, is added to the cells in sealed plastic bags. Molten magnesium is pumped from wells at the front of the cells into a crucible in the basement, which is then transferred to the casting plant.

Asbestos paper has two major uses at Magnesium III. It is used in small quantities (generally one piece at a time) when cells are being patched by the Running Repair Operators. A piece of asbestos paper is torn to cover the hole being patched while the employee takes a short break to cool off. The purpose of the paper is to keep the metal around the hole from freezing, and to keep the cell sealed to insure that suction on the cell can be maintained. In general, a given Running Repair Operator patches cells about every two weeks.

Once or twice a year, the plant is shut down (usually two buildings at a time) for major electrical repairs. On these occasions, several employees tear pieces of asbestos paper to cover the metal wells and plug the feed and suction pipes. It takes 3-4 employees about an hour to cover the cells in two buildings (approximately 60 cells), and from 1/2-1 hour to remove and dispose of the paper after repairs are completed. The plant shutdown clearly represents the highest potential employee exposures to asbestos fibers, and is the procedure which was monitored in this study.

METHODOLOGY

Personnel samples were collected during both handling procedures (covering cells and paper removal) to determine employee exposures to asbestos fibers. The samples were collected by drawing a measured volume of air (approximately 1.5 liters per minute) at employee breathing zone height through aerosol filters (Millipore MAWG 937A0) with Bendix Micronair II sampling pumps. The pumps were calibrated before and after use with a calibrated Brooks rotameter. Fibers were counted using optical microscopy by Central Laboratory, B-1225.

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EVALUATION CRITERIA

Permissible exposure limits (PEL's) are concentrations of airborne substances to which nearly all employees may be repeatedly exposed throughout a working lifetime without adverse effect. Most PEL's are time-weighted average concentrations for 8 to 12-hour work days and 40-hour work weeks. Permissible exposure limits do not represent line lines between safe and dangerous exposures; they are based on industrial experience and experimental human and animal toxicological studies, and are intended for use as guides for plant design and for evaluating employee exposures.

The permissible exposure limit for asbestos fibers is two fibers per cubic centimeter of air (2 fibers/cc), as an eight-hour time-weighted average. An asbestos fiber is defined as a particle greater than or equal to five microns in length. Ten fibers/cc are allowed as a ceiling concentration for periods up to 15 minutes, provided the exposure for the entire 8-12 hour work day does not exceed 2 fibers/cc, and there are no more than four excursions per day, which are separated by at least an hour.

RESULTS AND DISCUSSION

The results of the personnel monitoring for asbestos fibers are shown in Table 1. All potential employee exposures (nose-mouth respirators were worn during the entire procedure) to asbestos during the handling procedures were well within the permissible exposure limit of two fibers per cubic centimeter of air. The highest potential exposure was about 20% of the allowed level; however, all others were 5% or less.

CONCLUSIONS AND RECOMMENDATIONS

Employees at Magnesium III are not being overexposed to asbestos fibers. The highest potential exposures occur during plant shut downs once or twice a year, and are well within the permissible exposure limit.

It is recommended that monitoring be repeated during the next plant shut down to further substantiate the results of this survey. Monitoring for asbestos fibers during cell patching procedures is not necessary at this time.

It is also recommended that employees be informed of the results of this survey, the consequences of overexposure to asbestos fibers, methods of control, and the care and use of respiratory protective equipment. This informing process should be documented.

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TABLE I
ASBESTOS MONITORING RESULTS

SAMPLE NO.	EMPLOYEE MASTER NO.	DATE	TIME(MIN.)	ASBESTOS CONCENTRATION (FIBERS/CC)
88-1702-1	140319	11-28-78	45	0.068
2	133302	11-28-78	50	0.073
3	134916	11-28-78	--	pump stopped
4	135541	11-28-78	25	0.34
5	140319	11-28-78	--	pump stopped
6	135541	11-28-78	17	0.080
7	135541	11-28-78	36	0.040
8	140319	11-28-78	61	0.044
9	141180	11-28-78	48	0.099
10	141298	11-28-78	34	0.007

Permissible exposure limit (fibers/cc air)*

2

* 8 hour time-weighted average

Samples 1-6 represent cell covering procedures; 7-10 were collected during paper removal and disposal.

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CONSEQUENCES OF OVEREXPOSURE

COMPOUND: ASBESTOS

EXPOSURE LIMIT: 2 FIBERS/ML , > 5 MICRONS IN LENGTH

ODOR: NONE

EYES: CONTACT WITH THE DUST CAN CAUSE IRRITATION
SIMILAR TO THAT CAUSED BY SIMILAR FOREIGN
BODIES.

INGESTION: SOME EVIDENCE INDICATES THAT SWALLOWED
ASBESTOS MAY INCREASE CHANCES OF STOMACH
CANCER.

DUST INHALATION:

SHORT TERM: INHALATION OF HIGH CONCENTRATIONS
OF THE DUST MAY CAUSE MODERATE
DISCOMFORT. INHALATION OF
MODERATELY HIGH CONCENTRATIONS
MAY CAUSE NO DISCOMFORT.

LONG TERM: INHALATION OF THE ASBESTOS FIBERS
IN CONJUNCTION WITH SMOKING HAS BEEN
SHOWN TO INCREASE CHANCES OF LUNG
CANCER BY ABOUT 90 TIMES THAT OF A
PERSON WHO NEITHER SMOKES NOR WORKS
WITH ASBESTOS. CAN ALSO CAUSE A
SERIOUS LUNG DISEASE CALLED ASBESTOSOS.
CAN ALSO CAUSE CANCER OF THE CHEST
LINING.

COMMENTS: PROPER RESPIRATOR IS REQUIRED WHEN WORKING WITH
ASBESTOS.

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