



**DALHOUSIE
UNIVERSITY**

Department of
Facilities Management
Occupational Health and Safety

Safe Job Procedure for Ventilation of Confined Spaces

Building _____ Confined Space ID # _____

Date: _____ Work Order No. _____

Shop Doing Work _____

Application:

This safe job procedure applies to all Facilities Management employees involved in confined space entry work.

Safe Job Procedure

Job steps are listed in the order in which they must be completed. Key steps and the associated activities must be followed in the order presented to achieve maximum efficiency in safety, production, quality and overall loss prevention.

If atmospheric hazards exist, or are likely to exist, in a confined space, it shall be ventilated, and purged if necessary, to ensure safe atmospheric levels before any employee enters the space.

If continuous mechanical ventilation of the space is required to maintain acceptable atmospheric levels while work is performed in the confined space the ventilation equipment must have an adequate warning system for alerting entrants if the equipment fails. As well, a space specific evacuation procedure must be developed.

Ventilation should also be used to maintain a comfortable atmosphere in the confined space and must be used to capture and exhaust contaminants resulting from work being performed.

Purging

The following steps must be taken when purging a confined space:

1. Refer to the Confined Space Inventory for the confined space in question to see if its volume has been calculated.

2. If there is no volume recorded on the inventory form, measure or estimate as accurately as possible, the height, length and width of the space so you can calculate its volume. (If you must estimate dimensions, you should estimate high rather than low to ensure a margin of safety.)
3. Record the volume of the confined space on the appropriate inventory form.
4. Calculate the amount of time required for one exchange of air in the space by dividing the volume of the space by the flow rate of the fan you have selected for use. (The flow rate is stated on the fans label.)
5. Divide 60 minutes by the number calculated as the time required for one exchange of air in order to calculate the number of air exchanges you can complete per hour.
6. If necessary choose a fan with a higher or lower flow rate so that you can ensure 8 to 10 air exchanges per hour when ventilating.
7. Ensure that you have selected a fan with a capacity that will quickly purge the space.
8. Set up the fan and hoses, positioning it so that can only take in clean, fresh air.
9. Sample atmospheric conditions in the confined space and record the reading on the Confined Space Entry Permit.
10. Purge the confined space for the amount of time required for a minimum of 8 air exchanges.
11. Stop the fan and wait for at least 10 minutes.
12. Test atmospheric conditions in the confined space to ensure that safe atmospheric levels exist.
13. If a hazardous atmosphere still exists repeat steps 10, 11 and 12.
14. If testing indicates that safe atmospheric levels exist continue to purge the space for the entire time that entrants are working in the confined space.
- 15. If safe atmospheric levels cannot be achieved after purging the space a second time the work must be contracted to a contractor that is competent in the work to be performed and confined space entry.**

Ventilation

Ventilation is to be used to introduce fresh air to a confined space or to exhaust contaminants created by work performed such as welding, abrasive work, oxygen / acetylene cutting, coring in materials containing silica, etc.

Ventilation is to be done as follows:

1. Select a fan capable of 8 to 10 fresh air exchanges in the space per hour.
2. Ensure that the fan or fans are in good working condition.
3. Ensure that fans are grounded and bonded to the confined space.
4. Follow the instructions of all safety and warning labels on fans.
5. Locate supply fan(s) so that only clean fresh air will be drawn into the confined space.
6. Ensure the supply fan is located well away from building exhausts, generator exhausts, automobile exhausts or any other toxic or flammable substances.
7. Direct the ventilation duct so that good clean fresh air is provided throughout the confined space including alcoves where contaminated air may be trapped.
8. Position the inlet for exhaust ventilation next to the source of the contaminant. (Welding, cleaning with solvents, concrete coring, etc.)
9. Ensure that exhaust fan outlets are positioned so that contaminants cannot be drawn back into the confined space by the intake ventilation.
10. Ensure that intake and outlet ducting does not get kinked.
11. Keep ducting as far away from work areas as possible in order to avoid damage.
12. Ensure outlets are positioned where natural air currents will disperse quickly and not create a danger to other people.
13. If there is any chance that exhaust air could be flammable ensure that there are no ignition sources anywhere near the outlet.

14. Continue to ventilate the confined space for the entire time that entrants are working in the space.
15. When entrants leave a confined space, for what ever reason, the confined space atmosphere must be tested before any employee re-enters the space.
16. Test the confined space atmospheric levels prior to the start of work each day.
17. If the confined space is not oxygen deficient, appropriate air purifying respirators should be used, in addition to ventilation, to help protect entrants if the atmospheric contaminants are not Immediately Dangerous to Life or Health.