



TOOL BOX SAFETY TOPIC

CONFINED SPACES

Introduction

The OSHA General Industry standard for Permit-Required Confined Spaces is found in 29 CFR 1910.146.

OSHA's construction standards do not include a separate confined spaces standard. However, the construction standards include various requirements related to confined spaces, such as training, personal protective equipment, ventilation, excavation and welding and cutting.

Some examples of confined spaces include, but are not limited to, storage tanks, ventilation and exhaust ducts, underground utility vaults, excavations, manholes, and pipelines. Open top spaces may be a confined space depending on difficulty in exiting in an emergency, such as pits, tubs, vaults, and vessels.



Confined Space Definition

A confined space is large enough and so configured that an employee can enter and perform assigned work but has limited or restricted means for entry or exit and is not designed for continuous human occupancy.

Permit-Required Confined Space Definition

A permit – required confined space is any confined space that contains or has potential to contain a hazard. The workplace should first be surveyed for confined spaces, and then a hazard analysis should be performed on the confined spaces to determine if they are permit-required.

A permit-required confined space means a confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential for engulfing an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section, or.
- Contains any other recognized serious safety or health hazard.

Evaluation Permit - Required Confined Spaces

A permit - required confined space must be evaluated for the presence of hazards such as hazardous atmospheric conditions (toxic, flammable, asphyxiating), electrical and mechanical hazards, engulfment and configuration that could cause entrapment.

In addition to a completed entry permit and attendant, rescue procedures, equipment and personnel must be present. Any employer who allows employee entry into a permit-required confined space must develop and implement a written program for the space. A permit, signed by the entry supervisor, must be posted at all entrances or otherwise made available to entrants before they enter a permit-required confined space.

Physical Hazards

Physical hazards include:

- Hazardous Energy – electrical, mechanical and hydraulic; therefore, it must be locked out.
- Cave In – when cave-ins are possible, OSHA’s excavation rules must be followed.
- Drowning – heavy rain or water from pipes can enter the space.
- Underground utilities – hazardous fumes, gasses or liquids.
- Communication problems – poor communication systems may delay rescue.
- Heat – temperatures can build up quickly in a confined space and cause exhaustion or dizziness.
- Noise – sound from equipment and workers in the space and make it difficult to hear warnings and/or directions.
- Entry and Exit difficulties – entry and exit openings can be limited by size and location.
- Hazardous Atmospheres.

Atmospheric Hazards

Asphyxiation caused by atmospheric problems is the main hazard in confined spaces.

Atmospheric hazards include:

- Oxygen deficiency – oxygen levels must be monitored continuously. Oxygen level must be at least 19.5%. Oxygen is reduced in a space as it is consumed or replaced by other gasses.
- Flammable air – fire and explosion are dangers from combustible fumes and vapors and combustible dust.



Testing the Air

Air must be tested before employees are allowed to enter into a permit-required confined space and on a regular basis during work activities.

Precautions must be taken to prevent employee exposure to:

- Air containing less than 19.5% and not more than 23.5% maximum oxygen.
- A hazardous atmosphere, which is defined as an atmosphere with greater than 1-% of the lower flammable limit.
- Other toxic or hazardous air.

Special instruments are required for testing the levels of oxygen, combustibility, and toxicity in confined spaces. The specific required order of testing is; oxygen deficiency, flammable air and toxic air contaminants.

Excavations where oxygen deficiency or other hazardous atmosphere exists or could be reasonably expected must be tested.

Employees should be encouraged to watch all air monitoring to confirm it is safe to enter.

If test indicate the space is unsafe to enter, notify your supervisor and tag out the permit-required confined space. Use wording such as "UNSAFE FOR ENTRY".



Ventilation

When welding, cutting or heating in a permit-required confined space, ventilation must be provided to ensure oxygen levels are safe and toxic fumes are removed. Oxygen levels must be at 19.5% minimum and not more than 23.5%. Toxic gases and vapors shall be within accepted levels prescribed by OSHA. A Hot Work Permit may be required for welding, cutting, or heating work in permit-required confined spaces.

Working Safely in Confined Spaces

A confined space may show obvious signs of being dangerous such as a toxic smell, close proximity to electrical equipment, or loose materials. However, at times, the confined space

you are entering may not appear to be hazardous. You must always be aware of your surroundings and learn to recognize the dangers of confined spaces.

Even if the confined space hazards have been controlled, you should always be aware that potential hazards could still exist.

- If in an excavation – is there potential for hazardous atmosphere? Such as natural gas or exhaust fumes of running equipment.
- Are there any utilities in the work area? Such as electrical wires.
- Is there any standing water?
- Do you have at least 19.5 % oxygen?
- If you are unsure about any confined space you are entering, **always** get help from the Person in Charge (superintendent, foreman, or safety person).

CONFINED SPACE TEST QUESTIONS

1. A confined space can have limited means of entry and exit and limited work area.
 - a. True
 - b. False
2. Excavations over 4 feet deep where oxygen deficiency or other hazardous atmospheres exist must be tested.
 - a. True
 - b. False
3. The oxygen level in a confined space is not important.
 - a. True
 - b. False
4. Heat, noise and working in a restricted work are all conditions that can affect the employee in a confined space.
 - a. True
 - b. False

5. If a confined space has a hazardous atmosphere you should still go ahead and enter it.
 - a. True
 - b. False

6. You should test the air in a confined space for proper oxygen content after you enter the confined space.
 - a. True
 - b. False

ANSWERS:

1-T, 2-T, 3-F, 4-T, 5-F, 6-F

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