



NIOSH Recommendations for Limiting Potential Exposures of Workers to Asbestos Associated with Vermiculite from Libby, Montana

What is vermiculite?

Vermiculite is a mineral that expands when rapidly heated. Expanded vermiculite is used in construction and consumer materials (e.g., loose-fill insulation, acoustic finishes, spray-on insulation, and concrete mixes for swimming pools), agricultural and horticultural products (e.g., potting mixes and soil conditioners) and in industrial products (e.g., brake shoes and pads, drilling muds, furnaces, and insulation blocks). Expanded vermiculite granules are shaped like small accordions, and vary in color from silver/gold to gray/brown.

Vermiculite has been an established commercial commodity for well over 50 years, and is currently used throughout the world. Vermiculite ore mined near Libby, Montana, which accounted for more than half the worldwide production of vermiculite from 1925 to 1990, was contaminated with asbestos and asbestos-like fibers. Workplace exposure to these fibers caused a serious health problem in local miners and millers, as well as some downstream workers.

Mining stopped at the mine near Libby in 1990. However, concerns remain about health effects from environmental and other occupational exposures to asbestos-contaminated vermiculite, especially vermiculite that has been installed as loose-fill insulation in homes and other buildings. Much of the vermiculite from the mine near Libby was used in the manufacture of Zonolite™ Attic Insulation. However, not all Zonolite™ product was made with vermiculite from that same mine.

What health effects are caused by uncontaminated vermiculite?

Based on available information, there is no clear evidence that dust from vermiculite itself causes any serious health effects. Nevertheless, as with any dust, workers should avoid prolonged, high-level exposures. The observed health effects associated with asbestos-contaminated vermiculite can be attributed to contaminant fibers, rather than to vermiculite itself.



Source: US Environmental Protection Agency. Actual size of vermiculite granules can vary substantially

What are the health effects caused by asbestos?

Exposure to asbestos can result in a scarring disease of the lung known as asbestosis, inflammation of the chest cavity (pleuritis) with or without fluid build-up, lung cancer, and another type of cancer known as malignant mesothelioma. The risk of these diseases, which can be disabling or fatal, generally increases with intensity and duration of exposure. The risk of lung cancer from inhaling asbestos fibers is also increased in smokers. Most people who get asbestos-related diseases have been exposed to high levels of asbestos for a long time. Most asbestos-related diseases rarely occur until at least 15 years after first exposure to asbestos.

How can workers be protected from asbestos-contaminated vermiculite?

In general, any vermiculite that originated from the mine near Libby, Montana, should be regarded as potentially contaminated with asbestos.

As with any asbestos-containing or asbestos-contaminated material, the only way to know the amount of asbestos pres-



ent is to have the material tested. Bulk sampling is reliable only when over 1% of the material is asbestos. Negative results from bulk samples can therefore be falsely reassuring when less than 1% of the sample is asbestos. However, disturbing contaminated vermiculite with less than 1% asbestos can still result in hazardous concentrations of airborne asbestos fibers. NIOSH recommends workers consult Occupational Safety and Health Administration (OSHA) asbestos standards for general industry and construction (29 CFR 1910.1001 and 1926.1101) when work will involve vermiculite that is known or presumed to be contaminated with asbestos. Relevant information is posted on the OSHA web site: <http://www.osha.gov/SLTC/asbestos/index.html>.

If the vermiculite is known or presumed to be contaminated with asbestos, NIOSH recommends the following general guidelines for limiting asbestos exposure:

- Avoid handling or disturbing loose vermiculite
- Isolate work areas with temporary barriers or enclosures to avoid spreading fibers
- Use wet methods, if feasible, to reduce exposure
- Never use compressed air for cleaning
- Avoid dry sweeping, shoveling, or other dry clean-up methods
- Use disposable protective clothing or clothing that is left in the workplace. Do not launder work clothing with family clothing
- Use proper respiratory protection.
- Dispose of waste and debris contaminated with asbestos in leak-tight containers in accordance with OSHA and EPA standards.

Which respirators should be selected if the vermiculite contains or is presumed to contain asbestos?

When working with vermiculite that is known or presumed to be contaminated with asbestos, proper respiratory protection should be used. When needed to reduce asbestos exposure below the OSHA 8-hour time-weighted average limit of 0.1 fiber/cubic centimeter or OSHA excursion limit of 1.0 fiber/cc averaged over 30 minutes, respirators equipped with high-efficiency (e.g., N100) filters or supplied air respirators should be used. The type of respirator depends upon the airborne concentration of asbestos or conditions of use. Medical clearance and respirator training are also required (29 CFR 1910.134). Disposable respirators or dust masks are not appropriate for avoiding asbestos exposure.

Further information concerning respirators can be found on the NIOSH and OSHA web sites: <http://www.cdc.gov/niosh/respinfo.html> and <http://www.osha.gov/SLTC/respiratoryprotection/index.html>.

What should be done for workers who have had significant exposure to vermiculite from Libby?

Workers who have had significant past exposure, or have significant ongoing exposure to asbestos, to vermiculite from Libby, or to other asbestos-contaminated materials should consider getting a medical exam from a physician who knows about diseases caused by asbestos. The appendices to the OSHA asbestos standard (<http://www.osha.gov/SLTC/asbestos/compliance.html>) describe the types of medical tests routinely done for workers exposed to asbestos. Workers who have been exposed and currently smoke should quit smoking. Employers can assist them by offering smoking cessation programs.

Is NIOSH involved in research or prevention activities relating to asbestos-contaminated vermiculite?

NIOSH is evaluating the potential for asbestos exposure during work with vermiculite from sources other than the mine near Libby. NIOSH is also updating a study of vermiculite workers originally conducted in the 1980s. That study found significant excesses of asbestosis and lung cancer related to contaminant fiber exposures among workers at the vermiculite operations in and around the mine near Libby.

In addition, NIOSH is providing technical assistance to the U.S. Environmental Protection Agency (EPA) and the Agency for Toxic Substances and Disease Registry (ATSDR), which are the lead Federal government agencies for addressing current concerns about community health risks relating to asbestos-contaminated vermiculite from Libby.

While information continues to be gathered, precautions should be taken to minimize the generation and inhalation of dust during the handling of vermiculite known or presumed to be contaminated by asbestos. As with any dust, workers should avoid prolonged high-level exposures.

For further information on NIOSH research, contact NIOSH toll-free at 1-800-35-NIOSH (1-800-356-4674) or visit: www.cdc.gov/niosh.

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Fax: 513-533-8573, or visit the NIOSH Web site at: www.cdc.gov/niosh

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