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#### Occupational Hazards: Are your Facilities Department Employees Adequately Protected?

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#### **Occupational Hazards in Schools**

The protection of facilities department employees from the variety of health risks is a complex undertaking.

This session will discuss the range of health risks in facilities department operations around campus and provide specific guidance on protection from asbestos, lead paint, and silica.

# So Many Risks!

- Asbestos
- Back Injury
- Biological Hazards
- Bloodborne Pathogens
- Chemical Hazards
- Compressed Gases
- Electrical
- Emergency Planning/Terrorism
- Equipment and Machinery
- Ergonomics
- Extreme Temperatures
- Forklifts/Aerial lifts
- Indoor Air Quality
- Infectious Diseases
- Laboratories

- Ladder Climbing
- Lead
- Lockout/Tagout
- Manual Materials Handling
- Noise
- Pesticides
- Respiratory Diseases
- Silica
- Slips, Trips, Falls
- Traffic
- Treated lumber
- Vibration
- Welding Cutting Brazing Soldering
- Workplace Violence
- Working at Heights



#### Maintenance Custodians Groundskeepers







#### **Custodians**

Slip and Fall Hazards

**Ergonomic Hazards** 

Chemicals

**Electrical Hazards** 

**Infectious Diseases** 

#### Groundskeepers

**Power Tools and Equipment** 

**Ergonomic Hazards** 

Chemicals

Slip and Fall Hazards

Noise

Heat/Sun

**Electrical Hazards** 

#### Maintenance

**Power Tools and Equipment** 

**Ergonomic Hazards** 

Chemicals

Slip and Fall Hazards

**Electrical Hazards** 

#### Asbestos

• A mineral fiber that occurs in rock and soil.



• Used in construction materials for insulation and as a fire retardant.

Three major health effects are associated with asbestos exposure:

- 1. Lung cancer
- 2. Mesothelioma, a rare form of cancer that is found in the thin lining of the lung, chest and the abdomen and heart
- **3. Asbestosis**, a serious progressive, long-term, noncancer disease of the lungs

#### **Asbestos**

Phased out but never entirely banned in US.

Commonly used in the 1970's, building materials after 1980 are considered asbestos free.

It is not possible to visually determine if a material contains asbestos. The presence of asbestos can only be determined by specific sampling and analytical procedures.

#### Where is Asbestos Found?

In many different products and many different places.

- Sprayed on fire proofing
- Insulation for pipes and boilers
- Brake linings and clutch pads
- Wall and ceiling insulation
- Ceiling and floor tiles
- Wall and ceiling texture
- Floor tile mastic
- Joint compound
- Gaskets
- Laboratory equipment: gloves, pads, equipment lining, transite hoods

#### **Asbestos Materials: Likely Locations**



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#### **Fire Proofing / Insulation**



#### Sprayed on fire proofing and insulation

#### Insulation for pipes and boilers



#### **Brake Linings, Clutch Pads**







#### Wall & Ceiling Insulation





### **Ceilings, Floors, Mastic**

Asbestos ceiling and floor tiles are usually asphalt asbestos or or vinyl asbestos





Nearly all nine-inch vinyl tiles produced prior to the 1970s contain asbestos fibers or adhesive. Twelve-inch tiles prior to the 1970's were also produced.



#### **Roof Tiles**







# Wall & Ceiling Textures / Joint Compounds



Wall and ceiling texture

#### Joint compound may have up to 5% asbestos





#### **Pipes and Gaskets**







#### Laboratory Equipment









#### **Asbestos Exposure**

- Must become airborne and inhaled or ingested
- Fibers will not be released unless disturbed or damaged
- Fibers dry out, break off



#### How to Avoid Asbestos Exposure

Prohibit any activity that intentionally disturbs asbestos such as:

- Drilling holes, sawing or sanding transite duct or slate roof singles.
- Hanging anything on a structure with surface ACM.
- Sanding floor tile or stripping floor tile wax with machines greater than 300 rpm or using abrasive pads (black pads).
- Using an ordinary vacuum, sweeping dust etc. to clean-up ACM.
- Taking asbestos samples
- Changing car brakes or clutches dry, using air to blow off brakes.

Determine the presence, location and quantity of asbestos containing material at your facility and inform employees and contractors of its presence.

### **Asbestos Training**

#### 2-hour Asbestos Awareness Training

For maintenance and custodial staff involved in cleaning and minor maintenance tasks where ACM may be accidentally disturbed.

#### 16-hour Special O&M Training

For maintenance and custodial workers involved in general maintenance and asbestos-containing material repair tasks.

For example, the job may involve repair or removal of a small section of damaged thermal system insulation, or the installation of electrical conduit in an air plenum containing ACM or ACM debris.

#### 40-hour Abatement Worker Training

For workers who may conduct asbestos abatement activities.

#### Lead

• Lead exposure causes damage to brain, nervous system and kidneys.



- There is no safe level of lead exposure.
- Easily carried on clothing and shoes.
- Poisoning can occur gradually, and there are often no obvious symptoms.
- Found in most commercial paints sold before 1993.

- In air, soil, water
- On objects like tools or toys
- On food, drink, or cigarettes
- In pipes

LEAD

POISONING

- On painted surfaces
- On surfaces like floors or counters

- Art supplies
- Pottery glazes
- Science labs
- Contaminated soil
- Auto exhaust
- Industrial pollution
- Pesticides
- Contaminated water



# Assume housing built before 1978 contains lead-based paint.







#### Ceramics, arts, chemicals



Solder, pipes, plumbing, batteries, construction materials.







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#### **Exposure to Lead**

During any work that produces lead dust or fumes.

- Sanding, scraping or grinding paint
- Carpentry
- Renovation/demolition
- Welding
- Soldering
- Sand blasting
- Doing cleanup



#### **Exposure to Lead**

Lead can become airborne during:

- The removal, renovation, or demolition of structures painted with lead pigments.
- Installation, maintenance, or demolition of lead pipes and fittings, lead linings in tanks and radiation protection, leaded glass, work involving soldering, and other work involving lead metal or lead alloys.
- During soldering of plumbing fixtures.

Airborne lead may be inhaled or ingested as lead dust, fumes, particles, or chips.

#### How to Avoid Lead Exposure

- Restrict access to the work area
- Use containment
- Choose safer work methods
- Work wet
- Clean up thoroughly



# Students, staff at UW-Madison may have been exposed to lead during painting in two buildings

Karen Herzog, Milwaukee Journal Sentinel Published 6:33 a.m. CT Oct. 5, 2017 | Updated 6:59 p.m. CT Oct. 5, 2017



(Photo: Mark Hoffman, Milwaukee Journal Sentinel)



An undetermined number of University of Wisconsin-Madison faculty, students and staff may have been exposed to unacceptable levels of lead dust during painting projects in two buildings this summer and fall, the university notified the campus this week.

University officials urged anyone who spent time in

Agricultural Hall or Bascom Hall who is pregnant, considering becoming pregnant, and/or nursing, or has another health-related concern to contact University Health Services or their primary health care provider.

#### **How Do We Detect Lead**

No visual detection

Hand-held XRF

Lead paint test kits







# Lead Training

Airborne exposure, at any level, requires training to the OSHA standard.

Exposure at or above the action level includes:

- Annual training
- 1910.1025
- Operations which may result in exposure
- Respiratory protection
- Medical surveillance
- Engineering controls
- · Health effects of lead
- Personal protective equipment
- Lead-safe work practices



#### Lead Abatement

- Qualified lead abatement technicians
- There are four methods that are currently used for treating a lead-based paint hazard:
  - -encapsulation
  - -enclosure
  - -removal
  - -replacement



#### Silica

Silica exists in nine different crystalline forms, the three main are:

- Quartz
- Tridymite
- Cristobalite



#### Silica

Major health effects from exposure:

- Chronic silicosis caused by low, but frequent exposures with symptoms developing in 10 – 40 yrs
- Accelerated silicosis the exposure level increases; symptoms develop within 5 to10 yrs
- Acute silicosis extremely high levels of exposure, such as in sand blasting, over a short period of time; symptoms can develop within a few weeks
- Lung cancer

#### Where is Silica Found?

- Ceramics classrooms / kilns
- Ceilings
- Glassmaking
- Flooring compounds, mortars, specialty cements, stucco, roofing shingles, skid resistant surfaces, and asphalt mixtures, sealants and caulks, concrete
- Sandblasting
- Paints and coatings
- Recreational

- Ceramics classrooms / kilns
- Glassmaking























#### Silica Exposure

Cutting, breaking, crushing, drilling, grinding, or abrasive blasting







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## How to Avoid Silica Exposure

- Do not cut or drill materials that contain silica.
- Minimize the risk by not using power tools.
- During power tool use, a water suppression or extraction tool should be used to control the dust produced.
- Provide workers with a respirator.
- Carry all work that involves cutting, drilling or otherwise disrupting silica-containing materials away from others.

#### How to Avoid Silica Exposure

- Use safer alternatives steel shot or glass beads for abrasive blasting operations.
- Avoid creating dust scoop materials rather than pouring them.
- Wetting the work piece or area while cutting, grinding, and similar operations. Apply a fine mist at the point of operation to prevent dusts from becoming airborne.

# How to Avoid Silica Exposure

- Clean up with care.
- Don't sweep dry materials or use air to blow surfaces clean.
- Use vacuums with high-efficiency particulate air (HEPA) filtration, or squeegees, and sweeping compound.
- Use local exhaust ventilation; change the filters regularly.
- Use barriers and enclosures.



# Silica Training

- In a language the employee understands.
- Using words and terms "at a level of understanding" that the employee comprehends (i.e.: avoiding terms that are too technical or over-the-heads of workers).
- Without relying on written training materials if employees cannot read.

The training requirement is performance-based. This means that during an OSHA inspection, compliance will be judged based on an employee's ability to "perform," or demonstrate knowledge of the rules.

# Silica Training

- Health hazards
- Tasks that could result in exposure
- Exposure control methods
- Medical surveillance

A full hour of training, on average, is expected for all covered workers.

OSHA says they don't care exactly how you do it, but they want to see your employees being able to show that they can provide this basic information.

#### **Steps to Managing Health Risks**

Identify the Hazard

Assess the Risk

Eliminate or Control Risks

Ensure Knowledge and Understanding

#### **Spot the Hazard**

- Undertaking workplace inspections
- Investigating complaints and incidents
- Conducting safety audits
- Monitoring the work environment
- Observing work practices

#### • Consulting with staff

#### **Assess the Risks**

- Evaluate the likelihood of an injury or illness occurring and the likely severity of that injury or illness, using a risk assessment matrix to assign a risk rating.
- Identify the factors that may be contributing to the risk.



#### **Effective Training**

Provide regularly-scheduled environmental, safety and health training for workers throughout all shifts.

Develop and update training materials based on industry standards, hazard assessments and needs assessments.

Incorporate a mechanism to test transfer of knowledge.