



ZERO FATALITY STANDARD – ZFS No.9 CONFINED SPACE WORK

3rd Versión – December 2022

PURPOSE OF THE STANDARD

The purpose of this standard is to establish the requirements for work in confined spaces, as well as to indicate the minimum content that must be considered in Colbun's procedures and those of Collaborating Companies.

It applies to all work conducted in spaces that are designed with limited entry and exit points, have inadequate natural ventilation that may result in high concentrations of airborne contaminants, and are not intended for continuous worker occupancy.

Examples of confined spaces include storage tanks, boilers, ventilation ducts, sewers, underground chambers, pits, and tunnels. Each confined space must be evaluated on a case-by-case basis by the person responsible for the activity to determine the potential atmospheric risks.

GUIDELINES

1. PERSONNEL REQUIREMENTS

1.1. COMPETENCE REQUIREMENTS

Personnel entering confined spaces must:

- a. Possess the necessary competencies relevant to the specific activity being performed.

2. EQUIPMENT AND FACILITIES REQUIREMENTS

2.1. WORK AREA REQUIREMENTS

Confined space work areas must comply with the following, as applicable:

- a. Delimitation and Signage: Establish barriers and signage to demarcate and restrict access to the work area.
- b. Personnel Identification: Implement a system indicating who is inside the confined space, the number of people, the time of entry, and the tasks being performed.
- c. Support Personnel: Always maintain a support person outside the confined space to monitor and communicate with workers inside. Direct visual contact is preferred; if not feasible, use light signals, acoustic signals, ropes, or intercom systems.
- d. Team Size: Confined space activities should ideally involve at least two workers, provided the enclosure allows for safe operation.

- e. Entry and Exit Mechanisms: Provide appropriate means (e.g., ladders, ramps, hoists) to facilitate the safe entry and exit of workers.
- f. Atmospheric Monitoring: Measure atmospheric conditions before personnel entry and periodically during work if conditions may change.
- g. The following atmospheric conditions must be maintained for safe confined space work:
 - i. Oxygen Levels: Between 19.5% and 23.5%.
 - ii. Flammability: Less than 10% of the Lower Explosive Limit (LEL).
 - iii. Toxic Substance Concentration: Must not exceed the Permissible Exposure Limit (PEL) or Short-Term Exposure Limit (STEL), as applicable.
 - iv. Heat Load: Perform ambient heat load measurements (WBGT) when applicable.
- h. Ventilation: If atmospheric conditions deviate from acceptable levels, provide forced ventilation (air injection and extraction) to eliminate harmful gases and supply fresh air.
- i. Energy Isolation: Ensure complete isolation from energy sources in accordance with ZFS No. 1, Energy Isolation and Lockout/Tagout (LOTO).
- j. Prohibition of Mobile Phones: Prohibit the use of mobile phones in areas with flammable atmospheres.

2.2. EQUIPMENT AND WORKING TOOLS REQUIREMENTS

Equipment and tools used for confined space work must be inspected for functionality and meet the following requirements:

- a. Calibrated Atmospheric Monitoring Equipment: Ensure gas detection devices and atmospheric monitors are properly calibrated and within the validity period.
- b. Minimize Atmospheric Contamination: Avoid using equipment that can emit pollutants into the confined space.
- c. Explosion-Proof Equipment: Use explosion-proof tools and equipment when working in areas with potential explosive atmospheres.
- d. Electrical Safety in Humid Environments: In enclosures with high humidity or conductive surfaces, use low-voltage tools and lighting. Where feasible, prioritize pneumatic tools over electric tools to enhance safety.

3. RECORDS

[Use Checklist No. 9 to verify compliance Zero Fatalities Standards-Colbun S.A.](#)

EXCEPTIONS

Previous to the start of work, Colbun's Facility Manager (Project, Power Plant, Transmission Zone) may authorize exceptions to this Standard in writing. Should there be a discrepancy where there is more than one Facility Manager, it must be escalated to a higher hierarchical level for definition.