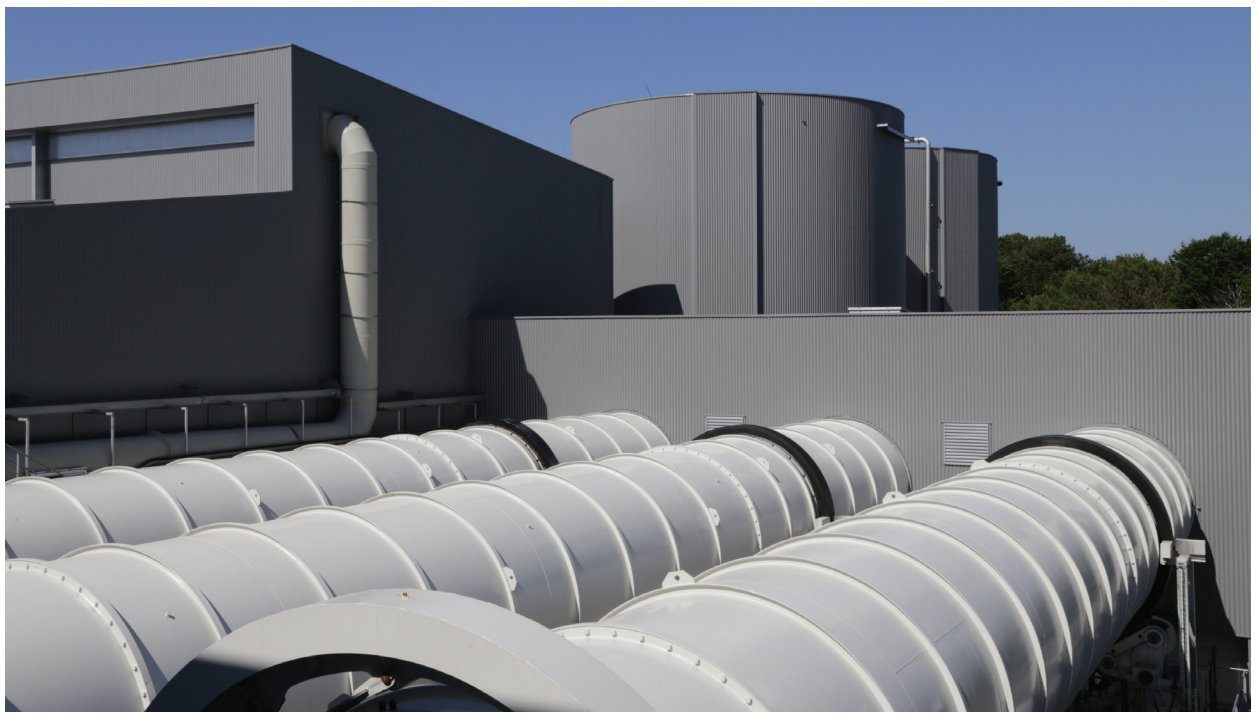
DIRECT CH4 AND NMTHC QUANTIFICATION WITH CERTIFIED & RELIABLE RESULTS

Chromatotec has developed innovative chemical and odor control monitoring systems offering response to this constraint for odor control units (scrubbers, charcoal filters, biofilters)



Biofilter Plant

Monitoring of methane (CH4) and Non-Methane Total Hydrocarbons (NMTHC) is an important tool for ambient air (indoor, outdoor, combustion), industrial hygiene, pure gas or process monitoring. Depending on the process, the amount of Volatile Organic Compounds (VOCs) can vary from ppb to tens of ppm while the matrix gas can be air or pure gases like N2, CO2, or O2.

However, most of the instruments which measure NMTHC are very sensitive to the matrix composition. Therefore, there is a need for an instrument which can measure methane and NMTHC VOCs without matrix effects. Ideally, the online monitoring should be performed with an all-in-one solution allowing accurate and fast results at ppb level.

Chromatotec® solutions

Chromatotec Group® is specialized in the manufacturing of process gas analyzers based in automatic Gas Chromatography (autoGCs) for online monitoring. The solutions provided allow tracking VOCs at very low concentration levels (from ppt to ppb) as well as concentration levels from ppm to %.

Chromatotec® is permanently involved in new turn-key solution developments for gas analysis at industrial sites. In response to the latest demands, a new solution has been developped: the chromaTHC, an all-in-one package industrial analyzer in wall-mounted box with gas generators inside as well as a calibration system for automatic data validation.

Main characteristics of the chromaTHC

The chromaTHC is an automated isothermal industrial gas chromatograph with a Flame Ionization Detector (FID) dedicated to the analysis of Volatile Organic Compounds (VOCs) in ambient air (indoor, outdoor, combustion), industrial hygiene and pure gases.

Unlike other instruments that measure only methane and total hydrocarbons, the chromaTHC developed by Chromatotec® provides a direct measurement of methane and non-methane concentrations without any calculation or conversion. This allows accurate and precise measurement of low levels of NMTHC, even in the presence of methane at much higher concentrations. The GC column used in the chromaTHC achieves absolute separation of methane from all other volatile organic compounds.

Also, the special configuration of this analytical system allows complete separation of the matrix gas from methane and VOCs. Therefore the measurements are independent from the amount of oxygen in the sample. There is no need of specific calibrations for different matrix!

The stability and accuracy of the system can be checked daily with the internal calibration system with permeation tube to provide automatic data validation. Also, as a continuous online fully automatic instrument, the chromaTHC allows un-attended operation after commissioning of **up to 16 streams** using a multiplexing system.

Chromatotec® supervising software Vistachrom provides automatically all concentrations of the compounds analyzed: CH4, NMTHC and THC by sum. It records all data in an embedded computer for full traceability and can transfer all results and

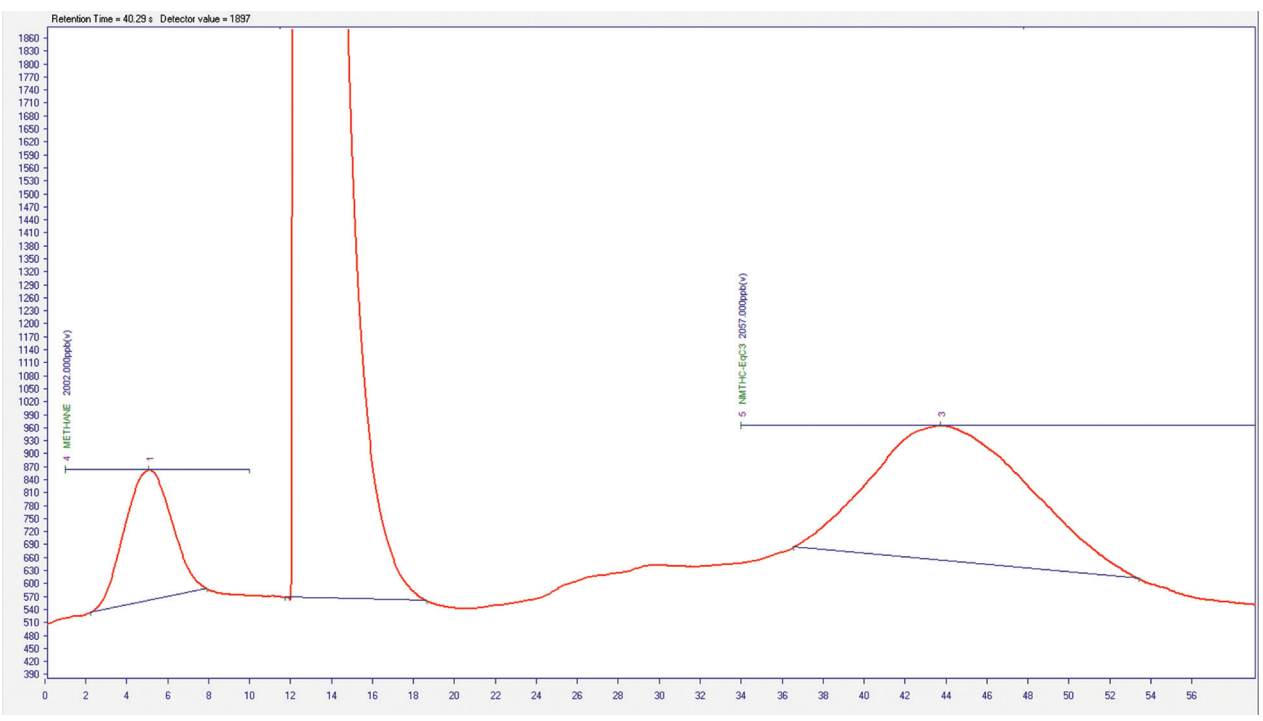


Figure 1. Analysis of a methane / propane cylinder with commutation peak at 13s

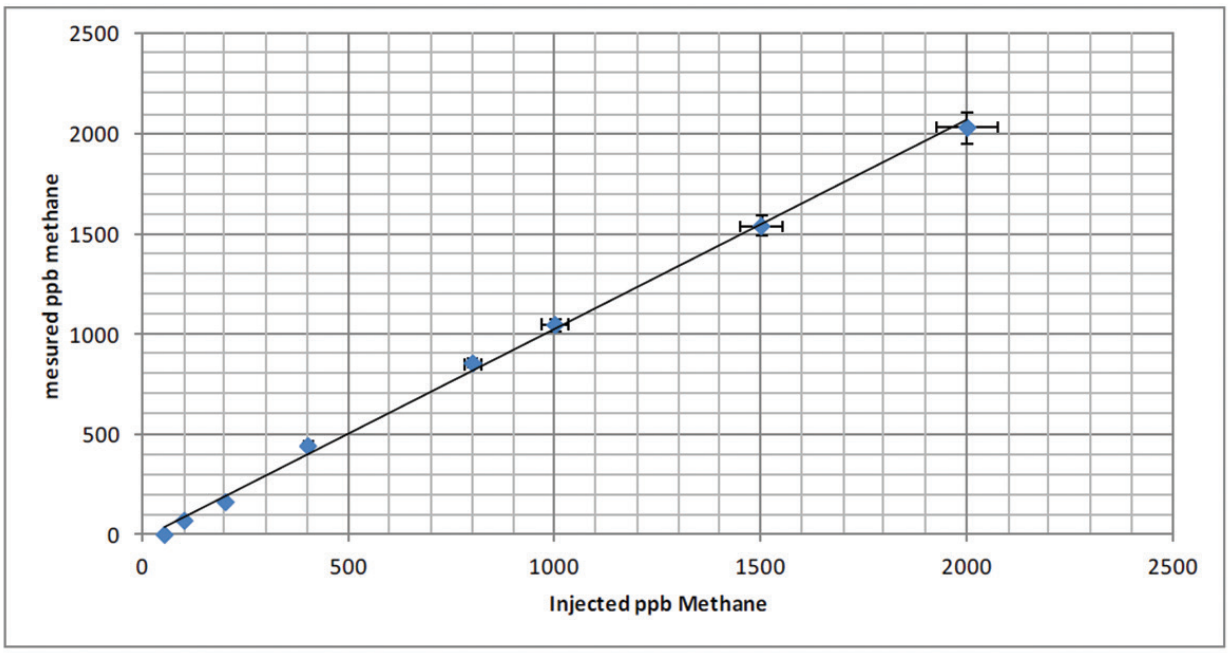


Figure 2. Linearity curve for methane using high amplification

information using different data transfer protocols (MODBUS / MGS1 / 4-20mA /0-10V). Vistachrom software also allows remote control and setting up threshold alarms.

Dedicated configurations of chromaTHC

The standard rack version of chromaTHC for VOCs monitoring allows very fast and accurate measurements within only 2 minutes and without matrix effects.

The instrument offers unique linearity and sensitivity, from low ppb up to 20 ppm with the same signal amplification.

The instrument can be easily adapted to work from low to very high concentrations, such as odor diagnosis and treatment. For these applications, longer cycle times (from 3 to 5 minutes) will allow to work up to 1000 ppm without changing loops and without memory effects offering high versatility of applications with a unique configuration.

Specially designed for **odor and VOCs monitoring in Odor and Chemical Control Units (OCU),** a wall-mounted version of this fully automatic instrument is available. It includes a chromaTHC analyzer with a built-in computer and zero air and hydrogen generators.

It associates 2 probes with heated transfer lines to collect and analyze in automatic mode gas before and after deodorizing in odor unit or by chemical treatment using a scrubber, biofilter or charcoal filters. It allows checking the process performance ratio.

Additionally, a 3G/4G MODEM is available for data transmission and automatic alarm by SMS function to inform user and provider when media support (charcoal or bio filters) is saturated and needs to be replaced.

This all-in-one solution allows accurate and fast results for rapid diagnosis of odor issues occurring at an industrial site to define the best source treatment strategy.

It avoids problems during sampling and transport to the laboratory for analysis by performing the online analysis to monitor odors constituents such as methane and non-methanic VOCs instead of manual sampling techniques.

This fully automatic user-friendly system does not require specialized people to operate. The high quality of the information is assured without the need for verification by an expert.

Also, remote access allows checking data and performing diagnosis without human intervention. Sample and calibration standard can be injected directly from an office, no need to be on site.

Analyzer for safe or hazardous areas offering capabilities of VOCs or Sulfurs monitoring as well as odor for OCU units

A versatile system

chromaTHC can be installed together with Chromatotec®'s airmoBTX or airmoVOC C6-C12 to provide an extremely versatile system that can measure THC concentration and also the concentrations of specific VOCs of concern such as Benzene, Toluene and Cyclohexane. Large cost savings can be achieved with a combined installation. The chromaTHC can use the airmoBTX's internal computer and both analyzers can share the same hydrogen and pure air supply (supplied by our Hydroxychom and airmoPURE gas generators).

Finally, a liquid sampling module can be included for total VOCs in water or other liquid sample in such as Liquid Propane Gas (LPG), Liquified Natural Gas (LNG), crude oil, diesel, fuel, oil or condensates without any human intervention for preparation. It consists of a simplified enhanced sampling system designed to extract representative samples from the liquid phase. The extracted liquid sample is then vaporized and injected

Chroma THC analyzer in odor control unit

automatically and in continuous mode into the column of the analyzer.

Recently, the liquid sampling system was coupled to a chromaTHC to quantify the hydrocarbons in the rainwater. The water of the pipelines in industrial sites can be contaminated with heavy oils. Before pouring it into the river, industries must analyze it to prevent any environmental and public health problem. Thanks to chromaTHC's intelligent system, a rejection valve can be programmed to block the passage of water charged with hydrocarbons to the river and warn the user.

Conclusion

The chromaTHC analyzer is a dedicated solution to supervise odor or chemical odor control unit and check their performances in ration of pollutants reduction. The analyzer is operating as intelligent measurement by providing warning and alarms when drift of OCU performances is observed. It is a tool to optimize the process by replacing media as charcoal filter when needed to offer long term performances of process.

In two minutes, the measurement of methane and non-methane concentrations on automatic mode with automatic data validation as the system integrate the embedded permeation tube with standard.

The results are accurate due to the presence of separative unit (automatic gas chromatograph) which is not affected by matrix effects when ration of nitrogen or oxygen change. With the flame ionization detector, the range of concentration is very large as this unique detector is linear from dozen of ppb to thousands of ppm without saturation of signal. With the latest solution developed for the sampling, the coverage is large as it is not only dedicated on gas but can work for liquid phase.

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