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Overview

This Facilitator Guide is organized into two main sections: Awareness and Abatement.

**Awareness Section**
The Awareness section provides a general awareness of asbestos, its hazards and steps you can take to prevent exposure for employees who may come in contact with asbestos containing materials in buildings as part of the job function. This includes employees who perform housekeeping services, custodial duties, maintenance, or repair work. Topics covered include:

- ✔️ What is Asbestos
- ✔️ Where Asbestos is Located
- ✔️ Health Effects
- ✔️ Hazard Communication
- ✔️ Recognizing Damage and Deterioration
- ✔️ Housekeeping
- ✔️ Safe Work Practices.

**Abatement Section**
Employees who work directly with asbestos during removal procedures will also need to be trained on proper abatement procedures. This section provides an overview of the requirements and proper procedures for conducting glove bag removal and isolated or enclosed space removal. Specific topics covered include:

- ✔️ Classes of Asbestos Work
- ✔️ Required Compliance Activities, such as initial exposure assessments, permissible exposure limit, air monitoring, medical surveillance, and requirements for regulated areas
- ✔️ Personal Protective Equipment, including respiratory protection and protective clothing
- ✔️ Glove Bag Removal
- ✔️ Isolated or Enclosed Space Removal.
Train the Trainer

Stress the purpose and goals of training.
Adults want training to solve a particular problem, to be practical, and to relate to everyday experiences. Adults are goal oriented. Because they want training to solve a particular problem, most adults are more concerned with learning specific topics that relate to them rather than broad or general subjects. State the purpose of training in a clear, specific manner -- whether it’s to cut costs, increase production, improve quality, improve working conditions, etc. Review the goals and objectives of the training so adults know what is expected of them.

Organize training time efficiently.
In today’s busy work climate, it can be difficult to find the time needed for training. Because of this, it is important that when you do schedule training sessions you are organized and well prepared to use your time efficiently. Whether you use Summit’s suggested Lesson Plan or not, it is very important to have a game plan prepared that you can implement with relative ease. This ensures that time spent in training is productive and beneficial for everyone.

Capture their attention.
An adult’s attention is often divided between family, work, friends, sports, and other people and activities. Training often needs to be interesting and compelling to compete with these outside interests. To help motivate learners, give them specific evidence that their effort makes a difference, and provide feedback on their progress. Also, remember that the first experience with a new subject usually forms a lasting impression on the learner. By making that experience a positive one, you can help ensure your audience retains the information learned.

Make new learning experiences pleasant.
For some adults, past experiences with education were unpleasant and not helpful. Adults learn best when they feel comfortable. By making the learning environment open and friendly, you can help adults to feel secure in their new learning experience. Also offer support and feedback as often as possible, and be ready to provide extra attention to those who may require it.

Answer questions.
When most adults learn new information that conflicts with what they already know, they are less likely to integrate those new ideas. It is very important to make sure participants fully understand the training and do not have any unresolved questions. Provide for a question and answer period so participants can resolve those questions and/or answer questions throughout the training session.
The key to any successful training program is to be well-organized and knowledgeable about your subject. These steps for ROOM SETUP are designed to help you prepare the training environment to get the best results for your training session.

**Room and Supplies**

- Will everyone be able to see the video from their seats? Try arranging the chairs in a half circle instead of in straight rows. Many education experts agree that the standard classroom setup with chairs arranged in rows and a lectern in front is least conducive to the learning environment.

- Is lighting adequate for reading the workbook? Poor lighting damages the eyes and can frustrate employees’ efforts to participate.

- Is the temperature at a comfortable setting? A setting that is too cold or warm may cause participants to lose attention in the training session.

- Bring enough pens and pencils for all employees during the training session.

- Are all supplies and equipment in place and functioning properly (i.e., video player, monitor, blackboard, chalk, paper and pens/pencils, workbooks, etc.)

**Video Equipment**

- Make sure the monitor is hooked up properly to the video player. If you are using a television, is the TV on the right channel? It will operate on either channel 3 or 4, depending on the setting of your VCR.

- Adjust the color and volume to the right settings. Will everyone be able to hear the video from their seats?

- Do you have the correct format of videotape for the equipment you are using?

- Make sure the tape has been rewound.
Lesson Plan

As a qualified trainer, your job is to effectively communicate a great deal of information in a well-organized manner. By preparing a lesson plan, you can ensure that each minute of the training session is productive. Summit has provided a suggested Lesson Plan for your use.

1. **Introduce the topic and purpose of training**

   Research proves that audience retention is higher when programs are given a brief introduction before viewing them. Prepare an introduction which explains the reasons for training and what will be taught. Adult learning is very goal-oriented and adults learn best when they know the purpose of their training and what is expected of them.

   Sample introduction:
   *Asbestos poses a serious health hazard to you when asbestos fibers become airborne and are breathed into the lungs. This video provides you with special precautions you can take when working with or around asbestos. After the video, we will discuss specific asbestos work practices for our facility.*

2. **Show the video: “Understanding the Asbestos Hazard”**

3. **Discussion and Demonstration**

   The following topics are designed to increase participation in the training session and to help you relate the training to your facility. They can be used as discussion questions or as exercises to demonstrate skills learned.
   - ✔ Specific engineering controls and work practices related to the employee’s job
   - ✔ Location(s) of asbestos and quantity at the work site
   - ✔ Purpose, proper use and limits of respiratory protection and protective clothing
   - ✔ Purpose and description of the medical surveillance program

4. **Go Over Handbooks & Take the Quiz**

   The handbooks increase comprehension and reinforce the information learned in the video program by explaining the main points and expanding on the original material. For increased employee retention, go over one section at a time and stop to answer questions. The quiz at the back of the Facilitator Guide is provided to document employee comprehension.
   - ▲ Have employees who are being trained on awareness answer questions 1-16 only.
   - ▲ Employees who will also be involved in asbestos removal take the whole quiz.
   - ▲ Answers to the quiz are provided on a separate page.

5. **Questions and Answers**
Frequently Asked Questions

**What is asbestos and how can it harm me?**
Asbestos is a mineral fiber that is extracted from rock. Asbestos fibers have been used for centuries for their fire resistance and because they are not easily destroyed or degraded by natural processes.

Exposure to asbestos usually occurs when you breathe in asbestos fibers that have been released into the air. Exposure to asbestos has been shown to cause cancer of the lung and stomach. Symptoms of exposure do not develop immediately, but may take 20 years or more to occur.

**Are all asbestos containing materials a health risk?**
No. Asbestos is only a health risk to you when the asbestos fibers are released from the material and enter the air you breathe. You cannot see the tiny fibers and they are so small that they pass through the filters of normal vacuums. Friable (easily crumbled) asbestos has the greatest potential to be released into the air.

**What should I do if I find materials that contain asbestos?**
If you find materials that could contain asbestos in your building, you should notify your supervisor immediately. You should also report any damage or deterioration to asbestos materials. Avoid touching or disturbing walls or ceilings covered with asbestos materials.

**Will a dust-mask respirator protect me from airborne asbestos fibers?**
No. A dust-mask respirator does not protect you from airborne asbestos fibers.

**What constitutes “disturbance” of asbestos?**
Disturbance is any contact with asbestos which releases fibers from asbestos containing material (ACM) or debris. This includes any activities that disrupt the matrix of ACM, renders ACM friable, or generates visible debris. An example of disturbance is cutting away small amounts of ACM to access a building component such as an electrical box. The amount of asbestos disturbed must be able to fit into a standard sized glove bag or waste bag.
Asbestos Awareness Introduction

Asbestos, once the solution to thousands of industrial needs, is now considered a leading respiratory health hazard. It has been shown to cause various forms of cancer, including asbestosis, an emphysema-like condition, and mesothelioma, a cancer of the lining of the lung and abdominal cavities.

Who could be at risk? Any person who could come in contact with asbestos containing materials in buildings as part of their job function. This includes employees who perform housekeeping services, custodial duties, maintenance, or repair work.

This handbook is designed to provide you with an awareness of asbestos, its health effects, and what you can do to prevent exposure. Topics covered include:

✓ What is Asbestos
✓ Where Asbestos is Located
✓ Health Effects
✓ Hazard Communication
✓ Recognizing Damage and Deterioration
✓ Housekeeping Requirements
✓ Safe Work Practices.

Asbestos becomes a danger to you when asbestos fibers are released into the air and you breathe them in. By following safe work practices and good housekeeping, and by reporting any damage or disturbance to asbestos containing materials, you can prevent your exposure.
Asbestos is a naturally occurring mineral that is usually excavated from open-pit mines. The asbestos rock is then crushed to free the fibers. The three most common types of asbestos found in today’s industrial applications include:

▲ Chrysotile
The most often used asbestos, it is highly resistant to heat and can easily be spun into asbestos cloth.

▲ Amosite
Commonly referred to as brown asbestos, amosite is highly resistant to heat and acid. It has been used mainly in bulk form for heat insulation and molded into pipe insulation.

▲ Crocidolite
Highly resistant to acid, it is used to make electric battery cases and acid-resistant cement pipes. Crocidolite is also commonly referred to as blue asbestos.

Asbestos is usually mixed with a material that binds the fibers together so they can be used in many different products. In a bonded state, asbestos poses no danger to you. There are two forms of asbestos that you should be aware of: friable and non-friable asbestos.

Friable Asbestos
Friable asbestos can be crumbled, pulverized or reduced to a powder by hand pressure. Because it is easily crumbled, friable asbestos is more likely to release fibers into the air. Examples include sprayed-on materials used for fire-proofing, insulation or sound proofing.

Non-Friable Asbestos
Non-friable asbestos does not usually release airborne fibers unless it is subjected to cutting, sanding or grinding. Materials such as vinyl asbestos floor tile or roofing felts are considered non-friable.
Where Asbestos is Located

Asbestos fibers have been used for centuries for the same reasons that hold true in today’s industrial applications:

- Fibers are almost indestructible by common agents
- Heat and chemical resistance
- Thermal and noise insulator

Common locations and uses for asbestos in public and commercial buildings have included the following:

- Added to some vinyl floor tiles to strengthen them and on the backing of some vinyl sheet flooring
- Patching compounds manufactured before 1977 used to patch some walls and ceiling joints
- Wall and ceiling insulation
- Fluffy, friable asbestos sprayed on ceiling tiles for fire-proofing protection
- Asbestos-containing material has been sprayed or troweled onto ceilings or walls as an acoustical or decorative treatment.
- Insulation around pipes, heating ducts, furnaces and boilers
- Some roofing shingles, siding shingles and sheets have been manufactured with asbestos.
- Sprayed on steel reinforcing beams as fire-proofing
- It has been used for brake linings and clutch pads.
In a bonded state, asbestos is not a harm to you. It is only when the materials that contain asbestos are disturbed, damaged or deteriorated, and the asbestos fibers are released into the air that they are a danger to your health. These tiny airborne fibers are too small to be seen by the human eye. The most common risk to your health occurs when you breathe them into your lungs.

Activities Which Could Result in Exposure

Activities such as drilling, sawing, mechanical abrasion, or the installation of cables, ducts and other systems that must be attached to a building for support may cause asbestos fibers to become airborne. When that happens, they become a threat to your health.

How Exposure Occurs

When you breathe airborne asbestos fibers into your lungs, the body traps some of the fibers in the nose and throat. But other fibers can pass through the nose and throat, down your windpipe and into the lungs. Once there, they can become embedded in the alveoli.

Alveoli are tiny air sacs in your lungs that are surrounded by blood vessels. Each lung has between 300 and 400 million alveoli. They have thin membranes that separate them from the blood stream. Their purpose is to pass the oxygen you inhale into the blood stream and collect the carbon dioxide from the blood so it can be exhaled.
Effects on the Body

Once asbestos fibers enter the alveoli, they cannot be removed. Over a period of time scar tissue forms.

This reduces the alveoli’s ability to pass oxygen into the blood stream and causes shortness of breath, a condition that is called asbestosis. As the condition worsens, oxygen starvation sets in. Permanent physical disability and/or death can occur. Asbestosis is also suspected to cause cancer in various organs of the digestive tract.

Other diseases caused by years of unprotected exposure to asbestos include lung cancer and mesothelioma, a cancer of the lining of the lungs or abdominal cavities. Symptoms of mesothelioma include shortness of breath, pain in the chest, and/or abdominal pain.

Symptoms of these diseases do not develop immediately, but may take 20 years or more to occur.

Smoking

A worker who smokes and has also been exposed to asbestos may have as much as a 90 times greater risk of getting cancer than a worker who does not smoke.

Medical Surveillance Program

A medical surveillance program is available from your employer which includes the following: a medical history questionnaire, a pulmonary function test and chest x-ray, and a complete physical examination with emphasis on the respiratory, cardiovascular and digestive systems.
Hazard Communication

It is important that you know whether building components may expose you to asbestos. Employers and building owners are required to inform you about the presence and location of asbestos containing materials (ACM) or presumed asbestos containing materials (PACM). Building owners are also required to keep records of all known information about the presence, location and quantity of ACM and PACM in the building or facility.

The hazards of asbestos are communicated to you in three ways:

- Warning Signs
- Warning Labels
- Material Safety Data Sheets.

Warning Signs

Warning signs are placed at all approaches to regulated areas to prevent unauthorized persons from entering. The signs must state the following information:
Warning Labels
Warning labels must be placed on all raw materials, mixtures, scrap, waste, debris and other products containing asbestos fibers, or to their containers. The labels must include the following information:

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

Material Safety Data Sheets
Manufacturers and importers of asbestos or asbestos products are required to maintain a Material Safety Data Sheet (MSDS) on asbestos unless the asbestos fibers have been modified by a bonding agent, coating, binder or other material and if the release of asbestos fibers does not exceed the permissible exposure limit.

The MSDS contains detailed safety and health information on a substance, precautions for handling, and emergency and first aid procedures.
Damage and Deterioration

When ACM wears down, is damaged or friable, it can be hazardous to your health. Conditions that can cause damaged or deterioration and cause asbestos to become airborne include:

- **Water damage**
- **Aging and degradation** of bonding agents that hold asbestos together
- **Vibration**
- **Impact** such as striking, cutting or penetration
- **Air vents** that blow directly onto friable material.

Evidence of deterioration includes debris on horizontal surfaces, hanging material, cracks, scrapes or marks, missing or dislodged material, friable materials or dust on the floor or other surfaces, stains due to water damage, or evidence of ACM in air ducts.

You should always avoid any ACM that is damaged, deteriorated or friable.

- ▲ Know where asbestos is located in your building.
- ▲ If you find materials that could contain asbestos, notify your supervisor.
- ▲ If you see any asbestos containing materials that have been disturbed, report the damage immediately.
If you work around asbestos containing materials or products during your job activities, it is important that you follow good housekeeping practices to prevent the release of asbestos fibers into the air.

**Housekeeping Requirements**

- Never sand flooring that contains asbestos.
- Strip floor finishes using wet methods and low abrasion pads at speeds lower than 300 revolutions per minute (rpm).
- Only burnish and dry buff flooring that contains asbestos if it has enough finish so that the pad cannot contact the asbestos-containing material.
- Never dust, dry-sweep, or use a vacuum without a HEPA filter on flooring in an area that contains thermal system insulation (TSI), surfacing ACM/PACM, or visibly deteriorated ACM.
Other precautions you should take to prevent your exposure to asbestos include the following:

▲ Never drill holes or hammer nails in walls or ceilings that contain asbestos.

▲ Never hang plants or anything else from ceilings or pipes covered with asbestos materials.

▲ Do not disturb asbestos material when replacing light bulbs.

▲ Never hang pictures on walls covered with asbestos materials.

▲ Avoid damaging asbestos materials while moving furniture.

▲ Do not let curtains, drapes or dividers damage asbestos materials.

▲ Avoid touching or disturbing ceilings and walls covered with asbestos materials.

▲ When removing air filters, never shake the filter. It is best not to remove the filter when dry. Mist the filter with water first. Always properly dispose of filters.
Asbestos Abatement Introduction

Asbestos, once the solution to thousands of industrial needs, is now considered a leading respiratory health hazard. It has been shown to cause various forms of cancer, including asbestosis, an emphysema-like condition, and mesothelioma, a cancer of the lining of the lung and abdominal cavities.

This handbook is designed to provide you with an awareness of asbestos, including the following:

- What is Asbestos
- Where Asbestos is Located
- Health Effects
- Hazard Communication
- Recognizing Damage and Deterioration
- Housekeeping
- Safe Work Practices.

This handbook also provides an overview of the requirements and proper procedures for conducting glove bag removal and isolated or enclosed space removal, including the following:

- Classes of Asbestos Work
- Required Compliance Activities, such as initial exposure assessments, permissible exposure limit, air monitoring, medical surveillance, and requirements for regulated areas
- Personal Protective Equipment, including respiratory protection and protective clothing
- Glove Bag Removal
- Isolated or Enclosed Space Removal.

Asbestos becomes a danger to you only when asbestos fibers are released into the air and you breathe them in. By following proper procedures for abatement of asbestos, you can prevent your exposure.
The Occupational Safety and Health Administration (OSHA) has developed four classes of work activities based on potential risk of asbestos exposure. Class I work represents the greatest risk and has the most stringent control requirements, while each following level represents decreasing risk potential and control requirements.

**Class I Work**
Class I work includes the removal of thermal system insulation (TSI) and of other asbestos containing material (ACM) that has been sprayed on, troweled on or otherwise applied. TSI includes ACM that is applied to pipes, boilers, tanks and ducts.

**Class II Work**
Class II asbestos work includes the removal of ACM or presumed asbestos containing material (PACM). This does not include TSI or surfacing. Examples of Class II activities include removal of floor or ceiling tiles, siding or roofing.

**Class III Work**
Class III asbestos work is defined as repair and maintenance operations involving the intentional disturbance of ACM or PACM. An example is cutting away small amounts of ACM or PACM to access an electrical box for repair.

**Class IV Work**
Class IV work involves maintenance and custodial activities in which contact with ACM may occur. This includes dusting surfaces, vacuuming carpets, mopping floors, cleaning up asbestos or presumed asbestos containing material from TSI or surfacing.

Compliance activities such as air monitoring, medical surveillance and employee training are based on these classifications.
Compliance Activities

Initial Exposure Assessment
Before beginning any work involving asbestos, an initial exposure assessment must be performed. It is conducted by a trained, competent person to determine the exposure potential of an asbestos job or a series of similar asbestos jobs. This is important in deciding what type of engineering controls to put into place.

In some cases, it is determined that employee exposures during the job are likely to be below the permissible exposure level. In these cases, the assessment is called a “Negative Initial Exposure Assessment.”

Permissible Exposure Limit
When the level of asbestos fibers in the air exceeds 0.1 fibers per cubic centimeter of air (0.1 f/cc) averaged over an 8-hour day, then regulated activities must be established. You cannot be exposed to airborne concentrations of asbestos above this level without personal protective equipment. Always follow the proper rules and regulations in regulated asbestos areas. They are there for your safety and your co-workers’.

Air Monitoring
Two types of air monitoring are conducted to ensure your safety and the safety of others in adjacent areas: personal and area monitoring. Both are performed using the same type of air filter.

Personal Air Samples
Personal air samples are taken by attaching a portable pump to the worker to monitor potential exposure.
Area Samples
Area samples are taken with a stationary, high volume air pump and have three main purposes:

✔ They determine the background concentration of airborne asbestos before the start of asbestos related work.

✔ They let you know if engineering controls such as negative air machines are functioning properly during asbestos work.

✔ They let you know if the area is free of airborne asbestos fibers after you have completed any work that involves friable asbestos.

Medical Surveillance
A medical surveillance program is established at your facility for employees exposed to asbestos and other hazards. The program includes a medical history questionnaire with a section on respiratory health, a pulmonary function test and a chest x-ray.

A complete physical examination by or under the supervision of licensed physician is also made available each year at no cost to employees. The exam emphasizes the respiratory, cardiovascular and digestive systems.
Regulated Areas

▲ Only authorized persons may enter regulated areas.

▲ All asbestos work performed in regulated areas must be supervised by a competent person.

▲ Respirators and protective clothing must be worn.

▲ You may not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.

▲ Warning signs must be placed at all entrances to the regulated area.

▲ Warning labels must be placed on all raw materials, mixtures, scrap waste, debris and other products that contain asbestos fibers. The labels must state the following information:

DANGER

CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD.
Personal Protective Equipment

When engineering controls are not feasible or able to reduce your exposure at or below the permissible exposure limit, the proper respiratory protection and personal protective equipment must be worn.

Respiratory Protection
Since asbestos becomes a hazard to you when it becomes airborne, your respirator is the most important piece of protective equipment you will use. The purpose of a respirator is to provide you with a clean supply of air. There are two ways this can be done: with an air purifying respirator or with an air supplying respirator.

Air Purifying Respirator
An air purifying respirator cleans the air by filtering out the contaminants when the air passes through an air purifying element such as a canister or filter. They do not supply fresh air, but clean the existing contaminated air.

Air Supplying Respirator
An air supplying respirator provides fresh air to the face piece from an outside source. There are two types of air supplying respirators: Air Line and Self-Contained Breathing Apparatus (SCBA). An air line respirator provides air through a hose from a compressor. An SCBA provides a supply of clean air from a tank that is carried on your back.

The type of respirator you used will depend on the concentration of asbestos fibers in the air. The higher the concentration of airborne fibers, the more protection required.
Proper Fit

Because of the important role your respirator plays in protecting you from asbestos, it is important that you understand how it works and the importance of a proper fit. Fit tests must be performed by certified personnel.

There are two types of fit tests: qualitative and quantitative. During a qualitative fit test, you are exposed to a test agent such as an odorous chemical or an irritant smoke while you are wearing your respirator. If you can smell the odor or if your nose or throat become irritated, that particular respirator fails the fit test.

During a quantitative fit test, the air inside your face piece is sampled by a probe while you are simulating workplace movements.

Facial hair that interferes with the respirator forming a good seal around your face must be removed.

Always inspect your respirator before each use to make sure it fits properly and is in good condition.

Properly clean and store your respirator after each use.
Protective Clothing

Protective clothing prevents asbestos fibers from contacting your skin. It also prevents you from carrying asbestos fibers home on your street clothing and exposing others.

Always wear the proper protective clothing whenever you work in a regulated asbestos work area. Protective clothing includes coveralls or similar full-body clothing, head coverings such as hoods and hard hats, gloves, and foot protection.
Glove Bag Removal

Removal of asbestos using a glove bag is an efficient and cost effective method of stripping asbestos from pipes, pipe fittings and gaskets. In Class I work, at least two people are required to conduct a glove bag operation.

In glove bag removal, a polyethylene bag seals off the area where asbestos will be removed. The bag has armholes with glove-like appendages on the inside so you can slip your hands into the bag to remove the asbestos without touching it. Access holes are also provided for a sprayer to wet the asbestos and a vacuum hose which can be used to collapse the bag at the end of the project.

Step 1
▲ The first step in glove-bag removal is to place danger signs at all approaches to the removal site.

▲ Warning tape should also be used to cordon off the work area.

Step 2
▲ Cut the sides of the bag to fit the size of the pipe that it will fit over. Slice the side ports to fit the spray nozzle and vacuum hose.

▲ Place all tools that will be used for the removal into the bag. Then tape the bag and seal it around the pipe at both ends.

▲ After the bag is attached to the pipe, perform a smoke test to determine if there are any leaks. Never use a glove bag that does not pass a smoke test.

Step 3
▲ To reduce your exposure to airborne fibers, asbestos must be handled, removed, cut, stored or otherwise worked in a wet state. A surfactant is used instead of water because it penetrates the asbestos material better.
Glove Bag Removal
(continued)

Step 4
▲ One worker inserts their arms into the gloves on the inside of the bag to remove the asbestos, while the other worker continuously wets the asbestos material.

▲ Place the asbestos debris on the bottom of the bag.

▲ When tools and other material need to be taken out, they must first be rinsed and placed in the pockets at the top of the bag.

Step 5
▲ When you are finished removing the asbestos, squeeze the bag in the middle, twist it, and tape it closed to keep all asbestos material at the bottom of the bag.

▲ Remove the glove bag from the pipe and place it inside another bag that has the proper asbestos warning label.

▲ Tape the second bag shut, remove it from the work site and dispose of it properly.
Isolated or Enclosed Space Removal

Isolated or enclosed space removal is used when asbestos fibers can contaminate other occupied areas, such as office space.

**Step 1**

▲ Before beginning the isolated space procedure, an area sample is taken to determine the airborne concentration of asbestos fibers.

**Step 2**

▲ Setup begins by clearing the floor of all removable objects.

▲ Seal all openings such as ventilation and heating ducts, elevator shafts and windows with plastic and tape to prevent airborne asbestos fibers from escaping.

▲ Lockout all electrical circuits.

▲ Cover walls and floors with 6 mil plastic (one mil equals one-thousandth of an inch). Duct tape is used to seal the plastic and hold it in place. Spray glue can be used to hold the plastic in place during taping.

▲ At least two overlapping layers of plastic are recommended on the floor and walls to provide extra protection against the possibility of asbestos fibers escaping and possible water damage.
Step 3
Government guidelines also require a separate equipment room, shower room and clean room to be set up next to the regulated area. This is also referred to as the decontamination area. Two sheets of plastic are hung as doorways between each room. Always enter and exit the isolated work area through the decontamination area.

Step 4
For Class I work, negative pressure enclosures are required. With a negative pressure enclosure, the air pressure inside the enclosure is less that that on the outside. This allows fresh air to enter the room and prevents contaminated air from escaping.

A negative air filtration system has two functions:

- First, it reduces the level of fibers in the air by moving contaminated air away from the workers and into a HEPA filter. The HEPA filter traps 99.97 percent of the asbestos fibers.
- Ventilation equipment must be used to create at least four air changes per hour.
- Second, it prevents fibers from escaping from the isolated space by drawing outside air through the plastic doors and across the work area. It then discharges the filtered air outside of the work space.
**Step 5**

▲ After the isolated work area, decontamination area and negative air filtration system are in place, you are ready to put on your respirator and protective clothing. This is done in the clean room.

- Remove your street clothing before putting on protective coveralls. After putting on your respirator, check the fit to make sure it is secure.

- Next, put on your head covering, foot protection and gloves. Gloves are then taped at the wrists.

- A personal air monitoring filter is attached to your body suit near your breathing zone.

**Step 6**

▲ Now you are ready to enter the isolated work space. Whether you are removing friable ceiling insulation or pipe insulation, it is a good idea to work in teams of two or more.

▲ One person wets the material while the others scrape it from the ceiling. A surfactant is used to wet the material to reduce the amount of fibers being released into the air.
As the material is removed from the ceiling, it is shoveled into asbestos waste bags marked with DANGER labels. Asbestos should only be shoveled when it is wet.

The bag is then twisted, taped shut, double bagged and removed from the isolated space.

Keep the floor as clean as possible. This helps to reduce the chances of asbestos fibers re-entering the air and prevents any unnecessary slipping and injuries.

Any tools and equipment that need to leave the isolated space must be cleansed and wiped down before removal through the decontamination chamber.

Step 7
After the asbestos material has been removed, detailed cleaning is performed to get rid of any material still visible. A small scrub brush or wet rag is used to remove any remaining material.

Never use a compressed air blower. It only increases the concentration of fibers in the air.
▲ When vacuuming, always use HEPA-filtered vacuuming equipment. Use and empty the equipment in a manner that minimizes the re-entry of asbestos into the workplace.

▲ Double-bag all asbestos waste in bags marked with the DANGER warning. Rinse the bags and pass them through the decontamination chamber for removal from the site.

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**Step 8**

▲ After a visual inspection is conducted, the first layer of plastic can then be taken down. Keep the negative air filtration system on during this cleanup procedure. Cut the plastic into strips small enough to fold and be bagged as asbestos waste.

▲ After the first layer of plastic is removed, a thorough inspection is conducted by the supervisor or person in charge of the removal project. It is that person’s responsibility to make sure the job has been thoroughly completed and is ready for final air clearance monitoring.

▲ Later, when air monitoring information from the lab shows the air quality is acceptable, the remaining plastic can be removed and bagged as asbestos waste.
Step 9

▲ Exit the isolated space through the decontamination area. Enter the storage area and remove all protective clothing and equipment except your respirator.

▲ Enter the shower while you are still wearing your respirator. Clean the respirator, your face and hair first. While still wearing your respirator, wash the rest of your body.

▲ Do not remove your respirator until you are ready to leave the shower area. The wet respirator filter can then be disposed of in an asbestos waste bag.

▲ Put your street clothing back on in the clean room.

▲ Make sure the respirator has been thoroughly cleaned, disinfected and dried.

▲ Make a final inspection of your respirator and store it in a plastic bag for the next use.

Other methods of compliance such as negative pressure glove box and water spray process are available. The process used must reduce direct or indirect employee exposure to below the PEL of 0.1 fibers per cubic centimeter of air (0.1 f/cc) during an 8-hour time-weighted average. Unlisted compliance methods for high risk asbestos abatement require OSHA notification.
Asbestos Quiz

1. Asbestos is a mineral rock that is crushed to free the fibers.
   A. True
   B. False

2. Asbestos may be found in . . .
   A. insulation.
   B. vinyl floor tiles.
   C. brake linings.
   D. roof shingles.
   E. All of the above

3. Asbestos that can be reduced to a powder by hand pressure is called . . .
   A. Amosite.
   B. friable asbestos.
   C. bonded asbestos.
   D. blue asbestos.
   E. None of the above

4. Asbestos fibers are too small to be seen by the human eye.
   A. True
   B. False

5. Exposure to asbestos usually occurs . . .
   A. by absorbing into the skin.
   B. through body openings such as eyes and cuts.
   C. by breathing it in.
   D. by swallowing asbestos fibers.
   E. None of the above

6. Asbestos can reduce the ability of oxygen to pass into the blood stream.
   A. True
   B. False

7. Symptoms of asbestos exposure develop immediately.
   A. True
   B. False
8. Diseases caused by asbestos exposure include . . .
   A. lung cancer.
   B. mesothelioma.
   C. asbestosis.
   D. All of the above

9. A worker who smokes and has been exposed to asbestos has a decreased chance of getting cancer than a worker who does not smoke.
   A. True
   B. False

10. Warning signs must be placed at all entrances to regulated asbestos areas to prevent unauthorized persons from entering.
    A. True
    B. False

11. Warning labels are placed on all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers.
    A. True
    B. False

12. Evidence that asbestos containing materials are damaged or deteriorated include. .
    A. dust or debris on horizontal surfaces.
    B. scrapes or marks.
    C. water stains.
    D. missing or dislodged material.
    E. All of the above

13. Asbestos waste must be disposed of in waste bags marked with what type of label?
    A. Caution
    B. Danger
    C. Warning
    D. None of the above

14. Only a vacuum with a HEPA filter may be used when vacuuming asbestos.
    A. True
    B. False

15. You should never drill holes or hammer nails into walls containing asbestos.
    A. True
    B. False

16. You can hang plants from ceilings covered with asbestos materials.
    A. True
    B. False
17. Match the job activity with the classification of asbestos work.
   A. Class I  1. Cutting away small amounts of asbestos to access an electrical box
   B. Class II  2. Removal of surfacing materials such as Thermal System Insulation
   C. Class III  3. Custodial activities in which contact with asbestos material may occur
   D. Class IV  4. Removal of ceiling tiles, siding or roofing

18. An initial exposure assessment must be performed . . .
   A. before beginning work involving asbestos.
   B. after the work is completed.
   C. to determine potential exposure of an asbestos job.
   D. on an annual basis.
   E. Both A and C

19. Regulated activities must be established when the airborne concentration level of asbestos fibers exceeds . . .
   A. 0.05 f/cc.
   B. 0.1 f/cc.
   C. 0.2 f/cc.
   D. 0.5 f/cc.
   E. 1.0 f/cc.

20. Air monitoring that is performed with a portable pump attached to the worker is called . . .
   A. area monitoring.
   B. respiratory monitoring.
   C. personal monitoring.
   D. pulmonary function test.
   E. initial exposure assessment.

21. A medical history questionnaire and complete physical exam are included as part of the . . .
   A. medical removal program.
   B. initial exposure assessment.
   C. medical surveillance program.
   D. permissible exposure limit.
   E. None of the above

22. Which of the following activities may not be performed in regulated areas?
   A. Eating food
   B. Chewing gum
   C. Smoking a cigarette or chewing tobacco
   D. Applying makeup
   E. All of the above
23. A paper dust-mask respirator may be used when working with asbestos.
   A. True
   B. False

24. The purpose of protective clothing is to . . .
   A. prevent asbestos fibers from contacting your skin.
   B. prevent you from carrying home asbestos fibers on your street clothing.
   C. prevent cuts while scraping off asbestos.
   D. Both A and B
   E. Both B and C

25. In Class I work, at least two people are required for a glove bag removal.
   A. True
   B. False

26. The first step in a glove bag removal is to . . .
   A. perform a smoke test.
   B. fit the bag onto the pipe.
   C. cordon off the area and place danger signs at all entrances.
   D. slice the side ports on the bag to fit the spray nozzle.
   E. None of the above

27. In isolated or enclosed space removal, all openings such as ventilation, heating ducts, elevator shafts and windows are sealed with plastic and tape.
   A. True
   B. False

28. In a negative pressure enclosure, the air pressure inside the enclosure is . . .
   A. greater than the air outside.
   B. less than the air outside.
   C. equal to the air outside.

29. The decontamination area is set up next to the regulated work area.
   A. True
   B. False

30. A compressed air blower may be used to clean asbestos from the work area.
   A. True
   B. False
Asbestos Quiz Answers

1. A
2. E
3. B
4. A
5. C
6. A
7. B  Symptoms of asbestos exposure may not develop for up to 20 years.
8. D
9. B  A worker who smokes and has been exposed to asbestos has an increased chance of getting cancer.
10. A
11. A
12. E
13. B
14. A
15. A
16. B  Never hang plants from ceilings or pipes covered with asbestos.
17. A-2
   B-4
   C-1
   D-3
18. E
19. B
20. C
21. C
22. E
23. B  A paper dust-mask does not protect you from asbestos fibers.
24. D
25. A
26. C
27. A
28. B
29. A
30. B  A compressed air blower only increases the concentration of fibers in the air.