EXHIBIT H

A ubiquitous, fibrous mineral, asbestos is mined, milled and used in a variety of products. Its major use is as a reinforcing agent in asbestos-cement products such as pipe.


Published by AsbestosClaims.Law
**asbestosclaims.law/library/24513/1**

## CHARACTERISTICS

Asbestos is the generic name for a variety of fibrous minerals that occur naturally throughout the world. A hydrous magnesium silicate, asbestos fiber can be separated from its host rock by milling, yielding very fine, silky strands of great tensile strength.

Known varieties of asbestos are divided into two main classes based on their crystalline structure: serpentine and amphiboles. The lone member of the serpentines is chrysotile asbestos, which accounts for about 95% of world production. Amphibole varieties are *crocidolite, amosite, anthophyllite, tremolite and actinolite.* Most of the western world's chrysotile asbestos is found in Canada.

Asbestos is seldom used alone, but, combined with other materials, it can provide protection from fire; insulation from heat, cold and noise; absorption of heat from friction; and reinforcement for cement, plastics and other materials. It is used in some 3,000 products including asbestos-cement pipe, sheets and siding, friction materials, floor tile and sheet flooring, textiles, sealants, adhesives, caulks and sound deadeners, rockets and space vehicles, and steam, gas and rocket engines.

## PRODUCTION

Since asbestos has a chemical composition identical to its host rock, fiber extraction and recovery is accomplished by successive stages of crushing, screening and aspirating. Asbestos ore is mined by open pit or underground methods, transported by trucks to primary rock crushers, and then to secondary crushers which further reduce the rock particle size. The fines fraction of the ore, which has an 18% moisture content, is routed to dryers. The coarse fraction goes directly to dry rock storage to be combined later with the dried fines. The purpose of dry rock storage is to provide a uniform ore feed to the mill.

More than 100 different grades of asbestos can be produced to exacting specifications of length, strength, openness, filterability, bulk and absorption. Milled asbestos is bagged, unitized and shipped from the mill by rail and truck to customers worldwide.

## HEALTH CONCERNS

Medical research has associated occupational exposure to asbestos fiber with increased risks of four human diseases: *asbestosis, bronchogenic (lung) cancer, mesothelioma and gastrointestinal cancer.*

Analysis of the bulk of medical research appears to indicate that the health risks are related only to inhalation of asbestos fiber. Except for some isolated cases, asbestos-related health risks appear to be confined to occupational and occupationally-related environments.



*Johns-Manville Health, Safety & Environment Department, Asbestos Information Pamphlet HSE-26L (1975)*
Published by AsbestosClaims.Law
ACL Doc 24513 · Page 2 of 8
asbestosclaims.law/library/24513/2

ASBESTOSIS is a non-cancerous, fibrotic lung condition caused by excessive inhalation of asbestos fiber that can be detected by X rays and pulmonary function tests in early stages of development. Common physical symptoms are abnormal shortness of breath upon physical exertion; crackling chest noises (rales) detectable with a stethoscope; and in some advanced cases, an enlargement of the fingertips. Asbestosis is in the category of lung diseases called pneumoconioses.

BRONCHOGENIC CANCER is a form of cancer that also is detectable by X rays in early stages of development. With almost no exceptions, bronchogenic cancer has been found only in asbestos workers who smoke cigarettes regularly. It appears both factors — asbestos exposure and cigarette smoking — must be present for the cancer to develop. Asbestos-exposed persons who do not smoke have no greater chance of getting this disease than any other person who does not smoke.

MESOTHELIOMA is a rare and fatal cancer of the lining of the pleural, (chest) or peritoneal (abdominal) cavities. Its exact association with asbestos fiber inhalation remains a medical mystery, and research has indicated that not all cases of mesothelioma are caused by asbestos.

There has been some medical evidence to indicate a slightly increased rate of GASTROINTESTINAL (GI) cancer in people occupationally exposed to heavy concentrations of asbestos. There also is some question as to whether asbestos has a causal role in the development of gastrointestinal cancer.

## LATENT PERIODS

All the diseases discussed have relatively long latent periods, in that detectable signs of the disease may not appear for many years after the onset of exposure. For asbestosis, the latent period can range from 5 years to 20 years or more. For bronchogenic cancer, a 20-year latent period is common, and cases of mesothelioma associated with asbestos can take 30 years or more to develop.

Therefore, precautions always should be taken to prevent inhalation of asbestos fiber, regardless of whether any immediate symptoms or discomfort is experienced.

Long latent periods also account for the disease being seen today among long-time employees in the asbestos industry. These cases are not an indication of present-day conditions, but of conditions that existed decades ago when higher dust levels existed due to the general lack of knowledge on the part of the medical/scientific community, government, labor and industry. While it can be expected that additional cases of asbestos-related disease will be seen among workers whose exposures began many years ago, it is generally believed that modern dust control technology eventually will eliminate asbestos-related occupational health risks.



*Johns-Manville Health, Safety & Environment Department, Asbestos Information Pamphlet HSE-26L (1975)*
Published by AsbestosClaims.Law
ACL Doc 24513 · Page 3 of 8
asbestosclaims.law/library/24513/3

## CONTINUING RESEARCH

From the time it was first recognized that there were health problems associated with exposure to asbestos fiber, the asbestos industry has sought through medical and engineering research to eliminate or reduce the hazards.

In the late 1920's, the asbestos industry sponsored some of the first medical studies of asbestos-related disease ever undertaken in the United States. These studies provided information that became the basis for dust control programs throughout the industry. Millions of dollars in sophisticated equipment and techniques have been devoted to reducing or eliminating occupational exposure to asbestos in mining, milling and manufacturing operations.

Through the Institute for Occupational and Environmental Health (IOEH) in Montreal, and through selected universities and hospitals in cooperation with the National Institutes of Health and other government agencies, the asbestos industry is sponsoring or cooperating in major epidemiological and medical research programs. These programs are designed to identify and eliminate asbestos-related health risks for workers within the industry, as well as for fabricators and applicators using finished products containing asbestos.

## OSHA REGULATIONS

On June 7, 1972, the U.S. Occupational Safety and Health Administration (OSHA) set a permanent standard for occupational exposure to asbestos.[1] The major provisions of that standard are outlined in the following sections.*

### Exposure Limits

Effective June 7, 1972, occupational exposure to asbestos is limited to five fibers per cubic centimeter of air (5 f/cc) on an eight-hour time-weighted average. Maximum ceiling concentration is 10 fibers per cubic centimeter.

On July 1, 1976, the time-weighted average exposure will be two fibers per cubic centimeter with no change in ceiling concentration.

In all cases, these levels refer to all asbestos fibers greater than five micrometers in length that can be seen under a phase contrast light microscope at approximately 430X magnification.

These and similar exposure limits are referred to as Threshold Limit Values or TLV's, and "represent conditions under which it is believed nearly all workers may be repeatedly exposed, day after day, without adverse effect."

*Revisions to the current standard now are being considered by OSHA.




Published by AsbestosClaims.Law
asbestosclaims.law/library/24513/4

## Monitoring

To determine occupational exposures, a program of monitoring must be conducted. Both personal breathing zone and work area samples must be taken to verify compliance with the exposure limits.

Monitoring usually is done by the membrane filter method, incorporating a sampling device that draws air through a filter. The filter then is examined under a microscope. Fibers of a certain size are counted and expressed as fibers per cubic centimeter of air.

Similar monitoring equipment can be used for both personal and work area sampling, since the device is portable and can be worn by the employee. Monitoring programs must be conducted regularly wherever employees are potentially exposed to asbestos fiber.

## Methods of Compliance

Engineering controls such as isolation, enclosure, exhaust ventilation, and dust collection are the approved means of meeting exposure limits. Equipment that might produce or release asbestos fibers must be provided with local exhaust ventilation systems wherever possible.[2]

## Protective Equipment

In some operations, where it can be anticipated that exposure levels might rise above permissible limits, employees are required to wear respiratory protective equipment. Acceptable respirators are those approved by the U.S. Bureau of Mines or the National Institute for Occupational Safety and Health (NIOSH) for control of pneumoconiosis-producing dusts.

Respirators also may be required as extra protection in operations where there is a possibility of an accidental or emergency situation creating high dust levels, such as packing and unloading activities.[3]

No employee should be assigned to any job requiring a respirator if a physical examination shows he or she would not be able to function normally while wearing one.

## Medical Surveillance

Pre-employment and annual medical exams are required for all employees in operations that might expose them to airborne asbestos fiber. These medical exams are to be provided at company expense and records must be kept at least 20 years.

## Signs and Labels

Special warning signs and labels should be placed in areas and on containers where asbestos exposure levels may exceed permissible limits.



*Johns-Manville Health, Safety & Environment Department, Asbestos Information Pamphlet HSE-26L (1975)* Published by AsbestosClaims.Law
ACL Doc 24513 · Page 5 of 8 **asbestosclaims.law/library/24513/5**

## Special Protection

Protective clothing, change rooms and separate clothes lockers for work and street attire must be provided for employees wherever there is a possibility of exposure above established limits.

OSHA also has established rules governing housekeeping, waste disposal, recordkeeping, and employee access to monitoring and medical data.

## EMISSION STANDARDS

The Environmental Protection Agency standard governing emission of asbestos fibers into the atmosphere stipulates that there shall be "no visible emissions" from any asbestos-using operation. Fabric bag filters or high energy wet scrubbers must be used in all plants where there is a potential release of fiber into the outside atmosphere. The "no visible emissions" requirement also extends to waste disposal and sanitary landfill operations, and requires the application of a variety of dust suppressing procedures in order to achieve compliance.

## GENERAL PRECAUTIONS

AVOID CREATING DUST

Take every precaution to prevent generation of airborne asbestos fiber. Maintain ventilation and dust collection systems regularly. Wear respirators wherever there is a possibility of exposure above permitted limits.

HANDLE ASBESTOS WITH CARE

Make sure packages and containers of asbestos are not damaged or broken. Immediately repair, reseal, or place in closed receptacles any damaged asbestos containers or bags.

VACUUM OR WET FIRST

Clean any spillage of asbestos fiber immediately with vacuum equipment, or, after wetting, by sweeping. Never sweep dry asbestos. You will create airborne dust.

FOLLOW WORK PRACTICES

Follow established safety procedures at all times. Bag opening and other equipment designed to prevent inhalation of fiber by workers should be used correctly and never bypassed.

USE PROTECTIVE GEAR PROPERLY

Protective equipment such as respirators should be selected for proper fit. Respirator face masks must fit securely to be effective.

WASTE DISPOSAL

Dispose of asbestos waste in a way that will prevent airborne dust at all times, using sealed bags or other closed receptacles.



*Johns-Manville Health, Safety & Environment Department, Asbestos Information Pamphlet HSE-26L (1975)*
Published by AsbestosClaims.Law
ACL Doc 24513 · Page 6 of 8
**asbestosclaims.law/library/24513/6**

DON'T SMOKE

Medical studies have conclusively established that cigarette smoking greatly increases the risk of developing lung cancer in persons occupationally exposed to asbestos. People working with asbestos should be encouraged to stop smoking or never start.

## FAMILY PROTECTION

Take precautions to prevent asbestos being carried from the plant. Change rooms should be provided in each facility along with showers and lockers to limit the possibility of asbestos being carried into the home. Employees should wear head covering at work if hair cannot be satisfactorily cleaned before going home.

## FINISHED PRODUCTS

The installation, fabrication, handling or use of most finished asbestos-containing products will not produce hazardous dust levels. In more than 90% of the asbestos products produced in the U.S., the fibers are safely "locked" in by cement, plastic or other binders. Therefore, fibers are not easily released during normal handling and application. However, they can be released during drilling, sawing, grinding, or other machining and fabrication operations. In these cases, exhaust ventilation, water, or other means must be used to prevent dust generation.

Some asbestos products, such as unsaturated textiles and insulations, can release asbestos during handling or fabrication. Demolition and removal of some old asbestos insulations also can be potentially hazardous. Strict adherence to approved methods of dust suppression and control is mandatory in these cases.

## INGESTION STUDIES

While medical evidence clearly indicates a potential health hazard from occupational inhalation of asbestos fiber, there is no evidence of any public health risk from ingestion of the mineral. Numerous studies have been done on the use of asbestos-cement pipe for transmission of potable water and the use of asbestos filters for beverages and pharmaceuticals, and there has been no evidence of a human health hazard.[4] [5]



*Johns-Manville Health, Safety & Environment Department, Asbestos Information Pamphlet HSE-26L (1975)*
Published by AsbestosClaims.Law
ACL Doc 24513 · Page 7 of 8
asbestosclaims.law/library/24513/7

## PUBLIC HEALTH STUDIES

Medical studies have identified the presence of fibrous bodies in the lungs of people not occupationally exposed to asbestos. These tiny bodies, containing a core of some inhaled particle, are a result of the natural human protective system that coats foreign particles with a protein substance. Because the cores of these bodies do not necessarily contain asbestos and because the coating contains some identifiable iron, they usually are referred to as ferruginous (iron-containing) bodies.

These bodies have not been connected in a causative way with any disease, or with the cause of death, in the subjects studied.

Medical scientists studying the occupational health hazards of asbestos see no evidence that asbestos poses any risk to the general public. There is no evidence that asbestos is present in the ambient atmosphere in amounts of any significance to human health.

## Explanatory Notes

[1]Federal Register, Vol. 37, No. 110, June 7, 1972.

[2]American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2 — 1971.

[3]American National Standards Practices for Respiratory Protection, ANSI Z88.2 — 1969.

[4]Report of the Advisory Committee on Asbestos Cancers to the Director of the International Agency for Research on Cancer, 1972.

[5]"A Study of the Problem of Asbestos in Water," American Water Works Association Journal, September 1974.

**Johns-Manville**

**HEALTH, SAFETY & ENVIRONMENT DEPARTMENT**

**Greenwood Plaza • Denver, Colorado 80217**

HSE-26L-672

Litho in USA



Published by AsbestosClaims.Law

**asbestosclaims.law/library/24513/8**