Asbestos Awareness

University of Southern Maine Environmental Health and Safety
What Will be Covered?

- Awareness
- History
- Definition
- Types of Asbestos
- Health Effects
- Asbestos Containing Materials
- Materials to be Aware of Asbestos at USM
- How to Avoid Exposure
Asbestos can be a serious health hazard. This training presentation is designed to educate employees at the University of Southern Maine about asbestos and the hazards it can bring to the workplace. It is important for USM employees who may be exposed to asbestos to be aware of potential hazards and avoid exposure.
Asbestos has been used for over 2,000 years.

It was first used by the Greeks who named it asbestos, meaning “inextinguishable.”

The first diagnosis of an asbestos related disease was in 1924.
Deposits of asbestos are found throughout the world: Russia (largest producer), Canada, South Africa, and Australia.

Asbestos is extracted by open cast mining. It is crushed, processed and refined into a wool like fibrous mass.

Use of asbestos in building products peaked in the Sixties and early Seventies.
Thetford Mines Quebec, Canada
Asbestos has been used in hundreds of products worldwide. It became popular because there are large quantities of it available, it is easily and quickly accessible, and it is low in cost. Asbestos has several unique properties:

- It does not burn.
- It is strong.
- It is a poor conductor of electricity and heat.
- It is impervious to chemical corrosion.
OSHA defines asbestos as: the name given to a group of naturally occurring minerals that has been used in certain products, such as insulation, tiles, building materials and vehicle brakes to resist heat and corrosion.

Asbestos includes the mineral fibers:
- Chrysotile
- Amosite
- Crocidolite
- Tremolite
- Anthophyllite
- Actinolite
There are three most common forms of asbestos:

- **Chrysotile** (white) is the most common.
- **Amosite** (brown / off-white)
- **Crocidolite** (blue)
Chrysotile is the most common form of asbestos. Accounts for 95% of asbestos currently in the United States. Fibers are resilient to heat, insoluble in water and are considerably strong, they can even be woven into fabric. Chrysotile is considered to be a carcinogen.
Amosite

- According to the Environmental Protection Agency, amosite is the second most commonly used type of asbestos.
- Usually brown or off white in color.
- Fibers are long and thin and can be broken into very small fibers.
- Amosite is considered to be a carcinogen.
Crocidolite is the third most commonly used form, making up roughly 4% of the total asbestos in the United States.

Usually more flexible than amosite or chrysotile.

Blue in color and less heat resistant.

Crocidolite is considered to be a carcinogen.
Health Effects

- Asbestos related diseases take a long time to develop.
- Usually, diseases show up 15–60 years later in people who have been exposed to asbestos.
- When inhaled, most asbestos fibers are exhaled back out, but some can stick in the lungs causing scarring which can lead to disease over time.
Health Effects

- Asbestos can cause a wide range of diseases.
- Fibers associated with these health risks are too small to be seen with the naked eye, so it is crucial to take proper safety precautions.
- Smokers are at a higher risk of developing many asbestos-related diseases.
- People who are exposed to high quantities of asbestos, over long periods of continual time, are more likely to develop an asbestos-caused disease.
The following are potential health effects of asbestos exposure:

- Lung cancer
- Mesothelioma
- Asbestosis
- Pleural plaques
- Pleural thickening
- Pleural effusions
Health Effects

- **Asbestosis**
  - Scarring of lung tissues, caused by fibres reaching the alveoli.
  - Scarring results in reduced lung capacity and increased risk of lung cancer.
  - Symptoms include extreme shortness of breath.
  - Not always fatal but extremely debilitating.

- **Lung Cancer**
  - Cancerous tumours in lung tissue.
  - Symptoms include shortness of breath, coughing (up blood).
  - Nearly always fatal.
Health Effects

- **Mesothelioma**
  - Cancerous cells form on the membrane covering the internal organs. Most commonly on the pleura covering lungs.
  - Cancerous growth inhibits normal lung tissue function.
  - Symptoms: shortness of breath, cough, pain in chest.
  - Always fatal – life expectancy 6 – 24 months from diagnosis.

- **Pleural Plaques**
  - Fibres lodged in the lung tissue push through and scratch the inside of the pleural membrane.
  - This causes inflammation and areas of scarring.
Friable vs. Non-Friable ACM

- **Friable**: can be crumbled or reduced to powder by hand pressure. (EPA)
- Friable Asbestos releases fibers into the air more readily.
- **Non-friable**: not easily reduced to powder.
- Many types of non-friable ACM can also release fibers if disturbed.
- Regulations usually deal with friable asbestos.
3 Categories of ACM in Buildings

- The EPA defines three categories of ACM:
  - **Surfacing materials**: ACM sprayed or troweled on surfaces for acoustical, decorative, or fireproofing purposes (plaster, insulation, etc.).
  - **Thermal System Insulation**: Insulation used to inhibit heat transfer or prevent condensation (pipe lagging, pipe wrap, block bat and blanket insulation, cements, muds, etc.).
  - **Miscellaneous Materials**: Other, largely non-friable products and materials such as floor tile, ceiling tile, roofing felt, concrete pipe, outdoor siding, and fabrics.
Employee Groups Likely to be Exposed

- General maintenance staff
- Electricians
- Plumbers
- Gas Fitters
- Painters and Decorators
- Joiners
- Plasterers
- Demolition Workers
- Shop fitters

- Construction Workers
- Roofers
- Heating and Ventilation Engineers
- Telecommunications Engineers
- Fire and Burglar Alarm Installers
- Computer Installers
- Architects, building surveyors and such
## Typical Friable ACM Material

<table>
<thead>
<tr>
<th>Friable Material</th>
<th>Where Found</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos Cord</td>
<td>Electrical insulations and equipment</td>
<td>Electrical element insulation</td>
</tr>
<tr>
<td>Asbestos Tape, Strip &amp; Tubing</td>
<td>Electrical installations and pipe joints</td>
<td>Electrical conductor insulation, high temperature pipe joint insulation wrap</td>
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<tr>
<td>Fire resistant theater and welding curtains, protective clothing</td>
<td>Auditoriums, stages, metal shops, high temperature occupations</td>
<td>Fire and heat barrier</td>
</tr>
<tr>
<td>Spray Applied or Trowled-on Insulation</td>
<td>Steel I-beams and decks, concrete ceilings and walls, hot water tanks, pipe elbows, boiler casings</td>
<td>Thermal and acoustical insulation, decorative coverings</td>
</tr>
<tr>
<td>Preformed Thermal Insulation</td>
<td>Boilers, pipes, hot water tanks</td>
<td>Thermal insulation, condensation control</td>
</tr>
<tr>
<td>Artificial Snow</td>
<td>General commercial use</td>
<td>Decoration</td>
</tr>
<tr>
<td>Artificial Fireplace</td>
<td>General commercial use</td>
<td>Decoration</td>
</tr>
<tr>
<td>Corrugated Asbestos Paper</td>
<td>Hot water, steam pipes</td>
<td>Thermal insulation</td>
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</tbody>
</table>
Common Non-Friable Materials

- Acoustic Plaster
- Asbestos Cement Products
- Roofing Shingles
- Laboratory Tabletops
- Floor and Ceiling Tiles
- Filtration Materials
- Roofing Felts
- Asbestos Stucco

- Roofing Asphalt
- Quality Vinyl Wall coverings
- Gaskets
- Millboard, Rollboard
- Pipeline Wrap
- Asbestos Insulation Board
- Certain sealants, tapes, and grouts
Insulating Board

- Structural fire protection – on steel work, behind radiators and boilers, inside doors,
- Also used for acoustic insulation, lining, ceiling tiles, general building board (resists moisture ingress)
- Interior walls of older fume hoods in chemistry labs.
- Only to be removed by a licensed contractor
Lagging

- Thermal insulation for pipes/boilers
- Common lagging up to 15% asbestos
- Quilts/blankets up to 100% asbestos
- Often has protective foil, paper or wire covering
- Only to be removed by a licensed contractor
Asbestos Cement Products

- Roof sheets, flue pipes, guttering, down comers, roof tiles, permanent shuttering
- Only 10–15% asbestos (usually white asbestos)
- Fibres are tightly bound with Portland Cement, unlikely to give off fibres unless badly damaged
- Sheets should be removed whole and kept wet
Asbestos Containing Plastics

- Floor tiles, stair nosings, sink pads, toilet seats and cisterns
- Can also find asbestos in the adhesive used with floor tiles
- Up to 25% asbestos
- Fibre release unlikely under normal use
Rope and Cloth

- Fire blankets, gaskets, cable insulation, flash guards
- Up to 100% asbestos
- Release of fibres depends on material
- All 3 types of asbestos used pre1970, only chrysotile since
Sprayed Coating

- Used as fire protection and acoustic control for structural steelwork
- Up to 85% asbestos
- Fibre release likely if disturbed. Can also degrade as it ages
Textured Coating

- Commonly referred to as ‘artex’.
- Low percentage of asbestos
- Fibres may be released if the material is drilled or sanded
Asbestos Paper Products
- Backing on fibre boards, floor tiles
- Covering on electrical equipment insulation, pipe insulation
- Damp proof course

External Building Panels
- Asbestos boarding can be used for external cladding
Avoiding Exposure

- Asbestos containing materials should not be broken, sanded, scraped or drilled unless absolutely necessary.
- If working around or near ACM avoid contact with the material.
- If you are concerned you might be working around ACM, contact your supervisor to get the area tested.
Emergency Procedures

- If you discover or disturb asbestos containing materials
  - STOP work immediately!
  - Prevent access to the area.
  - Minimize spread of contamination to other areas.
  - Notify your supervisor immediately!
Thank You
Avoiding Exposure: PPE

- Personal Protective Equipment
  - Asbestos removal operatives wear:
    - Disposable overalls (Type 5 – Particle tight)
    - Boots without laces, or boot covers
    - Respiratory Protection
Avoiding Exposure: RPE

- Respiratory Protective Equipment
  - 3 types
    - Disposable respirators – with FFP3 filter
    - Half Face Masks
    - Full Face Masks