



TCM 2430 – Construction Safety

Week 6 - Personal Protection



Dr. Tommy Tafazzoli

What do we mean by personal safety?

- Personal safety is an individual's ability to go about their everyday life free from the threat or fear of psychological, emotional, or physical harm from others.
- It is often said that personal safety is a matter of common sense. However, **common sense does not always result in common practice.**
- For personal safety in the workplace to become common practice, it needs to be **prioritized across the organization** and **championed** by strong **leadership**.
- Without a clear **organizational approach** to personal safety, the **response** of each worker to a threatening or confrontational situation can **differ dramatically** and will rely heavily on **individual judgments**.



Personal Protective Equipment (PPE)

PPE is considered **the last line of defense** when it comes to protecting workers from injuries on the job site.

Employers are expected to enforce **engineering controls** and other safety measures to prevent accidents and injuries.



Video: Types of Personal Protective Equipment (PPE) - Safety Training

- https://youtu.be/rGRt4UBhuwY?si=tMGQFtADbTc1e5_V



Who should provide the PPE?

- **Employers** are expected to **pay** for and supply workers with all **PPE** and are responsible for **ensuring** their **use** where appropriate.
- Employers can **allow** workers to **use their** own PPE.
- If employee-owned equipment is allowed, **employers** are responsible for **ensuring** that the PPE is in good **working condition**, but they are not **required** to **reimburse** workers for PPE they **provide themselves**.

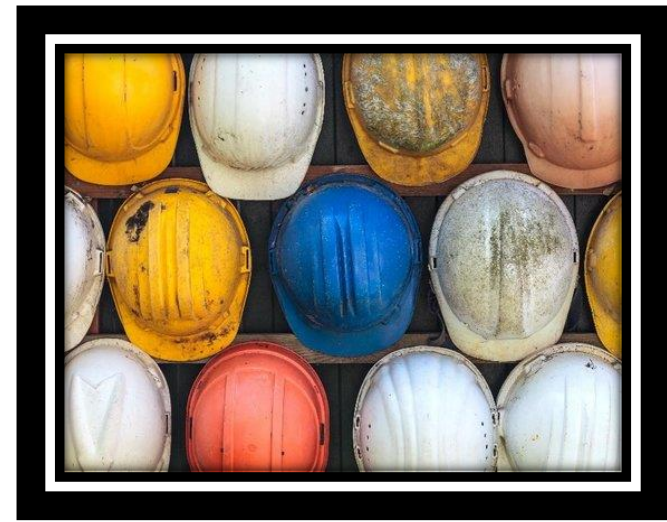




Head Protection

Head Protection

- Head injuries are commonly caused by **falling** or **flying** objects, or by **bumping** the head against a **fixed** object.
- Head injuries can be **minor** or **deadly**. Injuries can include minor abrasions, concussions, lacerations, fractures, burns, or even electrocution.
- The **employer** must **assess** the hazards in the **workplace** to **determine** if head protection is **needed**.



Play this video here
(not in YouTube)

When is head protective equipment needed?

**Risk of falling
objects**

**Overhead
Hazards**

**Construction
Machinery and
Equipment**

**Working with
Hand and
Power Tools**

**Structural
Work**

**Demolition
Work**

**Working in
Trenches or
Excavations**

**Tree and Brush
Clearing**

**Working near
Elevated
Platforms**

**Confined
Spaces**

**Safety
Inspections
and Site Walks**

**Specific Job
Requirements**



Hearing Protection

When is hearing protection needed?



- Hearing protection is needed on a construction job site when workers are exposed to **hazardous noise** levels that have the potential to cause **hearing damage** over time.
- Loudness is measured in **decibels(dB)**. Intensity that exceeds an average of **85 dB** over an **8-hour** day may cause hearing loss.
- According to OSHA standards, employers must provide hearing protection when workers are exposed to noise at levels of 85 dB or more averaged over an 8-hour period.
- How you're affected by noise depends on several things—**loudness** and **frequency**, **length** of **exposure**, and even your **age** and **health**.

What are some types of hearing protection tools?

- Enclosure
- Earplugs
- Canal caps
- Earmuffs





Why is hearing loss hard to measure?

Hearing loss due to noise in the workplace is frequently ignored because it usually takes place **over a long period of time** and may not be readily apparent **until the damage is done**. There's no visible wound or other sign of injury.

Video Ear Protection

- <https://www.youtube.com/watch?v=GrC5-s4Cl64>



When should you ask workers to use hearing protection equipment?

Heavy Machinery

Power Tools

Most Loud Construction Equipment

Demolition Work

Traffic and Transportation

Welding and Grinding

Prolonged Exposure

Specialized Tasks

Indoor Construction

Worksite Assessments





Eye & Face Protection

When is eye and face protection needed?



Flying Debris

Welding and Cutting

Chemical Exposure

Grinding and Chipping

Concrete and Masonry Work

Pneumatic Tools

Demolition Work

Electrical Work

High-Pressure Fluids

Working at Heights

Woodworking

Nail and Screw Gun Use

Hazardous Weather Conditions

Video Protect your eyes

- <https://youtu.be/5MXjKj6SDQ8?si=EQCvS5Q3ljLxfd-R>





Hand Protection

When is hand protection needed?

Handling Tools and Equipment

Handling Materials

Chemical Exposure

Heat and Cold Exposure

Electricity and Electrical Work

Welding and Cutting

Handling Glass or Sharp Objects

Mechanical Hazards

Hand and Wrist Support

Biological Hazards from Impact

Climbing and Rigging



Video
Protect Your Hands - Four
Basics
Safety Training Video - Avoid
Hand Injuries

- https://www.youtube.com/watch?v=-Blx_OsfbCk





Foot Protection

When is foot protection needed?

General Work Activities

Falling Objects

Piercing Hazards

Crushing Hazards

Electrical Hazards

Chemical Exposures

Extreme Temperatures

Slip and Trip Hazards

Uneven Terrain

Concrete Work

Welding and Hot Work

Climbing and Working at Heights



What are some examples of foot protection tools?

- **Metatarsal Guards.** Shoes with metatarsal or instep guards protect the upper foot from impacts. For these shoes, the metal guards stretch over the foot rather than just over the toes.
- **Conductive Shoes.** Conductive shoes allow the static electricity which builds up in the wearer's body to drain to the ground harmlessly.
- **Chemical-Resistant Safety Boots.** Rubber or plastic safety boots offer protection against oil, water, acids, corrosives, and other industrial chemicals. They are also available with features such as steel-toe caps, puncture-resistant soles, and metal guards. Some rubber boots are designed to be pulled over regular safety shoes.



What are some examples of foot protection tools?



- **Electrical Hazard Shoes.** Electrical hazard shoes offer insulation from electrical shock hazards from contact with circuits of 600 Volts or less under dry conditions. These shoes are used in areas where employees work on live or potentially live electrical circuits. The toe box of the shoe is insulated, so there is no exposed metal. These shoes are most effective when dry and in good repair.
- **Sole Puncture-Resistant Footwear.** Puncture-resistant soles in safety shoes protect against hazards of stepping on sharp objects that can penetrate standard shoe soles. They are used primarily in construction work.
- **Static Dissipative Shoes.** Static dissipative footwear is designed to reduce the accumulation of excess static electricity by conducting the body charge to the ground while maintaining some resistance to electrical shock. Such shoes are worn by workers in the electronics industry, where static items can be harmful.
- **Foundry Shoes.** Foundry shoes are used by welders and molders in foundries or steel mills

Video

Foot Safety in the Workplace – Safety care

Workplace Safety Video

- <https://youtu.be/J8sRxipqdG8?si=NsCHnYgF5zjLQpmi>



Respirator

- A respirator is a protective device that covers the worker's nose and mouth or the entire face and head to keep airborne contaminants out of the worker's respiratory system and to provide a safe air supply.
- Respirators are needed on a construction job site when workers may be exposed to hazardous **airborne contaminants** that could pose a risk to their health. The use of respirators is crucial in protecting workers from inhaling **harmful substances**, including **dust, fumes, gases, vapors, and particulate matter**.
- The specific situations in which respirators are required on a construction job site can vary depending on the nature of the work and the potential hazards involved.



When is a respirator needed?

Slide 1 of 2



- **Dust and Particulate Matter:** Respirators may be required when workers are exposed to high levels of dust, such as during activities like cutting, grinding, sanding, or demolishing materials like concrete, drywall, or asbestos-containing materials.
- **Chemical Fumes and Vapors:** When construction work involves the use of chemicals, paints, solvents, or adhesives that release fumes or vapors into the air, respirators may be necessary to protect against inhalation of these harmful substances.
- **Welding and Soldering:** Welders and those involved in soldering operations should use respirators to protect against the fumes and gases produced during these processes.

When is a respirator needed?

Slide 2 of 2



- **Confined Spaces:** In confined spaces, the air quality may be compromised due to the presence of toxic gases or insufficient oxygen. Workers entering confined spaces, such as tanks, tunnels, or manholes, may require respirators.
- **Biological Hazards:** In situations where there is a risk of exposure to biological contaminants, such as mold spores or bacteria, respirators may be needed to prevent inhalation of these hazardous agents.
- **Asbestos and Lead Removal:** When construction work involves the removal of asbestos-containing materials or lead-based paints, specialized respirators, often with HEPA filters, are typically required to protect workers from inhaling these toxic substances.
- **Airborne Infectious Diseases:** During outbreaks of airborne infectious diseases, such as COVID-19 or tuberculosis, construction workers may need to wear respirators to reduce the risk of exposure.

Personal Training

Employers must provide formal training to all **employees** who may be exposed to **ergonomic hazards** to inform them of the hazards associated with their work and of the tools, machinery, and equipment they use.

Information that must be included in the training includes **specific risk factors**, their **causes**, recognizing and reporting **symptoms**, and the **prevention** of these occurrences.



A group of construction workers wearing hard hats and high-visibility vests are gathered on a construction site. In the background, there are concrete pillars, a yellow excavator, and a blue building under construction. The scene is brightly lit, suggesting daytime.

Job-Specific Training

All **new** employees and those assigned **new tasks** must be made aware of the **specific risks** associated with a particular job before they start their work. A practical demonstration should be arranged in order to show the employees how to **use** all the **tools** and **equipment properly** and how to **carry out all procedures** efficiently.

Training for Supervisors

In addition to training received by employees, supervisors should be provided with additional training to help them **recognize early signs and symptoms of risk, hazardous work practices**, how to correct such practices, and how to reinforce the ergonomic program.

