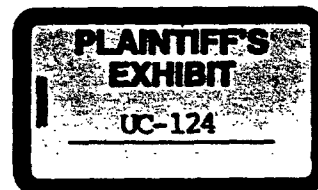


Murray
4/47
2000



Mr. D. C. Willard

April 28, 1967

Building 8-96-2

E. Q. Hull, M.D.

Particulate Matter in Air
Asbestos Dust
Project No. IH-PAR-76-67

Dear Don:

As per our telephone conversation today, I am attaching a resume' of our determinations of dust breathed by the employees while cutting and installing "kale" insulation.

We feel that further air sampling is needed to give you more meaningful conclusions as to the best protection for the employees handling this material.

At your convenience, we will be glad to discuss these findings with you. In the meantime, if you would keep us informed of jobs pertaining to cutting, installing and removing "kayle" insulation, it would be helpful in scheduling the air sampling work.

Thanks,

Bert Murray
Bert Murray

Deposition Exhibit No 10
5-14-87

A04878

DISTRIBUTION:

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General Foremen's Office

A04878

PARTICULATE MATTER IN AIR

Dust Breathed by the Employees While Cutting and Installing "Kaylo" Insulation

Plant-wide Survey - Plant 514

Authors: H. H. Warwick
B. L. Murray

Date: September 21, 1965
Project No.: IH-1G-65

Doctor Hull, Plant Medical Director, requested a plant-wide industrial hygiene study to determine the potential exposure of insulators to asbestos fiber dust concentrations. Table I gives the results of seven separate tests, including 24 breathing zone level air samples and shows an average dust concentration of 5.2 million particles per cubic foot of air. A "threshold limit value" of 20 mppcf of air has been suggested.¹

When three employees, or less, hand-cut and apply "Kaylo" insulation, the concentration of dust is considered safe from the health standpoint; however, with 6 men the dust count exceeds the TLV. It is at this phase of the operation that exhaust ventilation should be used. Excessive dust concentrations can be expected when the insulation is removed from piping and tanks. Again, exhaust ventilation should be used to move the dust away from the employees, if possible; otherwise, respirators are advised.

"Kaylo" insulation contains 12 to 13% asbestos and 5.6 to 7.4% crystalline-free silica.² This material is received in block and pipe form and the insulator measures and marks the material into appropriate sizes and cuts it with a hand saw. The insulation material is wired into position around the tank or pipe. The tasks of cutting and applying the "Kaylo" insulation are shown in Figures 1 and 2.

The air samples were collected with a midjet impinger and a Uni-jet sampler, drawing 0.1 cubic foot of air per minute through impinger flasks containing 10 milliliters of distilled water. Dust counts, made by the Light Field Microscopic Counting Technique, appear in Table I.

This study has revealed that further research work is needed to:

1. Attain an established figure for the "threshold limit value".
 2. Utilize exhaust ventilation to remove the dust from the work area.
 3. Determine the particle size of the asbestos fiber where the dust count exceeds 5 mppcf.
 4. Obtain Range Finding Tests on animals exposed to different percents of asbestos fiber.
 5. Continue our plant-wide study in support of these conclusions.
-
1. Cook, Warren A., and Peole, Robert E., Letter dated February 12, 1962 - The University of Michigan School of Public Health.
 2. Peole, R. E., Industrial Hygiene Survey - Construction Insulation Shop, Building 511-2018. Report 62-IH-1-G-1 (March 21, 1962).

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TABLE I

PARTICULATE MATTER IN AIR

Dust Breathed by Employees While Cutting and Installing
"Kaylo" Insulation

Date	Sample Number	Sampling Conditions at Breathing Level	Number of Employees	Dust Count MPPCF (1)
11-16-64	1	5-min. cutting, 5-min. application inside building	2	2.1
	2	Same	2	2.6
	3	Same	2	1.7
	4	7-min. cutting, 3-min. application	2	3.0
1-19-65	5	Cutting and application during entire sampling period - inside building	6	22.5
	6	Same	6	17.0
	7	Same	6	22.5
2-16-65	8	Same	2	3.6
	9	Same	2	1.6
	10	Application of insulation - no hand saw cutting	2	0.3
	11	Same	1	0.1
3-1-65	12	Cutting and application during sampling period - outside building	2	7.6
	13	Same	2	2.4
	14	Same	2	4.0
3-22-65	15	Application of insulating - no cutting - inside building	3	1.9
	16	Same	3	13.0
	17	7-min. cutting; 3-min. application	1	7.3
5-26-65	18	Clean up of insulation from floor - sweeping and shoveling - inside bldg.	2	0.0
	19	Same	2	0.1
	20	Same	2	2.5
6-14-65	21	Cutting and application during sampling period - inside building	2	1.0
	22	Same	2	5.0
	23	Same	2	2.5
	24	Same	2	1.1

(1) Million particles per cubic foot of air.

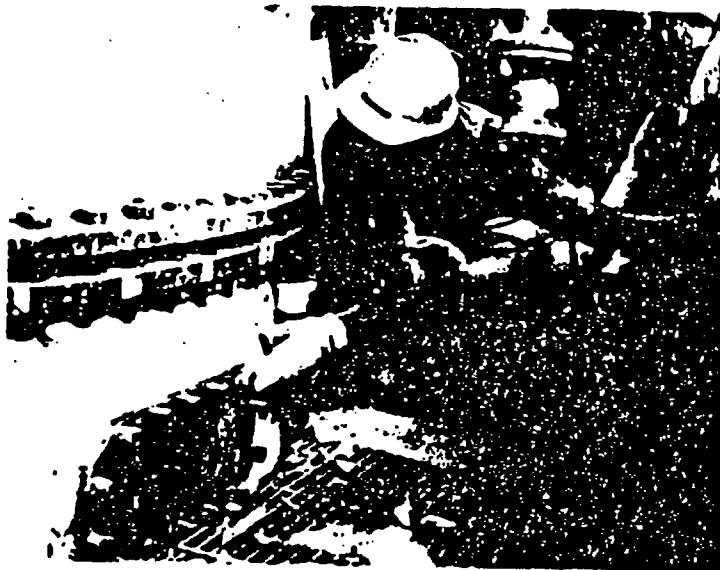
PARTICULATE MATTER IN AIR

**Dust Breathed by the Employees while Cutting and Installing
"Kaylo" Insulation**

Plant-wide Survey - Plant 514



**Figure 1. Sawing block sections. Breathing zone level
air sample being collected in the background.**



**Figure 2. Applying insulation block. Breathing zone level
air sample being collected in the foreground.**

INDUSTRIAL HYGIENE EVALUATION AND SURVEY

PROJECT NO. 711

Date 9-11-66 Time 1:00 Project Asbestos Insulation Plant in G.R.

Department Maintenance Location Cell 13 & 14 Bldg. No. 427

Requested by _____ Reason Survey

General Conditions: Type insulation being cut, fitted and secured to frame on cell 13 & 14

Sampling Method and Equipment 12.4 gal. canisters containing 100 cc. of 10% formalin and 100 cc. of 10% HCl

Shift: Day _____ Eve. _____ Mid _____ No. Employees _____ Sampled by 11/10/66 CGC

Sample Number	Zone	Sampling Time-Min.	Flow Rate	CONCENTRATION		
				CFM	CFM	CFM
1		10	2.8	1.0	<0.1	<0.25
2		10	2.8	1.0	0.6	1.5
3		10	2.8	1.0	0.8	2.0
4		10	2.8	1.0	0.2	0.5

Special Conditions

Breathing level inside cell 14 (not cell 13) 2.5 gal. canister fitted and secured to lungs in cutting time approximately 2 min. Same as for cell 1 cutting time 5 min. Same as for cell 1 cutting time 8 min. Breathing level inside cell 13 - in solution being cut & fitted and secured to frame in cutting time 5 min. for above floor level by 4 employees.

Calculation:

5 10 2.8 1.0 <0.1 <0.25 Same as for No. 4

Remarks:

1000 $\frac{1000 \times 100 \times 250 \times 10^3}{1000 \times 10^6}$

17475

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Sketch - See Reverse Side. Reference No. 7JND 45 Analyzed by Gene R. R. Date 9-28-66

[Signature]

PLANT 514

132 17

PROJECT NO. JH 66

INDUSTRIAL HYGIENE EVALUATION AND SURVEY

Date 4-13-66 Time 10:00 AM Effect Dust in Air (Asbestos 2nd edition)
Department Maintenance floor (north end) Bldg. No. 156
Requested by Surve nature of Concentration
General Conditions: locus (2' - 6' being cut (scored))
application

Sampling Method and dist. water 1' wet sampler

Shift: Day Eve. Mid No. Employees 5 Sampled by HH/KI-C6C

Sample Number	Zone	Sampling Time-Min	Flow Rate	CONCENTRATION		
				Colt	Count	PPCF
1		10	2.8	1.0	<0.1	<0.25
2		10	2.8	1.0	0.8	2.0
3		10	2.8	1.0	2.2	5.5

Special Conditions
Breathing level of employee as he cut insulation. Another employee cutting nearby intermittently.
Ditto
Ditto

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Calculation:

$$\frac{\text{Net Count} \times 7.50 \times 10^3}{6} = \text{ppcf}$$

Remarks: