

### PART III

#### PROTECTING THE ASBESTOS WORKER

The asbestos industry has invested millions of dollars in equipment and techniques to prevent the inhalation of asbestos dust by workers involved in the mining and milling of asbestos and in the manufacture of asbestos-containing products. Many more millions are earmarked today for continued improvement in the years to come.

##### Establishing Safe Dust Levels

When asbestos is mined, milled or processed in manufacturing plants, its minute dry fibers become airborne like dust particles. Long exposure to heavy concentrations of asbestos dust has been linked directly to an increased incidence of such diseases as pulmonary fibrosis (asbestosis), bronchogenic carcinoma (lung cancer) and mesothelioma among long time workers in the asbestos industry.

The first epidemiological study of the effects of asbestos dust on workers was reported in 1930.<sup>1</sup> From that time on, it was generally recognized in industry that asbestosis serious enough to interfere with respiratory or cardiovascular functions could be prevented by reducing dust levels to a specified threshold limit value (TLV).

The American Conference of Governmental Industrial Hygienists (ACGIH) set the industry's first standard in 1938 by establishing a threshold limit value of five million particles per cubic foot. Independent research supported by the Johns-Manville Corporation concluded at about the same time that a TLV of one million fibers, 10 microns or longer, per cubic foot would be an adequate level for safe occupational exposure.

In 1968, the ACGIH established a new standard with a TLV of 12 asbestos fibers, five microns or longer, per cubic centimeter, and this was later modified in 1970 by reducing the time-weighted average to five fibers per cubic centimeter with a maximum of 10 fibers per cubic centimeter at any one time.

This standard was adopted as a temporary measure in 1972 by the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor, and is the present accepted level. However, on July 1, 1976 a new standard is scheduled to go into effect that will reduce the TLV to only two asbestos fibers, five microns or longer, per cubic centimeter on a time-weighted average.

##### Protecting the Worker

While there are many differences of opinion within the medical profession concerning the problem of asbestos and health, it is universally accepted that levels of asbestos dust in the workplace must be kept to a minimum.

Industry has attacked the problem in a number of ways. Typical methods implemented to control dust levels include sophisticated dust collection systems (which combine high-power exhaust fans, duct networks and high-efficiency filters); special methods of waste disposal; use of protective clothing and portable dust respirators; and innovative wetting and dampening methods which minimize dust generated during production.

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1. E. R. A. Merewether, "The Occurrence of Pulmonary Fibrosis and other Pulmonary Affections in Asbestos Workers," *Journal of Industrial Hygiene*, 1930.

The asbestos industry has developed a completely automatic fiber bag opening station that will permit workers to open the bags, remove the fiber, dispose of the bags and enter fiber into the manufacturing process without creating dust. In general, greater use of automation is being sought throughout the asbestos industry to reduce dust levels and to minimize exposure of employees to airborne asbestos fiber.

Basically, the requirements of an effective dust control program are twofold: (1) Design fabrication processes and production equipment so as to minimize dust generation as much as possible; and (2) Implement highly organized programs of industrial maintenance (including hygiene surveys) to insure that safe levels are maintained. Periodic monitoring of dust concentrations should reveal dust levels which exceed the threshold limit value (TLV).

It is obvious that good preventive maintenance must go hand in hand with effective dust control measures if the standards recently announced by OSHA are to be achieved.

### **OSHA Regulations**

On June 7, 1972, the Occupational Safety and Health Administration established by the Williams-Steiger Occupational Safety and Health Act of 1970 issued standards regulating asbestos dust exposures. These occupational standards deal with (1) permissible concentrations of asbestos fibers, (2) methods of compliance, (3) warning signs and labeling of potentially dangerous products, (4) monitoring of dust levels, (5) medical examinations for employees, and (6) recordkeeping by employers. These standards have one basic purpose—to protect employees from exposure to potentially hazardous amounts of asbestos dust in their workplace.

The major obligations placed on employers, and industry in general, by the new standards can be summed up as follows:

- A. The employer shall maintain a healthy workplace, making sure that no employee is exposed to concentrations of airborne asbestos fiber in excess of established limits.
- B. Where the exposure limits are exceeded, the employee shall be notified in writing of the situation by his employer and shall be informed of corrective measures being undertaken to reduce his exposure to a safe level.
- C. Engineering controls and the implementation of safe work practices are the only approved permanent methods of correction.
- D. While corrective measures are being instituted, the employee shall be protected by other means, such as the wearing of an approved respirator provided by his employer, or by job rotation.
- E. The use of respirators or shift rotation to achieve control is not permitted except (1) during the time required to install engineering controls or implement safe work practices, or (2) in situations where such controls or practices are not technically feasible, or (3) in emergencies.
- F. No employee shall be assigned to a task requiring the use of a respirator if his most recent yearly medical examination indicates that he would be unable to function properly while wearing one, or if the wearing of a respirator would endanger the employee's health or safety, or that of another workman on the job.
- G. Special protective clothing, change rooms, and separate clothes lockers shall be provided for employees in certain situations.
- H. The personal and environmental monitoring of a workplace shall be conducted by the employer to assure that the standards are being met. Employees shall have access to the results of the monitoring of their jobs.
- I. Warning signs shall be posted at entrances to areas where dust levels are in excess of the standard.

- J. Caution labels shall be placed on any finished asbestos-containing products that are likely to release free asbestos fiber in excess of the standard during handling, application, or fabrication.
- K. The employer shall provide yearly medical examinations for employees exposed to concentrations of asbestos dust. Pre-employment and termination medical exams also are required.
- L. Upon request, an employee's medical records will be made available to his family physician.

Other requirements included in the standard require that: (1) where respirators are permitted, they must be selected from among types approved by the U.S. Bureau of Mines or the National Institute for Occupational Safety and Health (NIOSH); (2) no asbestos cement, mortar, coating, grout, plaster or similar material containing asbestos can be removed from shipping bags or their containers without being either wetted, enclosed or ventilated; (3) insofar as practicable, asbestos must be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state to reduce fiber emissions unless this would diminish the usefulness of the product; (4) hand tools that may produce or release asbestos fibers in excess of the limits must be provided with local exhaust ventilation systems; (5) external work surfaces must be kept free of excessive accumulations of asbestos fiber; (6) waste must be collected in sealed impermeable bags or other closed, impermeable containers.

#### **The Asbestos Industry's Commitment**

The asbestos industry is firmly committed to the protection of its employees from health problems related to asbestos dust.

This commitment is evidenced by three major factors:

- (1) *Past and Present Research.* The industry has spent millions of dollars to improve mining, milling and manufacturing methods during the past 30 years. Accompanying these advances have been increasingly safer working conditions in mines, factories and at job locations. This work continues unabated. The asbestos industry is working openly and enthusiastically with the Federal government, and with independent medical researchers.
- (2) *Cooperation in Setting Work-Safety Standards.* The asbestos industry has participated without reserve on government committees, investigative panels and at public hearings to review and improve work-safety regulations and asbestos control standards.
- (3) *Implementation of Controls.* In the past decade, the industry has spent some \$110 million to implement work-safety controls in its mines and plants. At least another \$95 million will be spent during the next three or four years to upgrade facilities to meet the standards set by OSHA. Through its organizations—principally the ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA—the industry shares information on new control technology with its own members, its customers, and small producers and users not associated with its industry groups.

The asbestos industry also is striving for better communication between all concerned parties—workers and their unions, government agencies, basic producers and end users. The ultimate goals are the reduction of dust to a minimum level, the protection of all workers from asbestos-related diseases, and protecting the general public from future exposures to levels of asbestos dust that could be potentially hazardous to health.

## **PART IV**

### **ASBESTOS AND THE GENERAL PUBLIC QUESTIONS & ANSWERS**

Much has been printed and said about asbestos and health, much of it inaccurate, misleading or completely false.

Some of the more prevalent of these fallacies are discussed in a question and answer format in the following pages.

### QUESTION

Is asbestos a major air and water pollutant in our society?

### ANSWER

Asbestos exists naturally in small though detectable amounts in serpentine rock formations throughout the world and is constantly being released into the atmosphere through erosion by wind and water. Asbestos is thus natural to our environment, and—as analysis of dated ice from the polar caps has revealed—has been for thousands or even millions of years.

Man therefore probably evolved into his present form in an atmosphere containing a natural background level of asbestos—both in the air he breathed and in the water he drank. While precise comparisons are impossible, today's atmospheric levels of asbestos, even in urban settings, are still only marginally higher than in the distant past and are many thousands of times lower than any levels known to result in disease in occupational settings.

There is no indication that levels of asbestos in community air and water have been increased significantly by modern uses of asbestos. The only exceptions that have been found were in the past in environments close to manufacturing and mining facilities, and in applications where simple controls were not implemented—such as unrestricted spraying of asbestos fireproofing in construction. These emissions are currently under control, in accordance with federal, state and local standards that are designed to help keep asbestos in ambient air everywhere at levels that are not injurious to health.

### **QUESTION**

Do asbestos-containing brake linings used on trucks, buses and automobiles release harmful amounts of asbestos dust into community air?

### **ANSWER**

Brake linings used in transportation vehicles contain up to 55 percent asbestos fiber, but this fiber is locked into the linings with various resins and polymers. When brakes are applied, enormous amounts of heat are generated, which changes the chemical nature of the asbestos in the lining, thus producing a non-fibrous, non-toxic material called fosterite. Studies conducted in the United States and Great Britain have shown that brake lining dust contains only traces (one to three percent) of free asbestos fiber.

In fact, the total amount of free fiber released by brake lining wear throughout the United States in an entire year is less than 20% of the total emissions of particulate matter in a city the size of Los Angeles in a single day!

In addition, tests conducted in New York City at specially selected locations where traffic is heavy and braking frequent have shown that asbestos dust levels are only marginally higher than normal background levels, and many thousands of times lower than levels which could be considered potentially hazardous.

### QUESTION

Is asbestos used in the manufacture of clothing worn by the general public?

### ANSWER

In 1971, a clothing manufacturer imported cloth from Italy that contained 8 percent asbestos fiber. It was used to make 200,000 women's overcoats. An emotional outcry resulted, but Food & Drug Administration tests showed that the amount of asbestos dust which could be generated from such a coat, even under extreme conditions, would not pose a health hazard to the wearer of the coat.

The FDA, nevertheless, decided to ban the manufacture of such "general use" garments in the future because they felt it constituted an "inappropriate use of asbestos fiber, one in which none of the special properties of the fiber that contribute to the welfare of the public are utilized." The Asbestos Information Association officially concurred in this decision.

Garments in which the special properties of asbestos are utilized, such as fireproof suits, barbecue mitts and aprons, etc., were not banned by the FDA because the asbestos fibers are "locked in" the garments by chemical agents or other means.

### QUESTION

Will there be an "epidemic" of asbestos-related mesothelioma in the future among people who worked in United States shipyards during World War II?

### ANSWER

Despite the predictions of some doctors to the contrary, it appears highly unlikely that such an "epidemic" will occur. Predictions of this nature have been based primarily on the experience of workmen in British, not United States, shipyards, where a relatively small number of mesothelioma cases have been reported among yard employees not known to have worked directly with loosely-bound asbestos products in their jobs. There are several important factors, however, which do not make the British experience comparable with that in American shipyards. These are:

1. The prime method of applying asbestos-containing insulations aboard British warships was by spraying, a notoriously dusty method of application. Dust counts during spraying in British shipyards have been recorded as high as 1500 fibers per cubic centimeter of air (300 times higher than the current United States standard for asbestos exposure). Counts taken during the sweeping and bagging of asbestos debris have reached the astronomical figure of 3815 fibers per cc (more than 750 times the U.S. standard). This resulted in very high dust levels throughout the shipyard area.
2. Spray application methods were never used in United States shipyards during the Second World War. The alternative methods used in this country, while creating dusty conditions for the men doing the actual work, did not result in hazardous conditions throughout the yard, as was the case in Great Britain.
3. The type of asbestos fiber most used in British shipyards for insulation purposes was crocidolite, the variety of fiber most medical experts agree is the most likely to cause mesothelioma. Crocidolite was not used in U.S. shipyard work.
4. The actual number of shipyard mesothelioma cases reported in Great Britain, while of great concern, cannot be considered of "epidemic" proportions. In the Scottish yards, for example, 49 cases have been reported in the 18 year period ending in 1967.
5. Millions of men were employed in United States and British shipyards during the First World War and in the intervening years down to World War II. Asbestos insulations were used extensively during this period. The practices employed for the application of these insulations were similar, if not dustier, than those used in U.S. yards during World War II, yet no "epidemic" of mesothelioma occurred as a result of these exposures. If thousands of cases had developed, this disease would certainly have come to the attention of asbestos-health experts much earlier than it did (in the early 1960s).

This is not to say that a few cases of mesothelioma will not develop among indirectly exposed United States shipyard workers. However, the printed medical and exposure data does not support the prediction that a hundred thousand or more will die as a result of their World War II exposures.

#### **QUESTION**

Are cosmetic talcum powders, including baby powders, contaminated by excessive amounts of asbestos fibers?

#### **ANSWER**

A form of asbestos called tremolite can be found in nearly all talcum powder, since it is a naturally occurring contaminant in talc stone. In some industrial talcs not intended for human use, the percentage can be quite high. In cosmetic talcum powders, however, including baby powders, the percentage has been found to be very small. A 1972 study by the Office of Product Technology of the Food and Drug Administration showed that, of 40 cosmetic talcum powder samples tested, 39 contained one percent asbestos or less, while the 40th had to be retested for traces. This is far below the 15 to 25 percent figures quoted in some newspaper reports.

### **QUESTION**

Do asbestos-containing filter materials release asbestos fibers in potentially hazardous quantities into liquors, beers, wines, soft drinks and other liquids offered for sale to the public?

### **ANSWER**

Asbestos-cellulose filter pads have been used in the filtration of liquids since the beginning of this century. These filter pads play an important role in clarifying and improving the taste of certain beverages, as well as removing potentially toxic substances from the finished product. The mass production of many of our more important injectable drugs would be virtually impossible without the use of asbestos-containing filter media.

While it is possible that very tiny amounts of electron microscope sized asbestos fibrils are released into some beverages from the use of asbestos-containing filter pads, there is no evidence whatever that the size and quantity of the fibrils released constitute any hazard to human health.

This same question was raised in Great Britain a few years ago with regard to fibrils of asbestos found in beer. The furor died when it was shown that the total amount of asbestos fiber found in British beer added up to only two one-thousandths of an ounce in the total United Kingdom beer production of over a thousand-million gallons a year.

In addition, a consensus report from a 1972 international meeting on asbestos-health sponsored by the World Health Organization found "no evidence of an increased risk of cancer resulting from asbestos fibers present in water, beverages, food or in the fluids used for the administration of drugs."

### **QUESTION**

Is the atmosphere being polluted by asbestos sprays used to fireproof the superstructure of buildings under construction?

### **ANSWER**

The use of asbestos-containing, spray-on fireproofing compounds in high-rise building construction has been banned in the United States by the Federal Environmental Protection Agency (EPA) because the methods developed for the control of emissions of fiber from these sources proved to be ineffective.

Once this fact became established, the asbestos manufacturing industry concurred with the EPA that the use of spray fireproofing compounds should be prohibited.

### QUESTION

Are asbestos-containing modeling compounds still being used by school children in art classes in the United States?

### ANSWER

From time to time, a newspaper will carry a report that children at a local school or YWCA are using asbestos as a modeling compound to construct puppets or to sculpt heads. This normally results in excited denunciations by local politicians and others, who demand that the practices be stopped. Simply speaking, the asbestos industry agrees with them—the practice should be stopped!

In November 1971, the Asbestos Information Association sent a caution letter on this subject to nearly 5,000 teachers associations, hobby and craft publications, state boards of education, boy and girl scout councils, YMCA's and YWCA's, etc. This letter said in part:

"It has come to our attention that on occasion the leaders of youth activity groups have used asbestos fiber as an inexpensive substitute for modeling clay and papier-mache.

"We feel strongly that this use of asbestos should be discontinued. Although the levels to which children may be exposed are probably very small and present no hazard to health, we do know that heavy exposure to asbestos in occupational settings can be a cause of illness.

"For this reason we feel that it is prudent that the use of asbestos for hobby purposes be eliminated."

As a result of this letter, appropriate steps were taken by many of the groups contacted to discontinue this particular use of asbestos. When the Association learns of instances where this practice has not been discontinued, appropriate letters of warning are sent to the parties involved.