Module 21: Asbestos Exposure Pages 467 - 481

Lesson Summary

- In order to minimize employee exposure to lead, employers must make sure that lead control measures and proper work practices are used whenever workers are performing lead-related tasks. The permissible exposure level of lead is 50ug/m3. If exposure beyond this level exists, additional controls are required.
- Common lead control measures include ventilation, encapsulation, substitution, process modification, and isolation.
- You can minimize your exposure to lead by adopting rigorous personal hygiene and housekeeping practices. These practices ensure that you do not take lead-contaminated dust from the worksite to your home where it can endanger your family.
- Lead exposure can be minimized through proper housekeeping and personal hygiene practices, using changing areas and showers as required, and following the proper end-of-day procedures.
- If you are required to perform lead-related tasks, your employer must provide you with clean, dry, protective clothing and equipment free of cost. Clothing that may be required at lead-containing construction sites include:
    - Full-body protective work clothing
    - Gloves
    - Goggles with protective shields
    - Blasting or welding helmets
- At some construction sites the lead content in the air may be high or might vary widely over time. At such sites, workers may be required to use respirators in addition to other protective measures. If lead levels require this kind of additional protection, workers must put on respirators before entering the work area and remove them only after leaving the work site.
- Employers are required to maintain records of all the findings of employee exposure assessments.

Module 21: Asbestos Exposure

Module Description

Asbestos is a substance that has been used for centuries. Its heat-resistant properties make it almost indestructible; due to this property, asbestos has been widely used in the construction industry, including for pipe and boiler insulation, flooring and ceiling tiles, drywall, adhesives, and much more. Asbestos has also been widely used in products such as vehicle brakes, wire insulation, and dryers. Before 1973, asbestos was sprayed onto different surfaces for fire protection purposes, but this practice was banned due to its hazardous nature. Furthermore, it is no longer legal to use asbestos for insulating pipes and boilers in most countries, including the United States.

Because it was used for so long, asbestos can still be found in many buildings. Those who work in construction, repair, demolition, and renovations are at a greater risk of

contracting asbestos-related diseases such as asbestosis, lung cancer, and mesothelioma. Very stringent exposure guidelines have been established for asbestos. This module introduces students to the hazards of asbestos in the workplace and provides information about the measures that must be taken in order to minimize the effects of exposure to asbestos.

Module Learning Objectives

At the conclusion of this module, students will be able to:

- Describe the hazards of asbestos in the workplace
- Discuss the health effects of exposure to asbestos
- Identify and assess asbestos-related work activities
- Apply control measures for low-risk, moderate-risk, and high-risk activities
- Relate the proper disposal of asbestos containing material
- Select appropriate protective equipment

Lesson 1: Asbestos in the Workplace

Lesson Topics

At the end of this lesson, students will be able to:

- Describe asbestos and its properties
- Describe how asbestos has been used and where it may be commonly found
- Describe the health effects related to asbestos exposure
- Describe the most common asbestos-related diseases

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. Because of these properties, asbestos has long been used in the construction industry, 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 of its significant health hazards, it is rarely used for these applications anymore. Most worker exposures therefore occur during the removal of asbestos and the renovation and maintenance of buildings and structures containing asbestos.

Types of Asbestos

The three types of asbestos that were commonly used in building materials are Chrysotile, Amosite, and Crocidolite. Chrysotile or “white asbestos” was the most commonly used type. It is often found in roofs, walls, and floors in residential and

commercial structures. Amosite, commonly referred to as "brown asbestos," is the second most common type of asbestos and accounts for approximately four to six percent of the asbestos used in building materials in the United States. It is commonly found in cement sheets and pipe insulation. Crocidolite is the least common type of asbestos and accounts for only about one to four percent of the asbestos materials used in the United States. Crocidolite is commonly known as "blue asbestos," and was found insulating steam engines and in some types of spray-on insulation.

Uses of Asbestos

Asbestos has many properties that make it ideal for use in a variety of products. It is strong, fire-resistant, a poor conductor of heat and electricity, corrosion-resistant, and found in abundance. Those products that are made with asbestos are called asbestos-containing materials (ACM).

By the end of the 19th century, and until around 1980, asbestos was widely used in the construction industry for the manufacture of building material. Building materials that contain asbestos are known as asbestos-containing building materials (ACBMs).

The most common uses of ACBMs include:

- **Insulation:** This was usually applied with spray, trowel, or manually installed on many surfaces to insulate them from heat and cold.
- **Fireproofing:** This material was applied with a spray to steel beams that were used in construction of multi-story buildings. This helped to protect the structural members from damage caused by heat in case there was a fire.
- **Acoustical or soundproofing:** Apart from soundproofing, this material was also used for decoration. A mixture of asbestos and some other materials was sprayed onto ceilings and walls to create a textured look.
- **Miscellaneous:** Asbestos has been used in the making of many products, including roofing felts, roofing shingles, floor tiles, vehicle brakes, combustion vents, exterior siding and wallboard, and flues for waste gases and heat.

The asbestos fibers in these products are tightly woven into the materials and are easily released if the material is damaged (for example, by a mechanical process such as drilling, grinding, cutting, or sanding). The asbestos present in roofing shingles and siding that is exposed to weathering can also deteriorate gradually and release asbestos fibers in the air.

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 already containing asbestos. The potential for a product containing asbestos to release breathable fibers depends, in part, on its degree of friability.

- **Friable** means that the material can be easily crumbled or reduced to dust-size particles likely to emit fibers into the air. It is more dangerous than a non-friable piece of asbestos.

The fibrous or fluffy sprayed-on materials used for fireproofing, insulation, or sound proofing are considered to be friable, and they may readily release airborne fibers if disturbed. Materials such as vinyl-asbestos floor tile or roofing felts are considered nonfriable and generally do not emit airborne fibers unless subjected to damage, polishing, grinding, sanding, and similar operations. Asbestos-cement pipe or sheet can emit airborne fibers if the materials are cut or sawed, or if they are broken.

Health Hazards of Exposure to Asbestos

Many studies have proven that any prolonged or excessive exposure to asbestos is likely to have adverse health effects. Inhaling asbestos fibers can cause several lung diseases, and the greater the exposure to asbestos fiber, the greater is the risk of developing an illness.

Asbestos fibers enter the body when a person inhales or ingests airborne particles, which 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.

If someone is exposed to brief bursts of asbestos fibers in addition to those present in the background, he or she is at a greater risk of contracting an asbestos-related disease. Construction workers who work on and disturb asbestos-containing materials in buildings are at a much greater risk of coming in contact with additional asbestos fibers.

Asbestos and the Respiratory System

Exposure to asbestos fibers can damage the lungs. There are several mechanisms in the human body that are used to "filter" the air we breathe. Many large particles from the air are removed in the nose and mouth. Then air is passed to the airway tubes that are covered with mucus that traps smaller particles. Tiny hair-like cells present in the airway tubes then push these particles upwards into the nose or the back of the mouth. From there they can either be swallowed or expelled. It is important to know that the effectiveness of these hair-like cells may be greatly impaired when a person smokes. This may render the body susceptible to unwanted dust or fibers that may be present in the air.

Dust particles too small or too numerous to be captured and expelled through the body's normal protective mechanisms may enter the tiny air sacs in the lungs where respiration

occurs. A smoker is likely more susceptible to this than a non-smoker due to the compromised filtration system. The human immune system then releases large cells called macrophages that attempt to digest the dust particles. This is another one of the body's defense mechanisms against unwanted particles in the lungs.

The risk of developing an asbestos-related disease increases greatly when the body's natural defenses are not able to control or remove asbestos fibers that enter the lungs. The three main factors that determine the likelihood of developing an asbestos related disease include smoking, the amount and duration of the exposure, and the person's age. Common asbestos-related diseases include asbestosis, lung cancer, mesothelioma, and some other cancers.

Asbestosis

Asbestosis is a serious disease that causes severe scarring of the lungs and reduces lung elasticity. Due to this, breathing becomes very difficult. The scarring makes it hard for oxygen to get into the blood. Workers who have been exposed to asbestos fibers for long periods of time often manifest the symptoms of this disease. Symptoms of asbestosis include shortness of breath and a dry, crackling sound in the lungs while inhaling. There is no effective curative treatment for asbestosis, which can lead to disability or even death.

All types of asbestos can cause asbestosis. Just like all other diseases that are associated with asbestos exposure, it may take many years for the disease to show up. Typically, asbestosis has a latency period of 15 to 40 years.

Mesothelioma

Mesothelioma is a type of cancer that affects the abdominal lining or the chest cavity lining. Asbestos exposure is the leading cause of this type of cancer. It most often affects the tissue that surrounds the lungs (pleura), causes great damage to the vital functions of the body, and almost always results in death. Signs and symptoms may include:

- Chest pain
- Painful coughing
- Shortness of breath
- Unusual lumps of tissue under the skin on your chest
- Unexplained weight loss

Mesothelioma occurs in people who have been exposed to asbestos for a limited period of time. There is no direct link between cigarette smoking and mesothelioma, though research suggests that smoking can increase a worker's risk after asbestos exposure has occurred. It depends on the amount of asbestos inhaled and the period of exposure. Mesothelioma has a latency period of 15 to 50 years.

Lung Cancer

Lung cancer occurs due to long periods of exposure to asbestos. The risk of contracting this disease increases if the worker smokes cigarettes. In fact, workers who are cigarette smokers are 50% more likely to develop lung cancer than those who do not smoke. Asbestos-related lung cancer has a latency period of 15 to 30 years. The most common symptoms of lung cancer are coughing and a change in breathing. Other symptoms include shortness of breath, persistent chest pains, hoarseness, and anemia.

Lesson Summary

- 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. Because of these properties, asbestos has long been used in the construction industry, 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.
- If someone is exposed to brief bursts of asbestos fibers in addition to those present in the air, he or she is at a greater risk of contracting an asbestos-related disease. It has been demonstrated that the greater the exposure to asbestos fiber, the greater the risk of developing an illness.
- Asbestos-related diseases include asbestosis, lung cancer, and mesothelioma. Workers who have been exposed to asbestos fibers for long periods of time often manifest the symptoms of asbestosis; this disease can lead to disability or even death. Mesothelioma, on the other hand, may occur in people who have been exposed to asbestos for a limited period of time.

Lesson 2: Protection Against Asbestos

Lesson Topics

At the end of this lesson, students will be able to:

- Describe the engineering controls and safe work procedures needed when asbestos is present
- Describe the personal protective equipment necessary to protect workers from asbestos

Compliance Program

OSHA has established limits for worker exposure to asbestos in the workplace. These exposure limits are the levels considered to be safe for the average worker. However, keep in mind that everyone is different! Genetic makeup or previous exposures may affect your reactions to certain chemicals.



OSHA exposure limits for asbestos are:

- **Permissible Exposure:** The level of exposure to airborne asbestos fibers may not exceed 0.1 fibers per cubic centimeter of air (0.1 f/cc) averaged over the 8-hour workday.
- **Excursion Limit:** The employer should ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes.

The time-weighted average (TWA) is the average exposure to a hazardous substance measured over a specific time period. If the TWA and/or excursion limit is exceeded, the employer must establish a program to reduce employee exposure until it drops to or below the TWA and/or the excursion limit. This is done by means of engineering and work practice controls, and by the use of respiratory protection where required or permitted. Such programs should be updated as necessary to reflect significant changes in the status of the employer's compliance program.

The employer must inform all employees concerning the availability of self-help smoking cessation program material. The employer should also institute engineering controls and work practices to reduce and maintain employee exposure to or below the TWA and/or excursion limit except to the extent that such controls are not feasible. When they are not sufficient, they will be supplemented by appropriate respiratory protection. Employers must provide respirator training and medical clearance to use respirators.

For any employee exposed to airborne concentrations of asbestos that exceed a Permissible Exposure Limit (PEL), employers must provide and require the use of protective clothing, such as coveralls or similar full-body clothing, head coverings, gloves, and foot coverings. Also, employers must provide face shields, appropriate eye and face protection, or other appropriate protective equipment wherever the possibility of eye irritation exists and require workers to wear it.

Employers must establish decontamination areas and hygiene practices for employees exposed above a PEL. In addition, employees may not smoke in work areas that might expose them to asbestos. In general industry, employers must provide medical examinations for workers who are exposed above a PEL.

Sign Specifications

The warning signs should indicate the following information:

- Danger
- Asbestos
- Cancer and Lung Disease
- Hazard
- Authorized Personnel Only

In addition, where the use of respirators and protective clothing is required in the regulated area, the warning signs should include “Respirators and protective clothing are required in this area.”

Warning Labels

Warning labels must be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers. The labels should comply with the requirements of OSHA's Hazard Communication (HazCom) standard and include the following information:

- Danger!
- Contains Asbestos Fibers
- Avoid Creating Dust
- Cancer and Lung Disease Hazard

All hand-operated and power-operated tools that would produce or release fibers of asbestos, such as saws, scorers, abrasive wheels, and drills, must be equipped with local exhaust ventilation systems, which should be designed, constructed, installed, and maintained in accordance with good practices of ANSI Z9.2-1979.

As much as possible, asbestos should be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the release of airborne fibers.

Engineering Controls and Safe Work Procedures

Employers are not allowed to use employee rotation as a means of compliance with the TWA and/or excursion limit. In general industry, employers must perform initial monitoring for workers who may be exposed above a PEL or above the excursion limit. Employers must conduct subsequent monitoring at reasonable intervals, and in no case at intervals greater than six months for employees exposed above a PEL.

Employers must establish regulated areas wherever asbestos concentrations may exceed a PEL. These areas are designed to protect employees where certain work with asbestos is performed, and employers should limit access to these areas to authorized persons who are wearing appropriate respiratory protection and who have been properly trained. Employers should also prohibit eating, smoking, drinking, chewing tobacco or gum, and applying cosmetics in these areas, and they must display warning signs at each regulated area.

Low-risk Work Activities

Low-risk work activities are those that do not pose a great health and safety threat to workers. Work that will be done near friable asbestos-containing material but will not disturb it is categorized as low-risk work. Moving asbestos containing material that is in

clean and sealed bags is also considered a low-risk task. Workers who have to carry out such tasks, however, must still be informed about the hazards of asbestos.

Employers are required to identify and clearly label all areas where asbestos-containing materials are present. Employers must also ensure that all workers are properly trained to handle asbestos-containing materials when workers are required to perform this work.

Moderate-risk Work Activities

There are many asbestos-related work tasks that are categorized as moderate-risk activities. These tasks require workers to follow specific procedures in order to ensure their safety and the safety of others.

Activities that carry a moderate risk of exposure to airborne asbestos fibers may include:

- Cutting, drilling, grinding, shaping, or removing non-friable manufactured products that contain asbestos using hand tools
- Using a coarse disc to buff floors
- Drilling into non-friable asbestos-containing materials
- Removing mounting screws from cement products that contain asbestos
- Analyzing asbestos samples in a laboratory
- Collecting samples of materials that might contain asbestos for laboratory analysis
- Removing a false ceiling to get to a work area when there are friable asbestos-containing materials on the surface
- Taking apart drywall that contains asbestos in the joint-filling material
- Carrying out a procedure that does not create any friable asbestos waste material, such as removing vinyl-asbestos floor coverings
- Destroying a block wall that contains asbestos fragments in the cavity
- Taking apart the treated enclosure after the asbestos-containing materials have been removed
- Installing or removing a glove-bag apparatus in order to remove pipe insulation when the insulation is in good condition
- Removing asbestos insulation from piping using prefabricated glove-bags

Workers who are involved in a moderate-risk task must follow specific work procedures. They must make sure that all those present at or near the work area are not exposed to the asbestos fibers in the air. Workers must place necessary enclosures, barricades, or similar structures around the work area so that everyone knows the exact location of the designated work area. They must warn unauthorized people from entering the work area by placing signs around it.

Workers are required to put on suitable protective equipment and clothing. The material of the clothing must not allow penetration of asbestos fibers. Torn or defective clothing must be replaced immediately. A respirator with an appropriate filter must also be worn.

All dust and waste produced during work must be wiped—compressed air must never be used to clean clothing or work surfaces! That could send asbestos particles into the air. Polyethylene sheets should also be used to prevent the spread of asbestos dust to other parts of the work area. These sheets can be used to seal doorways, windows, or any other openings. If a worker suspects the presence of friable asbestos on any surface in the work area, he or she must wipe it off with a damp cloth and take necessary steps to identify the source and correct any deficiencies that may have allowed the dust to be present.

All sealable containers or bags containing asbestos waste must be labeled properly to identify the contents, the associated hazards, and the precautionary measures required when handling the substance. These bags and containers must not be left in the work area and should be removed after each work shift. Workers must make sure to wipe the surface of each container or bag before it is removed from the work area.

Once work is completed, all polyethylene sheets and work area barriers should be sprinkled with water. They should then be folded carefully in order to contain any remaining dust. After that, they should be placed in bags or containers and properly sealed. The bags should be disposed of as asbestos waste.

Before removing it from the work area, workers must use proper materials to clean all protective equipment and clothing. If there is no designated storage area for clothing within the work area, it must be placed in a sealable bag or container and disposed of as asbestos waste. The encapsulation of asbestos-containing materials also requires covering with a sealant or glue to prevent the release of fibers.

After the work has been completed, a document must be presented to the employer stating that the work area is safe to enter by unprotected personnel.

High-risk Work Activities

Those work activities that are categorized as high-risk must be carried out very carefully, following certain specific procedures in order to protect workers and other personnel who may be otherwise affected by them.

Some of the tasks that may pose a high risk of exposure to asbestos fibers in the air include:

- Maintaining, cleaning, or removing air-handling equipment in structures and buildings where fireproofing material contains sprayed asbestos
- Encapsulating, removing, or enclosing friable asbestos-containing materials while repairing, altering, maintaining, or demolishing a building or a structure



- Repairing, dismantling, demolishing, or altering any structure, building, or device that contains asbestos
- Any task where large amounts of friable asbestos fibers can become airborne

High-risk activities require special measures for specific tasks including isolating the work area, decontaminating workers, controlling airborne asbestos fibers, disposing of asbestos containing material, and collecting samples of materials that may contain asbestos.

Isolating the Work Area

All designated work areas must be isolated to prevent unauthorized personnel from entering. To isolate a work area, employers should place signs around it to warn unauthorized people against entering. The work area must be enclosed with proper polyethylene sheets that will contain the asbestos fibers. If the work area cannot be enclosed, a notice must be provided to all workers specifying alternative work procedures that can control the risk of asbestos exposure.

In order for the contaminated air to remain in the enclosed area or filtered prior to release, the air pressure in the work area must be kept lower than that of the surrounding area. This low pressure should be maintained until all work has been completed. Stairways and elevators must be sealed off using polyethylene sheets and tape. The air heating and ventilation system in the work area must also be shut down and all ducts should be sealed off with polyethylene sheets.

All devices and fixtures that can be removed should be wiped with damp cloths and removed from the contaminated area. All non-removable devices and fixtures should be covered with polyethylene sheets. The floor of the work area must be covered with polyethylene sheets that also extend at least 12 inches up the wall. All enclosures must be inspected on a regular basis to ensure that there are no breaks, tears, or leaks.

Decontaminating Workers

In order to ensure that workers do not carry any contaminants outside the work area, they must be decontaminated in a designated space inside the work area. Before entering the contaminated work area, workers should remove their street clothing in a clean room and put on clean work clothes. They must make sure that their respirator fits properly. Workers are required to enter the personnel transfer room and put on the required personal protective equipment. They can then proceed towards the contaminated work area to carry out the assigned tasks.

After leaving the contaminated work area, workers should remove the asbestos fibers from personal protective equipment using a proper system. They must remove all protective clothing and equipment in the personnel transfer room. Any disposable clothing must be placed in polyethylene bags and disposed of properly.



When the respirator and its harness are free from all contaminants, these should then be removed. The workers can then enter the clean room to put on their street clothes. The respirator should be cleaned and disinfected and stored in the clean room until it is required again. All tools and equipment must be stored in the equipment holding room.

Controlling Airborne Asbestos Fibers

In order to properly control the asbestos fibers in the air:

- Materials containing asbestos should only be removed after getting an approval from authorized personnel. Workers must never use dry clothes or compressed air to clean asbestos-containing materials.
- After all the asbestos-containing materials have been removed, all exposed surfaces in the work area must be properly cleaned.
- Employers must identify all asbestos material that is encapsulated and must ensure that it is firmly bound by the encapsulating material so that there are no loose fibers. Workers must ensure that encapsulating material does not disturb the bond between asbestos-containing material and its supporting surface.
- Workers must make sure that they disturb or displace the least amount of asbestos-containing material possible while repairing it. After performing this task, they should seal the exposed asbestos and then remove the work enclosure. All surfaces that are exposed must be washed thoroughly and properly protected.

Disposing of Asbestos Waste Materials

To ensure that asbestos waste is properly disposed of, all waste materials should be placed in leak-proof containers while they are still inside the enclosed area. These containers should be sealed and labeled, and their outside surfaces should be decontaminated before they are removed from the storage room and the waste transfer room.

In order to prevent the containers from getting damaged or torn while being transported to the disposal site, workers must properly package them using double polyethylene bags. Employers must ensure that asbestos-containing waste material is disposed of immediately or after each work shift. All arrangements must be made in advance with the concerned authorities to transport the waste to the assigned dumpsters. It is very important to inform the transport drivers about the hazards of asbestos and the appropriate measures they must take. Signs must be placed on the transport vehicles displaying the nature of the materials being transported.

Once the asbestos waste has been removed, workers must decontaminate the enclosure and all the equipment by washing and vacuuming. Finally, the air inside the enclosure must be decontaminated before taking apart the enclosure.

Collecting Samples of Materials that May Contain Asbestos

Only a qualified person may collect samples of materials that may contain asbestos. These samples must then be sent immediately to a laboratory where their contents can be determined.

To collect samples, a qualified person must take the safety precautions that are recommended for moderate-risk activities. Before starting work, there must be no unprotected workers present in the work area. The materials should be prepared to ensure that no asbestos fibers will be released during the collection process, and the workers must disturb the least amount of material possible.

To ensure that the sample is valid, it should be taken by deep penetration into the material. The sample collector must observe the color and the texture of the various materials present in the work location in order to collect samples of all those present. Samples should then be placed in leak-proof containers and properly sealed. Labels must also be placed on the containers to identify the contents as laboratory samples. To collect any loose material that may break off while sampling, the floor of the work area should be covered with polyethylene sheets. After completion of the work, these sheets must be placed in leak-proof containers and disposed of properly.

All workers present near the sampling area must be equipped with a respirator, as sampling can create airborne asbestos fibers that could be injurious to health.

Personal Protective Equipment (PPE)

Protective Clothing

Personal protective equipment includes all clothing designed to protect against asbestos exposure, such as coveralls or any other full-body clothing, hard hats, gloves, rubber boots without laces, and eye protection. All workers who are required to perform asbestos-related tasks must wear protective clothing that meets the following requirements:

- It should be made with a material that does not allow asbestos fibers to penetrate.
- It should cover the whole body, and it should fit comfortably at the neck, wrists, and ankles.
- It should include headgear and proper boots that can resist the penetration of asbestos fibers.
- If protective clothing gets damaged or torn, it must be replaced immediately.

Workers must not exit the work area while wearing their protective clothing. All contaminated clothing and equipment must be taken off and kept in the equipment room or work area so that the contaminants do not enter the clean area.

Respiratory Protection

Many types of respirators provide protection from asbestos dust and fibers. A respirator is usually selected according to the nature of the work and the amount of asbestos that may be produced. Before entering the work area, workers must put on their respirators, make sure that they fit properly, and check that there are no gaps through which asbestos fibers may enter.

Respiratory protection against asbestos can be obtained through two basic types of respirators: air-purifying respirators and atmosphere-supplying respirators.

- **Air-purifying Respirator:** A respirator with an air-purifying filter, cartridge, or canister is called an air-purifying respirator. This respirator removes asbestos contaminants from the air by passing it through an air-purifying component, making it acceptable to breathe normally.
- **Atmosphere-supplying Respirator:** An atmosphere-supplying respirator consists of a component that provides the user with breathable air that is not taken from the ambient atmosphere. There are two types of atmosphere-supplying respirators: supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.
    - **Supplied-air respirators (SAR):** Supplied-air Respirators use a hose called an airline to provide clean air from an air tank. There are two types of supplied-air respirators. One, a pressure-demand respirator, prevents the contaminated air from entering the face-piece by maintaining positive pressure. The other type, continuous-flow respirators, also maintain positive pressure, this time by constantly supplying fresh air to the face-piece.
    - **Self-contained Breathing Apparatus (SCBA) Unit:** A SCBA unit consists of a hose that is connected to a cylinder of compressed air. Activities that carry a risk of exposure to asbestos do not usually require the use of SCBAs. However, in some cases, pressure-demand SCBAs are used, which supply air to the face-piece if the inside pressure reduces due to inhalation or leakage.

Employee Notification of Monitoring Results

The employer, within 15 working days after receiving the results of any monitoring performed, must notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to all affected employees. The notification should contain the corrective action being taken by the employer to reduce exposure to or below the TWA and/or excursion limit, wherever monitoring results indicated that the TWA and/or excursion limit had been exceeded.



You must keep accurate records of the following:

- All measurements taken to monitor employee exposure to asbestos (kept for 30 years)
- Medical records, including physician's written opinions (kept for the duration of the employee's employment, plus 30 years)
- Training records (kept for 1 year beyond employee's last date of employment)

Lesson Summary

- All workers who are required to perform asbestos-related tasks must wear the appropriate protective equipment. Protective clothing should be made with a material that does not allow asbestos fibers to penetrate. The protective clothing should cover the whole body, and should fit comfortably at the neck, wrists, and ankles. Headgear and boots that resist the penetration of asbestos fibers must also be worn, and if protective clothing gets damaged or torn, it must be replaced immediately.
- To collect any loose material that may break off while sampling, the floor of the work area may need to be covered with polyethylene sheets. After completion of the work, these sheets must be placed in leak-proof containers and disposed of properly. Only a qualified person may collect samples of materials that may contain asbestos. These samples must then be sent immediately to a laboratory where their contents can be determined.
- Workers must disturb the least amount of material possible. By washing and vacuuming, one must then decontaminate the enclosure and all of the equipment. Next, all exposed surfaces from which asbestos has been removed should be sealed or protected. Finally, the air inside the enclosure must be decontaminated before taking apart the enclosure.
- In order to prevent the containers from getting damaged or torn while being transported to the disposal site, they must be properly packaged using double polyethylene bags. All permanent enclosures around asbestos-containing materials must be airtight, and warning signs must be put up inside enclosures to warn workers about the dangers of asbestos and any protective measures that must be taken.
- Workers must never use dry clothes or compressed air to clean asbestos-containing materials. Also, in order for the contaminated air to remain in the enclosed area or filtered prior to release, it must be ensured that the air pressure in the work area is lower than the surrounding area. This low pressure should be maintained until all work has been completed. All designated work areas must be isolated in order to prevent unauthorized personnel from entering. In order to isolate a work area, signs should be placed around it to warn unauthorized persons against entering.



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