

Asbestos Standard for the Construction Industry

OSHA 3096
2002 (Revised)



OSHA Occupational
Safety and Health
Administration

U.S. Department of Labor

This informational booklet provides a generic, non-exhaustive overview of a particular topic related to OSHA standards. It does not alter or determine compliance responsibilities in OSHA standards or the *Occupational Safety and Health Act of 1970*. Because interpretations and enforcement policy may change over time, you should consult current administrative interpretations and decisions by the Occupational Safety and Health Review Commission and the Courts for additional guidance on OSHA compliance requirements.

This publication is in the public domain and may be reproduced, fully or partially, without permission. Source credit is requested but not required.

This information is available to sensory impaired individuals upon request.

Voice phone: (202) 693-1999;
Teletypewriter (TTY) number: (877) 889-5627.

Asbestos Standard for the Construction Industry



U.S. Department of Labor
Elaine L. Chao, Secretary

Occupational Safety and Health Administration
John L. Henshaw, Assistant Secretary

OSHA 3096
2002 (Revised)

Contents

Introduction

What is asbestos?	1
What are the dangers of asbestos exposure?	1
What construction activities does this booklet cover?	1

Provisions of the OSHA Standard

What is work classification?	3
What is the permissible exposure limit for asbestos?	4
Which asbestos operations must employers monitor and assess?	4
What is the function of a <i>competent person</i> ?	4
What is an initial exposure assessment?	5
What is a negative exposure assessment?	6
Are employers required to perform exposure monitoring?	6
When must employers conduct periodic monitoring?	7
Is additional monitoring ever needed?	8
Are employers required to establish medical surveillance programs for employees?	8
Do employers have to keep any employee records?	10
What is a regulated area?	12
Who is responsible for communicating asbestos hazards at worksites?	14
Does the OSHA standard require the posting of warning signs?	15
Must employers provide asbestos warning labels?	16
Do employers have to train employees regarding asbestos exposure?	16

Methods of Compliance

What methods must employers use to control asbestos exposure levels?	19
What are the compliance requirements for Class I work?	20
What are the compliance requirements for Class II work?	23
What are the compliance requirements for Class III work?	27
What are the compliance requirements for Class IV work?	28
Does the competent person have duties that apply to more than one work class?	28
What does the OSHA standard require concerning respirators?	29
Do employers have to provide protective clothing for employees?	31
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?	32
What are the hygiene-related requirements for employees performing other Class I asbestos work and Class II and III asbestos work where exposures exceed a PEL or where a negative exposure assessment has not been produced?	34
What are the hygiene-related requirements for employees performing Class IV work?	35
What are an employer's housekeeping responsibilities?	35
Quick Reference of Provisions by Work Class	37

OSHA Assistance

What are safety and health system management guidelines?	43
What are state programs?	44
How do I obtain consultation services?	44

What are Voluntary Protection Programs (VPPs)?	45
What is the Strategic Partnership Program?	46
Does OSHA offer training and education?	46
Does OSHA provide any information electronically?	47
How do I learn more about related OSHA publications?	48
How do I contact OSHA about emergencies, complaints, or further assistance?	48

OSHA Office Directory

OSHA Regional Offices	49
OSHA Area Offices	50
OSHA-Approved State Plans	53
OSHA Consultation Projects	56

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 construction activities does this booklet cover?

The asbestos standard for the construction industry (29 CFR Part 1926.1101, see www.osha.gov) 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.

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.

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 (see 29 *CFR* Part 1926.1101, Appendix D, Part 1) and an abbreviated standardized questionnaire with annual exams (see 29 *CFR* Part 1926.1101, Appendix D, Part 2);
- 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. (See 29 *CFR* Part 1926.1101 for specific testing requirements.)

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. (See recordkeeping requirements elsewhere in this publication for more specific information.)

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* (29 CFR Part 1910.1200). 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 self-help 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 (see 40 *CFR* Part 763, Subpart E, Appendix C).

- 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 (see 40 *CFR* Part 763.92). 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 (see 29 *CFR* Part 1926.1101 for more information). 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.

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 (as contained in 40 *CFR* Part 763, Subpart E of the *EPA Asbestos in Schools* rule) 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-facepiece 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.

(See *Respiratory Protection*, *29 CFR Part 1910.134*, for complete program requirements.)

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 facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT);
- Ensure that an employee using a tight-fitting facepiece respirator is fit tested prior to initial use of the respirator, whenever a different size, style, model or make of respirator facepiece 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. (See the hazard communication section elsewhere in this publication for label requirements.)

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

For a quick reference to the OSHA standard's provisions by work class, please see the following table.

Quick Reference of Provisions by Work Class*

	Class I	Class II	Class III	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"> ■ Must be onsite ■ Must inspect each workshift ■ Must attend supervisory training 	<ul style="list-style-type: none"> ■ Must be onsite ■ Must inspect often ■ Must attend supervisory training 	<ul style="list-style-type: none"> ■ Must be onsite ■ Must inspect often ■ Must attend operational and maintenance training 	<ul style="list-style-type: none"> ■ Must be onsite ■ Must inspect often ■ Must attend operational and maintenance training
Air Monitoring	<ul style="list-style-type: none"> ■ Initial if no negative exposure assessment (NEA) ■ Daily unless positive pressure mode respirator is used ■ Additional if conditions change <p><i>Note:</i> Terminate if < permissible exposure limits (PELs)</p>	<ul style="list-style-type: none"> ■ Initial if no NEA ■ Daily unless positive pressure mode respirator is used ■ Additional if conditions change <p><i>Note:</i> Terminate if < PELs</p>	<ul style="list-style-type: none"> ■ Initial if no NEA ■ Periodic to accurately predict if > PELs ■ Additional if conditions change <p><i>Note:</i> Terminate if < PELs</p>	<ul style="list-style-type: none"> ■ Initial if no NEA ■ Periodic to accurately predict if > PELs ■ Additional if conditions change <p><i>Note:</i> Terminate if < PELs</p>

*This is an overview of the standards' requirements. You must consult the standard for the specifics of the requirements for each class.

Quick Reference of Provisions by Work Class* *(continued)*

	Class I	Class II	Class III	Class IV
Medical Surveillance	Required if <ul style="list-style-type: none"> ■ Wearing negative-pressure respirator, or ■ > 30 days of work/year 	Required if <ul style="list-style-type: none"> ■ Wearing negative-pressure respirator, or ■ > 30 days of work/year 	Required if <ul style="list-style-type: none"> ■ Wearing negative-pressure respirator, or ■ > 30 days of work/year 	Required if <ul style="list-style-type: none"> ■ 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"> ■ Non-intact removal, or ■ No NEA, or ■ > PEL, or ■ Dry removal (except for roofing), or ■ In emergencies 	Mandatory if <ul style="list-style-type: none"> ■ No NEA, or ■ TSI or SM disturbed, or ■ > PEL, or ■ Dry removal (except for roofing), or ■ In emergencies 	Mandatory <ul style="list-style-type: none"> ■ In regulated area where required, or ■ If > PEL, or ■ In emergencies
Protective Clothing and Equipment	Required for all jobs if <ul style="list-style-type: none"> ■ > 25 linear or 10 square feet of TSI or ■ SM removal, or ■ No NEA, or ■ > PEL 	Required for all jobs if <ul style="list-style-type: none"> ■ No NEA, or ■ > PEL 	Required for all jobs if <ul style="list-style-type: none"> ■ No NEA, or ■ > PEL 	Required for all jobs if <ul style="list-style-type: none"> ■ No NEA, or ■ > PEL
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

*This is an overview of the standards' requirements. You must consult the standard for the specifics of the requirements for each class.

Quick Reference of Provisions by Work Class* (continued)

	Class I	Class II	Class III	Class IV
Employee and Equipment Decontamination	<p>Required if > 25 linear or 10 square feet TSI or SM removal</p> <ul style="list-style-type: none"> ■ Full decon unit ■ 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) ■ Lunch areas <p><i>Note:</i> Must follow detailed decontamination procedures (see 29 CFR Part 1926.1101(j)(1)(iii))</p> <p>If < 25 linear or 10 square feet TSI or SM removal</p> <ul style="list-style-type: none"> ■ Equipment room/area required ■ Impermeable dropcloths required ■ Area must accommodate cleanup ■ Must decontaminate all personal protective equipment (PPE) ■ Must enter regulated area through equipment room/decon area <p>No smoking in work area</p>	<p>If > PEL or no NEA</p> <ul style="list-style-type: none"> ■ Equipment room/area required ■ Impermeable dropcloths required ■ Area must accommodate cleanup ■ Must clean work clothes with HEPA vacuum before removal ■ Must Decontaminate all PPE ■ Must enter regulated area through equipment room/decon area <p>No smoking in work area</p>	<p>If > PEL or no NEA</p> <ul style="list-style-type: none"> ■ Equipment room/area required ■ Impermeable dropcloths required ■ Area must accommodate cleanup ■ Must clean work clothes with HEPA vacuum before removal ■ Must Decontaminate all PPE ■ Must enter regulated area through equipment room/decon area <p>If 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"> ■ Equipment room/area required ■ Dropcloths required ■ Area must accommodate cleanup ■ Must clean work clothes with HEPA vacuum before removal ■ Must decontaminate all PPE ■ Must enter regulated area through equipment room/decon area <p>No smoking in work area</p> <p><i>Note:</i> 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>

*This is an overview of the standards' requirements. You must consult the standard for the specifics of the requirements for each class.

Quick Reference of Provisions by Work Class* *(continued)*

	Class I	Class II	Class III	Class IV
Generally Required Work Practices and Engineering Controls	<ul style="list-style-type: none"> ■ Wet methods ■ HEPA vacuum ■ Prompt cleanup/disposal 	<ul style="list-style-type: none"> ■ Wet methods ■ HEPA vacuum ■ Prompt cleanup/disposal 	<ul style="list-style-type: none"> ■ Wet methods ■ HEPA vacuum ■ Prompt cleanup/disposal 	<ul style="list-style-type: none"> ■ Wet methods ■ HEPA vacuum ■ Prompt cleanup/disposal
Required Work Practices and Engineering Controls to Comply with PELs	<ul style="list-style-type: none"> ■ HEPA local exhaust ■ Enclosure or isolation ■ Directed ventilation ■ Other work practices ■ Respirators 	<ul style="list-style-type: none"> ■ HEPA local exhaust ■ Enclosure ■ Directed ventilation ■ Other work practices ■ Respirators 	<ul style="list-style-type: none"> ■ HEPA local exhaust ■ Enclosure ■ Directed ventilation ■ Other work practices ■ Respirators 	<ul style="list-style-type: none"> ■ HEPA local exhaust ■ Enclosure ■ Directed ventilation ■ Other work practices ■ Respirators
Prohibited Work Practices and Administrative Controls	<ul style="list-style-type: none"> ■ High-speed abrasive disc saws without HEPA ■ Compressed air without capture device ■ Dry sweeping/shoveling 	<ul style="list-style-type: none"> ■ High-speed abrasive disc saws without HEPA ■ Compressed air without capture device ■ Dry sweeping/shoveling 	<ul style="list-style-type: none"> ■ High-speed abrasive disc saws without HEPA ■ Compressed air without capture device ■ Dry sweeping/shoveling 	<ul style="list-style-type: none"> ■ High-speed abrasive disc saws without HEPA ■ Compressed air without capture device ■ Employee rotation
Controls and Work Practices	<ul style="list-style-type: none"> ■ Critical barriers/isolation methods required if <ul style="list-style-type: none"> • > 25 linear or 10 square feet of TSI or SM removal • < 25 linear or 10 square feet of TSI or SM removal only if no NEA or there are adjacent workers ■ HVAC isolation required 	<p>For indoor work only</p> <ul style="list-style-type: none"> ■ Critical barriers/isolation methods required if <ul style="list-style-type: none"> • no NEA • likely > a PEL • non-intact removal ■ Impermeable dropcloths required 	<ul style="list-style-type: none"> ■ Critical barriers required <ul style="list-style-type: none"> • If no NEA • > Pel via monitoring ■ Impermeable dropcloths required ■ Local HEPA exhaust required 	<p>See <i>Generally Required Work Practices and Engineering Controls</i> in this table</p>

*This is an overview of the standards' requirements. You must consult the standard for the specifics of the requirements for each class.

Quick Reference of Provisions by Work Class* (continued)

Class I	Class II	Class III	Class IV
<p>Controls and Work Practices (continued)</p> <ul style="list-style-type: none"> ■ Impermeable dropcloths required ■ Directed ventilation required if no NEA or > a PEL ■ Objects must be covered <p>One or more of the following controls must be used:</p> <ul style="list-style-type: none"> ■ Negative-pressure enclosure ■ Glove bag ■ Negative-pressure glove bag ■ Negative pressure glove box ■ Water spray process ■ Mini enclosure 	<p>For removal of vinyl and asphalt flooring materials</p> <ul style="list-style-type: none"> ■ No sanding ■ HEPA vacuum ■ Wet methods ■ No dry sweeping ■ Any mechanical chipping must be done in negative-pressure enclosure ■ Intact removal if possible ■ Dry heat removal allowed ■ Assume contains asbestos without an analysis <p>For removal of roofing materials</p> <ul style="list-style-type: none"> ■ Intact removal if possible ■ Wet methods if feasible ■ Cutting machine misting ■ HEPA-vacuum debris ■ Lower to ground as soon as possible but no later than day's end ■ Control dust of unbagged material ■ Prevent intake of airborne asbestos through roof vent system 	<p><i>Note:</i> Enclosure or isolation of operation required if TSI or SM is drilled, cut, abraded, sanded, sawed, or chipped</p>	

*This is an overview of the standards' requirements. You must consult the standard for the specifics of the requirements for each class.

Quick Reference of Provisions by Work Class* *(continued)*

Class I	Class II	Class III	Class IV
Controls and Work Practices <i>(continued)</i>	For removal of cement-like siding, shingles, or transite panels <ul style="list-style-type: none"> ■ Intact removal if possible ■ Wet Methods ■ 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 ■ Cut nail heads For removal of gaskets <ul style="list-style-type: none"> ■ Use glove bags if not intact ■ Wet removal ■ Prompt disposal ■ Wet scraping Additional requirements <ul style="list-style-type: none"> ■ Wet methods ■ Intact removal if possible ■ Cutting, abrading, or breaking prohibited 		

*This is an overview of the standards' requirements. You must consult the standard for the specifics of the requirements for each class.

OSHA Assistance

OSHA can provide extensive help through a variety of programs, including technical assistance about effective safety and health programs, state plans, workplace consultations, voluntary protection programs, strategic partnerships, and training and education, and more. An overall commitment to workplace safety and health can add value to your business, to your workplace, and to your life.

What are safety and health system management guidelines?

Effective management of worker safety and health protection is a decisive factor in reducing the extent and severity of work-related injuries and illnesses and their related costs. In fact, an effective safety and health program forms the basis of good worker protection and can save time and money—about \$4 for every dollar spent—and increase productivity and reduce worker injuries, illnesses, and related worker compensation costs.

To assist employers and employees in developing effective safety and health programs, OSHA published recommended *Safety and Health Program Management Guidelines* (*Federal Register* 54(16): 3904-3916, January 26, 1989). These voluntary guidelines can be applied to all places of employment covered by OSHA.

The guidelines identify four general elements critical to the development of a successful safety and health management system:

- Management leadership and employee involvement,
- Worksite analysis,
- Hazard prevention and control, and
- Safety and health training.

The guidelines recommend specific actions, under each of these general elements, to achieve an effective safety and health program. The *Federal Register* notice is available online at www.osha.gov.

What are state programs?

The *Occupational Safety and Health Act of 1970* (OSH Act) encourages states to develop and operate their own job safety and health plans. OSHA approves and monitors these plans. There are currently 26 state plans: 23 cover both private and public (state and local government) employment; 3 states, Connecticut, New Jersey, and New York, cover the public sector only. States and territories with their own OSHA-approved occupational safety and health plans must adopt standards identical to, or at least as effective as, the federal standards.

How do I obtain consultation services?

Consultation assistance is available on request to employers who want help in establishing and maintaining a safe and healthful workplace. Largely funded by OSHA, the service is provided at no cost to the employer. Primarily developed for smaller employers with more hazardous operations, the consultation service is delivered by state governments employing professional safety and health consultants. Comprehensive assistance includes an appraisal of all mechanical systems, work practices, and occupational safety and health hazards of the workplace and all aspects of the employer's present job safety and health program. In addition, the service offers assistance to employers in developing and implementing an effective safety and health program. No penalties are proposed or citations issued for hazards identified by the consultant. OSHA provides consultation assistance to the employer with the assurance that his or her name and firm and any information about the

workplace will not be routinely reported to OSHA enforcement staff.

Under the consultation program, certain exemplary employers may request participation in OSHA's Safety and Health Achievement Recognition Program (SHARP). Eligibility for participation in SHARP includes receiving a comprehensive consultation visit, demonstrating exemplary achievements in workplace safety and health by abating all identified hazards, and developing an excellent safety and health program.

Employers accepted into SHARP may receive an exemption from programmed inspections (not complaint or accident investigation inspections) for a period of 1 year. For more information concerning consultation assistance, see the list of consultation projects listed at the end of this publication.

What are Voluntary Protection Programs (VPPs)?

Voluntary Protection Programs and onsite consultation services, when coupled with an effective enforcement program, expand worker protection to help meet the goals of the OSH Act. The three VPPs—Star, Merit, and Demonstration—are designed to recognize outstanding achievements by companies that have successfully incorporated comprehensive safety and health programs into their total management system. The VPPs motivate others to achieve excellent safety and health results in the same outstanding way as they establish a cooperative relationship between employers, employees, and OSHA.

For additional information on VPPs and how to apply, contact the OSHA regional offices listed at the end of this publication.

What is the Strategic Partnership Program?

OSHA's Strategic Partnership Program, the newest member of OSHA's cooperative programs, helps encourage, assist, and recognize the efforts of partners to eliminate serious workplace hazards and achieve a high level of worker safety and health. Whereas OSHA's Consultation Program and VPP entail one-on-one relationships between OSHA and individual worksites, most strategic partnerships seek to have a broader impact by building cooperative relationships with groups of employers and employees. These partnerships are voluntary, cooperative relationships between OSHA, employers, employee representatives, and others (e.g., trade unions, trade and professional associations, universities, and other government agencies).

For more information on this program, contact your nearest OSHA office, or visit OSHA's website at www.osha.gov.

Does OSHA offer training and education?

OSHA's area offices offer a variety of information services, such as compliance assistance, technical advice, publications, audiovisual aids and speakers for special engagements. OSHA's Training Institute in Des Plaines, IL, provides basic and advanced courses in safety and health for federal and state compliance officers, state consultants, federal agency personnel, and private sector employers, employees, and their representatives.

The OSHA Training Institute also has established OSHA Training Institute Education Centers to address the increased demand for its courses from the private sector and from other federal agencies. These centers are nonprofit colleges, universities, and other organizations that have been selected after a competition for participation in the program.

OSHA also provides funds to nonprofit organizations, through grants, to conduct workplace training and education in subjects where OSHA believes there is a lack of workplace training. Grants are awarded annually. Grant recipients are expected to contribute 20 percent of the total grant cost.

For more information on grants, training, and education, contact the OSHA Training Institute, Office of Training and Education, 1555 Times Drive, Des Plaines, IL 60018, (847) 297-4810. For further information on any OSHA program, contact your nearest OSHA area or regional office listed at the end of this publication.

Does OSHA provide any information electronically?

OSHA has a variety of materials and tools available on its website—www.osha.gov. These include e-Tools such as Expert Advisors, Electronic Compliance Assistance Tools (e-CATs), Technical Links; regulations, directives, publications; videos, and other information for employers and employees. OSHA's software programs and compliance assistance tools walk you through challenging safety and health issues and common problems to find the best solutions for your workplace.

OSHA's CD-ROM includes standards, interpretations, directives, and more and can be purchased on CD-ROM from the U.S. Government Printing Office. To order, write to the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 or phone (202) 512-1800.

How do I learn more about related OSHA publications?

OSHA has an extensive publications program. For a listing of free or sales items, visit OSHA's website at www.osha.gov or contact the OSHA Publications Office, U.S. Department of Labor, 200 Constitution Avenue, N.W., N-3101, Washington, DC 20210. Telephone (202) 693-1888 or fax to (202) 693-2498.

How do I contact OSHA about emergencies, complaints, or further assistance?

To report an emergency, file a complaint, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or contact your nearest OSHA regional or area office listed at the end of this publication. The teletypewriter (TTY) number is 1-877-889-5627.

You can also file a complaint online and obtain more information on OSHA federal and state programs by visiting OSHA's website at www.osha.gov.

For more information on grants, training, and education, contact the OSHA Training Institute, Office of Training and Education, 1555 Times Drive, Des Plaines, IL 60018, (847) 297-4810, or see **Outreach** on OSHA's website at www.osha.gov.

OSHA Office Directory

OSHA Regional Offices

Region I

(CT,* ME, MA, NH, RI, VT*)
JFK Federal Building, Room
E340
Boston, MA 02203
(617) 565-9860

Region II

(NJ,* NY,* PR,* VI*)
201 Varick Street, Room 670
New York, NY 10014
(212) 337-2378

Region III

(DE, DC, MD,* PA,* VA,* WV)
The Curtis Center
170 S. Independence Mall West
Suite 740 West
Philadelphia, PA 19106-3309
(215) 861-4900

Region IV

(AL, FL, GA, KY,* MS,
NC,* SC,* TN*)
SNAF
61 Forsyth Street SW, Room 6T50
Atlanta, GA 30303
(404) 562-2300

Region V

(IL, IN,* MI,* MN,* OH, WI)
230 South Dearborn Street,
Room 3244
Chicago, IL 60604
(312) 353-2220

Region VI

(AR, LA, NM,* OK, TX)
525 Griffin Street, Room 602
Dallas, TX 75202
(214) 767-4731 or 4736 x224

Region VII

(IA,* KS, MO, NE)
City Center Square
1100 Main Street, Suite 800
Kansas City, MO 64105
(816) 426-5861

Region VIII

(CO, MT, ND, SD, UT,* WY*)
1999 Broadway, Suite 1690
PO Box 46550
Denver, CO 80202-5716
(303) 844-1600

Region IX

(American Samoa, AZ,*
CA,* HI, NV,* Northern
Mariana Islands)
71 Stevenson Street, Room 420
San Francisco, CA 94105
(415) 975-4310

Region X

(AK,* ID, OR,* WA*)
1111 Third Avenue, Suite 715
Seattle, WA 98101-3212
(206) 553-5930

*These states and territories operate their own OSHA-approved job safety and health programs (Connecticut, New Jersey, and New York plans cover public employees only). States with approved programs must have a standard that is identical to, or at least as effective as, the federal standard.

OSHA Area Offices

Anchorage, AK
(907) 271-5152

Birmingham, AL
(205) 731-1534

Mobile, AL
(251) 441-6131

Little Rock, AR
(501) 324-6291(5818)

Phoenix, AZ
(602) 640-2348

Sacramento, CA
(916) 566-7471

San Diego, CA
(619) 557-5909

Denver, CO
(303) 844-5285

Greenwood Village, CO
(303) 843-4500

Bridgeport, CT
(203) 579-5581

Hartford, CT
(860) 240-3152

Wilmington, DE
(302) 573-6518

Fort Lauderdale, FL
(954) 424-0242

Jacksonville, FL
(904) 232-2895

Tampa, FL
(813) 626-1177

Savannah, GA
(912) 652-4393

Smyrna, GA
(770) 984-8700

Tucker, GA
(770) 493-6644/6742/8419

Des Moines, IA
(515) 284-4794

Boise, ID
(208) 321-2960

Calumet City, IL
(708) 891-3800

Des Plaines, IL
(847) 803-4800

Fairview Heights, IL
(618) 632-8612

North Aurora, IL
(630) 896-8700

Peoria, IL
(309) 671-7033

Indianapolis, IN
(317) 226-7290

Wichita, KS
(316) 269-6644

Frankfort, KY
(502) 227-7024

Baton Rouge, LA
(225) 389-0474 (0431)

Braintree, MA
(617) 565-6924

Methuen, MA
(617) 565-8110

Springfield, MA
(413) 785-0123

Linthicum, MD
(410) 865-2055/2056

Augusta, ME
(207) 622-8417

Bangor, ME
(207) 941-8177

Portland, ME
(207) 780-3178

Lansing, MI
(517) 327-0904

Minneapolis, MN
(612) 664-5460

Kansas City, MO
(816) 483-9531

St. Louis, MO
(314) 425-4249

Jackson, MS
(601) 965-4606

Billings, MT
(406) 247-7494

Raleigh, NC
(919) 856-4770

Bismark, ND
(701) 250-4521

Omaha, NE
(402) 221-3182

Concord, NH
(603) 225-1629

Avenel, NJ
(732) 750-3270

Hasbrouck Heights, NJ
(201) 288-1700

Marlton, NJ
(856) 757-5181

Parsippany, NJ
(973) 263-1003

Carson City, NV
(775) 885-6963

Albany, NY
(518) 464-4338

Bayside, NY
(718) 279-9060

Bowmansville, NY
(716) 684-3891

New York, NY
(212) 337-2636

North Syracuse, NY
(315) 451-0808

Tarrytown, NY
(914) 524-7510

Westbury, NY
(516) 334-3344

Cincinnati, OH
(513) 841-4132

Cleveland, OH
(216) 522-3818

Columbus, OH
(614) 469-5582

Toledo, OH
(419) 259-7542

Oklahoma City, OK
(405) 278-9560

Portland, OR
(503) 326-2251

Allentown, PA
(610) 776-0592

Erie, PA
(814) 833-5758

Harrisburg, PA
(717) 782-3902

Philadelphia, PA
(215) 597-4955

Pittsburgh, PA
(412) 395-4903

Wilkes-Barre, PA
(570) 826-6538

Guaynabo, PR
(787) 277-1560

Providence, RI
(401) 528-4669

Columbia, SC
(803) 765-5904

Nashville, TN
(615) 781-5423

Austin, TX
(512) 916-5783 (5788)

Corpus Christi, TX
(361) 888-3420

Dallas, TX
(214) 320-2400 (2558)

El Paso, TX
(915) 534-6251

Fort Worth, TX
(817) 428-2470 (485-7647)

Houston, TX
(281) 591-2438 (2787)

Houston, TX
(281) 286-0583/0584 (5922)

Lubbock, TX
(806) 472-7681 (7685)

Salt Lake City, UT
(801) 530-6901

Norfolk, VA
(757) 441-3820

Bellevue, WA
(206) 553-7520

Appleton, WI
(920) 734-4521

Eau Claire, WI
(715) 832-9019

Madison, WI
(608) 264-5388

Milwaukee, WI
(414) 297-3315

Charleston, WV
(304) 347-5937

OSHA-Approved State Plans

Commissioner
Alaska Department of Labor
1111 W. 8th Street, Room 308
P.O. Box 21149
Juneau, AK 99802-1149
(907) 465-2700

Director
Industrial Commission of Arizona
800 W. Washington
Phoenix, AZ 85007
(602) 542-5795

Director
California Department of
Industrial Relations
455 Golden Gate Avenue
10th Floor
San Francisco, CA 94102
(415) 703-5050

Commissioner
Connecticut Department of Labor
200 Folly Brook Boulevard
Wethersfield, CT 06109
(860) 263-6505

Director
Hawaii Department of Labor
and Industrial Relations
830 Punchbowl Street
Honolulu, HI 96831
(808) 586-8844

Commissioner
Iowa Division of Labor
1000 E. Grand Avenue
Des Moines, IA 50319
(515) 281-3447

Commissioner
Indiana Department of Labor
State Office Building
402 West Washington Street
Room W195
Indianapolis, IN 46204
(317) 232-2378

Secretary
Kentucky Labor Cabinet
1047 U.S. Highway 127 South
Suite 4
Frankfort, KY 40601
(502) 564-3070

Commissioner
Maryland Division of Labor
and Industry
Department of Labor Licensing
and Regulation
MOSH
1100 N. Eutaw Street, Room 613
Baltimore, MD 21201-2206
(410) 767-2215

Director
Michigan Department of
Consumer and Industry Services
P.O. Box 30643
7150 Harris Drive
Lansing, MI 48909
(517) 373-7230

Commissioner
Minnesota Department of Labor
and Industry
443 Lafayette Road
St. Paul, MN 55155
(651) 284-5010

Commissioner
North Carolina Department
of Labor
4 West Edenton Street
Raleigh, NC 27601-1092
(919) 807-2900

Commissioner
New Jersey Department of Labor
John Fitch Plaza—Labor Building
Market and Warren Streets
P.O. Box 110
Trenton, NJ 08625-0110
(609) 292-2975

Secretary
New Mexico Environment
Department
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-2850

Commissioner
New York Department of Labor
W. Averell Harriman State Office
Building-12, Room 500
Albany, NY 12240
(518) 457-2741

Administrator
Nevada Division of
Industrial Relations
400 West King Street, Suite 400
Carson City, NV 89703
(775) 684-7260

Administrator
Oregon Department of
Consumer and Business Services
Occupational Safety and
Health Division (OR-OSHA)
350 Winter Street, N.E. Room 430
Salem, OR 97310-3882
(503) 378-3272

Secretary
Puerto Rico Department of
Labor and Human Resources
Prudencio Rivera Martinez
Building
505 Munoz Rivera Avenue
Hato Rey, PR 00918
(787) 754-2119

Director
South Carolina Department
of Labor
Licensing and Regulation
Koger Office Park
Kingstree Building
110 Centerview Drive
P.O. Box 11329
Columbia, SC 29211
(803) 896-4300

Commissioner
Tennessee Department of Labor
and Workforce Development
710 James Robertson Parkway
Andrew Johnson Tower
Nashville, TN 37243-0659
(615) 741-2582

Commissioner
Labor Commission of Utah
160 East 300 South Street
3rd Floor
P.O. Box 146650
Salt Lake City, UT 84111
(801) 530-6901

Commissioner
Virginia Department of Labor
and Industry
Powers-Taylor Building
13 South 13th Street
Richmond, VA 23219
(804) 786-2377

Commissioner
Virgin Islands Department
of Labor
2203 Church Street
Christiansted
St. Croix, VI 00820-4660
(340) 773-1990

Commissioner
Vermont Department of Labor
and Industry
National Life Building—
Drawer 20
120 State Street
Montpelier VT 05620-3401
(802) 828-2288

Director
Washington Department of
Labor and Industries
P.O. Box 44001
Olympia, WA 98504-4001
(360) 902-4200
(360) 902-5430

Administrator
Worker's Safety and
Compensation Division (WSC)
Wyoming Department of
Employment
Herschler Building, 2nd Floor East
122 West 25th Street
Cheyenne, WY 82002
(307) 777-7786

OSHA Consultation Projects

Anchorage, AK
(907) 269-4957

Tuscaloosa, AL
(205) 348-3033

Little Rock, AR
(501) 682-4522

Phoenix, AZ
(602) 542-1695

Sacramento, CA
(916) 263-2856

Fort Collins, CO
(970) 491-6151

Wethersfield, CT
(860) 566-4550

Washington, DC
(202) 541-3727

Wilmington, DE
(302) 761-8219

Tampa, FL
(813) 974-9962

Atlanta, GA
(404) 894-2643

Tiyam, GU
9-1-(671) 475-1101

Honolulu, HI
(808) 586-9100

Des Moines, IA
(515) 281-7629

Boise, ID
(208) 426-3283

Chicago, IL
(312) 814-2337

Indianapolis, IN
(317) 232-2688

Topeka, KS
(785) 296-2251

Frankfort, KY
(502) 564-6895

Baton Rouge, LA
(225) 342-9601

West Newton, MA
(617) 727-3982

Laurel, MD
(410) 880-4970

Augusta, ME
(207) 624-6400

Lansing, MI
(517) 322-1809

Saint Paul, MN
(651) 284-5060

Jefferson City, MO
(573) 751-3403

Pearl, MS
(601) 939-2047

Helena, MT
(406) 444-6418

Raleigh, NC
(919) 807-2905

Bismarck, ND
(701) 328-5188

Lincoln, NE
(402) 471-4717

Concord, NH
(603) 271-2024

Trenton, NJ
(609) 292-3923

Santa Fe, NM
(505) 827-4230

Henderson, NV
(702) 486-9140

Albany, NY
(518) 457-2238

Columbus, OH
(614) 644-2631

Oklahoma City, OK
(405) 528-1500

Salem, OR
(503) 378-3272

Indiana, PA
(724) 357-2396

Hato Rey, PR
(787) 754-2171

Providence, RI
(401) 222-2438

Columbia, SC
(803) 734-9614

Brookings, SD
(605) 688-4101

Nashville, TN
(615) 741-7036

Austin, TX
(512) 804-4640

Salt Lake City, UT
(801) 530-6901

Richmond, VA
(804) 786-6359

Christiansted St. Croix, VI
(809) 772-1315

Montpelier, VT
(802) 828-2765

Olympia, WA
(360) 902-5638

Madison, WI
(608) 266-9383

Waukesha, WI
(262) 523-3044

Charleston, WV
(304) 558-7890

Cheyenne, WY
(307) 777-7786

OSHA

Occupational Safety
and Health Administration

U.S. Department of Labor

Asbestos: Standard for the Construction Industry

Updated on: 9/03/2012

1. Asbestos, naturally occurring, fibrous minerals with high tensile strength and flexibility, are _____ heat, chemicals, and electricity.
 - a) not resistant to
 - b) resistant to
 - c) attracted to
 - d) repulsed by

2. Asbestos can be found in _____.
 - a) sprayed-on fireproofing
 - b) drywall joint compounds
 - c) floor tiles
 - d) all of the above

3. Which of Suzanne's last four jobs was most likely to have the greatest level of exposure to asbestos?
 - a) Laying new tile in an apartment built in the last few months
 - b) Replacing the drywall in her 2-year old kitchen after her son threw a baseball through the wall
 - c) Renovating a kitchen in one of her oldest properties (~25 years old)
 - d) all of the above are likely to have the same level of threat of asbestos

4. Exposure to asbestos is most dangerous in what system of the body?
 - a) Nervous System
 - b) Digestive System
 - c) Respiratory System
 - d) both b) and c)

5. The removal of asbestos-containing floor or ceiling tiles would fall under Class _____ of the OSHA work classification.
 - a) I
 - b) II
 - c) III
 - d) IV

6. Employees should not be exposed to airborne concentrations of asbestos in excess of _____ in an 8-hour time-weighted average.
 - a) 0.01 f/cc
 - b) 0.02 f/cc
 - c) 0.1 f/cc
 - d) 0.2 f/cc

7. Employers must assess all asbestos operations for the potential to generate airborne fibers, and use exposure monitoring data to assess employee exposures.
- a) True
 - b) False
8. Employers must provide a medical surveillance program for all employees who _____.
- a) wear negative-pressure respirators
 - b) engage in Class I, II, or III work
 - c) are exposed at the PEL for more than 30 days total per year
 - d) all of the above
9. A(n) _____ 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.
- a) off limits area
 - b) regulated area
 - c) quarantined area
 - d) none of the above
10. Posted warning signs demarcating the regulated areas must state _____.
- a) Danger Asbestos
 - b) Cancer and Lung Disease Hazard
 - c) Respiratory and Protective Clothing Required
 - d) all of the above
11. _____ must oversee all asbestos work, even though they may not be the designated competent person.
- a) Employees
 - b) Owners
 - c) Environmental Engineers
 - d) General contractors
12. Employers must provide _____ specifying asbestos contamination to ensure the safety of their employees.
- a) signage
 - b) warning labels
 - c) both a) and b)
 - d) none of the above

13. In compliance with the PEL and STEL, employers must use _____ for all covered work.

- a) local exhaust ventilation equipped with HEPA-filter dust collection systems
- b) enclosure or isolation of processes producing asbestos dust
- c) feasible engineering and work practice controls to reduce exposure to the lowest possible levels
- d) all of the above

14. Regardless of exposure levels, _____ is prohibited for all asbestos-related work or work that disturbs asbestos or PACM.

- a) compressed air to remove asbestos or ACM (unless used with enclosed ventilation system)
- b) dry sweeping, shoveling, or other dry cleanup of dust and debris
- c) employee rotation to reduce exposure
- d) all of the above

15. Employers must place critical barriers over all openings to regulated areas to prevent airborne asbestos migration for all Class I jobs removing more than _____ linear or _____ square feet of thermal system insulation or surfacing material.

- a) 15; 3
- b) 20; 7
- c) 25; 10
- d) 30; 12

16. Employees must use respirators during all Class I, II, III, and IV regardless of how non-threatening the job is, in regards to asbestos and the techniques used for removal.

- a) True
- b) False

17. Asbestos waste, scrap, debris, bags, containers, equipment, and contamination clothing consigned for disposal must be collected and disposed of in sealed, labeled, impermeable bags or other closed, labeled impermeable containers.

- a) True
- b) False

Use the "Quick Reference" located in the back of the document to answer questions 18-20.

18. The definition, Maintenance and repair operations disturbing material containing > 1% asbestos, falls under which class?

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

19. The Competent Person must be onsite, inspect each work shift, and attend supervisory training for Class _____ activities.

- a) I
- b) I, II
- c) I, II, III
- d) I, II, III, IV

20. Generally required work practices and engineering controls, such as _____, are required for Class I, II, III, and IV.

- a) HEPA vacuum
- b) wet methods
- c) prompt cleanup/disposal
- d) all of the above