



ASBESTOS OPERATIONS AND MAINTENANCE SAFETY PROGRAM

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## Objective

- Asbestos is a broad term to describe a group of naturally occurring silicate minerals. These minerals have been integrated into thousands of building products due to the functional and versatile properties they retain. The commonly found forms of asbestos are chrysotile, amosite and tremolite. Asbestos minerals have many properties that make it an ideal ingredient in multiple building products. For example, these properties include high heat resistance, electrical resistance, high tensile strength and the ability to be woven. *However, asbestos exposure has been well documented to cause many adverse health effects.*

The most common form of asbestos is chrysotile. This mineral is primarily mined in Canada and is shipped worldwide to be used in many products. Chrysotile is a long fibrous mineral in its natural state. Tremolite asbestos is a very common mineral found primarily in vermiculite insulation. Vermiculite insulation is found usually in the attic and walls of older homes. The asbestos mineral amosite is known as “being hard to wet” due to its very short needle like fibers.

Exposure to airborne asbestos fibers can lead to the development of an asbestos related disease. Asbestosis is the first recognized disease associated with asbestos exposure. Asbestosis is known as the “scarring of the air sacs.” Asbestos exposure can lead to a rare form of cancer called mesothelioma. Lung cancer has been connected to asbestos exposure and is complicated by cigarette smoking.

## Purpose

- The purpose of the Asbestos Operations and Maintenance Program is to ensure that Case Western Reserve University (CWRU) employees are equipped with the knowledge, skill and experience to identify and control potential exposure to airborne asbestos fibers during daily activities.

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## 1.0 Definitions

- Aggressive method means removal or disturbance of building material by sanding, abrading, grinding or other methods that breaks, crumbles or disintegrates intact asbestos-containing material (ACM).
- Amended water means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.
- Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos and any of these minerals that has been chemically treated and/or altered. For purposes of this standard, asbestos includes presumed asbestos-containing material (PACM), as defined below.
- Asbestos-containing material (ACM) means any material containing more than one percent asbestos.
- Authorized person means any person authorized by the employer and required by work duties to be present in regulated areas.
- Building/facility owner is the legal entity, including a lessee, which exercises control over management and record keeping functions relating to a building and/or facility in which activities covered by this standard take place.
- Certified industrial hygienist (CIH) means one certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.
- Class I asbestos work means activities involving the removal of thermal system insulation (TSI) and surfacing ACM and PACM.
- Class II asbestos work means activities involving the removal of ACM which is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles and construction mastics.
- Class III asbestos work means repair and maintenance operations where ACM, including TSI, surfacing ACM and PACM, is likely to be disturbed.
- Class IV asbestos work means maintenance and custodial activities during which employees contact, but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II and III activities.
- Clean room means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

- Closely resemble means that the major workplace conditions which have contributed to the levels of historic asbestos exposure are no more protective than conditions of the current workplace.
- Competent person means, in addition to the definition in 29 CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure and who has the authority to take prompt corrective measures to eliminate them as specified in 29 CFR 1926.32(f). In addition, for Class I and Class II work, a competent person means anyone who is specially trained in a training course which meets the criteria of the Environmental Protection Agency's (EPA) Model Accreditation Plan (40 CFR 763) for supervisors, or its equivalent. For Class III and Class IV work, a competent person means anyone who is trained in a manner consistent with EPA requirements for the training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92 (a)(2).
- Critical barrier means one or more layers of plastic is sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.
- Decontamination area means an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area and clean room, which is used for the decontamination of workers, materials and equipment that are contaminated with asbestos.
- Disturbance means activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM and PACM no greater than the amount which can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.
- Employee exposure means exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.
- Fiber means a particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.
- Glovebag means not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around ACM with glove-like appendages through which material and tools may be handled.
- High-efficiency particulate air (HEPA) filter means a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

- Homogeneous area means an area of surfacing material or thermal system insulation that is uniform in color and texture.
- Industrial hygienist means a professional qualified by education, training and experience who is able to anticipate, recognize, evaluate and develop controls for occupational health hazards.
- Intact means that the ACM has not crumbled, been pulverized or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.
- Modification for purposes of paragraph (g)(6)(ii), means a changed or altered procedure, material or component of a control system which replaces a procedure, material or component of a required system. Omitting a procedure or component, or reducing or diminishing the stringency or strength of a material or component of the control system, is not a "modification" for purposes of paragraph (g)(6) of this section.
- Negative initial exposure assessment means a demonstration by the employer, which complies with the criteria in paragraph (f)(2)(iii) of this section, that employee exposure during an operation is or will be expected to be consistently below PEL (Permissible Exposure Limit).
- PACM means "presumed asbestos-containing material."
- PACM means thermal system insulation and surfacing material found in buildings constructed no later than 1980. The designation of a material as PACM may be rebutted pursuant to paragraph (k)(5) of this section.
- Regulated area means an area established by the employer to demarcate areas where Class I, II and III asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate. It also indicates a work area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed PEL.
- Removal means all operations where ACM and/or PACM are taken out or stripped from structures or substrates and include demolition operations.
- Renovation means the modifying of any existing structure or portion thereof.
- Repair means overhauling, rebuilding, reconstructing or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.
- Surfacing material means material that is sprayed, troweled-on or otherwise applied to surfaces, i.e., acoustical plaster on ceilings and fireproofing materials on structural members or other materials on surfaces for acoustical, fireproofing

and other purposes.

- Surfacing ACM means surfacing material which contains more than one percent asbestos.
- Thermal system insulation (TSI) means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.
- TSI ACM is thermal system insulation which contains more than one percent asbestos.

## 2.0 Methods of Compliance

- Classification System: The Occupational Safety and Health Administration (OSHA) has established a classification system for construction work in which the disturbance of ACM will occur. The OSHA standard dealing with asbestos in construction is 29 CFR 1926.1101. The level of engineering controls, work practices, training and personal protective equipment (PPE) depends on the type of materials to be removed. OSHA classifies asbestos work into the following categories:
  - Class I asbestos work means activities involving the removal of TSI and surfacing ACM and PACM.
  - Class II asbestos work means activities involving the removal of ACM which is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles and construction mastics.
  - Class III asbestos work means repair and maintenance operations, where ACM, including TSI and surfacing ACM and PACM, is likely to be disturbed.
  - Class IV asbestos work means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II and III activities.
  - All Class I and II activities must be performed by a licensed asbestos abatement contractor utilizing licensed workers and supervisors. Asbestos work must follow all applicable local, state and federal regulations.
  - Under no circumstances should Class I or II activities be performed by CWRU personnel. CWRU personnel will have the appropriate training to perform Class III operations and maintenance procedures on asbestos containing materials. Class III activities being performed on Class I materials, such as TSI and surfacing materials, shall be performed within mini-enclosures, glovebag systems or other acceptable isolation methods.

## 3.0 Training

- Class Operations
  - Contractor Training for Class I operations and for Class II operations that require the use of critical barriers (or equivalent isolation methods) and/or negative pressure enclosures shall be the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement workers training (40 CFR Part 763, subpart E, appendix C).

- Other Class II training that specifically involves activities dealing with asbestos containing roofing materials, flooring materials, siding materials, ceiling tiles or transite panels shall include, at a minimum, all the elements included in paragraph (k)(9)(viii) of the OSHA standard 29 CFR 1926.1101 and, in addition, the specific work practices and engineering controls set forth in the standard relating to that category. Such training courses shall include "hands-on" training and shall take at least eight hours.
- Training for Class III employees shall be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth in the EPA's Asbestos Hazard Emergency Response Act (AHERA) Standard 40 CFR 763.92(a)(2). Such a course shall also include hands-on training and shall take at least 16 hours. CWRU will provide this training at no cost to the employee. All CWRU employees who anticipate having to deal with asbestos containing material during normal maintenance routines will be provided this training.
- Training for employees performing Class IV operations shall be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth in the EPA's AHERA Standard 40 CFR 763.92(a)(1). Such a course shall include available information concerning the locations of TSI and surfacing ACM/PACM and any asbestos-containing flooring material or flooring material where the absence of asbestos has not yet been certified. Instruction in recognition of damage, deterioration and delamination of asbestos containing building material shall also be taught. Such course shall take at least two hours.

#### **4.0 Occupant Notification**

- Persons Who Should Be Notified of Asbestos Hazards
  - CWRU shall notify the appropriate persons of the presence, location and quantity of ACM or PACM at the work sites in their buildings and facilities. Notification shall either be in writing or consist of a personal communication between CWRU and the person to whom the notification must be given or their authorized representatives. The following persons are to be notified:
    - tenants of the space



- outside contractors
  - CWRU employees working in the area
  - all employers and their employees if the area is part of a multi-employer worksite as stated in 29 CFR 1926.1101 (k)(1).
- CWRU shall perform asbestos related activities during those times that are the least disruptive to the areas' occupants. CWRU will attempt to provide at minimum, a 24-hour notice prior to proceeding with Class III asbestos activities.

## 5.0 Work Practices

- Implementation
  - CWRU employees shall implement the work practices defined in 29 CFR 1926.1101(g)(1)(i-iii). These work practices include the use of a vacuum equipped with a HEPA filter, wet methods and prompt clean-up of debris. These work practices will be followed every time asbestos containing materials are disturbed. CWRU will utilize work practices that will maintain the asbestos containing material in an intact state when possible.
  - When performing Class III activities where no negative exposure assessment has been made, CWRU employees will perform the following:
    - HEPA vacuums, wet methods, and prompt clean-up will be employed.
    - The work area will be regulated with barrier tape and an asbestos danger sign.
    - Critical barriers will be sealed within the regulated area to isolate the work. If the work involves the disturbance of Class I materials, mini enclosures or glovebags shall be used to isolate the work.
    - A decontamination area will be established adjacent to the regulated work area and will consist of a piece of polyethylene sheeting on the floor.
    - The work shall be performed utilizing local exhaust ventilation as feasible.
    - Drop cloths will be placed on the floor directly beneath the work area.

- Polyethylene sheeting may be used to cover the contents within the regulated work area.
- CWRU employees will utilize PPE such as respirators equipped with HEPA filters, disposable suits, gloves, safety glasses, etc.
- CWRU will conduct OSHA personal air monitoring during these activities.
- When performing Class III activities where a negative exposure assessment has been made, CWRU employees will perform the following:
  - The work area will be regulated with barrier tape and an asbestos danger sign
  - HEPA vacuums, wet methods and prompt clean-up will be employed.
  - The work shall be performed utilizing local exhaust ventilation. This may be in the form of tools equipped with HEPA filtration systems.
  - Drop cloths will be placed on the floor directly beneath the work area.
  - Polyethylene sheeting may be used to cover the contents within the regulated work area.
- Employees conducting Class IV asbestos work must have attended an asbestos awareness training program. They must use wet methods and HEPA vacuums to promptly clean asbestos-containing or presumed asbestos-containing debris. When cleaning debris and waste in regulated areas, employees must wear respirators. In areas where thermal system insulation or surfacing material is present, workers must assume that all waste and debris contain asbestos.

## **6.0 Engineering Controls**

- CWRU employees are only trained to perform OSHA Class III work and have received operations and maintenance training consistent with 29 CFR 1926.1101 (k)(9)(v) of the OSHA standard. In addition to the engineering controls listed in 29 CFR 1926.1101 (g) (1)(i-iii) which include wet methods, use of HEPA filtered vacuums and prompt clean up, CWRU will also utilize engineering controls which will minimize the exposure to employees performing asbestos work. To the extent feasible, the work shall be performed utilizing local exhaust ventilation. If the work being performed by CWRU exposes the employee to limits above permissible exposure or for which a negative exposure assessment has not been completed, the work area shall be contained with impermeable drop cloths and

polyethylene barriers. Mini enclosures or glovebag systems will be utilized to contain Class III activities involving TSI and surfacing materials.

## **7.0 Record Keeping**

- In accordance with 29 CFR 1910.1020, exposure monitoring data utilized to establish a negative exposure assessment shall be maintained by CWRU for at least 30 years from the time in which it was collected. All data utilized to identify asbestos containing materials found on the campus of CWRU will be kept for the life of the building. The records of CWRU employees that are in a medical surveillance program shall be maintained by CWRU for the employee's duration of employment plus an additional 30 years. Employees' training records shall be maintained by CWRU for one year past the last date of employment.

## **8.0 Worker Protection**

- Clothing and Health Requirements
  - CWRU will supply all necessary equipment and PPE to employees dealing with asbestos containing materials. Examples of necessary equipment include, but are not limited to:
    - polyethylene sheeting
    - duct tape
    - HEPA vacuums or HEPA equipped tools
    - caution tape
    - asbestos danger signs
    - water sprayers
  - PPE required to deal with asbestos containing materials will be provided to the employee at no cost. PPE may include: respirators, HEPA filters, safety glasses, gloves, disposable suits, hearing protection, etc.
  - If a CWRU employee is issued a negative pressure respirator he/she will be included into CWRU respiratory protection program. The employee will be required to undergo a physical examination in compliance with

OSHA's respiratory protection standard 29 CFR 1910.134 in order to determine if the employee will be able to function normally while utilizing the respirator. Every employee issued a negative pressure respirator will also undergo fit testing to ensure that the respirator seal is adequate. The medical monitoring program and respirator fit testing will occur on an annual basis.

## **9.0 Initial Exposure/Negative Exposure Assessment**

- Monitoring/Assessment
  - CWRU shall perform monitoring to accurately determine the airborne concentration of asbestos to which employees may be exposed. Determinations of employees exposure will be made from samples collected from the employees breathing zone that are representative of the eight hour time weighted average (8hr TWA) and 30 minute short term exposures of the employee. The CWRU's employee that is designated as the competent person shall be responsible for collecting the personal air samples.
  - The permissible exposure limit for asbestos is 0.1 fibers per cubic centimeter (F/CC) and the short term excursion limit is 1.0 f/cc over a 30 minute time frame as defined by OSHA. A negative exposure assessment is considered complete when all of the monitoring data is below the 0.1 f/cc PEL and the 1.0 f/cc excursion limit. A negative exposure assessment will remain valid for 12 months from the date which it was performed. The negative exposure assessment will remain valid for all projects that closely resemble the processes, type of material, control methods, work practices and environmental conditions in the current operations. All employees performing the work shall have the same training and experience of those employees sampled. CWRU will make available to the employee or their designated representative the opportunity to observe any monitoring of employee exposure to asbestos.

## **10.0 Emergencies**

- When performing emergency Class III operations where a negative exposure assessment has not been performed, CWRU employees shall follow the procedures listed in section 5.0 Work Practices of this program for Class III activities where no negative exposure assessment has been performed.

## 11.0 References

- OSHA 29 CFR 1926.1101 – Asbestos Construction Standard
- OSHA 29 CFR 1910.134 – Respiratory Protection Standard
- OSHA 29 CFR 1910.1020 – Access to Employee Exposure and Medical Records
- EPA 40 CFR 763 – Asbestos Hazard Emergency Response Act

### Appendix B OSHA Quick Reference of Provisions by Work Class\*

	Class I	Class II	Class III (CWRU Employees)	Class IV
Definition	Removal of thermal system insulation (TSI) and surfacing material (SM) containing > 1% asbestos	Removal of material other than TSI or SM containing > 1% asbestos	Maintenance and repair operations disturbing material containing > 1% asbestos	Housekeeping and custodial cleanup of dust, waste, and debris from Class I, II, or III activities
Regulated Areas	Required (warning signs mandatory)	Required (warning signs mandatory)	Required (warning signs mandatory)	Required (warning signs mandatory)
Competent person	<ul style="list-style-type: none"> <li>•Must be onsite</li> <li>•Must inspect each work shift</li> <li>•Must attend supervisory training</li> </ul>	<ul style="list-style-type: none"> <li>•Must be onsite</li> <li>•Must inspect often</li> <li>•Must attend supervisory training</li> </ul>	<ul style="list-style-type: none"> <li>•Must be onsite</li> <li>•Must inspect often</li> <li>•Must attend operational and maintenance training</li> </ul>	<ul style="list-style-type: none"> <li>•Must be onsite</li> <li>•Must inspect often</li> <li>•Must attend operational and maintenance training</li> </ul>
Air Monitoring	<ul style="list-style-type: none"> <li>•Initial if no negative exposure assessment (NEA)</li> <li>•Daily unless positive pressure mode respirator is used</li> <li>•Additional if conditions change</li> <li><b>Note:</b> Terminate if &lt; permissible exposure limits (PELs)</li> </ul>	<ul style="list-style-type: none"> <li>•Initial if no NEA</li> <li>•Daily unless positive pressure mode respirator is used</li> <li>•Additional if conditions change</li> <li><b>Note:</b> Terminate if &lt; PELs</li> </ul>	<ul style="list-style-type: none"> <li>•Initial if no NEA</li> <li>•Periodic to accurately predict if &gt; PELs</li> <li>•Additional if conditions change</li> <li><b>Note:</b> Terminate if &lt; PELs</li> </ul>	<ul style="list-style-type: none"> <li>•Initial if no NEA</li> <li>•Periodic to accurately predict if &gt; PELs</li> <li>•Additional if conditions change</li> <li><b>Note:</b> Terminate if &lt; PELs</li> </ul>
Medical > Surveillance	Required if Wearing negative- pressure respirator, or > 30 days of work/year	Required if Wearing negative-pressure respirator, or > 30 days of work/year	Required if Wearing negative-pressure respirator, or > 30 days of work/year	Required if Wearing negative-pressure respirator, or > PEL for more than 30 days/year
Respirators	Mandatory for all Class I jobs	Mandatory if <ul style="list-style-type: none"> <li>•Non-intact removal, or</li> <li>•No NEA, or</li> <li>•&gt; PEL, or</li> <li>•Dry removal (except for roofing), or</li> <li>•In emergencies</li> </ul>	Mandatory if <ul style="list-style-type: none"> <li>•No NEA, or</li> <li>•TSI or SM disturbed, or</li> <li>•&gt; PEL, or</li> <li>•Dry removal (except for roofing), or</li> <li>•In emergencies</li> </ul>	Mandatory <ul style="list-style-type: none"> <li>•In regulated area where required, or</li> <li>•If &gt; PEL, or</li> <li>•In emergencies</li> </ul>
Protective Clothing and Equipment	Required for all jobs if <ul style="list-style-type: none"> <li>•&gt; 25 linear or 10 square feet of TSI or</li> <li>•SM removal, or</li> <li>•No NEA, or</li> <li>•&gt; PEL</li> </ul>	Required for all jobs if <ul style="list-style-type: none"> <li>•No NEA, or</li> <li>•&gt; PEL</li> </ul>	Required for all jobs if <ul style="list-style-type: none"> <li>•No NEA, or</li> <li>•&gt; PEL</li> </ul>	Required for all jobs if <ul style="list-style-type: none"> <li>•No NEA, or</li> <li>•&gt; PEL</li> </ul>
Training	Equivalent to EPA Model Accreditation Plan (MAP) asbestos abatement workers course	Equivalent to MAP course if critical barriers required; otherwise, train on specific work practices and engineering controls that must be used	Equivalent to AHERA course for maintenance and custodial staff	Equivalent to AHERA course for maintenance and custodial staff

Employee and Equipment Decontamination	<p>Required if &gt; 25 linear or 10 square feet TSI or SM removal</p> <ul style="list-style-type: none"> <li>•Full decon unit</li> <li>•Equipment room, shower, and clean room in series connected to the regulated area; other decon facility arrangements are acceptable if the specified series arrangement is not feasible (see 29 CFR Part 1926.1101, Subpart Z)</li> <li>•Lunch areas</li> </ul> <p><b>Note:</b> Must follow detailed decontamination procedures (see 29 CFR Part 1926.1101(j)(1)(iii) If &lt; 25 linear or 10 square feet TSI or SM removal</p> <ul style="list-style-type: none"> <li>•Equipment room/area required</li> <li>•Impermeable drop cloths required</li> <li>•Area must accommodate cleanup</li> <li>•Must decontaminate all personal protective equipment (PPE)</li> <li>•Must enter regulated area through equipment room/decon area</li> <li>No smoking in work area</li> </ul>	<p>If &gt; PEL or no NEA</p> <p>Equipment room/area required</p> <p>Impermeable drop cloths required</p> <p>Area must accommodate cleanup</p> <p>Must clean work clothes with HEPA vacuum before removal</p> <p>Must Decontaminate all PPE</p> <p>Must enter regulated area through equipment room/decon area</p> <p>Must enter regulated area through equipment room/decon area</p> <p>No smoking in work area</p>	<p>&gt; PEL or no NEA</p> <p>Equipment room/area required</p> <p>Impermeable drop cloths required</p> <p>Area must accommodate cleanup</p> <p>Must clean work clothes with HEPA vacuum before removal</p> <p>Must Decontaminate all PPE</p> <p>Must enter regulated area through equipment room/decon area</p> <p>Must enter regulated area through equipment room/decon area</p> <p>NEA must vacuum</p> <p>No smoking in work area</p>	<p>If cleaning up asbestos containing surfacing material or thermal system insulation debris from a Class I or III activity after the activity is finished</p> <ul style="list-style-type: none"> <li>•Equipment room/area required</li> <li>•Drop cloths required</li> <li>•Area must accommodate cleanup</li> <li>•Must clean work clothes with HEPA vacuum before removal</li> <li>•Must decontaminate all PPE</li> <li>•Must enter regulated area through equipment room/decon area</li> </ul> <p>No smoking in work area</p> <p><b>Note:</b> If cleaning up dust, waste, and debris while a Class I, II, or III activity is still in progress, the requirements of that activity apply.</p>
Generally Required Work Practices and Engineering Controls	<ul style="list-style-type: none"> <li>•Wet methods</li> <li>•HEPA vacuum</li> <li>•Prompt cleanup/disposal</li> </ul>	<ul style="list-style-type: none"> <li>•Wet methods</li> <li>•HEPA vacuum</li> <li>•Prompt cleanup/disposal</li> </ul>	<ul style="list-style-type: none"> <li>•Wet methods</li> <li>•HEPA vacuum</li> <li>•Prompt cleanup/disposal</li> </ul>	<ul style="list-style-type: none"> <li>•Wet methods</li> <li>•HEPA vacuum</li> <li>•Prompt cleanup/disposal</li> </ul>
Required Work Practices and Engineering Controls to Comply with PELs	<ul style="list-style-type: none"> <li>•HEPA local exhaust</li> <li>•Enclosure or isolation</li> <li>•Directed ventilation</li> <li>•Other work practices</li> <li>•Respirators</li> </ul>	<ul style="list-style-type: none"> <li>•HEPA local exhaust</li> <li>•Enclosure</li> <li>•Directed ventilation</li> <li>•Other work practices</li> <li>•Respirators</li> </ul>	<ul style="list-style-type: none"> <li>•HEPA local exhaust</li> <li>•Enclosure</li> <li>•Directed ventilation</li> <li>•Other work practices</li> <li>•Respirators</li> </ul>	<ul style="list-style-type: none"> <li>•HEPA local exhaust</li> <li>•Enclosure</li> <li>•Directed ventilation</li> <li>•Other work practices</li> <li>•Respirators</li> </ul>
Prohibited Work Practices and Administrative Controls	<ul style="list-style-type: none"> <li>•High-speed abrasive disc saws without HEPA</li> <li>•Compressed air without capture device</li> <li>•Dry sweeping/shoveling</li> </ul>	<ul style="list-style-type: none"> <li>•High-speed abrasive disc saws without HEPA</li> <li>•Compressed air without capture device</li> <li>•Dry sweeping/shoveling</li> </ul>	<ul style="list-style-type: none"> <li>•High-speed abrasive disc saws without HEPA</li> <li>•Compressed air without capture device</li> <li>•Dry sweeping/shoveling</li> </ul>	<ul style="list-style-type: none"> <li>•High-speed abrasive disc saws without HEPA</li> <li>•Compressed air without capture device</li> <li>•Employee rotation</li> </ul>
Controls and Work Practices	<ul style="list-style-type: none"> <li>•Critical barriers/isolation methods required if</li> <li>• &gt; 25 linear or 10 square feet of TSI or SM removal</li> <li>• &lt; 25 linear or 10 square feet of TSI or SM removal only if no NEA or there are adjacent workers</li> <li>•HVAC isolation required</li> <li>•Impermeable drop cloths required</li> <li>•Directed ventilation required if no NEA or &gt; a PEL</li> <li>•Objects must be covered</li> </ul> <p>One or more of the following controls must be used:</p> <ul style="list-style-type: none"> <li>•Negative-pressure enclosure</li> <li>•Glove bag</li> <li>•Negative-pressure glove bag</li> <li>•Negative pressure glove box</li> <li>•Water spray process</li> <li>•Mini enclosure</li> </ul>	<p>For indoor work only</p> <ul style="list-style-type: none"> <li>•Critical barriers/isolation methods required if</li> <li>• no NEA</li> <li>• likely &gt; a PEL</li> <li>• non-intact removal</li> <li>•Impermeable drop cloths required</li> </ul> <p>For removal of vinyl and asphalt flooring materials</p> <ul style="list-style-type: none"> <li>•No sanding</li> <li>•HEPA vacuum</li> <li>•Wet methods</li> <li>•No dry sweeping</li> <li>•Any mechanical chipping must be done in negative-pressure enclosure</li> <li>•Intact removal if possible</li> <li>•Dry heat removal allowed</li> <li>•Assume contains asbestos without an analysis</li> </ul> <p>For removal of roofing materials</p> <ul style="list-style-type: none"> <li>•Intact removal if possible</li> <li>•Wet methods if feasible</li> <li>•Cutting machine misting</li> <li>•HEPA-vacuum debris</li> </ul>	<ul style="list-style-type: none"> <li>•Critical barriers required</li> <li>• If no NEA</li> <li>• &gt; Pel via monitoring</li> <li>•Impermeable drop cloths required</li> <li>•Local HEPA exhaust required</li> </ul> <p><b>Note:</b> Enclosure or isolation of operation required if TSI or SM is drilled, cut, abraded, sanded, sawed, or chipped</p>	<p>See Generally Required Work Practices and Engineering Controls in this table</p>

		<ul style="list-style-type: none"> <li>•Lower to ground as soon as possible but no later than day's end</li> <li>•Control dust of unbagged material</li> <li>•Prevent intake of airborne asbestos&lt; through roof vent system Class II</li> </ul> <p>For removal of cement-like siding, shingles, or transite panels</p> <ul style="list-style-type: none"> <li>•Intact removal if possible</li> <li>•Wet Methods</li> <li>•Lower to ground via dust-tight chute, crane, or hoist immediately or place in an impervious waste bag or wrap in plastic sheeting and lower to ground by day's end</li> <li>•Cut nail heads For removal of gaskets</li> <li>•Use glove bags if not intact</li> <li>•Wet removal</li> <li>•Prompt disposal</li> <li>•Wet scraping</li> </ul> <p>Additional requirements</p> <ul style="list-style-type: none"> <li>•Wet methods</li> <li>•Intact removal if possible</li> <li>•Cutting, abrading, or breaking prohibited</li> </ul>		
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