



DOW CHEMICAL U.S.A.

PLAINTIFF'S EXHIBIT

DOW-1230

LOUISIANA DIVISION
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INDUSTRIAL HYGIENE REPORT

ASBESTOS SURVEY
CHLOR-ALKALI II BLOCK 36
LOUISIANA DIVISION

CRI NO. _____
FILE NO. LAD-IH-79.03
DATE May 8, 1979
AUTHOR Dannie Kennedy
CHECKED Charlie E. Helph
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SUMMARY

The asbestos in air monitoring for 1978 has been completed in the Chlor-Alkali II block. Survey results were satisfactory and well below the acceptable threshold limit value of 2 fibers per cubic centimeter of air.

Only three (3) of thirty-three samples recorded above 0.01 fibers per cubic centimeter of air. Due to the low results obtained in routine time weighted sampling, it is recommended that short duration excursion sampling be emphasized in the future surveys.

Good Housekeeping, strict safe operating procedures and a constant vigil for problem areas are the most important considerations for a successful abatement program. Employees must be informed of the survey results and must review the consequences of over-exposure to asbestos fibers. (See Attachment No. 2)

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INTRODUCTION

The required asbestos in air monitoring has been completed for 1978. The employees were monitored in each area of the plant to determine levels of exposure to asbestos fibers. (This survey included those areas not associated with asbestos handling or usage to validate the judgment that no problems exist in these areas.) The two major areas of concern are the cell operators' exposure during cell pulping and the asbestos storage area.

DISCUSSION

In addition to everyday safety equipment, operators are required to wear disposable paper suits, rubber gloves and proper dust respirators when handling or working with asbestos. The Chlor Alkali II procedure for handling asbestos and pulping cells should be discussed with each new cell operator and reviewed annually with the experienced operators as a part of the ongoing Industrial Hygiene Education Program.

EXPERIMENTAL

Sampling Method

Personnel samples are collected from the operators breathing zone with a millipore filter (37 mm diameter, 0.8 micron pore size) mounted on an open face filter holder and attached to the operator's lapel. These cassettes were connected to monitoring pumps calibrated with a soap bubble meter to operate at a range of 1.7 to 2.0 liters per minute.

Area samples are collected utilizing the same equipment and method as the personnel samples. Sampling pumps were located approximately ten feet downwind from the asbestos storage area and approximately five feet above the ground.

Analytical

After obtaining the sample on the millipore filter, a four-square-grid section is cut from the exposed filter and placed atop a drop of clear mounting solution. The sample is centered on a microscope slide, covered with a cover slip, and allowed approximately fifteen minutes to clear up before the fiber counting may begin. (The mounting solution is prepared by placing 3 ml each of diethyl oxalate and dimethyl phthalate in a container with 0.6 g of ground up plain white millipore filter paper which dissolves into a clear solution in approximately three days.)

The samples are magnified 500 times with the Reichert Zetopan optical microscope using the Nomarski interference contrast. All fibers over 5 microns in length with a 3:1 length to width ratio are counted as fibers (only one of the four squares is selected for a fiber count),

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After the square grid is selected to be counted, twelve passes are required with the microscope to cover the entire square. To obtain the fibers/cc concentration (greater than 5 microns in length), the following calculation is used.

$$\text{Fibers/cc} = \frac{\text{fiber count (>5 microns in length)} \times \text{sizing factor (92) for filter}}{\text{cc of air (sampling time in minutes} \times \text{flow rate of pump)}}$$

Standards are compared with other locations to confirm the integrity of the counting and analytical determination of fibers present.

RESULTS (see attachment)

Monitoring results indicate all samples were well below the threshold limit value of 2 fibers greater than 5 microns in length per cubic centimeter. The three highest results, of the thirty samples analyzed in the survey, exceeded 0.01 fibers but were less than 0.02 fibers per cubic centimeter. The remaining samples all recorded less than 0.01 fibers per cubic centimeter.

RECOMMENDATIONS

It is recommended that short term excursion sampling be emphasized in future surveys to better identify any potentially high exposure situations.

CONCLUSIONS

The monitoring results were satisfactory and well below the established threshold limit value of two fibers per cubic centimeter. However, due to the hazardous nature of asbestos, strict housekeeping practices and good safe operating procedures remain the most important considerations for a good abatement program. This must be a daily job-by-job program to be successful and to offer the greatest protection to employees.

The Chlor-Alkali employees must be informed of this survey's results and the consequences of overexposure must be reviewed. (See attachment 2)

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Attachment 1

MONITORING RESULTS

Sample #1	Date	Sample Description	Sampling time	Flow rate	Fibers per cc 5 microns in length
1	4/14/78	Operator working in the cell area performing routine duties on day shift. Wind was out of south at approximately 5 mph.	420 min	1500 cc/min	<0.01
2	4/19/78	Operator performing expanded day operations job duties - performing daily maintenance in plant on day shift.	480 min	2000 cc/min	<0.01
3	4/19/78	Stationary Sample - Sampler located in asbestos storage area.	480 min	1800 cc/min	<0.01
4	4/19/78	Operator working in cell area performing routine duties.	360 min	1800 cc/min	<0.01
5	4/19/78	Operator working expanded day operations - performing daily maintenance duties.	480 min	1000 cc/min	<0.01
6	4/20/78	Stationary Sample - Sampler located in asbestos storage area approximately 10 feet downwind from asbestos Pallet.	360 min	1000 cc/min	<0.01
7	4/20/78	Operator working with cell crew performing cell operator duties.	360 min	2000 cc/min	<0.01
8	4/20/78	Operator working with cell crew performing cell operator duties.	360 min	1700 cc/min	<0.01
9	4/20/78	Operator working in the cell area performing routine duties.	360 min	1900 cc/min	<0.01
10	4/21/78	Operator working in the cell area performing routine duties.	360 min	1800 cc/min	<0.01

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Attachment 1 (Cont'd)

MONITORING RESULTS

Sample #1	Date	Sample Description	Sampling time	Flow rate	Fibers per cc 5 microns in length
11	4/22/78	Sampler was accidentally wet during sampling period - could not be counted.			VOID Sample-(Could NOT Count)
12	5/16/78	Operator working in brine area performing routine duties.	360 min	2000 cc/min	<0.01
13	5/16/78	Operator working in caustic area performing routine duties.	360 min	1900 cc/min	<0.01
14	5/16/78	Operator working in the control room performing boardman duties.	360 min	2000 cc/min	<0.01
15	5/16/78	Operator working in the cell area performing routine duties.	360 min	1800 cc/min	<0.01
16	7/24/78	Operator working power section making routine rounds	360 min	1900 cc/min	<0.01
17	8/10/78	Operator working power section - making normal rounds running Lab samples and making adjustments - No upsets. Day shift, winds out of North at 3 mph.	360 min	2000 cc/min	0.014
18	8/10/78	Operator working caustic section - working near EV303 and ARU301. Wind out of North at 3 mph. Day shift.	360 min	1900 cc/min	<0.01
19	8/30/78	Operator working brine section of plant making routine rounds. Winds out of NE at 4 mph.	360 min	1800 cc/min	<0.01
20	8/30/78	Operator working expanded day operations - Worked in liquifaction area only. Winds out of NE at 4 mph.	480 min	2000 cc/min	0.011
21	9/5/78	Operator working Liquefaction Area making general rounds. Winds out of NNW at 3 mph	480 min	1600 cc/min	<0.01
22	9/5/78	Stationary Sample - Sampler located in CA II administration building by secretary's desk.	480 min	1600 cc/min	<0.01
23	9/5/78	Stationary Sample - Sampler located in control room under vent.		1300 cc/min	<0.01

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Attachment 1 (Cont'd)
MONITORING RESULTS

Sample #1	Date	Sample Description	Sampling time	Flow rate	Fibers per cc 5 microns in length
24	9/7/78	Operator working expanded day operations - worked on start-up blower. Wind out of SE at 5 mph.	360 min	1600 cc/min	<0.01
25	9/13/78	Operator working in Liquefaction area making routine rounds. Winds out of South at 5 mph.	360 min	1650 cc/min	0.013
26	9/15/78	Operator working expanded day operations - Working on start-up blower. Wind out of SE at 6 mph.	240 min	1650 cc/min	<0.01
27	9/13/78	Operator working caustic section of plant making general rounds. Wind out of South at 5 mph.	360 min	1600 cc/min	<0.01
28	9/21/78	Operator working power section of plant. No direct contact with asbestos. Wind out of North at 6 mph.	360 min	1650 cc/min	<0.01
29	9/28/78	Operator mixed dry asbestos with water to make pulp and pulped cells for one hour. Winds were out of NE at 6 mph.	60 min	1700 cc/min	<0.01
30	10/4/78	Instrument Specialist working near flat bed filters in caustic area. Winds were out of NW at 4 mph.	360 min	1650 cc/min	<0.01
31	10/4/78	Instrument Specialist worked in shop most of day. Worked in cell area for approximately one hour	480 min	1650 cc/min	<0.01
32	10/13/78	Craftsman worked 4 hours in the shop area and 2 hours in the caustic section of plant. Wind was out of NNW at 4 mph.	360 min	1650 cc/min	<0.01
33	10/13/78	Craftsman worked 4 hours in the shop area and 2 hours in the caustic section of plant. Wind was out of NNW at 10 mph.	360 min	1650 cc/min	VOID - Contaminated slide (Could not see any asbestos fibers.)

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Attachment 2

CONSEQUENCES OF OVEREXPOSURE

COMPOUND: ASBESTOS

EXPOSURE LIMIT: 2 FIBERS/CC, <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 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 ASBESTOSIS. CAN ALSO CAUSE CANCER OF THE CHEST LINING.

COMMENTS: PROPER RESPIRATOR IS REQUIRED WHEN WORKING WITH ASBESTOS.

BSHorvath
6/22/76

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