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Biochemical Research Laboratory

The Dow Chemical Company

1070

A SURVEY AND EVALUATION OF PIPE
COVERERS' EXPOSURES TO DUSTS FROM
ASBESTOS CONTAINING INSULATION
MATERIALS ENCOUNTERED DURING
ROUTINE PIPE COVERING OPERATIONS
WITHIN THE MIDLAND LOCATION OF
THE DOW CHEMICAL COMPANY

File: T2.1-1-64(H)
Date: March 21, 1969
By: R. A. DeGesero

Signed

Roy A. De Gesero

Date

March 24, 1969

Checked

A R Hoyle

Date

March 24, 1969

ST0030628

PROBLEM

Supervision requested that the Environmental Research Laboratory survey and evaluate current levels of pipe coverer's exposures to dusts from asbestos-containing insulation materials commonly used within the Midland location.

CONCLUSIONS

1. The present Threshold Limit Value (TLV) for asbestos of 5 mppcf will remain in force until 1971. Barring information to the contrary, the TLV will then be lowered to 2 mppcf (million particles per cubic foot).
2. Men are encountering time-weighted exposures to dusts from insulation materials containing asbestos approaching but not exceeding the present TLV of 5 mppcf.

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3. Men are encountering time-weighted exposures to dusts from insulation materials containing asbestos exceeding the proposed TLV of 2 mppcf.
4. If exposures are to be reduced to within tentatively accepted levels (2 mppcf) either the use of asbestos-containing insulation materials must cease, or pipe coverers must be protected through effective use of approved respiratory devices and/or local ventilation.

RECOMMENDATIONS

1. Pipe coverers should be educated to the true hazards associated with the several types of insulating materials they presently use.
2. Pipe coverers should be made aware of the several ways of protecting themselves during unavoidable, potential exposures to dusts containing substances known to be highly toxic, such as asbestos.
3. In the future, pipe coverers should be educated to the true hazards associated with any new types of insulation materials to be used, prior to use.

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PRESENTATION OF DATA

Indoor pipe covering operations were surveyed from 12/24/68 to 1/22/69. Outdoor pipe covering operations were surveyed from 2/20/69 to 3/5/69. Air samples to account for "miscellaneous" portions of the pipe covering functions were obtained from 3/1/69 to 3/5/69.

Sampling and Analysis

A total of 141 breathing zone samples were collected in midjet impingers and analyzed employing standard light field microscopy techniques for determining dust concentrations from insulating materials containing asbestos. Concentrations found in samples were expressed in terms of millions of particles per cubic foot of air (mppcf), according to the following formula.¹

$$\text{mppcf} = \frac{(\text{mean particles/quarter field}) \times 4 \times 1000 \times \text{sample volume}}{\frac{\text{liters}}{\text{min.}} (\text{pump flow}) \times \text{minutes} \times 3.51 \times 10^{-2} \frac{\text{ft}^3}{\text{liter}}}$$

¹Patty, F. A., INDUSTRIAL HYGIENE AND TOXICOLOGY, Vol. I. Second Revised Edition, p. 198.

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The means and ranges of concentrations found during sampling are listed in Table 1.

Job Analysis and Description

An environmental job analysis provides an estimate of the frequency and duration of men's exposures to dust concentrations surveyed. The job analysis expresses as per cent of the day (% day) the probable time distribution of pipe covering operations, averaged over several months. On any given day the pipe coverer's routines can be expected to vary from the estimate.

The job analysis reconciled input from discussions with pipe coverers and supervision, observations during sampling, estimates provided by an industrial engineering time study, and a questionnaire filled out by the pipe coverers. A sample questionnaire is found on page 1 of the Appendix.

The questionnaire requested that men estimate the per cent of time per day they spent working with the most common insulating materials. Men's averages were converted into ratios of time spent (% day) per operation and material, and are listed in Table 1.

Thirty-two per cent (26 men) of the Midland coverers responded. Responses concerning rarely used materials (e.g., cork, styrofoam, some putty adhesives, etc.) were set aside. Other information furnished by the coverers included:

Average age:	40 years
Years covering within Dow:	18
Years covering outside Dow:	0
Wear respirator?	Yes: 17 men; No: 9 men
Which material(s) are the dustiest?	Kaylo: 16 men Fiberglas: 14 men High temp.: 11 men Superpower: 6 men Mag oxide: 2 men Aircell: 2 men

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Time-Weighting Exposures

Men's exposures to dusts from asbestos-containing insulation materials were estimated by "time-weighting." The exposure frequency and duration (% day) to each material is multiplied by the mean concentration in air of each material, giving a set of "time-weighted factors." The "factors" (product of % day x mean concentration) are then added up for the eight hour day:

$$\text{Time-Weighted Exposure} = \sum_{i=0}^{100\%} \% \text{ day} \times \text{concentration}$$

$$\text{or, } \sum_{i=0}^{100\%} = (\text{time-weight factors})$$

Table 1 lists the % day, mean concentrations found, time-weighted factors and ranges for each material encountered in the listed operations. The time-weighted exposures to dusts from asbestos containing materials were 4.9 mppcf (indoor operations) and 4.2 mppcf (outdoor operations).

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Table 1. TIME-WEIGHTED EXPOSURES OF PIPE COVERERS TO DUSTS FROM
ASBESTOS CONTAINING MATERIALS

<u>Operations</u>	<u>Materials</u>	<u>% Day</u>	<u>Concentrations</u> (mppcf)		<u>Time-weight</u> <u>Factor:</u> <u>Asbestos</u>
			<u>Mean</u>	<u>Range</u>	
Remove	Air cell	1.2	11.4	0.3-24.9	0.137
	Kaylo	1.6	11.2	3.7-20.5	0.179
	Mag oxide	0.2	2.8	1.8-4.6	0.006
	Fiberglas	2.0	13.7	1.2-33.7	---
Mix	No. 1 Plus	1.6	13.4	2.2-30.5	0.219
	Armentite	0.1	9.6	2.7-13.5	0.010
	Superpower	0.8	34.9	19.6-6.14	---
Cut	Air cell	5.9	3.0	0.6-6.2	0.177
	Kaylo	8.8	11.7	4.9-23.1	1.030
	Fiberglas	2.2	1.7	0.8-2.6	---
	Others	0.6	--	---	---
Apply	Air cell	15.8	5.7	0.2-16.4	0.901
	Kaylo	19.9	5.7	0.4-22.3	1.123
	Fiberglas	4.5	2.4	1.2-3.8	---
	Others	2.6	--	---	---
	No. 1 Plus	4.8	9.6	1.1-39.5	0.461
	Armentite/ Superpower	2.4	2.1	0.9-3.9	0.050
Clean up removed covers		3.0	8.5	2.4-24.6	0.255
Stocking; get new covers		2.0	1.0	0.1-2.3	0.020
Move to job, set up		5.0	2.0	1.4-2.9	0.100
Breaks, lavatory		15.0	1.4	0.1-3.9	0.201

Time-weighted exposure to
asbestos containing dusts
(indoor) in mppcf

= 4.9

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Table 1. CONTINUED

<u>Operations</u>	<u>Materials</u>	<u>% Day</u>	<u>Concentrations</u> (mppcf)		<u>Time-weight</u> <u>Factor:</u> <u>Asbestos</u>
			<u>Mean</u>	<u>Range</u>	
Remove	Air cell	1.2	5.2	5.1-5.2	0.062
	Kaylo	1.6	9.0	3.6-14.0	0.144
	Fiberglas	2.0	10.0	5.5-20.2	---
	Others	0.2	--	---	---
Mix	No. 1 Plus	1.6	9.6	5.9-12.5	0.154
	Armentite	0.1	17.0	14.1-21.6	0.017
	Superpower	0.8	21.3	13.1-25.4	---
Cut	Air cell	5.9	2.5	0.9-3.4	0.148
	Kaylo	8.8	9.4	6.3-7.4	0.827
	Fiberglas	2.2	2.5	1.4-3.8	---
	Others	0.6	--	---	---
Apply	Air cell	15.8	1.5	0.3-3.5	0.237
	Kaylo	19.9	9.2	1.9-17.9	1.831
	Fiberglas	4.5	3.6	1.6-6.7	---
	Others	2.6	--	---	---
	No. 1 Plus	4.8	1.4	0.3-2.3	0.067
	Armentite/ Superpower	2.4	5.2	3.5-7.9	0.125
Clean up removed covers		3.0	8.5	2.4-24.6	0.255
Stocking; get new covers		2.0	1.0	0.1-2.3	0.020
Move to job, set up		5.0	2.0	1.4-2.9	0.100
Breaks, lavatory		15.0	1.4	0.1-3.9	0.210

Time-weighted exposure to
asbestos containing dusts
(outdoor) in mppcf

= 4.2

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Threshold Limit Values (TLV)

A TLV describes that time-weighted concentration of a material to which men can be repeatedly exposed for eight hours with no adverse effects on health. A TLV indicates a mean concentration which can be exceeded, provided there are corresponding exposures lower than the TLV.

At present the TLV for dust containing asbestos is 5 mppcf using standard light microscopy techniques. Based on best current information, the proposed TLV of 2 mppcf would provide better protection. A two year trial period preceeds acceptance of proposed TLV's. In 1971, 2 mppcf will be the TLV for asbestos, unless better information during the interim casts doubt upon the proposed figure.

This report evaluated current exposures using the proposed standard of 2 mppcf if the material in question had even trace (<5%) asbestos content. Manufacturers were consulted regarding the composition of the insulating product(s) found in common usage. The following table lists these materials and the per cent asbestos plus the appropriate TLV for that material.

DISCUSSION

Men were found to be working almost exclusively with asbestos-containing materials. Their time-weighted exposures to dusts from the asbestos-containing materials were in excess of the proposed TLV of 2.0 mppcf and barely under the present TLV of 5 mppcf. Steps should be taken to lower the time-weighted exposures to within proposed acceptable limits.

Several means of reducing the time-weighted exposures are apparent:

1. Cease using asbestos-containing materials. If use of asbestos-containing materials was stopped, exposures would be reduced to acceptable levels, even though some low-level exposure would be experienced until presently installed coverings have been replaced due to natural attrition.
2. Effective use of approved respiratory devices. Respiratory protection is practical for jobs which are of short duration and infrequent occurrence. It can be seen from Table 1 that jobs requiring respiratory protection are neither infrequent nor of short duration. Men encounter greatest exposures during the cutting and applying of Air cell and Kaylo. These two operations are done for 50% of the day -- sometimes 100% of the day. Many other operations listed in Table 1 could require

Table 2. MATERIALS MOST COMMONLY USED FOR FIRST TEN MONTHS OF 1968

<u>Tradename (and Manufacturer)</u>	<u>Use</u>	<u>% Asbestos</u>	<u>Composition Inerts</u>	<u>Threshold Limit Value (mppcf)</u>
No. 1 Plus (BEH Company)	Adhesive	<5-7%	95% mineral wool	2.0
Superpowerhouse (BEH Company)	Adhesive	0%	100% mineral wool	50.0
Armentite (Johns-Manville Corporation)	Adhesive	100%	0%	2.0
Air cell (Carey Company)	Covers	80%	20% (?)	2.0
Mag Oxide (85%) (Carey Company)	Covers	15%	85% MgO	2.0
Fiberglas (Owens-Corning)	Covers	0%	100% amorphous silicates	50.0
Kaylo (Owens-Corning)	Covers	~5%	95% diatomaceous calcium silicates	2.0

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APPENDIX
ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name _____ Man # _____ Age _____

Number of years with Dow _____ Number of years covering pipe _____

Do you wear a respirator? Yes _____ No _____ What make _____

If yes, list those operations during which you wear a respirator _____

What per cent. of the day is this? _____

Have you covered pipe or handled covering materials outside of Dow? _____

Yes _____ No _____ If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? _____

(b) Remove other types of covers? _____

List other types you remove: _____

(c) Mix "plus one" webbers? _____ Other adhesives? _____

(d) Use power saws? _____

List what you cut with a power saw: _____

(e) Use hand saws? _____

List what you cut with a power saw: _____

How much time per day do you:

(a) Work with "air cell" _____

(b) Work with "Kaylo" _____

(c) Work with "Hi-temp" _____

(d) Work with fiberglass _____

Which job(s) do you consider most dusty? _____

How often do you do this job(s)? _____

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UNIT INDEX

Pipe covering operations were surveyed and evaluated.

Men received time-weighted exposures to asbestos near the present Threshold Limit Value of 5 mppcf and in excess of the tentatively proposed Threshold Limit Value of 2 mppcf. Steps should be taken to reduce exposures to the proposed new standard.

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 J. Bradley, Plastic Prod. Maintenance, 433A Building
 B. B. Holder, M.D., Medical Department, 607 Building
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 RAD:sjl

N. Murray, Dow Canada at Sarnia 6-26-70
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MIDLAND, Michigan
June 24, 1969

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REPORT BC T2.1-1-64: "A SURVEY AND EVALUATION OF PIPE COVERERS' EXPOSURES TO DUSTS FROM ASBESTOS CONTAINING INSULATION MATERIALS ENCOUNTERED DURING ROUTINE PIPE COVERING OPERATIONS WITHIN THE MIDLAND LOCATION OF THE DOW CHEMICAL COMPANY"

Please note the following corrections in the above report dated March 21, 1969, by R. A. DeGesero.

Page 6: Line 5, change 4.5 mppcf to 4.2 mppcf.

Page 7: Line 10, erase 0.037 under the last column entitled Time-weight Factor: Asbestos.

Page 8: Line 7, erase 0.176 under the last column entitled Time-weight Factor: Asbestos.

Line 14, erase 0.162 under the last column entitled Time-weight Factor: Asbestos.

Line 22, change the last entry in the last column entitled Time-weight Factor: Asbestos, from 4.5 to 4.2 mppcf.

The above alterations in no way affect the conclusions or recommendations of this report.

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RAD:sjl

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Questionnaires - Summized
ratios: obtain ratio of time spent on job and nature
and multiply by % day spent on job

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RATIOS: (Time Study)		Means
	Mean	Sd
Yrs old:	40.1	8.56
Down Yrs away :	17.8	7.78
Mos conv:	132.0	115.02
Yrs out:	0.2	0.0

% Da

I Ratio 22.80 11.55		
Aircell	5.57	5.63
Cal del	3.94	3.26
Wtump	3.25	4.59
Fi	9.03	10.92
Other	1.01	2.96
	22.80	

Ratio	
22.80	x 5%
0.244	1.22
0.315	1.58
0.394	1.98
0.044	0.22

Σ Mix 6.08 3.85		
W	5.23	4.51
Sp	2.56	3.11
Ar	0.23	0.62
	8.02	

8.02	x 2.5
0.652	1.63
0.319	0.80
0.029	0.07

Σ Cut 5.82 3.82		
A.	5.05	3.99
K	5.01	4.70
Hi	2.51	2.60
Fi	1.90	2.87
Other	0.56	1.17
	15.03	

15.03	x 17.5
0.336	5.88
0.333	5.83
0.167	2.92
0.126	2.20
0.037	0.65

Hand Saw:	14.84	8.79
	0.27	0.52

Σ apply 52.00 17.00		
A	17.21	14.24
C	15.25	11.96
H	6.44	5.78
Fi	4.89	5.11
Other	2.82	6.00
W	5.23	2.1

54.90	x 50.0
0.316	15.80
0.280	14.00
0.118	5.90
0.090	4.50
0.052	2.60
0.024	1.20

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TABLE II - Summary of Sampling times using Gelma Impingers

Operation	Sampling time / operation			Shipping
	Removal	Mixing	Filtering	
	8.0	3.0	7.1	5.0
	7.5	5.0	0.8	12.0
	8.0	7.5	9.0	10.0
	8.3	5.0	5.5	13.0
	2.0	11.5		10.0
	8.0	3.3		9.5
	5.1	3.2		9.8
	5.7	2.6		19.1
	5.0	8.0		15.5
	6.0	4.3		15.0
	5.0	7.0		15.0
	6.0	4.5		13.2
	6.0	4.5		10.0
	1.6	2.8		10.0
	2.0	2.5		10.4
	2.6	2.3		2.3
		4.2		24.0
		3.0		10.0
		3.3		10.0
				9.8
				5.5
				14.0
				15.0
				9.0
				6.7
				5.5
				5.6
				5.6
				5.0

Spl. Mean (minutes) $\pm$	5.2	2.4	4.4	10.6
% time/day =	1.0	0.5	0.9	2.2
Time Study % time.	0.95	0.45	22.59	47.38

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450#1 Hays

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name J. L. Hemingway Man # 032538 Age 34

Number of years with Dow 12 Number of years covering pipe 1

Do you wear a respirator? Yes No What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow? NO

Yes No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers?

(b) Remove other types of covers?

List other types you remove:

(c) Mix "plus one" webbers? Other adhesives?

(d) Use power saws?

List what you cut with a power saw:

(e) Use hand saws?

List what you cut with a power saw:

How much time per day do you:

(a) Work with "air cell"

(b) Work with "Kaylo"

(c) Work with "Hi-temp"

(d) Work with fiberglass

Which job(s) do you consider most dusty? Fiberglass

How often do you do this job(s)? Depends on Area working

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ENVIRONMENTAL RESEARCH QUESTIONNAIRE

LSU# 9 Anger

Please answer the following questions as completely as possible, using average estimates.

Name W. J. Yergaites Man # 059745 Age 24

Number of years with Dow 5 Number of years covering pipe 1 1/4

Do you wear a respirator? Yes No X What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow?

Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 10%

(b) Remove other types of covers? 15%

List other types you remove: AIR CELL, CALSIL, CORK, STYRO-FOAM.

(c) Mix "plus one" webbers? 5% Other adhesives? 2%

(d) Use power saws? 1%

List what you cut with a power saw: CALSIL.

(e) Use hand saws? 10%

List what you cut with a ^{HAND} power saw: CALSIL, AIR CELL, STYRO-FOAM

How much time per day do you:

(a) Work with "air cell" 65%

(b) Work with "Kaylo" 25%

(c) Work with "Hi-temp"

(d) Work with fiberglass 10%

Which job(s) do you consider most dusty? ANYTHING WITH CALSIL & MIXING POWER HOUSE CEMENT.

How often do you do this job(s)? ABOUT 25% OF THE TIME.

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ENVIRONMENTAL RESEARCH QUESTIONNAIRE

HSU#2 Nelson

Please answer the following questions as completely as possible, using average estimates.

Name T.P. Dzura Man # 008977 Age 49

Number of years with Dow 27 1/2 Number of years covering pipe 18

Do you wear a respirator? Yes X No What make Dust protection only

If yes, list those operations during which you wear a respirator

Cutting & installing magnesium, Cal sil, also Kaylo & fibreglas

What per cent. of the day is this? 50%

Have you covered pipe or handled covering materials outside of Dow?

Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? Average - 10% of time

(b) Remove other types of covers? 8%

List other types you remove: Asbest, Calcium silicate Unibestos

cord, Styrofoam, Magnesium, hi temp, Kaylo, fibreglas, milled, & fibrocrete.

(c) Mix "plus one" webbers? 5% Other adhesives?

(d) Use power saws? yes -

List what you cut with a power saw: Styrofoam, cord, magnesium

& Calcium silicate block

(e) Use hand saws? yes - 5%

List what you cut with a power saw:

How much time per day do you:

(a) Work with "air cell" 2%

(b) Work with "Kaylo" 5%

(c) Work with "Hi-temp" 2%

(d) Work with fibreglas 2%

Which job(s) do you consider most dusty? Magnesium, fibreglas (used)

How often do you do this job(s)? 100%

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ENVIRONMENTAL RESEARCH QUESTIONNAIRE

ASU # 12 McLaughlin

Please answer the following questions as completely as possible, using average estimates.

Name L. R. Bott Man # 063255 Age 28

Number of years with Dow 3 Number of years covering pipe 1

Do you wear a respirator? Yes X No X What make 9

If yes, list those operations during which you wear a respirator WHENEVER I MIX POWERHOUSE CEMENT & #1 PLUS.

What per cent of the day is this? DEPENDS. SOME DAYS 0%, OTHER DAYS 15%

Have you covered pipe or handled covering materials outside of Dow? _____

Yes _____ No X If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 10%

(b) Remove other types of covers? 15%

List other types you remove: AIRCELL, CALSIL, HI-TEMP, CAL-MAG, STYROFOAM, DUCK-LINER, ASBESTOS BLANKET

(c) Mix "plus one" webbers? 5% Other adhesives? 3 & 4%

(d) Use power saws? HAVE USED POWER SAW ONLY 304 HRS DURING LAST YEA

List what you cut with a power saw: STYRO FOAM.

(e) Use hand saws? 10%

List what you cut with a power saw: SUGGEST YOU READ (D). IF YOU MEAN HAND SAW, AIRCELL, CALSIL, HI-TEMP, CAL-MAG.

How much time per day do you: DEPENDS ON AREA.

(a) Work with "air-cell" 15%

(b) Work with "Kaylo" 15%

(c) Work with "Hi-temp" 5%

(d) Work with fiberglass 15%

Which job(s) do you consider most dusty? FIBERGLAS WHEN REMOVING COVERING. THE REST ABOUT EVEN WHEN CUTTING. HI-TEMP & KAYLO ARE DUSTY WHILE HANDLING ANYTIME.

How often do you do this job(s)? WE REMOVE FIBERGLAS MORE OFTEN THAN THE REST PERHAPS TWICE A DAY OR 10 & 15% OF TOTAL TIME.

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ENVIRONMENTAL RESEARCH QUESTIONNAIRE

LSO# 12 Sherwood

Please answer the following questions as completely as possible, using average estimates.

Name W J. Boyer Man # 010675 Age 43

Number of years with Dow 20 Number of years covering pipe 1.5

Do you wear a respirator? Yes ☒ No ☐ What make Little cloth mask

If yes, list those operations during which you wear a respirator

extremely dusty area, working on hard saw, mixing concrete

What per cent of the day is this? maybe 15% on day nothing the next day

Have you covered pipe or handled covering materials outside of Dow?

Yes No ☒ If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? varies sometimes 25 sometimes 50

(b) Remove other types of covers? same

List other types you remove: aircell, caulking, etc.

(c) Mix "plus one" webbers? varies Other adhesives?

(d) Use power saws? 16 hrs in a year or half

List what you cut with a power saw: mag blocks

(e) Use hand saws? 5 to 10 %

List what you cut with a power saw: everything

How much time per day do you:

(a) Work with "air cell" 15

(b) Work with "Kaylo" 15

(c) Work with "Hi-temp" 15

(d) Work with fiberglass 5

Which job(s) do you consider most dusty? removing old covering

How often do you do this job(s)? most work days you uncover small jobs a few days no uncovering

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ASD# 12 McLaughlin

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name D. R. THOMAS Man # 023451 Age 46

Number of years with Dow 18 Number of years covering pipe 17

Do you wear a respirator? Yes No ✓ What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow?

Yes ✓ No If yes, how long did you cover pipe? 2 days

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 2 Hour

(b) Remove other types of covers? 3 "

List other types you remove: 1 " styrofoam

(c) Mix "plus one" webbers? 4 hour Other adhesives? POWER House

(d) Use power saws? 2000 times

List what you cut with a power saw: styrofoam

(e) Use hand saws? yes

List what you cut with a ~~power~~ saw: Hand aircell & Kaylo

How much time per day do you:

(a) Work with "air cell" 5 hours

(b) Work with "Kaylo" 1 "

(c) Work with "Hi-temp" 1 "

(d) Work with fiberglass 2 "

Which job(s) do you consider most dusty? Fiberglass

How often do you do this job(s)? over day

SI0030649

397512

7

ASU# 12-Babinski

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name N. H. Mottow, TSCM Man # 059759 Age 23

Number of years with Dow 5 Number of years covering pipe about 3

Do you wear a respirator? Yes ☒ No ☒ What make _____

If yes, list those operations during which you wear a respirator _____

with Kaylo, Hi Temp blocks, etc. dust is greatly present

What per cent of the day is this? 10 to 15 percent each day

Have you covered pipe or handled covering materials outside of Dow? Yes

Yes ☐ No ☐ If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? _____

(b) Remove other types of covers? _____

List other types you remove: _____

about 1/4 to 1/2 day. Every from day to day more or less

$(25 - 50\%) = 37.5\%$

(c) Mix "plus one" webbers? Whenever needed Other adhesives? _____

(d) Use power saws? section my self

List what you cut with a power saw: _____

Hi Temp blocks

(e) Use hand saws? just about all the time

List what you cut with a power saw: _____

X X X X

How much time per day do you:

(a) Work with "air cell" about 50%

(b) Work with "Kaylo" about 50%

(c) Work with "Hi-temp" _____

(d) Work with fiberglass as soon as possible

Which job(s) do you consider most dusty? _____

Most dusty - Working with Kaylo, Hi Temp, powerhouse, webbers, and armatight

How often do you do this job(s)? some every day

397513

(8)

ISO # 8 Warren

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name R. W. Wierman Jr. Man # 005084 Age 55

Number of years with Dow 33 Number of years covering pipe 25

Do you wear a respirator? Yes X No What make

If yes, list those operations during which you wear a respirator

Removing Kaylo - Hi temp - fiberglass

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow?

Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 1 per cent of day

(b) Remove other types of covers? 2 per cent of day

List other types you remove: air cell - Kaylo - Hi temp - styrofoam

(c) Mix "plus one" webbers? 1 per cent Other adhesives? 2 per cent

(d) Use power saws? 1 per cent

List what you cut with a power saw: styrofoam

(e) Use hand saws? 15 per cent

List what you cut with a power saw:

How much time per day do you:

(a) Work with "air cell" 10 per cent

(b) Work with "Kaylo" 20 per cent

(c) Work with "Hi-temp" 5 per cent Hi Temp

(d) Work with fiberglass 2 per cent

Which job(s) do you consider most dusty? Hi temp and Kaylo

How often do you do this job(s)? 25 per cent of time

ST0030651

397514

9.

ASU# 8 Warren

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name D. L. PHILLIPS Man # 052863 Age 33

Number of years with Dow 13 Number of years covering pipe 1

Do you wear a respirator? Yes No What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow?

Yes No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 2%

(b) Remove other types of covers? 5%

List other types you remove: Kaylo, Hi-temp, AirCell, Styrofoam

(c) Mix "plus one" webbers? 2% Other adhesives? 1%

(d) Use power saws? 10%

List what you cut with a power saw: Styrofoam

(e) Use hand saws? 10%

List what you cut with a ~~hand~~ saw: AirCell, Kaylo, Hi-temp, Styrofoam

How much time per day do you:

(a) Work with "air cell" 10%

(b) Work with "Kaylo" 15%

(c) Work with "Hi-temp" 2%

(d) Work with fiberglass 5%

Which job(s) do you consider most dusty? "Kaylo" and "Hi-temp"

How often do you do this job(s)? 17%

ST0030652

397515

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

CCP

Please answer the following questions as completely as possible, using average estimates.

Name R.J. PELTON Man # 027403 Age 36

Number of years with Dow 18 Number of years covering pipe 3

Do you wear a respirator? Yes X No What make

If yes, list those operations during which you wear a respirator UNDER DUSTY COND. SUCH AS WITH MAG. IN POWER & ETC.

What per cent of the day is this? 5%

Have you covered pipe or handled covering materials outside of Dow? NO

Yes No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers?

(b) Remove other types of covers?

List other types you remove:

(c) Mix "plus one" webbers? 5% Other adhesives? 5%

(d) Use power saws? YES

List what you cut with a power saw: STYRA FORM & CAL-SIL

(e) Use hand saws? YES

List what you cut with a power saw:

How much time per day do you:

(a) Work with "air cell" 5

(b) Work with "Kaylo" 5

(c) Work with "Hi-temp" 5

(d) Work with fiberglass 1

Which job(s) do you consider most dusty? CAL-SIL & FIBERGLASS HI TEMP

How often do you do this job(s)?

ST0030653

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

John H. E. Maynard
A.P.S.

Please answer the following questions as completely as possible, using average estimates.

Name D. M. ELLIOTT Man # 026005 Age 44

Number of years with Dow 18 Number of years covering pipe 4

Do you wear a respirator? Yes No X What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow?

Yes No No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 2 hr.

(b) Remove other types of covers? 1 hr.

List other types you remove:

(c) Mix "plus one" webbers? 15 Min Other adhesives? 15 Min

(d) Use power saws?

List what you cut with a power saw: Mag.

(e) Use hand saws? 2 hr.

List what you cut with a power saw: Mag.

How much time per day do you:

(a) Work with "air cell" 1

(b) Work with "Kaylo" 5 hr.

(c) Work with "Hi-temp" 1 hr.

(d) Work with fiberglass 5

Which job(s) do you consider most dusty? Mag.

How often do you do this job(s)? 8 hr. a day

ST0030654

397517

12

ASD#4-~~1111~~
Toland

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name B. F. Jones Man # 05280- Age 32

Number of years with Dow 13 Number of years covering pipe 2 1/2

Do you wear a respirator? Yes No X What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow? No

Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 40%

(b) Remove other types of covers? 10%

List other types you remove: Kaylo - Hi Temp - Air cell

(c) Mix "plus one" webbers? 5% Other adhesives? Power House 5%

(d) Use power saws?

List what you cut with a power saw:

(e) Use hand saws? 10%

List what you cut with a power saw: Kaylo - Hi Temp - Air cell

Fiberglass

How much time per day do you:

(a) Work with "air cell" 10%

(b) Work with "Kaylo" 10%

(c) Work with "Hi-temp" 10%

(d) Work with fiberglass 50%

Which job(s) do you consider most dusty? Removing & Replacing

Fiberglass - Hi-Temp - Kaylo - Mixing Power House cement

How often do you do this job(s)? 85%

ST 0030655

397518

PLEASE RETURN FILLED OUT FORM TO: LARRY WARREN, 189 BUILDING

JLVH 11 Mung

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name W.C. Hutson Man # 021039 Age 30
 Number of years with Dow 23 Number of years covering pipe 19 yrs 4 M.
 Do you wear a respirator? Yes X No What make Dust for
 If yes, list those operations during which you wear a respirator un cover & mix Power house to one plus
 What per cent of the day is this? 20 %
 Have you covered pipe or handled covering materials outside of Dow?
 Yes No X If yes, how long did you cover pipe?

ST0030656

Answer the following if they apply to you.

How much time per day do you:
 (a) Remove old fiberglass covers? 1/4 of our time
 (b) Remove other types of covers? 12 hrs a week
 List other types you remove: all kinds of covers
 (c) Mix "plus one" webbers? 15 % Other adhesives? 1/10
 (d) Use power saws? 10 %
 List what you cut with a power saw:
 (e) Use hand saws? 10 %
 List what you cut with a power saw: Kaylo Hi-temp

How much time per day do you:
 (a) Work with "air-cell" none on job at this time
 (b) Work with "Kaylo" 50 %
 (c) Work with "Hi-temp" 50 %
 (d) Work with fiberglass Will not use it.

Which job(s) do you consider most dusty? un cover in power house

How often do you do this job(s)? 40 hrs a week

just over ten

397519

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name J. E. Ley Man # 050220 Age 35

Number of years with Dow 3 Number of years covering pipe 1

Do you wear a respirator? Yes X No What make DUST FOR

If yes, list those operations during which you wear a respirator making Powerhouse and Rustie jobs

What per cent of the day is this? 10% some time some time more

Have you covered pipe or handled covering materials outside of Dow?

Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? sometimes all day

(b) Remove other types of covers? if hrs.

List other types you remove: every kind

(c) Mix "plus one" webbers? 1 hr, Other adhesives?

(d) Use power saws? 5%

List what you cut with a power saw: stump

(e) Use hand saws? a lot of the time

List what you cut with a power saw: Arsell cut

mag Kaylo Hi-temp

How much time per day do you:

(a) Work with "air cell" sometimes all day

(b) Work with "Kaylo"

(c) Work with "Hi-temp"

(d) Work with fiberglass don't use it

Which job(s) do you consider most dusty? Fiberglass Hi-temp

Kaylo in that order

How often do you do this job(s)? all the time

ST0030657

397520

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

ASO #11 Meng

Please answer the following questions as completely as possible, using average estimates.

Name EJ KRZYZANIAK Man # 052791 Age 33

Number of years with Dow 13 Number of years covering pipe 1 year 4 mos

Do you wear a respirator? Yes ☒ No ☐ What make Dust & Mist Mine Respirator

If yes, list those operations during which you wear a respirator Wear it when it is real Dusty

What per cent of the day is this? 10%

Have you covered pipe or handled covering materials outside of Dow? No

Yes ☐ No ☐ If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? Can't figure on per day basis

(b) Remove other types of covers? " " " " " "

List other types you remove: Kaylo - High Temp - Styrofoam - Air Cell

(c) Mix "plus one" webbers? 2% Other adhesives? 3%

(d) Use power saws? Haven't used a power saw yet

List what you cut with a power saw: _____

(e) Use hand saws? yes

List what you cut with a power saw: _____

How much time per day do you:

(a) Work with "air cell" _____

(b) Work with "Kaylo" 50%

(c) Work with "Hi-temp" 30%

(d) Work with fiberglass refuse to work with it

Which job(s) do you consider most dusty? Hi Temp "Kaylo"

Mixing Power House Cement

How often do you do this job(s)? ALL The Time

ST0030658

397521

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

JISU #11 Menge

Please answer the following questions as completely as possible, using average estimates.

Name H. S. ZIMMERMAN Man # 022396 Age 54

Number of years with Dow 22^{4M} Number of years covering pipe 22^{4M}

Do you wear a respirator? Yes X No What make duet flow

If yes, list those operations during which you wear a respirator sometimes making P.H. & webbers, uncovering some materials

What per cent of the day is this? 20%

Have you covered pipe or handled covering materials outside of Dow? No
Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 1/2 of time

(b) Remove other types of covers? 4 hrs a week

List other types you remove: Kalar, Calasil, P.H. webbers

(c) Mix "plus one" webbers? to Other adhesives? to

(d) Use power saws?

List what you cut with a power saw: styrofoam Calasil, Kaylo

(e) Use hand saws? 20%

List what you cut with a power saw: 10%

How much time per day do you:

(a) Work with "air cell" none on present jobs just overtime

(b) Work with "Kaylo" 50

(c) Work with "Hi-temp" 50

(d) Work with fiberglass Refuse to use it.

Which job(s) do you consider most dusty? removing cov. MIXING MWD. We also have a lot of fly ash.

How often do you do this job(s)? 8 hrs a day

ST0030659

397522

17

JSU# 10 Bender

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name E. Ross Man # B14054 Age 48

Number of years with Dow 26 Number of years covering pipe 24

Do you wear a respirator? Yes No X What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow? No

Yes No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? about 1/2 hr.

(b) Remove other types of covers? about 1/2 hr.

List other types you remove: Kalo and Celadil and foam

(c) Mix "plus one" webbers? 1/2 hr. Other adhesives?

(d) Use power saws? not really

List what you cut with a power saw: I have cut brick insulation
mag. styrofoam

(e) Use hand saws? 4 hrs.

List what you cut with a power saw:

How much time per day do you:

(a) Work with "air cell" 2 hrs

(b) Work with "Kaylo" 3 hrs

(c) Work with "Hi-temp" 1/2 hr

(d) Work with fiberglass 2 hrs.

Which job(s) do you consider most dusty? Hi Temp. Kalo
fiberglass - all are bad when contaminated

How often do you do this job(s)? mostly every day

397523

SL 244 1 - Horton

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name R. D. BURBAUGH Man # 019243 Age 41

Number of years with Dow 23 1/2 Number of years covering pipe 15

Do you wear a respirator? Yes No What make

If yes, list those operations during which you wear a respirator In not working in incinerator area so I don't use respirator To after

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow? no

Yes No no If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 1/2 hour per week

(b) Remove other types of covers? 1/2 hour per day

List other types you remove: Kaylo 1/2 hour per week

(c) Mix "plus one" webbers? 10 min per week Other adhesives? 1 hour per week

(d) Use power saws? NO

List what you cut with a power saw:

(e) Use hand saws? yes

List what you cut with a power saw: Air Cell Kaylo

How much time per day do you:

(a) Work with "air cell" 6 hour

(b) Work with "Kaylo" 1/2 hour

(c) Work with "Hi-temp" very little

(d) Work with fiberglass Little as possible

Which job(s) do you consider most dusty? fiberglass

How often do you do this job(s)? Little as possible

ST0030661

397524

19

Fred W. H. 5 Anderson

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name P. J. Jezewski Man # 021807 Age 50

Number of years with Dow 22½ Number of years covering pipe 22 yrs 3 mos.

Do you wear a respirator? Yes ☒ No ☐ What make Panthers

If yes, list those operations during which you wear a respirator _____

cutting block with a power saw removing covering under dusty conditions

What per cent of the day is this? 3%

Have you covered pipe or handled covering materials outside of Dow? no

Yes ☐ No ☒ If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 2%

(b) Remove other types of covers? 2%

List other types you remove: _____

(c) Mix "plus one" webbers? 2% Other adhesives? 3%

(d) Use power saws? 2%

List what you cut with a power saw: cellulose block Styrofoam
vermiculite blk.

(e) Use hand saws? 20%

List what you cut with a power saw: _____

How much time per day do you:

(a) Work with "air cell" 10%

(b) Work with "Kaylo" 10%

(c) Work with "Hi-temp" 2%

(d) Work with fiberglass 2%

Which job(s) do you consider most dusty? Hi Temp & Kaylo

How often do you do this job(s)? 20%

ST0030662

7

397525

20

LSU#1 Heritiers

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name L. V. Dowker Man # 05421 Age 33

Number of years with Dow 14 Number of years covering pipe 1

Do you wear a respirator? Yes X No What make Martindale Protector 7

If yes, list those operations during which you wear a respirator Mixing webber cutting Kaylo and putting on fiberglass

What per cent of the day is this? 1/8

Have you covered pipe or handled covering materials outside of Dow?

Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 1/4 hour

(b) Remove other types of covers? 2 hours

List other types you remove: air cell, kaylo

(c) Mix "plus one" webbers? 1/2 hour Other adhesives? NONE

(d) Use power saws? NO

List what you cut with a power saw:

(e) Use hand saws? YES

List what you cut with a ~~HAND~~ saw: air cell, Kaylo

How much time per day do you:

(a) Work with "air cell" 3 hours

(b) Work with "Kaylo" 1/2 hour

(c) Work with "Hi-temp" NONE

(d) Work with fiberglass 1/4 hour

Which job(s) do you consider most dusty? Mixing webbers and cutting Kaylo and putting on fiberglass

How often do you do this job(s)? 1 1/4 hours per day

ST0030663

397526

SLVH4 - Carlotta

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

21

Please answer the following questions as completely as possible, using average estimates.

Name E. A. Kozum Man # 011549 Age 45

Number of years with Dow 26 1/2 Number of years covering pipe 18

Do you wear a respirator? Yes ☒ Occasionally No ☐ What make Cartridge & gauge type

If yes, list those operations during which you wear a respirator

While removing contaminated covering, Old fiberglass

What per cent of the day is this? last two weeks 0

Have you covered pipe or handled covering materials outside of Dow?

Yes No ☒ If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 15%

(b) Remove other types of covers? 10%

List other types you remove:

(c) Mix "plus one" webbers? 12% Other adhesives? 5%

(d) Use power saws? 0

List what you cut with a power saw: Styrofoam

(e) Use hand saws? 15%

~~List what you cut with a power saw:~~

How much time per day do you:

(a) Work with "air cell" 80%

(b) Work with "Kaylo" 15%

(c) Work with "Hi-temp"

(d) Work with fiberglass 5%

Which job(s) do you consider most dusty? Fiberglass - Kaylo

How often do you do this job(s)? generally every day.

ST0030664

397527

Job # 10 - McEarm

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name M. L. Richmond Man # 012619 Age 44

Number of years with Dow 27 Number of years covering pipe 26

Do you wear a respirator? Yes No X What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow?

Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 1.5%

(b) Remove other types of covers? 10%

List other types you remove: aircel, Cal Sil, styrofoam

(c) Mix "plus one" webbers? 1% Other adhesives? 1%

(d) Use power saws?

List what you cut with a power saw: styrofoam

(e) Use hand saws? 2.5%

List what you cut with a ^{HAND} power saw: Cal Sil, aircel, Hi-temp, Kaylo fiberglass

How much time per day do you:

(a) Work with "air cell" 50%

(b) Work with "Kaylo" 2.5%

(c) Work with "Hi-temp"

(d) Work with fiberglass 1.5%

Which job(s) do you consider most dusty? Fiberglass Cal Sil, Power house cement,

How often do you do this job(s)? ABOUT 40% of our time

ST0030665

397528

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name E. Haermet Man # 025562 Age 41

Number of years with Dow 18 Number of years covering pipe 17

Do you wear a respirator? Yes No ✓ What make

If yes, list those operations during which you wear a respirator

What per cent of the day is this?

Have you covered pipe or handled covering materials outside of Dow? No

Yes No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 15%

(b) Remove other types of covers? 10%

List other types you remove: Air Cell, Cal Cell, Styrofoam

(c) Mix "plus one" webbers? 1% Other adhesives? 1%

(d) Use power saws? ?

List what you cut with a power saw: Styrofoam

(e) Use hand saws? 25%

List what you cut with a ~~power~~ ^{hand} saw: Cal Cell, Air Cell, Hi-temp, Kaylo, Fiberglass

How much time per day do you:

(a) Work with "air cell" 60%

(b) Work with "Kaylo" 25%

(c) Work with "Hi-temp"

(d) Work with fiberglass 15%

Which job(s) do you consider most dusty? Fiberglass, Cal cell & power house

condensate

How often do you do this job(s)? 40%

S10030666

397529

ASO# 4 Mitakiki

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name L. H. Hoxie Man # 050834 Age 37

Number of years with Dow 15 Number of years covering pipe 1 1/2

Do you wear a respirator? Yes X No #66 What make MSA - Bantec

If yes, list those operations during which you wear a respirator when working with fiberglass, Kaylo and Hi-temp in confined areas with poor ventilation.

What per cent of the day is this? _____

Have you covered pipe or handled covering materials outside of Dow? _____

Yes _____ No X If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 40%

(b) Remove other types of covers? _____

List other types you remove: Kaylo, air-cell, and Hi-temp
we use little or no styrofoam in 794 Bldg.

(c) Mix "plus one" webbers? 2% Other adhesives? 1%

(d) Use power saws? _____

List what you cut with a power saw: _____

(e) Use hand saws? 10%

List what you cut with a power saw: Kaylo, air-cell, and Hi-temp
styrofoam

How much time per day do you:

(a) Work with "air cell" 20%

(b) Work with "Kaylo" 15%

(c) Work with "Hi-temp": we use very little Hi-temp in 794 Bldg

(d) Work with fiberglass 50% in 794 Bldg

Which job(s) do you consider most dusty? working with fiberglass and Hi-temp then Kaylo and air-cell in this order

How often do you do this job(s)? these are the materials we

work with each day as you know. There are days we
work with one more than others depending on the Bldg we are
working in. This Bldg has all fiberglass and as it is taken
off we replace it with Kaylo or air-cell

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ST0030667

397530

ASU # 5 Paradise

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name EL Youmans Man # 016151 Age 44

Number of years with Dow 25 Number of years covering pipe 25

Do you wear a respirator? Yes X No What make SURE GUARD R 2031

If yes, list those operations during which you wear a respirator FOR
POUFGING URETHANE

What per cent of the day is this? FOUR (4) HOURS.

Have you covered pipe or handled covering materials outside of Dow?

Yes No X If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? SEVEN (7) HOURS.

(b) Remove other types of covers? SEVEN (7) HOURS.

List other types you remove: CALCIUM SILICATE, STYROFOAM ROCK CORK,
VEGETABLE CORK HI-TEMP, AIR CEL, HAIR FELT 85% MAG.

(c) Mix "plus one" webbers? YES Other adhesives? YES

(d) Use power saws? YES

List what you cut with a power saw: STYROFOAM VEGETABLE CORK AND
CILCEL BRICK.

(e) Use hand saws? YES

List what you cut with a power saw: AIR CEL, CALCIUM, HI-TEMP
STYROFOAM WOOLFELT.

How much time per day do you:

(a) Work with "air cell" SEVEN (7) HOURS.

(b) Work with "Kaylo" SEVEN (7) HOURS.

(c) Work with "Hi-temp" SEVEN (7) HOURS.

(d) Work with fiberglass SEVEN (7) HOURS.

Which job(s) do you consider most dusty? HI-TEMPERATURE.

How often do you do this job(s)? WE DO THESE JOBS AS THEY COME IN AS THIS IS
OUR WORK

397531

PLEASE RETURN FILLED OUT FORM TO: LARRY WARREN, 189 BUILDING

John H. Hering Eisen

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

1

Please answer the following questions as completely as possible, using average estimates.

Name D R Brewer Man # ~~29028~~ 29028 Age

Number of years with Dow Number of years covering pipe

Do you wear a respirator? Yes No What make

If yes, list those operations during which you wear a respirator

What per cent. of the day is this?

Have you covered pipe or handled covering materials outside of Dow?

Yes No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers?

(b) Remove other types of covers?

List other types you remove:

(c) Mix "plus one" webbers? Other adhesives?

(d) Use power saws?

List what you cut with a power saw:

(e) Use hand saws?

List what you cut with a power saw:

How much time per day do you:

(a) Work with "air cell"

(b) Work with "Kaylo"

(c) Work with "Hi-temp"

(d) Work with fiberglass

Which job(s) do you consider most dusty?

How often do you do this job(s)?

397532

905 Roving Eren.

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name K. D. Hugen Man # 060475 Age _____

Number of years with Dow _____ Number of years covering pipe _____

Do you wear a respirator? Yes _____ No _____ What make _____

If yes, list those operations during which you wear a respirator _____

What per cent of the day is this? _____

Have you covered pipe or handled covering materials outside of Dow? _____

Yes _____ No _____ If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? _____

(b) Remove other types of covers? _____

List other types you remove: _____

(c) Mix "plus one" webbers? _____ Other adhesives? _____

(d) Use power saws? _____

List what you cut with a power saw: _____

(e) Use hand saws? _____

List what you cut with a power saw: _____

How much time per day do you:

(a) Work with "air cell" _____

(b) Work with "Kaylo" _____

(c) Work with "Hi-temp" _____

(d) Work with fiberglass _____

Which job(s) do you consider most dusty? _____

How often do you do this job(s)? _____

397533

FD-20#1 Page

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name W. E. Hebrer Man # 021935 Age 43

Number of years with Dow 23 Number of years covering pipe 21

Do you wear a respirator? Yes No What make

If yes, list those operations during which you wear a respirator

What per cent. of the day is this?

Have you covered pipe or handled covering materials outside of Dow?

Yes No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers?

(b) Remove other types of covers?

List other types you remove:

(c) Mix "plus one" webbers? Other adhesives?

(d) Use power saws?

List what you cut with a power saw:

(e) Use hand saws?

List what you cut with a power saw:

How much time per day do you:

(a) Work with "air cell"

(b) Work with "Kaylo"

(c) Work with "Hi-temp"

(d) Work with fiberglass

Which job(s) do you consider most dusty?

How often do you do this job(s)?

397534

PLEASE RETURN FILLED OUT FORM TO:

ST0030671

SH 2#1 Doring Co.

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name A. D. GUTHRIE Man # 062835 Age _____

Number of years with Dow _____ Number of years covering pipe _____

Do you wear a respirator? Yes _____ No _____ What make _____

If yes, list those operations during which you wear a respirator _____

What per cent of the day is this? _____

Have you covered pipe or handled covering materials outside of Dow? _____

Yes _____ No _____ If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? _____

(b) Remove other types of covers? _____

List other types you remove: _____

(c) Mix "plus one" webbers? _____ Other adhesives? _____

(d) Use power saws? _____

List what you cut with a power saw: _____

(e) Use hand saws? _____

List what you cut with a power saw: _____

How much time per day do you:

(a) Work with "air cell" _____

(b) Work with "Kaylo" _____

(c) Work with "Hi-temp" _____

(d) Work with fiberglass _____

Which job(s) do you consider most dusty? _____

How often do you do this job(s)? _____

ST0030672

397535

PLEASE RETURN FILLED OUT FORM TO _____

ASDH 15 Mr. Laughlin

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name P. J. SMITH Man # 028051 Age _____

Number of years with Dow _____ Number of years covering pipe _____

Do you wear a respirator? Yes _____ No _____ What make _____

If yes, list those operations during which you wear a respirator _____

What per cent of the day is this? _____

Have you covered pipe or handled covering materials outside of Dow? _____

Yes _____ No _____ If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? _____

(b) Remove other types of covers? _____

List other types you remove: _____

(c) Mix "plus one" webbers? _____ Other adhesives? _____

(d) Use power saws? _____

List what you cut with a power saw: _____

(e) Use hand saws? _____

List what you cut with a power saw: _____

How much time per day do you:

(a) Work with "air cell" _____

(b) Work with "Kaylo" _____

(c) Work with "Hi-temp" _____

(d) Work with fiberglass _____

Which job(s) do you consider most dusty? _____

How often do you do this job(s)? _____

ST0030673

397536

JSD#12 Sherwood

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name D. R. Anderson Man # 059754 Age _____

Number of years with Dow _____ Number of years covering pipe _____

Do you wear a respirator? Yes _____ No _____ What make _____

If yes, list those operations during which you wear a respirator _____

What per cent. of the day is this? _____

Have you covered pipe or handled covering materials outside of Dow? _____

Yes _____ No _____ If yes, how long did you cover pipe? _____

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? _____

(b) Remove other types of covers? _____

List other types you remove: _____

(c) Mix "plus one" webbers? _____ Other adhesives? _____

(d) Use power saws? _____

List what you cut with a power saw: _____

(e) Use hand saws? _____

List what you cut with a power saw: _____

How much time per day do you:

(a) Work with "air cell" _____

(b) Work with "Kaylo" _____

(c) Work with "Hi-temp" _____

(d) Work with fiberglass _____

Which job(s) do you consider most dusty? _____

How often do you do this job(s)? _____

397537

ST0030674

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

ALV# 5- Magnano
M.P.S.

Please answer the following questions as completely as possible, using average estimates.

Name J. R. Acun Man # 016182 Age 42

Number of years with Dow 19 Number of years covering pipe 15

Do you wear a respirator? Yes X No What make Dust Free

If yes, list those operations during which you wear a respirator when

nothing was or taking off covering when dusty

What per cent of the day is this? 50%

Have you covered pipe or handled covering materials outside of Dow? no

Yes No If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglas covers?

(b) Remove other types of covers? Two types

List other types you remove: Mag, like glass, circular
High temp

(c) Mix "plus one" webbers? 1 lb Other adhesives?

(d) Use power saws? yes

List what you cut with a power saw: Same as above

(e) Use hand saws? yes

List what you cut with a power saw: Same as above

How much time per day do you:

(a) Work with "air cell" 8 hr

(b) Work with "Kaylo" 8 hr

(c) Work with "Hi-temp" 8 hr

(d) Work with fiberglas 8 hr

Which job(s) do you consider most dusty? 11-15

How often do you do this job(s)? Twenty five to thirty

hours a week

ST0030675

397538

LSO# 12 Delmar

ENVIRONMENTAL RESEARCH QUESTIONNAIRE

Please answer the following questions as completely as possible, using average estimates.

Name C. J. Mitchell Jr Man # 052037 Age 32

Number of years with Dow 13 Number of years covering pipe 1

Do you wear a respirator? Yes ☒ No ☒ What make Dust free

If yes, list those operations during which you wear a respirator Some times while cutting or removing covering

What per cent of the day is this? Power house & has / other areas
20-30%

Have you covered pipe or handled covering materials outside of Dow? No

Yes ☐ No ☐ If yes, how long did you cover pipe?

Answer the following if they apply to you.

How much time per day do you:

(a) Remove old fiberglass covers? 5%

(b) Remove other types of covers? 20%

List other types you remove: Aircell Kaylo Hi Temp

(c) Mix "plus one" webbers? 5% Other adhesives? 3%
power house & power house

(d) Use power saws? Yes

List what you cut with a power saw: Kaylo & Temp
station

(e) Use hand saws? Yes

List what you cut with a ~~power~~ saw: Hand saw Kaylo & Hi Temp

How much time per day do you:

(a) Work with "air cell" 45%

(b) Work with "Kaylo" 15%

(c) Work with "Hi-temp" 5%

(d) Work with fiberglass 5%

Notes: Worked on Kaylo & Hi Temp
& Time spent there

Which job(s) do you consider most dusty? Hi Temp Kaylo Webbers
or Adhesives

How often do you do this job(s)? Every day

[Signature]

397539

ST0030676

SI0030677

- Unavailable
- 2.5 - May pots.
- N₂ SO₄ transfer
 - clean hot caustic pots
 - etc
 - work at Benzene station.
 - sewer repair

- 3° - saw w/ bench saw
- work at hot caustic pot
 - drive on h. way traffic
 - install overhead sprinklers
 - roof work (hot tar, etc.)

ST0030678

0.95 - remove old covers

2.05 - Scaffold work

0.59 - Mix plasters

0.28 - Order Materials

2.76 - handle materials

1.62 - Miscellaneous - make
hanger, coats, etc.

4.85 - Miscell. (tools,
13.11 setting open etc.)

Overall rating 3.5

outdoors ~~working~~ working → 3.0

unavoid exp. = 2.6

2 = limited injury to last time acc.

3 = cont. exposure to last time acc.

(1-5)

397541

1964 Journeyman Carpenter

7.0370 - Study job layout

17.36 - Measure, mark cut, to size

5.23 - Cut & fit Styrofoam

7.28 - Install Styrofoam

9.79 - Install Cel & Hi T

4.02 - " Fib. blankets

5.87 - apply sheet metal

9.07 - " Armentite? hard finish

2.58 - " Webbas

8.20 - Messed apply glass fabric cloth

2.98 - apply fm Felt

0.30 - apply air cell

6.14 - " Thermotex?

85.85 Insulmastic

- (throwing coats of cement
w/ Insulmastic)

1.50 Spray with P.E. foam

Remove

Mix

Cut

APM

0.95

0.59

5.23

7.22

17.36

9.79

4.02

5.63

9.07

2.58

8.20

2.98

0.30

6.14

1.50

0.95

0.59

22.59

57.73

18.52

(0) 47.38 ← (0) 28.94

Suph. 10.0

5.0

15.0

50.0

20.0

Subst. 22.7

7.5

15.2

52.2

El. 1

3.0

2.0

15.0

50.0

30.0

Mem)

Report

5.0

1.5

17.5

50.0

Nails

Mix

cut

cut/ppg

Mix

El. 1

to

to

to

to

to

to

Age		VRS		RESP?		DAYS		REMOVED					
CORR		MRS		% DAY		MATERIALS							
No		No											
1		2		3		4		5					
1	24	5	15	0	N	0	C, SP=25	25	10.8	4.2	1.0	0.0	
2	49	20	216	0	Y	50	F = 2	18	0.2	4.0	1.0	2.0	
3	28	3	12	0	Y	15	F, H, C=15	25	2.2	2.2	0.8	1.0	9.8
4	43	20	18	0	Y	15	REMOVE=38	38	11.0	11.0	1.0	1.0	
5	46	18	220	0	N	0	F	15	1.5	0.1	0.1	13.2	
6	23	5	36	0	Y	-	C, W, A	38	19.0	9.0	0.5	7.0	
7	55	33	274	0	Y	5	C, H=25	3	0.5	0.4	0.2	0.1	4.2
8	33	13	12	0	N	-	C, H=172	7	1.4	2.0	0.3	0.2	1.3
9	36	18	36	0	Y	5	C, F, H	0	-	0.7	0.5	0.5	
10	44	15	48	0	N	-	M	18.7	1.7	1.4	1.0	0.3	
11	32	13	30	0	N	-	F, H, K=85	500	3.4	3.3	2.3	4.0	
12	50	23	232	0	Y	20	P, H, H	22.0	0	1.5	1.0	5.0	
13	35	3	12	0	Y	10	F, H, K	25.0	8.3	0.4	0.3	-	
14	33	13	16	0	Y	5	H, K, SP	15	7.5	4.5	-	-	7.0
15	54	22	246	0	Y	20	Sp, P, H, H	35	-	5	5	25.0	
16	48	26	288	0	N	-	A, K, F	12	1.0	1.0	0.2	0.0	
17	41	21	130	0	N	-	F	8.0	0.0	1.0	-	1.0	
18	50	22	267	0	Y	3	H, K=20	4.0	0.2	0.9	0.2	2.0	
19	33	14	12	0	Y	13	W, K, F	2.0	7.0	3.0	-	3.0	
20	45	26	216	0	Y	-	F, K	25.0	8.0	2.0	-	0.0	
21	44	27	312	0	N	-	F, C, SP	25.0	7.0	3.0	-	15.0	
22	41	18	204	0	N	-	F, C, SP	25.0	7.0	3.0	-	1.0	
23	37	15	18	0	Y	-	F, H, K, A	42.0	1.0	1.0	-	4.0	
24	44	25	300	0	Y	50	H	40.0	10.0	10.0	10.0	10.0	
25	42	19	180	0	Y	50	H	25.0	6.3	6.3	-	7.0	8.9
26	32	13	12	0	Y	50	K, H, W, A	25.0	5.0	9	9	1	
Avg		40		18		12		20					

Worst offender

1 = 16
F = 14
H = 11
Sp = 6
Mg = 2
A = 2

Σ = 97.3

1.23% lost
(id up etc)

Professional Time study = BLUE

Warren = 870

18903061S

~~1070~~

Σ	A	C	N	F	O	H	M	Σ	A	C	N	F	O	H	M	Σ
15.2	8.2	28	-	6.0	-	10	1	37	8.2	28	-	6.0	-	10	1	37
5	3.1	2.8	1.1	0.1	1.1	5	0	72	1.8	34.0	1.6	1.8	1.8	1.8	1.8	72
10	1.5	1.5	0.5	0.5	5	10	0	50	8.1	7.1	7.4	7.1	28.3	5	4	50
8.2	0.1	2.4	2.8	1.3	-	10	0	48	7.2	13.2	4.2	4.4	-	5	-	48
12.5	-	0.8	0.8	3.0	-	12.5	-	62	3.3	3.3	3.3	3.3	-	-	10.1	62
9.7	4.8	4.9	-	-	-	9.7	-	48	2.1	2.2	-	-	-	4.0	-	48
16	4.1	8.1	2.0	0.8	1	15	1	78	20.3	10.5	10.1	10.1	6.0	1	2	78
11	2.2	4.0	0.5	4.4	8.9	10	1	79	20.5	30.8	4.1	10.3	10.3	2	1	79
14	4.7	4.7	7.0	0.9	-	15	-	70	20	2.0	3.0	5.0	-	5	5	70
25	3.3	5.0	5.8	0.1	-	25	0	62	8.8	4.1	8.8	4.1	-	0.1	-	62
10	1.2	1.3	1.2	0.3	-	10	-	30	2.4	2.4	2.4	12.6	-	5.0	5.0	30
20	-	1.0	1.0	-	-	20	-	25	-	1.0	6	-	-	6	5	25
10.3	3.5	3.4	2.4	-	-	9.3	-	51.7	12.6	15.5	15.5	-	-	5	0	51.7
12.3	6.7	4.0	-	-	7.6	13.3	-	6.7	39.8	14.5	-	-	12.4	2	3	6.7
10	-	5	5	-	-	10	-	35	-	6.0	7.0	-	-	10	10	35
50	13.8	20.0	3.0	13.5	-	50	-	50	5.4	8.0	1.2	4.4	-	6	-	50
15	13.8	1.2	-	-	-	15	-	65	5.0	5.0	-	-	-	0.5	3.5	65
22	7.0	1.0	2.0	2	-	22	-	69	2.0	2.0	3.0	3.0	-	2.0	3.0	69
11	9.4	1.6	2	-	-	11	-	55	4.1	7.3	-	-	-	6.8	-	55
15	15.0	3.0	-	0.4	-	15	-	45	6.0	6.0	-	2.3	-	0.7	-	45
25	7.5	6.2	7.1	3.8	-	25	-	23	6.3	5.1	6.3	7.2	-	1	-	23
25	7.5	6.4	2.5	2.8	-	25	-	29	6.3	4.2	6.3	3.4	-	1	-	29
10	2.0	1.5	1.5	5.0	-	10	-	45	6.8	6.8	6.3	2.0	-	2	-	45
10	2	6.5	2.5	2.5	-	10	-	45	10.0	10.0	10.0	10.0	-	3	-	45
10	2.0	1.5	4.0	2.0	10	10	-	50	10.0	10.0	10.0	10.0	-	2.5	-	50
11	2.2	4.0	4.0	2.4	0.4	10	-	54	7.2	10.0	10.0	10.0	10.0	5	5	54
17.2	5.0	5.4	2.0	2.0	0.5	-	-	50	7.2	10.0	10.0	10.0	10.0	5	5	50
37.2	37.6	1.8	1.8	7.3	-	-	-	50	7.2	10.0	10.0	10.0	10.0	5	5	50
37.2	37.6	1.8	1.8	7.3	-	-	-	50	7.2	10.0	10.0	10.0	10.0	5	5	50

ST0030682

397545

Use this form for historical data only.

Page 1 of 1

Industrial Hygiene Chemical Exposure Data Entry Log
Field Survey TWA Exposure And Excursion Exposure Data

Report no. 21-1-64/1070 Date 0369

Building no. 0 Index no.

Units of Data X Respirator Worn?

Master no. _____

Chemical Name

Asbestos

Job Classification

Job No.

DR#

270713

DR 8

TWA/Exc.

TWA/Exc.

Coveress(Pipe) 645755 4.9/39.5

/

397546

ST10030683