



BTEX applications

Outline

- **BTEX applications**
- BTEX comparison with competitor
- Options
- Different enclosure
- Reference customers

BTEX applications

Applications :

- Air quality monitoring in addition to conventional parameters: O₃, CO, CO₂ etc. for air quality monitoring networks: ARPA/EPA or equivalent by country
- Governmental agencies or lab services contractors who need to establish chemical diagnosis around industrial site
- Industries at fence line
- Meteorological institute
- Research center on atmospheric pollution
- Petrochemical
- Odor index based on odor threshold: aromatics, Styrene, Cyclo-hexane, Cumene (Iso-Propyl-Benzene) and other VOCs



TAGA from CEAQ Canada



AtmoNA mobile lab

BTEX monitoring solutions

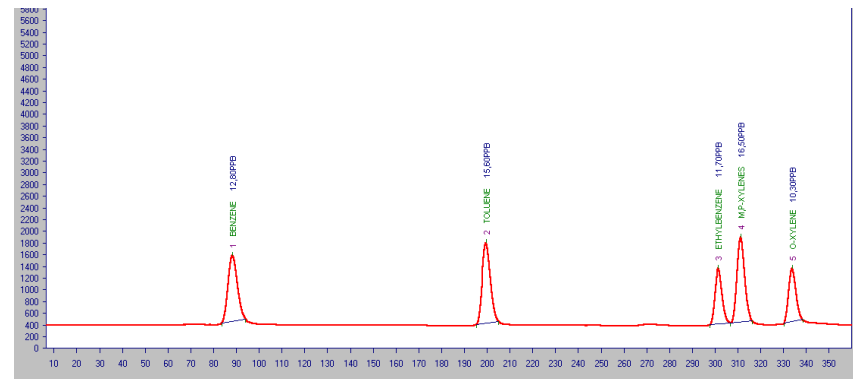
— auto GC - airmoVOC BTEX (FID)

- Best solution as stable, linear, sensitive, selective
- Needs H₂ and Air
- With H₂ and air generators no need of any gas cylinder

— autoGC - airTOXIC (PID)

- Sensitive
- Needs only Air **or** N₂
- But UV lamp become dirty over time = need of calibration
- With nitrogen generator no need of any gas cylinder

Molecule list	[C] in ppb
Benzene	12,8
Toluene	15,6
Ethylbenzene	11,7
m,p Xylene	16,5
O Xylene	10,3



BTEX monitoring

8 compounds in standard with 7 peaks:

Benzene, Cyclo-Hexane, Toluene, Ethyl-Benzene, O-Xylene, Styrene, M&P-Xylene

— auto GC - airmoVOC BTEX (FID)

- LDL < 10 ppt for benzene
- Carrier gas: H₂
- Compounds trapping into 1 phase trap
- Head column pressure control with piezo valve



— autoGC - airTOXIC (PID)

- LDL < 10 ppt for benzene
- Carrier gas: N₂
- Compounds trapping on 1 phase trap
- Self cleaning of the lamp

Additional compounds in option

Within the BTEX analyser:

- Phenol
- Naphthalene
- 1,3-Butadiene
- Cresol
- TriMethylBenzene
- Vinyl-Chloride
- And many other VOCs with up to 123 VOCs with full GCMS

With additional module:

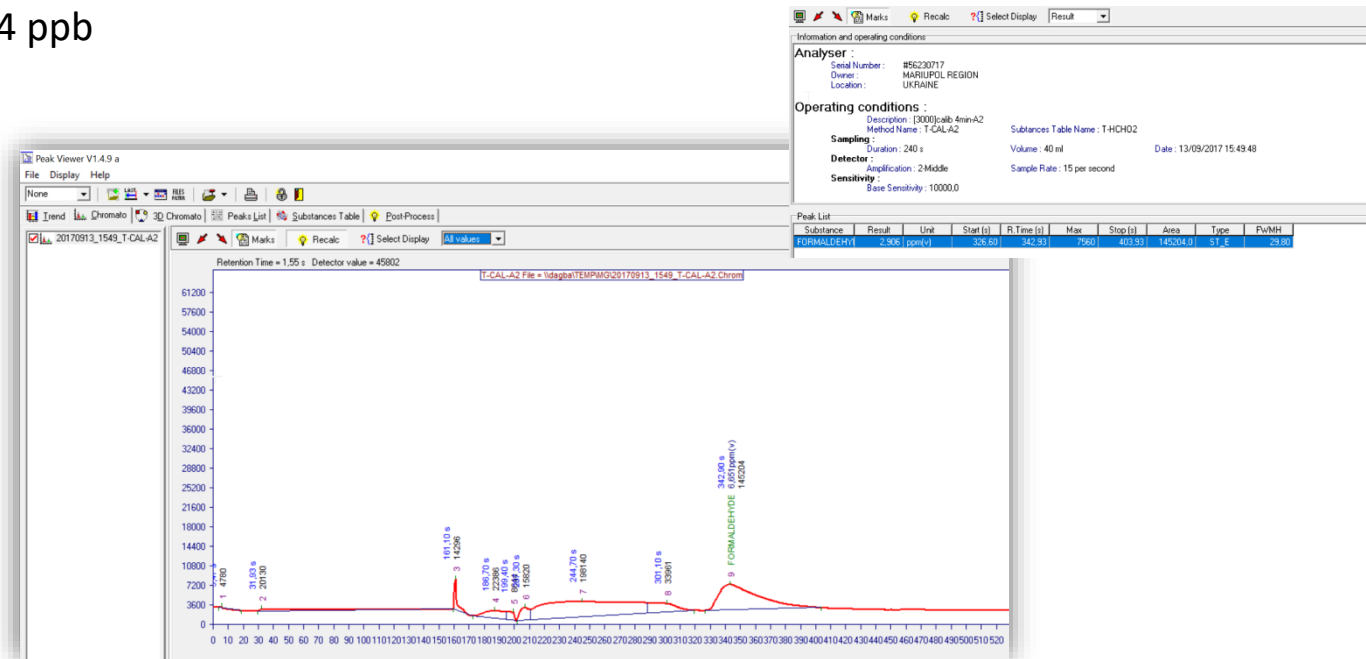
- Mercaptans and sulfides
- Formaldehyde
- Total VOCs with less than 1 ppb LDL
- NH₃
- odor

Ex : Formaldehyde monitoring

>> Additive parameters from BTEX

—auto GC — airmoHCHO (FID)

- Needs H₂ and Air
- With gas generators no need of any cylinder
- FID used after methanizer to improve the sensitivity
- LDL < 4 ppb



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BTEX competitors



AMA FID or PID



ESA PID



SYNSPEC FID or PID

CHROMATOTEC



PID



FID

BTEX competitors

	ESA/ENVEA	AMA	SYNSPEC	CHROMATOTEC
Certification on benzene	Mcert only on PID	Mcert without public report only on FID	Mcert using 30m column only on PID	Mcert on PID and FID and selected by US EPA
Certification test on other VOCs	NO	NO	NO	N-Hexane; I-Octane; N-Heptane; Toluene; N-Octane; Ethyl-Benzene; M&P Xylenes; O-Xylene; 135-TMB; 124 TMB; 123 TMB
Columns	Metallic capillary column 15m = Benzene interference	Fused silica : breakable and maintenance cost	Fused silica 15m : breakable and maintenance cost	Metallic capillary column 30m more than 5 years lifetime
Sampling Flow controls	Integrated vacuum pump + heated micro capillary tube			Integrated vacuum pump + automatic sampling (MONITOR) with sample volume controlled by sonic flow controller (dust protected). MFC in option
Carrier gas	Hydrogen 15 ml/min for PID version ! Risk of hydrogen leak	N2 as carrier gas	PID version: Nitrogen	PID version : Nitrogen from NITROXYCHROM FID version: Hydrogen from HYDROXYCHROM

BTEX competitors

	ESA	AMA	SYNSPEC	CHROMATOTEC
Supervisor and communication	CPU board but not Windows computer	Internal comptuer with Windows [®] XP Gesytec 2	Internal comptuer with Windows [®] 7	Internal industrial computer including WINDOWS [®] 10 MODBUS RTU/TCP IP / Gesytec 2
Compounds	5 compounds BTEX	5 compounds BTEX	5 compounds BTEX coelution between Benzene/ cyclohexane and Styrene/O-Xylene	8 compounds with 7 peaks BTEX + Cyclo hexane and styrene In option 1,3 Butadiene, Naphthalene, Terpenes, Phenol, TMB
Calibration	Cylinder	Cylinder	Cylinder	Cylinder and/or internal permeation tube with multipoint check in option. Linearity and stability allow to use response factor
Interference on Benzene according to EN 14662-3 (10 compounds) paragraph 8.4.9.3	Not tested in the certification report. Not compliant		Not compliant	Fully compliant to all EN14662-3:2015 criteria No interference according to MCERT certification report.

Compliance with EN14662-3:2015

Paragraph	EN14662-3:2015 laboratory test	CHROMATOTEC airTOXIC	ENVEA VOC 72e	SYNSPEC	MCERTS specification
	Repeatability standard deviation at 10% of limit value	0.03 µg/m ³	Not reported !	Not reported !	≤ 0.20 µg/m ³
8.4.4	Repeatability standard deviation at limit value	0.18 µg/m ³	0.012 µg/m ³	0,05 µg/m ³	≤ 0.25 µg/m ³
8.4.5	Lack of fit (residual from linear regression function)	4.60 %	2.205 %	4,2%	≤ 5 %
8.4.6	Sensitivity coefficient to sample gas pressure at span value	0.013 µg/m ³ /kPa	0.035 µg/m ³ /kPa	0,09 µg/m ³ /kPa	≤ 0.10 µg/m ³ /kPa
8.4.7	Sensitivity coefficient to sample gas temperature	0.008 µg/m ³ /K	0.053 µg/m ³ /K	0,07 µg/m ³ /K	≤ 0.08 µg/m ³ /K
8.4.8	Sensitivity coefficient to electrical voltage	0.0015 µg/m ³ /V	0.000 µg/m ³ /V	-0,014 µg/m ³ /V	≤ 0.08 µg/m ³ /V
8.4.3	Short term drift at span level	0.38 µg/m ³	Not reported !	-1,25 µg/m ³	≤ 2.0 µg/m ³
8.4.9.3	Response to organic compound mixture (VOCs interference on Benzene)	0.14 µg/m ³	Not reported !	Criteria not met according to test report	≤ 0.25 µg/m ³
8.4.9.2	Effect of H ₂ O at concentration of 19 mmol/mol	0.003 µg/m ³	-0.003 µg/m ³	0,014 µg/m ³	≤ 0.015 µg/m ³ (mmol/mol)
8.4.10	Carry over (memory effect)	0.37 µg/m ³	0.134 µg/m ³	0,94 µg/m ³	≤ 1.0 µg/m ³

Compliance with EN14662-3:2015

	EN14662-3:2015 field test	CHROMATOTEC airTOXIC	ENVEA VOC 72e	SYNSPEC	MCERTS specification
1	Reproducibility standard deviation under field conditions	0.08 µg/m ³	Not reported !	0,10 µg/m ³	≤ 0.25 µg/m ³
2	Long term drift at span value	7.52 %	Not reported !	- 8,8 %	≤ 10% of the maximum of the certification range
3	Maintenance interval	90 days	Not reported !	28 days	>14 days
4	Availability	99.9 %	Not reported !	99,9 %	>90%
5	Expanded uncertainty (laboratory and field tests)	19.5 %	Relative expanded uncertainty without test not reported 12,69%	16,3% 2 tests are missing which make this value not complete	≤ 25%

Response to organic compound mixture

- This test (chapter 8.4.9.3 of the EN 14662-3:2015 norm) is one of the most important as it is to ensure that no organic compounds (other VOCs) are interfering with the Benzene concentration. The list of compounds identified by the European comity is in the attached documents where CHROMATOTEC passed successfully this test we know that ENVEA and SYNSEPC failed and that is why they didn't report this test.

For final customer the impact is to have wrong reading because the Benzene concentration is overestimated as other compounds are measured with the Benzene like Cyclohexane typically emitted by 2 stroke engine or industry.

Difference between PID and FID

	PID	FID
Sensitivity	<p>Not stable</p> <p>High for new and clean lamp</p> <p>Decrease over the time because of the lamp</p> <p>Cannot detect compounds with IE > 10,6 EV like Dichloroethane</p>	<p>Very stable over years</p> <p>High sensitivity</p> <p>LDL down to 1 ppt on Benzene</p> <p>Detect all VOCs</p>
Maintenance	<p>Regular calibration to compensate PID drift</p> <p>Regular cleaning of the lamp</p>	<p>No maintenance</p>
Linearity	<p>PID not linear on all VOCs and require linearisation curve</p>	<p>Excellent linearity $R^2 = 1$ for all BTEX and many VOCs</p>
High amount of VOCs and humidity in air influence	<p>Accelerate the drift of the PID lamp</p>	<p>No influence all VOCs are burned by FID flame</p>
Calibration	<p>Must be done regularly and linearity curve is necessary on multiple point</p>	<p>Regular calibration is not necessary thanks to FID stability.</p> <p>Regular sensitivity and stability check is recommended and can be done on one compounds and one points using relative response factor on FID</p>

EUROPEAN MCERTs certified

Fully certified according to EN 14662-3: 2015
Official report available !



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

GC 866 FID airmoVOC (Model A21022)

manufactured by:

Chromatotec® / airmotec
15, Rue d'Artiguelongue
Saint-Antoine
33240 Val de Virvée
France

has been assessed by Sira Certification Service
and for the conditions stated on this certificate complies with:

MCERTS Performance Standards for Continuous Ambient Air Quality
Monitoring Systems, Version 10, dated June 2016;
EN 15267-1:2009, EN 15267-2:2009 & EN 14662-3:2015

Certification Ranges :

Airborne Benzene Vapour: 0 to 50 µg/m³

Project No. : 16A0385A / 70172875
Certificate No : Sira MC130231/03
Initial Certification : 26 July 2013
This Certificate issued : 25 July 2018
Renewal Date : 25 July 2023

Joe Prince MSc, Minst MC
Certification Manager

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
Tel: +44 (0)1244 670 900



Form 1335
Issue 2

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With FID



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

GC 866 PID airToxic (Model A73022)

manufactured by:

Chromatotec® / airmotec
15, Rue d'Artiguelongue
Saint-Antoine
33240 Val de Virvée
France

has been assessed by Sira Certification Service
and for the conditions stated on this certificate complies with:

MCERTS Performance Standards for Continuous Ambient Air Quality
Monitoring Systems, Version 10, dated June 2016;
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Certification Ranges :

Airborne Benzene Vapour: 0 to 50 µg/m³

Project No. : 16A0385A / 70172875
Certificate No : Sira MC130230/03
Initial Certification : 26 July 2013
This Certificate issued : 25 July 2018
Renewal Date : 25 July 2023

Joe Prince MSc, Minst MC
Certification Manager

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Unit 6, Hawarden Industrial Park
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Tel: +44 (0)1244 670 900



Form 1335
Issue 2

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With PID

US EPA references

GC Evaluation Study Category III QAPP
Contract EP-D-12-043
August 18, 2015
Revision 3

Exhibit 4. Candidate Vendors for the Field Deployment Phase

Candidate Vendor	Contact Information
Agilent/Marques (selected system)	Kelly Beard (Agilent; 970-310-0324; kelly.beard@agilent.com) Michael Cox (Agilent; 866-793-4961; michael_g_cox@agilent.com) David Wevill (Marques; 866-483-5684; Dwevill@Marques.com)
CAS/Chromatotech (selected system)	Seth Cloran (513-542-1200 (office); 513-900-7321 (cell); scloran@cas-en.com) Tomek Marchlewski (513-542-1200 (office); 513-593-4928 (cell); tmarch@cas-en.com)
Thermo/Marques (selected system)	Terry Jeffers (Thermo; 904-248-8204; Terry.Jeffers@thermofisher.com) Suresh Seethapathy (Thermo; 301-803-0896; Suresh.seethapathy@thermofisher.com) David Wevill (Marques; 866-483-5684; Dwevill@Marques.com)
Baseline (on loan system)	Brian Bischof (303-823-6661 x6139; brian.bischof@baselineindustries.com) Steve Grantham (303-823-6661 x6134; steve.grantham@baselineindustries.com) Ben Kahn (303-823-6661 x6135; ben.kahn@baselineindustries.com)
Perkin Elmer (on loan system)	Corey Whipp (225-747-7707; corey.whipp@perkinelmer.com) Heidi Grecsek (203-922-2403; Heidi.Grecsek@perkinelmer.com)
Synspec (on loan system)	Thomas Wilbur (603-880-7100 (office); 919-614-3674 (cell); thomasw@jjwilbur.com) John Wilbur (603-880-7100 (office); 603-321-5363 (cell); johnw@jjwilbur.com) Wouter Lautenbach (+11 31 50 5266454; W.Lautenbach@synspec.nl) Michael Rijpkema (+11 31 50 5266454; M.Rijpkema@synspec.nl)

Officially selected by National US EPA



A.5 Problem Definition/Background

On February 12, 1993, the U.S. EPA revised ambient air quality surveillance regulations in Title 40 Part 58 of the Code of Federal Regulations (40 CFR Part 58) to include provisions for enhanced monitoring of ozone (O₃), oxides of nitrogen (NO_x), volatile organic compounds (VOCs), and selected carbonyl compounds, and monitoring of meteorological parameters. The revisions required states and local monitoring agencies to establish Photochemical Assessment Monitoring Stations (PAMS) in ozone nonattainment areas classified as serious, severe, or extreme.

Monitoring agencies are given options to measure VOCs using either an auto-GC or collect samples in the field and analyze them in a laboratory. At the time the PAMS program was implemented, field rugged auto-GCs were not available and, as such, many monitoring agencies relied on conventional laboratory GCs equipped with automatic samplers. Since that time, new auto-GCs have been developed that are designed for use in monitoring stations.

The PAMS program has been in operation for more than 15 years, and much of the equipment used at PAMS sites is old and in need of replacement. Before recapitalizing the network, the EPA wants to evaluate the current state of auto-GCs. The purpose of this WA is to collect information on the existing commercially available auto-GCs in order to determine their suitability for use in the PAMS program.

The purpose of this work is to conduct a material review of fully automated GC units, perform a controlled laboratory evaluation of selected units, and deploy the units for a field evaluation. Based on

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Options

- Gas generators
- CALIB : permeation tube
- Multi point calibration
- Other options

Gas generators

For airTOXIC BTEX PID only N2 is required for operation



Model: XXX913-CS

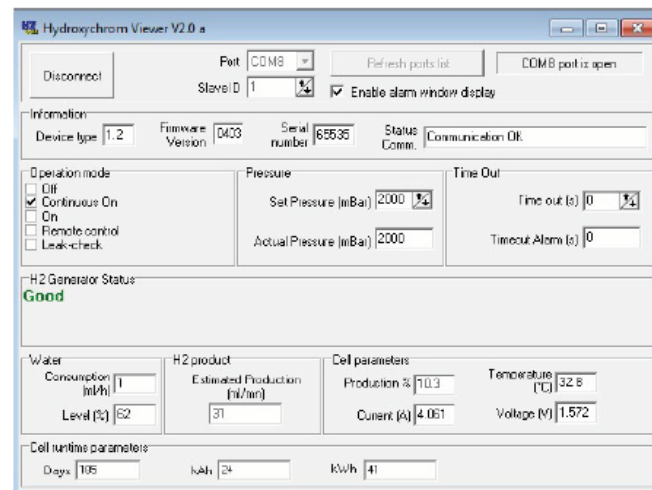
High purity N2 generator with internal compressor

Parameters displayed in Vistachrom and can be transferred by MODBUS

No cylinder requested

Gas generators

For airmoVOC BTEX FID: H₂ and air required



H₂ Generator :

- 100 mL/min in standard (1 GC = 30ml/min)
- 160 mL/min in option

Option internal zero air generator (in H₂ gen):

- Without compressor from external compressed air
- With internal compressor for 1 GC FID only

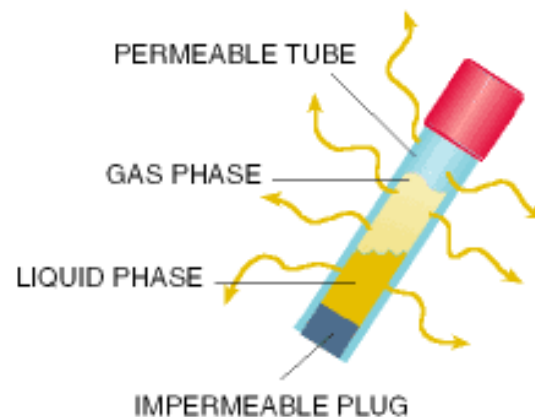
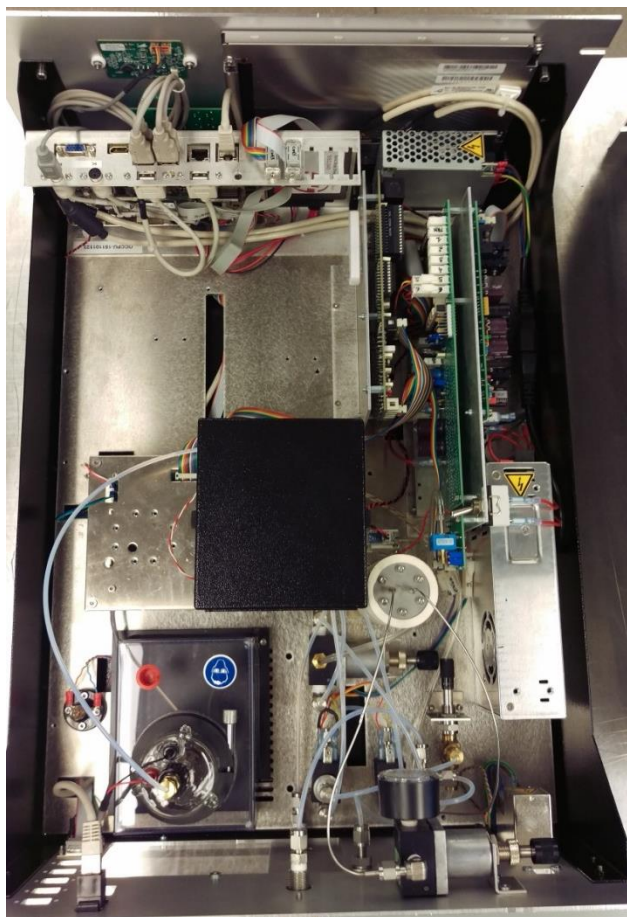
Parameters displayed and controlled by Vistachrom

Parameters transferred by MODBUS

Easy remote diagnostic and control

No cylinder requested

CALIB – Permeation tube



Gas phase goes through the permeable membrane:

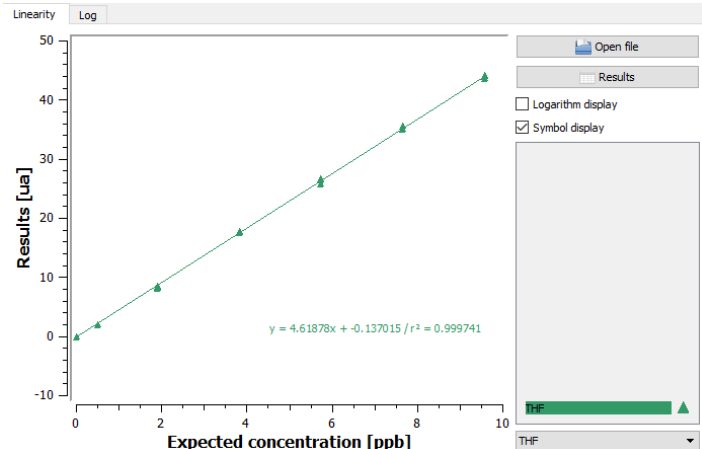
- Constant temperature ($\pm 0.1^{\circ}$ C)
- Constant flow rate

Allows automatic calibration of the instrument and validation of the results

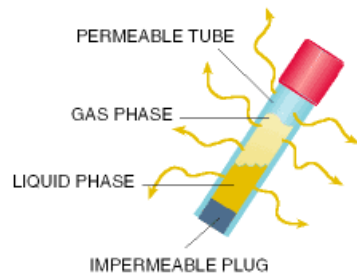
Benzene in standard (up to 6 tubes in same oven in option)

No need of cylinder!

CALIB – multi point



VistaCHROM linearity display



Internal CALIB on Benzene from 0 to 20 ppb:

In standard one point at around 15 ppb

Zero in option (XXXZERO)

Second point from permeation tube

Multi point on CALIB with MFC for dilution (XXX931-MFC)

External cylinder inlet with method XXXCYL

External cylinder inlet with MFC for dilution XXXCYL-MFC

Other options

Sample pressure inlet reading for security

Internal sampling pump 24 V DC (new on last BTEX)

Multiplexer up to 32 streams : line up to 100 m recommended

Purge module for BTEX from water or other liquids

Sampling bag inlet



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Rack mounted 19 inch



Example of integration on mini cabinet hosted in room with stable temperature



18U or 22U transportable cabinet



Example of integration in mobile labs





**Wall mounted for
industrial and harsh
environement**

Wall mounted autoGC

Up to IP 66 enclosure in 316 stainless steel

Colour touch screen

Full remote control function

Analyzer status LED

Liquid sampling module in option

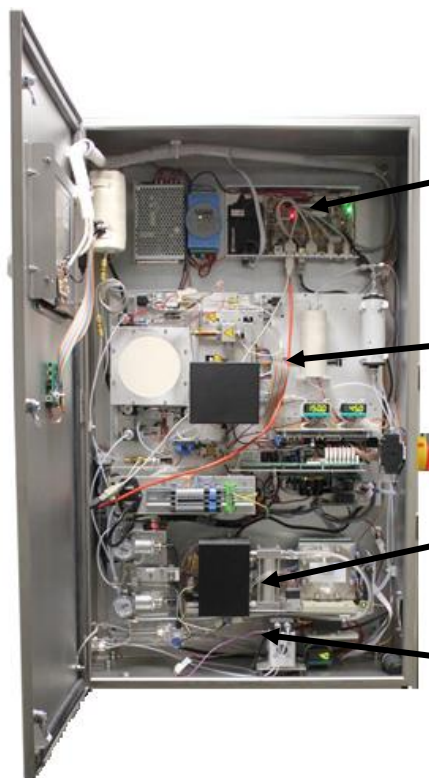
Support frame in option

Multiplexer capability up to 32 streams

**Can be installed in industrial building or
outside with temperature regulation option**



Wall mounted autoGC



Internal computer WINDOWS® based

Full analyser with internal CALIB

Hydrogen or nitrogen generator

Zero air generator with internal compressor or use instrument air

Totally stand alone system with gas generator and internal CALIB !

Cylinder free autoGC !

Wall mounted autoGC

Dual GC integrated

Gas generator wall mounted



Example of industrial installation in France



**Hazardous area with
purged enclosure**

Installation of autoGC in hazardous area

Exp cabinet for Zone 1 and Zone 2 : need instrument air



Installed outside with a gasket

Pressurised IP 66 cabinet for hazardous area with multiple analyser and/or rack

Colour touch screen for direct access of the internal computer: 10.6 inch

Exp available for MEDOR, chromaPID, chromaFID, airmoVOC, chromaTCD, DET NH3 products range

autoGC in hazardous area

Exp cabinet for Zone 1 and Zone 2 : need instrument air

IP 66 enclosure in 316 stainless steel

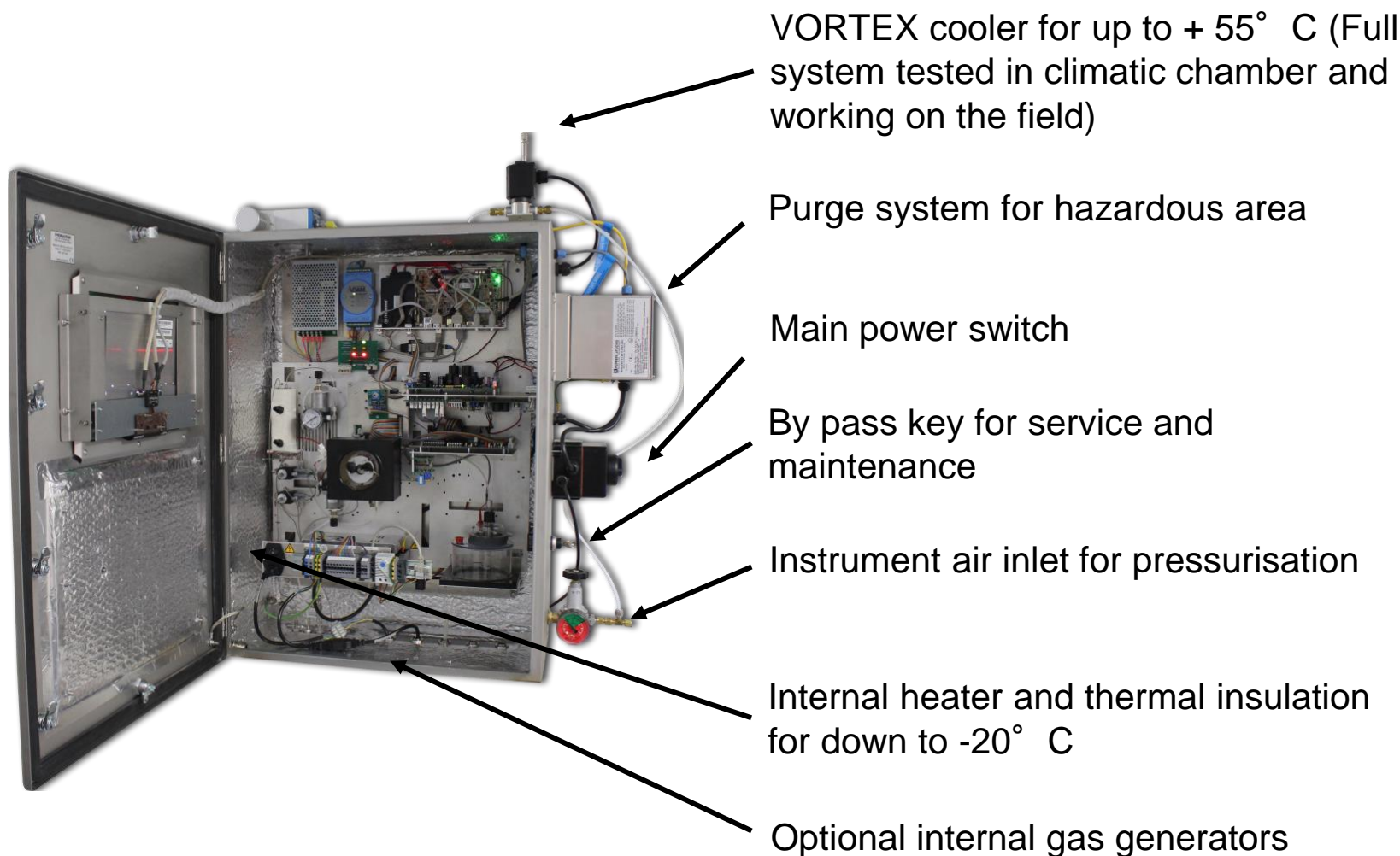
Colour touch screen

ATEX / IECEx or CSA certified



autoGC in hazardous area

Exp cabinet for Zone 1 and Zone 2 : need instrument air



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Reference customers: airTOXIC

Country	Customer	Qty	Market
Benelux	ISSEP	2	industrial areas
Benin	Town of Porto Novo	4	urban areas
Bosnia	University of Zenica	1	industrial areas
Brasil	Ambiant air network / Itagai	1	urban areas
Bulgary	EPA Sofia	7	urban areas
Canada	Government of Alberta	1	industrial areas
Croatia	INA Rijeka	1	industrial areas
France	Technodes	1	industrial areas
France	Aircom	1	industrial areas
France	Novergie Suez	1	industrial areas
France	Atmo Nord Pas de Calais	1	industrial & urban areas
France	Atmo Nord Pas de Calais	1	industrial & urban areas
France	Atmo Nord Pas de Calais	1	industrial & urban areas
Germany	Saarland network	1	urban areas
India	Gujarat Pollution Control Board	2	urban areas
India	Odisha EMC	2	urban areas
India	HPCL	2	urban areas
India	APPCB	3	urban areas
India	HPCL	3	urban areas
India	Bharat Petroleum Co	1	urban areas
India	Kochi refinery	2	industrial areas
Italy	Bolzano region	2	urban areas

Country	Customer	Qty	Market
Italy	Comune di Manfredonia	2	industrial & urban areas
Italy	ARPA Calabria	9	urban areas
Italy	ARPA Emilia Romagna	15	urban areas
Italy	ARPA Piemonte	2	urban areas
Italy	ARPA Sicilia	16	urban areas
Italy	Comune di Cagliari (Sardinia)	3	industrial areas
Poland	Wios Bydgoszcz	1	urban areas
Serbia	EPA	6	urban areas
Serbia	Air quality network - Belgrad	1	urban areas
South Africa	DEAT: Dpt of Education & Training	5	industrial & urban areas
Spain	Gobierno Vasco	1	industrial & urban areas
Spain	Valladolid	2	industrial & urban areas
Spain	Network Extremadura	1	industrial & urban areas
Syria	DAMAS EPA	5	industrial & urban areas
USA	US EPA / Nevada	1	urban areas

Reference customers: airmoVOC BTEX

Country	Final User	Quantity	Year
Germany	HLUG Network	1	2019
Germany	Shell	1	2019
Canada	Rotek	1	2019
Croatia	DUBROVNIK Airport	1	2019
Croatia	METEO SERV LAB	3	2019
Croatia	Meteorology Service Calibration Laboratory	1	2019
Croatia	Meterology service and calibration laboratory	4	2019
India	Assam	1	2019
India	Manipur Pollution Control Board	1	2019
India	MITPL India	1	2019
India	National Mineral Development Corporation LTD.	4	2019
India	Tripura Pollution Control Board	1	2019
Israel	Association of towns for Environment Sharon Carmel	1	2019
Israel	Ministry of environment	2	2019
Italy	ARPA LIGURIA	2	2019
Italy	COLACEM	1	2019
Italy	VOGHERA ENERGIA SPA	1	2019
USA	MONTROSEAIR Quality NETWORK	3	2019
Switzerland	Switzerland network	1	2019
UK	ENVIRONMENT AGENCY	1	2019
Ukraine	Dnipropetrovs'k Region	1	2019
Spain	BSG Valencia network	1	2018
Saudi Arabia	RC Yanbu	2	2018
India	CPCB Arunachal	4	2018
India	State Pollution Control Board, Sikkim	1	2018
India	Meghalaya Pollution Control Board	1	2018
India	Mizoram Pollution Control Board	1	2018
India	Nagaland Pollution Control Board	1	2018
India	Numalinghar refinery	1	2018
Italy	ARPA MARCHE	2	2018
Italy	ARPA LIGURIA	6	2018
Italy	Arpa Spezia	1	2018
Italy	Arpa Spezia	1	2018

Reference customers: airmoVOC BTEX

Country	Final User	Quantity	Year
Ukraine	Mariupol Region 2 units	2	2018
Croatia	Croatian Calibration institute	1	2018
Slovenia	Slovenia network	1	2018
OMAN	Sohar Port	6	2018
Germany	SHELL Germany	1	2018
Grece	Cyprus Ministry	1	2018
Belgium	VMM	6	2018
China	SINOPEC Jinling	1	2018
China	CNPC Huabei	1	2018
Israel	HADERA	2	2018
Slovenia	Slovenian Environment Agency	1	2018
Oman	Sohar Port	1	2018
Ukraine	Mariupol Region	2	2017
Poland	Lotos Refinery	1	2017
Norway	NTNU	1	2017
Australia	Compliance monitoring	1	2017
Croatia	Drzavni Hidrometeoroloski	1	2017
Germany	HLUG	1	2017
France	Air Pays de Loire	1	2017
UAE	Bahrein Tatweer	1	2016
USA	Michigan State	3	2016
Germany	MLU	1	2016
Thailand	Bangchak industrial zone	1	2016
china	Guangzhou development zone	1	2016
Oman	Global Gas Service	1	2016
Croatia	Croatian Medical Research Institute	1	2016

Conclusions

- Unique technology for VOCs quantification at low concentration levels
- Modular and innovative solutions according to your customer's needs
- Equipments 100 % Hand made and control with French Quality
- Solutions recognized as performant with amount of certifications

airmo S

Sulfur compounds analysis with dual mode operation:

- airmo S
- airmo S with trap for sampling
 - Detection range 100 ppt to 100 ppb

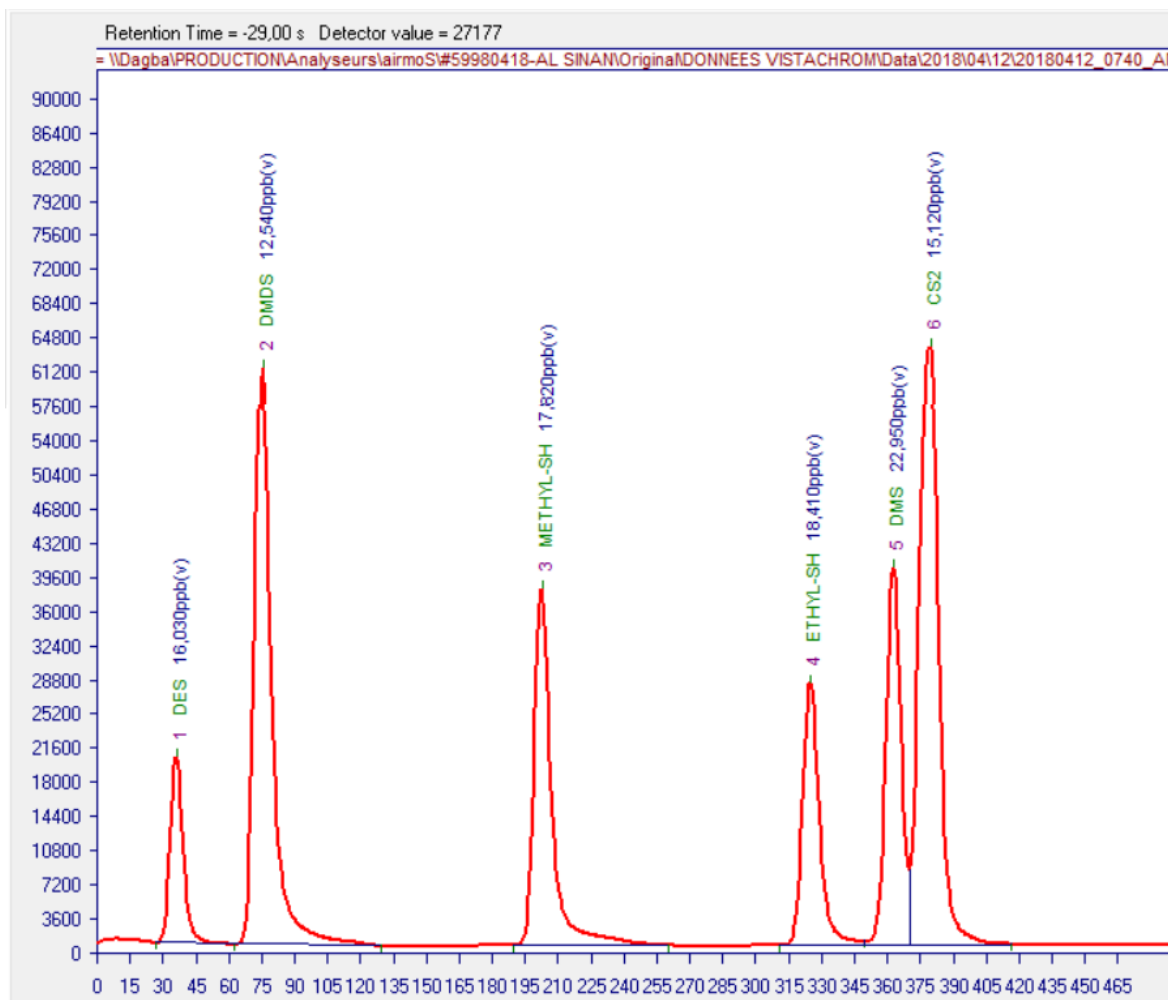


The instrument has:

- D-FPD detector: Dual Flame Photometric Detector
- Trap with peltier cooler
- Metallic capillary Column for speciation

6 sulfurs compounds analyzed

External sample analysis



DES 16 ppb
DMS : 12,5 ppb
MM : 17 ppb
EM : 18 ppb
DMS : 22,9 ppb
CS2 : 15,1 ppb

TRS MEDOR

Sulfur compounds analysis with only nitrogen !

- TRS MEDOR with loop for sampling
 - Detection range 1 ppb to 1 00 ppb
 - Extremely low maintenance



The instrument has:

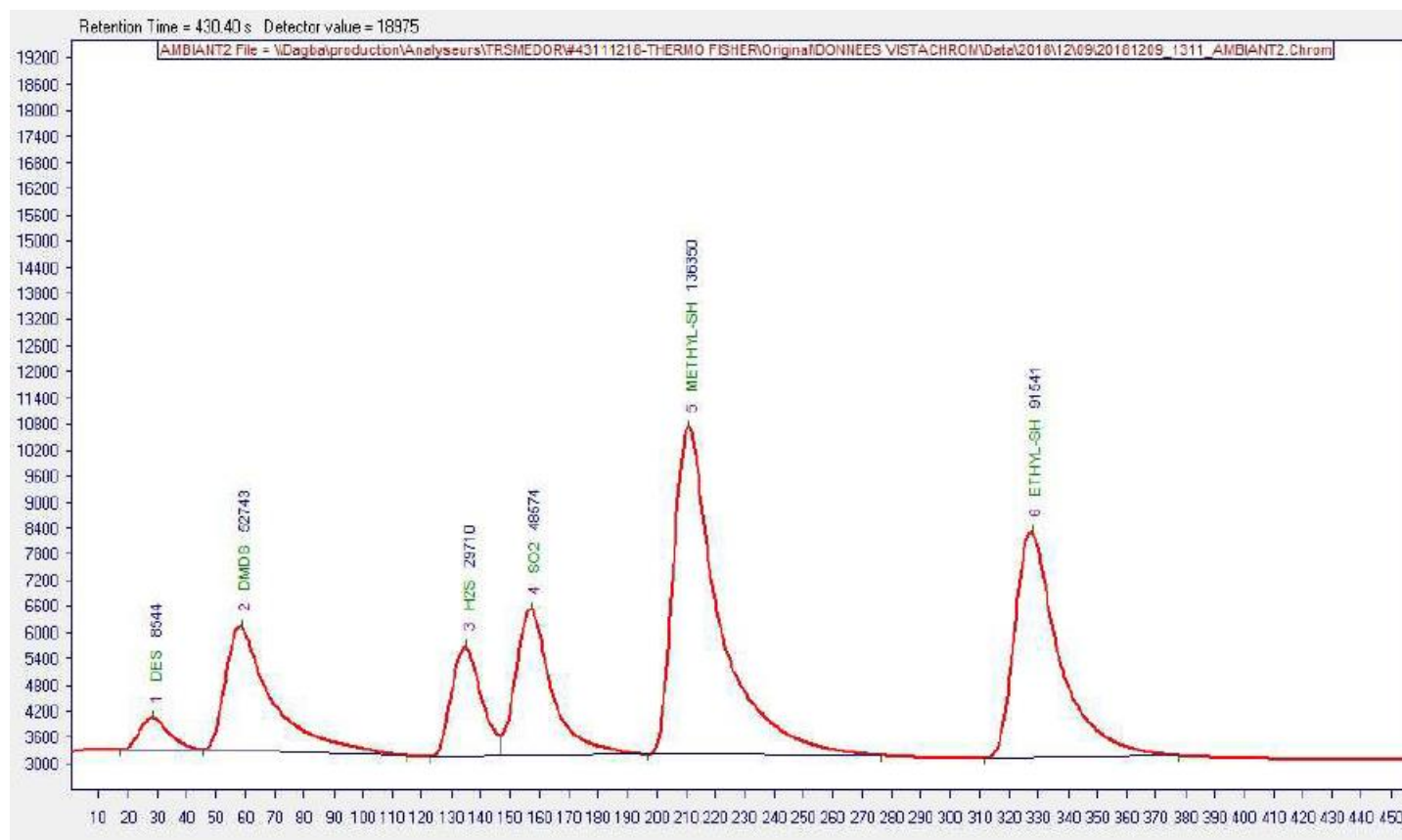
- MEDOR MEDOR® Electrochemical wet cell Detector
- Loop
- Metallic capillary Column for speciation

7 sulfurs compounds analyzed in standard

14 sulfur compounds analyzed with special application

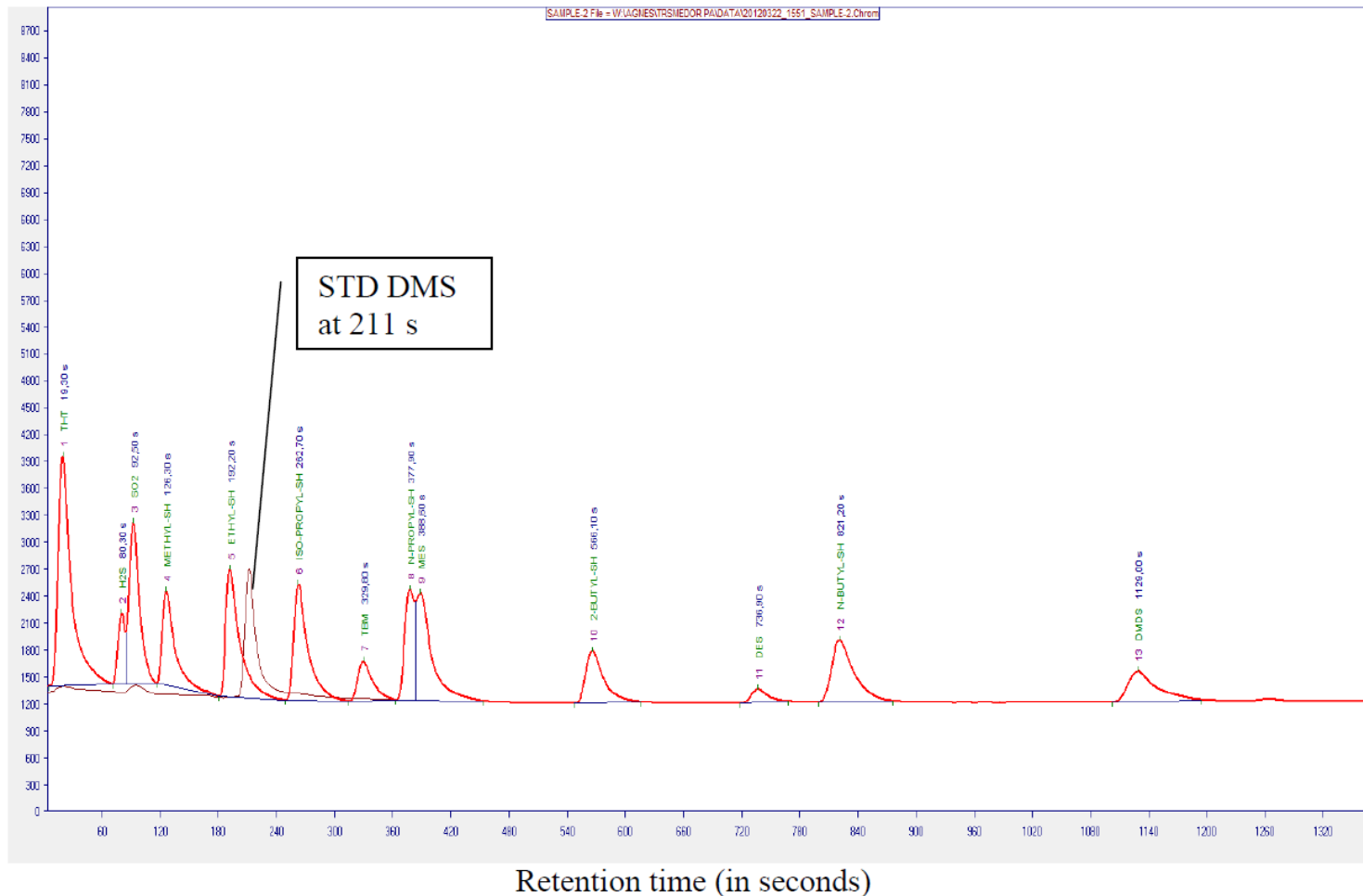
External sample analysis

7 compounds application: H₂S / SO₂ / MM / EM / DMS / DMDS / DES



External sample analysis

14 compounds application: H₂S / SO₂ / MM / EM / DMS / DMDS / DES
IPM / TBM / NPM / MES / 2BM / IBM / NBM / THT



References

Company	Country	Location	Purchase
ARPA MARCHE	Italy	Marche	TRS MEDOR Calib
DEGREMONT SUEZ	FRANCE	CROISSY SUR SEINE	TRS MEDOR
DEGREMONT SUEZ	FRANCE	RUEIL MALMAISON	TRS MEDOR
ECOSERDIANA S.P.A. - SARDINIA	ITALY	SARDINIA	TRS MEDOR
ENI SPA	ITALY	TARANTO	TRS MEDOR X 3
ENVIRONMENTAL PROTECTION INDUSTRIAL CONSORTIUM (C.I.P.A.) - SIRACUSA (SICILY)	ITALY	SIRACUSA	TRS MEDOR
ENVIRONMENTAL PROTECTION INDUSTRIAL CONSORTIUM (C.I.P.A.) - SIRACUSA (SICILY)	ITALY	SIRACUSA	TRS MEDOR X 2
GOBIERNO BASCO : PULP & PLANT FACTORY	SPAIN	BILBAO	TRS MEDOR
IRH ENVIRONNEMENT	FRANCE	GENNEVILLIERS	TRS MEDOR
IRH ENVIRONNEMENT	FRANCE	VANDOEUVRE LES NANCY	TRS MEDOR
MONDI PAPER MILL	POLAND	ŚWIECIE	TRS MEDOR
REGIONAL ENVIRONMENTAL PROTECTION AGENCY - CALABRIA	ITALY	CALABRIA	TRS MEDOR
SIAAP (DIFFERENT WASTE WATER PLANTS AROUND PARIS)	FRANCE	PARIS	MORE THAN 20 MEDOR SYSTEMS
SUEZ ENVIRONNEMENT CIRSEE	FRANCE	LE PECQ	TRS MEDOR
Dubai Municipality	UAE	Dubai	TRS MEDOR
Sohar Port	OMAN	Sohar	TRS MEDOR
USDA	USA	Washington	TRS MEDOR
Chevron Australia	Australia	Perth	TRS MEDOR
GASMAR	CHILE	Quintero	TRS MEDOR Exd
Prefecture of central Macedonia	GREECE	ATHENS	TRS MEDOR
Bharat Petroleum Corp	INDIA	KOCHI	TRS MEDOR
EIL	INDIA	Pune	TRS MEDOR



Some customer reference

Odor in ambient air in Chile at LPG odorization station: GASMAR

TRS MEDOR Exd for odor in
ambient air at ppb level



airmoMEDOR

Sulfur compounds analysis with only nitrogen !

- airmoMEDOR with trap for sampling
 - Detection range 0,1 ppb to 100 ppb
 - Extremely low maintenance



The instrument has:

- MEDOR MEDOR® Electrochemical wet cell Detector
- Pre concentration trap
- Metallic capillary Column for speciation

? sulfurs compounds analyzed in standard

? sulfur compounds analyzed with special application

External sample analysis

7 compounds application: H₂S / SO₂ / MM / EM / DMS / DMDS / DES