

INDUSTRIAL HYGIENE REPORT

TEXAS OPERATIONS

DOW CHEMICAL U.S.A.
AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

DOW-835

FILE NUMBER:	B1-3425
DATE ISSUED:	January 4, 1989
PLANT CODE:	82006

TITLE:

ASBESTOS MONITORING DURING TRANSITE MODIFICATION AT MACHINE SHOP,
B-105, DECEMBER, 1988 BY THE PLANT B CARPENTERS

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SUMMARY

On December 7, 1988 short term personal and eight-hour area monitoring for asbestos was conducted during a transite modification job at the B-105 Machine Shop by the Plant B Carpenters. The monitoring was done to ensure that the approved asbestos handling procedures would result in acceptable airborne concentrations of asbestos.

All measured asbestos concentrations were well below the OSHA STEL of 1.0 fiber per cubic centimeter (30 minute period) for employees performing the job and below the Permissible Exposure Limit (PEL) of 0.2 fibers per cubic centimeter for area sample taken during the job. The highest personal short-term level found was .01 fibers/cc. The area sample was .005 fibers/cc.

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**ASBESTOS MONITORING DURING TRANSITE MODIFICATION AT MACHINE SHOP,
B-105, DECEMBER, 1988 BY THE PLANT B CARPENTERS**

INTRODUCTION

Personal and area monitoring for asbestos was done during the modification of transite siding at B-105 by the Plant B Carpenters. The job consisted of cutting two 2-5/8 inches holes in a transite siding wall. The monitoring was done to ensure that the use of approved job procedures would result in acceptable airborne concentrations of asbestos.

CONCLUSIONS AND RECOMMENDATIONS

1. All measured asbestos concentrations were well below the OSHA Permissible Exposure Limit (PEL) of 0.2 fibers per cubic centimeter and the OSHA STEL of 1.0 fiber/cc for a thirty minute period. The highest level found was .01 fibers per cubic centimeter during the thirty minutes that it took to cut the holes in the transite. The area sample obtained was .005 fibers/cc. All exposures were potential since workers within the regulated areas wore half-face respirators with high-efficiency particulate air (HEPA) cartridges.
2. A local exhaust method was used during the cutting and removal of the transite material. The method used is described on Table I of this report. Texas Operations asbestos handling procedures must always be followed. The Texas Operations Asbestos Handbook and Safety Standard T-12 must be reviewed. These procedures are designed to make the transite removal jobs safe. If these procedures are not followed, a potentially serious exposure or safety situation may result. For this reason, the asbestos handling procedures must be reviewed, understood, and enforced by all personnel involved in the asbestos removal jobs.

RESULTS AND DISCUSSION

Table I shows the results of personnel monitoring during the cutting of holes in transite siding. The highest potential personnel measurement was .01 fibers per cubic centimeter, for the 35 minute job. Results showed that measured short-term concentrations were well below the OSHA STEL of 1.0 fibers per cubic centimeters for a thirty minute period. Table I also shows the result of area monitoring during the cutting and removal of transite. The area measurement was .005 fibers/cc, well below the OSHA PEL of 0.2 fibers/cc.

The results clearly show that the potential for harmful exposure to asbestos during the cutting and removal of transite jobs is very low when local exhaust ventilation is used when glove bag or enclosures are not feasible. However, improvement is needed in

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**ASBESTOS MONITORING DURING TRANSITE MODIFICATION AT MACHINE SHOP,
B-105, DECEMBER, 1988 BY THE PLANT B CARPENTERS****RESULTS AND DISCUSSION (CONT')**

the asbestos handling procedures (i.e. pre-job meetings, ensuring job procedures are followed, etc.). These procedures are designed to make the transite removal jobs safe. For this reason, the asbestos handling procedures must be reviewed, understood, and enforced by all personnel involved in the asbestos removal jobs.

METHODOLOGY

Asbestos samples were collected using Gilian HFS 513A and 113A air sampling pumps. A known volume of air was pulled through a 25 millimeter mixed cellulose ester membrane filter, 0.8 micron pore size. Samples were collected at a flow rate of approximately 2.0 liters per minute. The pumps were calibrated before and after the sampling, and the samples were counted by McKee Environmental Health Services using phase contrast microscopy. NIOSH method 7400 used.

EVALUATION CRITERIA

The evaluation of exposure levels was based on the following criterion:

AGENT	<u>EXPOSURE GUIDELINE</u>	<u>SOURCE**</u>
Asbestos	0.2 fibers/cc (8-Hr.TWA) 1.0 fibers/cc (30 minute)	OSHA (PEL) OSHA (STEL)
** OSHA (PEL)	Occupational Safety and Health Administration, Permissible Exposure Level	
OSHA (STEL)	Occupational Safety and Health Administration, Short Term Exposure Limit	

The OSHA (PEL) is the time-weighted average concentration for a normal 8-hour workday, 40-hour work week, to which nearly all workers may be repeatedly exposed without adverse health effects. The OSHA (STEL) is the excursion limit averaged over a thirty minute period.

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TABLE I

ASBESTOS MONITORING DURING TRANSITE MODIFICATION
AT MACHINE SHOP, B-105, TEXAS OPERATIONS
DECEMBER 7, 1988

SAMPLE DATE	MASTER NUMBER	SAMPLE TIME(min)	VOLUME(L)	SAMPLE NUMBER	CONCENTRATION (f/cc)TWA
12-7-88	202519	35	66.5	RLW12788-3	.007
12-7-88	118761	31	62	RLW12788-4	.01
12-7-88	(Area Sample)	44	88	RLW12788-2	.005

OSHA STEL (30 MIN)

1.0

OSHA PEL

0.2

NOTE:

The following job procedure was used:

Two 2-5/8 inches holes were cut in a transite wall using an electric hand drill motor and cutting tool. The transite material and cutting tool were kept wet during the entire job. The wall was double sided with hallow section in center. One hole was cut on one side then the other. During the entire procedure a HEPA filtered vacuum was used in the immediate area of the cutting tool to remove any contamination. All the requirements in Section XI, under Transite and asbestos shingles cutting, drilling, or abrading minimum requirements were followed during the job.

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McKEE ENVIRONMENTAL HEALTH SERVICES

11114 Sagepark • Houston, TX 77049 • (713) 481-3501

December 15, 1988

LAB ANALYSIS REPORT

Client:

Dow Chemical, USA
Attn: M.J. Sorrella B101Y
Texas Division
Freeport, TX 77541

Test Performed:

NIOSH Analytical Method #7400
Fiber Counts (Asbestos)

Sample Number	fields	fibers		f/mm ²
TP-1	100	0	LT	0.6
TP-2	100	51		64.97
TP-3	100	15		19.11
TP-4	100	0	LT	0.6
TP-5	55	102.5		237.4
TP-6	100	10.5		13.38
TP-7	53	102		245.2
TP-8	100	5.5		7
TP-9	100	31		39.49
TP-10	60	100.5		213.4
RLW12788-1	100	1		1.27
	2	2		2.55
	3	2		2.55
	4	3.5		4.46
B7200-1	100	8.5		10.83
	2	6.5		8.28
	3	.5		0.64
	4	0	LT	0.6
B42-7	100	2.5		3.18
B42-8	100	5		6.37
B42-9	100	29.5		37.58

LT = less than

Ronald S. McKee, C.I.H.
Ronald S. McKee
Certified Industrial Hygienist



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RECORD

ESS <u>B-105 Machine Shop</u>		BLDG. <u>B105</u>	DATE <u>12-7-68</u>
SAMPLING METHOD <u>25 um filter</u>		TRAPPING MEDIUM	
FLOW SET	FLOW RATE	FLOW FACTOR	

Cutting two $2\frac{5}{8}$ " holes. Temp. 100°[illegible]

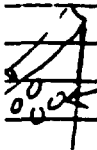
RED Drilled 1st Floor.	START	9:51 AM	44 min
	STOP	10:35 AM	
TOTAL LITERS AIR:			

Area sample BZ Height
1st Floor below job being
performed.

MACHINE SHOP
Shop
1st
BZ Height

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START	9:57 AM	35 min
STOP	10:32 AM	
TOTAL LITERS AIR :		


 Drilled two $\frac{3}{4}$ " holes through top on one side then the other. Used Hema Vac and spray bottle to wet. Tie back suits & wear half-mask respirators.

DATE:

NO. B-105	DATE 12-7-88
TRAPPING MEDIUM	
	FLOW FACTOR

TIME	TOTAL TIME (MIN.)	
10:01 AM		
10:32 AM	31 min	
IR:		
s being cut		
water on wall		

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[illegible]

DATE:

GILBRATOR VERSION 1.2

12-2-88
Pre Cal
R/W

FLOW	AVERAGE	# SAMPLES
0	235.1	01
-233.8	000.0	00
1973	1973	01
1973	1973	02
1979	1975	03
1974	1975	04
1970	1974	05

FLOW	AVERAGE	# SAMPLES
1973	1973	01
1979	1976	02
1986	1979	03
1986	1981	04
1987	1982	05

FLOW	AVERAGE	# SAMPLES
2028	2028	01
2032	2030	02
2036	2032	03
2038	2031	04
2026	2030	05

GILBRATOR VERSION 1.2

12-6-88
Pre Cal
R/W

FLOW	AVERAGE	# SAMPLES
1	190.3	01
2000	1095	02
2012	1401	03

FLOW	AVERAGE	# SAMPLES
2003	2003	01
2005	2004	02
2005	2004	03
2007	2005	04
1999	2004	05

FLOW	AVERAGE	# SAMPLES
1972	1972	01
1292	1632	02
-1292	1972	03
1976	1974	04
1977	1975	05
1974	1975	06
1978	1975	07

FLOW	AVERAGE	# SAMPLES
2000	2000	01
2029	2019	02
2008	2015	03
2021	2017	04
2020	2017	05

FLOW	AVERAGE	# SAMPLES
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B.105 - Machine Shop 12-7-88

#1 Blank Cartridge

#2 $(2.55 \text{ f/mm}^2 - \text{blank})$ Area Sample

$$\frac{(2.55 - 1.27) \times 385}{2000 \times 44 \text{ min.}} = \frac{492.8}{88000} = .0056 \text{ f/cc}$$

#3 $(2.55 - 1.27) \times 385$ #202519

$$\frac{492.8}{1900 \times 35} = \frac{492.8}{66500} = .0074 \text{ f/cc}$$

#4 $(4.46 - 1.27) \times 385$ #118761

$$\frac{1228.15}{2000 \times 31} = \frac{1228.15}{62000} = .0196$$

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