FILE NAME: Asbestos Textile Product Use (ATPU)

DATE: 1981 Dec 4

DOC#: ATPU026

DOCUMENT DESCRIPTION: Unpublished Consultant Report - Asbestos Cloth Survey for Law Offices of Kenneth W. Carlson

ASBESTOS CLOTH SURVEY
for
LAW OFFICES OF KENNETH W. CARLSON
by
George E. Caesar Jr., CIH
December 4, 1981

EAL W.O. 62-0149

2.

INTRODUCTION

This report covers the evaluation of potential exposures to airborne asbestos fibers during operations involving the handling of asbestos containing cloth. This project was conducted using the facilities at EAL Corporation, 2030 Wright Avenue, Richmond, California. This project was conducted for the Law Offices of Kenneth W. Carlson. The purpose of this project was to re-create similar conditions to those conditions in the past when asbestos containing cloth was used regularly for pipe insulating purposes and evaluate the personal exposures to asbestos during these conditions. The principal contacts for Kenneth W. Carlson were Mr. Stephan P. Angelides and Mr. John Robinson, Attorneys-at-Law. EAL's Project Manager for this project was Mr. George E. Caesar, Jr., Certified Industrial Hygienist (No. 1058).

SUMMARY OF RESULTS

Two atmospheric samples for asbestos fibers were taken on an asbestos worker tearing five inch strips from a roll of asbestos cloth. The measured concentrations during the two sampling periods were 5.8 and 13.7 fibers per cubic centimeter (fibers/cc). One area sample was taken continuously during the study period. This sample was analyzed at 6.3 fibers/cc.

The current CAL/OSHA and FED/OSHA eight hour time weighted average (TWA) permissible exposure limit (PEL) is 2.0 fibers/cc. The ceiling or short term concentration, which cannot be exceeded is 10.0 fibers/cc.

During the study, the ceiling limit was exceeded during one 16 minute sampling period. The time weighted average concentration measured during the two sampling periods indicates that similar operations performed for more than 105 minutes per work shift would exceed the present CAL/OSHA and FED/OSHA PEL of 2.0 fibers/cc.

EQUIPMENT AND STUDY PROCEDURES

1. A project study area at EAL was isolated from other laboratory areas by lining an approximate 6 feet by 15 feet laboratory with six mil visqueen

plastic. A decontamination chamber of approximate 6' x 6' dimension was installed at the door. The room was lined and the chamber constructed by General Industrial Insulation Company of Pacheco, California.

2. Atmospheric samples for asbestos fibers were taken by attaching a Mine Safety Appliances (MSA) portable sampling pump, Model G, to an experienced asbestos worker. The pump was connected by Tygon tubing to an open-faced 37 millimeter mixed cellulose ester filter cassette. The pump was pre-calibrated with a primary standard to 2.0 liters per minute (Lpm). Air was drawn through the open faced filters at the prescribed 2.0 Lpm rate. The cassettes were attached at the worker's breathing zone. An area sample was taken in a similar manner by attaching the cassette at 1.5 meters above the floor.

3. After the sampling period, the cassettes were closed and returned to the microscopy laboratory for analysis. The samples were analyzed by National Institute for Occupational Safety and Health (NIOSH) Method P&CAM 239. This method employs phase contrast illumination microscopy at 400-450 magnification. Only fibers greater than 5 microns in length were counted. One hundred counting fields per filter were counted.

   EAL Corporation is accredited by the American Industrial Hygiene Association (AIHA); accreditation number is 25.

4. The asbestos cloth was analyzed for asbestos content by polarized light microscopy (PLM), the method of choice designated by the United States Environmental Protection Agency (EPA).

DISCUSSION

An experimental asbestos cloth handling operation was developed and conducted at EAL Corporation for the Law Offices of Kenneth W. Carlson. The purpose of this project was to evaluate potential workman exposures to asbestos fibers during normal operations involving the handling of this cloth.

The asbestos cloth was received by Mr. George E. Caesar, Jr., CIH, Manager Environmental Sciences Department, of EAL on November 6, 1981. The

cloth was sent in a wooden box from Mare Island Naval Shipyard. The box was completely wrapped in approximately 4 mil plastic. The plastic was taped with duct tape. The shipper was noted to be R. L. Andrew (See Appendix 1).

The box was stored unopened in a secured location at EAL until December 4, 1981.

A laboratory section at EAL was prepared for this project. The company of General Industrial Insulation of Pacheco, California, was contracted to seal the laboratory with six mil visqueen plastic. A decontamination chamber was installed at the entrance to the lab. This was the only entrance to the lab. The total laboratory dimensions were approximately sixteen feet in length, six feet in width and nine feet in height. The decontamination chamber was approximately six feet long, six feet wide and six and one-half feet in height.

The room was not mechanically ventilated during this study. There were two non-operating exhaust hoods in the room and a passive ceiling return air duct.

On December 4, 1981, arrangements were made with Mr. Glenn Brown of Vacaville, California, to perform normal stripping techniques on the asbestos cloth. Mr. Brown is an experienced asbestos worker with specific experience in handling the asbestos cloth of interest. Mr. Brown, Mr. John Robinson of the Law Offices of Kenneth Carlson, Mr. Jeffrey Brown, Mr. Kipling Fout and Mr. George Caesar of EAL Corporation were present when the box containing the asbestos cloth was opened.

The product manufacturer was labeled as Raybestos-Manhattan of Charleston South Carolina, on the box. There was a GSA identification label on the box. There were no warning or precautionary labels or markings on the box or roll. The enclosed asbestos roll was wrapped securely in brown paper.

Mr. G. Brown was outfitted in a complete personal protective equipment uniform including coveralls, booties, gloves, head covering and NIOSH approved respirator for asbestos exposure. Mr. G. Brown was outfitted with a personal sampling monitor by Mr. J. Brown. The monitoring scheme involved a portable air sampling pump worn on a webbed belt around Mr. G. Brown's waist. The pump was connected by Tygon tubing to an open-faced filter cassette. The cassette was attached at Mr. G. Brown's lapel in a slight downward position

representative of his breathing zone. The pump was precalibrated at 2.0 liters per minute. An area air sampling monitor was also placed in the work area.

Mr. G. Brown then entered the work area and proceeded to cut the edge of the roll for two or three inches. Mr. G. Brown would then tear across the sheet until he had separated a strip about five inches wide and five feet long.

During the first sampling period, eight strips were taken from the roll. Six strips were bagged in plastic. The other two were stacked. During the second sampling period, an additional eight strips were removed. All of these strips were stacked in the work area.

Two sampling periods were chosen based upon professional judgement. The two periods were chosen to represent specific work periods. Their relationship to full shift operations was left open to interpretation due to the reported variability in typical work shifts.

Between the two sampling periods, Mr. Brown removed his personal protective equipment while in the decontamination chamber and exited for a break. Mr. J. Brown removed the sampling monitor before he removed the protective equipment.

After the sampling period, the filters were capped and returned to the Microscopy Laboratory for analysis. Additionally, a bulk sample was taken of the dust in the bottom of the box along with a sample of the cloth.

After completion of the project, the area was cleaned and restored by General Industrial Insulation. All waste materials were disposed according to state and federal regulations. The remaining portion of the asbestos roll was secured at EAL.

RESULTS AND CONCLUSIONS

The sample of material from the asbestos roll was analyzed for asbestos content. The sample was described as 90 to 95 percent chrysotile asbestos. The remaining portion was cellulose. This sample verifies that the asbestos cloth is very high in asbestos content.

The airborne samples taken during the monitoring periods were analyzed for asbestos fibers greater than 5 microns in length. Fibers were considered those particles with an aspect ratio of 3:1 or greater. Obviously non-asbestiform fibers were not counted. Otherwise, all fibers were counted. On the filter from the first sampling period, 126 fibers were counted in 40 fields. On the filter from the second sampling period 120 fibers were counted in 20 fields. From the filter from the area sample 308 fibers were counted in 20 fields.

The resulting airborne concentrations during the sampling periods were 5.8 and 13.7 fibers/cc respectively. The time weighted average (TWA) concentration for the two sampling periods was 9.2 fibers/cc. The time weighted average concentration is calculated from the equation:

$$TWA = \frac{C_1T_1 + C_2T_2}{T_{total}}$$

Where TWA = time weighted average concentration

C_1 = concentration during sampling period 1

C_2 = concentration during sampling period 2

T_1 = time, in minutes, of sampling period 1

T_2 = time, in minutes during sampling period 2

T_{total} = total minutes $T_1 + T_2$

The area sample measured during the two sampling periods indicated 6.3 fibers/cc. This sample describes the ambient concentration during the entire time of the project.

The measured concentrations during the asbestos cloth stripping were found to exceed the current CAL/OSHA and FED/OSHA PEL of 2.0 fibers/cc. Additionally, during the second sampling period the ceiling limit, or concentration, which should not be exceeded for any time period, was exceeded.

The variation in concentration between the two work periods may be due to an airborne accumulation of asbestos fibers over the test periods. The fibers generated were noted to be quite light and fluffy and appeared to be easily generated into the air.

Mr. G. Brown described the use of this type of cloth in this manner as being what is described as a short term continuous exposure. The workman would continuously cut strips until enough strips were available for the daily operation. The strips would then be used to insulate various sides of pipe.

Based upon the results for the two sampling periods, the 8-hour PEL of 2.0 fibers/cc would be exceeded if this operation were conducted for more than the 105 minutes. The following calculations explain.

$$TWA = \frac{C_1T_1 + C_2T_2 + C_3T_3 \ldots C_iT_i}{T_{total}}$$

$$2 \text{ fibers/cc} = \frac{(9.2) \times (X)}{480 \text{ min.}}$$

$$104.35 = X$$

where 2 fibers/cc = 8 hour PEL

9.2 fibers/cc = TWA concentration for two sampling periods

480 = minutes in 8-hour workshift

X = exposure time in minutes needed to exceed PEL

The conclusions from these results are that the cloth is extremely high in asbestos content and that significantly high expousres can result from handling the material. These exposures can exceed the ceiling maximum exposure limit and the 8-hour PEL. The TWA concentration indicates that operations exceeding 105 minutes per workshift will exceed the 8-hour PEL. Exposures at these levels can be injurious to health and require adequate engineering and protective equipment controls.

Since the type of operations involving the asbestos cloth tended to be variable, it is difficult to ascertain what type of daily exposure might have been typical. It is the conclusion of this study that certain aspects of handling the cloth are capable of generating significant high concentrations of asbestos fiber that would be potentially hazardous to worker health.

Respectfully submitted,

George E. Caesar, Jr., CIH
Manager
Environmental Sciences Department
Certified/Comprehensive Practice

ATMOSPHERIC SAMPLES FOR ASBESTOS FIBERS

for

Asbestos Cloth Analysis Project
for
Law Offices of Kenneth Carlson

12/4/81

Sample Location	Sample Time Start/Stop	Measured Concentrations fibers/fields	fibers/cc
Personal sample on Mr. Glen Brown ripping asbestos cloth	1352/1413	126 (40)	5.8
Area sample at 1.5 meters above floor on left side in demonstration area	1453/1509	120 (20)	13.7
	1340/1515	308 (20)	6.3

The CAL/OSHA "action" level for asbestos exposure is 0.1 fibers/cc.

The CAL/OSHA and FED/OSHA PEL for asbestos fibers is 2.0 fibers greater than 5 micron per cubic meter (fibers/cc).

The CAL/OSHA and FED/OSHA ceiling limit is 10.0 fibers/cc.

ANALYSIS OF ASBESTOS CLOTH FOR % ASBESTOS

for

Law Offices of Kenneth Carlson

12/8/81

Sample	% Asbestos/type	% Other Identifiable materials
Strip from roll of asbestos cloth	90-95% chrysotile	5-10% cellulose
Bulk sample of dust from bottom of box holding the cloth	< 1% trace chrysotile	20-30% miscellaneous particles (cellulose, synthetic fibers) 70-80% miscellaneous particles (quartz, feldspar, calcite vermiculite, clays)

APPENDIX

DOC IDENT	RI FROM	M & S	STOCK NUMBER FSC NIIN	ADD	UNIT OF ISSUE	QUANTITY	DOCUMENT NUMBER REQUISITIONER DATE SERIAL	SUFFIX	SUPPLEMENTARY ADDRESS	SIGNAL	FUND	DISTRIBUTION	PROJECT	PRIORITY	REQ'D DEL DATE	ADVICE	RI	UNIT PRICE DOLLARS CTS
A	N0Z		5640002671569		RO	1	N00221 2070 0023	A				90						

SHIPPED FROM
Mare Island Naval Shipyard
Code 560, Supply Dept.
Vallejo, CA 94592

SHIP TO
Mr. George E. Caesar
EAL Corp, 2030 Wright Ave.
Richmond, CA 94804

MARK FOR

PROJECT
Asbestos Litigation

TOTAL PRICE DOLLARS CTS.

WAREHOUSE LOCATION | TYPE OF CARGO | UNIT PACK | UNIT WEIGHT | UNIT CUBE | U F C | N M F C | FREIGHT RATE | DOCUMENT DATE 1309 | MAT COND | QUANTITY

SUBSTITUTE DATA (ITEM ORIGINALLY REQUESTED)

FREIGHT CLASSIFICATION NOMENCLATURE

ITEM NOMENCLATURE
Asbestos Cloth

Shipped By and Date, 11-6-81
[signature]

TYPE OF CONTAINER(S): roll
TOTAL WEIGHT

RECEIVED BY AND DATE
[signature] 11/6/81
George E. Caesar

INSPECTED BY AND DATE
George E. Caesar.

Emp. Badge No./Dept.
108430 Code 580

NO. OF CONTAINER(S): one
TOTAL CUBE

Receivers SSN
155-40-4423

WAREHOUSE LOCATION

REMARKS

FIRST DESTINATION ADDRESS
Same as B above

DATE SHIPPED

Authorization: Cap lane
US Dept of Justice ltr Oct 5.81

RECEIVER'S SIGNATURE (AND DATE)
George E. Caesar

15 RECEIVERS Company
EAL Corporation

DD FORM 1348—1, 1 MAR 74. EDITION OF 1 JAN 64 MAY BE USED UNTIL EXHAUSTED
N 0102-LF-013-1040
DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT

5284

APPENDIX 1



BILLING INSTRUCTION FORM
Environmental Sciences Department

SUMMARY

Date: 18 Dec 81

Customer Name: Kenneth Carlson

Dept. 22	Laboratory W.O. Number	470149	$ 136.00
Dept. 23	Field Services W.O. Number	620149	$ 1865.00
Grand Total Due from Client			$ 2001.00

Billing Instructions: Check One

Bill Grand Total Only	X
Bill Dept. Totals	
Bill Detail	

Summary should be prepared by Project Manager

Exhibit 25
Witness
Kathy Kusrow Rothstein
Dep. Date

PRELIMINARY LAB DATA REPORT AND BILLING INSTRUCTIONS

BILL TO: Law Offices of Kenneth W. Carlson

ADDRESS: 1970 Broadway, Suite 1250, Oakland, Ca 94612

ATTENTION: Stephen Angelides

RECEIVER NO. _____

P.O. NO. _____

PROGRAM MANAGER: _____

FREIGHT: $

O.K. FOR TYPING: _____

WORK ORDER NUMBER	CUSTOMER NUMBER	SET NUMBER	DATE RECEIVED	DATE DUE	ESTIMATED BILLING	BILLIN APPROV
620149-5421			12/4/81			
C 3	9	14	24	35	46	

ITEM	QTY.	DESCRIPTION OF LABORATORY WORK (SAMPLE, TYPE, ANALYSIS, ETC.)	PRICE EACH	TOTAL
1	3	Air samples for asbestos fibers by PCM-7 [illegible]	28	74
2	2	Bulk sample analysis by PLM	31	62

Exhibit 26
Witness
Kathy Kusiow Rothstein
Pgs. Date

ITEM	NO. HRS.	DESCRIPTION OF FIELD WORK	$/HRS.	TOTAL

Field Services

Customer Name: Kenneth Carlson

Customer Number: W.O. No. I.D. No. Date

Employee Name	Description of Work	Hrs.	Rate per Hour Direct $	Rate per Hour Marked up $	$ Total
[illegible]	[illegible]			[illegible]	
[illegible]				[illegible]	
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
				Total Labor	[illegible]

Expenses Reimbursable	Detail	$ Total
Travel: Airfare		
Mileage		
Auto Rental - EAL Van / Commercial		
Per Diem		
Lodging		
Reproduction		
Computer		
Other (Describe) [illegible]		[illegible]
Contracting Sub-Contractor [illegible]		
(Crane) Labor (Hrs. & Rate) 4 x [illegible] x .25 [illegible]		[illegible]
(Oil) Expense 40		
	Total Expense	$ [illegible]
	GRAND TOTAL	$ [illegible]

Exhibit 20
Witness
Kathy Kusrow Rothstein
Pgs. Date

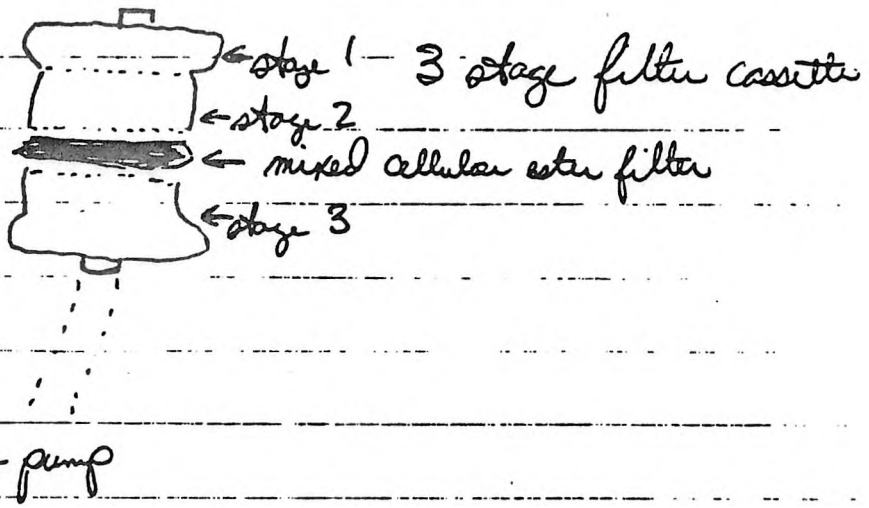


Exhibit 28

Witness

Kathy Kusrow Rothstein

Pgs. Date

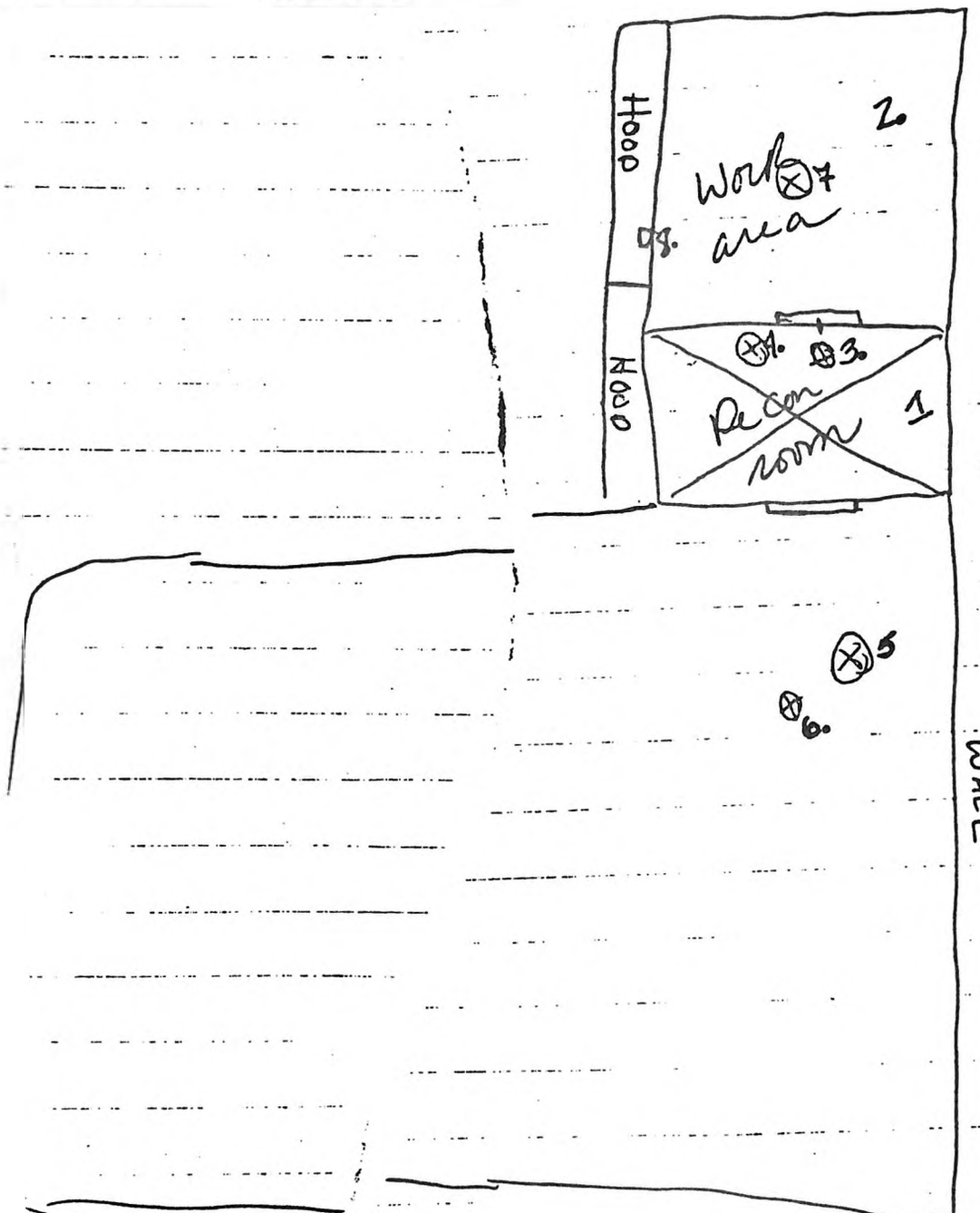


Exhibit 29

Witness

Kathy Kusrow Rothstein

Pgs. Date

TOP

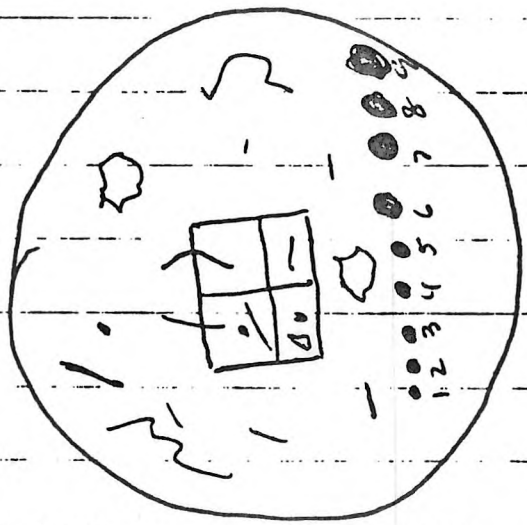


Exhibit 30

Witness Kathy Kusrow Rothstein

Pgs. Date

LFE Environmental Analysis Laboratories
CORPORATION

RAW DATA

Customer: Kenneth Carlson Date Received: 12-4-81

W. O. No: 620149-5421 Due Date: 12-11-81

Okay for Typing:

Sample No.

ANALYSIS	Raw Data Ref.	Units	2083-1-2 Tile	2083-1-3 Dust	
Asbestos PLM		%	<1	TRACE (<1%)	
		Type	None observ	Chrys	
			20-30	20-30	
			Cellulose	misc. fibers	
			70-80	inc. cellulose	
			mineral wool & perlite	synthetic hair	
				70-80	
				misc particles	
				inc: quartz	
				Feldspar	
				calc. ftc	
				vermic.	
				clay	

Exhibit 8

Witness

Kathy Kusrow Rothstein

Pgs. Date

CP3628B

LEE CORPORATION Environmental Analysis Laboratories

RAW DATA

Customer: George Caesar Date Received: 12-8-81

W. O. No: 62-0149 Due Date:

Okay for Typing:

ANALYSIS	Raw Data Ref.	Units	Sample No.												
		Cloth													
Asbestos		%	90-95			NF									
		Type	Chrysotile												
			5-10												
			cellulose												

Exh.bit 16

Witness Kathy Kusrow Rothstein

Pgs. Date

CP3628B

12/4/81

Kenneth Carlson

Pump Calibration : AA filter, closed face, bubble meter/rotameter method.

Pump No.	Vol.	Time	Rotameter pump	Rotameter Brooks*	Flow Rate
55	500ml	14.6	5½	119	
	"	15.0	"	"	
	"	15.0	"	115	
	"	14.8	"	119	
		$\bar{x}$ = 14.8 - - - - - - - ->			2.02 lpm
61	500 ml	14.8	5½	119	
	"	14.8		"	
	"	14.8		115	
	"	14.6		119	
	"	14.6			
		$\bar{x}$ = 14.7 - - - - - - ->			2.04 lpm

* Rotameter # 8005H 39774/2

Exhibit 12
Witness
Kathy Kusrow Rothstein
Pgs. Date

114 12/4/81

Kenneth Carlson, Law Offices of

Airborne Asbestos Sampling

Location	Filter #	Start/Stop	Flow Rate
Rm 212	AA 14300	1340/1515	s: 119 * = 2.0 Lpm
IC Room Asbestos	pump 55		c: 112
Demonstration			Volume = 190 l
Area Sample			
On left side taped to hood frame			
Rm 212	AA 14286	1352/1413	s: 119 = 2.0 Lpm
Personnel Sample	pump 61		c: 115
Glen Brown			Volume = 42 l
Ripping Asbestos cloth in Room			
"	AA 14293	1434/	S: 119 VOID
"	AA 14310	1453/1509	s: 119 = 2 Lpm
			c. 117
			Volume = 34 l

Air Temp. = 70°F

R.H. =

Location: EAL Corp.
2ND Floor
Room 212

Notes: Room is draped with plastic film as fiber barrier.
Double "air lock" at entrance
~ 4' × 15'

* Brooks Rotameter SIN 8005H39774/2

Work Schedule

Start Ambient: 1340
Start ~~Work~~ Personnel Sample: 1352
Start Work: 1352 - cutting cover off roll
1354 - ripping strips
1404 - Bagging excess & taping bagged strips
Stop - 1413

Restart: 1434
Stop: 1450 - Void cap on cassette

Restart: 1453 Ripping cloth