Environmental Health and Safety Statement

Iowa State University strives to be a model for environmental, health and safety excellence in teaching, research, extension, and the management of its facilities. In pursuit of this goal, appropriate policies and procedures must be developed and followed to ensure this community operates in an environment free from recognized hazards. Faculty, staff, and students are responsible for compliance with established policies and are encouraged to enunciate practices that ensure safety, protect health, and minimize the institution's impact on the environment.

As an institution of higher learning, Iowa State University
- fosters an understanding of and a responsibility for the environment,
- encourages individuals to be knowledgeable about environmental, health and safety issues that affect their discipline, and
- shares examples of superior environmental health and safety performance with peer institutions, the State of Iowa and the local community.

As a responsible steward of facilities and the environment, Iowa State University
- strives to provide and maintain safe working environments that minimize the risk of injury or illness to employees, students and the public,
- continuously improves operations, with the goal of meeting or exceeding required and applicable environmental, health and safety regulations, rules, policies, or voluntary standards, and
- employs innovative strategies of waste minimization and pollution prevention to reduce the use of toxic substances, promote reuse, and encourage the purchase of renewable, recyclable and recycled materials.

The intent of this statement is to promote environmental stewardship, protect health, and encourage safe work practices within the Iowa State University community. The cooperative efforts of the campus community to remain mindful of these goals will ensure that Iowa State University continues to be a great place to live, work, and learn.

Dr. Steven Leath
President
Directory of Service and Emergency Providers

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Emergency - Ambulance, Fire, Police
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# Asbestos Awareness

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A. Introduction

This review guide is intended to augment asbestos awareness training and to assist in providing an understanding of the properties and hazards of asbestos. Completing Asbestos Awareness Training does not imply that maintenance and custodial staff will be required to work with asbestos-containing materials (ACM). The purpose of this guide is to provide a basic overview of asbestos and its associated hazards in addition to satisfying the employee training requirements under 29 CFR 1926.1101(k) (8), “Occupational Exposure to Asbestos.” The scope and content of this guide is limited to the information essential to this requirement.

Occupational Safety and Health Administration (OSHA) regulations require ISU to present “awareness training” to maintenance and custodial personnel who may come in contact with asbestos-containing materials.

Custodial, maintenance staff, and their supervisors who work in buildings that may contain asbestos containing materials are required to complete Asbestos Awareness annually. Training may be completed online through Learn@ISU.
B. Asbestos - Its Various Uses and Forms

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. There are three commercially important types of asbestos.

Type 1

Chrysotile is white asbestos with fine silky fibers. It accounts for over 90 percent of the asbestos used in the U.S. Chrysotile is mined in Canada and the Soviet Union.

Type 2

Amosite is known as brown asbestos and is used in heat insulation materials. Amosite is mined primarily in Transvaal, South Africa.

Type 3

Crocidolite is known as blue asbestos and is occasionally found with amosite or chrysotile in pipe or boiler wrap. Crocidolite is mined in South Africa.

- 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 insulator
- Very good noise insulator
- Resistant to the effects of friction and wear

Friable

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 significant when we review the health effects of asbestos.
C. Potential Health Effects Related to Asbestos

Routes of Entry

While asbestos fibers may gain entry into the body through 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.

The Respiratory System

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 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.
- Alveoli in the lower respiratory system trap the smallest particles. The particles 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.

Asbestos Health Risks

Exposure to very high levels of airborne asbestos (typical of asbestos trades 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
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.
Asbestos Awareness

D. Asbestos - Where is it and what is it used in?

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

- floor tiles (9” x 9” and 12” x 12”) and mastic
- glazing and caulking
- thermal pipe insulation (water, steam and chilled water lines)
- fireproofing
- transite panels (fume hoods and siding)
- tank insulation
- acoustical ceiling texture
- roofing felts and shingles
- high temperature gaskets and valve packings
- adhesives

With the exception of the newest buildings on campus, most contain asbestos materials in one form or another. Vinyl asbestos floor tile is the most common asbestos-containing material on campus.

Notices and Labeling

In conjunction with the inspection of campus buildings for asbestos, Iowa State University personnel have labeled asbestos-containing materials where feasible. Mechanical spaces are labeled at the entrance with a notice that asbestos-containing materials are present at the location and provide information on how to avoid exposure situations.

Activities Involving Potential Exposure

OSHA regulations define exposure at or above 0.1 fibers per cubic centimeter for 30 or more days a year.

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

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 damaged, building maintenance, repair, renovation or other activities may disturb asbestos-containing materials (ACM), 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 currents 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 ACM degrades or is damaged, it may release asbestos into the air.

- Avoid touching or disturbing ACM on ceiling, pipes or boilers.
- Do not drill, sand or scrape materials that contain ACM
- 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.
- Cleanup 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 when 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 ACM. Use only wet methods or HEPA filtered vacuums.

Roles of Custodial and Maintenance Personnel

• Become familiar with the health hazards associated with ACM

• Be aware of areas that could potentially contain ACM.

• Assist in the prevention of activities which disturb the ACM (i.e. hanging plants or pictures, pushing furniture against, etc.)

• Report any evidence of disturbance or damage.

• EH&S will arrange to have any disturbed ACM properly cleaned up and repaired.

• Periodically inspect and report any dust or debris from ACM, change in appearance of ACM, or any improper action that could potentially damage the ACM.

If you see asbestos-containing materials (ACM) that has been damaged or disturbed, contact your supervisor or call EH&S at (515) 294-5359
Non-discrimination Statement

“Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 3350 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. 515 294-7612, email eooffice@iastate.edu”