

CONFINED SPACES

What is a confined space?



An area may be considered a confined space if it meets three criteria.



1. It must be large enough and so configured that an employee can enter it and perform the assigned task.
2. It must have a limited or restricted means of entry and exit.
3. It is not designated for continuous occupancy.



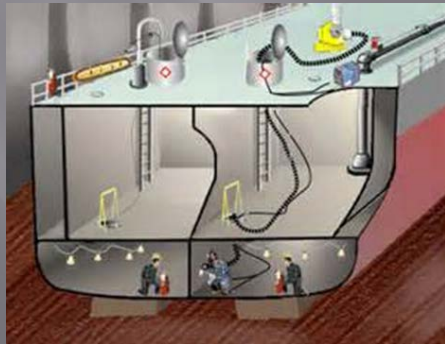
Confined spaces are divided into two categories

They are permit required and non-permit required spaces.



Permit required spaces meet the definition of a confined space plus any one of the following four characteristics.

1. Contains or has a reasonable potential to contain a hazardous atmosphere.
2. May contain a material with the potential to engulf someone who is in the space.
3. Has an internal configuration such that a person could be trapped or asphyxiated.
4. Contains other serious safety or health hazards.



Examples of permit required spaces includes:

- ▣ Inside boilers
- ▣ Sanitary sewer manholes
- ▣ Storage tanks
- ▣ Vessels
- ▣ Inside pipes or tunnels
- ▣ Energized electrical manholes
- ▣ Active steam manholes

Non-permit required areas includes:

- ▣ Telecommunication manholes
- ▣ Storm sewer
- ▣ Elevator pits
- ▣ Mechanical pits
- ▣ Non-energized electrical manholes
- ▣ Non-active steam manholes

Procedures for entering permit required confined spaces:

- ❑ Complete the confined space entry permit available on the EHS web site.
- ❑ Ventilate the space with a positive pressure blower for 30 minutes.
- ❑ Check the area with a four function (LEL, CO, H₂S, O₂) gas meter.
- ❑ If meter reads zero for LEL, H₂S, and CO and greater than 19.5 % oxygen prepare to enter space.
- ❑ Prior to entering space establish an evacuation system and designate an outside attendant.
- ❑ If after 30 minutes of ventilation the space shows any level of LEL, H₂S, CO and the O₂ level is less than or equal to 19.5% do not enter and contact EHS.
- ❑ Continuously ventilate and monitor the space while occupied.

Procedure for entering non permit required confined spaces.

- ▣ Set up ventilation
- ▣ After 10 minutes check the space with a four function gas meter
- ▣ If meter reads zero levels of LEL, H₂S, and CO and greater than 19.5% O₂ enter the space.
- ▣ Continuously ventilate and monitor the space while occupied.
- ▣ If at any time, the meter alarm goes off, exit the space and contact EHS.

Hazards Associated With Confined Spaces

- ▣ There are a number of hazards associated with confined spaces among these are:



- ▣ Poor air quality. This could be an insufficient amount of oxygen (less than 19.5%) or a toxic substance.
- ▣ Oxygen can be replaced by other gasses. An oxygen level of less than 19.5% can result in sudden unconsciousness without warning.
- ▣ Chemical exposures could be due to skin contact, inhalation or accidental ingestion. A fire hazard which could be due to flammable liquids, gases or combustible dusts or other materials.
- ▣ Noise in some cases; the 85 decibel limit may be exceeded.



- ▣ Safety hazards such as moving parts, structural hazards, entanglement, slips and falls may be present.
- ▣ Temperature extremes may be present which could result in burns or frostbite.
- ▣ A shifting or collapse of bulk material could result in entrapment or asphyxiation.
- ▣ A barrier failure could result in a flood of water or release of free flowing solids.
- ▣ Uncontrolled energy release which includes electrical shock.
- ▣ A lack of visibility could result in a slip, fall, or other injury.



PPE may Include

- ▣ Eye protection
- ▣ Gloves
- ▣ Coveralls
- ▣ ARC flash clothing
- ▣ Boots
- ▣ Hardhat



A four function gas meter measures the levels of carbon monoxide (CO), toxic materials, oxygen, and explosive limits (LEL).



- ▣ CO is carbon monoxide. The meter goes into alarm at 10 parts per million (ppm).
- ▣ CO is a byproduct of combustion. It is odorless, colorless and tasteless.
- ▣ The exposure limit for CO is 35 ppm.



- ▣ For toxic materials, the meter is generally calibrated against hydrogen sulfide. The meter goes into alarm at 10 ppm.



- ▣ Mixtures of dispersed combustible materials including gases, vapors, and some dusts in air will burn if the concentration falls between the lower and upper explosive limit.





- ▣ The meter goes into alarm at 10% of the lower explosive limit (LEL).

- ▣ The meter goes into alarm at 19.5% oxygen. Normal air has 20.9% oxygen.



Emergency Response

- ▣ Knowing what steps to take are the key to response in an emergency. Have a plan before working in a confined space. The initial step in an emergency is to get people out of the space as soon as possible.



An emergency situation exists when:

- ▣ Gas meter goes into alarm.
- ▣ Voice communication is lost.
- ▣ An injury occurs.
- ▣ Structural integrity of the space changes.



Emergency contacts

- ▣ UAPD 348-5454
- ▣ EHS 348-5905



- ▣ For more information about confined spaces consult the EHS web site or contact Hal Barrett or Jeff Hallman.