

## EXPERTS IN GAS ANALYSIS



Chromatotec Inc. and Consolidated Analytical Systems  
at **Natural Gas Odorization Conference** (Houston, Texas), 1 - 2 May 2013

### NGOC Conference abstract

1<sup>st</sup> of May, at 3.20 p.m.

#### Metrology and online Gas Chromatography on sulfur compounds in Natural Gas

By Franck Amiet, Michel Robert, Damien Bazin, Seth Cloran

The need for accurate, reliable and cost effective means for odorant and sulfur measurements in NG pipelines has led to the installation of this cutting edge yet established technology. Understanding the needs of the users and operators and tailoring a system to perform the direct measurement of sulphurs and mercaptan allows for immediate adjustment of your odorant injection rates, and an accurate defensible record of the amount of odorant and naturally occurring sulphurs in NG. With a simple low cost solution for installation, maintenance and operation combined with online validation of the results the energyMEDOR gas chromatograph performs in the most stringent application with the lowest cost of ownership on the market.



#### Presentation and analysis principle of the energyMedor

The energyMEDOR is the fully automated Gas Chromatograph for sulfur monitoring. With only a need for nitrogen carrier gas and standard electrical power, installation can be made into your current monitoring enclosure or installed in a standalone system. The energyMEDOR is equipped with two columns, heated in isothermal oven with a preset temperature of 45°C, a 10-ports pneumatic valve, electrochemical detector and an internal permeation standard or external cylinder to validate your results.

The energyMEDOR automatically samples the NG from the pipeline continuously in low volume, the NG travels through a loop, the loop is injected onto the chromatographic columns where the sulfurs are separated, after the columns the sample is detected on the electrochemical detector without additional conversion or sample manipulation.

Following the detection of the compounds the onboard system processes the data and provides the operator with data in either analog or digital formats. In addition the operator can review all data with the software installed into the energy MEDOR.

#### Performance criteria on calibration and validation of results:

The energyMEDOR has been proven by our partners globally to provide the most accurate and reliable analysis in the industry:

- USA, ASTM standard work, linearity and repeatability of several compounds have been tested.
- Spain, EN ISO 19739 test method for repeatability and linearity in addition.
- France, tests on intercomparison for response factors

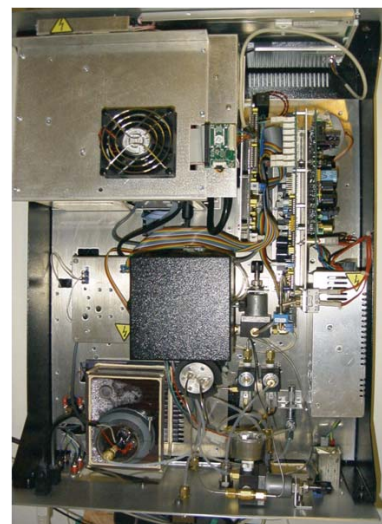
The energyMedor NG specific detector is sensitive to sulfur compounds at ppm or ppb levels. The technique results in unsurpassed separation of the sulfur compounds, exceptional stability of the results, combined with the ease of an automatic platform.

The MEDORs are fully automated rugged industrial analyzers that provide an ideal solution for companies and operators looking to increase data capture and maximize efficiency. Our partners validate the energyMEDOR measurement of sulfur compounds for odorization of natural gas and pipeline integrity monitoring.

For more information, please contact  
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### EXHIBITIONS 2013

- **NATURAL GAS ODORIZATION CONFERENCE - USA**  
Houston  
(1 - 2 May 2013)
- **ACHEMASIA - China**  
Pekin - National Convention Center  
(13 - 16 May 2013)
- **A&WMA - USA**  
Chicago - Hyatt Regency  
(25 - 28 June 2013)
- **TECHNICAL DAY - France**  
Paris - Maison d'Aquitaine  
(10 October 2013)
- **POLLUTEC - France**  
Paris Villepinte  
(3 - 6 December 2013)



Different electrical and pneumatic components inside the energyMedor analyser

#### MEDOR : Reference from USA

By William Jackson, Philadelphia Gas, PA

Philadelphia Gas Works has 2 Medor units that each monitor up to 4 separate Gas streams at two different locations. We are pleased with the Medor unit and its performance. The simplicity of the Medor Instrument by not requiring Hydrogen Gas supply or a high vacuum pump made our purchase choice very easy. With the factory sponsored service in America the use of the Medor System has become fabulous.

The Philadelphia Gas Works serves 550 000 customers.

#### H2S / TOS / TS analysis in 2 minutes

For many applications, the time of analysis and the number of sulfurs to be analyzed are very important. Therefore new applications have been developed to either decrease the time of analysis or increase the number of compounds without coelution. For the **odorization of gas**, not only odorant species but the total sulfur content must be quantified.

Therefore CHROMATOTEC™ has developed

a special instrument to measure H<sub>2</sub>S and the total amount of sulfur. This analysis can be carried out within 2 minutes.

This instrument can be used to control the process of odorization upstream and downstream.

Furthermore, it is equipped with alarm systems and remote controls which allows operator to follow and control the process.

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## MEDOR Exp : online monitoring of sulphur in Hazardous zones

The MEDOR Exp from CHROMATOTEC™ offers continuous, on-line analysis of sulphur compounds from concentrations as low as 1 ppb in natural and biogas feeds. The compounds analysed by the system include all naturally occurring sulphurs such as H<sub>2</sub>S, methyl and ethyl mercaptan as well as all odorant blends.



The system uses proven GC technology developed and improved over 35 years for odourisation, quality and safety applications in a wide variety of processes. The quality and performance of our systems has been recognised worldwide with recognition from Standard Organisations such as ISO, ASTM and CSA.

### Odourisation Application

The MEDOR Exp has been developed to monitor all available odorant and mercaptan blends available from all manufacturers.

The system can be used to continually analyse and control odorant injection systems for natural, landfill and biogas sites. The integrated software transfers

all results and information through to a host system automatically.

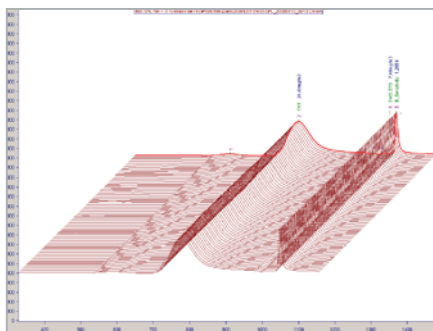
### Process monitoring – Gas Cleaning & desulphurisation

For sulphur removal processes, such as Landfill or BioGas treatment before injection into a pipeline network requires careful monitoring and control. With detection limits as low as 1 ppb H<sub>2</sub>S, the Medor Exp system offers users unparalleled security for process monitoring.

With the internal multiplexer, monitoring before and after treatment is possible with one analysis system. The integrated software, VistaChrom, is equipped with concentration based alarm thresholds which will trigger safety measures in the event of process failure. Natural gas destined for cracking processes is easily monitored automatically to ensure protection for catalytic plants. Our internal permeation system offers automatic validation of results & data.

### Pipeline Quality Control

The MEDOR Exp is widely used for sulphur content in natural gas storage and transport. Unodorised gas can be analysed for natural sulphur species before and during transport or storage. The continuing development of the energyMEDOR system has led to a new ASTM guideline being defined :



### ASTM D7493-08

Standard Test Method for Online Measurement of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatograph and Electrochemical Detection

## Features & benefits of the MEDOR Exp system

### Electrochemical detection

The use of our sulphur specific electrochemical cell ensures no interference of results. The only gas required by the system is a feed of Nitrogen and instrument air to purge the cabinet.

### Internal calibration system

All MEDOR Exp instruments are supplied with internal calibration by permeation tube. Results are thus automatically validated. No external calibration cylinders are required for operation.

### VistaChrom Software

The VistaChrom operating software developed by CHROMATOTEC™ offers a user-friendly interface for easy operation and processing of data. Alarms, status reports and results are easily transferred through a range of options including MODBUS and 4-20mA. Automatic calibration and sampling can be easily set-up and modified, directly or remotely as required.

### Low maintenance

The MEDOR Exp is an extremely low maintenance system offering considerable cost savings over the lifetime of the system.

Capillary columns and the Electrochemical detection system have lifetimes in excess of 10 years ensuring users have minimal annual maintenance procedures.

## Norms & Certifications of MEDOR Exp

Conforms to ASTM D7493-08, ISO 6362/2, DIN 51855

CSA Class 1 Division 2 group C&D



## Website «Customer Service» <http://support.chromatotec.com>

The CHROMATOTEC support website is customized to meet the needs of clients. This site has been designed to be a full technical platform. Users will find numerous technical resources which will enable them to make full use of Chromatotec™'s products.

Accessible at <http://support.chromatotec.com>, the site is international thanks to its multilingual function, allowing the users to choose between French, English and Chinese languages.

You can find:

- User manuals and technical documents

- Start-up and maintenance videos
- VistaChrom patches for enhanced performance

To ensure the website is accessible to all your colleagues, we implemented multi-account management. From one primary account, you can create as many secondary accounts as necessary. In order to offer you the best browsing experience, we designed our website with the latest technology compatible with most web browsers. Users can access the website from computer, Smartphone (iPhone and other Android phones) and tablet (iPad, TouchPad and other Android tablets).

If you are a distributor, send your request by email to our Customer Service department ([support@chromatotec.com](mailto:support@chromatotec.com)) to get your login and password which will allow you to access all data from our site.

If you are a customer, visit our website, enter your email address in the "First registration" box and follow the instructions.

Please try out this complimentary service and if you have any feedback or comments regarding our new support site, feel free to let us know at [itadmin@chromatotec.com](mailto:itadmin@chromatotec.com).

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