

The History of Asbestos Use

Although **Stone Age people used asbestos as reinforcement** in both clay pottery and the mud bricks of early cities, **the first written records documenting the use of asbestos come from the classical world of the Roman Empire.**

Both the Greeks and the Romans employed asbestos as wicking material for their oil lamps. In fact, the very word “asbestos” comes from a Greek word meaning “inextinguishable.” In a world where lamplight extended work hours, a lamp wick made from chrysotile asbestos would burn almost indefinitely. In addition to lamp wicks, the Greeks and Romans used the long fibers of the serpentine form of asbestos in weaving textiles. Even at this early stage in the history of asbestos, however, there were warning signs connected with its use.

Around the turn of the first millennium, **a Roman historian noted that the slaves who worked in the rock flax (asbestos) mines would commonly contract breathing illnesses.** Some went on to die. The life expectancy of a Roman mineworker was notoriously short, however, and the death of a certain percentage of these slaves was expected. **Interestingly, it was also documented that some slaves in the rock flax mine would wear tanned animal skin over their nose and mouth, and that those slaves tended to live longer.** In effect, this was the first example of any kind of “respirator” when working with asbestos, and established the importance of breathing protection more than 2000 years ago.

Employed in intervening centuries to weave fabrics that might be exposed to fire, asbestos continued to be used in much the same way as the Greeks and Romans had used it. In 1859, however, things began to change.

There were two key factors that drove the increased use in asbestos. One was **the Industrial Revolution**, which brought with it new technology and new inventions. **Advances in metallurgy, the use of steam power, and the resultant necessity of dealing with greater heats and pressures required a better insulating material, and asbestos was the natural solution.**

By the middle of the 1800’s, both the railroads and the shipbuilding industries had found multiple uses for asbestos as an insulating material. To this day, asbestos remains an important component in every sea-going vessel, though, thankfully, changes brought about by asbestos regulations have finally led to a decline in the shipyards’ traditionally high mortalities from asbestos-related disease.



The other factor that increased asbestos use was a result of the success of the Industrial Revolution: a population shift from the countryside to the cities. As production increased, the agrarian society of pre-industrial America was transformed into factory and shipyard workers anxious to stake their claim to the American Dream. With farm workers moving into towns, the towns grew into cities as quickly as wooden buildings could be raised. In the crowded streets, however, a moment's carelessness could turn the fire that cooked the family dinner into an inferno that claimed hundreds of lives and thousands of buildings. Volunteer fire brigades were inadequate and sometimes fought amongst themselves over who was entitled to put out a fire.



From the millionaire to the slum dweller, everyone was looking for a way to prevent the spread of fires when Henry Ward Johns introduced his “transite” shingle in 1859. John’s combination of asbestos and cement made his shingle not only longer lasting, but also fire-resistant! Although Johns himself died of “the white lung disease”—later to be called “asbestosis”—his company was merged with another owned by C.B. Manville to create the Johns-Manville Corp. in 1901. **With the advent of the transite shingle, asbestos began its steady conquest of the American building industry.**

In the wake of such disasters as the Great Chicago Fire of 1871, the Peshtigo, Wisconsin firestorm, and the fires started by ruptured gas lines during the 1906 San Francisco earthquake, city occupants clamored for a solution, and city councils throughout America began instituting building codes requiring the use of asbestos or its equivalents. Over the first half of the 20th Century, companies such as Johns-Manville and Owens Corning were ready to supply the demand for asbestos products.

From the use of **transite panels** in 1800’s to the use of **thermal system insulation** for boilers, tanks and pipes at the beginning of the 1900’s, asbestos was increasingly incorporated in buildings. By the 1920’s, **asbestos cement products** were used to build entire buildings, including municipal buildings built and donated to towns by companies like Johns-Manville and Owens Corning.

When spray-applied fireproofing was invented, it seemed the best possible solution to preventing fires, and this asbestos compound was promptly used on almost every commercial building built from 1935 until its ban in the mid 1970's. Asbestos spray—an initially wet fireproofing that contained 95% chrysotile and 5% binding agent—was used to insulate the steel infrastructure of buildings to prevent that skeleton from reaching critical heat during a fire. Once steel reached critical heat, it would lose structural integrity and begin buckling, so the use of asbestos spray was an integral part of building the high-rise structures that dominate American cities. Even today, debate continues to surface over the effect of the 1971 New York City asbestos fireproofing ban on the fate of the World Trade Center.



Asbestos spray fireproofing was not the last product to impact the building trade, however. **By the 1950's sheet rock assemblies, ceiling tiles, and flooring regularly contained asbestos.** The fact was, by the 1950's, the thousands of tons of asbestos that had been mined for the war effort in the previous decade had resulted in an over-supply, and manufacturers scrambled to find more uses for this plentiful resource.

In films like “The Wizard of Oz,” asbestos had been used to simulate snow, so fireproof Christmas snow made from 100% chrysotile asbestos was boxed up, ready to turn holiday celebrations into a wonderland of never-melting “snow.” Even more ironically, in an effort to produce a “healthier” smoking experience, Kent manufactured at least 13 million cigarettes between 1952 and 1957 which employed a “micronite filter” using crocidolite asbestos!

Even today, 1000's of products either deliberately contain or are contaminated by asbestos: spackling paste, joint compound, the reinforcing filament of some types of duct tape, rubberized leak stopper, gyp board, wire jacketing, vibration bands in HVAC components, roof patch, and gaskets are just a few. **Even the asbestos cement pipes that carry water to our homes are accepted because of their durability and low**

likelihood of fiber release. (Because asbestos is most dangerous when inhaled, the PEL, or permissible exposure limit, for asbestos is 7 million fibers per liter of water, versus 0.1 fibers per cubic centimeter of air over an 8 hour period—or 100 fibers per liter of breathable air.) **Long lasting and virtually maintenance free, asbestos cement products typically contain 20 % asbestos but may contain up to 50%.**

The truth is for some occupations and situations it is difficult to find a substitute for asbestos. **Asbestos remains the best naturally occurring heat resistant material we have. It does not begin to change molecular structure until 3000 degrees Fahrenheit.** At 3000 degrees, it begins to react like candle wax melting. **At 7000 degrees it vitrifies—cooks out its hydrogen and oxygen and turns into to something like sand—but 7000 degrees is an astounding heat limit. Consequently, asbestos is an essential ingredient in textiles used to protect high heat workers, such as firefighters, stuntmen, and welders.**



Used Protective Asbestos Clothing

Asbestos also provides insulation for sound, as well as fire and heat. It is resistant to bacteria, acids, and friction. It is mechanically strong—stronger than steel on structural level. It can be woven into textiles, providing flexibility missing from other substances. Finally, although asbestos is commonly regarded as fast drying, it is more accurate to say you can't keep asbestos wet with tap water—to keep asbestos wet, you must add a chemical surfactant like dish soap.

As long as asbestos continues to be useful, we will continue to find it in products, but we must also be aware that its presence is not always noted on MSDS, or Material Safety Data Sheets. It's easier to say what asbestos is not in, than to predict where you will find it. Asbestos is not in:

- Metal
- Glass
- Wood

Everything else could have asbestos in it. **All suspect material is guilty until proven innocent of having asbestos in it. You cannot always recognize asbestos by looking. Only rigorous testing can determine whether asbestos is truly present in any given substance.**