ETHANE ANALYSIS

Determing if a detected natural gas leak is true or false

Any methane generated by the decomposition of organic material buried under the ground of old industrial areas or former landfill sites can give leak alerts. Even naturally occurring swamp gas from sewers or marchlands is a common reason for getting false gas leak signals. Determing the precence of ethane helps field personnel avoid acting on false alarms caused by naturally occurring methane in the ground.

Application

Utility companies undertake regular surveys of their gas networks to check for leaks. In some conditions, especially if lower concentrations of gas are found, identifying the type of gas is crucial in deciding whether to excavate a pipeline for repair or not. This application note explains how to make an ethane analysis on site and determine if a natural gas leak is true or false, with help of the IRwin® Methane Leak Detector from INFICON.

Traditional method

Once a suspected natural gas leak is pinpointed, a common procedure to distinguish if gas comes from a leaking gas pipe or from any other source of methane, is sampling the gas in a bag, send it to an external laboratory and have the chemical compounds analyzed. However, this procedure is both time consuming and costly. Safety measures have to be taken and the leak treated as a true natural gas leak until the results are available, generally after one or two days. The chemical compound the laboratory normally searches for is ethane. They focus on this since ethane and other heavier hydrocarbons are not present in near-surface microbial gas like swamp gas, but are normally a major component of thermogenic gases like natural gas. The ethane concentration typically varies between 0.5vol% to 15vol% in natural gas. A sample with presence of ethane would therefore indicate that the detected leak originates from a leaking natural gas pipe.

IRwin is a portable methane leak detector with in-built gas chromatograph (GC) for easy and fast ethane analysis.

How we do it

The specially developed gas chromatograph (GC) and sensor combination allows near real-time distinction between swamp gas and natural gas to rapidly determine if the detected gas comes from a leaking pipe or from other natural gas sources.

Looking for moderate gas concentration
Gas samples drawn from the ground with the unique bell probe

Performing the ethane analysis
Gas concentrations analyzed on site to determine the precence of ethane

Documenting
Results visualized on the instrument screen, saved as pdf-file and shared

The solution from INFICON

This analysis could be easily done on site by any operator using the IRwin Methane Leak Detector from INFICON, with a built-in gas chromatograph (G-models). The complete test is finished within a few minutes after the leak is detected.

When gas has been detected, the precise location of the area with highest concentration needs to be pinpointed. Using the unique IRwin bell probe, samples can be drawn through almost any road surfacing material, consistently reducing the need for drilling bar holes and thus saving time.

The gas chromatography analysis can be made on samples with concentrations as low as 1000 ppm and up to 100 vol%. The IRwin methane leak detector automatically takes the sample for the analysis, whereas the operator only needs to follow the step-by-step instructions on the screen of the leak detector to have the test performed. Another benefit of the built-in gas chromatograph is the ability to detect ethane concentrations down to 0.5 vol%, even within a small sample. This extraordinary low ethane detection level will assure that all true leaks are found and classified.

The analysis result is presented as a live graph showing the sensor signal during the complete test sequence. The different gas compounds will be visualized as separate peaks in the graph and indicated with a symbol for each gas.

This is typically presented on the screen within 1-2 minutes from the time of sampling, whereas the complete cycle time, including system purging, is less than 4 minutes.

At the end of the analysis, the operator will be asked to save the result as a report. The report is downloadable as pdf at any time and contains all necessary information like date and time, a map with coordinates of the location, the results and the graph itself.

Benefits of ethane analysis with IRwin

Cutting costs and unnecessary work is a major driver for all businesses, including gas leak detection. The IRwin Methane Leak Detector (SXG and SXGT models) gives operators the ability to identify the precence of ethane at any time, in order to quickly determine if a detected natural gas leak is true or false. The main benefits of ethane analysis performed with help of IRwin are:

- On-site analyzing capability
- Rapid responses
- Reduced costs

Documentation

Results are always presented on the instrument screen and give a clear indication of what has been detected:

- NG with Ethane detected - indicates a true natural gas leak is found
- Methane detected - indicates a source of methane like swamp gas or biomethane
- LPG detected - indicates a propane leak with absence or low levels of methane and ethane

For more information → inficon.com

Tips!

IRwin features an integrated proprietary IR-sensor system for methane-specific measurement. The IR-Ethane analysis can be used as a rapid first indicator prior to the GC analysis.

Needs higher concentration

- Needs higher concentration
- Needs approx. 3–15 vol% NG
- Results in less than 1 min

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