



**Radcorps Fire & Safety Pvt Ltd**

*"Complete solution for Fire & Safety"*





# CONFINED SPACES AND CONFINED SPACE VENTILATION

**ALLEGRO**<sup>®</sup>  
I N D U S T R I E S



# WHAT IS CONFINED SPACE?

- An area large enough for an employee to enter and perform work.
- Has limited or restrictive means of entry or exit.
- Is not designed for continuous human occupancy.

# PERMIT-REQUIRED CONFINED SPACE

- Contains, or has the potential to contain, a hazardous atmosphere.
- Contains material with the potential for engulfment.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging wall, or a floor which slopes and tapers to a smaller cross-section.

# TYPICAL CONFINED SPACES

- Storage tanks
- Pump waste wells
- Degreasers
- Manholes
- Tunnels
- Underground vaults
- Boilers
- Railcar tanks
- Silos
- Vessels
- Grain elevators
- Mixers
- Water tanks
- Bottom access enclosures
- Chemical process tanks
- Centrifuges

# WHAT MAKE S CONFINED SPACE DANGEROUS?

- By-products of previously stored or processed materials and/or chemicals
- Accidental leaks or spills
- Chemical reactions
- Oxidation
- Mechanical operations
- Atmospheric hazards

# ATMOSPHERIC HAZARDS

- **Atmospheric hazards are often the most dangerous hazards in confined space work. An atmosphere which exposes the employee to risk of death, incapacity, injury and/or acute illness can result from any of the following:**
  - **Oxygen deficiency, below 19.5%.**
  - **Oxygen enrichment, above 23.5%.**
  - **Flammable or combustible gases and/or vapors.**
  - **Dusts that obscures vision at 5 ft. or less.**
  - **Any IDLH atmosphere, poses immediate threat to life or severe health effects which could impair escape.**



# **HAZARDOUS ATMOSPHERE ONLY** **CONFINED SPACE**

If the only hazard posed by a confined space is an actual or potentially hazardous atmosphere, and it can be demonstrated that forced air ventilation alone is sufficient to maintain a safe atmosphere, then the full requirements of a Permit-Required Confined Space do not have to be met.

- The air must be monitored before and during the occupation of the confined space –

Oxygen content (19.5% - 23.5%)

Flammable gases and vapors (less than 10% LEL)

Potential toxic air contaminants (less than PEL)



# SELECTING THE RIGHT VENTILATION UNIT

## 1. How to determine the size of the area that needs to be ventilated?

Step. 1: Get length, width, and height of the area in feet to determine volume.

Step. 2: Calculate in feet: Length x Width x Height = Total

*Note: If you have cubic meters, multiply volume by **35.315** to convert to feet.*

Step. 3: Divide total by **3** = CFM requirement

## 2. The Work Environment

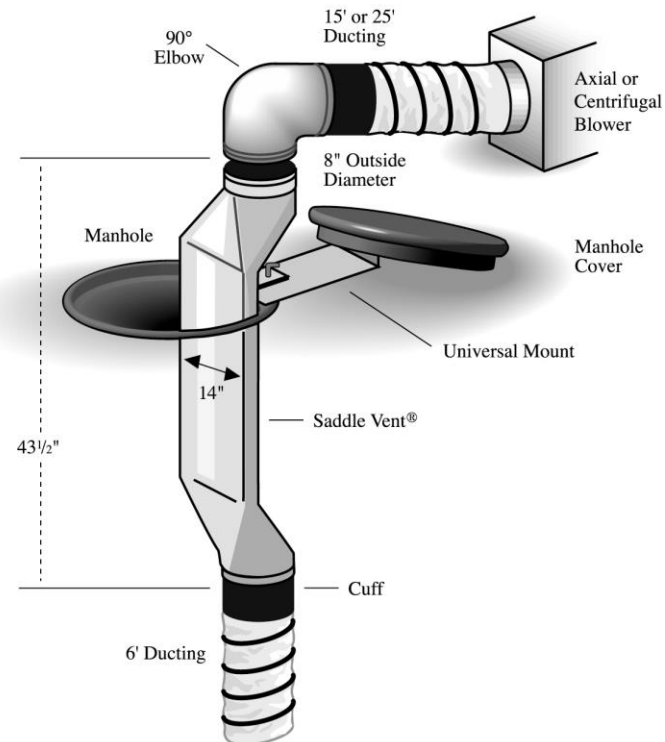
Are there any toxic or explosive vapors present? If so, explosion-proof equipment might be necessary.

### 3. Work To Be Performed

- Welding - Coating - Remediation - General ventilation
- Cooling - Blasting - De-contamination

### 4. Physical Limitations

Where will the ventilation units be placed? Will duct, connectors, elbows, or Saddle Vent<sup>®</sup> be needed to ventilate work area?



Saddle Vent<sup>®</sup> is a registered trademark of Air Systems International, Inc.; the Saddle Vent<sup>®</sup> device is protected by U.S. Patent Nos. 4,794,956,4,982,653, and foreign patents.

## **5. Type of Power Source Available**

A. Electricity – Must specify voltage and frequency  
(ex: 220 V / 60 Hz)

B. Compressed Air

C. DC Power – 12 Volt

D. Gasoline powered

(Note: Not to be used in work areas containing explosive vapors).

# 3 TYPES OF VENTILATION BLOWERS

## AXIAL BLOWERS



**LIGHT WEIGHT WITH  
OPTIONAL CANISTER  
FOR DUCTING STORAGE**

## CENTRIFUGAL BLOWERS



**GREATER DYNAMIC  
PRESSURE  
MORE POWER SOURCES**

## VENTURI BLOWERS



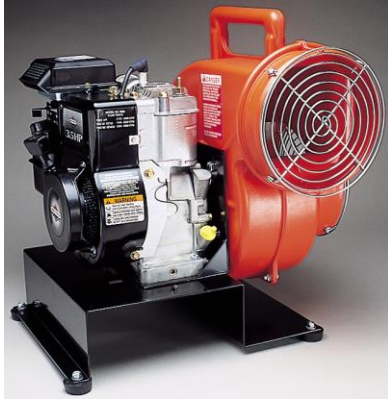
**VERY LIGHT WEIGHT  
MOVE LARGE AIR VOLUME  
REQUIRES COMPRESSED  
AIR SOURCE**

# AXIAL BLOWERS



- Ranges: 778 to 7500 CFM
- Explosion proof available
- 115V/AC (some 220V – 50 HZ) and 12V/DC
- With or without ducting canister – 15 ft. (4.m) and 25 ft. (7.6m).
- Optional 8, 12, 16, 20 inch ducting.
- Optional inlet adapter to extract air, as well as ventilate.

# CENTRIFUGAL BLOWERS



- Ranges: 760 to 3000 CFM
- ABS housings are lighter weight and offer greater durability.
- Some are offered in 220V
- Gasoline powered. (includes 10 ft. exhaust hose).
- Air-Driven (requires 30 CFM @ 40PSI)
- Explosion proof available
- Two speed available.



# VENTURI BLOWERS



- No Moving Parts.
- Lightweight construction.
- Explosion proof.
- No guards required.
- Fairly inexpensive.
- Multiple inlet ports.
- Sturdy galvanized steel diffuser.
- Static ground wire included.
- Single piece cast aluminum inlet housing.



# CONFINED SPACE ACCESSORIES



- Manhole Guard Rail and Shield.
- Manhole Guard Rail Tent
- Worksite Umbrellas
- Manhole Lid Lifter
- Dewatering pumps
- Work area tents
- Tent Heater

# Thankyou



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