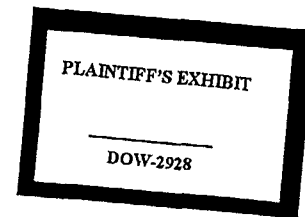




DOW CHEMICAL U.S.A.



TEXAS DIVISION
FREEPORT, TEXAS 77541

ENVIRONMENTAL HEALTH REPORT

EVALUATION OF ASBESTOS EXPOSURES,
DOW INDUSTRIAL SERVICES, HIGHWAY 332

FILE NO. M-152

DATE September 10, 1973

AUTHOR R.L. Silverthorne
L. G. Trahan

CHECKED R. G. Hahn RS

DATE 9-10-73

Summary

The employees exposure to asbestos fibers were evaluated during the cathode cleaning operations at Dow Industrial Services. The time weighted average and peak exposures to asbestos fibers are within acceptable levels.

ST0684751

Distribution

L. A. Little -
File



PROBLEM

Industrial Hygiene was asked to evaluate the exposure of Dow Industrial Service employees to asbestos fibers during the cathode cleaning operations.

CONCLUSIONS

- (1) The employees time-weighted average and peak exposures to asbestos fibers are within acceptable levels.
- (2) The entire cathode cleaning shed is covered with wet asbestos.
- (3) Asbestos fiber levels in the workers clothes were in the 0.09 to 0.16 fibers/ml range.

RECOMMENDATIONS

- (1) Wash down walls and floor of cathode cleaning shed daily.
- (2) Showering should be compulsory at the end of the work day for those employees who work at the cathode cleaning shed.
- (3) Employees should have clean work clothes daily.

PRESENTATION OF DATA

Table I shows the operators exposure to asbestos fibers based on an eight hour day when the cathode cleaning operation is in progress. The time weighted average and peak exposures are within acceptable levels based on the present standard.

Table A shows the results of the sample analyses for the various cathode cleaning operation. The highest asbestos fiber concentration, up to .166 fibers/ml, were found in the worker's clothes.

SAMPLE AND ANALYSIS

Breathing zone and general area air samples were collected on 47 mm diameter (.8 micron pore size) membrane filters at a sample rate of about 2.0 lpm. The fibers on the filters were counted by the standard phase-contrast microscopy technique at 450 magnification by the Texas Division Microscopy Laboratory.

S10684752

ST0684753

TABLE I

DOW INDUSTRIAL SERVICES OPERATOR (DIAPHRAGM CLEANING)

EXPOSURES TO ASBESTOS FIBERS, HIGHWAY 332

OPERATION	A	B	A X B
	TIME PER 8 HR. DAY (MIN.)	AVERAGE CONC. (FIBERS/ML)	480
Employees working under shed.	420	.133	.116
Lunch & Breaks	60	-----	-----
Time Weighted Average	480		.116
Threshold Limit Value*			5.0
Maximum Allowable Conc.		10.0	

*Threshold Limit Value (TLV) - The time weighted average concentration to which it is believed that most people could be exposed daily without adverse effect.

ST0684754

TABLE A

DOW INDUSTRIAL SERVICES SUMMARY OF SAMPLE ANALYSIS

AREA OPERATION	NUMBER OF SAMPLES	ASBESTOS CONCENTRATION FIBERS/ML	
		RANGE	AVERAGE
In middle of cathode cleaning shed on washing platform (no activity)	2	0--0.014	.007
On cathode washing platform (washer and hand lance being used)	3	0--0.107	.005
Man using hand lance for cleaning cathodes	3	.022--0.129	.106
Shaking work clothes after they were dirty and dry.	2	.099--0.166	.133
Man using hand lance to clean top and ends of cathode (pre- washing)	2	0	0
West end of shed during washing operation and lance cleaning of cathodes	2	.058--0.062	.060

ENVIRONMENTAL RESEARCH SAMPLE RECORD

ST0684755

FILE NUMBER M-153	PROCESS Cathode Cleaning Operation	BLDG. NO. D.I.S.	DATE 5-8-73
MATERIAL Asbestos	SAMPLING METHOD	TRAPPING MEDIUM .8 μ Millipore Filter	
EQUIPMENT NUMBER 1 & 2	TYPE OF EQUIPMENT MSA Monitor	FLOW INDICATOR SETTING 8	SAMPLE FLOW RATE
REMARKS (VENTILATION, ETC.)		OUTSIDE TEMP. °F	INSIDE TEMP. °F

SAMPLE NO.	CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME		CONCENTRATION
			START	INCREMENT	
Pump 1	1 x	In middle of slab area (no activity)	8:30 8:40	10 min	- 0 -
Pump 2	2 x	On cathode washing platform. Washer running & steam lance being used $\approx$ 20' N.W.	8:46 8:56	10 min	- 0 -
Pump 1	3 x	$\approx$ 8' W of man using lance to clean cathode	9:01 9:11	10 min	.0299 f/cc
Pump 2	4 x	$\approx$ 3' behind man using lance to clean ends of dirty cathodes	9:34 9:39	5 min	- 0 -
Pump 1	5 x	$\approx$ 3' behind man using lance to clean top of cathodes	9:51 9:56	5 min	- 0 -
Pump 2	6	Pump on man removing bolts holding copper plates on cathode (Washed the top of cathode with steam lance before removing copper plates)	10:27 10:37	10 min	- 0 -
Pump 1	7 x	Area sample on cathode east of washer. Men removing bolts with impact tools. Also sampled man using lance to clean cell.	10:31 10:41	30 min	.1293 f/cc

ENVIRONMENTAL RESEARCH SAMPLE RECORD

FILE NUMBER M-152	PROCESS Cathode Cleaning Operation	BLDG. NO. D.I.S.	DATE 5-8-73	
MATERIAL Asbestos	SAMPLING METHOD	TRAPPING MEDIUM .8 μ Millipore Filter		
EQUIPMENT NUMBER 1 & 2	TYPE OF EQUIPMENT MSA Monitor	FLOW INDICATOR SETTING	SAMPLE FLOW RATE	OUTSIDE TEMP. °F
REMARKS (VENTILATION, ETC.)		INSIDE TEMP. °F		

SAMPLE NO.	CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME		CONCENTRATION
			START	INCREMENT	
Pump 28	8x	Area sample, sitting on caustic soda drum west end of bldg, down wind of washing operation	10:39 to 11:09	30 min	.062 f/cc
Pump 1	9x	Shaking work clothes after they have been used and are dry. Did sampling $\approx$ 1 foot from clothes during shaking them up.	2 min		.099 f/cc

ST0684756

ST0684756

ENVIRONMENTAL RESEARCH AMPLE RECORD

FILE NUMBER M-152	PROCESS Cathode Cleaning Operation	BLDG. NO. D15	DATE 8-17-73
MATERIAL Asbestos	SAMPLING METHOD Cellulose Filter	TRAPPING MEDIUM .8μ millipore Filter	
EQUIPMENT NUMBER 5 & 6	TYPE OF EQUIPMENT MSA Monitor Pump	FLOW INDICATOR SETTING 8	SAMPLE FLOW RATE
REMARKS (VENTILATION, ETC.)		OUTSIDE TEMP. °F	INSIDE TEMP. °F

SAMPLE NO.	CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME		CONCENTRATION
			START	INCREMENT	
DIS #10	Pump 6*	In middle of slab area (no activity)		15	.014 f/cc
DIS #11	5*	On cathode washing pump platform. Washer is on and man is operating hand lance nearby.		14	.107 f/cc
DIS #12	6*	≈ 8' W of man using hand lance to clean cathode		15	.022 f/cc
DIS #17	6*	Area sampling. Sitting on caustic soda drum at W. end of bldg., down wind of washing operation. New automatic pre- washer is on ≈ 35' S of sample point. Also, hand lance operation is on.		19	.058 f/cc

S10684757

ST0684757

ENVIRONMENTAL RESEARCH AMPLE RECORD

FILE NUMBER M-152		PROCESS Cathode Cleaning Operation			BLDG. NO. DIS		DATE 8-17-73	
MATERIAL Asbestos		SAMPLING METHOD Cellulose Filter		TRAPPING MEDIUM .8μ millipore filter				
EQUIPMENT NUMBER 5 & 6		TYPE OF EQUIPMENT MSA Monitor Pumps		FLOW INDICATOR SETTING 8		SAMPLE FLOW RATE		OUTSIDE TEMP. °F
REMARKS (VENTILATION, ETC.)								°F

SAMPLE NO.	CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME		CONCENTRATION
			START	INCREMENT	
DIS #18	Pump 6*	Shaking work clothes after they have been used and are dry. Did sampling $\approx 1'$ from 3 uniforms.		14 th 2	.166 f/cc
DIS #19	5*	On cathode washing pump platform. Washer is on and man is operating hand lance nearby.		17	-0-

510664786

SEP 1961