Safety

Confined Space Safety: What's the Correct PPE, Equipment for Working in Hazardous Locations?

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Using the correct personal protective equipment (PPE) and access and rescue gear can help ensure your safety when working in a confined space. Here's what you need to know about staying safe in confined spaces.

Confined spaces are generally not designed for workers to enter and work in regularly. There's a risk that a worker may become trapped or may run into a variety of hazards, some of which can be fatal.

Understanding the PPE that workers need to wear in these hazardous locations is therefore vital. After all, even the simplest piece of safety gear can save a life.

Confined spaces are typically large enough for workers to enter and perform certain jobs, but they also have limited or restricted means for entry or exit. ***According to the Occupational Safety and Health Administration (OSHA)***, confined spaces "include, but are not limited to" such locations as tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, equipment housings, ductwork or pipelines.

> **"Equipping workers with the correct safety gear is essential, but safety managers should also consider what they will do if one or more of their workers becomes injured, incapacitated or trapped when working in a confined space, and must be rescued."**

OSHA uses the term "permit-required confined space" (or "permit space") to describe a confined space that has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains material that has the potential to engulf an entrant;
- Has walls that converge inward or floors that slope downward and taper into a smaller area which could trap or asphyxiate an entrant;
- Contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires or heat stress.

The PPE you use and your access and rescue equipment can mean the difference between getting in and out safely, or running into trouble.

Here's a list of some of the most important PPE for confined spaces:

Head Protection

Protective headgear is vital in confined spaces, where the potential for head injuries is high. It's important to find the best fit and to continually check your headgear for any damages that can compromise its effectiveness.

According to OSHA, ***protective helmets or hard hats should***:

- Resist penetration
- Absorb the shock of a blow
- Protect against electrical shock
- Be water-resistant and slow-burning
- Have clear instructions explaining proper adjustment and replacement of the suspension and headband

Eye protection is another important consideration. Safety glasses, safety goggles and face shields protect the user from impact hazards at various angles. Safety goggle frames must be properly fitted to the wearer's face to form a protective seal around the eyes. And workers who wear prescription glasses must also wear eye protection, whether in conjunction with their prescription glasses or using safety glasses that incorporate those prescription lenses.

You'll also want to think about ear protection if you expect noise levels to be high, in which casewearing earplugs or earmuffs can help prevent hearing loss.

Read more: Air Filtration: What Are MERV Ratings and How Do They Protect Your Workers?

Hand and Foot Protection

Working in confined spaces and hazardous locations often means working with your hands. Factors influencing the type of gloves you may use include:

- Type of chemicals handled
- Nature of contact (total immersion, splash, etc.) and duration of contact
- Area requiring protection (hand only, forearm or arm)
- Grip requirements (dry, wet or oily)
- Thermal protection
- Size and comfort
- Abrasion/resistance requirements

Gloves are made from a wide variety of materials to protect against various workplace hazards. They include leather gloves, or those made of canvas or metal mesh, fabric and coated fabric gloves, chemical and liquid-resistant gloves, and insulating rubber gloves. Protective gloves should be inspected before each use to ensure that they are not torn, punctured or made ineffective in any way.

Also consider foot and leg protection to guard against slips, the dangers of electrical or chemical hazards, extreme heat, or the impact of heavy or sharp objects.

Read more: Fogged-Up Glasses: 5 Ways to Keep Eye Protection from Fogging While Wearing a Mask

Respiratory Protection

In locations with potentially hazardous gases or a lack of oxygen, protection for respiratory health is important.

There are various types and levels of respiratory protection, including:

- Air-supplied respirators, which bring in breathable air from another source
- Air-purifying solutions that remove contaminants from the air
- Particulate respirators that filter out dust, fumes and mists
- Chemical cartridge or gas mask respirators, which use replaceable cartridges or canisters that remove the contaminant
- Self-contained breathing apparatuses (SCBA) that provide clean air from a portable air tank

OSHA notes that ***workers should be medically cleared to wear respirators*** before commencing work. Some respirators restrict breathing, while others are heavy or can cause claustrophobia. Masks should also be examined to ensure they provide an acceptable fit to the wearer.

Fall Protection

A full-body harness may be one of the most important items of PPE that a worker can wear. Rescue procedures often involve lifting equipment that carries an injured worker to safety, and it usually must be attached to a full-body harness, especially when lifting a worker out of a space vertically.

When a worker isn't wearing a full-body harness, the time it takes to attach that individual to the rescue equipment can be made much more difficult and time-consuming, potentially delaying the time it takes for the injured worker to receive medical attention.

A body harness ***is defined by OSHA*** as "straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders."

A full-body safety harness is often used as part of a personal fall arrest system (PFAS), which may be connected to a shock-absorbing lanyard or lifeline, which is secured to an anchor point.

Read more: Workplace Fall Protection: How to Use a Safety Harness and Lanyard

Rescue Equipment

Equipping workers with the correct safety gear is essential, but safety managers should also consider what they will do if one or more of their workers becomes injured, incapacitated or trapped when working in a confined space, and must be rescued.

Wearing a full-body harness connected to an anchor, which serves as a lifeline, is required for working in many confined spaces.

To ensure the safety of your workers, you may also consider:

Rescue and descent devices are used to retrieve workers who are experiencing difficulties and must return to a safe location. These devices can either be automatic, user-controlled or controlled by a co-worker and will therefore require various amounts of training to be used safely and effectively. Automatic descent devices usually require much less training than user-controlled systems, but they are also less flexible. It's therefore important to consider whether the device needs to be intuitive and instantly usable by anyone, or if specific personnel need to be trained to perform rescue tasks in the workplace.

Also, consider the height of rescue or descent needed for the workplace, and the maximum number of people who can use the devices at one time.

Equipment for entry and retrieval: Your confined space rescue gear must be adjustable and adaptable, given that confined spaces come in various shapes and sizes. For confined space rescue, 3M *recommends the following*:

- For temporary jobs, a good solution may be a lightweight and easy-to-use portable confined space system that can be moved from one location to another, such as a one-piece tripod.
- However, if a location is accessed often, you might consider a more permanent (and versatile) solution instead, such as a multi-piece davit system with a permanently mounted base.
- Consider the equipment's ease of use: It should allow you to "handle a crisis simply, efficiently and immediately."

- Your equipment should be strong enough to accommodate different scenarios in your work environment (fall arrest, rescue, etc.)
- Durability is also important: Your equipment's materials should be "strong enough to endure rough handling and exposure to the elements."

How are you making sure your employees working in confined spaces are safe? Share your thoughts in the comments below.