

Asbestos Awareness

Asbestos is a generic term for a group of naturally occurring silicate minerals that are mined primarily in South Africa, Canada and the former Soviet Union. Asbestos can appear in fibrous crystal form and when crushed, separates into flexible fibers.

Asbestos minerals have the following characteristics in common:

- Separate into smaller and smaller fiber bundles when disturbed or handled
- Resistant to heat, bacteria and chemicals
- Great tensile strength and stiffness
- Excellent electrical and thermal insulation
- Very good noise insulator
- Resistant to the effects of friction and wear

An important term used in describing the condition of asbestos is the word "friable." A material is considered friable if it can be reduced to powder by hand pressure when dry. This will become clearer when we review the health effects and routes of entry.

Potential Health Effects Related to Asbestos

While asbestos fibers may gain entry into the body through inhalation and ingestion, by far, the major route is inhalation. Asbestos fibers have no odor and those that you may inhale are invisible to the naked eye.

Your respiratory system includes the mouth, nose, wind pipe (trachea), bronchi and lungs. The lungs are located within the pleural cavity. Lying within the cavity and covering the lungs is a lining called the pleural mesothelium.

The lungs contain air sacks called alveoli. The alveoli are the sites where oxygen is absorbed into the blood and carbon dioxide is removed from the blood.

Your body's respiratory system has defense mechanisms that work to keep foreign particles from causing damage. Amazingly, estimates indicate that these mechanisms are 95 to 98 percent effective. Examples of some defense mechanisms and their functions are:

- The mouth and nose filter out very large particles.
- Coated bronchi filter out smaller particles.
- Cilia, which are hair-like protrusions on cells lining the airways (bronchial tree), move particles up to the back of the mouth where they are swallowed or expelled.
- The smallest particles that are not previously trapped may travel to the alveoli in the lower respiratory system. Here they may be attacked by large cells, known as macrophages, which try to digest them. Because asbestos is a mineral fiber, the macrophages are often not successful.

Most of the information about asbestos diseases comes from studying workers in the various asbestos industries. The bulk of the data comes from World War II shipbuilding activities and the asbestos industries in the United States and England. Exposure to very high levels of airborne asbestos typical of the asbestos workplace prior to 1972 has been linked with the following diseases:

Asbestosis is a chronic disease in which lungs become scarred (fibrosis) as a result of a biological reaction to the inhalation of asbestos fibers. Scarring causes thickening of the walls of the lungs and a reduction in the capacity for transfer of oxygen to the bloodstream. Victims usually die from heart failure, as the heart overworks in an attempt to deliver the required oxygen to the body. Asbestosis usually results after exposure to high concentrations of fibers over a long period of time. Symptoms usually occur 15 to 35 years after the first exposure.

Mesothelioma is a cancer of the covering of the lung or lining of the chest or abdominal cavities. It is the rarest form of the asbestos-related diseases. This disease is always rapidly fatal, usually within a year after diagnosis. There is a direct relationship between smoking and the risk of developing Mesothelioma. The latency period is usually 25 to 30 years for Mesothelioma.

Lung Cancer is now responsible for roughly one-half of the deaths that occur from past asbestos exposures. Lung cancer usually begins as a tumor in the lower lobes of the lungs. Generally, the earliest symptom is the development of a persistent cough or change in chronic cough. Later symptoms include loss of appetite, weight loss, pain and general weakness.

Other cancers have been noted in a very small number of individuals who are occupationally exposed to asbestos. These tumors are usually cancers of the gastrointestinal tract.

Smoking and Lung Cancer

The combination of asbestos exposure and smoking greatly increases the risk of developing lung cancer. Smoking in combination with asbestos exposure does not just double the risk, but multiplies it many times. Asbestos workers are approximately five times more likely to develop lung cancer than the general population. Smokers are ten times more likely to develop lung cancer than the general population. A person who works with asbestos and also smokes is likely to have a 90 times greater risk of contracting lung cancer.

Areas Where Asbestos May be Present

Although the use of asbestos in thermal, surfacing and fire proofing materials was banned in 1973, buildings constructed as late as 1976 have been found to contain asbestos building materials. Materials commonly found to contain asbestos at institutions include:

- Floor tiles (9" x 9" and 12" x 12")
- Ceiling tiles

- Thermal pipe insulation (water, steam and chilled water lines)
- Fireproofing
- Transite panels (siding and partitions)
- Tank insulation
- Acoustical ceiling spray
- Roofing felts and shingles
- High temperature gaskets and valve packings
- Textiles (auditorium curtains, laboratory aprons and gloves)

It is recommended that each institution conduct a building survey to determine the locations where asbestos-containing materials may be present.

Activities Involving Potential Exposure

OSHA regulations are geared to be effective when an employee is "occupationally exposed." Occupationally exposed is defined as an exposure at or above 0.1 fibers per cubic centimeter for 30 or more days a year.

As was stated earlier, asbestos-containing materials that can be reduced to powder by hand pressure are considered to be friable. Some non-friable materials may become friable if they are cut, drilled or damaged by water. Friable materials are more likely to release fibers into the air where they can be a source of exposure to you.

The presence of asbestos alone in a building does not mean that the building occupants are necessarily endangered. As long as asbestos-containing materials remain in good condition, exposure is unlikely.

When damage, building maintenance, repair, renovation or other activities disturb asbestos-containing materials, asbestos fibers can be released creating a potential hazard to building occupants. Some asbestos fibers can take up to 80 hours to settle. An airborne asbestos fiber can move laterally with air current and contaminate spaces distant from the point of release. Fiber release may occur in several ways:

Fallout - Old and/or deteriorated asbestos fibers may become airborne due to damage or destruction of the bonding agents used to hold the asbestos product together. Fallout may result in fibers being deposited on horizontal surfaces over time due to humidity, vibration or aging.

Contact - Striking, cutting, drilling, etc. may release fibers into the environment. Air erosion is also a form of contact and may release fibers to the environment from damaged or exposed material.

Reentrainment - Sweeping, dusting or unfiltered vacuuming of settled dust may result in asbestos fibers being re-suspended into the atmosphere.

Minimizing Potential Exposure

Damage and Deterioration

When an asbestos-containing material degrades or is damaged, it may release asbestos into the air. Therefore, you should:

- Avoid touching or disturbing asbestos-containing materials on ceilings, pipes or boilers.
- Do not drill, sand, or scrape items that have asbestos-containing materials.
- Do not attempt to clean any material that appears to contain asbestos.
- Contact your supervisor immediately to arrange proper cleaning of any material that you suspect may contain asbestos.
- Clean-up of asbestos-containing materials should only be done using a High Efficiency Particulate Air (HEPA) vacuum and/or wet methods by properly trained personnel.

Floor Care

In order to minimize the potential for exposure to asbestos during floor care, the following practices are recommended:

- Never sand or scrape asphalt or vinyl flooring that contains asbestos.
- Always strip floor finishes using wet methods and the lowest abrasion pads possible (Never use coarse black pads on asbestos flooring). Always use speeds less than 300 revolutions per minute (rpm).
- Burnish or dry-buff asbestos containing flooring only if it has enough finish so that the pad cannot contact the asbestos-containing material.
- Do not dust, dry sweep or vacuum dirt or debris in an area that contains damaged thermal asbestos insulation, surfacing or deteriorated asbestos-containing material. Use only wet methods or HEPA filtered vacuums.