

# ASBESTOS

What you need to know...

- **How has asbestos been used historically?**
- **What are the general characteristics of asbestos?**
- **What evidence is there of asbestos-related health risks?**
- **What diseases are associated with asbestos exposure?**
- **What requirements are there for notification, warning, education and removal?**

Enprotec / Hibbs & Todd, Inc. (eHT) is committed to developing awareness of the rules and regulations regarding asbestos-containing material, as well as the dangers associated with asbestos. eHT assists clients in managing asbestos-containing materials. This publication is meant to provide current information on asbestos and asbestos management, including abatement.

## HISTORY OF ASBESTOS

The word asbestos is derived from a Greek adjective meaning inextinguishable. The “miracle mineral” as it was referred to by the Greeks, was admired for its soft and pliant properties, as well as its ability to withstand heat. Asbestos was spun and woven into cloth in the same manner as cotton. Romans also recognized the properties of asbestos. From the time of the Greeks and Romans in the first century until its re-emergence in the eighteenth century, asbestos received little attention or use. It was not available in large amounts until extensive deposits were discovered in Canada in the late 1800’s. Following this discovery, asbestos emerged as an insulating component for boilers, pipes and other high temperature applications and as a reinforcement material for a variety of products.

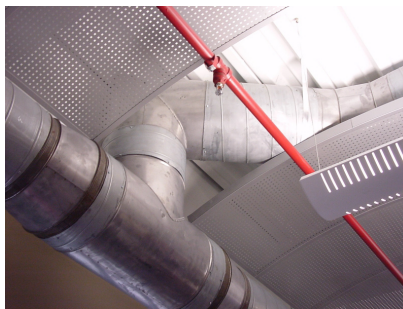
## USES OF ASBESTOS

Asbestos has been used in literally thousands of products. These are frequently referred to as asbestos-containing materials (ACM). Asbestos gained widespread use because it was plentiful, readily available and low in cost. Because of its unique properties — fire resistance, high tensile strength, poor heat and electrical conductivity and being generally impervious to chemical attacks — asbestos had a variety of uses in the construction trades.

One of the most common uses for asbestos was as a fireproofing material. It was sprayed on steel beams and columns and decking that were used in the construction of multi-storied buildings. This application prevented warping or collapsing in the event of fire. Asbestos comprised 5 to 95 percent of the fireproofing mixture and was used in conjunction with other materials. The materials may be exposed or concealed behind a suspended ceiling.

Asbestos was also added to a variety of building materials to enhance strength. It has been used in concrete and concrete-like products. Asbestos-containing cement products were used for siding and roofing shingles, wallboard, corrugated and flat sheets for roofing, cladding and partitions and for pipes. Asbestos was also added to asphalt, vinyl and other materials to make products like roofing felts, exterior siding, floor tile, joint compounds and adhesives.

Fibers in asbestos cement, asphalt and vinyl are usually firmly bound in the matrix and will be released only if drilling, cutting, or sanding mechanically damages the material.



As an insulator, asbestos was used for thermal insulation and condensation control. It was usually spray applied, trowel applied, or factory installed on or within equipment.

Asbestos was also used as a component of acoustical plaster. The material was applied by trowel or by spraying on ceilings and sometimes walls. Rarely was it painted as a noticeable loss of acoustical value occurred. Similarly, as a decorative product, asbestos was mixed with other materials and sprayed on ceilings and walls to produce a soft, textured appearance.

Asbestos can also be found in floor tile, tape, caulk, mastic, gaskets and plastic products.

## CHARACTERISTICS OF ASBESTOS

Asbestos is a naturally occurring mineral. It is distinguished from other minerals by the fact that its crystals form long, thin fibers.

Asbestos minerals are divided into two groups — serpentine and amphibole. The distinction between groups is based upon a mineral’s crystalline structure.

Chrysotile is the only asbestos mineral in the serpentine group. It was the most commonly used type of asbestos and accounts for approximately 95 percent of the asbestos found in buildings in the United States. Chrysotile is commonly known as “white asbestos.”

Five types of asbestos are found in the amphibole group. Amosite, the second most likely type to be found in buildings, is often referred to as “brown asbestos.”

Crocidolite, “blue asbestos,” was used in high temperature insulation applications.

The remaining three types of asbestos in the amphibole group are anthophyllite, tremolite and actinolite. Occasionally, they are found as contaminants in asbestos-containing material.

## EVIDENCE OF HEALTH RISKS

Most of the information on the health effects of exposure to asbestos has been derived from studies of workers exposed to asbestos in the course of their occupation. Asbestos fiber

concentrations for such workers are many times higher than those encountered by the general public, or by most workers in buildings with ACM. Because their exposure was much higher, asbestos workers will have a much higher incidence of asbestos-related diseases than people who live or work in buildings with ACM. However, people in buildings with ACM are still likely to experience higher risks than the public at large. Unfortunately, the available

data does not allow us to reliably estimate the actual risk.

Because asbestos fibers appear to be ubiquitous, virtually everyone is exposed to some extent. During autopsy, fibers have been detected in the lungs of most urban residents. Exposure may begin during childhood, leaving a long period for the manifestation of asbestos-related disease. Furthermore, asbestos may enhance the carcinogenic effects of other materials.

## DISEASES ASSOCIATED WITH ASBESTOS EXPOSURE

The Greeks and Romans observed the adverse health effects in the first century. They noted a breathing problem in slaves weaving asbestos cloth. Modern knowledge linking asbestos and a lung disease called “asbestosis” dates to 1900. Autopsy reports from 1938 to 1949 indicated that a large number of persons who died with asbestosis also had lung cancer. In the 1960’s the link between asbestos and a rare form of cancer called mesothelioma was established. These diseases are discussed below.

**Asbestosis** is a scarring (fibrosis) of the lung. The scarring impairs the elasticity of the lung tissue and hampers its ability to exchange gases. This leads to inadequate oxygen intake to the blood. The disease restricts breathing, leading to decreased lung volume, and it increases resistance in the airways. It is a slowly progressive disease with a latency period of 10 to 20 years. Asbestosis is irreversible and may progress even after exposure to asbestos has ceased. The earliest symptom of asbestosis is often coughing. Relatively high doses of exposure occur before asbestosis is observed. While there is no cure for asbestosis, anyone suffering with the disease should be removed from further exposure as more disabling fibrosis can be prevented by eliminating further inhalation of asbestos fibers.

**Lung cancer** is a malignant tumor of the bronchi covering. The tumor grows through surrounding tissue invading and often obstructing the air passages. The earliest symptom is often a persistent cough; a physical exam may attribute the symptoms to chronic bronchitis. Chest x-rays sometimes show shadows that indicate tumors and enlarged lymph nodes. The time between exposure to asbestos and the occurrence of lung cancer is typically 20 years. Although there are many causes of lung cancer, a clear increase in risk has been found among people who work with asbestos.

**Mesothelioma** is a cancer of the mesothelium, the lining of the chest or the lining of the abdominal wall. It is considered to be a marker disease for asbestos exposure. Early stages are associated with few symptoms. By the time it is diagnosed, it is almost always fatal. Effective therapy does not exist. Mesothelioma has an extended latency period of 20 to 40 years.

## REQUIREMENTS AND RECOMMENDATIONS

The Occupational Safety and Health Administration (OSHA) Worker Exposure Rules for Asbestos (1994) include requirements for notification, warning signs and labels and education programs on the part of any employer whose employees are exposed to asbestos fiber levels above the exposure standard.

The Environmental Protection Agency (EPA) recommends that building owners inform building occupants of the presence and location of asbestos-containing material and the need to avoid



disturbing them even if fiber levels are below the OSHA exposure limits. Accidental disturbance of ACM could easily raise airborne fiber levels to or above the OSHA exposure levels.

OSHA recommends that building occupants should be informed of any potential hazard in a building; that building occupants who are informed and instructed about ACM are less likely to disturb the material and cause fibers to be released; and that early and full disclosure may reduce legal liabilities and the likelihood of future litigation.

## HOW WE CAN HELP

According to the Texas Asbestos Health Protective Act Rules, prior to any renovation or dismantling within a public building or facility, including preparations for partial or complete demolition, a thorough asbestos inspection, by a licensed asbestos inspector, must be performed and the report must be produced upon request by the Texas Department of Health.



The presence of asbestos is a significant factor in a facility’s value and operation. eHT assists clients in managing, and if necessary, in the removal of asbestos-containing material in their facilities by providing the following services:

- **Building/facility surveys**
- **Condition assessments**
- **Bulk sample collection**
- **Preparation of operation and maintenance programs**
- **Abatement design and preparation of specifications and Corrective Action procedures and programs**
- **Abatement monitoring and administration**
- **Hazard awareness training and consulting**

For additional information on asbestos regulations, visit [www.dshs.state.tx.us/asbestos](http://www.dshs.state.tx.us/asbestos). Contact the eHT team of professionals if you would like more information on asbestos surveys, management, or abatement.



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