



Ingraham Environmental Inc. is committed to working with you to ensure that the environments where you live, work, and play are safe. We strive to provide you with the knowledge, experience and facts you need to make the most affordable, and more importantly, the healthiest decision for you and those you live, work and play with.

The most important thing you can do to ensure your environment is safe is to gain the knowledge to meet, and in most circumstances, exceed government established Permissible Exposure Limits for exposure to asbestos containing materials.

Some of the material presented here may seem a bit elementary, but are required “building blocks” to fully understand complex issues regarding asbestos management in your environments. The information is presented in a Frequently Asked Questions (FAQ’s) format. Each section below deals with issues specific to the topic; however, you will have to reference other topics for enough information to fully understand how to deal with your specific asbestos situation. EPA and state law, when used below, reflect Montana’s most current laws. Most states in the Northwest are similar; however, some differences may apply.

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Asbestos Basics

What is asbestos?

Asbestos is a naturally occurring mineral.

More specifically, asbestos is the generic name for six similar fibrous minerals that have been used in commercial products for their strength, flexibility, low electrical conductivity, and resistance to heat and chemicals. It is composed of silicon, oxygen, hydrogen, and various metals. Asbestos is a known carcinogen, and as a result is regulated.

Why & where was asbestos used?

Asbestos is a very versatile mineral. Because of its properties, it was used extensively in building materials for the last 80 years.

Asbestos is very heat resistant, chemical resistant, and does not conduct electricity well. This makes for excellent insulation and fire retardant materials. Additionally the tensile strength of asbestos made it a great element to ensure that building materials such as vinyl flooring, ceiling tiles, ceiling & wall texture, building material mastics and glues were durable and strong.

Why should you be aware of asbestos?

Asbestos can cause cancer in humans.

Asbestos, in certain states, is hazardous to human health. When asbestos fibers are inhaled by people they can become lodged in the lungs causing a form of lung disease called asbestosis or a similar cancer called mesothelioma. Both have a long latency period which means that 10 to 20 years after exposure is when symptoms FIRST appear. More often than not, diseases of this nature, especially if not caught early, can be fatal.

Are you at risk?

Not if proper procedures are followed to ensure compliance with state and federal laws.

Asbestos presents the greatest health risk when small fibers are inhaled. The fibers that present the greatest risk are 5 microns or smaller. They are too small to see without the aid of a microscope.

The most common uses of asbestos were as elements of various building materials. With these **Asbestos Containing Building Materials (ACBM's)** used widely across America for decades, nearly everyone has been in contact with some material that uses asbestos.

Often these materials are in good condition and not releasing asbestos fibers. When asbestos fibers are encapsulated in asphalt, vinyl or cement, the ACBM is defined as **NON-FRIABLE**. Flooring that contains asbestos can be walked on and used normally with no health risk until something causes that tile to break or more specifically become **FRIABLE**.

FRIABLE means easily reduced to a dust. For example a piece of boiler or pipe insulation is easily made friable.

NON FRIABLE materials are not easy to reduce to dust. However, drilling, sanding, cutting, sawing, tearing or other impacting may make a non-friable ACBM friable.

The most likely avenue of unhealthy exposure to asbestos is from remodeling projects that impact an ACBM. Laws and procedures are in place to ensure that health risk is limited. If properly followed, the probability of exposure to a known carcinogen is greatly reduced.

Next we examine how ACBM's can be dealt with. These materials can be separated into the building systems they are used in. This first section will deal with asbestos that you find in Thermal System Insulation.

Thermal System Insulation

As the name implies this is insulation that is used to reduce heat loss or absorption. Familiar uses are around hot water heating system pipes, tanks and boilers, and in attic and wall insulation. Asbestos containing building materials in this category are often friable already. However, if the material is not disturbed and is properly maintained there is a low likelihood of a health risk.

If you are going to remodel it is required that you identify asbestos containing building materials prior to impacting them, and then properly handle them according to state and federal law. The below section is meant to only be an overview of proper procedure. Specific help with your individual situation should be sought from an accredited and insured asbestos inspector or firm. Ingraham Environmental's staff is properly trained to assist you finding the best and most economical options for your individual situation.

The first step is to determine if the material contains asbestos. If you don't know if a material contains asbestos you should always assume that it DOES contain asbestos. State law requires suspect materials to be assumed to contain asbestos. The cost of testing can sometimes be saved by having an experienced and accredited firm perform a visual inspection. However, if the material is not able to be visually recognized as asbestos or planning dictates the material is impacted, testing may be required.

- ◆ *State and Federal Guidelines require testing protocols to meet certain criteria to ensure safety. Below is a summary of these guidelines.*
- ◆ *Bulk testing of a TSI material requires a MINIMUM of Three Samples to prove a material is NOT asbestos containing.*
- ◆ *Bulk testing requires only one sample to test POSITIVE to prove a material contains asbestos.*
- ◆ *The minimum prescribed testing method requires the use of a Polarized Light Microscope (PLM) to determine the asbestos type and content of the sample.*
- ◆ *The State of Montana and the EPA only regulate materials containing more than 1% asbestos.*

- ◆ *OSHA (which regulates workplace safety) requires anyone subject to OSHA regulations to be properly trained when dealing with any material with any amount of asbestos.*
- ◆ *If a PLM sample tests at 10% or less asbestos containing material, the sample should be "Point Counted" to more accurately determine the asbestos content. This is not necessary if, after the initial test, you wish to treat the material as a regulated asbestos containing building material.*

Different types of Thermal System Insulation (TSI)

Vermiculite

As mentioned earlier, classic examples of asbestos containing TSI include pipe insulation, boiler insulation and tank insulation. Ignored until recently, vermiculite insulation poses an asbestos exposure risk.

Vermiculite is the generic name for a wide variety of products many people are aware was mined in Montana. Most people in the region have heard of the vermiculite mine, WR Grace Co. and Libby, Montana. You may recognize the trade name "Zonolite" as the vermiculite mined and milled in Libby, MT and distributed nationally and world wide. This story brought asbestos and vermiculite to the national stage.



Regardless if the vermiculite you may come in contact with came from the Libby mine, another United States mine site that produced the material or even from a Canadian mine that still produces the material, you should treat vermiculite carefully.

Vermiculite, like asbestos, is a mineral. Vermiculite is geologically formed under the same conditions as asbestos. Vermiculite when used as a building material (not as a gardening product) has a high probability of being contaminated asbestos.

Vermiculite, as it is used here, refers to the vermiculite that is found in building materials. Though not exempt from containing asbestos, vermiculite used in gardening and other commercial products on the market today are usually refined and produced such that they do not present a health risk.



What do I do if I have vermiculite?

If you have vermiculite in you attic or in your walls, you should make every effort to be sure you have as little exposure as possible. You can do this by not entering the area where the vermiculite is. If you have to enter the attic (or other area), limit the number of times you enter and exit the attic and the duration of the time spent in the area. Avoid direct contact with the material, and do not set anything on the insulation directly. Do not let children or pets play in the area. Be sure that anything that has been stored in the area is not contaminated with vermiculite or vermiculite dust, as taking these items back into your living space could be exposing you and others to asbestos fibers.

Should I remove the insulation?

Often asbestos materials are best left in place. There is less risk of exposure the less the material is disturbed. Do not try to remove the material yourself. In most cases this is a violation of state and federal law. Fines can be up to \$25,000/day and without proper controls could contaminate your entire house or business. This could result in excessive clean up costs and leave the responsible party exposed to fines and lawsuits.

It sometimes becomes necessary to assess and possibly abate the material. If you are having an energy audit, installing a new heating or cooling system, considering remodeling or demolishing a structure, it is likely that you will be required to, at a minimum, assess whether ACM's are going to be impacted during the work. This process begins by contacting a firm that has a state accredited asbestos inspector. Additionally, a reputable firm should be a State Registered Contractor, with a current liability policy and experience with this type of situation. Such a firm can be found by contacting your State's Department of Environmental Quality, Asbestos Control Program. Ingraham Environmental Inc. is fully prepared to satisfy your inspection and construction requirements. Montana's DEQ asbestos control program's web site can be found at <http://www.deq.state.mt.us/Asbestos/index.asp> and offers a wide variety of resources, including advice, currently accredited individual and firms and more.

Once you find a firm that is qualified to inspect you work activities and building materials, they will perform a site visit. Each situation is unique and usually requires a plan of action specific to your situation. Generally speaking, the first step is to collect a minimum of three (3) representative samples. Representative means the sample is collected to best represent the material in question. Each sample should be taken from a different location in the area and the inspector should ensure that the sample not simply be taken from the top layer or the bottom layer, but should be comprised of all layers of the material.

Once collected, these samples will be sent to an accredited laboratory. EPA regulations require a minimum of **PLM (Polarized Light Microscopy)** analysis. PLM analysis costs vary, but are usually in the neighborhood of \$40 per sample, with a five day turnaround. While using this method meets the requirements of the EPA and the State of Montana for testing most ACBM's, recent data indicates that this method may not accurately reflect the asbestos content of the material in vermiculite or Zonolite.

In fact, the EPA recommends that you treat all vermiculite building materials as asbestos containing material.

There are more specific and accurate tests that can be performed to determine the asbestos content of vermiculite more accurately. Two options are the **Scanning Electron Microscope (SEM)** and the **Transmission Electron Microscope (TEM)**. These tests generally cost 3-4 times of a PLM test. This totals about \$120-\$160 per sample on a five day turnaround.

A regulated asbestos abatement requires a State permit. The permit fee for a residential abatement begins near \$100 and often can exceed \$500. To obtain such a permit, you must have a state accredited Project Designer submit and abatement plan. These usually cost \$250-\$300 for a standard residential property. Additionally, associated costs such as disposal, material and insurance can easily push the upfront costs of abatement into the \$1000-\$1500 range, and that is before any work actually begins. The abatement itself ranges from \$6.00-\$10.00 per square foot of material. Please keep in mind that these are very general numbers impacted by many things, including time frame for the project, accessibility to the area, slope and pitch of the roof, presence of other insulation and many other factors. It is easy to see why performing three PLM tests (\$120) can save you \$1000 or more. HOWEVER,

IMPORTANT: THE EPA RECOMMENDS THAT ALL VERMICULTIE BUILDING MATERIALS BE TREATED AS ASBESTOS.

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Though this oversight in the law and testing protocol can save you money, no amount of money can buy the long term health of you and your family once stricken by the diseases that asbestos can cause. When used properly, with similar controls to that of an asbestos abatement, this method can be an affordable solution to your asbestos problem. Be sure that you fully discuss these options with a firm that has the proper accreditations, insurance, registrations and experience.

Don't be afraid to ask questions until you fully understand the scope of the project, check references, or ask for the firm's contractor registration, proof of insurance and any other relevant documentation. Homeowners can also learn more about asbestos vermiculite through the EPA Hotline at 1-800-471-7127 or by calling their State Department of Environmental Quality.

Ingraham Environmental Inc. is committed to providing its clients with quality service. That includes educating you and your family to ensure that the action plan implemented for you limits health risks and provides the most affordable and reasonable solution to your needs.

Please contact us with any questions, concerns or comments. You can email us at vermiculite@ingrahamenvironmental.com, visit www.ingrahamenvironmental.com call us toll free 1+ (877) 723-7885, locally at (406) 723-7885 or mail or visit our corporate offices at PO Box 545, 606 South Utah Avenue, Butte MT 59703.

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