

These are the first samples taken after
the first OSHA regulation for asbestos.

Nearly all of these jobs were discontinued,
within 1-2 years. We found substitutes
as quickly as we could.

Subject: Asbestos Survey
from: G. J. Krueger

3-30-73
To: W. J. Tansley

Attached are the results of the plant-wide asbestos survey recently conducted in accordance with the new OSHA legislation effective January 7, 1972.

This law states that the airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed 5 fibers longer than 5 microns per ml of air, based on an 8-hour Time-weighted average. Effective July 1, 1976, this law becomes further refined when the TWA is lowered to 2 fibers longer than 5 microns per ml of air. A ceiling or peak concentration also exists that states the exposure may not exceed 10 fibers longer than 5 microns per ml of air.

With airborne fiber concentrations based on time-weighted averages, most areas in the plant are within the present TWA; however, since these samples were taken, it has been realized that, in some instances the results are not completely valid due to continued exposure after the job was completed. This exposure to fibers after completion of a dusty asbestos job reflects the following causes: ^① Clothes are not changed immediately after job is finished, ^② asbestos dust is left on floor which is constantly agitated by people walking through or by it, and through residual fibers suspended in the air for many hours. Bearing these exposures in mind, it is recommended that the areas showing 0.75 fibers/ml or higher, based on the time-weighted averages, be resampled to include these added exposures where applicable.

The sawing and drilling of Millboard into tapping boards was omitted in this report due to such excess of fibers on the filter it was impossible to count. The intention to resample this area with a lower volume of air was abandoned since elimination of

this operation is already indicated by requesting that the pieces be pre-cut and drilled before shipment from factory.

where analyzer came close or exceeded the ceiling of 10-cers/ml, the exposure areas should be resampled and evaluated individually to reduce the exposure threat by such methods as substituting of materials having no carcinogenic or toxic effects such as fiber glass, or changing the methods of handling the problem material. Some type of ventilation system is another possible solution in some cases.

Although this is only the initial survey, indications are that the problem areas of most concern relative to required physical examinations for employees working with asbestos are:

1. Cutting dry asbestos rope with hand shears
2. Counting and stacking millboard shields in warehouse
3. Cutting marine board in carpenter shop (This may be eliminated)
4. Cutting millboard in carpenter shop (This may be eliminated)
5. Picking up tagging boards, moving them and piling for storage.

If plant operations of high fiber emissions are to continue in the future, here are specific rules and regulations regarding respirators and clothing provided and required while doing this work. Employees exposed to such levels should be informed of the necessity and proper procedure for removal of outer clothing, (coveralls furnished by the company), after the dusty part of a job is completed. Further information must be made available on proper method of area clean-up so that dust is not blown or swept up as in the past but rather use a vacuum system.

cc.- C.E. Taylor
C.E. Fisher
P.A. McMaster

Sample No.	Date	Job Description	Shift Exposure	Precaution	Peak Conc. (Ceiling)	TWA Fiber per ml.
1	12-21-72	(Brickmasons) Mixing asbestos shorts and Lumnite. Dust evolves when mixing shorts with water.	1.6 Hr	Wore respirator	3.2	0.64
2	12-21-72	" " " " " "	1.6	" "	2.6	0.52
9	1-16-73	" " " " " "	2.5	" "	2.5	0.78
0	1-16-73	" " " " " "	1.7	" "	3.0	0.62
3	1-4-73	(Potlines) (Vent crew) Wrapping bells on goosenecks, as needed, with asbestos cloth.	3.2	Respirator and gloves worn	2.6	1.1
4	1-4-73	" " " " " "	3.2	" "	2.1	0.93
8	1-10-73	(Fab Shop) Cuts, folds and stacks asbestos cloth used for wrapping goosenecks.	2.7	None	1.8	0.60
7	1-10-73	" " " " " "	2.7	None	1.4	0.46
0	1-10-73	Sampler located in immediate area of cutting, folding and stacking asbestos.	2.4	None	2.4	0.72
6	1-15-73	" " " " " "	3.4	None	1.2	0.50
7	1-15-73	Cuts, folds and stacks asbestos cloth used for wrapping goosenecks.	3.2	None	0.96	0.39
8	1-15-73	" " " " " "	3.2	None	1.3	0.52
① Time-weighted averages of fibers/ml. that are longer than 5 microns.						

Sample No.	Date	Job Description	Shift Exposure	Precaution	Peak Conc. (ceiling)	TWA Fiber per ml.
6	1-15-73	(Anode Rebuild) Dry asbestos shorts mixed in a pail with watery glass.	0.3 Hr	None	1.7	0.59
7	1-5-73	Sealing skirts with a mixture of asbestos shorts and watery glass.	2.4	None	2.1	0.63
11	1-11-73	(Cathode Rebuild) Cutting dry asbestos rope with hand shears. (used between carbon blocks)	0.6	None	7.9	0.76
12	1-11-73	Sampler placed 5 ft from asbestos rope cutting	0.6	None	8.1	0.73
13	1-12-73	Putting wet asbestos rope between carbon blocks in cathode rebuild.	2.2	None	3.9	0.95
14	1-12-73	" " " " " "	2.0	None	2.9	0.71
15	1-12-73	Sampler placed 2-4 ft. from job of putting asbestos rope between blocks (warehouse)	2.2	None	3.1	0.87
24	1-22-73	Sampler placed 2 ft from area where heat shields, (Millboard) are counted.	0.6	None	8.7	0.61
25	1-22-73	Counting and stacking asbestos heat shields, (Millboard) in warehouse.	0.6	None	7.9	0.63
26	1-23-73	(Machine Shop) Scraping asbestos rope out of crucible lids.	3.3	None	1.7	0.71
27	1-23-73	Sampler placed about 3 1/2 ft. from scraping of crucible lids	3.1	None	1.5	0.59
28	1-24-73	Putting new dry asbestos rope in crucible lids.	3.1	None	1.7	0.67
29	1-24-73	Sampler placed 6 ft. from work area in	3.0		1.8	0.63

Sample No.	Date	Job Description	Shift Exposure	Precaution	Peak Conc. (ceiling)	TWA fiber per ml.
30	1-24-73	(Carpenter Shop) Cutting Marinite board 12 to 24" x 5" pieces with a table saw.	0.9 Hr.	Wore respirator	37.5	4.2
31	1-24-73	" " " "	0.9	Vacuum system below table saw " "	52.9	6.2
32	1-24-73	Sampler located about 4 ft. from the table saw cutting marinite, Samples 30 & 31	1.1	Vacuum system below table saw	13.1	1.9
33	1-24-73	Sampler operated 15 ft from samplers #30 & #31. Fan blowing toward sampler	1.4	Vacuum system below table saw	7.8	1.4
34	1-24-73	Cutting and dicing Marinite board.	4.4	None	6.8	3.8
37	2-8-73	Sawing Transite on band saw into 4" x 5" pieces (Transite 32% asbestos)	1.7	None	5.4	1.2
35	2-8-73	Sampler located 12-15 ft away from band saw	1.6	None	5.1	1.1
36	2-8-73	Working in immediate area of band saw, man doing different work however	1.7	None	3.8	0.79
38	2-8-73	Picking up top boards, moving them and piling for storage in Line I	0.3	None	23.2	0.97
21	1-22-73	These samples were taken too long a time and resulted in too big a sample to count.				
22						
23						

Asbestos Data Cathode Rebuild Survey

Sample No.	Date	Job Description	Shift + Exposure (Hrs.)	Precaution	Peak Conc. (ceiling)	TW/Fiber per ml.
	1-11-73	Cutting dry asbestos rope with hand shears	0.6	None	7.7	0.76
1	1-11-73	Sampler located 5 ft. from rope cutting	0.6	None	8.1	0.73
3	1-12-73	Putting wet asbestos rope between carbon blocks	2.2	None	3.9	0.98
	1-12-73	" " " " " "	2.0	None	2.9	0.71
	1-12-73	Sampler located 3-4 ft. during sample #13	2.2	None	2.1	0.87
7	4-16-73	Sampler located in cath. rebuild lunchroom ^{no asbes. work use in 3 days}	5.0	None	0.65	0.42
	4-16-73	Sampler by bench cutter at cath. rebuild. ^{no asbes. work use in 3 days}	5.3	None	0.57	0.37
7	4-9-73	Lunchroom, 15 ft. from asbes. rope in carb. block job	8.0	-	2.6	0.99
	4-9-73	Cutting and packing asbestos rope between carb. blocks	2.6	None	3.2	1.0
	4-9-73	" " " " " "	2.6	None	3.2	1.0
	4-16-73	Sampler in Cath. rebuild lunchroom. ^{no asbestos use in 3 days}	5.0	-	0.65	0.42
	4-16-73	Sampler in cath rebuild by bench cutter. ^{no asbes. work use in 3 days}	5.3	-	0.57	0.37
-A	5-9-73	Sampler 3-4 ft. from electro-melt furnace. One man in immediate area feeding iron to furnace. Asbestos curtain encloses top of furnace for venting purposes	3.8	None	0.83	
-B	5-9-73	Continuation of 75-A	2.75	None	0.8	0.63

Asbestos Data Mechanical Shops Survey

Sample No.	Date	Job Description	Shift + Exposure (Hrs)	Precaution	Peak Conc. (ceiling)	TW, Fibe per ml
8	1-10-73	Cuts, folds and stacks asbestos cloth for goose necks.	2.7	None	1.8	0.60
7	1-10-73	" " " " " " " " " " " "	2.7	None	1.4	0.46
2	1-10-73	Sampler located in immediate area	2.4	-	2.4	0.72
6	1-15-73	Cuts, folds and stacks cloth for goose necks ^{area} sample	3.4	None	1.2	0.52
7	1-15-73	Personal monitor at above asbestos cloth job	3.2	None	0.9	0.39
5	1-15-73	" " " " " " " " " " " "	3.2	None	1.3	0.52
1	4-18-73	Sampler 15-20 ft from asbestos cloth job above	5.7	-	0.6	0.39
2	4-18-73	Sampler 25 ft from asbestos cloth job above	5.7	-	0.7	8 hr = $\frac{0.48}{0.87}$
3-A	4-18-73	Cutting, folding and stacking asbestos cloth	2.1 hrs		2.1	0.56
B	✓		2.6 hrs		1.6	0.51
C	✓		2.4 hrs	7.0	None	1.9
					8 hr =	1.61
34-A	4-18-73	Cutting, folding and stacking asbestos cloth	2.1 hrs	None	1.8	
B	✓		2.6 hrs	✓	1.9	
C	✓		2.3 hrs	✓	2.2	
			7.0	None	8 hr =	1.73
65	4-18-73	Janitor sweeping floor after asbestos cloth job.	1.6	None	4.0	0.75
66	4-18-73	Sampler, 20 ft from cloth job and sweeping	1.4	None	4.0	0.76
18	4-9-73	6' to 8' from cutting asbestos cloth job	6.9	-	1.4	1.2

Asbestos Data Mechanical Shops Survey

Sample No.	Date	Job Description	Shift Exposure (Hrs)	Precaution	Peak Conc. (ceiling)	TW. Fib. per ml
26	1-25-73	Scraping asbestos rope from crucible lids.	3.3	none	1.7	0.71
27	1-25-73	Sampler about 3 1/2 ft. from lid scraping job	2.1	-	1.5	0.57
28	1-24-73	Relining cruc. lids with dry asbestos rope	2.4	none	1.7	0.6
9	1-24-73	Sampler 6 ft from #28 sampler point	3.0	-	1.8	0.62
7-A	5-2-73	Scrape & reline crucible lids - dry asbestos rope	2.3	None	1.9	0.57
-B	5-2-73	" " " " " " " "	3.3	None	1.1	0.4
-C	5-2-73	" " " " " " " "	1.4 7.0 hrs	None	2.3 5 hr	0.4 1.3
8-A	5-2-73	Sampler 40-50 ft. from cruc. cleaning job	2.5	-	0.83	0.3
-B	5-2-73	Partly reline job & partly janitor clean-up	3.2	-	0.94	0.2
-C	5-2-73	Job completed & some clean-up remaining	1.4 7.1 hrs	-	2.9 8 hr	0.57 1.17
9	5-2-73	Sampler about 100 ft away during cruc. lid work	2.5	-	0.85	0.51
10-A	5-2-73	Sampler about 25 ft away during cruc. lid work	2.6	-	1.3	0.41
-B	5-2-73	Continuation of 10-A. With change of filter paper	2.2	-	0.82	0.33
-C	5-2-73	Continuation - cruc. lid work finished by this time	1.6 7.4	-	1.1 8 hr	0.22 0.46
11-A	5-2-73	Custodian cleaning cruc. lid work area. Bruma Vacuum	3.1	None	0.93	0.3
-B	5-2-73	Custodian work continues partly in this area & other areas	2.5	None	1.8 8 hr	0.36 0.70
14	5-8-73	Sampler in cruc. lid work area 6 days after last job.	6.0	-	0.4	0.3
15	5-8-73	Sampler same location as #14 A, B, C, 6 days after job	5.9	None	0.29	0.21
55	4-13-73	Sampler w. of mech. shop tool room. ^{no asbes. in area for several days}	6.0	-	0.77	0.5
58	4-16-73	Sampler S. end mech. shop. No asbes. work in 3 days	5.1	-	0.41	0.21
59	4-16-73	Sampler on bench next to mech. shop tool room	5.1	-	0.74	0.48

Asbestos Data Kent Crew Survey

Sample No.	Date	Job Description	Shift + Exposure (Hrs)	Precaution	Peak Conc. (Ceiling)	TW Fibers per ml.
3	1-4-73	Wrapping goosenecks with asbestos cloth as needed.	3.2	Respirator + gloves	2.6	1.1
4	1-4-73	" " " " " "	3.2	" "	2.1	0.85
9	4-6-73	Stack asbestos cloth + wrapping goosenecks.	1.4	Respirator + gloves	5.2	0.91
1	4-6-73	After job completed. Exposure for balance of shift	4.0	Respirator	2.9	1.2
					8 hr =	2.1
0	4-6-73	Stack asbestos cloth + wrapping goosenecks	1.4	Respirator, gloves	6.6	1.2
2	4-6-73	After job completed. Exposure for balance of shift	4.1	Respirator	2.3	0.91
					8 hr =	2.1
3	4-6-73	Job same as Sample #40. Different line.	1.9	Respirator, gloves	2.4	1.0
-	4-6-73	After job completed. Exposure for balance of shift	2.2	Respirator	3.0	1.3
					8 hr =	2.3
	4-6-73	Same wrapping job as above. Different line	2.0	Respirator, gloves	3.0	0.75

asbestos Data

Potline Survey

ple	Date	Job Description	shift Exposure (Hrs)	Precaution	Peak Conc. (ceiling)	TW Fib per m ³
F	2-8-73	Picking up, moving and piling tap boun ^{in lines} ty (millboard)	0.3	None	23.2	0.9
A	5-9-73	Sampler worn by potman for 7.1 hrs. Heat shields on crust breaker are vinyl coated asbestos. New heat shields were in use.	4.2	None	1.3	0.6
B	5-9-73	Continuation of sample 76-A	2.9	None	1.5	0.5
					5 hrs	1.21
A	5-9-73	Sampler worn by potman for 7.6 hrs Heat shields on these crust breakers were worn & frayed.	4.0	None	0.59	
B	5-9-73	Continuation of 77-A	3.0	None	1.25	
					5 hrs	0.9
	5-10-73	Sampler located center Rm 5 for general ambient air check Pots 514 & 544.	7.1	-	0.21	0.1
	5-10-73	Sampler on window aisle side Pot 447 for general ambient air check with Line II down	7.0	-	0.19	0.11
	5-10-73	Sampler on window aisle side pot 311 with Line II completely down & cold.	7.0	-	0.15	0.15
	5-10-73	Sampler located window side 55P for general ambient air check with a Line operating	7.0	-	0.19	0.17
	5-14-73	Sampler worn by tapper, Line F, 20 pots, using millboard shield for checking metal level.	2.5	None	1.4	0.4
	5-14-73	Sampler worn by tapper Rms 9 & 10	2.6	None	1.5	0.4

Asbestos Data Warehouse Survey

mp/e 10.	Date	Job Description	Shift Exposure (Hrs)	Precaution	Peak Conc. (ceiling)	TW Fib p/m
4	1-22-73	Sampler 2 ft from counting Millboard heat shields	0.6	None	8.7	0.6
5	1-22-73	Counting and stacking Millboard heat shields	0.6	None	7.9	0.1

Asbestos Data

Carpenter Shop Survey

Plc	Date	Job Description	Shift + Exposure (Hrs)	Precaution	Peak Conc. (Ceiling)	TW Fibs per ml
	1-24-73	Cutting Marinite board into 6"x5" with table saw	0.9	Respirator + Vac. system	37.5	4.2
	1-24-73	" " " " " " " "	0.9	" "	52.9	6.2
	1-24-73	Sampler located 5 ft from Marinite cutting job	1.1	—	13.1	1.9
	1-24-73	Sampler 15 ft. from cutting job. Fan blowing toward sampler	1.4	—	7.8	1.4
	1-24-73	Cutting + drilling marinite board	4.4	NONE	6.8	3.8
	4-13-73	Sampler in carp. shop. no asbestos use within this area for several days	5.9	—	0.35	0.26
	6-5-73	Cutting Marinite board on band saw	0.08	1 of 2 carpenters wore respirator	72.2	0.7
	6-5-73	" " " " " "	0.07	" " "	94.6	0.76
					5 hr.	1.46

bestos Data Brickmason Survey

Date	Job Description	Shift Exposure (Hrs)	Precaution	Peak Conc. (Ceiling)	TW/Fiber per ml.
12-21-72	Mixing asbestos shorts & Lumnite with water	1.6	Respirator	3.2	0.61
12-21-72	" " " " " "	1.6	Respirator	2.6	0.5
1-16-73	" " " " " "	2.5	Respirator	2.5	0.78
1-16-73	" " " " " "	1.7	Respirator	3.0	0.62
<u>Anode Rebuild</u>					
1-15-73	Dry asbestos shorts mixed in a pail with watery glass	0.3	None	1.7	0.59
1-15-73	Sealing skirts with the above mixture	2.4	None	2.1	0.63
4-10-73	10 ft. from mixing asbes. shorts & water glass	3.0	-	1.2	0.47
4-10-73	25'-30' from job sampled by #51	2.9	-	1.9	0.70
4-10-73	Sealing skirts with asbes. shorts & watery glass mixture	2.7	None	2.8	0.97
4-10-73	Mixing asbestos shorts and watery glass	2.7	None	2.5	0.85
4-13-73					