PERSONAL PROTECTIVE EQUIPMENT SUBPART-I

INTRODUCTION

This course covers broad issues of Personal Protective Equipment (PPE) and its requirements to reduce employees' exposures to hazards. Employers are required to determine all exposures to hazards in their workplace and determine if PPE should be used to protect their workers.

If PPE is to be used to reduce the exposure of employees to hazards, a PPE program must be initialized and maintained. This program must identify and evaluate hazards in the workplace and if the use of PPE is an appropriate control measure. If PPE is to be used, the written program must address: how it is selected, maintained and evaluated; the training of employees using the PPE; and implementation and enforcement of the program to determine its effectiveness in preventing employee injury or illness.

LEARNING OBJECTIVES

- Identify OSHA's general PPE requirements
- Understand why employees are required to follow specific work procedures when using PPE
- Learn how to make decisions, based on hazards and use, to select appropriate PPE to protect employees
- Learn how to teach your employees how to wear and care for the PPE you provide.

KEY TERMS

- **ANSI**

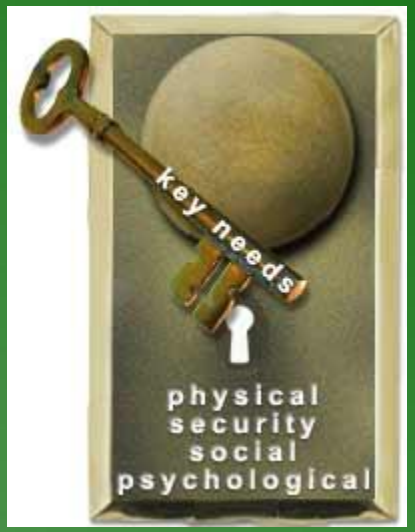
  American National Standard Institute

- **Air-purifying respirator:**

  means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

- **Atmosphere (Air)-supplied respirator**:

  means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units



KEY TERMS

- **Canister or cartridge**

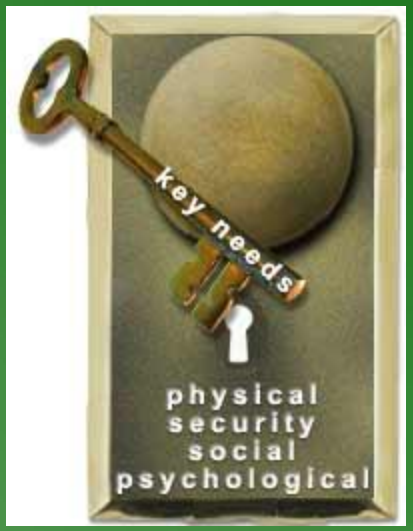
  means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

- **Conductive hearing loss:**

  Hearing loss which involves the outer and middle ear. This type of loss results in a decrease in loudness, but does not make it difficult to understand speech. It can often be corrected medically.

- **Demand respirator means:**

  an air-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.



KEY TERMS

- **Emergency situation**

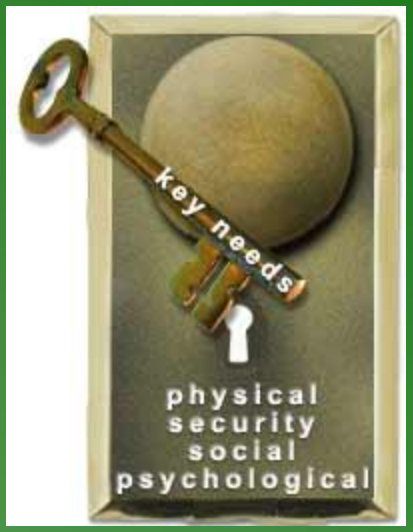
  Means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may, or does, result in an uncontrolled significant release of an airborne contaminant.

- **Employee exposure means:**

  an unprotected exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection when the incident occurred.

- **End-of-service-life indicator (ESLI)**

  means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.



KEY TERMS

- **Filter or air purifying element**

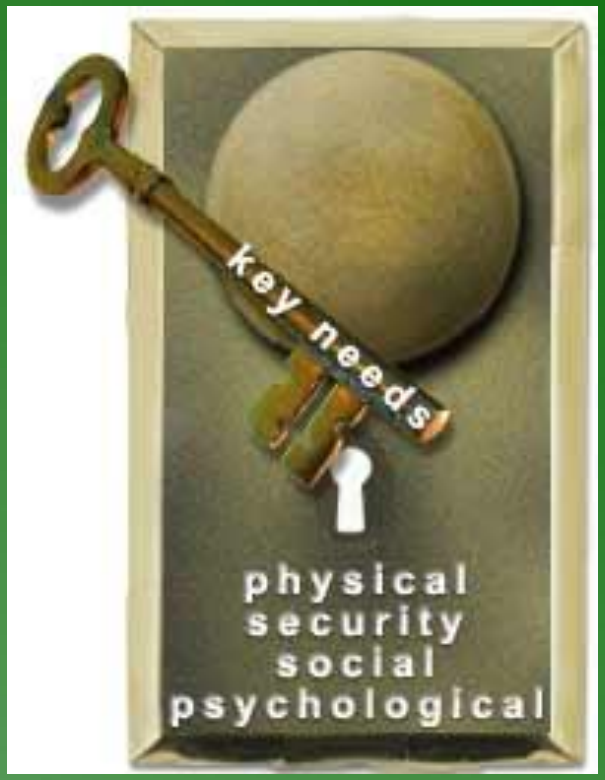
  means a component used in respirators to remove solid or liquid aerosols from the inspired air.

- **Fit factor**

  means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

- **Fit test**

  the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)



KEY TERMS

- **Health hazard**

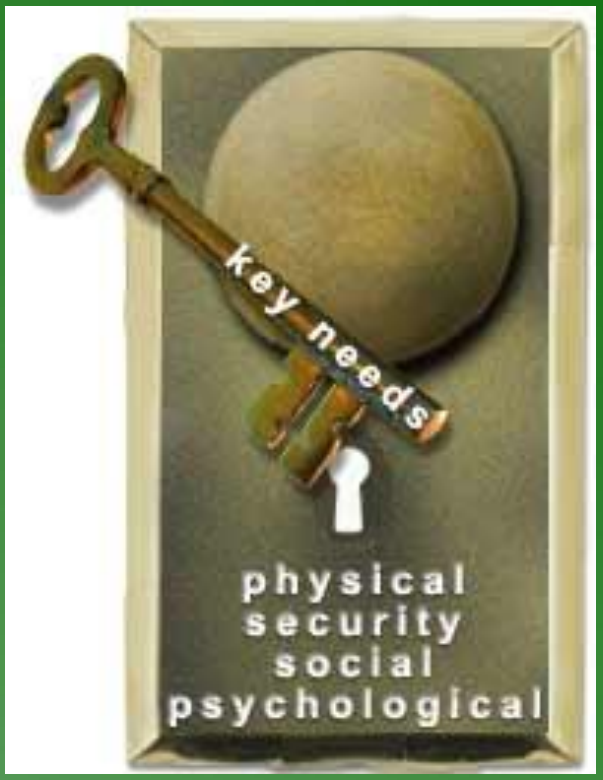
  substances, environments, and atmospheres which threaten employee health, usually causing an acute or chronic illness or disease process

- **Helmet**

  a rigid respiratory inlet covering that also provides head protection against impact and penetration.

- **High efficiency particulate air (HEPA) filter**

  a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.



KEY TERMS

- **Hood**

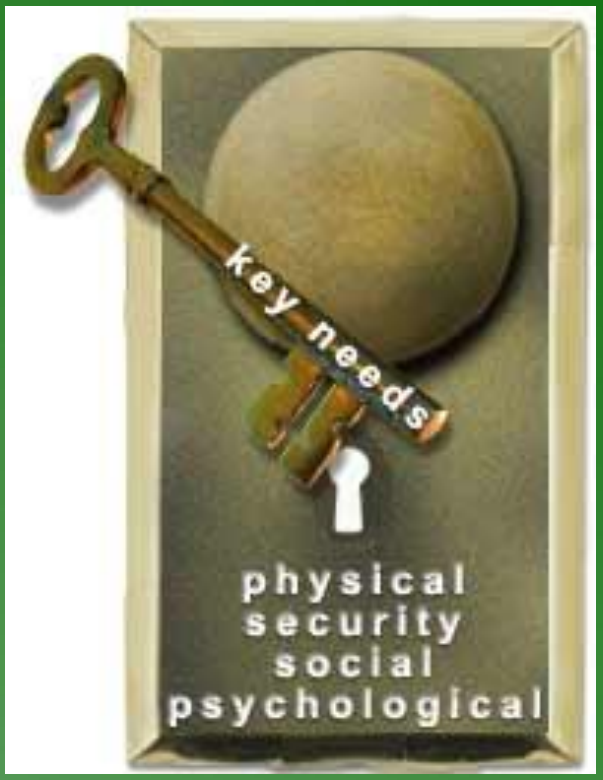
  a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

- **Immediately dangerous to life or health (IDLH)**

  an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

- **Interior structural firefighting**

  the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155)



KEY TERMS

- **Loose-fitting facepiece**

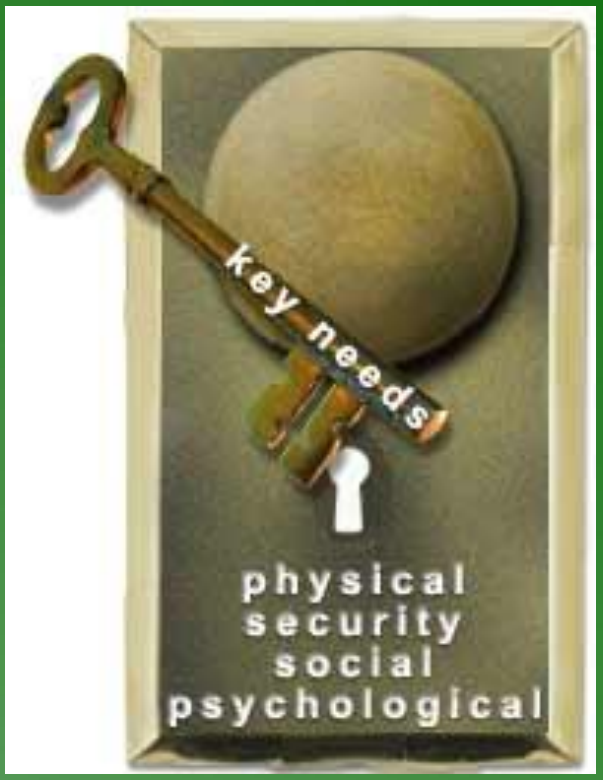
  a respiratory inlet covering that is designed to form a partial seal with the face.

- **Negative pressure respirator (tight fitting)**

  a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

- **Oxygen deficient atmosphere**

  an atmosphere with an oxygen content below 19.5% by volume.



KEY TERMS

- **Personal Protective Equipment (PPE):**

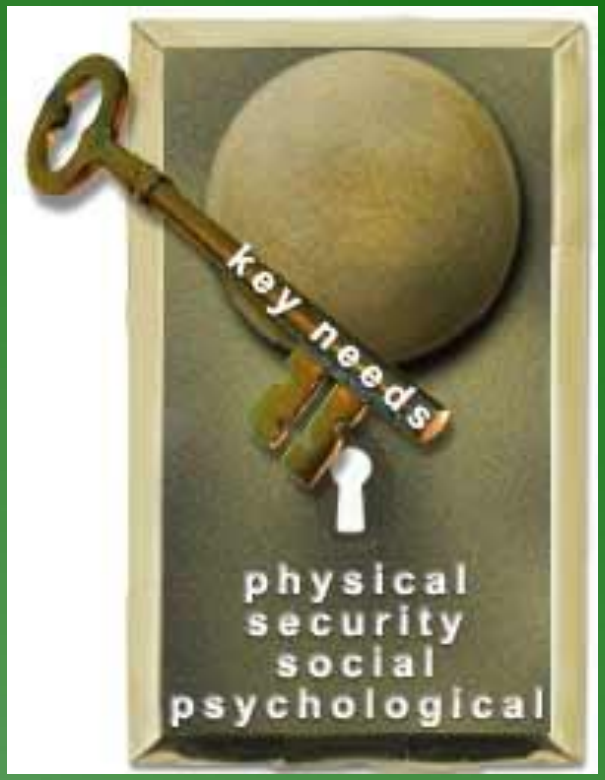
  Specialized clothing or equipment worn by employees for protection against health and safety hazards. Personal protective equipment is designed to protect many parts of the body, i.e., eyes, head, face, hands, feet, and ears.

- **"Personal Protective Equipment" Standard:**

  The Occupational Safety and Health Administration's regulation, 29 CFR 1910.132-138, which requires that employers must establish and administer an effective personal protective equipment (PPE) program for employees.

- **Physical hazard means:**

  substances, environments, chemical, radiological, mechanical and biological hazards which threaten the employees' physical safety by creating situations that can cause falls, crushing, cutting, burning, bruising, and the like.



KEY TERMS

- **Powered air-purifying respirator (PAPR)**

  an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

- **Positive pressure respirator**

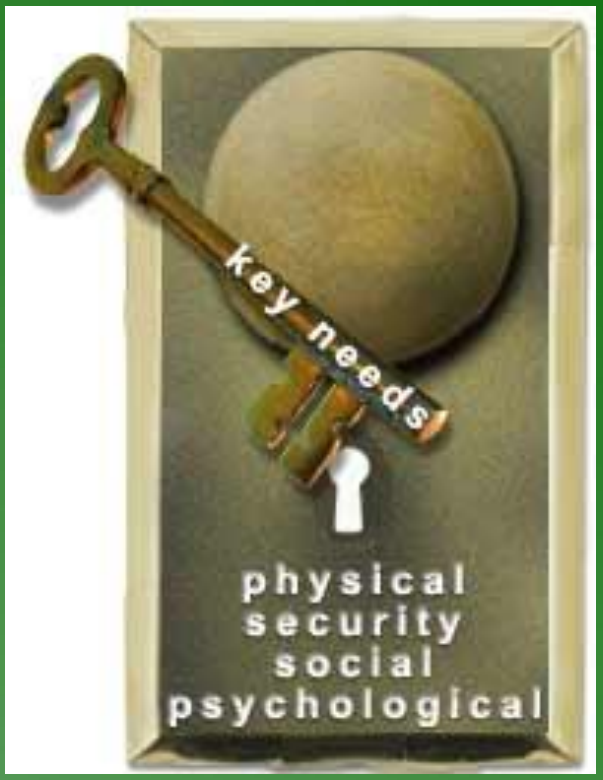
  a respirator in which the pressure inside the respiratory inlet cover exceeds the ambient air pressure outside of the respirator

- **Pressure demand respirator**

  a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

- **Qualitative fit test (QLFT)**

  a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.



KEY TERMS

- **Quantitative fit test (QNFT)**

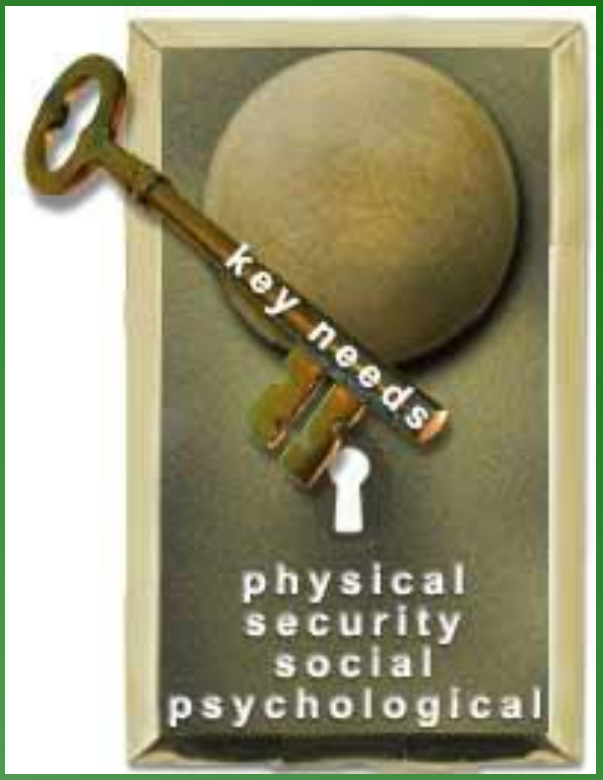
  an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

- **Respiratory inlet covering**

  that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

- **Self-contained breathing apparatus (SCBA)**

  an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.



KEY TERMS

- **Service life**

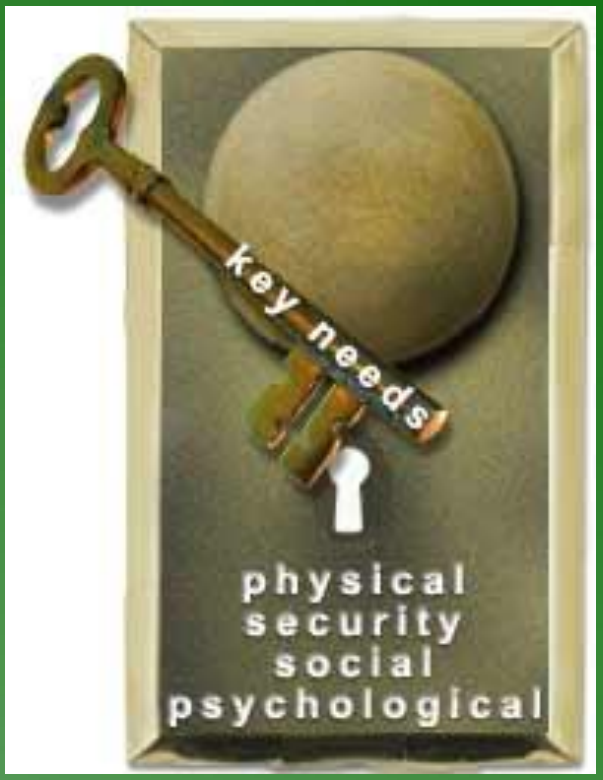
  the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

- **Supplied-air respirator (SAR) or airline respirator**

  an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

- **Tight-fitting facepiece**

  a respiratory inlet covering that forms a complete seal with the face.



LESSON 1

PERSONAL PROTECTIVE EQUIPMENT AND ASSESSMENT

This lesson focuses on the following topics:

- What is personal protective equipment (PPE)?
- PPE general requirements
- Employer responsibilities
- Personal protective equipment training
- Employee responsibilities

LESSON 1

WHAT IS PERSONAL PROTECTIVE EQUIPMENT?

Employees have used personal protective equipment (PPE) for centuries to protect themselves while they work. Personal protective equipment, or PPE, includes a variety of devices and garments to protect workers from injuries. You can find PPE designed to protect:

- Eyes
- Face
- Head
- Ears
- Feet
- Hands and arms
- Whole body

LESSON 1

WHAT IS PERSONAL PROTECTIVE EQUIPMENT?

PPE includes items such as:

- Goggles
- Face shields
- Safety glasses
- Hard hats
- Safety shoes
- Gloves
- Vests
- Earplugs and earmuffs
- Respirators

LESSON 1

WHAT IS PERSONAL PROTECTIVE EQUIPMENT?

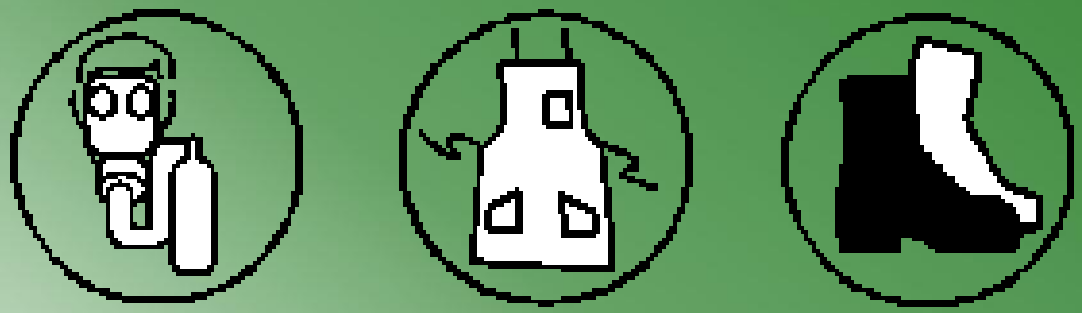
Personal protective Equipment should not be used as a substitute for engineering work practice, and/or administrative controls. Personal protective equipment should be used in conjunction with these controls to provide for employee safety and health in the workplace. Personal protective equipment includes all clothing and other accessories designed to create a barrier against workplace hazards.

LESSON 1

WHAT IS PERSONAL PROTECTIVE EQUIPMENT?

This example illustrates protective clothing requirement for pesticide users.

- Hard hat
- Chemical gloves
- Respirator
- Chemical apron and boots
- Safety goggles



LESSON 1

WHAT IS PERSONAL PROTECTIVE EQUIPMENT?

This man (entering confined space) is well protected with :

- Head Protection
- Eye Protection
- Foot Protection
- Fall protection

LESSON 1

WHAT IS PERSONAL PROTECTIVE EQUIPMENT?

Here is an example of Foundry worker who appears to be protected with

- Face protection
- Head protection
- Hand protection
- Feet protection
- Thermal protection

LESSON 1

PPE GENERAL REQUIREMENTS – 1910.132

Use Of PPE Must Be Based On A Hazard Written Assessment

1910.132

- "The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE)."
- Provide PPE based on the hazard assessment.
- Must certify in writing that a workplace hazard assessment has been performed.

LESSON 1

PPE GENERAL REQUIREMENTS – 1910.132

Personal protection equipment is important. So important, that in 1994, OSHA (the Occupational Safety and Health Administration) established 29 CFR 1910.132-139, the "Personal Protection Equipment" Standard.

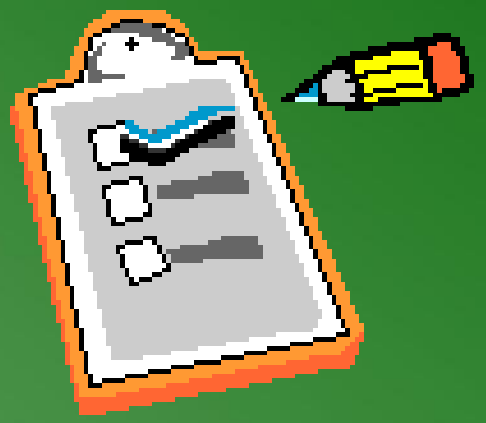
Briefly stated, this standard requires that employers must establish and administer an effective PPE (Personal Protection Equipment) program for employees and that employees be trained in the proper use of PPE.

LESSON 1

PPE GENERAL REQUIREMENTS – 1910.132

Requires written certification by the employer of workplace evaluation for personal protective equipment. This certification must identify:

- The workplace being evaluated
- The person certifying that the evaluation has been performed
- The date (s) of the assessment
- That the document is a certification of hazard assessment



"Personal Protective Equipment" Standard - The Occupational Safety and Health Administration's regulation, 29 CFR 1910.132-139, which requires that employers must establish and administer an effective personal protective equipment (PPE) program for employees.

EMPLOYER RESPONSIBILITIES

Assessment

Employers are required to conduct an assessment to determine the various physical hazards that may be present in your work area.

Physical hazards include:

- Sources of motion;
- Sources of high and low temperatures;
- Sources of light radiation
    - welding
    - brazing
    - heat treating
    - high intensity lights;

EMPLOYER RESPONSIBILITIES

- Sources of falling objects;
- Sources of sharp objects;
- Sources of rolling or pinching objects;
- Sources of electric hazards; and
- Floor conditions.

EMPLOYER RESPONSIBILITIES

Assessment

As part of the assessment, employers must also determine the various health hazards that may be present in the work area.

Health hazards include:

- Hazardous chemicals
- Harmful dusts
- Ionizing and non-ionizing radiation
- Excessive noise

LESSON 1

EMPLOYER RESPONSIBILITIES

Selection of PPE

Once your area has been assessed, your employer must select, with your help, appropriate personal protection equipment for you to use while performing your job.

Providing PPE

Once your area has been assessed, your employer must provide, at no cost to you, appropriate personal protection equipment that fits, for you to use while performing your job.

If you have your own personal protective equipment, it must be approved by your employer before you can use it on the job. Check with your supervisor or safety manager before using your own equipment.

LESSON 1

EMPLOYER RESPONSIBILITIES

What is a PPE program?

This program sets out procedures for selecting, providing, using, cleaning, storing, and maintaining PPE as part of your routine work operation. A written PPE program is easier to establish, maintain, and evaluate than an unwritten one.

LESSON 1

EMPLOYER RESPONSIBILITIES

How Does A Company Develop A PPE Program?

The first step is to think about how to best protect employees from potential hazards. The check list below will help establish a PPE program. The next steps, after program development and training, would be to enforce and evaluate the program.

LESSON 1

EMPLOYER RESPONSIBILITIES

PPE Program Check List

- Identify steps taken to assess potential hazards in every employee's work space and in workplace operating procedures
- Identify appropriate PPE selection criteria
- Identify how you will train employees on the use of PPE, including
    - What PPE is necessary
    - When PPE is necessary
    - How to properly inspect PPE for wear or damage
    - How to properly put on and adjust the fit of PPE
    - How to properly take off PPE
    - The limitations of the PPE
    - How to properly care for and store PPE

LESSON 1

EMPLOYER RESPONSIBILITIES

- Identify how you will assess employee understanding of PPE training
- Identify how you will enforce proper PPE use
- Identify how you will provide for any required medical examinations
- Identify how and when to evaluate the PPE program

LESSON 1

TRAINING FOR PERSONAL PROTECTIVE EQUIPMENT

Your employer must also provide you with training. Training must be documented in writing with the employees name, date of training and the subject of training. The training must include:

- When PPE is necessary
- What PPE is necessary
- How to put on, take off, adjust and wear the PPE
- The limitations of the PPE
- Proper care, maintenance, useful life and disposal of PPE

LESSON 1

EMPLOYEE RESPONSIBILITIES

The employee is responsible for attending all PPE training sessions. Remember, the best PPE in the world is useless unless you know how to use and care for it!

LESSON 1

EMPLOYEE RESPONSIBILITIES

Assess Potential Hazards

Before you start any job, assess the real and potential hazards associated with that job.

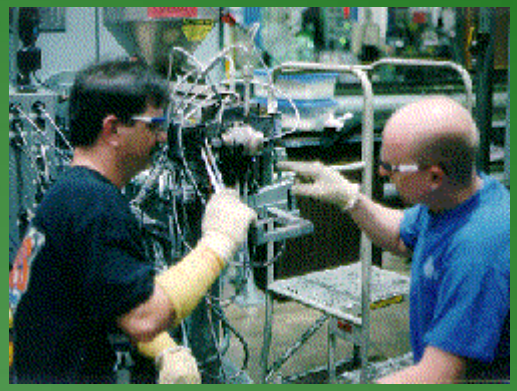
Follow ALL Warnings and Precautions

LESSON 1

EMPLOYEE RESPONSIBILITIES

Take time to read any and all warnings and precautions that may appear on tools, equipment, chemicals, MSDs, and personal protective equipment.

Listen and Follow Directions



LESSON 2

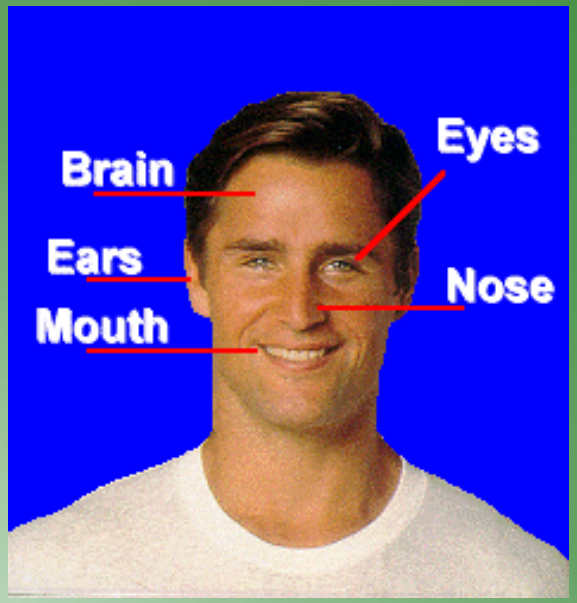
HEAD PROTECTION – 1910.135

This lesson focuses on the following topics:

- Why head protection is important
- Types of hard hats
- Purpose of wearing hard hats
- Caring for your hard hat

LESSON 2

WHY HEAD PROTECTION IS IMPORTANT



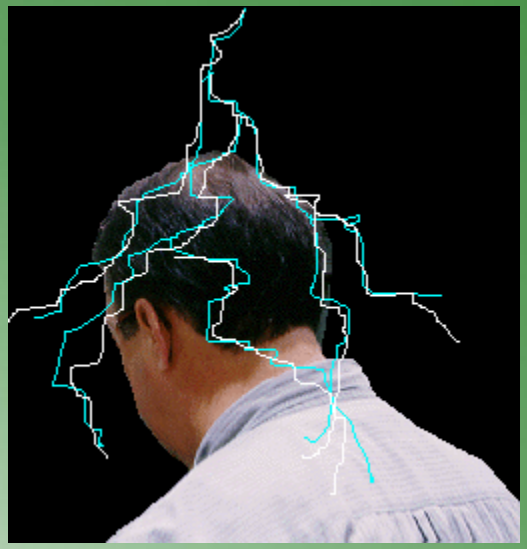
Your head is a very delicate part of your body. In and around your head are:

- Your eyes, with which you see
- Your ears, with which you hear
- Your nose, with which you detect odors
- Your mouth, with which you eat, breathe and speak
- Your brain, with which you think.

Injuries to the head are very serious, and for this reason, head protection and safety are very important.

LESSON 2

WHY HEAD PROTECTION IS IMPORTANT

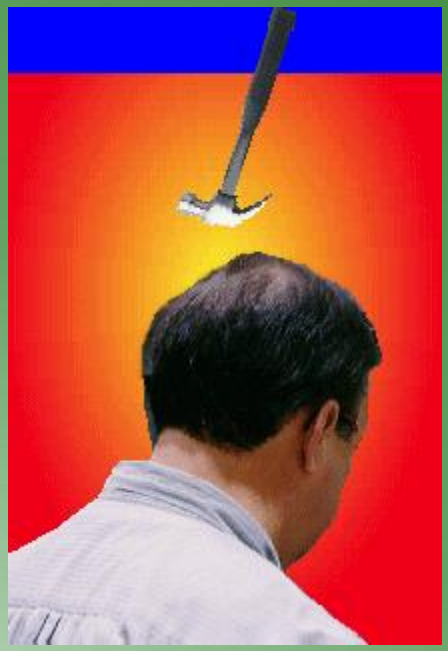


Electrical Shocks

Accidents involving electricity result in electrical shocks and burns.

LESSON 2

WHY HEAD PROTECTION IS IMPORTANT

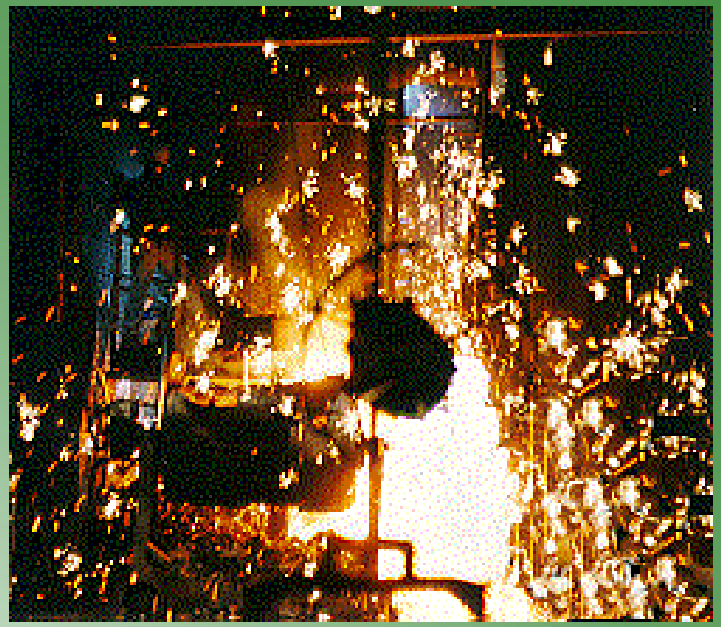


Impact to the Head

Falling or flying objects are a common cause of head injuries, as are falling or walking into hard objects. These injuries include neck sprains, concussions, and skull fractures.

LESSON 2

WHY HEAD PROTECTION IS IMPORTANT



Splashes, Spills, and Drips

Toxic liquids such as acids, caustics, and molten metals can irritate and burn the eyes and skin.

LESSON 2

WHY HEAD PROTECTION IS IMPORTANT

How Hard Hats Protect You

Hard hats protect you by providing the following features:

- A rigid shell that resists and deflects blows to the head
- A suspension system inside the hat that acts as a shock absorber
- Insulation against electrical shocks;
- A shield for your scalp, face, neck, and shoulders against splashes, spills, and drips
- Accessories so that you can add face shields, goggles, hoods, or hearing protection to them.

LESSON 2

TYPES OF HARD HATS

Class A hard hats are designed to:

- Protect you from falling objects
- Protect you from electrical shocks up to 2,200 volts.

Class B hard hats are designed to:

- Protect you from falling objects
- Protect you from electrical shocks up to 20,000 volts

LESSON 2

TYPES OF HARD HATS

Class C Hard Hats are designed to:

- Protect you from falling objects
- DO NOT protect you from electrical shocks
- DO NOT protect you from corrosive substances.

LESSON 2

TYPES OF HARD HATS

Bump Caps

Bump caps are made from lightweight plastic and are designed to protect you from bumping your head on protruding objects. Bump caps DO NOT: - Use a suspension system

- Protect you from falling objects
- Protect you from electrical shocks.

WARNING: You should never substitute a bump cap for a hard hat.

LESSON 2

WEARING HARD HATS

- Always wear your hard hat while you are working in areas where there are potential head hazards.
- Adjust the suspension inside your hard hat so that the hat sits comfortably, but securely on your head.
- Inspect the shell of your hard hat for cracks, gouges, and dents, daily.
- Inspect the suspension system, daily, for frayed or broken straps. If your hard hat needs to be repaired, have it repaired immediately or ask your employer for a new one.
- Never paint, scratch or drill "air holes" in your hard hat. You may apply reflective plastic tape if you must work at night. Never use metal tape on your helmet because it can conduct electricity.
- Never carry personal belongings such as cigarettes, lighters, or pens in your hat. your

LESSON 2

CARING FOR YOUR HARD HAT

Because your hard hat is an important piece of personal protective equipment, you should:

- Clean your hard hat at least once a month (or as needed) to remove oil, grease, chemicals, and sweat that can collect in and around your hat.
- You can clean your hat by soaking it in a solution of mild soap and hot water for 5-10 minutes. Rinse with clear water, wipe, and let air dry. Or, follow the manufacturer's recommendations for cleaning your hat.
- Because sunlight and heat can damage the suspension of your hat, always store your hat in a clean, dry, and cool location.

LESSON 3

EYE AND FACE PROTECTION – 1910.133

This lesson focuses on the following topics:

- Why eye and face protection is important
- Types of accidents that can cause eye injuries
- Protective measures
- Personal protective equipment
- Vision exams

LESSON 3

EYE AND FACE PROTECTION – 1910.133

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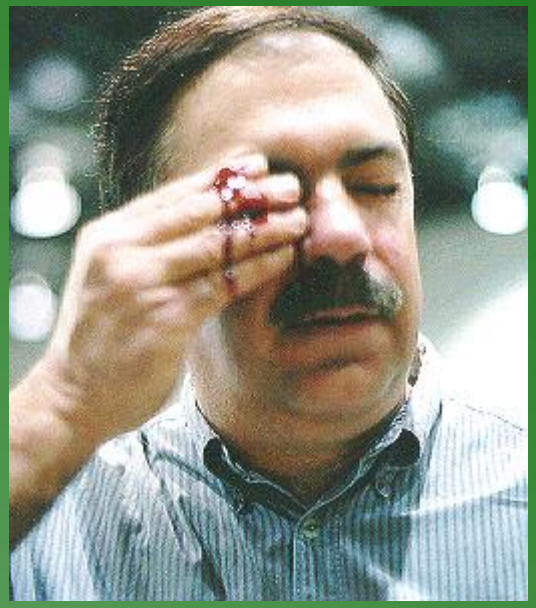
- Personal protective equipment
- Vision exams

LESSON 3

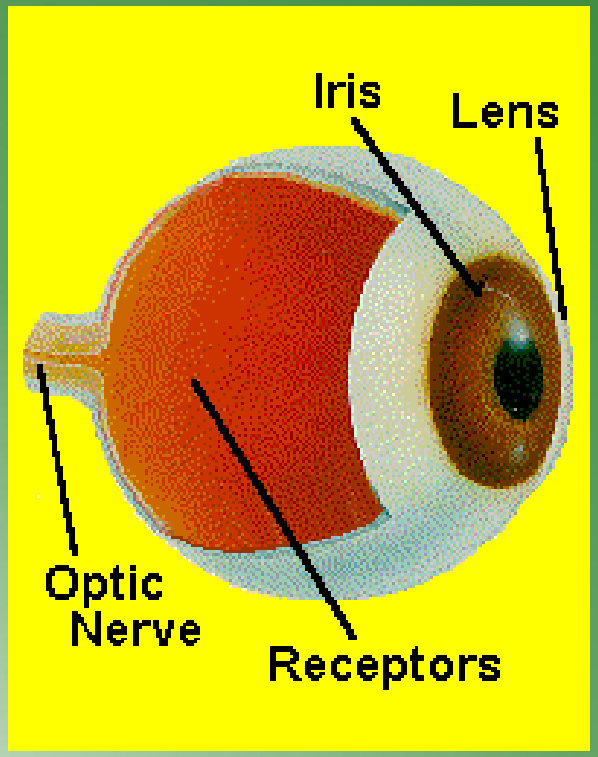
WHY EYE AND FACE PROTECTION IS IMPORTANT

Thousands of people are blinded each year from work related eye injuries. Injuries that could have been prevented, if only employees would have used eye or face protection.



LESSON 3

WHY EYE AND FACE PROTECTION IS IMPORTANT



Your eyes are very delicate. You can think of them as the color television cameras for your brain. Like a camera, your eyes include:

- A lens that focuses light
- An iris that controls the amount of light that enters the eye
- Receptors that "pick up" the image of what you see
- An optic nerve that serves as a "cable" to transmit information from the receptors in your eye to your brain.

Unlike a television camera that is made of plastic and metal, your eye is made of soft tissues and blood vessels. Damage your eyes, and you have big trouble -- trouble that is often permanent.

LESSON 3

WHAT TYPES OF ACCIDENTS CAUSE EYE INJURIES?

The major types of accidents that can cause blindness include:

- Objects striking the eye
- Contact with chemicals and other hazardous materials
- Being struck by swinging objects such as chains and ropes
- Viewing radiant energy sources such as welding operations or lasers.

Dusts, Powders, Fumes, and Mists

Small particles of matter can enter your eyes and damage them. Operations such as grinding, chiseling, sanding, hammering, and spraying can create small airborne particles -- particles that can injure your eyes.

LESSON 3

WHAT TYPES OF ACCIDENTS CAUSE EYE INJURIES?

Toxic Gases, Vapors, and Liquids

Toxic chemicals in the form of gases, vapors, and liquids can damage your eyes. Always read the appropriate MSDS before working with any hazardous material.

Some manufacturing processes produce hazardous gases, vapors and liquids. Always check with your supervisor or safety manager to learn the type of eye or face protection you will need to use in order to work safely.

LESSON 3

WHAT TYPES OF ACCIDENTS CAUSE EYE INJURIES?

Large Objects

Large objects such as:

- Swinging chains, cables and ropes
- Tools that are thrown or fall
- Any sharp objects such as knives, scissors, pencils, etc.
- Walking or falling into obstructions can damage your eyes or face.

LESSON 3

WHAT TYPES OF ACCIDENTS CAUSE EYE INJURIES?

Molten Metals

Operations which involve or produce molten metals, can, if splashed, splattered, or dripped into the eyes, cause severe burns and tissue damage.

LESSON 3

WHAT TYPES OF ACCIDENTS CAUSE EYE INJURIES?

Electrical Hazards

Any time you work around electricity, there is the potential for arcs and sparks to occur. Take time to talk with your supervisor or safety manager concerning the type of eye protection you should wear if you will be working around electrical hazards.

LESSON 3

WHAT TYPES OF ACCIDENTS CAUSE EYE INJURIES?

Thermal and Radiation Hazards

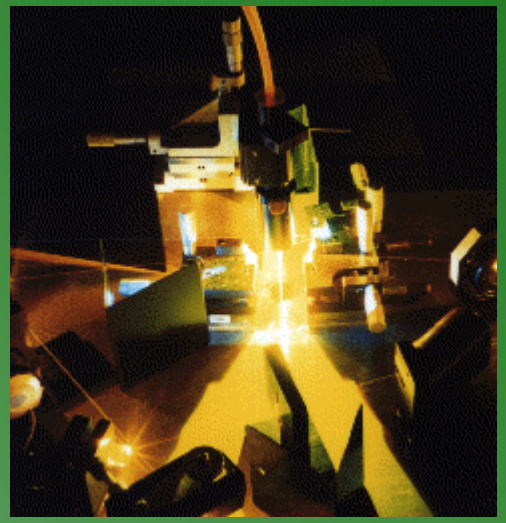
Operations such as welding, metal cutting, and working around furnaces can expose your eyes to heat, glare, ultraviolet, and infrared radiation. Check with your supervisor or safety manager to learn the specific type of eye protection you will need to use during these types of operations.

LESSON 3

WHAT TYPES OF ACCIDENTS CAUSE EYE INJURIES?

Lasers

Laser beams present a new hazard in some workplaces. Because there are different types of lasers, check with your supervisor or safety manager to determine the type of eye protection you need to use while working with lasers.

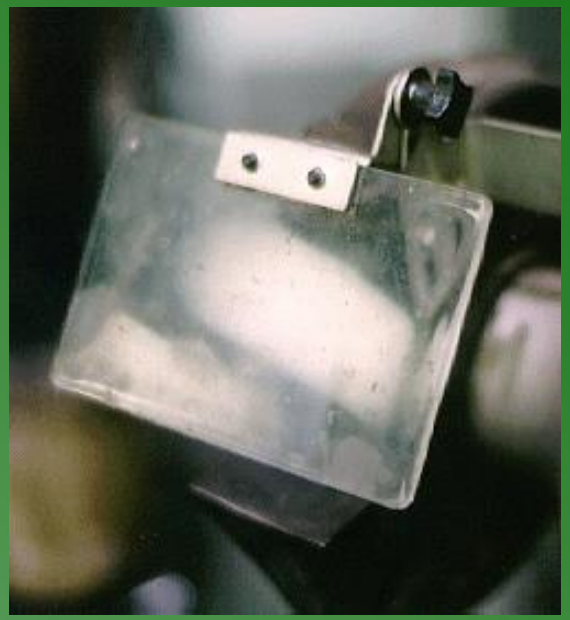


LESSON 3

PROTECTIVE MEASURES

Machine Guards

Many types of machines such as lathes, grinders, and sanders are equipped with guards, shields and screens. Always make sure that guards, shields, and screens are in place and in good working order before using these types of machines. Don't forget to wear eye protection, too!



LESSON 3

PROTECTIVE MEASURES

Work Area Barriers

Operations such as sanding, grinding, welding, and lathe operations produce dust, vapors, and flying particles. To protect other workers, work area barriers such as movable screens and barriers should be set up to separate workers and bystanders from hazardous operations.

LESSON 3

PROTECTIVE MEASURES

Ventilation

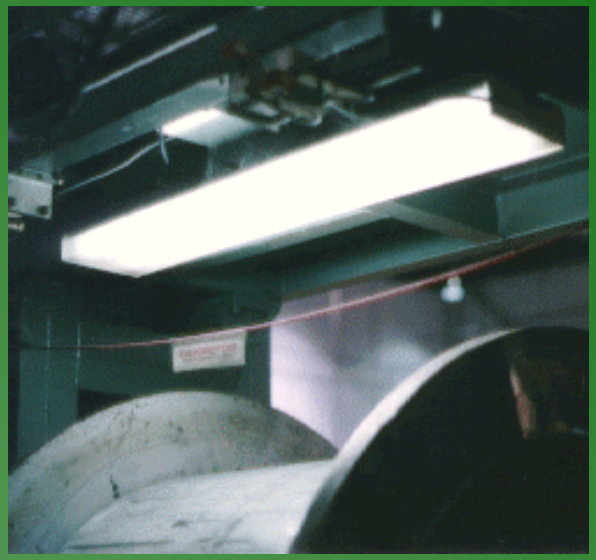
Operations which use or produce vapors, gases, mists, dusts, powders, and other airborne particles should be ventilated to remove the contaminants from the employees' breathing zone and work area. Ventilation, along with damping systems, can significantly reduce the amount of airborne particles that could be hazardous to your eyes.

LESSON 3

PROTECTIVE MEASURES

Lighting

Good lighting is important in work areas. Good lighting reduces eye strain and glare. It also promotes both safety and improved productivity.



LESSON 3

PROTECTIVE MEASURES

Signs and Warnings

As you work:

- Obstructions and protruding objects should be identified and marked. Use caution when working around obstructions and protruding objects
- Read and follow all warnings and precautions that may be found on equipment and hazardous materials
- Do not throw tools or participate in horseplay
- Keep sharp or pointed objects away from your eyes
- Follow your supervisor's or safety manager's procedures, suggestions and recommendations for working safely.

LESSON 3

PROTECTIVE MEASURES

Eye Protection-1910.151

Eyewash stations should be located within 100 feet of your work area. If you accidentally get something in your eyes, go directly to the eyewash station and flush your eyes with water for 15 minutes. Be sure to hold your eyes open with your fingers and "look" directly into the water streams. DO NOT RUB YOUR EYES! Rubbing your eyes may scratch or embed particles into your eyes. Once you have flushed your eyes with water, seek medical attention immediately.

CAUTION: Some chemicals are water reactive and become toxic when mixed with water. Talk with your supervisor or safety manager about the chemicals you will be using on your job. Be familiar with the MSDSs for all chemicals used in your job.

LESSON 3

PERSONAL PROTECTIVE EQUIPMENT

Safety Glasses

Safety glasses are perhaps the most widely used type of eye protection. While they may look similar to regular glasses, they are much stronger and more resistant to impact and heat than regular glasses. In addition, most safety glasses are equipped with side shields that give you protection from hazards that may not be directly in front of you. Both prescription and nonprescription safety glasses are available. In addition, a wide variety of lens coatings are available for special work situations. Safety glasses must be ANSI Z-87.1-1989 approved to meet OSHA regulations.

LESSON 3

PERSONAL PROTECTIVE EQUIPMENT

Goggles

Goggles give you more protection than safety glasses because they fit closer to your face. Because goggles surround the eye area, they give you more protection in situations where you might encounter splashing liquids, fumes, vapors, powders, dusts, and mists. Different types of goggles are available and must indicate that they can be worn for a specific purpose, such as chemical splash goggles.

LESSON 3

PERSONAL PROTECTIVE EQUIPMENT

Face Shields

Face shields offer you full face protection and are often used around operations which expose you to molten metal, chemical splashes, or flying particles. Many face shields can be used while wearing a hard hat.

You must always wear safety glasses or goggles when using a face shield for added protection. Face shields alone are NOT considered adequate eye protection.

LESSON 3

PERSONAL PROTECTIVE EQUIPMENT

Welding Helmets

Welding helmets provide both face and eye protection. Welding helmets use special absorptive lenses that filter out the intense light and radiant energy that is produced during welding operations. As with face shields, safety glasses or goggles should be worn when using a welding helmet.

LESSON 3

PERSONAL PROTECTIVE EQUIPMENT

Absorptive Lenses

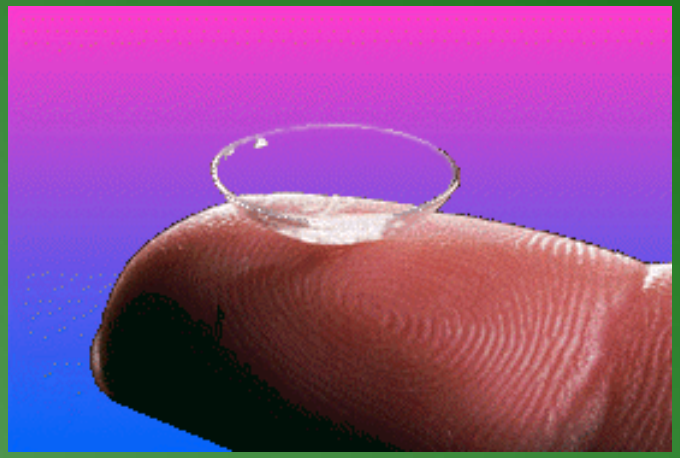
Though you may not be a welder, a wide variety of absorptive lenses are available for use in safety glasses and goggles. These absorptive lenses offer additional protection if you must work where there is bright light or glare.

LESSON 3

CONTACT LENSES

If you wear contacts, keep the following safety tips in mind:

- You may wear your contacts while using a full face respirator.
- Wear your contacts with caution if you work in areas where you might be exposed to fumes, dusts, powders, vapors, chemical splashes, molten metals, or intense heat, light or glare.
- If you get anything under your contacts, take time to remove and clean them



LESSON 3

CONTACT LENSES

- Always make sure that your hands are clean before you handle your contact lens
- Follow your eye doctor's instructions for cleaning and caring for your contacts.
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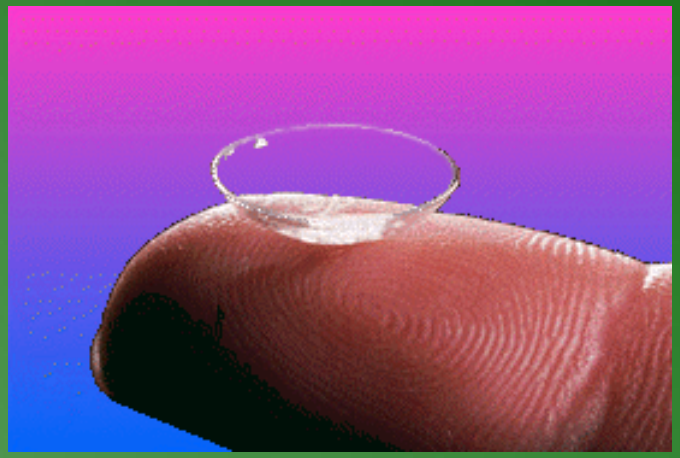
- Some chemicals may react with contacts and cause permanent injury.
- It is wise to keep an extra pair of contacts or a pair of glasses handy in case you should lose or damage one of your contacts while you are working.



LESSON 3

CONTACT LENSES

Eye Protection Equipment

- When cleaning your eye protection equipment, you can usually use mild soap and water. You may also use special wipes that are designed for cleaning protective eye equipment. Never use abrasive soaps, rough paper, or cloth towels as these items may scratch and damage your equipment.

- Always keep your eye protection equipment in good working condition an if it is damaged, have it repaired or replaced.

LESSON 3

CONTACT LENSES

- Store your eye protection equipment in a sanitary, cool, dry area away from moisture.
- Read the manufacturer's directions and warnings before using any eye protection equipment.
- If you have any questions concerning your eye protection equipment, talk with your supervisor or safety manager.

LESSON 3

VISION EXAMS

Let's face it -- you only have two eyes, and they must last you a lifetime.

As you age, your eyes will change. These changes can affect your safety at work and at home. So, it's a good idea to take a little time each year for a vision exam.

LESSON 4

HEARING PROTECTION: 1910.95

This lesson focuses on the following topics:

- Occupational Noise
- Why hearing protection is important
- Two types of hearing loss
- Types of hearing protection devices
- When should hearing protection devices be worn?
- Caring for hearing protection devices

LESSON 4

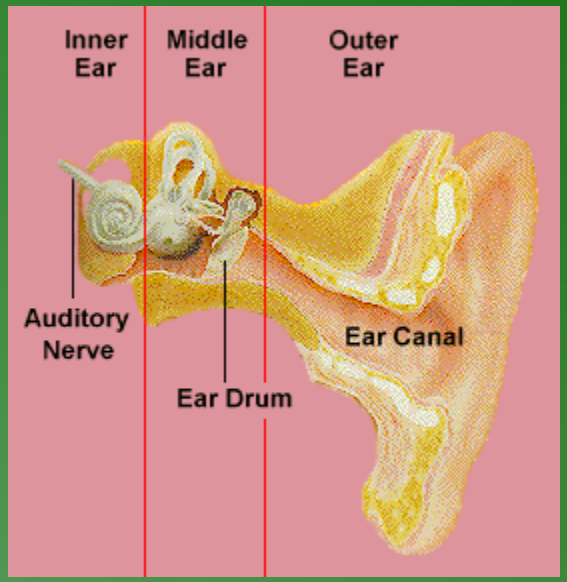
OCCUPATIONAL NOISE

Noise is a common problem found in many workplaces. Research has shown that high levels of noise can damage your hearing. Losing your hearing is a gradual process, and is less noticeable than other types of workplace injuries. It is, however, a permanent handicap for those who are affected.

LESSON 4

WHY HEARING PROTECTION IS IMPORTANT

- Hearing protection is important because your ears are composed of very delicate structures. Whenever a sound is produced, air is set into motion as sound waves.
- Sound is collected in the outer ear and funneled to the eardrum.
- When sound waves hit the eardrum, it vibrates and sends sound to the middle ear.
- The middle ear amplifies the vibrations and sends them to the inner ear. The vibrations stimulate hair cells in the inner ear and create an electrical impulse.
- This impulse travels to the brain along the auditory nerve, causing the sensation of sound.

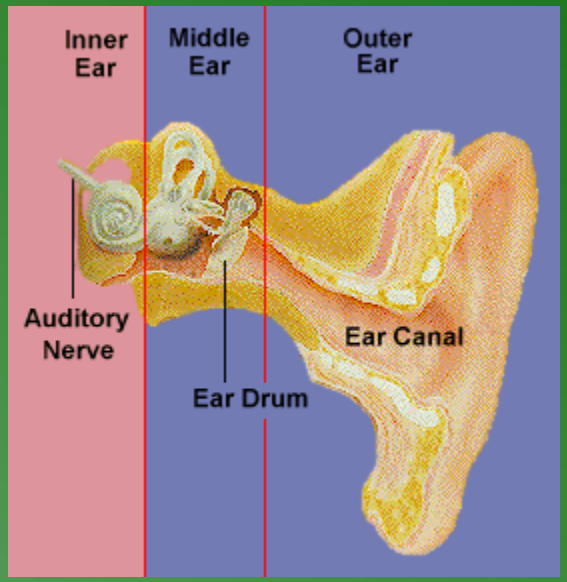


LESSON 4

TWO TYPES OF HEARING LOSS

Damage to the delicate structures of your ears can result in the loss of your ability to hear. There are two types of hearing loss:

1. Conductive
2. Sensory



Conductive hearing loss

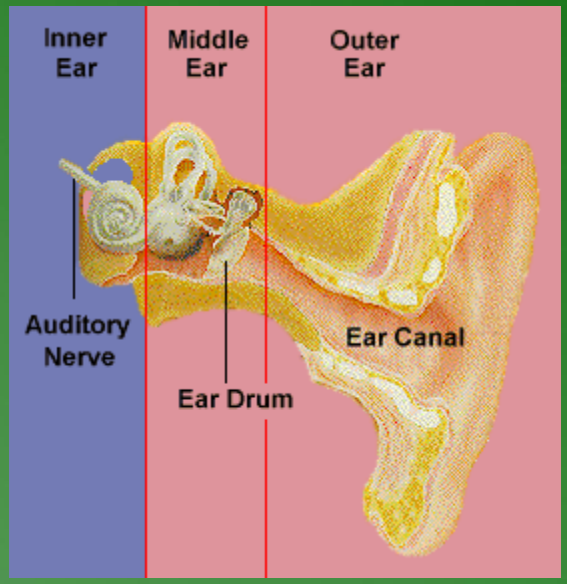
Conductive hearing loss is caused by damage to or a malfunction of the outer and middle ear. It results in a decrease in your hearing, but you can still understand speech.

LESSON 4

TWO TYPES OF HEARING LOSS

Sensory Hearing Loss

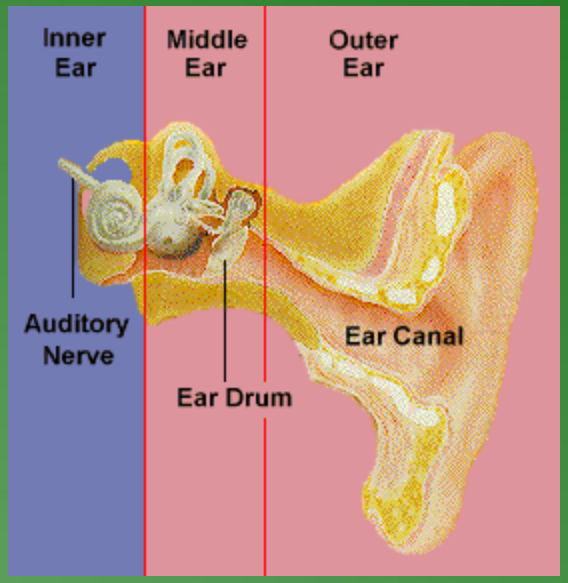
Sensory hearing loss is a hearing loss caused by damage to or a malfunction of the inner ear, auditory nerve, or the brain. It makes it more difficult to understand speech, but it does not result in a decrease in loudness.



LESSON 4

TWO TYPES OF HEARING LOSS

Sensory hearing loss cannot be corrected medically or surgically. It is permanent. As you can see from the above list, hearing loss in the workplace would most likely be a sensory hearing loss.



Causes of sensory hearing loss are:

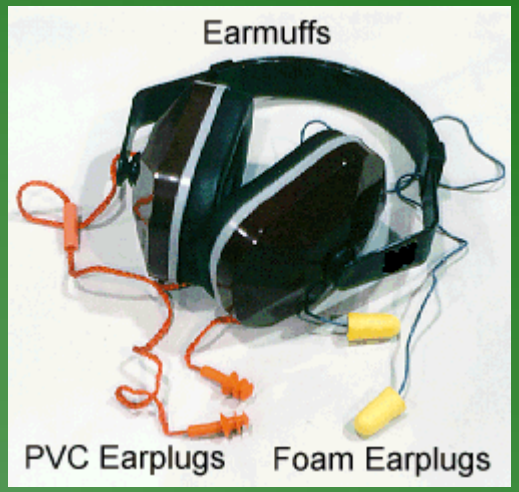
- Hereditary
- Damage to fetus
- Aging
- Excessive Noise
- Disease
- Injury
- Drugs

LESSON 4

TYPES OF HEARING PROTECTION DEVICES

Many types of hearing protection devices are available. Popular types of hearing protection devices are:

1. Foam Earplugs
2. PVC Earplugs
3. Earmuffs

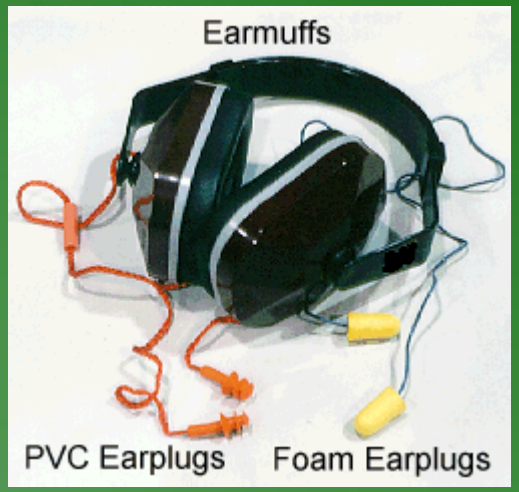


LESSON 4

TYPES OF HEARING PROTECTION DEVICES

Advantages of PVC and Foam Earplugs

1. Small & lightweight and disposable
2. Comfortable in hot environments
3. Easily used with other safety equipment



Disadvantages of PVC and Foam Earplugs

1. May work loose and require occasional refitting/repositioning
2. Require specific fitting instructions and may not fit all employees
3. Are frequently soiled

LESSON 4

TYPES OF HEARING PROTECTION DEVICES

Earmuffs are another type of hearing protection device.

The advantages of earmuffs are:

1. Easy for your employer to supervise the wearing of this device
2. One size fits all
3. Fits better for longer periods of time.

LESSON 4

TYPES OF HEARING PROTECTION DEVICES

The disadvantages of earmuffs are:

1. May fit too tightly on your head;
2. Uncomfortable in a warm environment
3. Problems occur when used with other safety equipment.

LESSON 4

WHEN SHOULD YOU WEAR A HEARING PROTECTION DEVICE?

You should wear a hearing protection device whenever you are exposed to noise that is 85 decibels or greater for an 8-hour period of time.

LESSON 4

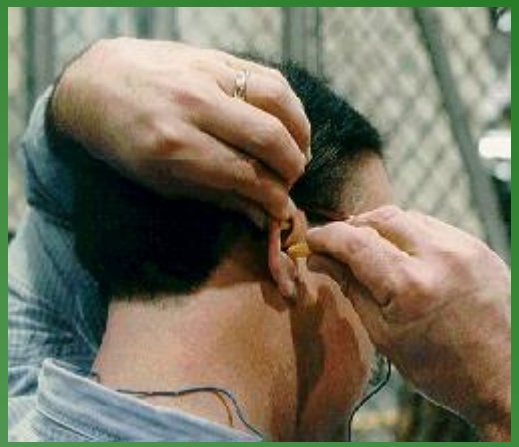
WHEN SHOULD YOU WEAR A HEARING PROTECTION DEVICE?

Wearing Hearing Protection Devices

Foam Earplugs

Foam earplugs provide the most protection.

To insert foam earplugs properly:



- Reach around the back of your head, and gently pull your ear back and up.
- With clean hands, roll the plug into a small diameter.
- Insert the plug well into the ear canal.
- Hold the plug in place for a few seconds while it expands and forms a good seal.

LESSON 4

WHEN SHOULD YOU WEAR A HEARING PROTECTION DEVICE?

Earmuffs

Earmuffs fit over the outside of the ears. Because their effectiveness is limited to the quality of the seal around your ear, they are often not as effective as earplugs. For this reason, a combination of earplugs and earmuffs are used in some work environments.

When using earmuffs:

- Make sure that the earmuffs fit snugly around your ears.
- Consider using earplugs if you wear glasses, earrings, or have facial hair that would prevent the earmuffs from forming a good seal around your ears.

LESSON 4

CARING FOR HEARING PROTECTION DEVICES

Foam Earplugs

- When not using your foam earplugs, store them in a clean, cool, dry place. Actually, foam earplugs should be discarded after each use.

- If your foam earplugs become soiled, torn or stiff, discard them and ask your supervisor or safety manager for a new pair.

LESSON 4

CARING FOR HEARING PROTECTION DEVICES

PVC Earplugs

- When not using your PVC earplugs, store them in a clean, cool, dry place.
- If your PVC earplugs become soiled, you can clean them with a mild solution of soap and water. Rinse, then dry them with a soft towel.
- If your PVC earplugs become torn or brittle, discard them and ask your supervisor or safety manager for a new pair.

LESSON 4

CARING FOR HEARING PROTECTION DEVICES

Earmuffs

- When not using your earmuffs, store them in a clean, cool, dry place.
- Always inspect your earmuffs for cracks around the foam cups. If your earmuffs are damaged, have them repaired immediately or ask your supervisor for new ones.

LESSON 5

FOOT PROTECTION – 1910.136

This lesson focuses on the following topics:

- Why foot protection is important?
- Potential hazards
- Preventative measures
- Wearing and using safety footwear

LESSON 5

WHY FOOT PROTECTION IS IMPORTANT?

Scientists and engineers for centuries have marveled at the design and structure of the human foot. The human foot is rigid enough to support the weight of your entire body, and yet flexible enough to allow you to run, dance, play sports, and take you anywhere you want to go. Without your feet and toes, your ability to work at your job would be greatly reduced.

LESSON 5

POTENTIAL HAZARDS

Impact Injuries

If you have ever stubbed your toe, you know that impact injuries can hurt. At work, heavy objects can fall on your feet. If you work around sharp objects, you can step on something sharp and puncture your foot.

LESSON 5

POTENTIAL HAZARDS

Injuries from Spills and Splashes

Liquids such as corrosives and molten metals can spill into your shoes and boots. These hazardous materials can cause chemical and heat burns.

LESSON 5

POTENTIAL HAZARDS

Compression Injuries

Heavy machinery, equipment, and other objects can roll over your feet. The result of these types of accidents is often broken or crushed bones.

LESSON 5

POTENTIAL HAZARDS

Electrical Shocks

Accidents involving electricity can cause severe shocks and burns

LESSON 5

PREVENTATIVE MEASURES

Housekeeping

Poorly maintained machinery and tools,

sloppy work areas, and cluttered aisles all contribute to foot injuries.

LESSON 5

PREVENTATIVE MEASURES

Safety Shoes and Boots

There are many types of footwear that are designed to protect your feet. Some of t hem are following:

Steel toe footwear

protects your toes from falling objects and from being crushed.

LESSON 5

PREVENTATIVE MEASURES

Metatarsal footwear

have special guards that run from your ankle to your toes and protect your entire foot.

Reinforced sole footwear

have metal reinforcement that protects your foot from punctures.

Latex/Rubber footwear

resists chemicals and provides extra traction on slippery surfaces.

LESSON 5

PREVENTATIVE MEASURES

PVC footwear

protects your feet against moisture and improves traction.

Butyl footwear

protects against most ketones, aldehydes, alcohols, acids, salts, and alkalies.

Vinyl footwear

resists solvents, acids, alkalies, salts, water, grease, and blood.

LESSON 5

PREVENTATIVE MEASURES

Nitrile footwear

resists animal fats, oils, and chemicals.

Electrostatic dissipating footwear

conducts static electricity to floors that are grounded.

Electrical hazard footwear

Electrical hazard footwear are insulated with tough rubber to prevent shocks and burns from electricity.

LESSON 5

PREVENTATIVE MEASURES

Disposable footwear includes shoe slip-ons and clear polyethylene and non-woven booties used in dust free work areas.

LESSON 5

WEARING AND USING SAFETY FOOTWEAR

- Select and use the right kind of footwear for the job you are going to be performing. Footwear should meet or exceed the standards set by ANSI (ANSI Z41-1991).

- Avoid footwear made of leather or cloth if you work around acids or caustics. These chemicals quickly eat through the leather or cloth, and can injure your feet.

- Select footwear that fit.

- Inspect your footwear before use. Look for holes and cracks that might leak.

LESSON 5

WEARING AND USING SAFETY FOOTWEAR

- Replace footwear that is worn or torn.

- After working with chemicals, hose off your footwear with water to rinse away any chemicals or dirt before removing your footwear.

- Avoid borrowing footwear. Footwear is personal protective equipment.

- Store footwear in a clean, cool, dry, ventilated area.

LESSON 5

WEARING AND USING SAFETY FOOTWEAR

ANSI PERFORMANCE REQUIREMENTS FOR OCCUPATIONAL FOOT PROTECTION

Class	Compression Resistance (pounds)	Impact Resistance (foot-pounds)
75	2,500	75
50	1,750	50
30	1,000	30

LESSON 6

HAND PROTECTION – 1910.138

This lesson focuses on the following topics:

- Why hand protection is important
- Potential hazards
- Preventative measures
- Wearing and using gloves

LESSON 6

WHY HAND PROTECTION IS IMPORTANT

- Take a moment to hold your hands out in front of you. Look at them. They are the only two hands you will ever have.

- It has been estimated that almost 20% of all disabling accidents on the job involve the hands. Without your fingers or hands, your ability to work would be greatly reduced.

- Human hands are unique. No other creature in the world has hands that can grasp, hold, move, and manipulate objects like human hands. They are one of your greatest assets, and, as such, must be protected and cared for.

LESSON 6

POTENTIAL HAZARDS

Traumatic Injuries

- You can suffer a traumatic injury to your hands in many ways.
- Tools and machines with sharp edges can cut your hands.
- Staples, screwdrivers, nails, chisels, and stiff wire can puncture your hands.
- Getting your hands caught in machinery can sprain, crush, or remove fingers and hands

LESSON 6

POTENTIAL HAZARDS

Contact Injuries

Coming into contact with caustic or toxic chemicals, biological substances, electrical sources, or extremely cold or hot objects can irritate or burn your hands.

WARNING: Toxic substances are poisonous substances that can be absorbed through your skin and enter your body.

LESSON 6

POTENTIAL HAZARDS

Repetitive Motion Injuries

Whenever you repeat the same hand movement over a long period of time, you run the risk of repetitive motion problems. Repetitive motion problems often appear as numbness or a tingling sensation accompanied by pain and the loss of gripping power in your hands.

LESSON 6

PREVENTATIVE MEASURES

Engineering Controls

Machine guards and safety mechanisms are designed to protect your hands and fingers.

WARNING: Never remove machine guards or bypass safety mechanisms. Check with your organization's lockout-tagout procedures before attempting to put your hands into machinery.

LESSON 6

PREVENTATIVE MEASURES

Housekeeping and Hygiene

Poorly maintained machinery and tools, sloppy work areas, and cluttered aisles all contribute to hand injuries. Good hygiene includes hand washing. Hand washing helps to remove germs and dirt from your hands. Clean hands are less susceptible to infection and skin problems such as contact dermatitis.

LESSON 6

PERSONAL PROTECTIVE EQUIPMENT

Safety Gloves ***1910.138***

There are many types of gloves that are designed to protect your hands.

LESSON 6

PERSONAL PROTECTIVE EQUIPMENT

Metal mesh gloves

resist sharp edges and prevent cuts.

Leather gloves

shield your hands from rough surfaces.

Vinyl and neoprene gloves protect your hands against toxic chemicals.

LESSON 6

PERSONAL PROTECTIVE EQUIPMENT

Dielectric rubber gloves

protect you when working around electricity

Padded cloth gloves

protect your hands from sharp edges, slivers, dirt, and vibration.

Vinyl and neoprene gloves

protect your hands against toxic chemicals.

LESSON 6

PERSONAL PROTECTIVE EQUIPMENT

Latex disposable gloves

are used to protect your hands from germs and bacteria.

Lead-lined gloves

protect your hands from radiation sources

LESSON 6

WEARING AND USING GLOVES

1. Select and use the right kind of glove for the job you are going to be performing.

2. Select gloves that fit.

3. Some gloves may be chemical specified and have a life expectancy. Discard them after the recommended time has expired.

4. Remove any rings, watches, or bracelets that might cut or tear your gloves.

5. Wash your hands before and after wearing your gloves.

LESSON 6

WEARING AND USING GLOVES

6. Inspect your gloves before you use them. Look for holes and cracks that might leak.

7. Replace gloves that are worn or torn.

8. After working with chemicals, hold your gloved hands under running water to rinse away any chemicals or dirt before removing the gloves.

9. Wash or dispose of cotton gloves as needed.

10. Avoid borrowing gloves. Gloves are personal protective equipment.

11. Store gloves right side out in a clean, cool, dry, ventilated area.

12. Never wear loose-fitting gloves around powered rotating equipment - drills, lathes, etc.

LESSON 7

RESPIRATORY PROTECTION - 29 CFR 1910.134 and .139

This lesson focuses on the following topics:

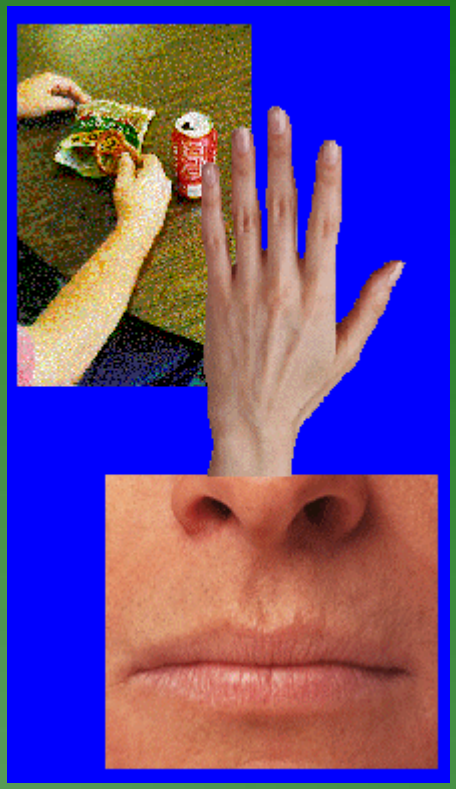
- Why respiratory protection is important
- The breathing process
- Respiratory related potential hazards types of respirators
- Selecting the correct respirator
- Monitoring your respirator

LESSON 7

WHY RESPIRATORY PROTECTION IS IMPORTANT

Health hazards in the workplace are a major concern for both employers and employees. It is important, though, to remember that hazardous materials only present a health hazard when they come into contact with your body. Hazardous materials can enter your body in four ways:

1. Ingestion
2. Skin Absorption
3. Inhalation
4. Injection



Because many substances which are health hazards can become airborne, knowing how to protect your respiratory system is very important.

LESSON 7

WHY RESPIRATORY PROTECTION IS IMPORTANT

Inhalation

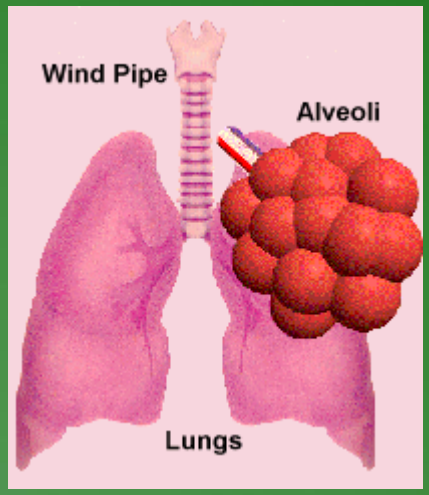
Of the four ways that hazardous materials can enter your body, inhalation is the most common route of exposure for most materials which are health hazards. This includes breathing in dust, fumes, oil mist, and vapors from solvents and various gases.

LESSON 7

THE BREATHING PROCESS

To better understand how health hazards can enter your body by inhalation, let's take a closer look at the breathing process.

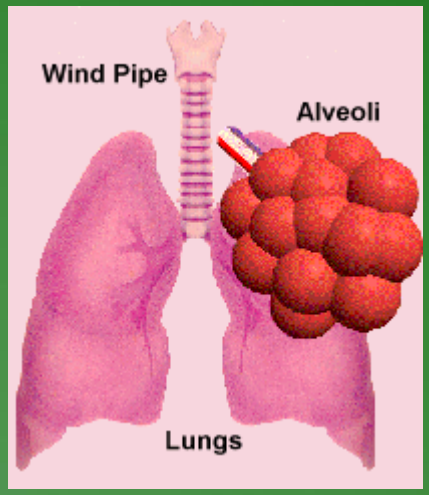
- Whenever you take a breath, oxygen rich air is taken into your body through your mouth and nose, goes down your windpipe and into your lungs.
- In your lungs, there are tiny air sacs called alveoli.



LESSON 7

THE BREATHING PROCESS

- These delicate air sacs then transfer the oxygen that is in the air into your blood. At the same time the oxygen is being absorbed into your bloodstream, carbon dioxide is being transferred from your bloodstream into the air sacs.
- When you breathe out, you are ridding your body of gaseous wastes.



LESSON 7

THE BREATHING PROCESS

Lung Damage

Inhaling hazardous materials damages the delicate structure of your lungs. Lungs that have been damaged are more susceptible to respiratory diseases. These diseases often cannot be cured, and eventually lead to death. In short, respiratory protection is serious business.

LESSON 7

RESPIRATORY RELATED POTENTIAL HAZARDS

Dusts

Dusts are formed whenever solid material is broken down into tiny particles. Dusts are often produced during sanding and grinding operations.

LESSON 7

RESPIRATORY RELATED POTENTIAL HAZARDS

Vapors

Vapors are substances that are created when a solid or liquid material evaporates. Materials that evaporate easily at room temperature include paint

LESSON 7

RESPIRATORY RELATED POTENTIAL HAZARDS

Fogs

Fogs are vapors which have condensed into tiny airborne particles or droplets. An example of a hazardous fog would be an insect fogger used to rid industrial and residential areas of ticks and fleas.

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RESPIRATORY RELATED POTENTIAL HAZARDS

Mists & Sprays

Mists and sprays are very small droplets of liquid material suspended in the air. They are often produced by spray and coating operations.

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TYPES OF RESPIRATORS

There are two major categories of respirators:

1. Air Purifying Respirators

These types of respirators include:

- Air Purifying Disposable Particulate Respirators
- Air Purifying Half Mask Respirators
- Air Purifying Full Face Mask Respirators
- Gas Masks
- Powered Air Purifying Respirators.

TYPES OF RESPIRATORS

2. Supplied Air Respirators

These types of respirators include:

- Supplied Airline Respirators
- Emergency Escape Breathing Apparatus
- Self-Contained Breathing Apparatus (SCBA).

SELECTING THE CORRECT RESPIRATOR

The first step in selecting the correct respirator is to determine the level of hazard that is posed by the environment in which you will be working. To do this, you must be able to answer four basic questions:

1. What type of contaminant is present?
2. What is the form of the contaminant?
3. How toxic is the contaminant?
4. What is the concentration of the contaminant?

Because you may not be able to answer these questions on your own, always work with your supervisor or safety professional to determine the correct answers to these questions.

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SELECTING THE CORRECT RESPIRATOR

Respiratory Protection Program

The following is the OSHA respiratory protection program that you must closely follow:

- Written standard operating procedures governing the selection and use of respirators
- Industrial Hygiene survey to determine exposure levels
- Medical evaluation and surveillance
- Fit testing
- User training
- Regularly maintained, cleaned, and disinfected.
- Proper storage

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MONITORING YOUR RESPIRATOR

As you work you must monitor how well your respirator is working. You will know that your respirator is not working when:

- You can smell or taste the contaminant;
- Breathing becomes difficult; You become dizzy or sick feeling;
- The manufacturer's recommended service life of the filters or cartridges expires
- The respirator is damaged.

WARNING: Never use or continue to use a respirator that is not working perfectly.