



# Confined Space Entry – Ventilation

## **Overview of Topic**

Ventilation is the primary method for making a confined space safe and free from hazardous atmospheres. Planning the confined space operation and selecting the proper ventilation equipment is critical. Every nook and cranny of the confined space must be continuously ventilated.

## **Types of ventilation**

Some confined spaces can be ventilated naturally. This is the case with most excavations. However, any time a naturally ventilated confined space is occupied, adequate precautions must be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen or to other hazardous atmospheres. Confined spaces that cannot be ventilated naturally must be ventilated with mechanical equipment.

## **Ventilation is important to:**

- (1) Clear the confined space of hazardous atmospheres before an employee is permitted to enter.*
- (2) Keep the confined space clear of hazardous atmospheres while the employee is working in the space.*
- (3) Keep the confined space comfortable to work in by lowering temperatures and providing fresh air.*

## **Types of equipment**

Blowers provide a continuous supply of outside air. Ventilation blowers can work two ways. They can either force fresh air into the confined space or suck the contaminated air out and pull fresh air in. The most popular (and efficient) method of the two is forced air. Ducting is also important. The positioning can mean proper circulation and venting of the whole confined space or leaving pockets of contaminated air in corners.

If you are using blower equipment in a potentially explosive hazardous atmosphere you must use equipment designed to be spark proof and have the ability to dissipate static electricity.

Because of the complications of selecting the right equipment, the White Electrical project manager must evaluate the confined space and select equipment powerful enough to exchange air in the space. To accomplish this identify size and configuration of the space, the output of the blower evaluated and documented on the Job Safety Analysis.

## **A sample process**

An example of the ventilation process for construction can be found in 1926.57-Ventilation. It says:  
Tanks which have been drained to permit employee entry to clean inspect or does maintenance may contain atmospheres hazardous to life or health.

- (1) Before employees can enter the tank, appropriate atmospheric tests must be made to ensure permissible exposure limits are not exceeded and, the oxygen concentration is less than 19.5 percent.*
- (2) If the tank is unsafe, it must be ventilated until the hazardous atmosphere is removed. Ventilation must continue as long as an employee is in the tank.*

The atmosphere within the space should be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.

## **Employee Training**

The White Electrical confined space permit specifies training for those employees required to enter into confined or enclosed spaces. They must be instructed as to the:

- (1) nature of the hazards involved,*
- (2) the necessary precautions to be taken, and*
- (3) the use of required protective and emergency equipment.*

## **Training Tips**

Show employees how to do a confined space problem to figure the size of blower needed, and correct configuration of the ducting.

## **Types of ventilation**

Ventilation is the best method for making a confined space atmosphere safe and free of hazardous air. Planning the confined space entry operation and selecting the proper ventilation equipment is critical. It is almost an art form to ensure every nook and cranny of the confined space is continuously ventilated. It also takes a little math to figure out how long it takes to ventilate a certain sized confined space with the equipment you have.

Some confined spaces can be ventilated naturally. This is the case with most excavations. However, any time a naturally ventilated confined space is occupied, adequate precautions must be taken to prevent employee exposure to air containing less than 19.5 percent oxygen and other hazardous atmospheres.

Other confined spaces must be ventilated with mechanical equipment.

Keep the confined space comfortable by lowering temperatures and providing fresh air.

## **Types of equipment**

Blowers provide a continuous supply of outside air. Ventilation blowers can work two ways. They can either force fresh air into the confined space or suck the contaminated air out and pull fresh air in. The most popular (and efficient) method of the two is forced air.

Ducting is also important. The positioning can mean proper circulation and venting of the whole confined space or leaving pockets of contaminated air in corners.

If you are using blower equipment in a potentially explosive hazardous atmosphere you must use equipment designed to be spark-proof and have the ability to dissipate static electricity.

Because of the complications of selecting the right equipment, your site's competent person must know how to evaluate the confined space and select equipment powerful enough to exchange air in the space. The size and configuration of the space and the output of the blower must be evaluated. Confined space work can be safe. Proper and continuous ventilation is one of the best and easier methods to accomplish a hazard free confined space.

## **Ventilation is important to:**

Clear the confined space of hazardous air before you are permitted to enter.

Keep the confined space clear of hazardous air while you are working in the space.

