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PART 1

**OSHA Requirements – Asbestos
(Course #13085) • 4 hours**

(Approved for 2 hours for Master Plumber, Master Plumber-Restricted, Master Plumber-Restricted Appliance, Journeyman Plumber, Journeyman Plumber-Restricted, Journeyman Plumber – Restricted Appliance, POWTS Inspector, POWTS Maintainer, Soil Tester, UDC-Plumbing Inspector, Utility Contractor, Commercial Plumbing Inspector, and Cross Connection Control Tester.)

DISCLAIMER NOTE: This course is APPROVED by the Wisconsin Department of safety and professional services for continuing education to renew your plumbing license and is not intended to replace or supersede any state or local adopted codes.

OSHA Requirements – Asbestos

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Introduction

What is asbestos?

Asbestos is the generic term for a group of naturally occurring, fibrous minerals with high tensile strength, flexibility, and resistance to heat, chemicals, and electricity.

In the construction industry, asbestos is found in installed products such as sprayed-on fireproofing, pipe insulation, floor tiles, cement pipe and sheet, roofing felts and shingles, ceiling tiles, fire-resistant drywall, drywall joint compounds, and acoustical products. Because very few asbestos containing products are being installed today, most worker exposures occur during the removal of asbestos and the renovation and maintenance of buildings and structures containing asbestos.

What are the dangers of asbestos exposure?

Asbestos fibers enter the body when a person inhales or ingests airborne particles that become embedded in the tissues of the respiratory or digestive systems. Exposure to asbestos can cause disabling or fatal diseases such as asbestosis, an emphysema-like condition; lung cancer; mesothelioma, a cancerous tumor that spreads rapidly in the cells of membranes covering the lungs and body organs; and gastrointestinal cancer. The symptoms of these diseases generally do not appear for 20 or more years after initial exposure.

What activities does this course cover?

The OSHA asbestos standard for the construction industry regulates asbestos exposure for the following activities:

- Demolishing or salvaging structures where asbestos is present.
- Removing or encapsulating asbestos-containing material (ACM).
- Constructing, altering, repairing, maintaining, or renovating asbestos-containing structures or substrates.
- Installing asbestos-containing products.
- Cleaning up asbestos spills/emergencies.
- Transporting, disposing, storing, containing, and housekeeping involving asbestos or asbestos-containing products on a construction site.

Note: The standard does not apply to asbestos-containing asphalt roof coatings, cements, and mastics.

Part 1 Exam Questions:

1. **Asbestos is a term for a group of naturally occurring, fibrous minerals with the following:**
 - a. High tensile strength
 - b. Flexibility
 - c. Resistance to heat
 - d. All of the above
2. **Because very few asbestos containing products are being installed today, most worker exposures occur during the removal of asbestos.**
 - a. True
 - b. False
3. **Asbestos fibers enter the body when a person inhales or ingests airborne particles that become embedded in the tissues of the respiratory or digestive systems.**
 - a. True
 - b. False
4. **Exposure to asbestos is never fatal.**
 - a. True
 - b. False
5. **The symptoms of asbestos related diseases generally appear quickly after initial exposure.**
 - a. True
 - b. False
6. **ACM is an acronym for:**
 - a. Asbestos Cleaning Material
 - b. Asbestos Compliance Manual
 - c. Asbestos Containing Material
 - d. None of the above

Provisions of the OSHA Standard

OSHA has established strict exposure limits and requirements for exposure assessment, medical surveillance, recordkeeping, competent persons, regulated areas, and hazard communication.

What is work classification?

The OSHA standard establishes a classification system for asbestos construction work that spells out mandatory, simple, technological work practices that employers must follow to reduce worker exposures. Under this system, the following four classes of construction work are matched with increasingly stringent control requirements:

- **Class I** asbestos work is the most potentially hazardous class of asbestos jobs. This work involves the removal of asbestos-containing thermal system insulation and sprayed-on or troweled-on surfacing materials. Employers must presume that thermal system insulation and surfacing material found in pre-1981 construction is ACM. That presumption, however, is rebuttable. If you believe that the surfacing material or thermal system insulation is not ACM, the OSHA standard specifies the means that you must use to rebut that presumption. Thermal system insulation includes ACM applied to pipes, boilers, tanks, ducts, or other structural components to prevent heat loss or gain. Surfacing materials include decorative plaster on ceilings and walls; acoustical materials on decking, walls, and ceilings; and fireproofing on structural members.
- **Class II** work includes the removal of other types of ACM that are not thermal system insulation such as resilient flooring and roofing materials. Examples of *Class II* work include removal of asbestos-containing floor or ceiling tiles, siding, roofing, or transite panels.
- **Class III** asbestos work includes repair and maintenance operations where ACM or presumed ACM (PACM) are disturbed.
- **Class IV** work includes custodial activities where employees clean up asbestos-containing waste and debris produced by construction, maintenance, or repair activities. This work involves cleaning dust-contaminated surfaces, vacuuming contaminated carpets, mopping floors, and cleaning up ACM or PACM from thermal system insulation or surfacing material.

What is the permissible exposure limit for asbestos?

Employers must ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 f/cc as an 8-hour time-weighted average (TWA). In addition, employees must not be exposed to an airborne concentration of asbestos in excess of 1 f/cc as averaged over a sampling period of 30 minutes.

Which asbestos operations must employers monitor and assess?

Employers must assess all asbestos operations for the potential to generate airborne fibers, and use exposure monitoring data to assess employee exposures. You must also designate a competent person to help ensure the safety and health of your workers.

What is the function of a *competent person*?

On all construction sites with asbestos operations, employers must designate a competent person—one who can identify asbestos hazards in the workplace and has the authority to correct them. This person must be qualified and authorized to ensure worker safety and health as required by *Subpart C, General Safety and Health Provisions for Construction* (29 CFR Part 1926.20). Under these requirements for safety and health prevention programs, the competent person must frequently inspect job sites, materials, and equipment.

The competent person must attend a comprehensive training course for contractors and supervisors certified by the U.S. Environmental Protection Agency (EPA) or a state approved training provider or a complete a course that is equivalent in length and content.

For Class III and IV asbestos work, training must include a course equivalent in length, stringency, and content to the 16-hour Operations and Maintenance course developed by EPA for maintenance and custodial workers. For more specific information, see 40 CFR Part 763.92(a)(2).

What is an initial exposure assessment?

To determine expected exposures, a competent person must perform an initial exposure assessment to assess exposures immediately before or as the operation begins. This person must perform the assessment in time to comply with all standard requirements triggered by exposure data or the lack of a negative exposure assessment and to provide the necessary information to ensure all control systems are appropriate and work properly. A negative exposure assessment demonstrates that employee exposure during an operation is consistently below the permissible exposure limit (PEL).

The initial exposure assessment must be based on the following criteria:

- Results of employee exposure monitoring, unless a negative exposure assessment has been made; and
- Observations, information, or calculations indicating employee exposure to asbestos, including any previous monitoring.

For *Class I* asbestos work, until employers document that employees will not be exposed in excess of the 8-hour TWA PEL and short-term exposure limit STEL, employers must assume that employee exposures are above those limits.

What is a negative exposure assessment?

For any specific asbestos job that trained employees perform, employers may show that exposures will be below the PELs (i.e., negative exposure assessment) through the following:

- Objective data demonstrating that ACM, or activities involving it, cannot release airborne fibers in excess of the 8-hour TWA PEL or STEL;
- Exposure data obtained within the past 12 months from prior monitoring of work operations closely resembling the employer's current work operations (the work operations that were previously monitored must have been conducted by employees whose training and experience were no more extensive than that of current employees, and the data must show a high degree of certainty that employee exposures will not exceed the 8-hour TWA PEL or STEL under current conditions); or
- Current initial exposure monitoring that used breathing zone air samples representing the 8-hour TWA and 30-minute short-term exposures for each employee in those operations most likely to result in exposures over the 8-hour TWA PEL for the entire asbestos job.

Are employers required to perform exposure monitoring?

Yes. Employers must determine employee exposure measurements from breathing zone air samples representing the 8-hour TWA and 30-minute short-term exposures for each employee.

Employers must take one or more samples representing full-shift exposure to determine the 8-hour TWA exposure in each work area. To determine short-term employee exposures, you must take one or more samples representing 30-minute exposures for the operations most likely to expose employees above the excursion limit in each work area.

You must also allow affected employees and their designated representatives to observe any employee exposure monitoring. When observation requires entry into a regulated area, you must provide and require the use of protective clothing and equipment.

Part 1 Exam Questions:

7. Which classification is for the most potentially hazardous of asbestos jobs?

- a. Class I
- b. Class II
- c. Class III
- d. Class IV

8. _____ asbestos work includes repair and maintenance operations where ACM or presumed ACM are disturbed.

- a. Class I
- b. Class II
- c. Class III
- d. Class IV

9. Removal of asbestos containing floor or ceiling tiles is considered the following work?
- Class I
 - Class II
 - Class III
 - Class IV
10. This work involves cleaning dust-contaminated surfaces, vacuuming contaminated carpets, and cleaning up ACM from thermal system insulation.
- Class I
 - Class II
 - Class II
 - Class IV
11. Employees must not be exposed to an airborne concentration of asbestos in excess of 1 f/cc as averaged over a sampling period of ____.
- 10 minutes
 - 20 minutes
 - 30 minutes
 - 40 minutes
12. For *Class III and IV* asbestos work, training must include a course equivalent in length, stringency, and content to the 16-hour *Operations and Maintenance* course developed by EPA for maintenance and custodial workers.
- True
 - False
13. A negative exposure assessment demonstrates that employee exposure during an operation is consistently above the permissible exposure limit.
- True
 - False
14. Employers must allow affected employees and their designated representatives to observe any employee exposure monitoring.
- True
 - False

When must employers conduct periodic monitoring?

For *Class I and II* jobs, employers must conduct monitoring daily that is representative of each employee working in a regulated area, unless you have produced a negative exposure assessment for the entire operation and nothing has changed. When all employees use supplied-air respirators operated in positive-pressure mode, however, you may discontinue daily monitoring. When employees perform *Class I* work using control methods not recommended in the standard, you must continue daily monitoring even when employees use supplied-air respirators.

For operations other than *Class I and II*, employers must monitor all work where exposures can possibly exceed the PEL often enough to validate the exposure prediction.

If periodic monitoring shows that certain employee exposures are below the 8-hour TWA PEL and the STEL, you may discontinue monitoring these employees' exposures.

Is additional monitoring ever needed?

Changes in processes, control equipment, personnel, or work practices that could result in new or additional exposures above the 8-hour TWA PEL or STEL require additional monitoring regardless of a previous negative exposure assessment for a specific job.

Are employers required to establish medical surveillance programs for employees?

It depends. Employers must provide a medical surveillance program for all employees who do the following:

- Engage in *Class I, II, or III* work or are exposed at or above the PEL or STEL for a combined total of 30 or more days per year; or
- Wear negative-pressure respirators.

In addition, a licensed physician must perform or supervise all medical exams and procedures that you provide at no cost to your employees and at a reasonable time.

Employers must make medical exams and consultations available to employees as follows:

- Prior to employee assignment to an area where negative pressure respirators are worn;
- Within 10 working days after the 30th day of combined engagement in *Class I, II, and III* work and exposure at or above a PEL, and at least annually thereafter; and
- When an examining physician suggests them more frequently.

If an employee was examined within the past 12 months and that exam meets the criteria of the standard, however, another medical exam is not required. Medical exams must include the following:

- Medical and work histories;
- Completion of a standardized questionnaire with the initial exam and an abbreviated standardized questionnaire with annual exams;
- Physical exam focusing on the pulmonary and gastrointestinal systems; and
- Any other exams or tests deemed necessary by the examining physician.

Employers must provide the examining physician with the following:

- Copy of OSHA's asbestos standard and its appendices D, E, and I;
- Description of the affected employee's duties relating to exposure;
- Employee's representative exposure level or anticipated exposure level;
- Description of any personal protective equipment and respiratory equipment used; and
- Information from previous medical exams not otherwise available.

It is the employer's responsibility to obtain the physician's written opinion containing results of the medical exam as well as the following information:

- Any medical conditions of the employee that increase health risks from asbestos exposure.
- Any recommended limitations on the employee or protective equipment used.
- A statement that the employee has been informed of the results of the medical exam and any medical conditions resulting from asbestos exposure.
- A statement that the employee has been informed of the increased risk of lung cancer from the combined effect of smoking and asbestos exposure.

Note: A physician's written opinion must not reveal specific findings or diagnoses unrelated to occupational exposure to asbestos. You must provide a copy of the physician's written opinion to the employee involved within 30 days after receipt.

Do employers have to keep any employee records?

Yes. Employers must maintain employee records concerning objective data, exposure monitoring, and medical surveillance.

If using **objective data** to demonstrate that products made from or containing asbestos cannot release fibers in concentrations at or above the PEL or STEL, employers must keep an accurate record for as long as it is relied on and include the following information:

- Exempt products.
- Objective data source.
- Testing protocol, test results, and analysis of the material for release of asbestos.
- Exempt operation and support data descriptions.
- Relevant data for operations, materials, processes, or employee exposures.

Employers must keep records of all employee *exposure monitoring* for at least 30 years, including following information:

- Date of measurement.
- Operation involving asbestos exposure that you monitored.
- Methods of sampling and analysis that you used and evidence of their accuracy.
- Number, duration, and results of samples taken.
- Type of protective devices worn.
- Name, social security number, and exposures of the employees involved.

Employers must also make exposure records available when requested to affected employees, former employees, their designated representatives, and/or OSHA's Assistant Secretary.

In addition to retaining a copy of the information provided to the examining physician, employers must keep all medical surveillance records for the duration of an employee's employment plus 30 years, including the following information:

- Employee's name and social security number.
- Employee's medical exam results, including the medical history, questionnaires, responses, test results, and physician's recommendations.
- Physician's written opinions.
- Employee's medical complaints related to asbestos exposure.

Employers must also make employees' medical surveillance records available to them, as well as to anyone having specific written consent of an employee, and to OSHA's Assistant Secretary.

Also, employers must maintain other records. Employers must maintain all employee training records for 1 year beyond the last date of employment.

If data demonstrate ACM does not contain asbestos, building owners or employers must keep associated records for as long as they rely on them. Building owners must maintain written notifications on the identification, location, and quantity of any ACM or PACM for the duration of ownership, and transfer the records to successive owners.

When employers cease to do business without a successor to keep their records, employers must notify the Director of the National Institute for Occupational Safety and Health (NIOSH) at least 90 days prior to their disposal and transmit them as requested.

What is a regulated area?

A regulated area is a marked-off site where employees work with asbestos, including any adjoining areas where debris and waste from asbestos work accumulates or where airborne concentrations of asbestos exceed, or can possibly exceed, the PEL.

All *Class I, II, and III* asbestos work, or any other operations where airborne asbestos exceeds the PEL, must be performed within regulated areas. Only persons permitted by an employer and required by work duties to be present in regulated areas may enter a regulated area. The designated *competent person* supervises all asbestos work performed in this area.

Employers must mark off the regulated area in a manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne asbestos. You may use critical barriers (i.e., plastic sheeting placed over all openings to the work area to prevent airborne asbestos from migrating to an adjacent area) or negative pressure enclosures to mark off a regulated area.

Posted warning signs demarcating the area must be easily readable and understandable. The signs must bear the following information:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORY AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA**

Employers must supply a respirator to all persons entering regulated areas. (See respiratory protection requirements elsewhere in this booklet.) Employees must not eat, drink, smoke, chew (tobacco or gum), or apply cosmetics in regulated areas.

An employer performing work in a regulated area must inform other employers onsite of the following:

- Nature of the work,
- Regulated area requirements, and
- Measures taken to protect onsite employees.

The contractor creating or controlling the source of asbestos contamination must abate the hazards. All employers with employees working near regulated areas, must daily assess the enclosure's integrity or the effectiveness of control methods to prevent airborne asbestos from migrating.

General contractors on a construction project must oversee all asbestos work, even though they may not be the designated *competent person*. As supervisor of the entire project, the general contractor determines whether asbestos contractors comply with the standard and ensures that they correct any problems.

Who is responsible for communicating asbestos hazards at worksites?

The communication of asbestos hazards is vital to prevent further overexposure. Most asbestos-related construction involves previously installed building materials. Building/facility owners often are the only or best source of information concerning these materials.

Building/facility owners, as well as employers of workers who may be exposed to asbestos hazards, have specific duties under the standard.

Before work begins, building/facility owners must identify all thermal system insulation at the worksite, sprayed or troweled-on surfacing materials in buildings, and resilient flooring material installed before 1981. They also must notify the following persons of the presence, location, and quantity of ACM or PACM:

- Prospective employers applying or bidding for work in or adjacent to areas containing asbestos.
- Building owners' employees who work in or adjacent to these areas.
- Other employers on multi-employer worksites with employees working in or adjacent to these areas.
- All tenants who will occupy the areas containing ACM.

Employers discovering ACM on a worksite must notify the building/facility owner and other employers onsite within 24 hours regarding its presence, location, and quantity. You also must inform owners and employees working in nearby areas of the precautions taken to confine airborne asbestos. Within 10 days of project completion, you must inform building/facility owners and other employers onsite of the current locations and quantities of remaining ACM and any final monitoring results.

At any time, employers or building and facility owners may demonstrate that a PACM does not contain asbestos by inspecting the material in accordance with the requirements of the *Asbestos Hazard Emergency Response Act* (AHERA) (40 CFR Part 763, Subpart E) or by performing tests of bulk samples collected in the manner described in 40 CFR Part 763.86.

Employers do not have to inform employees of asbestos free building materials present; however, you must retain the information, data, and analysis supporting the determination.

Does the OSHA standard require the posting of warning signs?

Yes. At the entrance to mechanical rooms or areas with ACM or PACM, the building/facility owner must post signs identifying the material present, its specific location, and appropriate work practices that ensure it is not disturbed.

Also, employers must post warning signs in regulated areas to inform employees of the dangers and necessary protective steps to take before entering. (See the regulated area requirements elsewhere in this publication.)

Must employers provide asbestos warning labels?

Employers must attach warning labels to all products and containers of asbestos, including waste containers, and all installed asbestos products, when possible. Labels must be printed in large, bold letters on a contrasting background and used in accordance with **OSHA's Hazard Communication Standard**. All labels must contain a warning statement against breathing asbestos fibers and contain the following legend:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD**

Labels are not required if asbestos is present in concentrations less than 1 percent by weight. They also are not required if bonding agents, coatings, or binders have altered asbestos fibers, prohibiting the release of airborne asbestos over the PEL or STEL during reasonable use, handling, storage, disposal, processing, or transportation.

When building owners or employers identify previously installed asbestos or PACM, employers must attach or post clearly noticeable and readable labels or signs to inform employees which materials contain asbestos.

Do employers have to train employees regarding asbestos exposure?

Yes. Employers must provide a free training program for all employees who are likely to be exposed in excess of a PEL and for all employees performing *Class I* through *IV* asbestos operations. Employees must be trained prior to or at initial assignment and at least annually thereafter. Training courses must be easily understandable and include the following information:

- Ways to recognize asbestos.
- Adverse health effects of asbestos exposure.
- Relationship between smoking and asbestos in causing lung cancer.
- Operations that could result in asbestos exposure and the importance of protective controls to minimize exposure.
- Purpose, proper use, fitting instruction, and limitations of respirators.
- Appropriate work practices for performing asbestos jobs.
- Medical surveillance program requirements.
- Contents of the standard.
- Names, addresses, and phone numbers of public health organizations that provide information and materials or conduct smoking cessation programs.
- Sign and label requirements and the meaning of their legends.
- Written materials relating to employee training and selfhelp smoking cessation programs at no cost to employees.

Also, the following additional training requirements apply depending on the work class involved:

- 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, training must be equivalent in curriculum, method, and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training.
- For employees performing *Class II* operations involving one generic category of building materials containing asbestos (e.g., roofing, flooring, or siding materials or transite panels), training may be covered in an 8-hour course that includes hands-on experience.

- For *Class III* operations, training must be equivalent in curriculum and method to the 16-hour Operations and Maintenance course developed by EPA for maintenance and custodial workers whose work disturbs ACM. The course must include hands-on training on proper respirator use and work practices.
- For *Class IV* operations, training must be equivalent in curriculum and method to EPA awareness training. Training must focus on the locations of ACM or PACM and the ways to recognize damage and deterioration and avoid exposure. The course must be at least 2 hours in length.

Note: Employers must provide OSHA's Assistant Secretary and the Director of NIOSH all information and training materials as requested.

Part 1 Exam Questions:

- For *Class I and II* jobs, employers must conduct monitoring _____ that is representative of each employee working in a regulated area.
 - Hourly
 - Daily
 - Weekly
 - Monthly
- Employers must provide a medical surveillance program for all employees who do the following:
 - Are exposed above the permissible exposure limit
 - Wear negative-pressure respirators
 - Engage in Class III work
 - All of the above
- A licensed physician must perform or supervise all medical exams provided by the employer _____.
 - At no cost to the employee
 - Not to exceed \$100
 - At the employers cost
 - None of the above
- Employers must provide the examining physician with the following:
 - Copy of OSHA's asbestos standards
 - Description of the employees duties
 - Employee's represented exposure level
 - All of the above
- The employer must provide a copy of the physician's written opinion to the employee involved with _____ after receipt.
 - 7 days
 - 14 days
 - 30 days
 - 60 days
- Employers must keep records of all employee *exposure monitoring* for at least _____.
 - 20 years
 - 30 years
 - 40 years
 - 50 years
- Employers are not required to make exposure records available when requested to affected employees.
 - True
 - False
- Employers must maintain all employee training records for _____ beyond the last date of employment.
 - 1 year
 - 10 years
 - 20 years
 - 30 years
- A regulated area is a marked-off site where employees work with asbestos.
 - True
 - False
- Which of the following work must be performed within regulated areas?
 - Class I
 - Class II
 - Class III
 - All of the above
- Employers are not required to supply a respirator to all persons entering regulated areas.
 - True
 - False

26. Before work begins, building owners must identify all thermal system insulation at the worksite, sprayed-on surfacing materials in buildings, and resilient flooring material installed before ____.
- 1961
 - 1971
 - 1981
 - 1991
27. Within ____ of project completion, you must inform building owners of the current locations and quantities of remaining ACM and any final monitoring results.
- 10 days
 - 14 days
 - 21 days
 - 30 days
28. At the entrance to mechanical rooms or areas with ACM, the building owner must post signs identifying the following:
- Material present
 - Specific location
 - Appropriate work practices to ensure it is not disturbed
 - All of the above
29. Labels are not required if asbestos is present in concentrations less than ____ by weight.
- 1%
 - 2%
 - 3%
 - 4%
30. Employers must provide a free training program for all employees who are likely to be exposed in excess of a permissible exposure limits.
- True
 - False

Methods of Compliance

What methods must employers use to control asbestos exposure levels?

For all covered work, employers must use the following control methods to comply with the PEL and STEL:

- Local exhaust ventilation equipped with HEPA-filter dust collection systems (a high-efficiency particulate air [HEPA] filter is capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter).
- Enclosure or isolation of processes producing asbestos dust.
- Ventilation of the regulated area to move contaminated air away from the employees' breathing zone and toward a filtration or collection device equipped with a HEPA filter.
- Feasible engineering and work practice controls to reduce exposure to the lowest possible levels, supplemented by respirators to reach the PEL or STEL or lower.

Employers must use the following engineering controls and work practices for all operations regardless of exposure levels:

- Vacuum cleaners equipped with HEPA filters to collect all asbestos-containing or presumed asbestos-containing debris and dust.
- Wet methods or wetting agents to control employee exposures except when infeasible (e.g., due to the creation of electrical hazards, equipment malfunction, and slipping hazards).
- Prompt cleanup and disposal in leak-tight containers of asbestos-contaminated wastes and debris.

The following work practices and engineering controls are *prohibited* for all asbestos-related work or work that disturbs asbestos or PACM regardless of measured exposure levels or the results of initial exposure assessments:

- High-speed abrasive disc saws not equipped with a point-of-cut ventilator or enclosure with HEPA-filtered exhaust air.
- Compressed air to remove asbestos or ACM unless the compressed air is used with an enclosed ventilation system.

- Dry sweeping, shoveling, or other dry cleanup of dust and debris.
- Employee rotation to reduce exposure.

In addition, OSHA's asbestos standard has specific requirements for each class of asbestos work in construction.

What are the compliance requirements for *Class I* work?

A designated *competent person* must supervise all *Class I* work, including installing and operating the control system. The *competent person* must inspect onsite at least once during each work shift and upon employee request.

Employers must place critical barriers over all openings to regulated areas or use another barrier or isolation method to prevent airborne asbestos from migrating for the following jobs:

- All *Class I* jobs removing more than 25 linear or 10 square feet of thermal system insulation or surfacing material.
- All other *Class I* jobs without a negative exposure assessment.
- All jobs where employees are working in areas adjacent to a *Class I* regulated area.

If using other barriers or isolation methods instead of critical barriers, employers must perform perimeter area surveillance during each work shift. No asbestos dust should be visible. Perimeter monitoring must show that clearance levels are met or that perimeter area levels are no greater than background levels.

Employers must ensure the following for all *Class I* jobs:

- Isolating heating, ventilating, and air-conditioning (HVAC) systems in regulated areas by sealing with a double layer of 6 mil plastic or the equivalent.
- Placing impermeable drop cloths on surfaces beneath all removal activity.
- Covering and securing all objects within the regulated area with impermeable drop cloths or plastic sheeting.
- Ventilating the regulated area to move the contaminated air away from the employee breathing zone and toward a HEPA filtration or collection device for jobs without a negative exposure assessment or where exposure monitoring shows the PEL is exceeded.

In addition, employees performing *Class I* work must use one or more of the following control methods:

- Negative-pressure enclosure systems when the configuration of the work area does not make it infeasible to erect the enclosure.
- Glove bag systems to remove ACM or PACM from piping.
- Negative-pressure glove bag systems to remove asbestos or PACM from piping.
- Negative-pressure glove box systems to remove asbestos or ACM from pipe runs.
- Water spray process systems to remove asbestos or PACM from cold-line piping if employees carrying out the process have completed a 40-hour training course on its use in addition to training required for all employees performing *Class I* work.
- Small walk-in enclosure that accommodates no more than 2 people (mini-enclosure) if the disturbance or removal can be completely contained by the enclosure.

For the specifications, limitations, and recommended work practices of these required control methods, refer to *Occupational Exposure to Asbestos*, 29 CFR Part 1926.1101. Employers may use different or modified engineering and work practice controls if they adhere to the following provisions:

- Control method encloses, contains, or isolates the process or source of airborne asbestos dust, or captures and redirects the dust before it enters into the employees' breathing zone.
- Certified industrial hygienist or licensed professional engineer qualified as a project designer evaluates the work area, the projected work practices, and the engineering controls and certifies, in writing, that based on evaluations and data the planned control method adequately reduces direct and indirect employee

exposure to or below the PEL under worst-case conditions. The planned control method also must prevent asbestos contamination outside the regulated area, as measured by sampling meeting the requirements of the *EPA Asbestos in Schools* rule or perimeter monitoring.

- Employer sends a copy of the evaluation and certification to the OSHA National Office, Office of Technical Support, Room N3653, 200 Constitution Avenue, N.W., Washington, DC 20210, before using alternative methods to remove more than 25 linear or 10 square feet of thermal system insulation or surfacing material.

What are the compliance requirements for *Class II* work?

In addition to all indoor *Class II* jobs without a negative exposure assessment, employers must use critical barriers over all openings to the regulated area or another barrier or isolation method to prevent airborne asbestos from migrating for the following:

- When changing conditions indicate exposure above the PEL, or
- When ACM is not removed substantially intact.

If using other barriers or isolation methods instead of critical barriers, employers must perform perimeter area monitoring to verify that the barrier works properly. In addition, impermeable drop cloths must cover all surfaces beneath removal activities.

All *Class II* asbestos work can use the same work practices and requirements as *Class I* asbestos jobs. Alternatively, *Class II* work can be performed using work practices set out in the standard for specific jobs.

For removing vinyl and asphalt flooring materials containing asbestos or installed in buildings constructed before 1981 and not verified as asbestos-free, employers must ensure that workers observe the following:

- Do not sand flooring or its backing,
- Do not rip up resilient sheeting,
- Do not dry sweep,
- Perform mechanical chipping only in a negative-pressure enclosure,
- Use vacuums equipped with HEPA filters to clean floors,
- Remove resilient sheeting by cutting with wetting of the snip point and wetting during delamination,
- Use wet methods to scrape residual adhesives and/or backing,
- Remove tiles intact, unless impossible (you may omit wetting when tiles are heated and removed intact), and
- Assume resilient flooring material—including associated mastic and backing—is asbestos-containing unless an industrial hygienist determines that it is asbestos-free.

To remove asbestos-containing roofing materials, employers must ensure that workers do the following:

- Remove them intact if feasible,
- Use wet methods when intact removal is infeasible, and
- Mist cutting machines continuously during use, unless the *competent person* determines misting to be unsafe.

When removing built-up roofs using a power roof cutter employers must ensure that workers observe the following procedures:

- Use power cutters equipped with HEPA dust collectors or perform HEPA vacuuming along the cut line for roofs that have asbestos-containing roofing felts and an aggregate surface.
- Use power cutters equipped with HEPA dust collectors, or perform HEPA vacuuming along the cut line, or gently sweep along the cut line and then carefully and completely wipe up the still-wet dust and debris that was acquired for roofs that have asbestos-containing roofing felts and a smooth surface.
- Do not drop or throw to the ground ACM that has been removed from a roof.
- Carry or pass the ACM to the ground by hand, or lower the material to the ground via covered, dust-tight chute, crane or hoist.

- Lower both intact ACM and non-intact ACM to the ground as soon as it is practicable, but no later than the end of the work shift.
- Keep material wet if it is not intact, or place it in impermeable waste bags, or wrap it in plastic sheeting while it remains on the roof.
- Lower to the ground, as soon as possible or by the end of the work shift, any unwrapped or unbagged roofing material using a covered, dust-tight chute, crane, or hoist.
- Place unwrapped materials in closed containers to prevent scattering dust after the materials reach the ground.
- Isolate roof level heating and ventilation air intake sources or shut down the ventilation system.

When removing cement-like asbestos-containing siding or shingles, or asbestos-containing transite panels on building exteriors other than roofs, employers must ensure that employees adhere to the following:

- Do not cut, abrade, or break siding, shingles, or transite panels unless methods less likely to result in asbestos fiber release cannot be used;
- Spray each panel or shingle with amended water before removing (amended water is water to which a surfactant [wetting agent] has been added to increase the ability of the liquid to penetrate ACM);
- Lower immediately to the ground any unwrapped or unbagged panels or shingles using a covered dust-tight chute, crane, or hoist, or place them in an impervious waste bag or wrap them in plastic sheeting and lower them to the ground no later than the end of the work shift; and
- Cut nails with flat, sharp instruments.

When removing asbestos-containing gaskets, employers must ensure that employees do the following:

- Remove gaskets within glove bags if they are visibly deteriorated and unlikely to be removed intact;
- Wet the gaskets thoroughly with amended water prior to removing;
- Place the wet gaskets in a disposal container immediately; and
- Keep the residue wet if removed by scraping.

For removal of any other *Class II* ACM, employers must ensure that employees observe the following:

- Do not cut, abrade, or break the material unless infeasible;
- Wet the material thoroughly with amended water before and during removal;
- Remove the material intact, if possible; and
- Bag or wrap removed ACM immediately or keep it wet until transferred to a closed receptacle no later than the end of the work shift.

Employers may use different or modified engineering and work practice controls under the following conditions:

- If they can demonstrate that employee exposure will not exceed the PEL under any anticipated circumstances; and
- If a *competent person* evaluates the work area, the projected work practices, and the engineering controls and certifies, in writing, that these different or modified controls will reduce all employee exposure to or below the PELs under all expected conditions of use and that they meet the requirements of the standard. This evaluation must include, and be based on, data representing employee exposure during use of the controls under conditions closely resembling those of the current job. Also, the employees participating in the evaluation must not have better training and more experience than that of the employees who are to perform the current job.

What are the compliance requirements for *Class III* work?

Employers must use wet methods and local exhaust ventilation, to the extent feasible, during *Class III* work. When drilling, cutting, abrading, sanding, chipping, breaking, or sawing of asbestos-containing thermal system insulation or surfacing materials occurs, employers must use impermeable drop cloths as well as mini-enclosures, glove bag systems, or other effective isolation methods and ensure that workers wear respirators. If

the material is not thermal system insulation or surfacing material and a negative exposure assessment has not been produced or monitoring shows the PEL is exceeded, employers must contain the area with impermeable drop cloths and plastic barriers or other isolation methods and ensure that employees wear respirators. (See also respirator requirements elsewhere in this publication.) In addition, the competent person must inspect often enough to assess changing conditions and upon employee request.

What are the compliance requirements for *Class IV* work?

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.

Does the competent person have duties that apply to more than one work class?

Yes. For *Class II, III, and IV* jobs, the competent person must inspect often enough to assess changing conditions and upon employee request.

For *Class I or II* asbestos work, the competent person must ensure the integrity of the enclosures or other containments by onsite inspection and supervise the following activities:

- Setup of regulated areas, enclosures, or other containments.
- Setup procedures to control entry to and exit from the enclosure or area.
- Employee exposure monitoring by ensuring it is properly conducted.
- Use of required protective clothing and equipment by employees working within the enclosure or using glove bags (a plastic bag-like enclosure affixed around ACM, with glove-like appendages through which materials and tools may be handled).
- Setup, removal, and performance of engineering controls, work practices, and personal protective equipment through onsite inspection.
- Use of hygiene facilities by employees.
- Required decontamination procedures.
- Notification requirements.

What does the OSHA standard require concerning respirators?

Employees must use respirators during the following activities:

- *Class I* asbestos jobs.
- *Class II* work where ACM is not removed substantially intact.
- *Class II and III* work not using wet methods.
- *Class II and III* work without a negative exposure assessment.
- *Class III* jobs where thermal system insulation or surfacing ACM or PACM is cut, abraded, or broken.
- *Class IV* work within a regulated area where respirators are required.
- Work where employees are exposed above the TWA or excursion limit.
- Emergencies.

Employers must provide respirators at no cost to workers, selecting the appropriate type from among those certified by NIOSH.

Employers must provide employees performing *Class I* work with full-face piece supplied air respirators operated in pressure-demand mode and equipped with an auxiliary positive-pressure, self-contained breathing apparatus when exposure levels exceed 1 f/cc as an 8-hour TWA.

Employers must provide half-mask purifying respirators—other than disposable respirators—equipped with high efficiency filters for *Class II and III* asbestos jobs where work disturbs thermal system insulation or surfacing ACM or PACM.

If a particular job is not *Class I, II, or III* and exposures are above the PEL or STEL, the asbestos standard, 29 CFR Part 1926.1101, contains a table specifying types of respirators to use.

According to 29 CFR Part 1910.134, employers must institute a respiratory program that includes the following:

- Procedures for selecting respirators for use in the workplace;
- Fit testing procedures for tight-fitting respirators;
- Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations;
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and maintaining respirators;
- Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators;
- Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations;
- Training of employees in the proper use and maintenance of respirators, including putting on and removing them, and any limitations on their use; and
- Procedures for regularly evaluating the effectiveness of the program.

With regard to fit testing, employers must do the following:

- Ensure that employees are fit tested with the same make, model, style, and size of respirator that they will be using;
- Ensure that employees using a tight-fitting face piece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT);
- Ensure that an employee using a tight-fitting face piece respirator is fit tested prior to initial use of the respirator, whenever a different size, style, model or make of respirator face piece is used, and at least annually thereafter.
- Conduct an additional fit test whenever an employee reports (or the employer, physician or other licensed health-care professional, supervisor, or program administrator makes) visual observations of changes in an employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

Employers must not assign any employee to tasks requiring respirator use who, based on the most recent physical exam and the examining physician's recommendations, would be unable to function normally. Employers must assign such employees to other jobs or give them the opportunity to transfer to different positions in the same geographical area and with the same seniority, status, pay rate, and job benefits as they had before transferring, if such positions are available.

Do employers have to provide protective clothing for employees?

Employers must provide and require the use of protective clothing—such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings—for the following:

- Employees exposed to airborne asbestos exceeding the PEL or STEL;
- Work without a negative exposure assessment; or
- Employees performing *Class I* work involving the removal of over 25 linear or 10 square feet of thermal system insulation or surfacing ACM or PACM.

Employers must ensure that the laundering of contaminated clothing does not release airborne asbestos in excess of the PEL or STEL. Employers who give contaminated clothing to other persons for laundering must inform them of the requirement to follow procedures that do not release airborne asbestos in excess of the PEL or STEL.

Employers must transport contaminated clothing in sealed, impermeable bags or other closed impermeable containers bearing appropriate labels.

The *competent person* must examine employee work suits at least once per work shift for rips or tears. Rips or tears found while an employee is working must be mended or the work suit replaced immediately.

What are the hygiene-related requirements for employees performing *Class I* asbestos work involving more than 25 linear feet or 10 square feet of thermal system insulation or surfacing ACM or PACM?

For this class of asbestos work, the requirements are as follows:

- Employers must create a decontamination area adjacent to and connected with the regulated area.
- Workers must enter and exit the regulated area through the decontamination area.

The decontamination area must include an equipment room, shower area, and clean room in series and comply with the following:

- Equipment room must have impermeable, labeled bags and containers to store and dispose of contaminated protective equipment.
- Shower area must be adjacent to both the equipment and clean rooms, unless work is performed outdoors or this arrangement is not feasible (in either case, employers must ensure that employees remove asbestos contamination from their worksuits in the equipment room using a HEPA vacuum before proceeding to a shower not adjacent to the work area or remove their contaminated worksuits in the equipment room, don clean worksuits, and proceed to a shower not adjacent to the work area).
- Clean room must have a locker or appropriate storage container for each employee.

Note: When it is not feasible to provide a change area adjacent to the work area, or when the work is performed outdoors, employees may clean protective clothing with a portable HEPA vacuum before leaving the regulated area. Employees then must shower and change into “street clothing” in a clean change area meeting the requirements described above.

To enter the regulated area, employees must pass through the equipment room. But before entering the regulated area, employees must do the following:

- Enter the decontamination area through the clean room.
- Remove and deposit street clothing within a provided locker.
- Put on protective clothing and respiratory protection before leaving the clean area.

Before exiting the regulated area, employees must do the following:

- Remove all gross contamination and debris.
- Remove protective clothing in the equipment room (depositing the clothing in labeled, impermeable bags or containers).
- Remove respirators in the shower and then shower before entering the clean room to change into “street clothing.”

Note: When workers consume food or beverages at the *Class I* worksite, employers must provide lunch areas with airborne asbestos levels below the PEL and/or excursion limit.

What are the hygiene-related requirements for employees performing other *Class I* asbestos work and *Class II* and *Class III* asbestos work where exposures exceed a PEL or where a negative exposure assessment has not been produced?

For this class of asbestos work, the requirements are as follows:

- Employers must establish an equipment room or area adjacent to the regulated area for the decontamination of employees and their equipment.

- Workers must cover area with an impermeable drop cloth on the floor or horizontal work surface and must be large enough to accommodate equipment cleaning and personal protective equipment removal without spreading contamination beyond the area.
- Workers must clean area with a HEPA vacuum before removing work clothing.
- Workers must clean all equipment and surfaces of containers filled with ACM before removal.
- Employers must ensure employees enter and exit the regulated area through the equipment room or area.

What are the hygiene-related requirements for employees performing *Class IV* work?

For this class of asbestos work, the requirements are as follows:

- Employers must ensure that workers cleaning up dust, waste, and debris while a *Class I, II, or III* activity is still in progress observe the hygiene practices required of the workers performing that activity.
- Workers cleaning up asbestos-containing surfacing material or thermal system insulation debris from a *Class I or III* activity after the activity is finished must be provided decontamination facilities required for *Class I* work involving less than 25 linear or 10 square feet of material, or for *Class III* work where exposure exceeds a PEL or no negative exposure assessment exists.

Note: For any class of asbestos work, employers must ensure that workers do not smoke in any work area with asbestos exposure.

What are an employer's housekeeping responsibilities?

Asbestos waste, scrap, debris, bags, containers, equipment, and contaminated clothing consigned for disposal must be collected and disposed of in sealed, labeled, impermeable bags or other closed, labeled impermeable containers. When vacuuming methods are selected, employees must use and empty HEPA-filtered vacuuming equipment carefully and in a way that will minimize asbestos reentry into the workplace.

Unless the building/facility owner demonstrates that the flooring does not contain asbestos, all vinyl and asphalt flooring material must be maintained in accordance with the following conditions:

- Sanding flooring material is prohibited.
- Employees stripping finishes must use wet methods and low abrasion pads at speeds lower than 300 revolutions per minute.
- Burnishing or dry buffing may be done only on flooring with enough finish that the pad cannot contact the flooring material.
- Employees must not dust, dry sweep, or vacuum without a HEPA filter in an area containing thermal system insulation or surfacing material or visibly deteriorated ACM.
- Employees must promptly clean up the waste and debris and accompanying dust, and dispose of it in leak-tight, labeled containers.

Part 1 Exam Questions:

31. The following work practices and engineering controls are required for all asbestos-related work:

- Dry sweeping
- Employee rotation to reduce exposure
- Compressed air to remove asbestos
- None of the above

32. Employers must ensure the following for all *Class I* jobs:

- Placing impermeable drop cloths on surfaces beneath all removal activity
- Isolating HVAC systems by sealing with plastic
- Ventilating the regulated area
- All of the above

33. For removing vinyl and asphalt flooring materials containing asbestos or installed in buildings constructed before 1981 and not verified as asbestos-free, employers must ensure that workers observe the following:
- Do not sand flooring
 - Do not dry sweep
 - Do not rip up resilient backing
 - All of the above
34. If using other barriers or isolation methods instead of critical barriers, employers must perform perimeter area monitoring to verify that the barrier works properly.
- True
 - False
35. During *Class III* work, employers must use the following to the extent feasible:
- Use wet methods
 - Use local exhaust ventilation
 - Both a & b
 - None of the above
36. Employees conducting *Class IV* asbestos work are not required to attend an asbestos awareness training program.
- True
 - False
37. Employees are not required to use respirators during *Class I* asbestos jobs.
- True
 - False
38. Employers must transport contaminated clothing in sealed, impermeable bags or other closed impermeable containers bearing appropriate labels.
- True
 - False
39. For *Class I* asbestos work involving more than 10 square feet, workers must enter and exit the regulated area through the decontamination area.
- True
 - False
40. For *Class I* asbestos work involving more than 10 square feet, the decontamination area must include the following:
- Equipment room
 - Shower area
 - Clean room
 - All of the above

[See Page 85 to fill out the Answer Sheet]
