



DOW CHEMICAL U.S.A.

TEXAS DIVISION
FREEPORT, TEXAS 77541

ENVIRONMENTAL HEALTH REPORT

ATMOSPHERIC CONCENTRATION OF ASBESTOS
FIBERS WHILE GRINDING ASBESTOS CONTAINING
DERAKANE CELL COVERSFILE NO. M-134DATE 11-30-72AUTHOR B.S. HorvathCHECKED 12/14/72DATE R. E. Hale MD

Summary

Concentrations of asbestos in the general atmosphere during grinding operations at Brazosport Plastics was found to be below the standards set in Federal regulations, but may be significant when considering possible carcinogenesis. Recommendations were formulated to reduce the atmospheric asbestos fiber concentration at a proposed Dow facility to go into operation at the Russellville, Arkansas Plant.

S10580579

Distribution

N. E. Eberspacher A-1003

AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY



PROBLEM

Environmental Health was asked to evaluate the asbestos hazard presented by the grinding of Derakane asbestos joints of Chlorine Cell Covers.

CONCLUSIONS

1. Asbestos fibers are liberated by the grinding operation in significant quantities and found in the atmosphere throughout the building.
2. The concentration of asbestos fibers found were as follows:
 - a. Breathing zone of man doing the grinding - $.84 \text{ f/cc}$
 - b. 20 ft. from grinding $.86 \text{ f/cc}$
 - c. 90 ft. from grinding $.21 \text{ f/cc}$
 - d. 120 ft. from grinding $.17 \text{ f/cc}$

Current government regulations allow no more than an 8 hour time weighted average concentration of 5 f/cc .

3. The current regulations governing permissible exposures to asbestos are based upon the possibility of contraction of asbestosis. Asbestos fibers, however, have also been shown to be carcinogenic. No dose/disease relationship has been established, so efforts must be made to reduce and eliminate, if possible, the workers exposures.

RECOMMENDATIONS

1. Grinding of asbestos reinforced Derakane should be minimized if possible.
2. Hand grinders should be equipped with dust collection devices.
3. Grinding should be done in an environmentally separate area from the rest of the work area, to reduce exposure of other employees.
4. The man assigned to grind should wear an approved dust respirator.
5. Work clothing should be changed and washed daily.
6. Exposed employees should shower daily.
7. A suitable periodic medical examination program should be

ST0580580

RECOMMENDATIONS (continued)

arranged for employees exposed to asbestos fibers.

8. Environmental measurements should be made annually to determine the adequacy of precautions taken.

DISCUSSION

Asbestos fibers inhaled over a prolonged period can cause a pulmonary disease called asbestosis. This fact has been recognized for many years by those involved in the production and sale of asbestos. During the last few years a threshold limit value has been established for asbestos fibers in the atmosphere, the purpose of which is to prevent asbestos workers from contracting asbestosis. The current standard is 5 fibers/cc as recognized by the Federal Government. However, over the last few years respirable asbestos fibers have been recognized as being carcinogenic. A dose/disease relationship has not yet been established, so no standard has been published prescribing the acceptable concentration of asbestos fibers below which cancers will not appear.

For this reason exposures must be reduced to as low a level as is possible. This is done most desirably by reducing the exposure to the workers, and then providing protective equipment if the exposure cannot be eliminated.

This survey was made November 17, 1972 at Brazosport Plastics. One man, wearing a disposable respirator was assigned to grind the rough spots off a couple of cell covers. He ground for 45 minutes while the two batches of samples were taken. During that time, visible dust could be seen in the atmosphere throughout the building. Photomicrograms reveal that most of the atmospheric dust is Derakane dust.

The recommendations are based upon the elimination of asbestos dust in a future Dow installation assuming that conditions are similar to those found at Brazosport Plastics. These recommendations are not intended to be applied to Brazosport Plastics. However, Brazosport Plastics should be informed of the potential hazards and what might be done to reduce the hazards of asbestos induced cancer.

A total of 4 samples were taken on Millipore 0.8 micron 47 mm AAWG membrane filters. MSA Monitaire portable vacuum pumps calibrated and used. Used filters were cropped into 4 grid sections and immersed

ST0580581

DISCUSSION (continued)

in 10% solution of diethyl oxylate and dimethyl phthalate on a slide, and then covered with a cover slip. When the membrane became transparent counting was performed using 40X objective and a 12.5X eyepiece, for a total magnification of 500X. The eyepiece was equipped with a micrometer of 100 divisions 2.5 microns each.

Phase contrast illumination was used.

It should be remembered that the numbers given as the concentrations of atmospheric asbestos fibers is not to be considered as the absolute concentration, but the best technique presently known. Tests have shown that this method produces numbers that are difficult to reproduce from lab to lab, or microscopist to microscopist. However, it is the best technique we have.

ST0580582

bbs
S&LP
11-30-72

ASBESTOS IN ATMOSPHERE
DURING GRINDING OF DERAKANE®
CELL COVERS

BSH Parwath
11-30-72

FILTER FACTOR = 154

SAMPLE NUMBER	TIME (MIN.)	SAMPLE RATE (LITER/MIN)	TOTAL VOLUME (LITERS)
1	20	2.13	42.6
2	20	2.08	41.6
3	20	2.13	42.6
4	20	2.08	41.6
BLANK			

FIBER > 5μ PER SQUARE	FILTER FACTOR	TOTAL FIBERS	TOTAL FIBERS CORRECTED	
1 240	154	37,000	35,770	= .84 %cc
2 240	154	37,000	35,770	= .86 %cc
3 66	154	10,200	8,970	= .21 %cc
4 54	154	8,320	7,090	= .17 %cc
BLK 8	154	1,230	0	—

ST0580583

ENVIRONMENTAL RESEARCH SAMPLE RECORD

FILE NUMBER	PROCESS Grinding Cell Covers (Derakane Type)	BLOG. NO.	DATE 11-17-72
MATERIAL Derakane @ asbestos	SAMPLING METHOD Filtration	TRAPPING MEDIUM Millipore 8µ membrane	
EQUIPMENT NUMBER MSA Pumps	TYPE OF EQUIPMENT	FLOW INDICATOR SETTING 8	SAMPLE FLOW RATE Varies
REMARKS (VENTILATION, ETC.)		OUTSIDE TEMP.	INSIDE TEMP.

SAMPLE NO.	CONTAINER NO.	DESCRIPTION OF SAMPLE	TIME		CONCENTRATION
			START	INCREMENT	
1	pump2	Personal sample, man grinding burr off of Derakane cell covers @ asbestos. A very dusty operation. Man wearing 3-M type disposable dust mask.		20	
2	pump3	Area sample taken 20 ft away from man grinding. The air was noticeably dusty.		20	
3	pump2	Area sample 90 ft away from grinding operation. Women working in area, but NOT wearing dust masks. Air noticeably dusty but very light		20	
4	pump3	Area sample 120 ft away from grinding operation. Dust in air noticeable, but light		20	
5		Blank			

11-17-72 BSH

ST0580584

DOW

THE DOW CHEMICAL COMPANY
TEXAS DIVISION

JOB NO. _____

AUTH. NO. _____

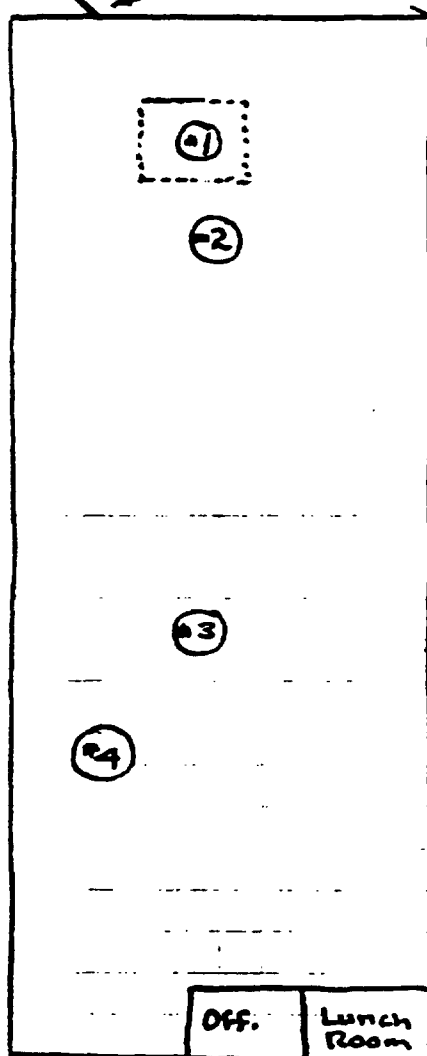
CHARGE NO. _____

FILE NO. _____

SUBJECT ASBESTOS IN ATMOSPHERE DURINGBY BSHGRINDING OF DERAKANEDATE 11-29-72SHEET 2 OF _____

CHECKED BY _____

Door closed



Sketch, no scale

ST0580588



DOW CHEMICAL U.S.A.
TEXAS DIVISION

JOB NO. _____

AUTH. NO. _____

CHARGE NO. _____

FILE NO. _____

SUBJECT ASBESTOS IN ATMOSPHERE DURING

BY B. S. Lowry

GRINDING OF DECAHANE CELL COVERS

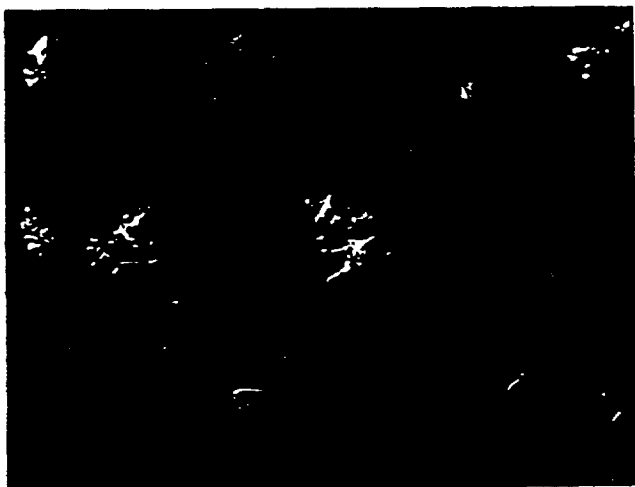
DATE 11-30-72

SHEET _____ OF _____

CHECKED BY _____



SAMPLE #1



SAMPLE #2

ST0580586

SCALE 1 DIVISION = 10μ



JOB NO. _____

AUTH. NO. _____

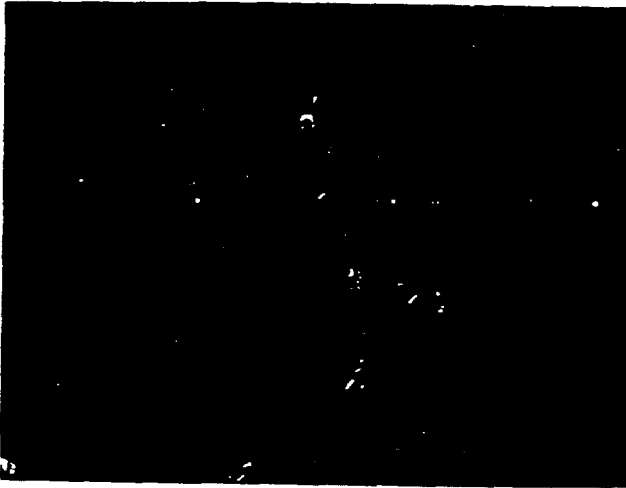
CHARGE NO. _____

FILE NO. _____

SUBJECT Asbestos in Atmosphere
Grinding Derakane Cell CoversBY B. PowellDATE 11-30-72

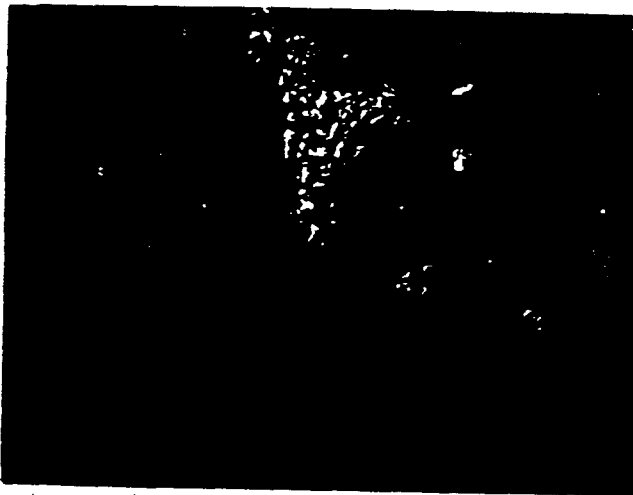
SHEET _____ OF _____

CHECKED BY _____



SAMPLE #3

ST0580587



SAMPLE #4