

Hazardous Location Identification: Selecting Proper Equipment

Confined spaces are some of the most dangerous and potentially life-threatening work environments in industry, making ventilation, respiratory and PPE equipment an integral component of a total safety program. U.S. OSHA states “electrical equipment must be approved by a Nationally Recognized Testing Laboratory (NRTL) “ . . . and stated in 29 CFR 1910.303(a). In addition, NRTL’s must approve this equipment using U.S. recognized test standards, 29 CFR 1910.7.” Proper selection and training with approved hazardous location safety equipment can reduce the cause of potential accidents and even loss of life. In order to select the proper equipment, the worker must first determine whether the location is considered a “Hazardous” or “Non-Hazardous” location.

What is a Hazardous Location?

All confined spaces should be considered a “Hazardous Location” until proven otherwise. Federal OSHA refers to the National Electrical Code (NEC) as the “Bible” for reference information concerning hazardous locations. NEC defines a hazardous location as those areas “where fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or flyings.”

NEC classifies hazardous locations in three ways: Type, Condition, and Nature.

Type

Three “Types” of hazardous conditions exist called Classes, describing the type of hazard expected:

CLASS I (NEC-500-5) - Areas in which flammable gasses or vapors may be present in the air in sufficient quantities to be explosive or ignitable.

CLASS II (NEC-500-6) - Areas made hazardous by the presence of combustible dust

CLASS III (NEC-500-7) - Areas in which easily ignitable fibers or flyings present, due to the type of material being handled, stored, or processed

Condition

Two kinds of hazardous “Conditions” exist called Divisions:

DIVISION I (NEC-800-5, 6, 7) - The hazard is present continuously

DIVISION II (NEC-500-5, 6, 7) - The hazard is atypical - may occur accidentally such as a ruptured drum of fuel or chemical spill

Nature

The “Nature” of the hazardous substance is called a Group (NEC-500-3).

Groups A, B, C, or D where Group A is most volatile (Acetylene) and Group D would be least flammable (Propane). All Class I locations, Flammable Gases and Vapors, fall into Groups A, B, C or D.

Groups E, F, and G where Group E is conductive and explosive metal dust, Group F is carbon (coal) dust, and Group G is flour and grain dust. All Class II locations, Combustible Dusts, fall under Groups E, F or G.

Not Grouped - Hazards consisting of textile and wood fibers. Class III locations, Ignitable Fibers for Flying, are not grouped.

Ventilation Tips

- 1) Proper ventilation procedures should be followed in accordance with all Federal, State, and local laws. For work in hazardous locations, follow ANSI/API 2015 and 2016 procedures.
- 2) Always test the confined space for hazardous gases and sufficient oxygen with a calibrated multi-gas monitor prior to ventilating the space. After ventilating for a sufficient amount of time, re-test the confined space before entering the space. Ventilation must remain in operation during entry.
- 3) Use a purge time chart, provided on Air Systems’ blowers, to calculate purge times prior to entering a confined space. Each 90° bend in a section of 8” duct will reduce flow approximately 10-15%.
- 4) If toxic or combustible gases or low oxygen levels are encountered, increase ventilation purge times by 50% and retest the air quality.
- 5) When ventilating a manhole or tank, always set the blower back from the opening a minimum of five (5) feet. This should prevent any hazardous gases that may be purged from the confined space from being drawn back into the intake of the blower and forced back into the confined space.
- 6) Never block or restrict entry and egress to or from a confined space opening. Always use Air Systems’ Conductive Saddle Vent® System placed in the opening of the manhole or tank to allow continuous ventilation without restricting entry and egress to the opening.
- 7) With gases heavier than air, ventilation duct should be placed at the bottom of the confined space allowing the blower’s air to push the gases out the top of the confined space.
- 8) Always use non-sparking tools in and around a hazardous work site
- 9) When using a Venturi style pneumatic air horn (also called an eductor) on a steel tank, make sure the aluminum base is not dragged along the surface of the steel tank; this may cause a spark where rust is forming. Always make certain that the Venturi blower has been properly bonded to the tank prior to ventilating and assure the tank is properly grounded.
- 10) Always have proper respiratory equipment for the ventilated work space and for emergency rescue.
- 11) The build-up of static electricity is more prevalent during cool dry conditions, typically below 50% relative humidity. Depending on the work environment, anti-static clothing and special static removal devices may be necessary to prevent ignition from static electrical discharge.

