

Personal Protective Equipment



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One way to keep workers safe is through the use and proper maintenance of personal protective equipment (PPE).

What is PPE?

This specialized clothing or equipment worn by employees for protection against health and safety hazards comes in a variety of forms:

- Eye and face protection
- Hearing protection
- Head protection
- Arm and hand protection
- Foot and leg protection
- Torso protection
- Respiratory protection

OSHA Standard Requirements for PPE

OSHA governs the use, selection, maintenance, fit and disposal of PPE.

- Prohibits use of defective or damaged equipment.
- Requires employee training in PPE use, fit, maintenance, life expectancy and disposal.
- Expects employers to assess hazards in workplaces before providing appropriate PPE to employees. Employers are to certify in writing that the hazard assessment has been completed.

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The Importance of PPE Use

Eye and Face Protection

Combating hazards

Safety glasses provide protection from flying particles, molten metal, liquid chemicals, acids, caustic liquids, chemical gases or vapors, and light radiation.

Face shields are intended to protect the entire face, or portions thereof, from impact hazards, such as flying fragments, objects, large chips and particles. When worn alone, face shields do not protect employees from impact hazards.

Employees must be provided with eye and face protection equipment when machines or operations present potential eye or face injury from physical, chemical or radiation agents.

Selecting the right equipment

- Make sure the safety glasses or face shield are comfortable to wear, do not restrict vision or movement, are durable, and easy to clean and disinfect.
- Employees requiring prescription lenses should use safety prescription lenses or eye protection worn over their regular glasses or contacts.

Hearing Protection

Combating hazards

- Employees exposed to excessive noise must use appropriate hearing protection when other controls are not feasible to reduce exposure.
- Long-term exposure can result in permanent hearing loss or impairment.
- Improperly worn or maintained PPE will not sufficiently reduce the noise level.

Selecting the right equipment

The choice of hearing protection depends on a number of factors, including level of noise, comfort and the suitability of the hearing protection for both the employee and their environment. Most importantly, the hearing protection should provide the desired noise reduction. When protection must be used, it's best to provide a number of different types to choose from.



The most popular types of hearing protection include:

- **Ear plugs** — Inserted to block the ear canal. They are typically pre-molded or moldable foam ear plugs. Ear plugs are sold as disposable products or reusable plugs. Custom molded ear plugs are also available.
- **Canal caps** — Ear plugs held over the ends of the ear canal by a rigid headband.
- **Ear muffs** — Sound-attenuating material and soft ear cushions that fit around the ear with hard outer cups. They are held together by a head band.

Head Protection

Combating hazards

Employees should wear head protection if:

- Objects might fall from above and strike them on the head.
- They might bump their heads against fixed objects, such as exposed pipes or beams.
- They work near exposed electrical conductors.

Selecting the right equipment

All hard hats are classified according to the specific impact and electrical performance requirements they are designed to meet.

Hard hats are divided into three industrial classes:

Class A: These helmets are for general service. Used mainly in mining, building construction, shipbuilding, lumbering and manufacturing, they provide good defense against impacts but limited voltage protection.

Class B: A necessity for employees engaged in electrical work, these helmets protect against falling objects and high-voltage shock and burns.

Class C: Designed for comfort, these light-weight helmets offer protection limited to workers bumping against fixed objects — they don't protect against falling objects or electric shock.

Arm & Hand Protection

Combating hazards

Proper hand protection can be the first line of defense against hazardous chemicals and other substances, temperature extremes and sharp objects. Without it, employees can suffer injuries including cuts, abrasions, burns, amputations, shock and chemical absorption.

Selecting the right equipment

- The level of protection a particular glove provides should be obtained from the manufacturer.
- Proper protection includes gloves, sleeves, hand pads and wristlets.
- Keep in mind that rubber insulating equipment is needed for electrical workers to prevent electrical shock.

Consider the following when making a selection:

- Types of chemicals handled
- Immersion or splash hazards
- Duration of contact
- The type of protection is needed — whether hand-only or forearm and upper arm as well
- Grip requirements — dry, wet, oily, etc.
- Thermal protection requirements
- Size and comfort
- Abrasion resistance requirements

Foot and Leg Protection

Combating hazards

OSHA requires protective footwear whenever employees are working in areas where there is a danger of foot injuries. By using the proper foot protection, employees can be protected from a variety of potential hazards, including:

- Impact, compression and puncture injuries
- Hot or wet surfaces that can become slippery
- Molten metal and welding sparks
- Static buildup and electrical hazards
- Heavy objects, such as barrels or tools that might roll onto or fall on feet



Selecting the right equipment

- Check with the manufacturer to make sure the footwear will protect from the hazards faced.
- Ensure safety footwear meets compression and impact performance standards.
- Look for ANSI Z.41 – 1991 approved footwear, which has a protective toe and offers impact and compression protection that varies.

Respiratory Protection

Combating hazards

- Particulates — tiny piece of matter, whether dust (solid form) or mist (liquid form)
- Fumes — when metal becomes a gas. Prevalent in welding, foundry work, etc.
- Gases — carbon monoxide, nitrogen, carbon dioxide
- Vapors — when liquid becomes a gas. Found in solvents, petroleum, water, etc.

Selecting the right equipment

This type of protection should include:

- A medical evaluation
- Training
- Fit testing

The type of respirator selected is based on the hazards faced:

For particulates

- Filter Types
 - N Series — Non-oil; you can use and reuse
 - R Series — Oil-resistant; if oil



present, use up to an eight-hour shift

- P Series — Oil-proof; if oil present, use up to 40 hours
- Filter Classes
 - N95, N99, N100 — Non-oil
 - R95, R99, R100 — Oil-resistant
 - P95, P99, P100 — Oil-proof

For gases and vapors

- Filter Color Coding
 - White — for acid gases
 - Black — for organic vapor
 - Yellow — for acid gas and organic vapor
 - Green — for ammonia and methylamine
 - Blue — for formaldehyde and certain organic vapors
 - Pink — for radioactive material
 - Brown — for multi-gas and certain organic vapors
 - Orange — for mercury vapor or chlorine gas

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Torso Protection

Combating hazards

Equipment including vests, jackets, aprons coveralls and full body suits, protects from hazards, such as heat, splashes from liquids, impacts, cuts and radiation. This helps avoid injuries including heat burns, radiation burns, chemical burns, lacerations and abrasions.

Selecting the right equipment

Protective clothing should cover all parts of the body exposed to possible injury.

Types of body protection

- Vests
- Aprons
- Jackets
- Coveralls
- Full body suits

The right kind of clothing for the right kind of hazard

- Paper-like fiber for disposable suits should be used to protect against dust and splashes.
- Treated wool and cotton should be used to protect against dust, abrasions and rough surfaces.
- Leather should be used to protect against dry heat and flames.
- Rubber and neoprene should be used to protect against chemicals.

Care and Maintenance of PPE

- Make sure that the PPE assigned to each employee fits properly.
- Clean PPE regularly, following the manufacturer's suggestions.
- Be familiar with the life expectancy of each PPE and dispose of it when needed.
- Report any discomfort, problems or questions immediately.

