

Asbestos Safety (from www.asbestos.com)

WHAT IS ASBESTOS?

The term "asbestos" has been given to six naturally occurring mineral fibers that have been used for commercial purposes. It can be found in hundreds of countries on just about every continent. These fibers belong to two separate mineral groups, known as serpentine and amphibole. The serpentine group, usually of a curly form, contains only one asbestiform variety, referred to as chrysotile. The amphibole group, which is straight and needle-like, contains five asbestiform varieties: anthophyllite, grunerite (amosite), riebeckite (crocidolite), tremolite, and actinolite. The U.S. Bureau of Mines has listed more than 100 mineral fibers as "asbestos-like" fibers, but the United States government only regulates the six aforementioned forms (primarily due to effective lobbying on behalf of the asbestos and stone industries).

These very fine fibers are separable, hundreds of times thinner than human hairs, and too small to be seen with the naked eye. The Occupational Safety and Health Administration (OSHA) defines fibers of concern as at least five micrometers long and at least three times as long as their diameters. For a frame of reference, mineralogists work with fibers as much as a thousand times as long as their diameters.

TYPES OF ASBESTOS

The six recognized asbestos minerals, which are considered silicates (molecules that include silicon and oxygen), include:

- ✚ Chrysotile - (Also known as white or green asbestos, from the Greek word meaning "fine, silky hair") Appears as curly, whitish fibers and constitutes 95 percent of the asbestos in use. Chrysotile is mined throughout the world, but most of the United State's chrysotile supply comes from Canada, Africa, and former USSR. Scientists believe this to be the least toxic of all asbestos forms.
- ✚ Crocidolite - (Also known as riebeckite or blue asbestos) Composed of straight fibers, most crocidolite comes from southern Africa and Australia. It is believed to be the most toxic form of all asbestos minerals.
- ✚ Amosite - (Also known as cummingtonite-grunerite or brown asbestos) The trade name "amosite" is an acronym for Asbestos Mines of South Africa, after the Amosa mines. Amosite is also straight in shape, but brittle in structure and excellent for use in heat insulation.
- ✚ Anthophyllite - This form of asbestos is brittle, white, and contains various forms of iron. It has been found to have excellent resistance to chemicals and heat.
- ✚ Tremolite - In rough form, tremolite appears white and chalky. Tremolite can also be naturally found in other mineral forms aside from asbestiform. It has been the major ingredient in industrial and commercial talc.

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- ✚ Actinolite - Typically prismatic, flat in structure, and elongated. Actinolite also comes in forms other than asbestiform and has poor resistance to chemicals.

The last five amphibole (which translates to "ambiguous" in Greek) types have a slightly more complex crystal structure than chrysotile and are not used as extensively in commercial products as chrysotile. Due to their structure, amphiboles tend to stay in the lungs longer than chrysotile and are more likely to cause illness because of this factor. Some hypothesize very small contaminations of amphibole fibers within chrysotile are most to blame for cancer deaths caused by asbestos exposure.

Asbestiform minerals are found in serpentine and ultramafic rock. These rocks are located throughout the United States, especially near mountainous regions. California is exceptionally bountiful in asbestos, where the mineral can be found in at least 44 of the state's 58 counties (some geologists report asbestos is found in 50 of the 58 counties). Asbestos fibers especially form near fault zones, where temperature, pressure, and time have transformed the molecules into the asbestiform crystals.

WHERE CAN NATURALLY OCCURRING ASBESTOS BE FOUND?

Though asbestos can be found throughout the United States, a map compiled from a U.S. Geological Survey database of records, along with literature on the history of asbestos mining, shows a strong band of asbestos deposits running down the eastern shoulder of the Appalachian Mountains from northern New Jersey through northern Georgia and into Alabama. In Fairfax County, Virginia, a total of eleven square miles is underlain with naturally occurring asbestos. The county has set up specific procedures in monitoring and reporting requirements for construction in the area. Another strip of asbestos deposits can be found running up the middle of Vermont and stretching into Maine. Clusters can be found in (but are not limited to) Michigan's Upper Peninsula, throughout the Rocky Mountains, across Northern and Central Washington, in Northeast and Southwest Oregon, and a high concentration is found north of Tucson, Arizona. Many deposits are located in California along fault lines, the Sierra foothills, the Klamath Mountains, and the Coast Ranges of California. California is also home to one of the largest asbestos deposits in the world, which is located within the Clear Creek Management Area.

Russia (presently the world's leading supplier), China, Kazakhstan, Brazil, Zimbabwe, and more than 15 other countries have a history of asbestos production. Only China's mining operations are growing, and they mostly serve that country's needs. Chrysotile asbestos is still mined heavily in Canada, which supplied 89 percent of the asbestos used in the United States between 2002 and 2005. Canadian labor authorities estimate the minerals are present in almost two-thirds of the earth's crust.

The intentional mining of asbestos in the United States reportedly ended in 2002, but the United States is still exporting more than one thousand metric tons a year, including asbestos-containing materials (ACMs) and reexports of materials that have come into the United States from overseas. The U.S. Geological Survey reports the United States imports nearly two thousand metric tons a year.

WHY IS ASBESTOS USED?

The mineral's innate resistance to heat and fire is what has made asbestos so valuable in both industrial and domestic products. Another valuable feature is its reluctance to conduct electricity. The fibers are fine, flexible and can be spun into thread and woven into cloth that is flameproof, difficult to tear, and carries excellent insulation properties. It is virtually indestructible by heat, salt water, corrosive chemicals (especially alkalis), and any chemical or biological process. The fibers mix well into other materials, such as asphalt or cement, and make such products stronger, more flexible, and fire-retardant. They do not dissolve or evaporate with water, which makes the light fibers easy to mix.

WHY IS ASBESTOS SO DANGEROUS?

The fact that asbestos is composed of readily separated fibers is what contributes to the easy inhalation and ingestion of asbestos. The shape of these fibers reacts negatively with human tissue and biological processes. When inhaled or swallowed, these fibers can become lodged in the tissues of the linings of organs, most commonly the lungs and digestive system. Over time, the lodged fibers cause inflammation and cellular damage, which can eventually lead to a variety of terminal diseases. Even though the dangers of asbestos have been recognized since antiquity, the caustic mineral was used to make a number of products, many of which were commonly found in the home. Today, the use of asbestos in the United States is more regulated, but most U.S. residents are under the impression that asbestos was banned in the late-1980s. The Environmental Protection Agency tried to enforce a ban in 1989, but the ban was thrown out by the Fifth Circuit Court of Appeals in 1991. Asbestos is known to cause asbestosis, lung cancer, mesothelioma, and asbestos exposure increases the risk of gastrointestinal, colorectal, throat, kidney, esophagus, and gallbladder cancer. Those who suspect they may have been exposed to asbestos should speak with a doctor to be medically assessed for asbestos exposure.

FOR MORE INFORMATION ON ASBESTOS, PLEASE VISIT: www.asbestos.com

