



A PRIMER OF HAZARDOUS AREA SAFETY

METHANE EMISSION DETECTION, MONITORING, AND MEASUREMENT EQUIPMENT

HAZARDOUS LOCATIONS CERTIFICATION AND INTRINSICALLY SAFE EQUIPMENT

SUMMARY

All equipment utilized for on-site detection, monitoring, and measurement of atmospheric methane (CH_4) emissions testing is required to be **hazardous area certified** and deemed as being **intrinsically safe** or **explosion-proof**.

The Ventbuster[®] is the most technologically advanced, build-for-purpose, point-source measurement device for testing and evaluating venting methane emissions to atmosphere. It enables industry to obtain an auditable, accurate, intuitive, repeatable, and continuous, real-time, emissions quantification and reporting.

The Ventbuster[®] is **hazardous area certified** and engineered as intrinsically safe for working in all hazardous areas, and explosive gas environments. Our technology is marked;



US: Class I Zone 0 AEx ia IIB T3 Ga
Canada: Ex ia IIB T3 Ga
-40°C < Tamb < 55°C

The Ventbuster[®] is compliant with Alberta Energy Regulator (AER) Directives 20 and 87.

STANDARDIZATION

The Canadian Electrical Code (CEC) and National Electrical Code (NEC) in the USA, define a North American **Hazardous Location** (Hazloc) as any area “where fire or explosion hazards *may exist* due to flammable gases or vapours, flammable liquids, combustible dust, or ignitable fibres, or flyings.”

Class 1: Explosive Gas Atmospheres

Area Classifications:

Division 1: Where ignitable concentrations of flammable gases, vapours, or liquids **can exist all the time or some of the time** under normal operating conditions.

* **Zone 0:** Where ignitable concentrations of flammable gases, vapours, or liquids **are continuously present or present for long periods** under normal operating conditions.

* **Zone 1:** Where ignitable concentrations of flammable gases, vapours, or liquids **are likely to exist** under normal operating conditions.

Division 2: Where ignitable concentrations of flammable gases, vapours, or liquids **are not likely to exist** under normal operating conditions.

* **Zone 2:** Where ignitable concentrations of flammable gases, vapours, or liquids **are not likely to exist** under normal operating conditions.

CH_4 emission monitoring and metering equipment is to be Class 1 Zone 0 or Division 1 Hazloc certified.

INTRINSIC SAFETY

Methane (CH₄) emission detection, monitoring, and metering equipment requires an electrical power source to operate. Since the equipment is expected to operate within Class 1 Zone 0 or Division 1 Hazloc areas, in which an explosive hazard **can exist all the time or some of the time under normal operating conditions**; these devices must be designed so as not to trigger an explosion. An explosion is imminent in the Hazloc area when the correct amount of flammable methane (fuel) is mixed with the correct amount of air (oxygen) and exposed to an ignition source (energy). Since both CH₄ and air would be present and cannot be controlled while emission detecting, monitoring, and metering, the operator must ensure that an ignition source is not introduced into the testing environment.

The two energy sources inherent with electrical equipment that could potentially initiate an explosion, are electrical sparking and/or hot surfaces. There are two engineered controls that may be designed into these devices being intrinsically safe or explosion proof.

SO, WHAT MAKES THE DEVICE INTRINSICALLY SAFE?

Electrical equipment is engineered with safety systems to mitigate the risk of explosion when operating in a Class 1 Zone 0 or Division 1 Hazloc area, as is the case with CH₄ emissions detection, monitoring, and metering equipment.

Intrinsically safe refers to electrical equipment that is **not capable of causing an explosion**. Explosion-proof means that **should an explosion occur, it will be contained** within the enclosure of the device.

The most employed engineering control to mitigate the risk of explosion is to design the device to be intrinsically safe, by removing the ignition (sparking) potential and lowering the energy or thermal level to below the ignition point. Typically, the device is designed with a barrier board to protect the electrical circuit and prevent thermal heating, non-sparking electrical components or motors, encapsulation, and electrical connections that can be connected or disconnected without sparking or shorting out.

All CH₄ emission monitors and metering devices that are electrically powered and deployed on-site and exposed to flammable gases, are to be **hazardous area certified** and classified as being either **intrinsically safe** or **explosion-proof**. This certification approval must be clearly displayed on the device with the certification agency marking.

The Ventbuster® is hazardous area certified and engineered as intrinsically safe for working all hazardous area Class 1 explosive gas environments.



MOVING TOWARDS NET-ZERO

Ventbuster Instruments customizes its equipment to measure a vast array of CH₄ emitters. Using the Ventbuster® technology to measure emission flow rates and CH₄ mass volumes, assists not only in effective management but has proven invaluable in carbon trading and the carbon offset market. By taking on this responsibility to precisely quantify and acknowledge our carbon footprint, the energy industry and Ventbuster Instruments can make significant steps along the path to achieving net-zero.

For further information about Ventbuster Instruments and our technology, visit www.ventbusters.com. Gain insight into our technology, its function and deployment and review our technical data sheets and other information.