



DOW CHEMICAL U.S.A.

PLAINTIFF'S EXHIBIT

DOW-775

TEXAS DIVISION
FREEPORT, TEXAS 77541

ENVIRONMENTAL HEALTH REPORT
CONFIDENTIAL----FOR THE USE OF DOW EMPLOYEES ONLY

EVALUATION OF EXPOSURES TO ASBESTOS
AT GLYCERINE II, ~~B-2300~~
FIELD SERVICES INSULATION SHOPS
B-108 AND A-510

FILE NO. B1-2086
DATE November 13, 1980
AUTHOR J. R. Sanders
CHECKED *George A. Hines*
DATE Nov 20, 1980

Summary

The Insulators, removing asbestos insulation had time-weighted average exposures to asbestos well within the acceptable exposure limits. The concentration of asbestos, in the area around the insulation removal, were also found to be well within the acceptable limits.

Recommendations include the continued use of high efficiency dust respirators and disposable cover-alls.

ST0015145

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INTRODUCTION

Exposures to asbestos were evaluated on October 6 and 7, 1980 during the removal of asbestos insulation at Glycerine II, B-2300. Asbestos was considered the main stress of concern, based on the 1980 Industrial Hygiene Inventories and program plans for the Field Services Insulation Shops, B-106 and A-510.

JOB DESCRIPTION

The Insulators of the Insulation Shops, B-106 and A-510, spend less than one percent of their time working with the removal of asbestos insulation. After asbestos insulation is removed, it is replaced with non-asbestos insulation.

During the removal of the asbestos insulation, the Insulators wore high efficiency dust respirators and disposable coveralls. The insulation was watered down, then the insulation sections were allowed to drop to the ground. The insulation was then placed in properly labeled bags and the bags were sealed. The bags of asbestos insulation were placed into a dumpster and transported to the landfill disposal site.

METHODOLOGY

Asbestos fibers were collected on 37 mm, 0.8 micron pore size, Type MAWG Millipore® filters in cassette filter holders. Bendix BDX44 personal pumps flow rates (1.6-1.9 lpm) were checked with a calibrated rotameter.

The asbestos fibers greater than 5 microns in length were counted at Analytical Services, B-1225 (Analytical Report No. 8997). The analytical method is given in detail in Appendix I.

EVALUATION CRITERIA

The evaluation of exposure levels were based on the following criteria of acceptable levels of exposure.

	<u>CONCENTRATION (FIBERS/CC)</u>	
	<u>Dow IHG</u>	<u>TLV</u>
Asbestos fibers > 5u	(2)	2

Both the Dow Industrial Hygiene Guide (IHG) and the Threshold Limit Value (TLV) are measures of acceptable 8-hour time-weighted average (TWA) exposures. The IHG in parentheses are recommended as temporary guides until official Dow guides are established.

ST0015146

RESULTS AND CONCLUSIONS

The Insulators time-weighted average exposures to asbestos (<0.01 fibers/cc) were well within the acceptable exposure limits (Table I). Both the Insulators assigned to removing the insulation and those assigned to bagging the insulation had very low TWA exposures to asbestos (<0.01-0.01 fibers/cc).

The area concentrations of asbestos during the removal of asbestos containing insulation were also well within the acceptable limits (Table II). The highest area concentration of asbestos (0.03 fibers/cc) was found 15 feet directly downwind from the insulation removal.

As long as the proper procedures for asbestos containing insulation are followed (wetting down the insulation before removal and the wearing of high efficiency dust respirators and disposable cover-alls) there should be no problem of over-exposure to asbestos.

While the asbestos insulation was removed, the insulation sections were allowed to drop to the ground. When the insulation hit the ground it would break up and produce asbestos containing dust. During the bagging of the asbestos, not all of the small pieces of insulation could be picked up. After the asbestos insulation left on the ground dries, asbestos could possibly become airborne.

RECOMMENDATIONS

The following recommendations are made to reduce unnecessary exposures.

1. During the removal of asbestos insulation, the practice of wetting the insulation before removal should be continued to reduce the production of dust.
2. The Insulators should continue to wear high efficiency dust respirators and disposable cover-alls during the removal of asbestos containing insulation.
3. The asbestos insulation should be carefully lowered to the ground rather than dropped, to reduce the production of dust (see Dow Safety Standard No. 45).

The employees of the Field Services Insulation Shops, B-106 and A-510 should be informed of the results of this survey and the informing should be documented.

ST0015147

TABLE II
SUMMARY OF AREA CONCENTRATIONS OF
ASBESTOS
(10-6-80 & 10-7-80)
GLYCERINE II, B-2300

DISTANCE FROM INSULATION REMOVAL	DATE	SAMPLE TIME (MIN.)	CONCENTRATION (FIBERS/CC) ASBESTOS
<u>Downwind</u>			
Under pipe	10-6-80	112	0.01
10 feet	10-6-80	116	0.02
15 feet	10-6-80	163	0.03
15 feet	10-7-80	372	<0.01
25 feet	10-6-80	165	<0.01
55 feet	10-7-80	364	<0.01
70 feet	10-7-80	370	<0.01
<u>To the Side</u>			
5 feet	10-6-80	285	0.02
15 feet	10-7-80	369	<0.01

TABLE I
SUMMARY OF TIME-WEIGHTED AVERAGE
EXPOSURES TO ASBESTOS
(10-6-80 & 10-7-80)
GLYCERINE II, B-2300

JOB CLASSIFICATION/ JOB ASSIGNMENT	SOC. SEC. NO.	SAMPLE TIME (MIN.)	CONCENTRATION (FIBERS/CC) ASBESTOS
<u>Contract Insulator</u>			
Asbestos Insulation Removal	455-08-2675	295	0.01*
Asbestos Insulation Removal	449-25-8781	292	<0.01
Asbestos Insulation Bagging	304-68-0365	384	<0.01
Industrial Hygiene Guide			2

ST0015149

* High efficiency dust respirators and disposable cover-alls were worn.

APPENDIX I

ANALYTICAL METHOD
ASBESTOS FIBER COUNTING

Approximately four squares are cut from the center of the filter paper and they are mounted on a microscope slide. The filters are dissolved in a one to one solution of diethyloxalate and diethyl phthalate with 0.1 g. of dissolved Millipore® filter per ml. of solution, leaving the asbestos fibers and the dyed lines intact. One square is counted in 12 microscope passes at a magnification of 400X. If less than 12 passes are made, the number of passes are noted, since less than one entire square was counted. The number of fibers per square is multiplied by 88 squares per filter to obtain the total number of fibers per filter.

ST0015150

FILE NUMBER 0055-2086	PROCESS Asbestos Insulation Removal	BLOG. NO. 8-2100	DATE 10-6-90
MATERIAL Asbestos	SAMPLING METHOD Personal	TRAPPING MEDIUM 37mm Ø 9m MAWB filters	
EQUIPMENT NUMBER Bendix BOX 44	TYPE OF EQUIPMENT Personal pump	FLOW INDICATOR SETTING CC FURN.	SAMPLE FLOW RATE CC STROKS
REMARKS (VENTILATION, ETC.)		FLOW FACTOR CC	JOB INDEX

ST0015151

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14

INDUSTRIAL HYGIENE SAMPLE RECORD

FILE NUMBER 88-2086	PROCESS Asbestos Insulation Removal	IN. NO. B-2300	DATE 10-6-80
MATERIAL Asbestos	SAMPLING METHOD Area	TRAPPING MEDIUM 37mm 0.8µ Millipore filter	
EQUIPMENT NUMBER Bendix 88X44 Personal Pump	TYPE OF EQUIPMENT	FLOW INDICATOR SETTING	SAMPLE FLOW RATE CC MIN.
REMARKS (VENTILATION, ETC.)		FLOW FACTOR CC STROKE	JOB INDEX

SAMPLE NO.	DESCRIPTION OF SAMPLE	Counts	TIME	MATERIAL	CONC. (PPM)
3	Monitor was 5 ft to the side of the insulation removal for 2 hrs	98830 105355 10525 counts	9:49 a		
	the rest of the period it was 10-15 ft away as they moved further down the pipe				
	^{all} The monitors were at breathing zone height		2:34 p		
Pump 1	10525 counts X 0.04102 L/count = 431.74 liters		285 min		
	285 min X 1.62 L/min = 461.70 liters				
4	Monitor was 26 ft downwind from the job	71967 79223 7356 counts	9:58 a		
Pump 1	7356 counts X 0.041860 L/count = 307.92 liters		12:35 p		
	165 min X 1.8 L/min = 297.00 liters		165 min		
	Northeasterly winds 10-15 mph				
5	Monitor was 15 ft directly downwind	81139 85255 4116 counts	9:53 a		
Pump 1	4116 counts X 0.055252 L/count = 227.42 liters		12:36 p		
	163 min X 1.74 L/min = 283.62 liters		163 min		
6	Monitor was 10 ft directly downwind	79723 84601 5278 counts	12:36 p		
	5278 X 0.041860 L/count = 220.94 liters		2:32 p		
Pump 1	116 min X 1.8 L/min = 208.8 liters		116 min		
7	Monitor was under pipe while insulation was removed	85255 87507 2252 counts	12:40 p		
Pump 1	2252 counts X 0.05525 L/count = 124.43 liters		2:32 p		
	112 min X 1.62 L/min = 181.44 liters		112 min		

ST0015152

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DATE

INDUSTRIAL HYGIENE SAMPLE RECORD

FILE NUMBER B-2086	PROCESS Asbestos Insulation Removal	INCL. NO. B-2300	DATE 10-7-80
MATERIAL Asbestos	SAMPLING METHOD Personal Area	TRAPPING MEDIUM 37mm, APAL Millipore Filter	
EQUIPMENT NUMBER Bendis 80X 44	TYPE OF EQUIPMENT Personal pump	FLOO INDICATOR SETTING CC	SAMPLE FLOW RATE CC
REMARKS (VENTILATION, ETC.)		FLOW FACTOR STROKS	JOB INDEX

SAMPLE NO.	DESCRIPTION OF SAMPLE	COUNTS	TIME	MATERIAL	CONC (PPM)
10	55 ft Contract Insulator R. Abel 304-68-0365	87556 96280	9:26a		
	Bagged the fallen asbestos	8724 counts			
	and put the bags in the dumpster; watered down the insulation breaks		2:50p		
Pump 10		8724 counts X 0.062333 L/count = 543.79 liters	384		
		min X 1.87 L/min = 718.08 liters			
11	55 ft away on the down wind side of the dumpster (1hr) 15 ft down wind	84666 101250 16584 counts	9:29a 2:33p		
	after the dumpster was moved closer		364min		
Pump 1		16584 counts X 0.037174 L/count = 616.49 liters			
		364 min X 1.71 L/min = 622.44 liters			
12	15 ft away to the side of the removal	83919 18390 12971 counts	8:35a 2:44p		
Pump 4/12/80		12971 counts X 0.41030 L/count = 532.07 liters			
		369 min X 1.62 L/min = 597.78 liters	369a		
13	15 ft downwind on warning sign	33875 49085 14210 counts	8:36a 2:46p		
Pump 4		14210 counts X 0.046750 L/count = 664.32 liters			
		372 min X 1.87 L/min = 695.64 liters	372min		
14	70 ft downwind from asbestos removal	73260 87745 14485 counts	8:36a 2:46p		
		14485 counts X 0.045000 L/count = 651.83 liters			
Pump 4		370 min X 1.80 L/min = 666.00 liters	370min		

ST0015153

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DATE

File: ~~100-101~~ 2086

Process :

Process: Asbestos disposal

Building :

0-2300

Date

10-6-50

Pump Number	Filter Weight (mg)				Air Flow (liters)	Concentration (mg/m ³)		
	before	after	gain/loss	Correction		Total Dust	Fibers/ Asbestos	
BLANKS								
B-1	47.1	47.0	-0.1	0.0				
B-2	44.9	44.9	0.0					
B-3	47.9	47.9	0.0					
B-4	50.0	50.0	0.0					
B-5	42.3	42.3	0.0					
SAMPLES								
1	43.4	43.5	0.1	0.1	533.10	0.2	0.01	
2	48.0	48.6	0.6	0.6	505.75	1.2	<0.01	
	49.6	49.6	0.0	0.0	431.74	20.1	0.02	
4	46.1	47.1	0.4	0.4	307.92	1.3	<0.01	
5	46.2	46.2	0.0	0.0	227.42	20.1	0.03	
6	48.4	48.9	0.5	0.5	220.94	2.3	0.02	
7	48.2	48.4	0.2	0.2	124.43	1.6	0.01	
8	43.1	Void			—	—		
9	47.76	Void	—	—	—	—		
10	47.5	48.8	1.3	1.3	543.79	2.4	<0.01	
11	43.1	43.3	0.2	0.2	616.49	0.3	<0.01	
12	43.3	43.3	0.0	0.0	532.07	40.1	<0.01	
13	45.3	45.7	0.4	0.4	664.32	0.6	<0.01	
14	46.0 45.9	46.1	0.2	0.2	651.83	0.3	<0.01	
15	45.89	Void 45.89			—	—		

ST0015154

J. R. Sanders - B101
 CHARGE NO. 1529
 SUBJECT Air Monitors

DATE 10-16-80
 FILE NO. 8997
 BY D. Pahlmeyer

Sample Description	Fibers Counted	Fibers $\geq 5\mu$ per square	Fibers per fil
	12 passes/square		
1	11	51 x $\frac{12}{11}$	56 x 88
2	11	24	26
3	11	75	82
4	11	16	17
5	11	79	86
6	11	43	47
7	11	9	10
8	insulation sample NOT on air monitor		
9	11	106	Void
10	11	15	16
11	11	13	14

ST0015155

File:

B-2300

Process:

Asbestos - solution Removal at Glycine II

Building:

B-2300

Pump Number	Rotometer Reading	Air Flow	counts /min	CC/Count	Counts Start Finish A	Total Air Flow liters	0 10
Deck 00144							
EHS							
1	51	1.8	43 43	41.860	Sample 4 71967 79323 7356 Sample 6 79323 84601 5278	307.92 220.94	10
4	81	1.8	41 41	43.902	Sample 2 22180 33700 11520	505.75	
9	81	1.8	41 41 41	43.902	Sample 1 61047 73190 12143	532.10	1
10	79	1.74	31 32	56.124 54.375 $\bar{X}=55.252$	Sample 5 81139 85255 4116 Sample 7 85255 87507 2882	227.42 124.43	1
EBA F	75	1.62	39 40	41.534 40.500 $\bar{X}=41.020$	Sample 3 94830 05355 10528	431.74	1
1-76-46							
4							

ST0015157

File:

B-2096

Process:

Asbestos Insulation Removal at Glyce. II

Building:

B-2300

Pump Number	Rotometer Reading	Air Flow	C/Count		Counts			Total Air Flow liters	
			counts min		Start	Finish	A		
EHS									
4	83	1.87	40 40	46.750	33875	48085	14210	664.22	1
10	83	1.87	30 30	62.333	87556	96280	8724	543.79	1
1	78	1.71	46 46	37.174	84666	01250	16584	616.49	
9	81	1.80	40 40	45.000	75260	87745	14485	651.83	
EDA F SN 1-16-96	75	1.62	40 39	40.500 41.539 <u>81.039</u> 41.020	05419	18390	12971	532.07	

ST0015158