

INDUSTRIAL HYGIENE MONITORING FOR ASBESTOSTO: R. F. Painter, Trlr. 5583
511Computer Ref. W-1076

CC: C. W. Carman, 725-105 D. R. Paugh, 511-2009 E. J. Tawney, 5583
 G. F. Hurley, 701-334 H. L. Robinson, 701-401 R. G. Rowe, M.D., 753
 L. R. Noble, 511-2149 E. C. Shipley, 511-2009 R. J. Sexton, M.D., 51

PERSON MONITORED _____

Location Bldg. 777 - Room 111 Date 8/19/80

EXPOSURE RESULTS

	Conc.	Sampling Time	Comments
Sample 1	10.1 fibers > 5 $\mu\text{m}/\text{cm}^3$	118 minutes	P.M. - Wetting and bagging insulation and cleaning up area
2			
3			
4			
5			
6			

Time-Weighted Average Concentration (TWA) 2.5 fibers > 5 $\mu\text{m}/\text{cm}^3$
 Ceiling Concentration _____

ALLOWABLE EXPOSURE

TWA 2 fibers > 5 $\mu\text{m}/\text{cm}^3$ OSHA UCC Other
 Ceiling _____ OSHA UCC Other

COMMENTS

Even though the workers had been advised to keep the insulation well wetted, it didn't appear as if they had done so.

WORK BY

Ruth Clise

APPROVED BY

George Hurley

UCC 017448

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512

PERSON MONITORED _____

Location Bldg. 777 - Room 111 Date 8/19/80

EXPOSURE RESULTS

	Conc.	Sampling Time	Comments
Sample 1	fibers > 14.4 5 $\mu\text{m}/\text{cm}^3$	125 minutes	P.M. Stripping insulation and cleanup of area.
2			
3			
4			
5			
6			

Time-Weighted Average Concentration (TWA) 3.8 fibers > 5 $\mu\text{m}/\text{cm}^3$
Ceiling Concentration _____

ALLOWABLE EXPOSURE

TWA 2 fibers > 5 $\mu\text{m}/\text{cm}^3$ OSHA UCC Other
Ceiling _____ OSHA UCC Other

COMMENTS

The concentration of fibers was as great the second day even though the men had been advised to keep the insulation well watered.

WORK BY

Ruth Clise

APPROVED BY

George Hurley

UCC 017449



INTERNAL CORRESPONDENCE

CHEMICALS AND PLASTICS

P. O. BOX 8361, SOUTH CHARLESTON, WEST VIRGINIA 25303

To (Name)	Mr. D. L. Johnson	Date	November 16, 1979
Division	511-5518 (512)		
Location		Originating Dept.	Technical Center IH/EP
Copy to	Mr. C. W. Carman	Subject	Asbestos Monitoring
	Mr. G. F. Hurley		704 Powerhouse, First and
	Mr. C. R. Johnson		<u>Second Level</u>
	Mr. D. R. Paugh		
	Mr. P. A. Perry		
	Mr. C. E. Richardson		
	Mr. H. L. Robinson		
	Mr. E. C. Shipley		

PROJECT

Determine the exposure of Construction workers to asbestos fibers during insulation stripping in Building 704.

DATE OF SURVEY

October 26, 1979

DISCUSSION

On October 26, 1979, separate breathing zone samples were taken on 1, and F to determine their exposure to asbestos fibers. They were stripping and bagging approximately thirty feet of an 8-foot by 6-foot exhaust duct coming from No. 3 boiler in Building 704 - Powerhouse on the first and second levels. During the stripping and clean-up procedure all Construction workers wore Norton disposable dust respirators, gloves, and coveralls. All others who needed to be working in the 704 Powerhouse operating area were given 3M disposable dust masks to wear during the stripping. Because the duct was hot and electric motors were situated near the duct, the insulation was only minimally wetted with a garden sprayer.

The dust created by the stripping and throwing the insulation to the floor became so heavy that the insulators were advised to

hand the insulation to the laborers to be bagged. The stripped asbestos was placed in plastic bags for disposal.

When the dust became so heavy at the site of stripping on the second level, samples were taken on the first level on the north and south side of the stack.

After the stripping of the duct on the second level was completed and the dust had settled some, breathing zone samples were taken on as they finished bagging the stripped insulation and cleaned the second level area.

When the stripping started on the first level, only area samples were taken. Two samples were taken on the first level on the north and south side of the stack, and one sample was taken on the west wall north of the stack on the second level. All area samples were placed at breathing zone level.

CONCLUSIONS

The dust collected on the breathing zone samples of , was so heavy that it was impossible to determine the concentration of asbestos fibers on these samples. The results of the other samples are given in the attached table.

Since asbestos levels were so high on samples taken after some of the initial dust had cleared, they were likely higher during the period of greatest dust concentrations. Since all people in the area wore masks they were probably protected if a good mask fit was obtained.

RECOMMENDATIONS

It is suggested that all Construction workers that are involved with the stripping and disposal of suspected asbestos containing insulation be shown the Industrial Hygiene slide presentation on the proper handling of asbestos containing materials.

REFERENCES

Volume 38C-29X4-R1a Asbestos, Dust Determination By Membrane Filter Technique Using Phase Contrast Microscopy

INDUSTRIAL HYGIENE MONITORING FOR ASBESTOS

TO: R. F. Painter, Trlr. 5583
511

Computer Ref. W-1075

CC: C. W. Carman, 725-105
G. F. Hurley, 701-334
L. R. Noble, 511-2149

D. R. Paugh, 511-2009
H. L. Robinson, 701-401
E. C. Shipley, 511-2009

E. J. Tawney, 55
R. G. Rowe, M.D.
753
R. J. Sexton, M.I
512

PERSON MONITORED

Location Bldg. 777 - Room 111 Date 8/18/80

EXPOSURE RESULTS

	Conc.	Sampling Time	Comments
Sample 1	fibers 15.4 5 $\mu\text{m}/\text{cm}^3$	> 41 minutes	A.M. Stripping insulation
2	11.3 "	149 minutes	P.M. Stripping insulation
3			and helping with cleaning of area
4			
5			
6			

Time-Weighted Average Concentration (TWA) 4.1 fibers > 5 $\mu\text{m}/\text{cm}^3$
Ceiling Concentration

ALLOWABLE EXPOSURE

TWA	2 <u>fibers > 5 $\mu\text{m}/\text{cm}^3$</u>	OSHA	UCC	Other
Ceiling		OSHA	UCC	Other

COMMENTS

More water should be used to wet the insulation before stripping. Those stripping and bagging should always wear their disposable dust respirator while in the area and until the cleanup is finished.

WORK BY

Ruth Clise

APPROVED BY

George Hurley

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512

PERSON MONITORED _____

Location Bldg. 777 - Room 111 Date 8/18/80

EXPOSURE RESULTS

	Conc.	Sampling Time	Comments
Sample 1	6.3 5 $\mu\text{m}/\text{cm}^3$ fibers	42 minutes	A.M. - Wetting and bagging insulation
2			
3	3.9 "	149 minutes	P.M. - Wetting and bagging insulation and cleaning up area
4			
5			
6			

Time-Weighted Average Concentration (TWA) 2.8 fibers > 5 $\mu\text{m}/\text{cm}^3$
Ceiling Concentration _____

ALLOWABLE EXPOSURE

TWA 2 fibers > 5 $\mu\text{m}/\text{cm}^3$ OSHA UCC Other
Ceiling _____ OSHA UCC Other

COMMENTS

More water needs to be used in keeping the insulation wetted. Disposable dust respirators should be worn while in the stripping area and until the cleanup is completed.

WORK BY

Ruth Clise

APPROVED BY

George Hurley

RESULTS

<u>DATE</u>	<u>SAMPLE TYPE</u>	<u>TIME (MINUTES)</u>	<u>ASBESTOS FIBERS (Fibers >5 μm/cm³)</u>	<u>REMARKS</u>
10/26/79	Area	32/2 LPM	0.28	First level, north side of stack while dust was settling after stripping on the second level. Cleanup being completed on second level.
10/26/79	Area	27/2 LPM	0.51	First level, south side of stack while dust was settling after stripping on the second level. Cleanup being completed on second level.
10/26/79		15/2 LPM	3.93	Bagging insulation after stripping on second level finished.
10/26/79		15/2 LPM	2.97	Bagging insulation after stripping on second level finished.
10/26/79	Area	51/2 LPM	1.01	First level, north of stack while first level being stripped.
10/26/79	Area	55/2 LPM	0.9	First level, south of stack while first level being stripped.
10/26/79	Area	48/2 LPM	1.16	Second level, on west wall, north of stack while first level being stripped.

REPORT PREPARED BY

Ruth Clise
Technical Center Industrial Hygiene Group

Ruth Clise

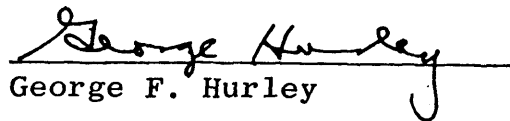
Ruth Clise

Mr. D. L. Johnson

- 4 -

11/16/79

REPORT APPROVED BY


George F. Hurley

RC/sc

RCT WU-0090 #2

UNION CARBIDE CORPORATION TECHNICAL CENTER
P.O. BOX 8361 S. CHARLESTON, WY 25303

INTERNAL CORRESPONDENCE

To: See Distribution List

Date: July 22, 1986

Orig. Dept: HS&EA

Area: Industrial Hygiene

C.C. T. L. Collins
 T. E. Hanning
 C. P. Maxwell

Subject: Amended Asbestos Standard

On June 20, 1986 OSHA amended its present standard 29 CFR 1910.1001 for Asbestos which has gone into effect on July 21, 1986.

A summary of the changes in the health standard has been prepared by T. E. Hanning of our Health, Safety and Environmental Technology Group is attached for your review.

A significant difference in the new standard is the permissible exposure limit now reduced from 2.0 fibers per c.c. (f/c.c.) to 0.2 f/c.c. with an action level of 0.1 f/c.c., 8-hour time-weighted average (TWA8). A ceiling limit of 10 f/c.c. is no longer applicable in the amended standard.

The amended standard will result in a few changes in how we handle asbestos containing materials. These changes are mainly relative to exposure monitoring techniques (Industrial Hygiene responsibility), posting, training and protective equipment.

We will provide guidance to those groups who are involved in handling asbestos containing materials. All questions relative to compliance with this standard may be addressed to this writer.

Manhar A. Patel

Manhar A. Patel
Technical Center Industrial Hygienist

Attachment/
MAP

UNION CARBIDE CORPORATION

ENGINEERING, MANUFACTURING AND TECHNOLOGY SERVICES DEPARTMENT
HEALTH, SAFETY AND ENVIRONMENTAL TECHNOLOGY
SOUTH CHARLESTON, WEST VIRGINIA

RECEIVED
JUL 15 1986
C. P. MAXWELL

MEMORANDUM
July 11, 1986

RECEIVED
JUL 17 1986
M. A. PATEL

TO: S. W. Clark
D. A. Gosselin
V. H. Johnkoski
J. A. Leonard
J. B. Leverton
C. P. Maxwell
J. E. Neff
T. P. Raby

FROM: T. E. Hanning

SUBJECT: Final Rules for Occupational Exposure
to Asbestos, Tremolite, Anthophyllite,
and Actinolite (Amended Standard)

Gentlemen:

Attached is a preliminary summary of the changes between the amended subject health standard and the original asbestos standard as stated in 29 CFR 1910.1001. The amended standard was published by OSHA in the Federal Register on June 20, 1986 and will take effect on July 21, 1986.

The Safety and Health Technology Manual health operating practice SH-256 (Removal and Handling Asbestos Containing Insulation Material) will be revised to reflect the changes set forth in the amended OSHA standard.

Please call if you have further questions or comments.


T. E. Hanning
Ext. 5903

TEH/jc
Attachments

Changes Between the Original and Amended Asbestos Occupational Health Standard

General

OSHA amends its present standard (29 CFR 1910.1001) regulating occupational exposure to asbestos by developing two final standards that apply to general industry and to construction because the differences in exposure and work place conditions in general industry and construction work sites warrant separate treatment.

UCC activities would generally fall under the revised standard for general industry.

OSHA has concluded that chemically modified asbestos should be regulated in the same manner as unmodified asbestos.

OSHA concludes that all forms of tremolite, anthophyllite and actinolite should be regulated under the revised standards.

In the final standard the action level has been set at 0.1 fibers per cubic centimeter (f/cc) which triggers the monitoring, medical, and employee information and training requirements. This action represents no real change to the standard with regard to this provision, but merely clarifies OSHA's policy.

Permissible Exposure Limit

OSHA has reduced the current 2 f/cc permissible exposure limit (PEL) to an 8-hour time-weighted average (TWA) PEL of 0.2 f/cc. This lower limit should reduce the recorded mortality from lung cancer, mesothelioma, gastrointestinal cancer, and other types of cancer due to asbestos exposure.

Ceiling Limit

The amended standards do not designate a ceiling limit for exposure to asbestos. The original standard had a ceiling limit of 10 f/cc and was met through engineering and work practice controls.

Exposure Monitoring

The table below lists the two exposure situations along with the monitoring frequency for each.

<u>Exposure Scenario</u>	<u>Required Monitoring Activity</u>
1. Below action level	1. No monitoring required
2. At or above the action level →	2. Monitor exposure at least every 6 months

The amended standard requires the employer to collect airborne asbestos samples using 25 mm diameter mixed cellulose filters and a 50 mm extension cowl. Samples must be analyzed using a phase contrast microscope calibrated using a phase shift test slide and equipped with a Walton-Beckett graticule. The filter samples must be prepared using acetone-triacetin clearing solution and be counted in accordance with the "A" rules contained in the NIOSH 7400 method.

Regulated Areas

The amended standard requires employers to identify as regulated areas any locations in their work places where there may be occupational exposures to airborne concentrations of asbestos above the PEL. The amended standard prohibits eating, drinking and smoking in these areas. Only authorized persons may enter regulated areas which must be clearly marked. The existing OSHA standard does not contain a provision for establishing regulated areas.

Methods of Compliance

The amended standard requires employers to institute engineering and work practice controls to reduce the exposure of employees to or below the PEL. If the employer establishes that such controls are not feasible, selected respirators may be used to supplement the engineering and work practice controls.

Respiratory Protection

Respirators may be used to limit employee exposure to asbestos in the following circumstances.

1. During the interval necessary to install or implement feasible engineering and work practice controls,
2. In work operations such as maintenance and repair activities or other activities which the employer establishes that engineering and work practice control procedures are not feasible.
3. In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the PEL.
4. In emergencies.

These limitations on the required use of respirators are consistent with the requirements of the past asbestos standard and with good industrial hygiene practice.

Protective Work Clothing and Equipment

The final standard makes a change from the current standard to respond to the evidence developed since 1971 that asbestos is a potent human carcinogen. Protective clothing is to be supplied to employees exposed above the PEL of 0.2 f/cc.

The final standard provides that the employer ensure that all protective clothing is removed at the end of each work shift only in change rooms. The standard emphasizes the need to assure that contaminated clothing is stored, cleaned/laundered, or disposed of in a safe manner.

The final standard clarifies that the obligation is on the employer to provide personal clothing at no cost to the employee.

The final standard also requires the employer to inform those who handle the contaminated protective clothing of the potentially harmful effects of exposure to asbestos.

Hygiene Facilities and Practices

The final standard like the existing standard reiterates the type of change room an employer must provide and the requirement that the employer prohibit the consumption of food and beverages in areas where there is exposure to toxic substances. Unlike the existing standard, the final standard requires employers to assure that employees exposed to asbestos during their work shift shower before leaving the plant and do not leave wearing work clothing.

The final standard requires employers to provide persons working in asbestos areas with filtered air lunchrooms which are readily accessible. Employers must also assure that employees wash their hands and face prior to eating or smoking and do not enter the lunch room wearing protective clothing, unless cleaned beforehand.

Communication of Hazards to Employees

The final rule for asbestos requires that legible caution signs be posted at each regulated area where occupational exposures could exceed the PEL. Signs must also be posted at all approaches to areas containing excessive concentrations of airborne asbestos fibers. Signs must bear the following:

Danger - Asbestos; Cancer and Lung Disease
Hazard - Authorized Personnel Only;
Respirators and Protective Are Required
in This Area.

The final standard is not substantially different from the present OSHA standard. The section on sign specifications simplifies the sign requirements and eliminates unnecessary detailed specifications (letter sizes and styles, spacing between lines) in favor of a more performance oriented approach.

The amended standard also requires that all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or their containers, be labeled with the appropriate information.

Danger - Contains Asbestos
Fibers; Avoid Creating Dust;
Cancer and Lung Disease Hazard.

The new standard allows two exceptions to the labelling and material safety data sheets (MSDS) requirements; no label or MSDS is required in those instances where

- Asbestos fibers have been modified by a bonding agent provided that the manufacturing can demonstrate that during any use the employee will remain below the action level; or
- Asbestos is present in a product in concentrations less than 0.1%. The new standard updates the existing standard by providing that airborne concentrations must be kept below the action level rather than the PEL.

The final standard requires employers to provide a training program for all employees expected to be exposed to airborne asbestos at or above the action level of 0.1 f/cc.

Housekeeping

Unlike the existing standard which requires that surfaces be maintained free of accumulation of asbestos fibers if, with their dispersion, there would be an excessive concentration, the revised standard removes the ambiguous phrase of excessive concentration. Specific provisions for housekeeping are included in the final rule. Some of these are prohibiting the clean-up of asbestos dust with compressed air, dry-sweeping and dry clean-up, and prohibiting the accumulation of asbestos waste on surfaces. OSHA anticipates that compliance with this provision will entail a regular housekeeping schedule based on exposure conditions at a particular plant and the capability for emergency cleanup of spills or other unexpected source of exposure.

Medical Surveillance

The final standard requires that the medical surveillance program provide each affected employee with an opportunity for a comprehensive annual medical examination. This does not change the provisions of the existing standard. In the final standard however, OSHA believes it appropriate to trigger the medical surveillance requirements at the action level of 0.1 f/cc as an eight-hour TWA.

OSHA has also revised the time within which the employer must conduct preplacement examinations after hiring employees. The final standard requires that preplacement medical examinations be given prior to the assignment of an individual to a job exposed to concentrations of airborne asbestos. The current standard permits the employer to conduct medical examinations within the first 30 days of the hire date.

The employer is also required to have medical examinations performed by or under the supervision of a licensed physician, provide the physician with a copy of this standard and all work practice information performed by the employer, and obtain a written signed opinion from the physician containing the results of the medical examination.

The final standard requires that x-rays be offered at 5 year intervals during the 10 years following an employee's first exposure to asbestos. After 10 years the employee's age category will determine the frequency of x-ray testing.

Record Keeping

The final rule provides that records be kept to identify the employee monitored and to reflect the employee's exposure accurately. The employer is free to keep records the most effective way. The time period required for retention of exposure records is thirty years. Employers must notify the Director in writing at least 3 months prior to the disposal of any records.

Appendices

Eight appendices are included in this final standard.

<u>Appendix</u>	<u>Status</u>
A - Reference Method for Analyzing Air Samples for Asbestos	Mandatory
B - Asbestos Sampling and Analysis by NIOSH Method 7400	Non-mandatory
C - Qualitative and Quantitative Respirator kit testing Procedures	Mandatory
D - Medical Questionnaire Given to Employees Who May Be Exposed to asbestos	Mandatory
E - Interpretation and Classification of Chest Roentgenograms	Mandatory
F - Work Practice and Engineering Controls for Automotive Brake Repair Operations	Non-mandatory
G - General Technical Information on Asbestos	Non-mandatory
H - Medical Surveillance Guidelines	Non-mandatory

TEH:jc
07-10-86
51220

R/D GRADE 12 AND ABOVE

C. D. Aikman	2000 - 2235
F. E. Andrews	3001 - 709A
K. W. Applegate	3001 - 1107
R. A. Beehl	2000 - 4335
R. G. Baier	3005 - 2
R. R. Banister	2000 - 4132
H. N. Baylor	3007 - 4201
L. L. Bissett	2000 - 4501
E. H. Blair	3007 - 1313
Max Blair	3001 - 219
W. D. Bradbury	2000 - 4335
T. L. Collins	740 - 2320
R. A. Conway	770 - 342
G. H. Coppala	2000 - 118
H. D. Cox	6000 - 118
G. A. Coyer	3001 - 216A
D. A. Deckman	2000 - 4135
R. A. Derr	3005 - 156
C. K. Dolan	82 - 612
P. D. Franson	2000 - 3336
J. R. Gagnon	2000 - 4228
R. E. Gardner	2000 - 2201
B. J. Barner	2000 - 2201
D. L. Garrison	2000 - 4201
D. A. Green	6000 - 118
R. E. Harris	2000 - 3201
F. L. Harvey	82 - 609
D. E. Heath	2000 - 4135
R. E. Jenkins	3005 - 251
P. R. Kavasmaneck	2000 - 3235
K. S. Kincaid	3005 - 249
H. P. Krog	740 - 4417
G. W. Lanham	3001 - 7
R. W. Martin	2000 - 3336
A. M. McClain	2000 - 2219
M. P. McCready	2000 - 1201
B. R. McMakin	511 - 2009
R. L. Morgan	3001 - 1005A
R. G. Meadows	2000 - 3201
C. C. Neely	2000 - 1432
K. D. Negley	3001 - 623
L. R. Noble	725 - 105
J. F. Oaks	3001 - 1207
W. E. O'Neil	3001 - 818
J. T. O'Neil	82 - 827
D. E. Pauley	3001 - 610
J. B. Rader	82 - 524
R. J. Romagnoli	701 - 328
G. M. Rosengarten	2000 - 1202
R. G. Rowe, M.D.	791 - West
R. W. Scoular	701 - 4th fl.
L. L. Simpson	2000 - 4112
R. O. Spencer	3007 - 106
B. G. Summers	82 - 809
B. H. Thomas	3001 - 623

Asbestos

June 23, 1982

BLANK ○

#1
Z 3732 (6-10-82)

$$12 \text{ fibers}/100 \text{ fields} = .12 \text{ fibers/field}$$

$$\frac{.12 \times 855}{6.24 \times 24} = .7 \text{ fiber } 75 \mu\text{m}/\text{cm}^3$$

#2 - Z-3733 (6-10-82)

$$6 \text{ fibers}/100 \text{ fields} = .06 \text{ fibers/field}$$

$$\frac{.06 \times 855}{6.24 \times 28} < .1 \text{ fiber } 75 \mu\text{m}/\text{cm}^3$$

#3 - Z 3734 (6-10-82)

$$0 \text{ fibers}/100 \text{ fields}$$

$$< .1 \text{ fiber } 75 \mu\text{m}/\text{cm}^3$$

Asbestos - Calculations

January 12, 1982 -

511-HHF-1 (11-13-81)

$$\left. \begin{array}{l} 11 \text{ fibers/100 fields} \\ .11 \text{ fiber/field} \end{array} \right\} = \frac{.11 \times 855}{6.24 \times 30} = .5 \text{ fiber } > 5 \mu\text{m/cm}^3$$

511-HHF-2 (11-13-81)

$$\left. \begin{array}{l} 5 \text{ fibers/100 fields} \\ .05 \text{ fibers/field} \end{array} \right\} = \frac{.05 \times 855}{6.24 \times 30} = .2 \text{ fiber } > 5 \mu\text{m/cm}^3$$

6A - (11-30-81)

$$\left. \begin{array}{l} 3 \text{ fibers/100 fields} \\ .03 \text{ fiber/field} \end{array} \right\} = \frac{.03 \times 855}{6.24 \times 28.65} = .1 \text{ fiber } > 5 \mu\text{m/cm}^3$$

7A - (11-30-81)

$$\left. \begin{array}{l} 8 \text{ fibers/100 fields} \\ .08 \text{ fiber/field} \end{array} \right\} = \frac{.08 \times 855}{6.24 \times 30} = .4 \text{ fibers } > 5 \mu\text{m/cm}^3$$

8A - (11-30-81)

$$\left. \begin{array}{l} 1 \text{ fiber/100 fields} \\ .01 \text{ fiber/field} \end{array} \right\} = \frac{.01 \times 855}{6.24 \times 28.5} = < .1 \text{ fiber } > 5 \mu\text{m/cm}^3$$

9A - (11-30-81)

$$\left. \begin{array}{l} 1 \text{ fiber/100 fields} \\ .01 \text{ fiber/field} \end{array} \right\} = \frac{.01 \times 855}{6.24 \times 30} = < .1 \text{ fiber } > 5 \mu\text{m/cm}^3$$

Asbestos - calculations for Institute

10-15-81

by Ruth Thomas

HMF-¹⁰⁷~~108~~

2 fibers/100 field

.02 fibers/field

$$.02 \times 855$$

$$6.24 \times 36 = .08 = \underline{< .1 \text{ fiber } 75 \mu\text{m}/\text{cm}^3}$$

HMF-108

< 1 fiber/100 fields

< .01 fiber/field

$$.01 \times 855$$

$$6.24 \times 34 = .04 = \underline{< .1 \text{ fiber } 75 \mu\text{m}/\text{cm}^3}$$

HMF-109

3 fibers/100 fields

.03 fiber/field

$$.03 \times 855$$

$$6.24 \times 30 = .18 = \underline{> .1 \text{ fiber } 75 \mu\text{m}/\text{cm}^3}$$

HMF-110

< 1 fiber/100 field

< .01 fiber/field

$$.01 \times 855$$

$$6.24 \times 30 = .05 = \underline{< .1 \text{ fiber } 75 \mu\text{m}/\text{cm}^3}$$

Asbestos Calculations (cont'd)

Oct. 15, 1981

H H F - 111

8 fibers/100 fields

.08 fibers/field

.08 x 855

6.24 x 30 =

.4 fibers 75 μ m/cm³

H H F - 112

4 fibers/100 fields

.04 fibers/^{field}~~100 fields~~

.04 x 855

6.24 x 30 =

.2 fibers 75 μ m/cm³

Asbestos Calculation (from Institute) ^{Calculated} 12-18-80

#1-12-1280 -

90 fibers/100 fields
 .9 fibers/field

$$\frac{.9 \times 855}{6.24 \times 30} = \underline{4.1 \text{ fibers } > 5 \mu\text{m/cm}^3}$$

#2-12-1280

2 fibers/100 fields
 .02 fibers/field

$$\frac{.02 \times 855}{6.24 \times 30} = \underline{.1 \text{ fibers } > 5 \mu\text{m/cm}^3}$$

#3-12-1280

17 fibers/100 fields
 .17 fibers/field

$$\frac{.17 \times 855}{6.24 \times 30} = \underline{.8 \text{ fibers } > 5 \mu\text{m/cm}^3}$$

#4 12-12-80

43 fibers/100 fields
 .43 fibers/field

$$\frac{.43 \times 855}{6.24 \times 30} = \underline{2.0 \text{ fibers } > 5 \mu\text{m/cm}^3}$$

Asbestos Calculations (from Institute)

Calculated
(12-19-80)

5 - 12-12-80 -

1 fiber / 100 fields
.01 fiber / field

$$\frac{.01 \times 855}{6.24 \times 30} =$$

$$.05 \text{ or } .1 \text{ fibers } > 5 \mu\text{m/cm}^3$$

6 - 12-12-80

6 fibers / 100 field
.06 fibers / field

$$\frac{.06 \times 855}{6.24 \times 30} =$$

$$.3 \text{ fibers } > 5 \mu\text{m/cm}^3$$

7 - 12-12-80

8 fibers / 100 field
.08 fibers / field

$$\frac{.08 \times 855}{6.24 \times 30} =$$

$$.4 \text{ fibers } > 5 \mu\text{m/cm}^3$$

8 - 12-12-80

2 fibers / 100 field
.02 fibers / field

$$\frac{.02 \times 855}{6.24 \times 30} =$$

$$.1 \text{ fibers } > 5 \mu\text{m/cm}^3$$

9 - 12-12-80

14 fibers / 100 fields
.14 fibers / field

$$\frac{.14 \times 855}{6.24 \times 30} =$$

$$.6 \text{ fibers } > 5 \mu\text{m/cm}^3$$

Asbestos Calculations (from Institute) Calculated (12-19-80)

#0 - 12-12-80

20 fibers / 100 field
 .2 fibers / field

$$\frac{.2 \times 855}{6.24 \times 30} =$$

$$\underline{.9 \text{ fibers } > 5 \mu\text{m} / \text{cm}^3}$$

#11 - 12-12-80

32 fibers / 100 field
 .32 fibers / field

$$\frac{.32 \times 855}{6.24 \times 30} =$$

$$\underline{1.5 \text{ fibers } > 5 \mu\text{m} / \text{cm}^3}$$

#12 - 12-12-80

2 fibers / 100 fields
 .02 fibers / field

$$\frac{.02 \times 855}{6.24 \times 30}$$

$$\underline{< .1 \text{ fibers } > 5 \mu\text{m} / \text{cm}^3}$$

WD-0090 #21

Analyzed for WAYNE BOSSERMAN at Sistersville

Asbestos Analysis 7-31-80 by Keith Clise (DRC,
(38C-29X4-RIA)

BLANK - No Fibers SEEN / 100 field

Z 1438

$$\begin{array}{l} 4 \text{ fibers} / 100 \text{ fields} \\ .04 \text{ fibers} / \text{field} \\ \frac{.04 \times 855}{6.24 \times 60} = \underline{.09 \text{ fibers } 75 \mu\text{m} / \text{cm}^3} \end{array}$$

Z 1439

$$\begin{array}{l} 1 \text{ fiber} / 100 \text{ fields} \\ .01 \text{ fibers} / \text{field} \\ \frac{.01 \times 855}{6.24 \times 60} = \underline{.02 \text{ fibers } 75 \mu\text{m} / \text{cm}^3} \end{array}$$

Z 1467

$$\begin{array}{l} 2 \text{ fibers} / 100 \text{ field} \\ .02 \text{ fibers} / \text{field} \\ \frac{.02 \times 855}{6.24 \times 60} = \underline{.05 \text{ fibers } 75 \mu\text{m} / \text{cm}^3} \end{array}$$

Z 1470

$$\begin{array}{l} 5 \text{ fibers} / 100 \text{ fields} \\ .05 \text{ fibers} / \text{field} \\ \frac{.05 \times 855}{6.24 \times 60} = \underline{.11 \text{ fibers } 75 \mu\text{m} / \text{cm}^3} \end{array}$$

UCC 017471

Asbestos Calculations (2)

7-31-80

Z 1468

#

$$\frac{.02 \times 855}{6.24 \times 60}$$

2 fibers/100 fields

.02 fibers/field

$$= \frac{.05 \text{ fibers } 75 \mu\text{m}/\text{cm}^3}{}$$

Z 1469

1 fiber/100 fields

.01 fibers/field

$$\frac{.01 \times 855}{6.24 \times 60}$$

$$= \frac{.02 \text{ fibers } 75 \mu\text{m}/\text{cm}^3}{}$$

Z 1471

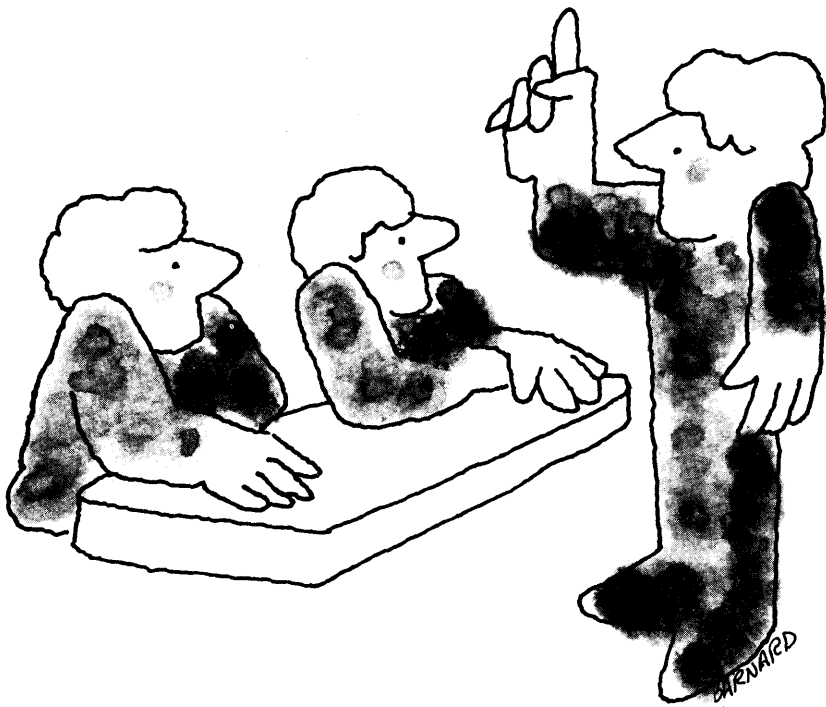
2 fibers/100 field

.02 fibers/field

$$\frac{.02 \times 855}{6.24 \times 68}$$

$$= \frac{.04 \text{ fibers } 75 \mu\text{m}/\text{cm}^3}{}$$

What You Should Know About Asbestos And Health



Frankly Speaking

You certainly are important to your family and loved ones, and you are important to the company. It makes good sense for the company to do everything possible to protect you in your working environment, and for you to take every precaution to avoid possible hazards to your health.

If your work involves the use of asbestos or asbestos-containing products, you should be aware of:

- What the health hazards can be.
- What obligations your employer has to protect you.
- What you can do as an individual to protect your own health and that of your fellow employees.



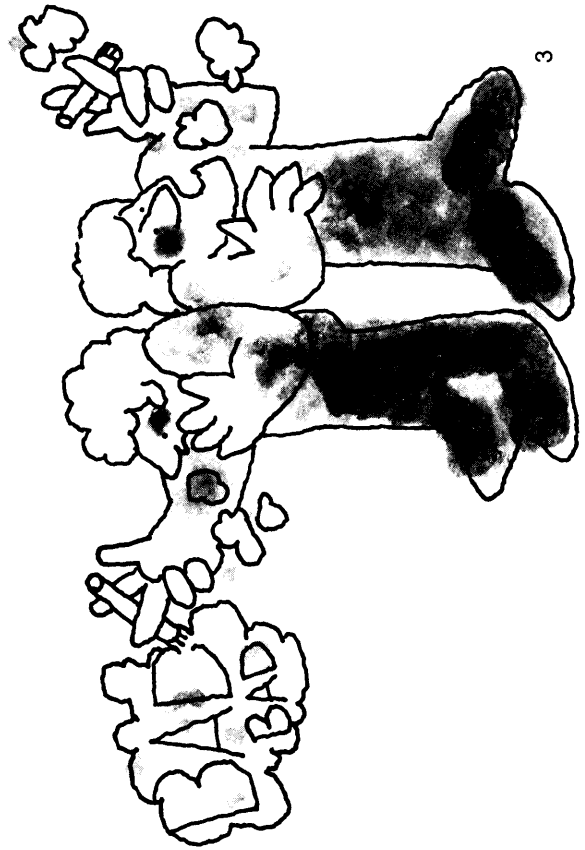
These are the Facts

Exposure to asbestos fiber can increase the risk of developing certain diseases over a period of years. The four diseases associated with inhalation of asbestos fiber are: asbestosis — a non-malignant scarring lung condition; cancer of the lung, and to a lesser degree, cancer of the digestive tract; and mesothelioma — a rare cancer of the lining of the chest or abdominal cavities.

Reduction of asbestos dust exposure is at present the only known method of preventing disease among asbestos industry workers. Experience has shown that when dust levels are low, the risk to the worker and the incidence of asbestos-related disease is low.

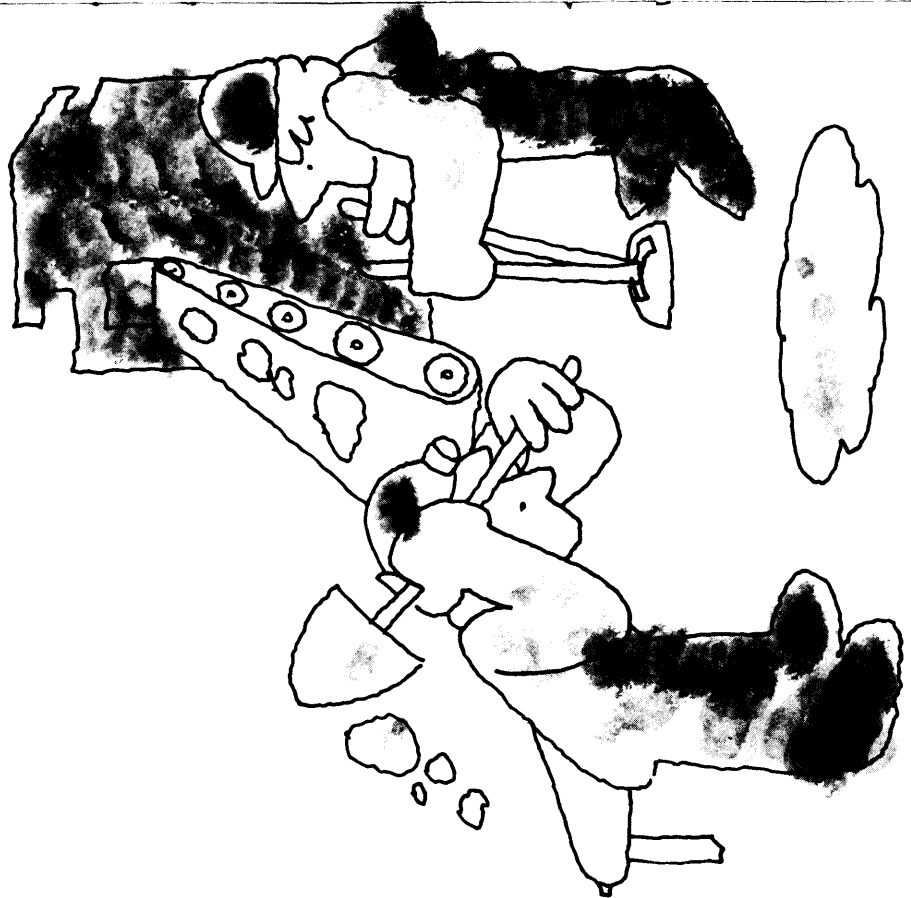
Now . . . About Smoking

It has been established that cigarette smoking **greatly** increases the risk of developing lung cancer in persons exposed to asbestos. On the other hand, asbestos industry workers who do not smoke cigarettes — and who never have smoked regularly — have shown no greater frequency of lung cancer than the average person who does not smoke.



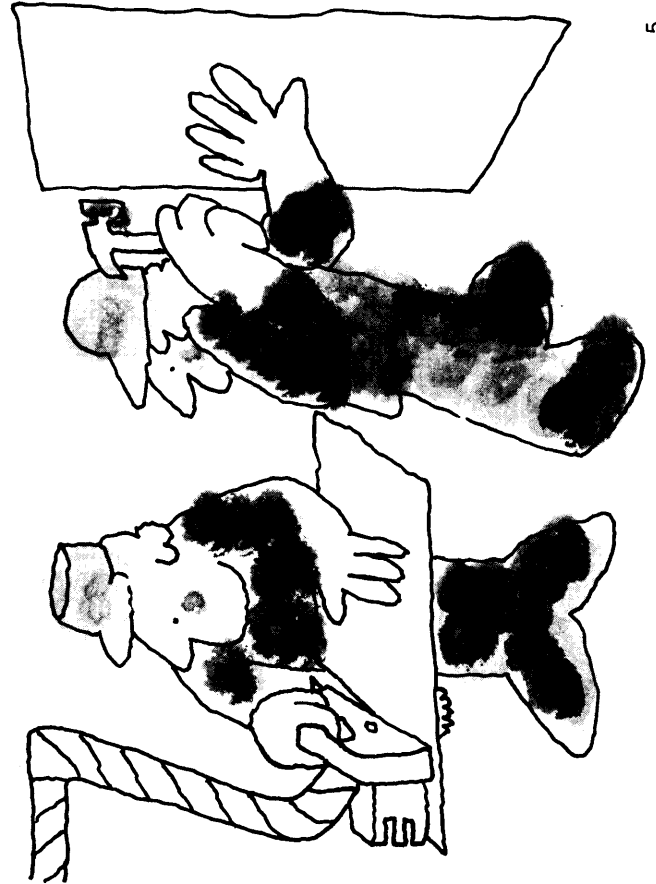
If You Work in a Plant or Mine

Employees in asbestos mines, mills, or product manufacturing plants will be exposed to airborne asbestos fiber. But, when dust levels in mines, mills and factories are properly controlled, the asbestos content of the air will be low and within safe levels, and will not be a hazard to workers.



If You Work in Field Operations

Most finished asbestos-containing products, when correctly used, will not produce dust levels high enough to be a hazard to workers. In more than 90% of the asbestos-containing products made in the United States, the asbestos fibers are "locked in" the product by means of cement, plastic or other binders. Consequently, the fibers are not easily released into the air, except during sawing or certain other machining operations. The tear-out, removal or demolition of old asbestos-containing insulations also can release fibers. Such operations must be carried out with approved methods of dust suppression and control.



Regulations to Protect You

To insure the safety of all, occupational standards for exposure to asbestos dust have been established by the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor. These standards are designed to protect you from exposure to potentially hazardous amounts of asbestos dust and are being carefully observed by the company.

Here is what these standards provide:

1 A SAFE WORKPLACE

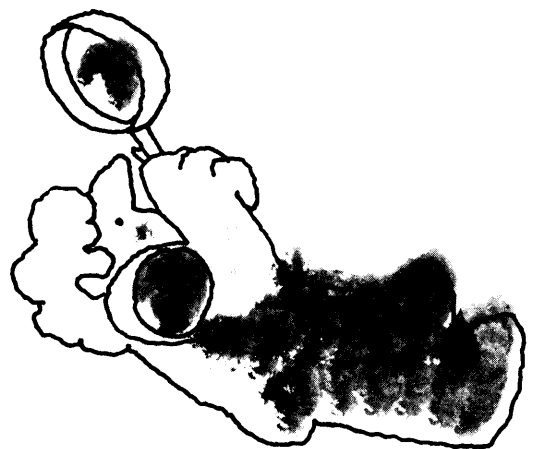
Your employer is required to make sure that no employee is exposed to more asbestos dust than permitted by the government standard. Your company will exert every effort to keep levels not only below permissible limits, but as low as possible.

2 IN CASE OF RISK

If exposure limits are exceeded, the employee will be notified by his employer, and will be informed of the corrective measures being undertaken to reduce his exposure to permitted levels.

3 CORRECTIVE ACTION

Engineering controls and safe work practices will be the approved methods of correction.



4 IN THE MEANTIME

While corrective measures are being taken, the employee will be protected by other means, which may include the wearing of an approved respirator provided by his employer, or by shift rotation.

5 TEMPORARY MEASURES

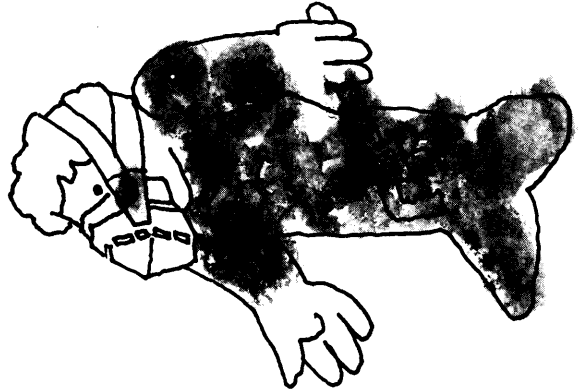
The use of respirators or shift rotation to achieve proper dust control will be permitted only (a) during the time necessary to install engineering controls or to institute safe work practices, (b) in situations where such controls or practices are not technically feasible, or (c) in emergencies.

6 AND ONLY IF YOU PASS THE MEDICAL

No employee will be assigned to a task requiring the use of a respirator if his most recent yearly medical examination indicates that he would not be able to function properly while wearing one, or if the wearing of the respirator would create a hazard to the employee's health or safety.

7 SPECIAL PROTECTION WHEN NEEDED

Protective clothing, change rooms, and separate clothes lockers will be provided for employees in situations where exposure standards are exceeded.



8 CHECKING THE AIR

Monitoring of workplace air will be conducted by the employer to assure that government standards are being met. Employees may review results of the monitoring in their particular job areas.

9 SIGNS TO GUIDE YOU

Caution signs will be posted in work areas where airborne levels of asbestos may be in excess of the exposure limits, and where respiratory protection and special handling precautions are required. Employees should obey these signs at all times.

10 CAUTIONS ON PRODUCTS, TOO

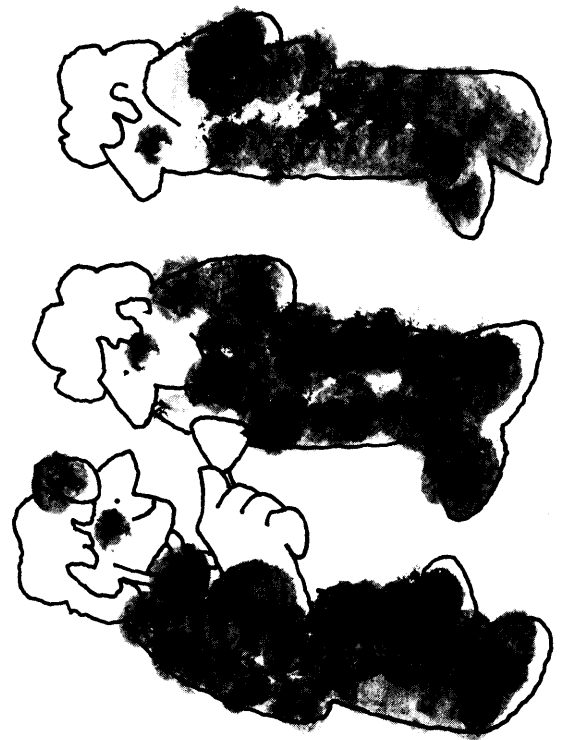
Caution labels will be placed on asbestos-containing products which, during any reasonably foreseeable use, handling, application, machining or disposal may release asbestos fiber into the air in concentrations that exceed the exposure limits.

11 ANNUAL CHECK-UPS

The employer, at no cost to the employee, will provide yearly medical examinations for employees exposed to asbestos dust. Pre-employment and termination medical exams also are provided.

12 COUNSELING AND RESULTS AVAILABLE

Results of each employee's medical examination will be reviewed with him by a physician, and, at the worker's request, his own medical exam records will be made available to his family physician.



And, Most Important . . .

Another word about smoking. First, an assurance. If you don't smoke cigarettes now and never have smoked them regularly, statistical studies show you have no greater chance of getting lung cancer than a nonsmoker who has never worked with asbestos.

But, on the advice of medical specialists: If you work with asbestos and you do smoke cigarettes, **quit smoking!** If you work with asbestos and do not smoke, **don't start!**

Your family and the company need you and your special abilities. Guard your health in every way, but particularly where cigarette smoking is concerned.

After You Leave Work

You also should take precautions to prevent taking asbestos home on any work clothes or other materials in order to protect members of your family from possible exposure to asbestos dust.

To reduce the possibility of carrying asbestos fibers home on your person and clothing, facilities for showering and changing from work to regular clothes may be provided by your employer. Work clothing taken home for laundering should be carried in a closed bag or container and then washed separately from other family clothing.

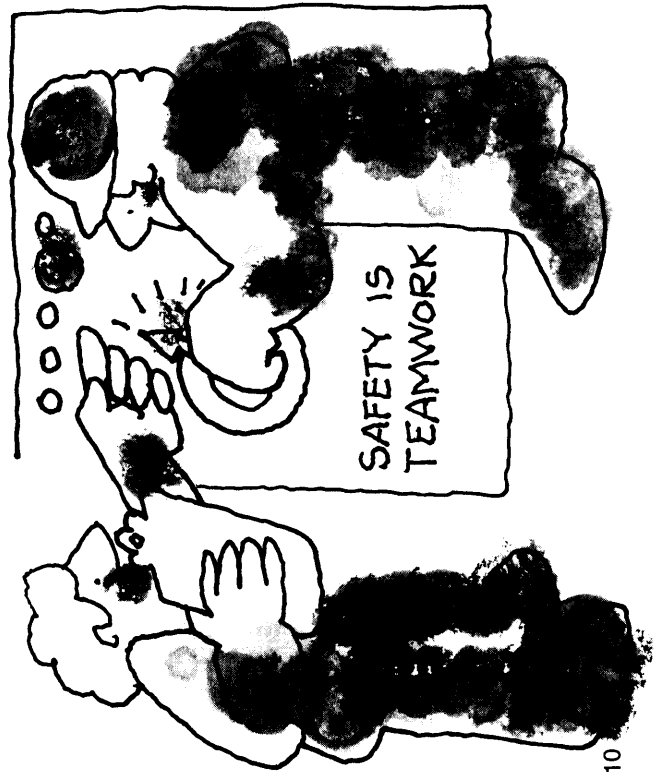
Never take loose fiber home. Your family should not be needlessly exposed to asbestos dust through any carelessness on your part.



What Else Can You Do?

Industrial safety and health can never be the responsibility of only one person. Both you and your employer must work together to provide a safe and healthy environment.

- For safety in specialized areas, detailed work practices must be instituted to make sure we are complying with government regulations. As an employee, it is your duty to follow these work practices at all times. Never take shortcuts that may endanger your health and that of others.
- If you see a possible hazard that your employer may have overlooked, bring it to his attention.
- If you can suggest more efficient and safer work practices, do so. If you are not sure how to handle a material or perform an operation without creating dust, talk with your supervisor first.



REMEMBER

- Asbestos fiber may be hazardous to your health, and exposure to it, over a period of time, may increase your risk of developing asbestosis, cancer of the lung or digestive tract, or mesothelioma.
- Every precaution should be taken by you and your employer to keep dust levels low and to avoid unnecessary exposure.
- The asbestos industry is working hard to control dust exposure and to alert every worker to proper safety precautions. Government and company regulations designed to protect you and other workers against exposure to asbestos dust should be strictly followed by everyone.
- The vast majority of the thousands of finished asbestos products are not hazardous when properly handled or used, but workers who are engaged in their manufacture, fabrication or installation should be aware of possible dangers. Don't be careless — urge your fellow workers not to be.
- Asbestos is used in some 3,000 products daily throughout the world . . . products that help prevent and control fire in our homes, schools, factories, offices, hospitals and theaters . . . products that help stop our cars and trucks . . . products that save fuel and energy in this important time of conservation. If we are to continue making these much-needed products, it is important that you and your employer cooperate in maintaining the highest standards of safety and health on the job.



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