



CLEVELAND INTEGRITY SERVICES, INC.

Hazards of Confined Space

Goals: This session teaches employees to:

- Know the characteristics and hazards of confined spaces.
- Understand how to follow confined space rules and regulations to protect themselves.

Applicable Regulations: 29 CFR 1910.146

1. OSHA Defines Confined Spaces As Work Areas With Certain Features

- Large enough to enter and work in
- Limited entry and exit areas
- Not designed to be occupied for extended periods
- Examples include: tanks, silos, storage bins, hoppers, vaults, pits, furnaces, tunnels, sewers, pipelines, crawl spaces, process vessels, or underground areas
- Confined space tasks include: cleaning, painting, welding, scraping, performing repairs, or maintenance.
- It becomes a permit-required confined space if, in addition, it presents or has the potential for any recognized serious hazard.

2. Employers Must Test Confined Spaces to Determine If They're Hazardous.

Failing to identify hazards and take precautions causes thousands of serious injuries, and sometimes deaths, in confined spaces.

Certain hazards create permit-required confined spaces. OSHA allows work only with written permits, entry limits, and specific employee roles and practices in spaces with one or more of the following:

- Hazardous atmosphere, or potential for one
- Material that could potentially engulf a person in the space
- Slanting walls or sloped and tapering floor that could trap or asphyxiate an entrant
- Any other recognized serious safety or health hazard

3. A Confined Space's Atmosphere May Make It Hazardous

Employees could risk death or serious illness, become incapacitated, or have trouble escaping if the confined space's atmosphere contains:

- Levels of flammable gas, vapor, or mist in excess of 10 percent of their lower flammable limits
- Airborne dust levels at or above their flammable limits or permissible exposure limits (PELs) or that prevent visibility of fewer than 5 feet
- Oxygen concentration above 23.5 percent or below 19.5 percent
- Any condition immediately dangerous to life or health that could threaten life, cause irreversible health problems, or make it difficult to escape the space without help



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4. A Confined Space's Atmosphere May Pose Fire, Explosion, and Toxicity Risks

Anything that could burn or explode (e.g., gasoline, methane, dust) is more likely to do so in a confined space.

- These substances can be ignited by smoking, grinding or welding sparks, unapproved electrical equipment, or metal friction (even from nails in shoes).
- Inhaling toxic substances above their PELs can cause illness, suffocation, or even death (e.g., from carbon monoxide, hydrogen sulfide, or sulfur dioxide).

5. Too Much or Too Little Oxygen Is a Major Confined Space Hazard

- Oxygen levels over 23.5 percent create a serious fire or explosion risk.
- Oxygen levels below 19.5 percent are a dangerous health risk:
 - Sixteen percent can cause drowsiness and nausea; 12 percent, unconsciousness; 6 percent, death.
 - Methane, carbon dioxide, nitrogen, corrosion, or rust can displace oxygen.

6. A Confined Space May Be Hazardous Because of Engulfment Potential

A person could be covered, buried, or smothered in a space that contains a liquid, or a flowing solid such as sand or grain.

7. A Confined Space May Be Hazardous Because of an Entrapping Design

If a space's walls curve in or its floors slope and taper down, you could:

- Slip or fall into a space that is too tight to escape from
- Get pushed into machinery in the space

8. Confined Spaces May Have Physical Hazards

- Heat can build up and create the danger of exhaustion or heat stroke.
- Falls can be fatal if you're trapped with a serious injury, are in a toxic or low oxygen area, or you can't get a foothold on floors or a grip on handholds to get out.
- Noise bounces off walls in a space, making it hard to hear directions or warnings and creating a risk of hearing damage.
- Power equipment creates injury, electrocution, fire, and explosion risks:
 - That's why power is turned off, equipment locked out, and pipes and valves turned off, blocked and bled before spaces are entered.

Discussion Points:

- Ask participants to name hazards of particular confined spaces in your workplace.

Conclusion: Take Confined Space Permits and Precautions Seriously

A hazardous confined space can be deadly unless the testing, entry limits, and safety precautions spelled out on the permit are followed.