NORTH AMERICAN ASBESTOS CORPORATION

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January 24, 1973

Mr. F. Bilton
Foseco Inc.
20200 Sheldon Road
Cleveland, Ohio

Dear Frank,

We have received some information from the Asbestos Information Association of North America pertaining to hazards of asbestos.

We are attaching a copy of the document, which we thought you might find interesting and useful.

Sincerely yours,

NORTH AMERICAN ASBESTOS CORPORATION

Vice President/General Manager

CGMorgan/jc
encl.

PART I

ASBESTOS AND HEALTH

Asbestos, used since antiquity, has widespread and important applications in modern society. Up to 3,000 different products containing asbestos are in daily use throughout the world. Its increased use in the 20th century has lent urgency to the need to cope with health hazards related to the inhalation of asbestos dust.

Evidence to date has shown that these hazards are primarily and almost exclusively related to occupations and geographical areas where asbestos is mined, processed and extensively handled. This fact is recognized by the asbestos industry, which is making considerable progress in protecting those who work with asbestos or near dust-producing facilities.

Such problems are not unique to the asbestos industry. Many substances and materials are detrimental to the health and safety of industrial workers under uncontrolled and specific conditions. A vital and widely used raw material, asbestos is but one of a number of harmful substances released by industrial processes.

Research, most of it conducted in the past ten years, has shown that a link does exist between various lung diseases and on-the-job inhalation of asbestos dusts over an extended period. There appear to be limits to the amount of asbestos fibers a person can inhale without risk. Once this limit is reached, the affected person is subject to subsequent illness regardless of whether he continues or discontinues his exposure to asbestos fibers. Prolonged heavy exposure does not always mean disease and death - but there is little question that risks are significantly increased.

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Risks to the General Public

Findings of medical research, based on occupational incidence of asbestos-caused disease, are sometimes extrapolated by writers and researchers working with secondary sources as "proofs" that the health of the general public is endangered by asbestos dust. However, there is no evidence -- either from experience or from scientific research -- that anyone in the general public has ever contracted asbestos-related disease from exposure to the wearing or weathering of such asbestos-containing products as brake linings, floor tile, roofing, wall or ceiling panels or other similar products that include asbestos. In such products, the asbestos fibers are locked in by cement, plastics and other binding materials and are not released in a harmful form by even the heaviest of heavy-duty wear.

This was the conclusion of a paper, "Asbestos Dust Exposures at Various Levels and Mortality," which reported in 1967: "Asbestos dust at levels to which general populations are exposed probably is of little importance in the etiology (cause) of disease." (1)

A similar conclusion was reached more recently in 1972 by the International Agency for Research on Cancer. A comprehensive report on the findings of a conference attended by 137 scientists, medical researchers and physicians from 20 nations concluded that there is "no evidence of a risk to the general public (from asbestos) at present". It specifically stated that asbestos fibers sometimes found in "water, beverages, food, or in the fluids used in the administration of drugs" do not lead to increased risk of cancer. (2)

Asbestos and Air Pollution

Scientific and medical research on general air pollution also had found little or no cause for public concern about the possible presence of asbestos fibers in ambient air. Asbestos fibers have floated in ambient air throughout the ages, and are found in small numbers as so-called ferruginous (iron-like

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bodies in the autopsied lungs of some city dwellers. (These microscopic bodies are composed of protein and iron pigment deposited over specks of fibrous material that may remain in the lungs).

However, ferruginous bodies found in lungs are not always caused by asbestos; they often are the result of more than a hundred other types of fibers found in urban-dwellers' lungs which also attract iron pigment and protein. Nor does the finding of these so-called "asbestos bodies" mean that an asbestos-related disease is present, or that this limited exposure to asbestos in the air will cause cancer or other asbestos-related diseases. Various investigators have found that the "asbestos bodies" found in human lungs are not related either to the cause of death or to any history or symptoms of pulmonary disease among the subjects they have studied.

The National Research Council Report on Asbestos for the National Academy of Sciences in 1971 stated that most human lungs harbor thousands or millions of fibers. Some are derived from the burning of leaves and plant products, such as paper, wood and coal. Some are man-made, mostly vitreous. Some are asbestos fibers. The report, as noted above, found no evidence of risks to human health from asbestos fibers in ambient air, except in areas of very high concentration, such as mines and dust-producing manufacturing facilities. In these areas, asbestos has been found to be a potential danger both to the health of those who work with it, and to those who are continuously exposed to dusts carried into households on workers' clothing, or in neighborhood air that is heavily-laden with asbestos fibers. (3)

In brief, there is evidence to suggest that risks of asbestos-related disease decline from direct occupational, to indirect occupational, to worker household and asbestos mine and facility neighborhood exposures. Such evidence also suggests that there are levels of asbestos exposure that will not be associated with any detectable risk. What those levels are is not known, but,

again, there is no evidence that persons in the general population have any increased risk of neoplasm, even though there may be ferruginous bodies in their lungs.

Known and Suspected Occupational Risks

There are three primary diseases known to be caused or exacerbated by prolonged and heavy inhalation of asbestos fibers. They are asbestosis, bronchogenic (lung) cancer, and mesothelioma. Generally, the severity of these asbestos-associated diseases is related predominantly to the numbers of fibers inhaled (dose) and the proportion that are retained. The higher the dose the more severe are the symptoms of the disease.

Asbestosis. This is an occupational disease characterized by lung scarring, and is one of the lung diseases called pneumoconioses. It is caused by the inhalation of substantial amounts of asbestos dust over a long period of time (average, 17 years), and is found only among those who have worked regularly and continuously with asbestos under inadequately controlled conditions.

Asbestosis is neither malignant nor necessarily fatal. Many asbestos workers with minor cases can and do continue to work and lead normal lives without difficulties. As far as can be determined, asbestosis never has been found in the general public, even among people living in close proximity to asbestos mines and processing plants.

The consensus among medical researchers and the asbestos industry is that chrysotile, the type of asbestos most used in the United States, is least likely to produce asbestosis. However, the asbestos industry has long recognized the risk of this disease and has implemented safeguards to protect workers' health.

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Bronchogenic (Lung) Cancer. A number of medical studies have linked asbestos with lung cancer. While lung cancer occurs far less frequently among asbestos industry workers than asbestosis does, these workers -- particularly those who smoke cigarettes -- do have a higher frequency of lung cancer than is found in the general public.

One study, issued in 1968, found that asbestos insulation workers who smoke cigarettes run eight times more risk of lung cancer death than do those who do not smoke, and about ninety-two times more risk than those who neither work with asbestos nor smoke.(4)

Also, a continuing study of workers in a British asbestos textile plant has shown that dust control measures, which had substantially reduced the incidence of asbestosis, also reduced the incidence of lung cancer among workers to the rate existing among the general public.(5) Lung cancer, it is said, will not likely develop if first the asbestos worker does not have asbestosis.

Mesothelioma. This disease is a rare cancer of the lining of the chest (pleura) and the abdominal cavity (peritoneum). It is found more frequently among those with asbestos exposure than among the general population. It als has been found among people who live or have lived in close proximity to an asbestos plant or mine, and in the households of employees who work or have worked in asbestos factories or mines and who presumably brought quantities of asbestos fiber into their homes on their work clothes.

This was pointed up in a study conducted in an asbestos-mining area in South Africa, where mesotheliomas were found in persons who had only household and neighborhood exposure.(6) Obviously, such exposures are limited to small areas contiguous to mines and processing facilities. However, mesotheliomas also may result from exposure by workers in

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proximity to those working directly with asbestos, such as shipyard workers and construction-insulation workers. Exposures of these types can be and are being limited and reduced by strictly enforced industrial safety devices and procedures.

It is this evidence of a non-occupational or para-occupational risk of mesothelioma that generates much of the world-wide concern with asbestos exposures to the general public. However, some recent studies have indicated that asbestos exposure must be heavy and/or of long duration before a mesothelial tumor results. (7) There is usually a lengthy time gap between the exposure and the appearance of a tumor. For asbestosis, it averages 17 years; for bronchogenic cancer, from 15 to 25 years; and for mesothelioma, from 30 to 45 years.

Thus, disease that is being reported today among asbestos workers is a result of occupational exposures that occurred or began decades ago -- at a time when less was known about the amount of asbestos a human could tolerate, and when dust control equipment then available was not as sophisticated or efficient as it is now.

Evidence also has been found of higher-than-normal rates of gastro-intestinal cancer among asbestos insulation workers. (8) However, there has been no reported incidence of asbestos-caused gastro-intestinal cancer among the general public.

The search for the cause of mesothelioma is hampered by the fact that its diagnosis and recognition are still considered problems among medical experts. In several countries, mesothelioma registries have been set up to collect histories of the tumor. The asbestos industry has made research grants to aid medical efforts to gain this knowledge.

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Asbestos and Health Research

Scientific research into health risks from asbestos dust and their reduction is under way in many laboratories throughout the world. This work is being done by government and private medical investigators, with the sponsorship and cooperation of the asbestos industry.

These studies are exploring --

1. The specific identification and health significance of ferriginous bodies found in lung tissues;

2. The health of asbestos mining, processing and fabricating workers compared with the general population;

3. The relationship between cigarette smoking and cancer among asbestos insulation workers;

4. The accurate identification of particles found in the air over a major industrial city;

5. The development and evaluation of the most effective industrial hygiene practices for use in the asbestos industry.

Even as this work is being done, the industry, by itself and in cooperation with other agencies, is continuing to seek new information about the biological effects of asbestos fiber and to develop new ways of assuring maximum possible protection for its employees and users.

Much has been learned about asbestos and health in a very short time -- especially when you consider that the greater part of all medical information about asbestos-related disease is less than a decade old. According to Dr. Premysl Pelnar of the Institute of Occupational and Environmental Health of the Quebec Asbestos Mining Association, at least 90 per cent of all information and data now available is the result of medical studies undertaken during the

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past 10 years.

Much more is being done: The International Agency for Research on Cancer recently made recommendations for further research and indicated priorities for work of immediate and long-term value. Emphasis was placed on epidemilogical and pathological studies, and high priorities were urged for certain projects.

These included:

1. Early detection and surveillance of effects caused by asbestos;
2. Usefulness of early detection in the prevention of progressive fibrosis and asbestos cancers and in the identification of hazardous conditions;
3. Assessment of excess cancer risks following exposure to only one type of fiber;
4. Amount and type of asbestos in the lungs of cases of mesotheliomas;
5. Secular changes in incidences of pleural and peritoneal mesotheliomas nationally and internationally;
6. Association between past exposure to asbestos and cancer of sites other than lung, pleura and peritoneum;
7. Amount and type of asbestos in the lung and estimates of past dust exposure and interval since last exposure;
8. Methods for determining amounts, types and structural features of asbestos in tissue;
9. Relationship of asbestosis and risk of carcinoma;
10. Monitoring by immunological methods of populations exposed to asbestos to ascertain whether or not it is possible to recognize those who are developing or will develop tumors.

PART I

FOOTNOTES

1. P. E. Enterline and M. A. Kendrick, "Asbestos Dust Exposures at Various Levels and Mortality," from Archives of Environmental Health, Aug. 1967.

2. Report of the Advisory Committee on Asbestos Cancer to the Director of the International Agency for Research on Cancer; Lyon, France, October 5-6, 1972.

3. Asbestos - The Need for and Feasibility of Air Pollution Controls, National Research Council Report on Asbestos for the National Academy of Sciences, 1971.

4. I. J. Selikoff, E. Cuyler Hammond, and Jacob Churg, "Asbestos Exposure, Smoking and Neoplasia," Journal of American Medical Association, April 8, 1

5. J. F. Knox, S. Holmes, R. S. Doll and I. D. Hill, "Mortality From Lung Cancer and Other Causes Among Workers in An Asbestos Textile Factory," from British Journal of Industrial Medicine, October, 1968.

6. J. C. Wagner, "Some Pathological Aspects of Asbestos in the Union of South Africa," Proceedings of the Pneumoconiosis Conference, 1959.

7. G. W. Wright, "Asbestos and Health in 1969," American Review of Respiratory Diseases, October 1969.

8. I. J. Selikoff, E. Cuyler Hammond, and Herbert Seidman, "Cancer Risk of Insulation Workers In The United States," Biological Effects of Asbestos, International Agency for Research on Cancer, October 5-6, 1972.

PART II

WHAT ASBESTOS IS: HOW AND WHERE IT IS USED

"Asbestos" is derived from an ancient Greek word meaning "inextinguishable". In reality, mineral asbestos is non-flammable at extremely high temperature, inhibits certain types of chemical reaction, and is extremely flexible and durable. All these qualities combine to make it uniquely suitable for a wide variety of demanding uses, particularly those that protect human life and property.

What Asbestos Is

Asbestos is the generic name given to a group of hydrated silicate minerals that can be separated into relatively soft, silky fibers. Certain grades can be carded, spun and woven. Others can be pressed or laid to form paper.

Chrysotile, crocidolite (or blue fiber), and amosite are the three asbestos varieties that are commercially significant today. Each differs from the others both physically and chemically (See Appendix A for chemical breakdowns).

Chrysotile is a flexible white magnesium silicate which can be attacked by acids. It differs from other asbestos minerals in that it has a positive rather than a negative electrical charge in water. Chrysotile now accounts for 95 percent of all asbestos used annually in the United States. This high percentage of use is due in part to results of medical studies that show amosite and crocidolite can produce more severe cases of asbestosis, which is a non-malignant lung disease afflicting long-time workers in the asbestos industry. Canada and the Soviet Union are the leading producers of chrysotile fiber, but small deposits are also found in the United States, Italy, South Africa, Rhodesia and China.

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Crocidolite, characterized by a deep blue color, is a ferrous sodium silicate that is acid resistant but less flexible than chrysotile. The bulk of the world's supply comes from South Africa. Crocidolite was a strategic material during World War II, when it was used as the filtering element in gas mask cannisters. It can be spun or woven into materials and fabrics used in acid-resistant packings and flame-resistant clothing, etc., but today, it is mainly used for reinforcement of asbestos-cement pipe.

Amosite, which is mined commercially only in the Transvaal district of South Africa, is a brown ferrous magnesium silicate that occurs in the same type of iron-rich sedimentary rock as does crocidolite. It is brittle and not as acid resistant as crocidolite. Amosite is used principally in the manufacture of heat insulating materials.

Properties and Advantages

It is estimated that as many as 3,000 different products in daily use throughout the world contain some asbestos. While in certain products the percentage of asbestos may be small, the unique properties of asbestos usually are responsible for the functioning of the product in a demanding application.

The heat-resistant properties and fibrous structure of asbestos make it extremely desirable as a fireproofing and insulating material, where it already has saved countless lives and prevented billions of dollars of property damage. Typically, asbestos is used wherever fire and excessive heat are a threat to safety.

The wide range of applications for asbestos indicates the incredible demands which any substitute material would have to satisfy. At this time, there is no one material which can outperform asbestos in this wide range of applications, especially where high temperatures are critical.

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Companies now are looking at fiber glass, plastics, ceramics, and various types of sheet metal as possible replacements for asbestos in low-temperature applications, in a few reinforcement applications and as a filtering medium.

However, in high-temperature applications, there generally is no adequate substitute material available since increased costs and weight often make their replacement for asbestos unattractive.

The general feeling in industry continues that asbestos fiber can be used safely and effectively, if efficient dust control methods and organized programs of preventive plant maintenance are implemented according to the standards set by OSHA, the EPA and the Department of Labor.

How Asbestos Is Used

Asbestos fibers can be classified into two types: spinning and non-spinning. Spinning fibers comprise the longer grades of chrysotile and crocidolite; non-spinning fibers include the shorter grades of chrysotile and crocidolite, plus the long and short grades of amosite. Use of a specific grade of fiber depends greatly upon application, and to a lesser extent on price and availability.

Longer-grade chrysotile fibers can be carded, spun and woven to make textile products such as rovings, yarn, tape and cloth. Asbestos fabrics are used to make fireproof clothing, brake linings, packings and gaskets, lagging cloth, and laps that provide electrical and thermal insulation. Spinning-grade asbestos fibers also are used in such non-spinning applications as compressed sheet packings and gaskets. They also are an ingredient of strong asbestos paper used in tape form to wrap electrical wires and cable.

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The shorter-grade (non-spinning) chrysotile fibers make up the great majority of chrysotile used in the U.S. These fibers go into numerous asbestos-cement products, including pipe, roofing shingles, flat and corrugated siding, millboard, cements and fillers, and insulation paper. Short chrysotile fibers are being used increasingly in friction materials, due to the substitution of molded materials for all-woven types used previously. The trend toward increased use of non-spinning grade asbestos fibers is, in part, dictated by medical evidence which has shown a relationship between long fibers and a greater incidence of asbestos-related diseases.

Approximately 85 percent of the asbestos fiber used in the United States (roughly 640,000 tons) is incorporated into finished products where the fiber is entrapped, or locked in, and not free to serve as a possible contaminant in the atmosphere. Asbestos can be locked into a product with a binder, saturant, coating or bonding agent so that normal handling, application and use will not generate asbestos dust. Asbestos-cement products are examples of "locked-in" materials; whereas insulating materials and spray-on fireproofing compounds are so-called "non-locked-in" materials.

Where Asbestos Is Used

The total annual world production of asbestos is approximately four million tons. Canadian production accounts for about 30 percent of the total; production in the United States accounts for about 3 percent.

Use of asbestos fiber in the United States increased after World War II. By 1950, use of asbestos reached a plateau, and during the last 20 years usage in the U.S. has remained fairly constant. Asbestos consumed in the United States in 1971 amounted to nearly 750,000 tons (See Appendix B for

breakdown), and valued at $85 to $90 million. Gross sales of finished products containing asbestos amounted to nearly $1 billion (See Appendix C for sales breakdown). These were products manufactured in over 500 different facilities, large and small, that employ approximately 50,000 people with a total payroll of $500 million dollars.

PART II

APPENDIX A

There are six common varieties of asbestos -- actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite. Chrysotile, which accounts for more than 95 percent of the asbestos used in this country, is a member of the Serpentine group of minerals that consist essentially of a hydrous magnesium compound. The five other varieties -- none of which has the commercial significance that chrysotile has -- are members of the Amphibole group of minerals. They have like crystalline structures and generally consist of three metal ions -- magnesium, iron and silicon.

These six major types of asbestos minerals are distinguished chemically as follows:

Chrysotile	$3MgO\ 2SiO_2\ 2H_2O$
Actinolite	$2CaO\ 4MgO\ FeO\ 8SiO_2\ H_2O$
Amosite	$1.5MgO\ 5.5FeO\ 8SiO_2\ H_2O$
Anthophyllite	$7MgO\ 8SiO_2\ H_2O$
Crocidolite	$Na_2O\ Fe_2O_3\ 3FeO\ 8SiO_2\ H_2O$
Tremolite	$2CaO\ 5MgO\ 8SiO_2\ H_2O$

PART II

APPENDIX B

Following is a listing of product lines containing asbestos and the tonnage shipped for each in the United States in 1971:

Product Lines	Tonnage
Vinyl-Asbestos Floor Tile	145,000 tons
Asbestos-Cement Pipe	140,000
Felt and Paper	110,000
Friction Materials	80,000
Asbestos-Cement Building Materials	50,000
Packing Materials	25,000
Textiles	22,000
Asbestos Insulation	16,000
Spray-on Asbestos Materials	15,000
All Other Asbestos Products	147,000
TOTAL	750,000 tons

PART II

APPENDIX C

Following is a listing of product lines containing asbestos and a breakdown in sales in the United States for 1971:

Product Line	Sales in Millions of Dollars
Vinyl-Asbestos Floor Tile	$190.3
Asbestos-Cement Pipe	147.1
Brake Linings	135.3
Packings and Gaskets	99.5
Asbestos Paper	75.0
Asbestos-Cement Building Materials	70.4
Other Friction Materials	43.8
Asbestos Insulations	40.9
Textiles	38.2
Asbestos Felts	35.2
Asbestos Reinforced Plastics	12.1
All Other Asbestos Products	104.8
TOTAL	$992.6

PART II

APPENDIX D

Following is a listing of some of the products in which asbestos plays a crucial part:

Typical Products which contain Asbestos

Vinyl and asphalt floor tile

Brake linings and clutch facings

Roof shingles

Space vehicle heat shields

Gaskets for spark plugs

Fireproof clothing

Boiler jackets

Awnings, mail bags and theatre curtains

Asphalt paving

Pressure pipe, sewer pipe

Ventilators, air and fume ducts

Thermal, electrical and acoustical insulations

Molded plastics

Paints and varnishes

Motion picture screens

Oven linings, conveyor belts

Filters for dust and processed liquids

Roofing, siding and flooring

Protective coatings

Motor casings

Steam hose, fire-retardant hose

Wicks, rope and twine

Conduits for electrical wiring, etc.

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 in the mining and milling of asbestos and in the manufacture of asbestos- containing products. Many more millions are earmarked for continued improvement today.

It is clear that dust control measures decades ago were not sufficient to prevent the occupational diseases that are now being reported among asbestos workers with 30 and 40 years work experience. Today, with more knowledge, more concern and greater technological know-how, there is reason to believe that the present asbestos worker will be safeguarded from the dangers his predecessors faced.

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.[1] 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 certain specified threshold limit values (TLV).

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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 will 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.

Whatever level is decided upon, it should be noted that there is no scientific evidence available which supports or establishes a specific safe threshold limit value for levels of asbestos dust either in the workplace or in the environment. Hygiene standards such as two or five fibers per cubic centimeter are only a general consensus as to what a safe level is in an occupational setting.

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. At the ~~present~~ time dust control is the only known method of preventing asbestos-related disease.

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); a system of waste disposal; protective clothing; portable dust respirators; equipment and plant cleaning devices; and innovative wetting and dampening methods which minimize dust generated during production.

Recent developments in dust control include a wide variety of exhaust hoods designed to fit various types of processing equipment and a sealed plastic bag in order to mix asbestos and cement without creating dust.

The asbestos industry currently is working on the development of 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 minimize exposure to employees.

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 (hygiene surveys) to insure that safe levels are maintained. Continual monitoring of dust concentrations should reveal dust levels which exceed the threshold limit value (TLV).

It is obvious that preventive maintenance must go hand in hand with innovative 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, or 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. 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 shift rotation.

D. Engineering controls and the implementation of safe work practices are the approved methods of correction.

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 in 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: 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); 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; 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

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diminish the usefulness of the product, ...ools that may produce or release asbestos fibers in excess of the limits must ... provided with loc... exhaust ventilation systems; external work surfaces must be kept free of excessive accumulations of asbestos fiber; and waste must be collected in sealed, impermeable bags or other such containers.

The Asbestos Industry's Commitment

The asbestos industry is committed to the protection of its employees at all levels of employment from health hazards related to asbestos dust.

This has been a growing commitment. As has been the case with health hazards in many other industries, it has been perhaps longer in coming than those equipped with the hindsight of present knowledge would allow.

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 has been increasingly safer working conditions in mines, factories and at on-job locations. This research continues unabated, with the asbestos industry working openly and enthusiastically with Federal, labor and independent medical researchers.

(2) Cooperation in Setting Work-Safety Standards. The asbestos industry has participated without reserve on government committees and panels, and through public hearings, to review and improve work and public emission standards on asbestos.

(3) Implementation of Controls. In the past decade, the industry spent some $100 million to implement work-safety controls in its mines and plants. At least another $100 million will be spent during the next

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three or four years to upgrade facilities and meet the standards set by OSHA with industry consultation. 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 continually striving for better communication between all concerned parties -- workers and their unions, governmental agencies, basic producers and end users. The ultimate goals are the reduction of dust levels, the physical protection of all workers from asbestos-caused diseases, and the protection of the general public from undue exposures to levels of asbestos dust that are potentially hazardous to health, and significantly in excess of those found generally in nature.

PART III

FOOTNOTES

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

PART IV

ASBESTOS AND THE GENERAL PUBLIC

FALLACIES & REALITIES

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 the following pages.

FALLACY

Asbestos is a major air pollutant which endangers public safety.

REALITY

Asbestos exists naturally in rock formations throughout the world and is constantly being eroded by wind and waves into the atmosphere. It thus is found in all places and -- as analysis of the polar caps has revealed -- in all periods of time.

There is no indication that levels of asbestos in air have been increased by use of asbestos for manufactured products. The only exceptions have been found in environments close to manufacturing and mining facilities, and in applications where simple controls are not implemented -- such as unrestricted spraying in construction. These emissions are currently under control, in accordance with federal and international standards that are designed to help keep asbestos in ambient air everywhere at levels that are not injurious to health.

FALLACY

The atmosphere is being contaminated by asbestos sprays that are used to fireproof the superstructure of buildings under construction.

REALITY

Use of asbestos-containing, spray-on fireproofing compounds in high-rise building construction has been banned in a number of major cities -- because it is considered to be an occupational hazard.

The asbestos industry agrees that the use of spray compounds should be prohibited, unless the asbestos fibers are solidly locked into the spray.. Where spraying is still practiced, asphalt and asbestos spray compounds are now used. These compounds contain no more than five percent asbestos fiber, which is locked in so as to eliminate any danger to the public and to those applying it. As further protection, wind breaks and drop cloths are used at job locations, preventing contamination of the immediately surrounding atmosphere.

FALLACY

Talcum powders, including baby powders, are contaminated by asbestos fibers which, in some cases, constitute as much as 25 percent of the product.

REALITY

Recent newspaper stories based on medical and government research have decried the presence of asbestos in talcum powder. As written, they could be construed as pointing up willful debasement of talcum powders by their marketers.

Asbestos does exist in all talcum powder, since it is naturally interwoven in talc stone. A 1972 study by the Office of Product Technology of the Food and Drug Administration showed that, of 40 talcum powder samples tested, 39 contained one percent asbestos or less, while the 40th had to be retested for traces.(1) This is far below the 15 to 25 percent figures used in newspaper reports.

Whatever the implications of these findings, the asbestos industry does not sell asbestos to talcum powder producers for inclusion in their product.

FALLACY

Clothing made of asbestos fiber generates large amounts of asbestos dust, a known cause of lung cancer.

REALITY

Recently, a clothing manufacturer imported cloth that contained 8 percent asbestos fiber and was used to make 200,000 women's overcoats. An emotional outcry resulted, but Food & Drug Administration tests showed there would be an insufficient amount of asbestos dust generated from the coats to pose a health hazard to the general public.

Such incidents are not typical of the type and nature of asbestos-containing garments manufactured and used in the United States. Asbestos fiber is not presently being used in any clothing intended for general use.

Exceptions are fire-protective garments containing cloth made of asbestos fibers which are "locked in" by chemical agents. They include barbecue mitts and aprons, and protective clothing used by firefighters, steelworkers and others in hazardous occupations. There has been a sharp increase recently in the demand for such fire-safe clothing in industrial applications due to more stringent safety regulations.

FALLACY

Brake linings used on trucks, buses and automobiles produce harmful emissions of asbestos dust which endanger public health.

REALITY

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. Upon application, brakes generate enormous heat, which changes the chemical nature of the dust emitted by the lining. Studies conducted in the United States and Great Britain have shown that these decomposition products are essentially harmless, containing only traces (one to three percent) of asbestos fiber.[2] Maintenance personnel working on brakes in garages should protect themselves from the concentrations of dust to which they are exposed. However, the public is not endangered by exposure to the low level of asbestos fiber released through brake application on public thoroughfares.

FALLACY

Many liquors, beers, wines, soft drinks and other liquids offered for sale to the public are contaminated by asbestos fibers introduced by the filtering process during production.

REALITY

Asbestos-cellulose filter pads have been used in the filtration of liquids since the beginning of this century. The filtration process does not contribute any more asbestos fiber to the human body than does the local water supply.

A comprehensive study carried out by the Canadian Department of Health and Welfare in 1971 did reveal a finite number of asbestos fibers in various beers, wines and soft drinks.[3] However, analysis of different sources of tap water in Canada revealed a similar asbestos fiber count, and an analysis of melted snow from Ottawa showed a fiber count eight times as high as for the different kinds of beer tested.[4]

Also, findings from a 1972 international meeting of 137 medical researchers, scientists and doctors reported "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."[5]

Despite this evidence, the asbestos filter industry is currently developing a low-cost after-filter system which can be added to existing asbestos filter systems to catch any fibers released by the asbestos material. This will make asbestos virtually non-existent in the final product.

PART IV

FOOTNOTES

1. Grace Lichtenstein, "Count Warning Is Labelled False," New York Times, June 17, 1972.

2. J. R. Lynch, "Brake Lining Decomposition Products," Journal of the Air Pollution Control Association, 1968.

3. H. M. Cunningham & R. Pontrefaact, Nature, July 30, 1971.

4. R. S. Scott, "Occupational Safety & Health Administration & The Filtration of Liquids," Filtration Engineering, Aug. 1972.

5. Report of the Advisory Committee on Asbestos Cancers to the Director of the International Agency for Research on Cancer; Lyon, France; October 5-6, 1972.

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PART V

THE ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA

In recent years, new findings relating prolonged inhalation of asbestos fibers to various occupational health hazards have created understandable public and governmental concern. This concern, nurtured by lack of information on the true nature and extent of these hazards has at times created an emotional and irrational attitude toward asbestos in all its forms and applications.

Members of most major producer and user companies, which have for some time implemented worker-protection procedures, individually attempted to provide facts to the press, government and the public about the nature and extent of asbestos health problems and efforts to correct them. However, the industry lacked a single, constantly available source able to provide authoritative information on asbestos in the United States and Canada.

This situation was changed with formation of the ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA. Patterned after the British Asbestos Information Committee, the AIA/NA organized in December 1970. Its objective are:

1. To provide industry-wide information on asbestos and health, and on industry efforts to eliminate existing hazards;
2. To cooperate with governmental agencies in setting industry-wide standards for worker protection;
3. To exchange information on methods and techniques of asbestos dust control;
4. To correct misleading and uninformed reportage on asbestos-health problems;
5. To publicize the unique benefits and importance of asbestos in protecting human life and property.

MORE...

The AIA/NA is governed by a Board of Directors comprising representatives of all member companies. Day-to-day activities are conducted by an Administrative Sub-Committee, which consults with AIA officers, legal counsel and medical consultants whenever necessary. The chief staff officer is the Executive Secretary, Matthew M. Swetonic, who functions from AIA/NA headquarters, 22 East 40th Street, New York, New York 10016.

Among its earliest steps was to nominate, on request by the Environmental Protection Agency, three environmental control experts from the asbestos industry to serve on a committee reviewing proposed Federal emission standards on asbestos. This consultation was followed by participation in public hearings held by the Occupational Safety and Health Administration (OSHA) of the U. S. Department of Labor in Washington, D. C., in March 1972. These hearings led to the promulgation of present Federal standards on asbestos work conditions.

The AIA/NA also has provided information to the press, medical researchers and government officials. It has participated in local, regional and international conferences on industrial health. It also maintains a close working relationship with other asbestos industry groups, including the Asbestos Textile Institute, Asbestos Cement Products Association, National Insulations Manufacturers Association, Friction Materials Standards Institute, the British Asbestos Information Committee and similar groups in France and the Benelux countries.

(See Appendix A for membership list.)

MORE...

PART V

APPENDIX A

AIA/NA MEMBERSHIP LIST

American Asbestos Textile Corp.

Atlas Asbestos Company

Cassiar Asbestos Corp., Ltd.

Cement Asbestos Products Company (CAPCO)

Certain-teed Products Corp.

Congoleum Industries, Inc.

The Flintkote Company

GAF Corp.

Jim Walter Corp.

Johns-Manville Corp.

Kentile Floors, Inc.

National Gypsum Company

Nicolet Industries, Inc.

North American Asbestos Corp.

H. K. Porter Company, Thermoid Div.

Raybestos-Manhattan, Inc.

Supradur Manufacturing Corp.

Union Carbide Corp.,
Mining and Metals Division

Uvalde Rock Asphalt Company

January, 1974

PART II

WHAT ASBESTOS IS: HOW AND WHERE IT IS USED

"Asbestos" is derived from an ancient Greek word meaning "inextinguishable". In reality, mineral asbestos is non-flammable at extremely high temperature, inhibits certain types of chemical reaction, and is extremely flexible and durable. All these qualities combine to make it uniquely suitable for a wide variety of demanding uses, particularly those that protect human life and property.

What Asbestos Is

Asbestos is the generic name given to a group of hydrated silicate minerals that can be separated into relatively soft, silky fibers. Certain grades can be carded, spun and woven. Others can be pressed or laid to form paper.

Chrysotile, crocidolite (or blue fiber), and amosite are the three asbestos varieties that are commercially significant today. Each differs from the others both physically and chemically (See Appendix A for chemical breakdowns).

Chrysotile is a flexible white magnesium silicate which can be attacked by acids. It differs from other asbestos minerals in that it has a positive rather than a negative electrical charge in water. Chrysotile now accounts for 95 percent of all asbestos used annually in the United States. This high percentage of use is due in part to results of medical studies that show amosite and crocidolite can produce more severe cases of asbestosis, which is a non-malignant lung disease afflicting long-time workers in the asbestos industry. Canada and the Soviet Union are the leading producers of chrysotile fiber, but small deposits are also found in the United States, Italy, South Africa, Rhodesia and China.

MORE ...

Crocidolite, characterized by a deep blue color, is a ferrous sodium silicate that is acid resistant but less flexible than chrysotile. The bulk of the world's supply comes from South Africa. Crocidolite was a strategic material during World War II, when it was used as the filtering element in gas mask cannisters. It can be spun or woven into materials and fabrics used in acid-resistant packings and flame-resistant clothing, etc., but today, it is mainly used for reinforcement of asbestos-cement pipe.

Amosite, which is mined commercially only in the Transvaal district of South Africa, is a brown ferrous magnesium silicate that occurs in the same type of iron-rich sedimentary rock as does crocidolite. It is brittle and not as acid resistant as crocidolite. Amosite is used principally in the manufacture of heat insulating materials.

Properties and Advantages

It is estimated that as many as 3,000 different products in daily use throughout the world contain some asbestos. While in certain products the percentage of asbestos may be small, the unique properties of asbestos usually are responsible for the functioning of the product in a demanding application.

The heat-resistant properties and fibrous structure of asbestos make it extremely desirable as a fireproofing and insulating material, where it already has saved countless lives and prevented billions of dollars of property damage. Typically, asbestos is used wherever fire and excessive heat are a threat to safety.

The wide range of applications for asbestos indicates the incredible demands which any substitute material would have to satisfy. At this time, , there is no one material which can outperform asbestos in this wide range of applications, especially where high temperatures are critical.

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Companies now are looking at fiber glass, plastics, ceramics, and various types of sheet metal as possible replacements for asbestos in low-temperature applications, in a few reinforcement applications and as a filtering medium.

However, in high-temperature applications, there generally is no adequate substitute material available since increased costs and weight often make their replacement for asbestos unattractive.

The general feeling in industry continues that asbestos fiber can be used safely and effectively, if efficient dust control methods and organized programs of preventive plant maintenance are implemented according to the standards set by OSHA, the EPA and the Department of Labor.

How Asbestos Is Used

Asbestos fibers can be classified into two types: spinning and non-spinning. Spinning fibers comprise the longer grades of chrysotile and crocidolite; non-spinning fibers include the shorter grades of chrysotile and crocidolite, plus the long and short grades of amosite. Use of a specific grade of fiber depends greatly upon application, and to a lesser extent on price and availability.

Longer-grade chrysotile fibers can be carded, spun and woven to make textile products such as rovings, yarn, tape and cloth. Asbestos fabrics are used to make fireproof clothing, brake linings, packings and gaskets, lagging cloth, and laps that provide electrical and thermal insulation. Spinning-grade asbestos fibers also are used in such non-spinning applications as compressed sheet packings and gaskets. They also are an ingredient of strong asbestos paper used in tape form to wrap electrical wires and cable.

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The shorter-grade (non-spinning) chrysotile fibers make up the great majority of chrysotile used in the U.S. These fibers go into numerous asbestos-cement products, including pipe, roofing shingles, flat and corrugated siding, millboard, cements and fillers, and insulation paper. Short chrysotile fibers are being used increasingly in friction materials, due to the substitution of molded materials for all-woven types used previously. The trend toward increased use of non-spinning grade asbestos fibers is, in part, dictated by medical evidence which has shown a relationship between long fibers and a greater incidence of asbestos-related diseases.

Approximately 85 percent of the asbestos fiber used in the United States (roughly 640,000 tons) is incorporated into finished products where the fiber is entrapped, or locked in, and not free to serve as a possible contaminant in the atmosphere. Asbestos can be locked into a product with a binder, saturant, coating or bonding agent so that normal handling, application and use will not generate asbestos dust. Asbestos-cement products are examples of "locked-in" materials; whereas insulating materials and spray-on fireproofing compounds are so-called "non-locked-in" materials.

Where Asbestos Is Used

The total annual world production of asbestos is approximately four million tons. Canadian production accounts for about 30 percent of the total; production in the United States accounts for about 3 percent.

Use of asbestos fiber in the United States increased after World War II. By 1950, use of asbestos reached a plateau, and during the last 20 years usage in the U.S. has remained fairly constant. Asbestos consumed in the United States in 1971 amounted to nearly 750,000 tons (See Appendix B for

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breakdown), and valued at $85 to $90 million. Gross sales of finished products containing asbestos amounted to nearly $1 billion (See Appendix C for sales breakdown). These were products manufactured in over 500 different facilities, large and small, that employ approximately 50,000 people with a total payroll of $500 million dollars.

PART II

APPENDIX A

There are six common varieties of asbestos -- actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite. Chrysotile, which accounts for more than 95 percent of the asbestos used in this country, is a member of the Serpentine group of minerals that consist essentially of a hydrous magnesium compound. The five other varieties -- none of which has the commercial significance that chrysotile has -- are members of the Amphibole group of minerals. They have like crystalline structures and generally consist of three metal ions -- magnesium, iron and silicon.

These six major types of asbestos minerals are distinguished chemically as follows:

Chrysotile	$3MgO\ 2SiO_2\ 2H_2O$
Actinolite	$2CaO\ 4MgO\ FeO\ 8SiO_2\ H_2O$
Amosite	$1.5MgO\ 5.5FeO\ 8SiO_2\ H_2O$
Anthophyllite	$7MgO\ 8SiO_2\ H_2O$
Crocidolite	$Na_2O\ Fe_2O_3\ 3FeO\ 8SiO_2\ H_2O$
Tremolite	$2CaO\ 5MgO\ 8SiO_2\ H_2O$

PART II

APPENDIX B

Following is a listing of product lines containing asbestos and the tonnage shipped for each in the United States in 1971:

Product Lines	Tonnage
Vinyl-Asbestos Floor Tile	145,000 tons
Asbestos-Cement Pipe	140,000
Felt and Paper	110,000
Friction Materials	80,000
Asbestos-Cement Building Materials	50,000
Packing Materials	25,000
Textiles	22,000
Asbestos Insulation	16,000
Spray-on Asbestos Materials	15,000
All Other Asbestos Products	147,000
TOTAL	750,000 tons

PART II

APPENDIX C

Following is a listing of product lines containing asbestos and a breakdown in sales in the United States for 1971:

Product Line	Sales in Millions of Dollars
Vinyl-Asbestos Floor Tile	$190.3
Asbestos-Cement Pipe	147.1
Brake Linings	135.3
Packings and Gaskets	99.5
Asbestos Paper	75.0
Asbestos-Cement Building Materials	70.4
Other Friction Materials	43.8
Asbestos Insulations	40.9
Textiles	38.2
Asbestos Felts	35.2
Asbestos Reinforced Plastics	12.1
All Other Asbestos Products	104.8
TOTAL	$992.6

PART II

APPENDIX D

Following is a listing of some of the products in which asbestos plays a crucial part:

Typical Products which contain Asbestos

Vinyl and asphalt floor tile

Brake linings and clutch facings

Roof shingles

Space vehicle heat shields

Gaskets for spark plugs

Fireproof clothing

Boiler jackets

Awnings, mail bags and theatre curtains

Asphalt paving

Pressure pipe, sewer pipe

Ventilators, air and fume ducts

Thermal, electrical and acoustical insulations

Molded plastics

Paints and varnishes

Motion picture screens

Oven linings, conveyor belts

Filters for dust and processed liquids

Roofing, siding and flooring

Protective coatings

Motor casings

Steam hose, fire-retardant hose

Wicks, rope and twine

Conduits for electrical wiring, etc.

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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 in the mining and milling of asbestos and in the manufacture of asbestos- containing products. Many more millions are earmarked for continued improvement today.

It is clear that dust control measures decades ago were not sufficient to prevent the occupational diseases that are now being reported among asbestos workers with 30 and 40 years work experience. Today, with more knowledge, more concern and greater technological know-how, there is reason to believe that the present asbestos worker will be safeguarded from the dangers his predecessors faced.

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.[1] 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 certain specified threshold limit values (TLV).

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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 will 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.

Whatever level is decided upon, it should be noted that there is no scientific evidence available which supports or establishes a specific safe threshold limit value for levels of asbestos dust either in the workplace or in the environment. Hygiene standards such as two or five fibers per cubic centimeter are only a general consensus as to what a safe level is in an occupational setting.

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. At the present time dust control is the only known method of preventing asbestos-related disease.

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); a system of waste disposal; protective clothing; portable dust respirators; equipment and plant cleaning devices; and innovative wetting and dampening methods which minimize dust generated during production.

Recent developments in dust control include a wide variety of exhaust hoods designed to fit various types of processing equipment and a sealed plastic bag in order to mix asbestos and cement without creating dust.

The asbestos industry currently is working on the development of 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 minimize exposure to employees.

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 (hygiene surveys) to insure that safe levels are maintained. Continual monitoring of dust concentrations should reveal dust levels which exceed the threshold limit value (TLV).

It is obvious that preventive maintenance must go hand in hand with innovative 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, or 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. 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 shift rotation.

D. Engineering controls and the implementation of safe work practices are the approved methods of correction.

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 in 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: 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); 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; 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

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diminish the usefulness of the product, [illegible]ools that may produce or release asbestos fibers in excess of the limits must [illegible]provided with local exhaust ventilation systems; external work surfaces must be kept free of excessive accumulations of asbestos fiber; and waste must be collected in sealed, impermeable bags or other such containers.

The Asbestos Industry's Commitment

The asbestos industry is committed to the protection of its employees at all levels of employment from health hazards related to asbestos dust.

This has been a growing commitment. As has been the case with health hazards in many other industries, it has been perhaps longer in coming than those equipped with the hindsight of present knowledge would allow.

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 has been increasingly safer working conditions in mines, factories and at on-job locations. This research continues unabated, with the asbestos industry working openly and enthusiastically with Federal, labor and independent medical researchers.

(2) Cooperation in Setting Work-Safety Standards. The asbestos industry has participated without reserve on government committees and panels, and through public hearings, to review and improve work and public emission standards on asbestos.

(3) Implementation of Controls. In the past decade, the industry spent some $100 million to implement work-safety controls in its mines and plants. At least another $100 million will be spent during the next

MORE...

three or four years to upgrade facilities and meet the standards set by OSHA with industry consultation. 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 continually striving for better communication between all concerned parties -- workers and their unions, governmental agencies, basic producers and end users. The ultimate goals are the reduction of dust levels, the physical protection of all workers from asbestos-caused diseases, and the protection of the general public from undue exposures to levels of asbestos dust that are potentially hazardous to health, and significantly in excess of those found generally in nature.

PART III

FOOTNOTES

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

PART IV

ASBESTOS AND THE GENERAL PUBLIC

FALLACIES & REALITIES

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 the following pages.

FALLACY

Asbestos is a major air pollutant which endangers public safety.

REALITY

Asbestos exists naturally in rock formations throughout the world and is constantly being eroded by wind and waves into the atmosphere. It thus is found in all places and -- as analysis of the polar caps has revealed -- in all periods of time.

There is no indication that levels of asbestos in air have been increased by use of asbestos for manufactured products. The only exceptions have been found in environments close to manufacturing and mining facilities, and in applications where simple controls are not implemented -- such as unrestricted spraying in construction. These emissions are currently under control, in accordance with federal and international standards that are designed to help keep asbestos in ambient air everywhere at levels that are not injurious to health.

FALLACY

The atmosphere is being contaminated by asbestos sprays that are used to fireproof the superstructure of buildings under construction.

REALITY

Use of asbestos-containing, spray-on fireproofing compounds in high-rise building construction has been banned in a number of major cities -- because it is considered to be an occupational hazard.

The asbestos industry agrees that the use of spray compounds should be prohibited, unless the asbestos fibers are solidly locked into the spray.. Where spraying is still practiced, asphalt and asbestos spray compounds are now used. These compounds contain no more than five percent asbestos fiber, which is locked in so as to eliminate any danger to the public and to those applying it. As further protection, wind breaks and drop cloths are used at job locations, preventing contamination of the immediately surrounding atmosphere.

FALLACY

Talcum powders, including baby powders, are contaminated by asbestos fibers which, in some cases, constitute as much as 25 percent of the product.

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Recent newspaper stories based on medical and government research have decried the presence of asbestos in talcum powder. As written, they could be construed as pointing up willful debasement of talcum powders by their marketers.

Asbestos does exist in all talcum powder, since it is naturally interwoven in talc stone. A 1972 study by the Office of Product Technology of the Food and Drug Administration showed that, of 40 talcum powder samples tested, 39 contained one percent asbestos or less, while the 40th had to be retested for traces.(1) This is far below the 15 to 25 percent figures used in newspaper reports.

Whatever the implications of these findings, the asbestos industry does not sell asbestos to talcum powder producers for inclusion in their product.

FALLACY

Clothing made of asbestos fiber generates large amounts of asbestos dust, a known cause of lung cancer.

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Recently, a clothing manufacturer imported cloth that contained 8 percent asbestos fiber and was used to make 200,000 women's overcoats. An emotional outcry resulted, but Food & Drug Administration tests showed there would be an insufficient amount of asbestos dust generated from the coats to pose a health hazard to the general public.

Such incidents are not typical of the type and nature of asbestos-containing garments manufactured and used in the United States. Asbestos fiber is not presently being used in any clothing intended for general use.

Exceptions are fire-protective garments containing cloth made of asbestos fibers which are "locked in" by chemical agents. They include barbecue mitts and aprons, and protective clothing used by firefighters, steelworkers and others in hazardous occupations. There has been a sharp increase recently in the demand for such fire-safe clothing in industrial applications due to more stringent safety regulations.

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Brake linings used on trucks, buses and automobiles produce harmful emissions of asbestos dust which endanger public health.

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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. Upon application, brakes generate enormous heat, which changes the chemical nature of the dust emitted by the lining. Studies conducted in the United States and Great Britain have shown that these decomposition products are essentially harmless, containing only traces (one to three percent) of asbestos fiber.[2] Maintenance personnel working on brakes in garages should protect themselves from the concentrations of dust to which they are exposed. However, the public is not endangered by exposure to the low level of asbestos fiber released through brake application on public thoroughfares.

FALLACY

Many liquors, beers, wines, soft drinks and other liquids offered for sale to the public are contaminated by asbestos fibers introduced by the filtering process during production.

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Asbestos-cellulose filter pads have been used in the filtration of liquids since the beginning of this century. The filtration process does not contribute any more asbestos fiber to the human body than does the local water supply.

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FOOTNOTES

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3. H. M. Cunningham & R. Pontrefaact, Nature, July 30, 1971.

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PART V

THE ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA

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This situation was changed with formation of the ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA. Patterned after the British Asbestos Information Committee, the AIA/NA organized in December 1970. Its objective are:

1. To provide industry-wide information on asbestos and health, and on industry efforts to eliminate existing hazards;
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MORE...

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(See Appendix A for membership list.)

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PART V

APPENDIX A

AIA/NA MEMBERSHIP LIST

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Cement Asbestos Products Company (CAPCO)

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Nicolet Industries, Inc.

North American Asbestos Corp.

H. K. Porter Company, Thermoid Div.

Raybestos-Manhattan, Inc.

Supradur Manufacturing Corp.

Union Carbide Corp.,
Mining and Metals Division

Uvalde Rock Asphalt Company

January, 1974

PART II

WHAT ASBESTOS IS: HOW AND WHERE IT IS USED

"Asbestos" is derived from an ancient Greek word meaning "inextinguishable". In reality, mineral asbestos is non-flammable at extremely high temperature, inhibits certain types of chemical reaction, and is extremely flexible and durable. All these qualities combine to make it uniquely suitable for a wide variety of demanding uses, particularly those that protect human life and property.

What Asbestos Is

Asbestos is the generic name given to a group of hydrated silicate minerals that can be separated into relatively soft, silky fibers. Certain grades can be carded, spun and woven. Others can be pressed or laid to form paper.

Chrysotile, crocidolite (or blue fiber), and amosite are the three asbestos varieties that are commercially significant today. Each differs from the others both physically and chemically (See Appendix A for chemical breakdowns).

Chrysotile is a flexible white magnesium silicate which can be attacked by acids. It differs from other asbestos minerals in that it has a positive rather than a negative electrical charge in water. Chrysotile now accounts for 95 percent of all asbestos used annually in the United States. This high percentage of use is due in part to results of medical studies that show amosite and crocidolite can produce more severe cases of asbestosis, which is a non-malignant lung disease afflicting long-time workers in the asbestos industry. Canada and the Soviet Union are the leading producers of chrysotile fiber, but small deposits are also found in the United States, Italy, South Africa, Rhodesia and China.

MORE ...

Crocidolite, characterized by a deep blue color, is a ferrous sodium silicate that is acid resistant but less flexible than chrysotile. The bulk of the world's supply comes from South Africa. Crocidolite was a strategic material during World War II, when it was used as the filtering element in gas mask cannisters. It can be spun or woven into materials and fabrics used in acid-resistant packings and flame-resistant clothing, etc., but today, it is mainly used for reinforcement of asbestos-cement pipe.

Amosite, which is mined commercially only in the Transvaal district of South Africa, is a brown ferrous magnesium silicate that occurs in the same type of iron-rich sedimentary rock as does crocidolite. It is brittle and not as acid resistant as crocidolite. Amosite is used principally in the manufacture of heat insulating materials.

Properties and Advantages

It is estimated that as many as 3,000 different products in daily use throughout the world contain some asbestos. While in certain products the percentage of asbestos may be small, the unique properties of asbestos usually are responsible for the functioning of the product in a demanding application.

The heat-resistant properties and fibrous structure of asbestos make it extremely desirable as a fireproofing and insulating material, where it already has saved countless lives and prevented billions of dollars of property damage. Typically, asbestos is used wherever fire and excessive heat are a threat to safety.

The wide range of applications for asbestos indicates the incredible demands which any substitute material would have to satisfy. At this time, , there is no one material which can outperform asbestos in this wide range of applications, especially where high temperatures are critical.

MORE ...

Companies now are looking at fiber glass, plastics, ceramics, and various types of sheet metal as possible replacements for asbestos in low-temperature applications, in a few reinforcement applications and as a filtering medium.

However, in high-temperature applications, there generally is no adequate substitute material available since increased costs and weight often make their replacement for asbestos unattractive.

The general feeling in industry continues that asbestos fiber can be used safely and effectively, if efficient dust control methods and organized programs of preventive plant maintenance are implemented according to the standards set by OSHA, the EPA and the Department of Labor.

How Asbestos Is Used

Asbestos fibers can be classified into two types: spinning and non-spinning. Spinning fibers comprise the longer grades of chrysotile and crocidolite; non-spinning fibers include the shorter grades of chrysotile and crocidolite, plus the long and short grades of amosite. Use of a specific grade of fiber depends greatly upon application, and to a lesser extent on price and availability.

Longer-grade chrysotile fibers can be carded, spun and woven to make textile products such as rovings, yarn, tape and cloth. Asbestos fabrics are used to make fireproof clothing, brake linings, packings and gaskets, lagging cloth, and laps that provide electrical and thermal insulation. Spinning-grade asbestos fibers also are used in such non-spinning applications as compressed sheet packings and gaskets. They also are an ingredient of strong asbestos paper used in tape form to wrap electrical wires and cable.

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The shorter-grade (non-spinning) chrysotile fibers make up the great majority of chrysotile used in the U.S. These fibers go into numerous asbestos-cement products, including pipe, roofing shingles, flat and corrugated siding, millboard, cements and fillers, and insulation paper. Short chrysotile fibers are being used increasingly in friction materials, due to the substitution of molded materials for all-woven types used previously. The trend toward increased use of non-spinning grade asbestos fibers is, in part, dictated by medical evidence which has shown a relationship between long fibers and a greater incidence of asbestos-related diseases.

Approximately 85 percent of the asbestos fiber used in the United States (roughly 640,000 tons) is incorporated into finished products - where the fiber is entrapped, or locked in, and not free to serve as a possible contaminant in the atmosphere. Asbestos can be locked into a product with a binder, saturant, coating or bonding agent so that normal handling, application and use will not generate asbestos dust. Asbestos-cement products are examples of "locked-in" materials; whereas insulating materials and spray-on fireproofing compounds are so-called "non-locked-in" materials.

Where Asbestos Is Used

The total annual world production of asbestos is approximately four million tons. Canadian production accounts for about 30 percent of the total; production in the United States accounts for about 3 percent.

Use of asbestos fiber in the United States increased after World War II. By 1950, use of asbestos reached a plateau, and during the last 20 years usage in the U.S. has remained fairly constant. Asbestos consumed in the United States in 1971 amounted to nearly 750,000 tons (See Appendix B for

MORE ...

breakdown), and valued at $85 to $90 million. Gross sales of finished products containing asbestos amounted to nearly $1 billion (See Appendix C for sales breakdown). These were products manufactured in over 500 different facilities, large and small, that employ approximately 50,000 people with a total payroll of $500 million dollars.

PART II

APPENDIX A

There are six common varieties of asbestos -- actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite. Chrysotile, which accounts for more than 95 percent of the asbestos used in this country, is a member of the Serpentine group of minerals that consist essentially of a hydrous magnesium compound. The five other varieties -- none of which has the commercial significance that chrysotile has -- are members of the Amphibole group of minerals. They have like crystalline structures and generally consist of three metal ions -- magnesium, iron and silicon.

These six major types of asbestos minerals are distinguished chemically as follows:

Chrysotile	$3MgO\ 2SiO_2\ 2H_2O$
Actinolite	$2CaO\ 4MgO\ FeO\ 8SiO_2\ H_2O$
Amosite	$1.5MgO\ 5.5FeO\ 8SiO_2\ H_2O$
Anthophyllite	$7MgO\ 8SiO_2\ H_2O$
Crocidolite	$Na_2O\ Fe_2O_3\ 3FeO\ 8SiO_2\ H_2O$
Tremolite	$2CaO\ 5MgO\ 8SiO_2\ H_2O$

January, 1973

PART II

APPENDIX B

Following is a listing of product lines containing asbestos and the tonnage shipped for each in the United States in 1971:

Product Lines	Tonnage
Vinyl-Asbestos Floor Tile	145,000 tons
Asbestos-Cement Pipe	140,000
Felt and Paper	110,000
Friction Materials	80,000
Asbestos-Cement Building Materials	50,000
Packing Materials	25,000
Textiles	22,000
Asbestos Insulation	16,000
Spray-on Asbestos Materials	15,000
All Other Asbestos Products	147,000
TOTAL	750,000 tons

PART II

APPENDIX C

Following is a listing of product lines containing asbestos and a breakdown in sales in the United States for 1971:

Product Line	Sales in Millions of Dollars
Vinyl-Asbestos Floor Tile	$190.3
Asbestos-Cement Pipe	147.1
Brake Linings	135.3
Packings and Gaskets	99.5
Asbestos Paper	75.0
Asbestos-Cement Building Materials	70.4
Other Friction Materials	43.8
Asbestos Insulations	40.9
Textiles	38.2
Asbestos Felts	35.2
Asbestos Reinforced Plastics	12.1
All Other Asbestos Products	104.8
TOTAL	$992.6

January, 1973

PART II

APPENDIX D

Following is a listing of some of the products in which asbestos plays a crucial part:

Typical Products which contain Asbestos

Vinyl and asphalt floor tile

Brake linings and clutch facings

Roof shingles

Space vehicle heat shields

Gaskets for spark plugs

Fireproof clothing

Boiler jackets

Awnings, mail bags and theatre curtains

Asphalt paving

Pressure pipe, sewer pipe

Ventilators, air and fume ducts

Thermal, electrical and acoustical insulations

Molded plastics

Paints and varnishes

Motion picture screens

Oven linings, conveyor belts

Filters for dust and processed liquids

Roofing, siding and flooring

Protective coatings

Motor casings

Steam hose, fire-retardant hose

Wicks, rope and twine

Conduits for electrical wiring, etc.

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 in the mining and milling of asbestos and in the manufacture of asbestos- containing products. Many more millions are earmarked for continued improvement today.

It is clear that dust control measures decades ago were not sufficient to prevent the occupational diseases that are now being reported among asbestos workers with 30 and 40 years work experience. Today, with more knowledge, more concern and greater technological know-how, there is reason to believe that the present asbestos worker will be safeguarded from the dangers his predecessors faced.

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.[1] 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 certain specified threshold limit values (TLV).

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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 will 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.

Whatever level is decided upon, it should be noted that there is no scientific evidence available which supports or establishes a specific safe threshold limit value for levels of asbestos dust either in the workplace or in the environment. Hygiene standards such as two or five fibers per cubic centimeter are only a general consensus as to what a safe level is in an occupational setting.

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. At the present time dust control is the only known method of preventing asbestos-related disease.

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); a system of waste disposal; protective clothing; portable dust respirators; equipment and plant cleaning devices; and innovative wetting and dampening methods which minimize dust generated during production.

Recent developments in dust control include a wide variety of exhaust hoods designed to fit various types of processing equipment and a sealed plastic bag in order to mix asbestos and cement without creating dust.

The asbestos industry currently is working on the development of 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 minimize exposure to employees.

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 (hygiene surveys) to insure that safe levels are maintained. Continual monitoring of dust concentrations should reveal dust levels which exceed the threshold limit value (TLV).

It is obvious that preventive maintenance must go hand in hand with innovative 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, or 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. 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 shift rotation.

D. Engineering controls and the implementation of safe work practices are the approved methods of correction.

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 in 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: 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); 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; 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

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diminish the usefulness of the product; hand tools that may produce or release asbestos fibers in excess of the limits must be provided with local exhaust ventilation systems; external work surfaces must be kept free of excessive accumulations of asbestos fiber; and waste must be collected in sealed, impermeable bags or other such containers.

The Asbestos Industry's Commitment

The asbestos industry is committed to the protection of its employees at all levels of employment from health hazards related to asbestos dust.

This has been a growing commitment. As has been the case with health hazards in many other industries, it has been perhaps longer in coming than those equipped with the hindsight of present knowledge would allow.

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 has been increasingly safer working conditions in mines, factories and at on-job locations. This research continues unabated, with the asbestos industry working openly and enthusiastically with Federal, labor and independent medical researchers.

(2) Cooperation in Setting Work-Safety Standards. The asbestos industry has participated without reserve on government committees and panels, and through public hearings, to review and improve work and public emission standards on asbestos.

(3) Implementation of Controls. In the past decade, the industry spent some $100 million to implement work-safety controls in its mines and plants. At least another $100 million will be spent during the next

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three or four years to upgrade facilities and meet the standards set by OSHA with industry consultation. 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 continually striving for better communication between all concerned parties -- workers and their unions, governmental agencies, basic producers and end users. The ultimate goals are the reduction of dust levels, the physical protection of all workers from asbestos-caused diseases, and the protection of the general public from undue exposures to levels of asbestos dust that are potentially hazardous to health, and significantly in excess of those found generally in nature.

PART III

FOOTNOTES

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

January, 1973

PART IV

ASBESTOS AND THE GENERAL PUBLIC

FALLACIES & REALITIES

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 the following pages.

FALLACY

Asbestos is a major air pollutant which endangers public safety.

REALITY

Asbestos exists naturally in rock formations throughout the world and is constantly being eroded by wind and waves into the atmosphere. It thus is found in all places and -- as analysis of the polar caps has revealed -- in all periods of time.

There is no indication that levels of asbestos in air have been increased by use of asbestos for manufactured products. The only exceptions have been found in environments close to manufacturing and mining facilities, and in applications where simple controls are not implemented -- such as unrestricted spraying in construction. These emissions are currently under control, in accordance with federal and international standards that are designed to help keep asbestos in ambient air everywhere at levels that are not injurious to health.

FALLACY

The atmosphere is being contaminated by asbestos sprays that are used to fireproof the superstructure of buildings under construction.

REALITY

Use of asbestos-containing, spray-on fireproofing compounds in high-rise building construction has been banned in a number of major cities -- because it is considered to be an occupational hazard.

The asbestos industry agrees that the use of spray compounds should be prohibited, unless the asbestos fibers are solidly locked into the spray. Where spraying is still practiced, asphalt and asbestos spray compounds are now used. These compounds contain no more than five percent asbestos fiber, which is locked in so as to eliminate any danger to the public and to those applying it. As further protection, wind breaks and drop cloths are used at job locations, preventing contamination of the immediately surrounding atmosphere.

FALLACY

Talcum powders, including baby powders, are contaminated by asbestos fibers which, in some cases, constitute as much as 25 percent of the product.

REALITY

Recent newspaper stories based on medical and government research have decried the presence of asbestos in talcum powder. As written, they could be construed as pointing up willful debasement of talcum powders by their marketers.

Asbestos does exist in all talcum powder, since it is naturally interwoven in talc stone. A 1972 study by the Office of Product Technology of the Food and Drug Administration showed that, of 40 talcum powder samples tested, 39 contained one percent asbestos or less, while the 40th had to be retested for traces.[1] This is far below the 15 to 25 percent figures used in newspaper reports.

Whatever the implications of these findings, the asbestos industry does not sell asbestos to talcum powder producers for inclusion in their product.

FALLACY

Clothing made of asbestos fiber generates large amounts of asbestos dust, a known cause of lung cancer.

REALITY

Recently, a clothing manufacturer imported cloth that contained 8 percent asbestos fiber and was used to make 200,000 women's overcoats. An emotional outcry resulted, but Food & Drug Administration tests showed there would be an insufficient amount of asbestos dust generated from the coats to pose a health hazard to the general public.

Such incidents are not typical of the type and nature of asbestos-containing garments manufactured and used in the United States. Asbestos fiber is not presently being used in any clothing intended for general use.

Exceptions are fire-protective garments containing cloth made of asbestos fibers which are "locked in" by chemical agents. They include barbecue mitts and aprons, and protective clothing used by firefighters, steelworkers and others in hazardous occupations. There has been a sharp increase recently in the demand for such fire-safe clothing in industrial applications due to more stringent safety regulations.

FALLACY

Brake linings used on trucks, buses and automobiles produce harmful emissions of asbestos dust which endanger public health.

REALITY

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. Upon application, brakes generate enormous heat, which changes the chemical nature of the dust emitted by the lining. Studies conducted in the United States and Great Britain have shown that these decomposition products are essentially harmless, containing only traces (one to three percent) of asbestos fiber.[2] Maintenance personnel working on brakes in garages should protect themselves from the concentrations of dust to which they are exposed. However, the public is not endangered by exposure to the low level of asbestos fiber released through brake application on public thoroughfares.

FALLACY

Many liquors, beers, wines, soft drinks and other liquids offered for sale to the public are contaminated by asbestos fibers introduced by the filtering process during production.

REALITY

Asbestos-cellulose filter pads have been used in the filtration of liquids since the beginning of this century. The filtration process does not contribute any more asbestos fiber to the human body than does the local water supply.

A comprehensive study carried out by the Canadian Department of Health and Welfare in 1971 did reveal a finite number of asbestos fibers in various beers, wines and soft drinks.[3] However, analysis of different sources of tap water in Canada revealed a similar asbestos fiber count, and an analysis of melted snow from Ottawa showed a fiber count eight times as high as for the different kinds of beer tested.[4]

Also, findings from a 1972 international meeting of 137 medical researchers, scientists and doctors reported "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."[5]

Despite this evidence, the asbestos filter industry is currently developing a low-cost after-filter system which can be added to existing asbestos filter systems to catch any fibers released by the asbestos material. This will make asbestos virtually non-existent in the final product.

PART IV

FOOTNOTES

1. Grace Lichtenstein, "Count Warning Is Labelled False," New York Times, June 17, 1972.

2. J. R. Lynch, "Brake Lining Decomposition Products," Journal of the Air Pollution Control Association, 1968.

3. H. M. Cunningham & R. Pontrefaact, Nature, July 30, 1971.

4. R. S. Scott, "Occupational Safety & Health Administration & The Filtration of Liquids," Filtration Engineering, Aug. 1972.

5. Report of the Advisory Committee on Asbestos Cancers to the Director of the International Agency for Research on Cancer; Lyon, France; October 5-6, 1972.

PART V

THE ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA

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The AIA/NA is governed by a Board of Directors comprising representatives of all member companies. Day-to-day activities are conducted by an Administrative Sub-Committee, which consults with AIA officers, legal counsel and medical consultants whenever necessary. The chief staff officer is the Executive Secretary, Matthew M. Swetonic, who functions from AIA/NA headquarters, 22 East 40th Street, New York, New York 10016.

Among its earliest steps was to nominate, on request by the Environmental Protection Agency, three environmental control experts from the asbestos industry to serve on a committee reviewing proposed Federal emission standards on asbestos. This consultation was followed by participation in public hearings held by the Occupational Safety and Health Administration (OSHA) of the U. S. Department of Labor in Washington, D. C., in March 1972. These hearings led to the promulgation of present Federal standards on asbestos work conditions.

The AIA/NA also has provided information to the press, medical researchers and government officials. It has participated in local, regional and international conferences on industrial health. It also maintains a close working relationship with other asbestos industry groups, including the Asbestos Textile Institute, Asbestos Cement Products Association, National Insulations Manufacturers Association, Friction Materials Standards Institute, the British Asbestos Information Committee and similar groups in France and the Benelux countries.

(See Appendix A for membership list.)

MORE...

PART V

APPENDIX A

AIA/NA MEMBERSHIP LIST

American Asbestos Textile Corp.

Atlas Asbestos Company

Cassiar Asbestos Corp., Ltd.

Cement Asbestos Products Company (CAPCO)

Certain-teed Products Corp.

Congoleum Industries, Inc.

The Flintkote Company

GAF Corp.

Jim Walter Corp.

Johns-Manville Corp.

Kentile Floors, Inc.

National Gypsum Company

Nicolet Industries, Inc.

North American Asbestos Corp.

H. K. Porter Company, Thermoid Div.

Raybestos-Manhattan, Inc.

Supradur Manufacturing Corp.

Union Carbide Corp.,
Mining and Metals Division

Uvalde Rock Asphalt Company