



Confined Spaces Training Guidebook

From the Field

By Joe Bateman, Safety Outreach Director

As a result of some large OSHA fines in our industry lately, safety professionals everywhere are rethinking what we have always believed about Confined Spaces. What once were accepted as Non-Permit-Required Confined Spaces are now being re-evaluated as to whether they should be Permit-Required.

One element of a Permit-Required Confined Space is “converging walls” that could make it difficult or impossible for a person inside that confined space to get out. Recyclers have been cited in the past year under this definition with regard to horizontal balers with feed hoppers that have converging walls. Consider: Does the hopper of your baler have converging, or funnel-shaped, walls? If so, OSHA looks at that baler as a Permit-Required Confined Space.

OSHA fines over \$100,000 have resulted in some of these situations. Don't let it happen to you. Take a close, careful, honest look around your operation and make sure you're compliant. If you have questions, call ISRI Safety and let's talk it through. We're here for you if you need an onsite safety program assessment. This service is one of your member benefits, and the only thing we ask is the investment of your time.

One of the most critical issues with confined spaces is rescue. So—if I hit my head, or go into a diabetic coma while I'm in your confined space—do you have a way to get me out of there without pulling off my arms and legs and head? Are you sure? Have you practiced? Don't wait until an emergency happens to know whether you can respond effectively.

Finally, if you have signs on your balers, shredders, pits, or anywhere else out in your operation that say “Confined Space: Enter by Permit Only” you better have a file somewhere full of completed confined space permits. Take this time now to assure your Confined Space Program is everything it should be.



Why is there a Confined Space Standard?

- There are 122 confined space accidents each year in the U.S. across all industries, leading to 176 fatalities
- 60 percent of the fatalities in these accidents occur during rescue attempts

A Confined Space Standard is Intended to Protect Workers From:

- Toxic, flammable, explosive, or asphyxiating atmospheres
- Possible engulfment
- Any other recognized serious hazard
- **The standard focuses on areas with immediate health or safety risks, denoting them as “Permit Required Confined Space”**



Common Confined Spaces

- Scale Pit
- Shredder
- Baler/Logger
- Bag House
- Oil/Water Separator
- Tank
- Z-box
- Cyclone
- Trommel
- Baler Access Door



How to Identify Confined Spaces

1. Limited Openings for Entry and Exit; AND
2. Is large enough and so configured that an employee can **bodily enter*** and perform assigned work; AND
3. Not Designed for Continuous Worker Occupancy

***Definition of “Bodily Enter”**

Bodily enter means the action by which a person passes through an opening into a confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Dangerous Combinations

- Presence of all three confined space characteristics can complicate the situation.
- Working in and around the space.
- Rescue operations during emergencies.
- Worsened conditions due to work activities:
 - Welding and cutting
 - Cleaning with solvents, use of other chemicals
 - Use of gas-powered equipment



Confined Space

1. Limited Openings for Entry & Egress
2. Large enough to bodily enter and perform work
3. Not designed for continuous worker occupancy

Permit-Required Confined Space

- Hazardous atmospheres*
- Engulfment
- Trapped or asphyxiated by inwardly converging walls or by a floor
- Contains any other recognized serious safety or health hazard

***Hazardous Atmosphere**

1. Flammable gas, vapor, or mist in excess of 10% of its lower flammable limit (LFL);
2. Airborne combustible dust at a concentration that meets or exceeds its LFL;
3. Atmospheric oxygen concentration below 19.5% or above 23.5%;
4. Atmospheric concentrations of any substance for which a dose or PEL is published in Subpart G or Z of this Part and which could result in employee exposure in excess of its dose or PEL;
5. Any other atmospheric condition that is IDLH



Hazards of Confined Spaces

- Oxygen Deficient Atmospheres
- Oxygen Enriched Atmospheres
- Flammable Atmospheres
- Toxic Atmospheres
- Temperature Extremes
- Engulfment Hazards
- Noise, Slick/Wet Surfaces, Falling Objects



Oxygen Deficient Atmospheres

19.5 %	Minimum acceptable oxygen level.
15 - 19%	Decreased ability to work strenuously. Impair coordination. Early symptoms.
12-14%	Respiration increases. Poor judgment.
10-12%	Respiration increases. Lips blue.
8-10%	Mental failure. Fainting. Nausea Unconsciousness. Vomiting.
6-8%	8 minutes - fatal, 6 minutes - 50% fatal 4-5 minutes - possible recovery.
4-6%	Coma in 40 seconds. Death

Exposure to atmospheres containing 12% or less oxygen will bring about unconsciousness without warning and so quickly that individuals cannot help or protect themselves.



Oxygen Enriched Atmospheres

- Oxygen level above 23.5%.
- Causes flammable and combustible materials to burn violently when ignited.
- Hair, clothing, materials, etc.
- Oil soaked clothing and materials.
- Never use pure oxygen to ventilate.
- Never store or place compressed tanks in a confined space.

Flammable Atmospheres

The byproducts of work procedures can generate flammable or explosive conditions within a confined space.

Testing the Atmosphere

- Verify presence of safe work atmosphere.
- Test all areas of a confined space.
 - Top, Middle, Bottom
- Methane is lighter than air.
- Carbon Monoxide is the same as air.
- Hydrogen Sulfide is heavier than air.
- Oxygen Deficiency.



Lockout/Tagout

- First option to eliminate hazards.
- Locking and tagging out electrical sources.
- Blanking and bleeding pneumatic and hydraulic lines.
- Disconnecting mechanical drives and shafts.
- Securing mechanical parts.
- Locking and tagging out shutoff valves.

Ventilation

- Must be aware of hazards you are trying to correct in the confined space.
- Air intake in a safe location to draw fresh air only.
- Continuous ventilation whenever possible.
- Retest the confined space before entry.

Engulfment Hazards

- Material on Feed conveyors
- Fluff
- Flooding of confined space.
- Water or sewage flow.



The Necessity of Rescue

- Entrants are in spaces that could quickly render them unconscious
- Over 60% of fatalities in confined spaces are would-be rescuers
- A pre-planned and effectively executed rescue saves lives
- Entry programs that by-pass safeguards will eventually end up requiring rescue

Rescue Members are Trained

- To perform assigned duties
- As entrants
- In first aid and CPR (at least one member holds current certification)
- To be proficient in use of personal protective equipment
- To practice rescue at least once every 12 months