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JUNE / JULY 2016 - VOLUME 17 ISSUE 3

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SERVOMEX Gas Detection

Pearl: new and used motor & hydraulic oils

The Pearl™ allows the quick, easy & highly repeatable IR spectral measurement of viscous liquid.

SERVICE OILS ARE ESSENTIAL for minimising wear-and-tear in engines. But through use, they pick up elemental metals, soot and other contaminants which turn the fresh yellow oil into a dark and worn black.

IR spectral analysis can help determine which contaminants are present, as well as what kind of chemical degradation occurs in the oil.

Traditionally, a vertically mounted cell was always the standard method of loading viscous or sticky fluids, which posed many problems including sample introduction and clean up.

However, within the Pearl™ is a horizontal liquid sample cell called the Oyster Cell. Samples can be dropped onto the cell and loaded into the Pearl™ for fast analysis.

The Pearl™ was used in conjunction with fully-wedged ZnSe windows in the Oyster Cell. Three different pathlengths were used: 25, 50 and 100 microns.

Fresh samples of three hydraulic oils and lubricants were tested, along with samples of the same oils after 18 months of use in a petrol engine.

The infrared spectra were recorded with a 1 cm^{-1} resolution using the Pearl™ with a spectrometer.

Results

Figure 1 shows three spectra for a fresh sample of engine oil, recorded using three different pathlengths: 25, 50 and 100 µm.

The absorbance increases with the increasing pathlengths in the Oyster Cell, as can be expected.

It is worth noting that the oil samples had not been diluted, so they were at their maximum concentration during analysis. Despite this, the maximum absorbance in fingerprint region (500 – 1500 cm^{-1}) peaks at 2.5 for the 100 µm pathlength.

This demonstrates that no dilution or sample preparation is needed to record the transmission spectrum of oil samples with 25, 50 or 100 µm pathlength windows.

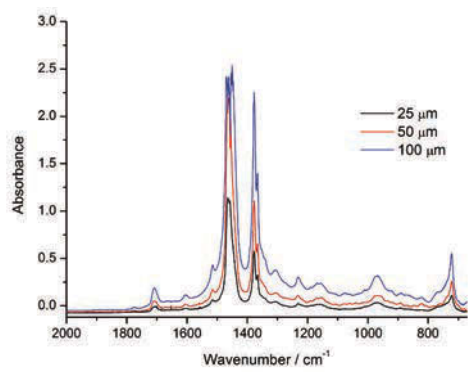

Figure 1: IR spectra of fresh engine oil.

Figure 2 compares the spectra of fresh and used engine oil samples using a 25 µm pathlength.

Very little sample, < 5 ml, was needed to quickly differentiate the oils.

The used sample shows evidence that the oil has been chemically altered and that contaminants have been introduced.

Around 1150 cm^{-1}, the hallmark signs of sulfation are visible, while the region of 1600 – 1700 cm^{-1} shows evidence of oxidation and nitration in the oil.

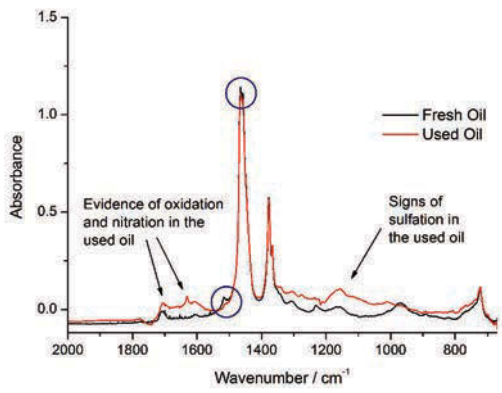

Figure 2: A comparison of new & used engine oil.

Conversely, there is a loss of relative signal intensity at 1500 and 1460 cm^{-1}.

This is marked by blue circles and indicates there is less of the original oil in the used sample.

Figure 3 compares three different fresh oil samples measured using a 25 µm pathlength, in black, red and blue.

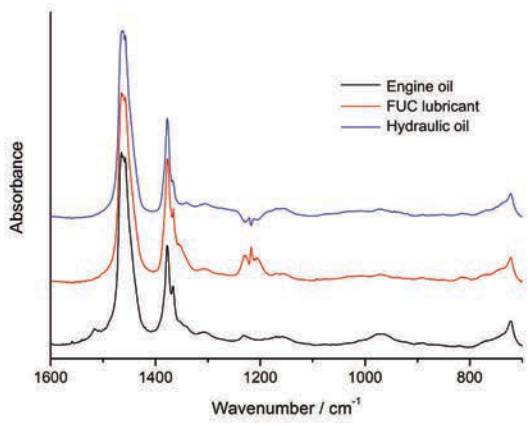

Figure 3: A comparison of the three oils.

Clearly, the oils share a similar aliphatic band at 1470 cm^{-1}, but their other molecular signatures are different.

Conclusion

Very little sample was needed to differentiate the oil samples.

The used samples showed evidence that contaminants had been introduced over time through use and contact with machinery.

A loss of signal intensity at certain frequencies indicated that the original oil sample had been chemically degraded through use in a car engine.

The fact that the maximum absorbance in the fingerprint region (500 – 1500 cm^{-1}) peaked at 2.5 for the 100 µm pathlength shows that a few drops of pure sample is enough to record top quality transmission spectra.

More in-depth studies to determine how quickly the oils degrade with use can easily be carried out using the Specac Pearl™.

A viscous oil sample can be analysed quickly using three different pathlengths in the Pearl™.

Find us online for equipment videos and application notes or to arrange a free product demonstration.

Specac

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Shell to Build a new Petrochemicals Complex in Pennsylvania

Shell Chemical Appalachia LLC (Shell) has taken the final investment decision to build a major petrochemical complex, comprising an ethylene cracker with polyethylene derivatives unit, near Pittsburgh, Pennsylvania, USA. Main construction will start in approximately 18 months, with commercial production expected to begin early in the next decade.

The complex will use low-cost ethane from shale gas producers in the Marcellus and Utica basins to produce 1.6 million tonnes of polyethylene per year. Polyethylene is used in many products, from food packaging and containers to automotive components.

The facility will be built on the banks of the Ohio River in Potter Township, Beaver County, about 30 miles north-west of Pittsburgh. As a result of its close proximity to gas feedstock, the complex, and its customers, will benefit from shorter and more dependable supply chains, compared to supply from the Gulf Coast. The location is also ideal because more than 70% of North American polyethylene customers are within a 700-mile radius of Pittsburgh.

The project will bring new growth and jobs to the region, with up to 6,000 construction workers involved in building the new facility, and an expected 600 permanent employees when completed.

"Shell Chemicals has recently announced final investment decisions to expand alpha olefins production at our Geismar site in Louisiana and, with our partner CNOOC in China, to add a world-scale ethylene cracker with derivative units to our existing complex there," said Graham van't Hoff, Executive Vice President for Royal Dutch Shell plc's global Chemicals business. "This third announcement demonstrates the growth of Shell in chemicals and strengthens our competitive advantage."

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The Gulf Coast Conference 2016

GCC "Serving The World of Chemical Analysis"

The Gulf Coast Conference is a non-profit organisation oriented toward the education and advancement of knowledge of Chemical Analysis Technology associated with the Petrochemical, Refining, and Environmental fields, and will forward this goal through annual technical meetings, regular communications, and training courses focused on these fields.

Attendees are asked to note the change in venue to The George R Brown Convention Center, 1001 Avenida de Las Americas, Houston, Texas, 77010.

A comprehensive programme of presentations will be included in the proceedngs. Presentations will include talks on 'Transferring Routine Lab GC Analysis to Automatic On-Line Measurement' and 'Determination of Trace Sulphur by ASTM D5453 under the EPA Protocol 40 CFR Part 80. D. Section 80.47_A PBMS approach for TIER III Gasoline.'

The itinerary for the show will be as follows -

Exhibits: Tuesday - Wednesday, Oct 11-12, 2016, 8:00 AM - 5:00 PM

Lunch: Tuesday Lunch, October 11th, 2016, Exhibit Hall, 11:30 AM- 1:00 PM

Wednesday Lunch, October 12th, 2016, Exhibit Hall, 11:30 AM- 1:00 PM

New Product Showcase: Tuesday-Wednesday, Exhibit Hall, Noon - 1:30 PM

20th Annual GCC Gulf Golf Classic, Monday, October 10th, 2016, Wildcat Golf Club, 12000 Almeda Rd, Houston, TX 77045, 11:00 AM Lunch//12:00 PM Shotgun Start

GCC Golf Classic Awards Night: Wildcat Golf Club, Monday, October 10th, 2016, 5:00 - 8:00 PM Rain or Shine

Vendor Meeting: Tuesday, October 11th, 2016, Upstairs Meeting Room TBD, 5:00 PM

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Over 1,200 Exhibits on Show in Munich

During four days in May a total of 1,244 exhibitors from 40 countries presented their product innovations including a number of world premieres to some 35,000 visitors at **analytica** in Munich. There was a considerable increase it the share of exhibitors and visitors from abroad. As a result, analytica's leading position as the world's most important trade fair for laboratory technology, analysis and biotechnology remains unsurpassed.

Dr. Reinhard Pfeiffer, Deputy CEO of Messe München, sums things up: "Thanks to presentations of several world premieres in particular, analytica demonstrated that it is number one and therefore the most important driving force behind innovations in industry and research." Siegbert Holtermüller, Chairman of the Technical Advisory Board for analytica and Managing Director at Olympus, confirmed the fair's character as a leading exhibition: "The industry needs analytica to present its innovations to an international audience and discuss ongoing developments."

The euphoric atmosphere at the fair was the result of warm weather and, above all, full halls and crowded stands—a clear sign that the industry is doing well. Mathis Kuchejda, Chairman of the SPECTARIS Trade Association for Analytical, Bio- and Laboratory Technology, feels that the industry's main growth opportunities lie in increasingly complex regulatory requirements as well as the networking and automation of laboratory processes and sample preparation, not least of all due to increasing globalization in sectors such as food safety. Growth is also being generated by recent developments in the health-care sector such as in-vitro diagnostics. For 2016, the trade association expects the German industry's domestic sales to improve, increasing by 6.5 percent to approximately 3.75 billion euros.

Approximately 35,000 visitors, 40 percent of whom came from abroad, attended analytica 2016. The countries with the largest contingents of visitors were Austria, Switzerland, Italy, Great Britain and the United States (in that order). There were significant increases in the number of visitors from countries including Great Britain, Iran, Thailand and Turkey.

According to a survey by the market research institute Gelszus Messe-Marktforschung, visitors were extremely satisfied with the outcome of the fair: 99% gave the exhibition a rating of good to excellent. Nearly 60 percent also feel that analytica is increasing in significance.

A total of 1,244 companies from 40 countries - a 6.5% increase over the record-breaking results from 2014 (1,168) - participated in analytica. Above all, that growth was due to an increase in international exhibitors, which rose four percent to a total share of 44%. Besides Germany, the countries with the largest contingents of exhibitors were China, the United States and Great Britain.

The scientific highlight of the fair was the three-day analytica conference. A total of 1,839 visitors - an increase of 12% over 2014 (1,638) - filled the rooms of the ICM - Internationales Congress Center München to capacity.

Prof. Marion Thevis from German Sport University in Cologne: "The analytica conference is extremely important. It promotes an international exchange and allows us to meet the manufacturers of analysis devices that are important to our work. After all, progress in this area is the only thing that allows us to offer modern and adequate test methods."

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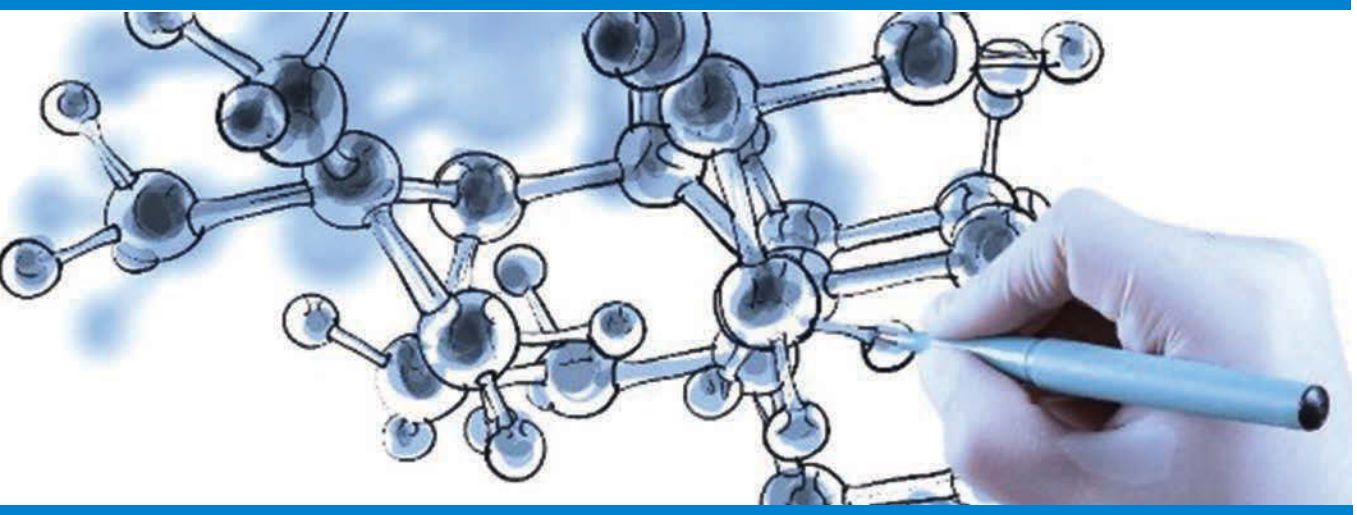

PREP C20 is a powerful and sophisticated equipment designed to fractionate large amounts of polymer in a completely automatic way, which works as a pilot plant eliminating the need of manual handling of high volumes of hot solvent. A column-based instrument in which fractionation can take place according to the basis of Temperature Rising Elution Fractionation (TREF) technique, or according to molar mass using a solvent-non solvent gradient.

Introduction

Preparative fractionation in a column packed with an inert support is a long used technique for polyolefins characterization, as it facilitates the analysis of the fractions to obtain the bivariate distribution of a resin. For decades, fractionation has been an important but challenging and tedious task because it requires manually handling of large volumes of toxic solvents at high temperature.

Thus, the significant amount of time and effort demanded for the operation called for an automatic equipment that avoided solvent handling by the analyst. In the 90's, Polymer Char developed the instrument PREP mc^2, an automated technique that was able to fractionate up to 2 grams of polyolefins according to their chemical composition (by temperature rising elution fractionation, TREF or by crystallization analysis fractionation, CRYSTAF) or according to their molar mass. Samples were placed into vessels and fractionation was performed automatically according to the selected method in less than 24 hours.

Nevertheless, with this method, fractionation takes place with the absence of a support, and it has started to become evident that, for some polymers, when fractionating by TREF, a support for the solution to adhere to is critical for a good separation of the fractions, as is the case with multiple reactor-catalyst resins.

As a response, Polymer Char introduced the PREP C20, a column-based equipment, which - by adding a support for the solution to crystallize - improves the separation for each of the fractions, and therefore becomes more appropriate for those types of complex resins.

Moreover, for a better understanding of the structure-properties relationship, fractionation techniques are needed in order to separate polymers into fractions, which allow for their subsequent characterization. Often, some of the techniques employed to analyze the fractions require high amounts of polymer, which implies doing several fractionations of the parent sample to achieve the needed amount for the fractions.

In this way, PREP C20 has been designed to fractionate high amounts of polymer, up to 20 grams depending on the sample. Therefore, one unique fractionation will be enough to obtain the fractions amount needed for their complete characterization.

Figure 1. PREP C20 main instrument

Experimental

To perform a fractionation, the user just needs to place a dry sample into a vessel, select the method and start the process. Once the fractionation is finished, the equipment is rinsed and ready to start a new one.

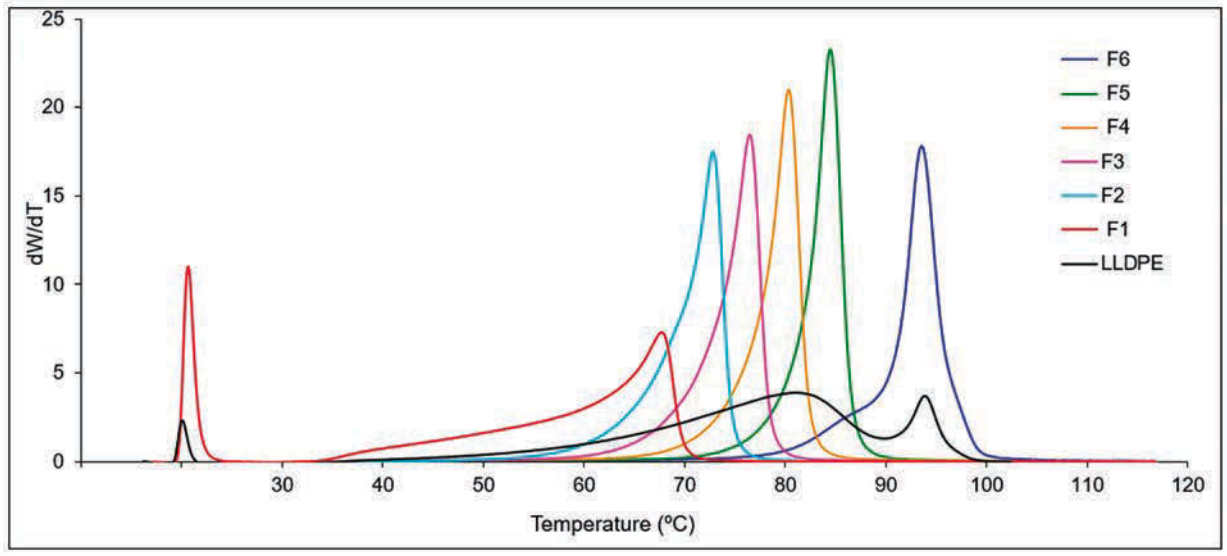

Figure 2. TREF curves of fractions obtained with PREP C20 and their LLDPE parent sample.

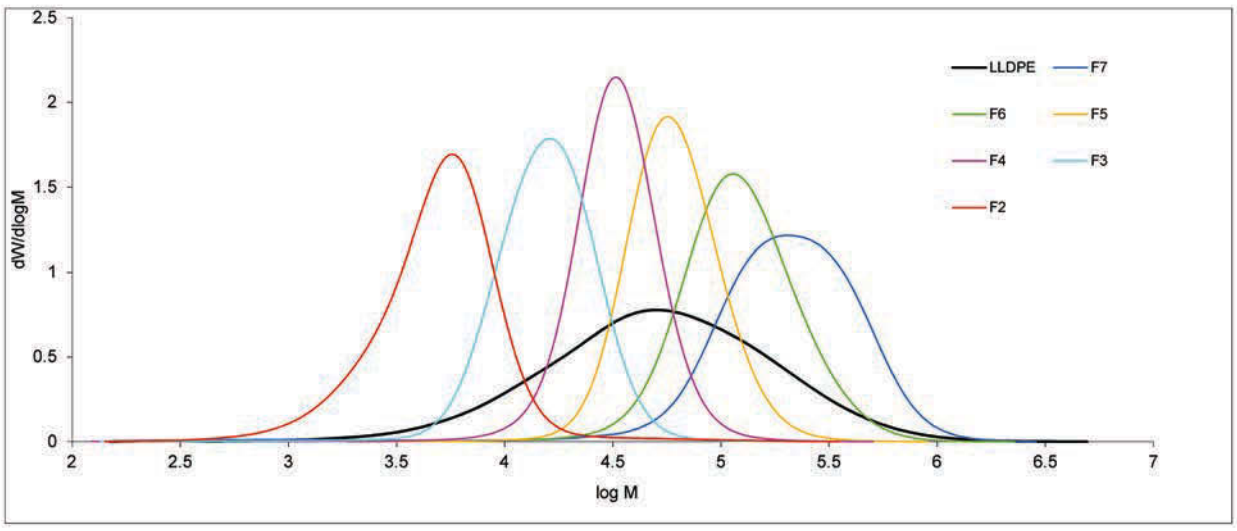

Figure 3. Molar Mass distribution of fractions obtained with PREP C20 and their LLDPE parent sample.

The main steps of fractionation are performed automatically following the selected method parameters:

1. The vessel is filled with solvent and heated up for dissolution with stirring at high temperature.
2. Column loading with the sample dissolved at high temperature.
3. Crystallization step following the selected temperature ramp (when subambient conditions are required, PREP C20 can work without the need of liquid coolants down to minus 20ºC).
4. Elution step and fractions collection by pumping solvent at selected increasing isothermal steps (composition mode) or selected non-solvent percentage at a fixed temperature (molar mass mode). For TREF mode, the concentration of the different fractions that are coming out of the column is monitored with an infrared detector, which facilitates the fractionation comprehension, so the analyst can modify the fractionation methods (elution volumes) according to his needs.

The control program allows the user to define different methods according to their needs. Therefore, dissolution temperatures or times, crystallization rates, elution volumes, etc. can be adjusted for each kind or amount of sample.

Fractionation According to Composition (TREF mode)

Chemical composition fractionation, in semi crystalline polymers, is based on differences in crystallizability of the polymer composition, and it is typically performed by crystallization at a slow cooling rate. Fractionation occurs by deposition of layers of decreasing crystallinity or increasing branch content, onto an inert support in the column, as temperature decreases.

Although at this stage the polymer is already segregated in layers or crystalline structures of different composition, the technique still requires a second temperature cycle to collect those fractions. This is achieved by pumping solvent meanwhile the temperature is being increased (elution step). The eluent dissolves fractions of increasing crystallinity, or decreasing branch content, as temperature rises. Figure 2 shows the fractionation of a complex dual reactor LLDPE polyolefin.

Fractionation According to Molar Mass

Molar mass fractionation has been implemented in PREP C20 using a solvent-non solvent gradient through the column at a constant temperature. Narrow fractions of increasing molar mass can be obtained as shown in Figure 3. The graph shows the molar mass distribution of a LLDPE and its fractions obtained with molar mass fractionation mode.

Future and Other Perspectives

Developed initially for polyolefins, PREP C20 can also be used for other polymers depending on the solvents required for dissolution.

Currently, fractionation takes place according TREF and molar mass modes, but other fractionation techniques such as thermal gradient interaction chromatography (TGIC) and solvent gradient interaction chromatography (SGIC) will be implemented soon.

Conclusions

Fractionation of polyolefins has always been a difficult and physically demanding task due to the manual manipulation of large volumes of hot solvent. After the first automation techniques, new complex polymers have shown to require a support to achieve a proper fractionation.

In this way, a column-based fractionation equipment has been developed, which also enables the fractionation of larger amounts of sample, in a completely automatic way.

The automated control program allows analysts to create their own methods adjusted to their samples and needs.

Fractions are automatically collected in bottles, and it is possible to check the process performance thanks to an interactive software.

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Next Generation Gas Chromatography Detector

VUV Analytics (USA) formally announced the launch of their newest bench-top spectrometer; the VGA-101 gas chromatography (GC) detector at the 40th International Symposium on Capillary Chromatography (ISCC) [http://192.167.108.132/slider.html] in Riva del Garda, Italy. Building upon the success of their innovative flagship instrument, the VGA-100 vacuum ultraviolet (VUV) detector, the VGA-101 features an expanded wavelength, higher maximum allowable operating temperature, and in-line GC compatibility. Equipped with these novel enhancements, the VGA-101 extends the utility of the VUV technology for customers seeking new solutions to their analytical problems.

VUV Analytics continues to pioneer innovations in VUV spectroscopy, from the launch of the VGA-100 in 2014, SVGA-100 in 2015, to our latest spectrometer; the VGA-101 in 2016. Our team is passionate about delivering unique analytical solutions to a wide range of applications," said Sean Jameson, Senior Vice President of Business Development at VUV Analytics. "Responding to our customer's feedback, the VGA-101 detector is uniquely engineered to provide qualitative and quantitative GC data with excellent sensitivity and selectivity at elevated operating temperatures throughout an expanded wavelength spectrum. We are excited to deliver these latest advancements to our customers to enable further discovery in the VUV spectrum."

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Mercury and Petrochemicals - Experience, Performance, Reliability and Support

For over 30 years **PS Analytical** (UK) has been at the forefront of trace mercury (Hg) determinations from petrochemical samples. It has never been more important to understand the fate of Hg in all aspects of oil and gas exploration, refining and production. The corrosive nature of Hg reacting with aluminium; the fate of Hg within a process itself; the concentration of Hg in feedstocks that could destroy expensive catalysts; as well as the OH&S concerns that Hg poses are, of course, well documented and are often a key driver in operational decisions. For these reasons much effort is spent on Hg removal technology and PSA partners with many companies to monitor and help manage this Hg removal process. This partnership happens from the research bench through to production with PSA taking a pivotal role in ensuring successful removal technologies are deployed in the real world.

PSA have analysers to suit all aspects of the monitoring and analysis of Hg, including laboratory instruments and on-line analysers for gases and liquids. More recently PSA have provided solutions for speciation (fractionation) analysis and also waste water systems associated with petrochemical processes.

Employing Atomic Fluorescence as a means of detection the PSA analysers provide ultimate detection performance. With literally thousands of systems in the field today, and support networks in Europe, USA and SE Asia, PSA offers the ideal package of performance, reliability and support.

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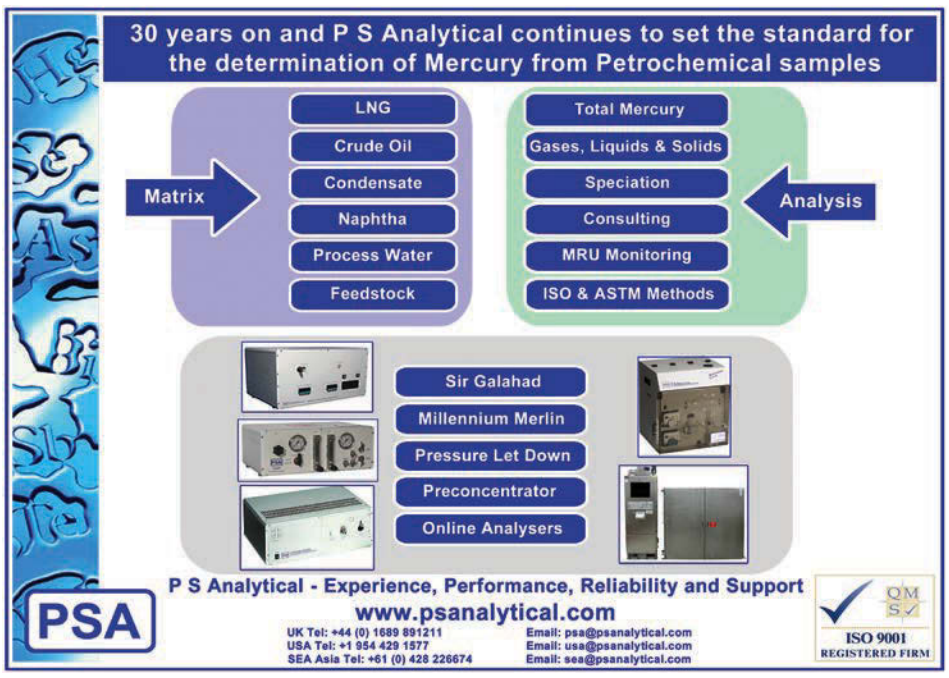

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Innovative MALDI-TOF/TOF Mass Spectrometer Shown at ASMS 2016

At the 64th ASMS Conference, **Bruker** (USA) introduces rapifleX, the highest performance MALDI-TOF/TOF mass spectrometer, which had been shown as work-in-progress to early adopters at HUPO 2015. The rapifleX is by far the most advanced TOF/TOF system today, and was re-designed from the ground up to meet today's highest demands for in-depth intact and top-down protein characterization, and high-performance, high-throughput mass spectrometry imaging (MSI).

With its next-generation TOF/TOF ion optics and smartbeam 10 kHz proprietary laser technology, the rapifleX system now offers significantly higher speed, better mass resolution and mass accuracy, and a significantly enhanced MS/MS mass range to enable new research and routine applications. Its unprecedented 10 kHz speed and ion source robustness, its wide dynamic range, higher specificity and resolution all contribute to the detailed characterisation of biologically and clinically relevant lipids, peptides and proteins, resetting customer MALDI-TOF/TOF expectations for in-depth protein characterization and imaging of tissues, cell cultures, or other applications. Its enhanced ease-of-use, robustness and stability make the rapifleX a game-changer for research and large-scale validation.

Dr. Julian D. Langer, at the Max-Planck Institute (MPI) of Biophysics and the MPI for Brain Research in Frankfurt am Main, Germany, stated: "In our lab, with its high MS2 isolation efficiency, resolution and mass accuracy at high m/z values, the rapifleX TOF/TOF has been instrumental in identifying and characterizing new subunits of membrane protein complexes, including prokaryotic respiratory chain complexes and antibiotic drug targets."

The rapifleX TOF/TOF is well-suited for detailed protein characterisation in life science research and biopharmaceutical laboratories. Many protein characterization tasks can be improved to gain better biological insight, including: fast identification of post-translational modifications (PTM), top-down protein sequencing, patented T³-Sequencing to identify or confirm suspected modifications or sequence alterations near protein N- or C-termini, automated disulfide analysis of intact proteins without a priori assumptions using Bruker's unique DisulfideDetect method and software, and disulfide scrambling and trisulfide analysis with simplicity, speed and dynamic range.

Tissue- and cell-type specific proteomics is a major advancement for relevant biomarker discovery and identification, and requires MALDI imaging studies which include the identification of detected biomarker candidates for validation and subsequent development of targeted assays. The rapifleX extends the MALDI Tissuetyper imaging capabilities with rapid, spatially resolved MS/MS data. It supports the patented ImageID workflow for biomarker discovery in MALDI imaging cohort studies, by obtaining matching identifications of tryptic peptides by LC-MALDI-TOF/TOF analysis.

The rapifleX integrates a novel, 10 kHz smartbeam 3D scanning laser for breakthrough mass-spec imaging (MSI) with dramatically improved spatial resolution, image contrast and quality, and a new ion source for superior robustness and throughput in MSI, pharma screening, as well as for anatomical pathology clinical research.

Unique to the rapifleX is that its laser and ion optics can be dynamically adapted to research or analytical needs. Its smartbeam 3D laser offers different focus profiles for highest performance in different workflows. The MS/MS ion optics can be removed from the ion path to achieve uncompromised MS ease-of-use for imaging, intact protein and peptide applications. The three stage grid-less ion reflector is software adjustable to MS/MS and intact molecular weight measurements to achieve best performance for top-down protein sequencing, as well as for MS/MS analysis up to 8 kDa.

Its 10-bit digitiser improves the dynamic range for quantitative applications, such as High Throughput Screening (HTS) in drug discovery, or quantification of scrambled disulfide bonds and trisulfides in the 0.1-1% range relevant in biologics development and QC.

The rapifleX MALDI-TOF/TOF system is for research use only.

email: 39213pr@reply-direct.com

ASTM D1160 Compliant Computer Controlled Boiling Analysis

Iludest (Germany) are renowned chemical engineers who have built a reputation over decades of supplying custom-built semi-automatic and fully-automatic laboratory installations and pilot plants that meet the precise specifications of the petroleum industry. With over 300 installations worldwide, Iludest are unsurpassed at configuring one-off assemblies which cater to individual specifications, e.g. purifying lub oils, essential oils, industrial blended oils, etc.

Aside from providing entire turnkey systems, Iludest have a range of their own tried and tested analytical tools that have been instrumental in their success. One of these is the i-Fischer® DIST D-1160 CC / FISCHER® AUTODEST® 850 AC, a fully computer controlled unit of turn-key design, and ready for use after installation and commissioning. The unit extends the current test method and does not limit your vacuum distillation testing options.

Users can define their own tailored program above and beyond current standards. The system is fully housed and equipped with doors in the front and rear to satisfy safety requirements and to facilitate servicing the unit.

The protocol is printed out and shown on the monitor whilst distillation is being carried out featuring distillation curves in actual boiling temperatures (ACT) and atmospheric equivalent temperatures (AET) as well as essential distillation parameters. The final data and the distillation curves are printed and stored on hard disk and/or data disks.

email: 38562pr@reply-direct.com

Accurate and Reliable Petrochemical Solutions

Whether you are involved in crude oil refining, natural gas production or one of the myriad of petrochemical processing or alternative fuel companies, being able to reliably identify and quantify organic and inorganic components is at the core of your ability to get your job done confidently day after day.

Scion Instruments recognises this, and we have made a commitment to customers to provide the broadest array of state-of-the-art analytical chromatography solutions possible to meet or exceed your needs, be they simple or highly complex. A wide range of GC Analyzer solutions to meet industry standard performance requirements for a variety of widely used methods (ASTM, UOP, EN, ISO and GPA).

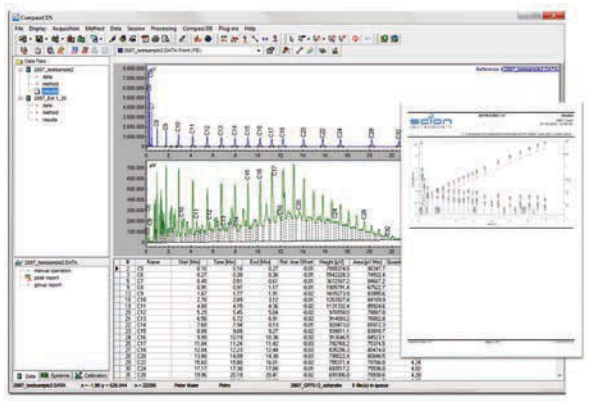
email: 35742pr@reply-direct.com

Accurate Determination of Ethanol and Methanol in Biofuels Made Easy

Biofuels have become increasingly important as alternatives to conventional fuels. Bioethanol, mainly produced by sugar fermentation, is an example of a biofuel. Ethanol has a high octane number and was originally intended to replace lead as an octane enhancer. Nowadays, ethanol is blended with gasoline to improve combustion efficiency thereby reducing polluting emissions. The most common blend is 10% ethanol and 90% petrol (E10), though the latest vehicles can operate on up to 85% ethanol and 15% petrol blends (E85). ASTM D 5501 is the method commonly used to determine the ethanol content of denatured fuel ethanol by gas chromatography. Ethanol is determined from 93 to 97 mass%. Accurate determination of ethanol and methanol according ASTM D 5501 is achieved using a Scion 456-GC Gas Chromatograph with CompassCDS software. Data shows that accurate repeatability means that data never exceeds the levels specified in the standard.

email: 28603pr@reply-direct.com

CompassCDS - Next Generation CDS



CompassCDS builds on 20 years of legacy and represents a rock-solid, industry-focused, networked chromatography data system solution that eliminates the costs associated with licensing individual named users.

It scales from standalone to a fully networked client/server, enterprise-wide application and provides operators with an intuitive, easy-to-use and information-rich user interface that simplifies day-to-day operation of GCs in all labs whether connected to R&D, IPC or QA/QC.

It is designed to operate in 24/7 production environments and optimized for virtualized and metaframe environments & rollouts, and seamlessly integrates with LIMS, LES, ERP/SAP, and SCADA/PCS.

With the CompassCDS platform GCs of different vendors can be controlled, including Varian CP 3800 and 3900, Bruker and Scion 43x and 45x series GCs, and HP/Agilent's 5890, 6890 and 7890 GCs. More control drivers to come soon.

For More Info, email: 39433pr@reply-direct.com

email: 6035ad@reply-direct.com

NEW Automatic PMCC Flash Point Analyser!

Koehler Instrument Company, Inc. (USA) is pleased to introduce our newly redesigned K71000 Automatic Pensky-Martens Closed Cup Flash Point Analyser. The analyser represents a perfect union of next generation technology with traditional robust quality. Thermocouple and ionisation flash detection systems are standard and a three position mechanical lift system allows for easy one touch positioning of the test cover.

The Windows based system software runs on an integrated processor PC. The 8.4" touch screen interface fully displays all operator parameters and results on a single screen. Over 65,000 results can be stored on the local hard drive allowing the user to store test programs and data for the life of the analyser.

Additional features have been incorporated into the instrument for ease of use and to further ensure user safety. Fire prevention, detection, and suppression systems are all integrated into the analyser. The cover assembly can be completely disassembled for thorough and easy cleaning of all wetted material. The analyser also comes equipped with a unique combination ignitor for simple switching between gas or electric ignition.

The New Automatic Pensky-Martens Flash Point Analyser conforms to a wide range of Standard Test Methods including ASTM D93 Procedure A, B and C; IP 34; ISO 2719; DIN EN 22719; JIS K2265; NF M 07-019.

The K71000 Automatic PMCC Flash Point Analyser is available from Koehler Instrument Company, Inc, a leading manufacturer and supplier of petroleum, synfuels, petrochemical and biofuels laboratory testing instrumentation worldwide.

For More Info, email: 39309pr@reply-direct.com

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WDXRF

email: 6467ad@reply-direct.com

Whatever your Sample – Density Meters Deliver the Results

Anton Paar (Austria) is a supplier of many different density meters ranging from portable, explosion-proof and compact mobile devices up to high-end equipment with either glass or Hastelloy C276 measuring cells. The broad portfolio includes numerous application-specific accessories covering a huge variety of measuring scenarios. There is a density meter for every requirement: Sample quantity: precise measurements either based on manual filling or fully automatic filling by modern sample filling equipment; Sample diversity: from low-viscosity samples to samples which are solid at room temperature. Anton Paar's DMA density meters measure liquid samples at temperatures from -10 °C up to 200 °C and immediately convert the measured result to the target reference temperature; Sample site: density measurement on platforms, at airports, in mobile labs, from tankers or in laboratories; and Sample purpose: highly accurate results with an accuracy ranging from 1 kg/m³ up to 0.005 kg/m³.

Product characterisation, quality control of final product specifications and mass-to-volume conversion based on density measurement has never been so easy. Anton Paar's high-end density meter DMA 5000 M (ASTM D4052, D5002) directly measures the density and API gravity with outstanding precision which makes it ideal for refined products such as diesel fuel.

The intrinsically safe portable density meter DMA 35 Ex Petrol (ASTM D7777) quickly checks the quality of fuels throughout the whole supply chain. It is used on-site whenever fuels are loaded or unloaded and for blending checks.

The compact DMA 500 density meter measures the API density, API gravity or API SG of lubes. It fits in the smallest of spaces in the lab and can be used outside the traditional lab space thanks to a battery life of up to 6 hours. Measurement temperatures of up to 40 °C ensure easy handling of highly viscous samples.

DMA 4200 M (ASTM D4052, D5002) measures the density and specific gravity of asphalt, asphalt binders and bitumen at elevated temperatures up to 200 °C. The measurement is 10 times faster than using a pycnometer and guarantees that the buyer obtains the correct mass of asphalt.

For More Info, email: 39195pr@reply-direct.com

Stay Connected Under Pressure

Press-fit style connectors work well for many applications, but the connector seal can be broken by extreme temperature and pressure cycling. In these situations, SilTite µ-Unions, from **Restek** (USA), are a better alternative as they create a permanent connection between fused silica analytical columns, guard columns, and retention gaps. SilTite FingerTite technology provides easy installation and a reliable, leak-tight connection. Data quality can be improved by using these connectors because their zero-dead-volume design and deactivated metal construction ensure optimal peak shapes. Robust SilTite µ-Unions are recommended for mass spectrometry work and any application with extreme temperature and pressure changes. Connector kits are available in six configurations that are designed to securely connect columns of either the same or different inner diameters. Each kit contains two SilTite µ-Union connectors, five double-taper ferrules, and installation tools.

For More Info, email: 38873pr@reply-direct.com

Reliable Contaminant Analysis with Lonestar Analyser

Owlstone's (USA) Lonestar portable analyser performs analysis in less than 10 minutes, Lonestar can be used to rapidly identify and quantify contaminants such as methanol, hydrogen sulphide scavengers (triazines), organic chlorides, acetic acid, amines, MEG and carbonyl sulphide, allowing producers to avoid expensive processing issues further downstream.

Using Owlstone's award-winning FAIMS technology, it can detect contaminants in oil and gas at parts per million levels, and its straightforward sampling module and user interface mean it can be operated easily by non-specialist personnel.

For More Info, email: 35786pr@reply-direct.com

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ON THE BLUE, BLUE DANUBE

A visit to Ferrexpo Port Services in Vienna, Austria
Measuring instruments: DMA 4500 M and DPRn

It is usually not a big deal for the driver of a motor vehicle to pull over and refuel when the fuel warning light indicates that it is time to do so: most likely the next gas station is conveniently located around the corner and the tank filled long before the last drop of fuel is consumed. But what does the captain of an inland waterway transporter do when the ship is running low on fuel? Easy enough: he directs the vessel towards the next bunker station.

The Danube: Habitat and Transportation Route

As early as the beginning of the seventeenth century, the Danube was traveled on by vessels. Today it still serves as a way of transportation for people and cargo. In central Vienna, on Handelskai, there is a bunker station called "Ferrexpo Port Services" which provides fuel to inland waterway vessels. In addition to the bunker station, the Ferrexpo has two small mobile bunker boats at its disposal with a fuel capacity of around 300 tons. These bunker boats deliver directly to cabin vessels in the Vienna area.

For legal reasons, the delivery and dispense of the fuels may only take place on the water. The bunker station itself consists of two separate ships: one is the fuel station from where ships are supplied with the necessary fuel, and the other is the storage tank that receives and holds the fuel which is subsequently transferred to the fuel station by means of a pipeline. In this way, deliverers and customers do not get in each other's way should they call at the Ferrexpo Port Services at the same time.

The Right Fuel for Each Season

Seasonal diesel compositions apply for ships as well as for cars. This variation in fuel composition also influences the fuel's price as the change in temperature goes hand in hand with a change in density of the fuel. As a consequence, the determination of the fuel's volume alone is not sufficient to calculate the correct price for the temperature-dependent volume of the delivered fuel.

Not only seasonal temperature fluctuations affect the factors that have to be considered when calculating the fuel's price: the fuel is stored in a floating tank that is partially immersed in water. As a consequence, additional temperature gradients apply caused by the temperature of water plus the ambient temperature. On top of that, with each fuel dispense or delivery the changes in fill height in the tanks also have to be considered.

Considering all these factors, how does Ferrexpo ensure that delivered as well as dispensed fuel quantities are being measured and priced independently of the prevalent temperatures?

Ferrexpo answers this question professionally!

Continuous Insight for Correct Dosage

In 2011, Ferrexpo purchased a DPRn measuring cell with density sensor for the continuous measurement of density and temperature during fuel delivery and fuel dispense and also, for measurements in the laboratory, a DMA 4500 M density meter by Anton Paar. From that time on, seasonal fluctuations did not impose a problem anymore. Ever since the acquisition of these measurement devices, dispensed quantities can be measured correctly and effortlessly. "We continuously measure temperature and density with DPRn," states Bernhard Benkovits, CEO of the Ferrexpo Port Services GesmbH.

Fuel continuously flows through the measuring cell with its built-in density sensor (see Figure 1).

The temperature is also measured and is, together with DPRn's frequency signal, transferred to an mPDS evaluation unit. This unit is conveniently mounted in the office and can be operated directly from there as can be seen in Figure 2. On the mPDS screen, the density and the density at a reference temperature or density-derived quantities such as concentration are displayed.

The DMA 4500 M density meter (see Figure 3) delivers fast and accurate measurement results in a wide viscosity and temperature range and is ideally suited for highly precise density measurements and for adjusting the DPRn measuring cell.

Figure 1. DPRn measuring cell with density sensor

"The dosed quantities are measured at the actual temperature by means of a flow meter. According to ASTM Table 53 b and 54 b the quantities are converted so they correspond to the respective quantity at 15 °C. At delivery, we also measure the current density value with DMA 4500 M," states Benkovits.

Always on the go for Their Clients

The fuel price is always calculated according to the daily market price. With accurate density measurements a fair calculation is always guaranteed: Looking at quantities from 1000 to 1200 metric tons per week Ferrexpo achieves a deviation between delivered to dispensed fuel that is is well below a tenth of one percent! In order to maintain the constant supply of fuel, the bunker station is operated in shifts around the clock most of the year.

Figure 2. The mPDS evaluation unit can be operated from the office

Safety for Humans, Animals and the Environment

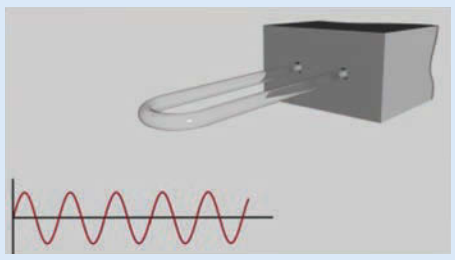
The protection of employees as much as legal requirements for environment and navigation characterize the careful handling of fuels. The legal requirements for fuels used for inland waterway vessels in Austria are very strict, but are meticulously adhered to by Ferrexpo. The fact that swans have made their home in the vicinity of the bunker station is testimony to this.

Figure 3. The DMA 4500 M density meter

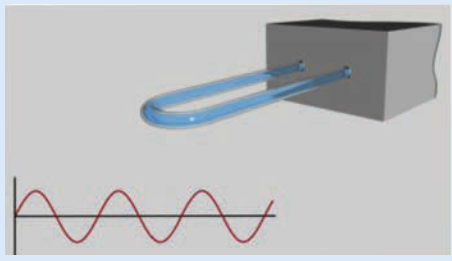
How Density Measurement Works

Sample flows through or is filled into the U-shaped tube of the DPRn and DMA 4500 M density measuring devices, respectively.

This U-shaped tube is electronically excited to oscillate. If the sample's density is low, as is the case with e.g. air, the U-shaped tube oscillates with high frequency.



If the density of the filled in sample is higher, for example water, the U-shaped tube oscillates with lower frequency.



The characteristics of the oscillations are measured and the frequency signals are recorded.

In laboratory density meters such as DMA 4500 M, a built-in reference oscillator makes it possible that one single adjustment at 20 °C is sufficient for the entire measuring range.

The density is determined highly accurately, deviations of the measurement result caused by thermal stress implied with the U-tube are compensated, and viscosity-related errors corrected.

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A New Approach in Sample Handling

With its easy handling, combined with reliable filling as well as optional cleaning, the new Xsample 340 for syringes frees up users' hands and ensures reproducible results.

The new Xsample 340 for syringes can be used with density meters and viscometers from **Anton Paar** (Austria) and handles a wide range of viscosities up to 36,000 mPa.s.

The use of syringes is common practice – now automated filling further improves the quality of measurements. The system's filling speed is freely adjustable, so movements can be accelerated for special treatment of samples to prevent filling warnings. The force-controlled movement of the pusher prevents excess pressure in the system and ensures smooth filling.

The cleaning procedure with a special cleaning module prevents the cross-contamination of two different samples. The whole system is cleaned with up to two different cleaning agents, after which it is dried automatically. The unit can be used with commercially available Braun syringes from 2 mL or 5 mL up to 10 mL.

The new Xsample 530 sample changer from Anton Paar brings a new kind of dynamic to automated measuring cycles. Its user-friendly handling combined with reliable filling and cleaning safeguards can process up to 71 vials.

The new Xsample 530 sample changer for vials is ideal for use with density meters, viscometers and refractometers from Anton Paar. It handles liquid viscosities up to 36,000 mPa.sand can process up to 71 samples in 12 mL vials.

Its removable magazine is easily lifted off its hub and carried by hand to wherever the user wants to fill it. Once in place, the magazine can be freely rotated for filling in place. To eliminate the risk of loose connections and leaks from the start, Xsample 530 detects whether the pressure source is at its expected level and runs automatic tightness tests. For measurements, users can manually define the pressure source, or they can let the system choose it automatically: In case of highly viscous samples, compressed external air at 2 bar can be used. An optional bar code reader supports sample identification and ensures traceable results.

This sample changer comes with various pre-programmed cleaning modes. Three different rinsing agents can be connected for customized cleaning. This extended cleaning capability is an essential "insurance coverage" for the wide range of diverse samples, including challenging materials. The instrument's robustness is ensured by mechanical components of uncompromising quality and an exceptional resistance to aggressive chemicals. Simply put, Xsample 530 is built for decades of around-the-clock operation.

For More Info, email: 39176pr@reply-direct.com

New Generation High-Resolution Continuum Source AA Spectrometers

More than a decade after its first commercial introduction with the contrAA family of instruments, High-Resolution Continuum Source AAS (HR-CS AAS) has become a well-established and appreciated analysis technology in routine, research, and academia. The technology developed by Analytik Jena together with the Leibnitz Institute for Analytical Sciences ISAS e.V. in Berlin more than 10 years ago revolutionized atomic absorption spectroscopy (AAS). In contrary to traditional Line Source AAS, which requires different lamps for different elements, HR-CS AAS uses a Xenon lamp that emits a continuous spectrum at high intensity. Thus, any element and wavelength can readily be analysed whenever the requirement occurs – the contrAA turned AAS into a true multi element technique with unmatched flexibility. An Echelle spectrometer with CCD detector produces a highly resolved absorption spectrum for each sample, allowing not only quantitative evaluation of but also qualitative information about the sample.

Features like fast sequential and simultaneous multi-element analysis, including semi-quantitative overview screening of unknown samples, and analysis of non-metals, have opened up new application fields previously reserved to other, much more expensive technologies. Superior correction algorithms for background and spectral interferences have taken productivity and accuracy of AAS to a new level – all while preserving its simple, robust, and low-cost operation.

With the new contrAA 800 **Analytik Jena** (Germany) now presents the next generation of this successful technology on the market. It cumulates the experience gained over the years, feedback and suggestions from the field, and our experts' refreshingly new ideas.

The most obvious feature is the compactness of contrAA 800 with its space-saving design. Both typical AAS technologies are implemented in one sample compartment via an automatic atomiser switching. The redesigned high-performance optical system provides improved stability and lowest noise, resulting in market-leading detection limits and superior accuracy. A new lamp design further reduces consumables costs.

Sample preparation and dilutions are reduced to a minimum because the contrAA is able to adapt itself to any analyte concentration present in the samples – from the ppb- to the percent-range.

Complemented by a wide range of accessories including autosamplers and online-dilutors, flow-injection, and hydride generation systems, the contrAA 800 is the most versatile AAS available today.

Analytik Jena highlights its expertise in high-performance optics with a unique long-term warranty of 10 years on the optical components.

For More Info, email: 39085pr@reply-direct.com

Versatile Automatic Viscometers

The U-VIsc series, from **Omnitek** (the Netherlands) consists of 4 different models of fully automatic viscometers, ranging from 1 bath with 1 tube, up to 2 independent baths with 2 tubes each, offering a solution for each application and sample load. The modified Ubbelohde viscometers offer a 100-fold measuring range which eliminates the need to exchange tubes frequently. Fitted with an autosampler holding 16 positions per tube, and optional sample preheating as well as dual solvent cleaning, the system is extremely versatile and can be used for a multitude of applications. Its intuitive design combined with advanced control software provides ease of use yet allows for customisation based on sample characteristics.

email: 29711pr@reply-direct.com

email: 5478ad@reply-direct.com

VIDA: The Plug & Play Density Meter that Increases your Laboratory Efficiency

The VIDA density meter from **PAC** (USA) offers unmatched reliability in density measurement through a user-friendly, fully automated, one button-push operation. VIDA by ISL|PAC is based on the proven oscillating U-tube method and integrates innovative features that ensure reliable and accurate analysis.

The VIDATM analyzers integrate innovative features to ensure reliable and accurate analysis of light and mid distillates, heavy oils, food and beverage applications or mobile labs.

VIDA is designed to be a true "push-button" solution, based on the proven oscillating U-tube method. Its smart software automates every step of the test sequence from sample injection, bubbles detection to system cleaning and data reporting allowing minimal operator attendance but also enhanced flexibility. The automatic cleaning feature reduces maintenance time and consumption of solvents, even when testing difficult samples.

We offer integrated tables for automatic conversions of density output for: API crude oil, refined products & lubricants, as well as alcohols, acids, alkalis, sugars and customizable tables (VIDA80H).

Special functions guarantee a complete operation traceability together with extra quality assurance in data management and strict compliance with ASTM D4052, ASTM D5002, ASTM D5931, ISO 12185, ISO 15212-1, DIN 51757 and JIS K2249-1.

VIDA comes in several presentations for different applications:

For More Info, email: 39427pr@reply-direct.com

New 2016 Catalogue - Viscometers, Rheometers, Texture Analysers and Powder Flow Testers

Brookfield AMETEK (USA) has released their new 2016 full-colour catalogue with complete details on all product lines. The 2016 Catalogue announces the acquisition of Brookfield Engineering Laboratories by AMETEK, Inc., an NYSE listed company (symbol: AME). Brookfield joins AMETEK 's Instrumentation and Specialty Controls (ISC) Division within the Electronic Instruments Group.

The Catalogue also presents the New DVE Viscometer, the most affordable digital viscometer on the market, which features a brand new user interface and keypad. The updated DVE has a contemporary design, adopting the look & feel of the DV1, DV2T Viscometer and DV3T Rheometer family of instruments.

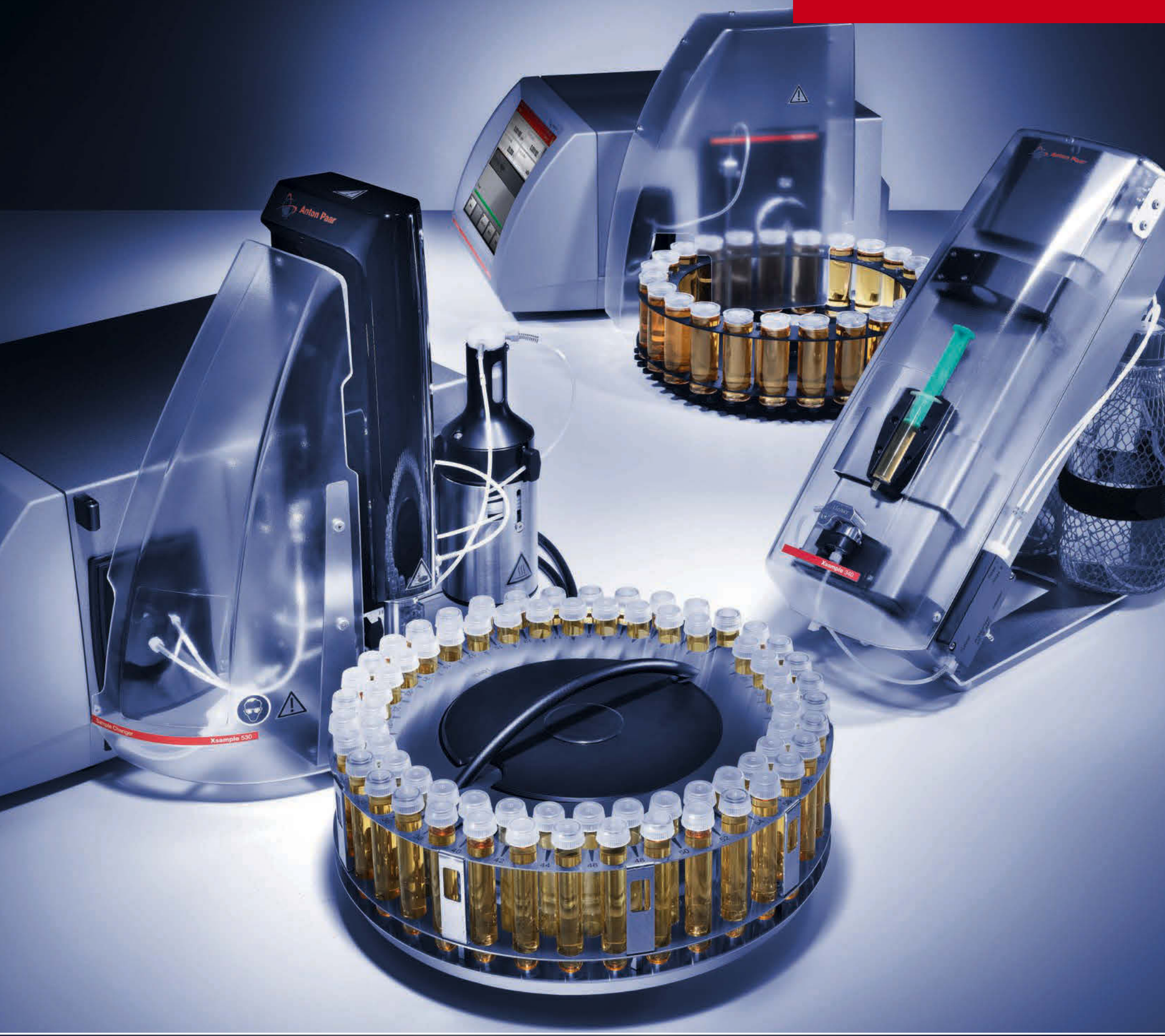
The 2016 edition also features an Option Guide for the RST-CC Coaxial Cylinder and RST-SST Soft Solids Tester Rheometers. The guide will help customers choose the correct spindles, chambers and other accessories for their particular application. Updated information for Rheo3000 Software is also presented and numerous charts have been updated throughout the catalogue.

This 2016 Catalogue includes Brookfield AMETEK's complete line of laboratory and in-line Viscometers/Rheometers, Texture Analysers and Powder Flow Testers.

For More Info, email: 38875pr@reply-direct.com

Your sample, our solution

Anton Paar



The Xsample series for automated sample handling

- Comprehensive and reliable sample handling
- Saves you time and money
- Robust and streamlined design
- Xsample 530 - Automated processing of up to 71 samples
- Xsample 340 - For your favorite syringe

Get in touch

www.anton-paar.com

email: 6094ad@reply-direct.com

Inert Coatings for Substantially Improving Analytical Accuracy

Measuring trace (ppm or lower) sulphur, mercury, and other emissions is both required by law and critical to productivity. SilcoNert- and Dursan- coated instruments from **SilcoTek** (USA) produce virtually instant readings with superior accuracy because critical compounds don't get adsorbed by stainless steel sample transfer equipment, an inevitable consequence of untreated metal.

Even electropolished flow paths take well over an hour to produce a signal without inert coatings. With them, analysts can start to see results within seconds of injecting the sample. This saves tremendous costs in the form of higher daily sample throughput, less labour, and compliance to environmental regulations.

The benefits of inert coatings aren't just limited to better instrument performance. Collecting samples off-site once entailed a frantic race to the lab to test them before important molecules were scavenged by the metal sample storage vessels. With SilcoNert- and Dursan- coated sampling equipment, trace-level samples can be adequately maintained for as long as 2 weeks without loss.

Dursan-coated sample cylinders retain almost 100% of H2S samples after 3 days. Uncoated cylinders consume nearly the entire sample within one day.

SilcoTek coatings offer the chemical resistance/inertness of PTFE but dramatically improved durability, temperature resistance, and adhesion. A SilcoTek coating can be used at 450° C and sometimes greater, whereas PTFE is destroyed above 230° C. SilcoTek's innovative chemical vapour-deposited (CVD) treatments are bound molecularly to the substrate so they won't flake, even on tubing that is bent or flexed.

Trust SilcoNert and Dursan coatings for any analytical application: Improve instrument performance and analytical accuracy, Fight corrosion, Reduce the impact of moisture in samples.

Easily integrate coatings into existing or new systems – just send your parts to SilcoTek for service or contact an Approved Partner to purchase already-coated parts.

For More Info, email: 38776pr@reply-direct.com

New Paper in Analytical Chemistry: Select TOF Spectrometer Unravels the Composition of Complex Motor Oils

Researchers at Birmingham University have used **Markes'** (UK) BenchTOF-Select time-of-flight mass spectrometer in combination with two-dimensional gas chromatography (GC×GC) to improve the separation and identification of hydrocarbons in motor oil.

The paper, entitled 'Using variable ionisation energy time-of-flight mass spectrometry with comprehensive GC×GC to identify isomeric species', shows how spectra acquired at 14 eV on BenchTOF-Select can be used to positively identify isomers from the previously unresolved complex mixture (UCM) in these samples.

The paper is the first literature citation of Markes' new Select-eV technology, which uses revolutionary ion-source technology to generate 'soft' electron ionisation spectra without the inconvenience of other approaches to soft ionisation.

The study, reported in the prestigious ACS journal Analytical Chemistry, was conducted under the FASTER program, which aims to monitor atmospheric pollution and establish the link to exhaust emissions.

Dr Mohammed Salim Alam, one of the principal researchers on this project, says Select-eV has "not only allowed us to observe the molecular ions of species, but has also led us to identify the positioning of branching of straight-chain aliphatic isomeric compounds due to their individual unique fragmentation patterns".

The authors conclude that "the combination of retention times in two dimensions and mass spectra at low and high ionisation energies confers unparalleled power to identify specific isomers within the chromatograms".

For More Info, email: 38553pr@reply-direct.com

email: 6047ad@reply-direct.com

Direct Mercury Analyser

The DMA-80 can analyse solid, liquid and gas samples with equal precision over a wide dynamic range. Analysis takes only five minutes per sample and requires no sample preparation so the need for any acid digestion or wet chemistry sample treatment is eliminated. This means ease of use, low running costs and no need for hazardous chemicals to purchase, handle and dispose. Moreover, the typical bottleneck in the analytical laboratory is eliminated and also the costs usually associated with traditional mercury techniques, such as CV-AAS, ICP-AES or ICP-MS.

The DMA-80 cost of analysis is minimised thanks to the speed of analysis, catalyst and amalgamator long lifetime, sample boats durability and the possibility of using air as combustion and carrier gas.

The DMA-80 uses the principle of thermal decomposition, mercury amalgamation and atomic absorption detection. It is extremely easy to use: just weigh your sample, load it onto the built-in auto-sampler and press 'start'.

Combining an innovative mercury measuring system with a unique optical path spectrophotometer, the DMA-80 achieves a detection limit as low as 0.001 nanograms of mercury and is capable of measuring up to a concentration of 300 mg/kg (300 ppm).

All the DMA-80 components, such as the catalytic furnace, amalgamator and spectrophotometer, are easily accessible for routine cleaning and maintenance.

The DMA-80 can be operated through a touch screen terminal or by using a standard PC. The EasyCONTROL software controls all the system functions, and provides valuable feedback on the instrument's performances.

The DMA-80 has been used to develop the US EPA method 7473 (Mercury in solids and solutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry).

It is furthermore compliant with ASTM method D-6722-01 (Total mercury in coal and coal combustion residues) and ASTM method D-7623-10 (Total mercury in crude oil).

For the past fifteen years, the **Milestone** (Italy) DMA-80 direct mercury analyser has offered labs around the world unmatched direct mercury analysis productivity, accuracy, safety and performance.

For More Info, email: 32597pr@reply-direct.com

Our next issue focuses on
Viscosity Measurement, Safety and Shale Gas Analysis and Monitoring.

If you'd like to share your news please contact our editor **Rachael Simpson** today

rachael@envirotechpubs.com

Modular Platform for Wet Chemical Analysis

Quality control in many industries depends on the routine analysis of a handful of key parameters. Often, determination of these parameters is distributed across several technologies and methods. This goes along with cumbersome aggregation of results and management of data from different sources. With the launch of the new, modular OMNIS platform for comprehensive wet chemical analysis, this situation will change.

The new modular platform by Metrohm integrates **comprehensive wet chemical analysis** focusing on titration methods at the time of its first release with the implementation of all other techniques of the Metrohm (Switzerland) portfolio (ion chromatography, spectroscopy, and more) scheduled to follow.

The benefits of **the new platform for multi-method analysis** are evident: No matter which parameters need to be determined and by which methods, the new, powerful software collects the results for each sample and shows them in a single report.

The **modular design and licensing concept** of the new platform enables users to scale up OMNIS step by step and customise it according to their requirements. Instead of investing in new analysers and software each time they need to push the limits of their installed base, users simply license additional functional modules as well as firm- and software modules to **scale up their OMNIS system.**

The modular concept of OMNIS also includes automation: OMNIS can be scaled up step by step from a stand-alone system for manual operation to a powerful robotic system enabling the analysis of up to 175 samples at 4 work stations simultaneously, completely unattended.

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Automated Titration of up to 175 Samples

Performing 4 different titrations simultaneously on a single, fully automated system is the new state of the art in titration. The new OMNIS platform by Metrohm includes an of x-y-z sample robot, taking the efficiency of wet chemical analysis to new levels.

Higher sample throughput …

Besides a titrator, the new OMNIS platform includes an x-y-z sample robot that is modular by design and accommodates up to seven racks with a maximum capacity of 175 samples altogether.

… on a smaller footprint …

It makes a substantial differences in terms of footprint to accommodate 175 samples on the square design of a modular x-y-z system vs. distributing the same number of samples across two or even three discrete autosamplers with turntables. The amount of bench space saved with the new titration platform is considerable.

… at a more competitive price …

As the capacity of turntable sample changers is inherently limited, pushing the limit used to mean investing in another autosampler and a titrator, possibly more, depending on the sample volume. Not so with the OMNIS platform. The OMNIS Sample Robot can be scaled up module by module from size S to M to L all connected to the same titration stand.

… in much less time

Fully automated parallel titration at 4 work stations means: getting the same number of samples analyzed for the same parameters up to three times faster than by sequential analysis. The titrations performed at 4 work stations can be all of the same kind or different ones – the new platform can handle both.

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New Adapter Technology Prevents Exposure to Hazardous Chemicals

Wet chemical analysis by definition includes handling liquid reagents. Exposure to chemicals during reagent exchange is a potential hazard to the health of laboratory workers, especially when removing aspiration tubes from bottles with toxic content. **Metrohm** (Switzerland) is pleased to present the OMNIS Liquid Adapter, a new technology that puts an end to this risk altogether by **handling reagents in a closed system** at any stage during reagent exchange.

The patented OMNIS Liquid Adapter is simply snapped onto a corresponding bottle cap that is part of the reagent bottle. As soon as this liquid adapter is connected to the bottle cap, reagent from the bottle can be aspirated by the system and the analysis can be started.

Artificial intelligence further enhances this new system enabling **unambiguous identification and monitoring of the reagent** at all times. To this end, the bottle cap contains an **RFID chip with complete information** about the content of the bottle. Upon connection to the Liquid Adapter, OMNIS identifies the reagent and checks it against the specifications of the method to be performed. This check prevents user errors and provides full traceability of the titration.

For More Info, email: 39228pr@reply-direct.com

TITRATION FASTER, SAFER & EASIER!

OMNIS is the new, modular titration platform by Metrohm. Scale up OMNIS module by module from a simple stand-alone analyzer to a powerful robotic system performing 4 fully automated titrations simultaneously! No matter the measurement, liquid handling, or automation requirement, OMNIS is:

- FASTER – Analyze 175 samples on 4 workstations completely unattended
- SAFER – Exchange reagents without opening bottles
- EASIER – Configure work systems intuitively by drag and drop
- MORE EFFICIENT – Whichever parameters you determine and by whichever methods, get the results in a single report

More information at **omnis.metrohm.com**

Metrohm

email: 6266ad@reply-direct.com

PRECISION + LOWER OPERATION COST + MINIMUM INITIAL INVESTMENT = CID 510

Refineries must analyze their end products frequently and precisely in order to contain the costs associated with adding cetane improving additives, while meeting the specification. Constant Volume Combustion Chamber (CVCC), is an easier and more precise technology developed to substitute the CFR Engine, which is difficult to perform and costly.

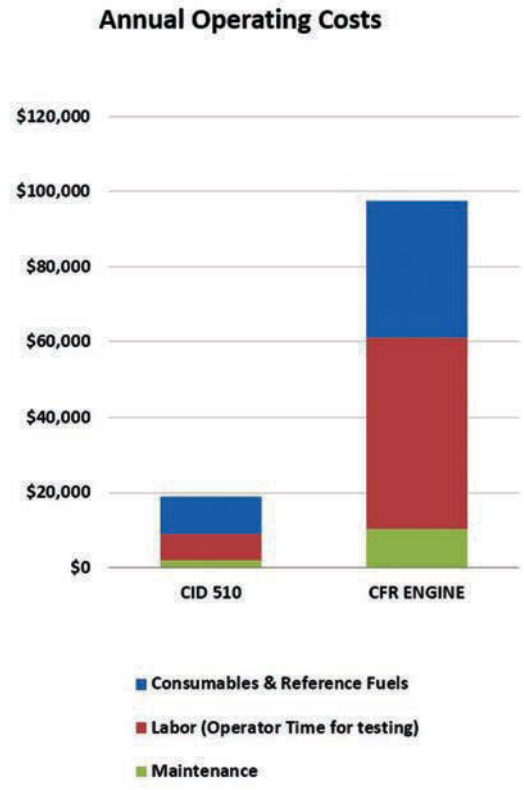
By combining an electronically controlled high pressure injection system with fully automated measuring and calibration procedures, the CVCC technology reached a new level of precision.

CID 510

Herzog by PAC pioneered this new technology in its CID 510 instrument which already has wide acceptance in the global market. With this unique technology, the CID 510 provides excellent precision in the complete DCN range from 15 to 100.

A joint ASTM and Energy Institute Inter-laboratory study with 20 samples including different diesel grades, biodiesel blends, biodiesel (B100) and samples with different cetane improver content was completed in March of 2013. A group of 17 laboratories participated from the United States and Europe to compare the cetane number determined with the CFR Engine and the DCN determined with the CID 510. The highly precise results for the DCN from the CID 510 achieved in this ILS are published by ASTM and CEN TC19 in the ASTM D7668 and EN 16715 test methods.

Test methods ASTM D7668 and EN 16715 for our CID 510 are officially approved as alternative test methods to the ASTM D613 / ISO 5165. Since 2015, ASTM D7668 is listed in the following diesel specifications: ASTM D975, ASTM D6751 and ASTM D7467. The European equivalent test method EN 16715 should be listed in the European Diesel Specification EN 590 by the end of 2016, since CEN TC19 WG 24 has already approved it.



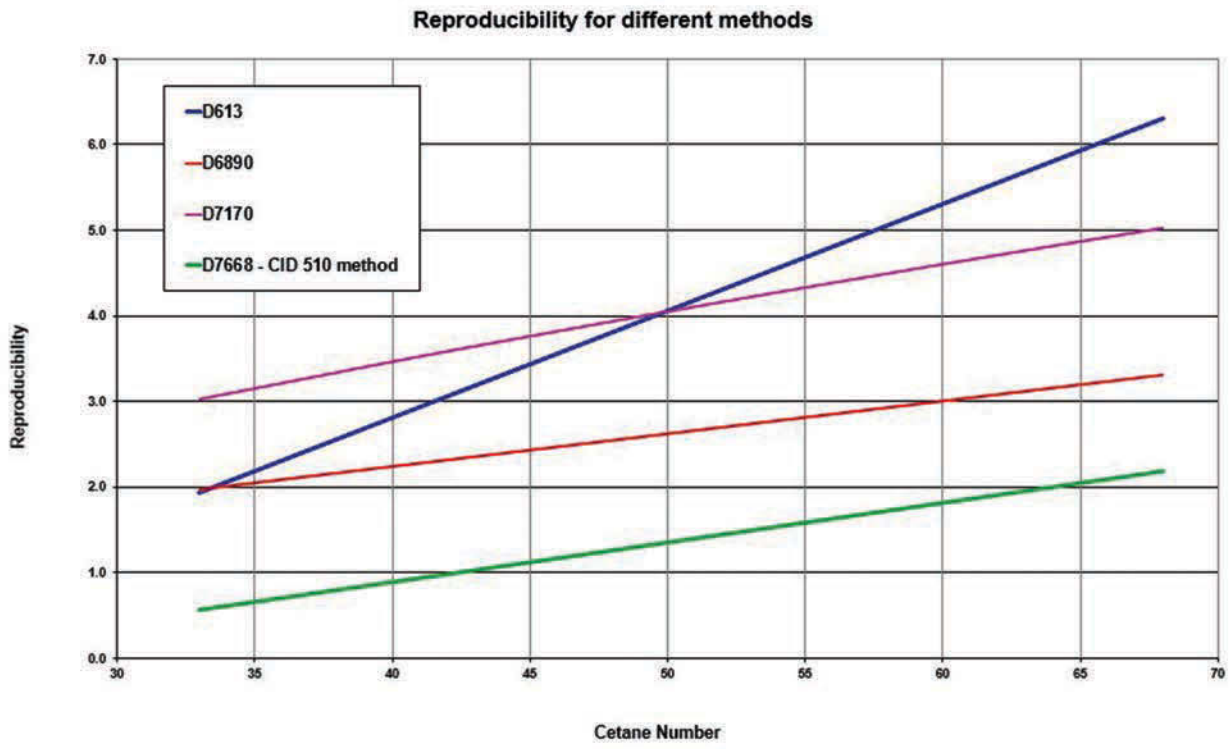
Annual Operating Cost

Besides excellent precision and perfect correlation to the reference methods ASTM D613 and ISO 5165, the CID 510 provides numerous benefits, including:

- **Improved ease of use** – fully automated measurement and calibration
- **High safety standards** –fully enclosed with over-temperature and over-pressure protection. Includes a built-in fire monitoring and extinguishing system.
- **Reduced maintenance** – with soot less combustion, operators do not need to clean the test chamber. Thanks to the high calibration stability operators don't require to do weekly or daily calibration
- **Space saving** – CID 510 is a bench-top model approximately 70% smaller than the CFR Engine

Refineries are constantly trying to contain costs while meeting ever-increasing fuel regulations. With electronically controlled high pressure injection technology and measurement of ID and CD (ASTM D7668) from the Herzog CID 510, the cetane number results are much more precise, which ultimately increases the refinery's profitability.

The Herzog|PAC CID 510's initial investment cost is less than half than the competition. The operational cost for: reference fuels to run the test, operator time for testing, calibration and maintenance costs can be reduced by 80% compared to the CFR engine operational costs. The high level of precision and low operational costs guarantee the CID 510 is the best option in the market.



ISL Study

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A Reliable Solution to Asphaltene Stability Measurement to ASTM D7157

The **ROFA** (France) S-Value analyser, was produced, in collaboration with a major petroleum company, to offer refineries and their customers rapid and accurate fuel stability analysis. ROFA are specialists in the development of analysers and CRMs for the petroleum sector. Their S-Value Analyser conforms to ASTM Method D7157, is very user friendly and gives users a quick return on investment.

When a fuel is unstable a sludge can form. This is bad news for both the refiner, who will lose valuable stock due to precipitation, not to mention the associated problems from blockages in the process. The end user will also suffer loss of stock and other problems such as filter chocking in engines. These sludges can form when the fuel is made up from different cycle streams at the refinery, or when they have a mixture of different fuels. The use of visbreakers can lead to coke formation too, however, the resultant suspended particles are usually too small (less than 5 microns) to create a major problem in terms of engine blockage or other components such as fuel filters. One approach to this problem has been for refineries to moderate the use of the visbreaker and stream in an aromatic diluent. This reduces the level of viscosity to the desired level, whilst aiding the fuel stability and homogenisation. Another, more primitive method, still used at some refineries has been to 'drop test' by dropping a sample of fuel on to porous paper and checking the resultant rings, asphaltenes form small rings at the centre of the paper, whilst the oils form wider rings. This method, whilst low on cost, does not offer a great level of accuracy. The results from a drop test can vary significantly even when using the same fuel, the same paper and the same operator. Using this old fashioned method can make a stable visbroken fuel appear unstable, which usually results in the need for costly, additional blending materials and a restriction of the effectiveness of the visbreaker. Clearly a solution to this problem was needed – and ROFA have provided it with their S-Value Analyser.

The S-Value Analyser operates by performing three titrations to ensure optimum accuracy when determining the actual points of precipitation. A further 'regressive' analysis then ensures the accuracy of the analysis. Three separate mixtures from the sample are prepared with toluene (an aromatic solvent)and then titrated minutely with heptanes (a paraffinic solvent), thus three readings of the asphaltenes' precipitation are taken through three optical probes. This analyser is computerised, working with Windows 7 based software. This unit includes a number of in-built safeguards and reminders to assist the operators. It measures three parameters: the stability of the sample, aromaticity of the asphaltenes (the ability of the asphaltenes to stay in colloidal dispersion) and the aromaticity of resins (their ability to maintain asphaltenes in colloidal The analyser comes complete with weighing scales, beakers, heaters optical probes, titration pumps etc. This versatile unit can handle large volumes of analytes cover the wide variety of feed stocks to the final, refined product, from crudes through to visbroken residues.

ROFA's analyser allows optimum performance from the Visbreaker, with rapid, highly accurate and constant monitoring of the output's stability. The S-Value Analyser has a unique ability to handle a large quantity of samples within a very short timeframe quickly and efficiently. An S-Value analyser can not only indicate the current stability of a fuel, but also show potential instability. This is an unsurpassed solution for operators of refineries to perform their analysis to ASTM 7157-05 and aim for optimal refinery performance.

This analyser is ideal for analysis of fuels in marine and stationary engines of diesel generating sets. In the case of these engines the viscosity stipulation is totally different at 180 CST maximum at 50 degrees Celsius. To reach this viscosity requirement , the visbreaker needs to be operated at a temperature of 470 degrees Celsius, which can make the fuel unstable. However, further usage of aromatic diluents have two major drawbacks, firstly the combustion quality of the fuel will dissipate due to the aromatic nature of the diluent and there will be significant value downgrade of a higher diluent stream to FO (the preventable wastage aspect).

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Using Pyrolysis as a Laboratory Tool to Save Time and Money in Biofuel Analysis

CDS Analytical Inc. (USA) is offering a paper detailing the use of pyrolysis on a micro scale to save time and money in biofuel analysis. Source materials currently being studied using laboratory pyrolysers include switchgrass, wood mess, and municipal waste. Laboratory pyrolysers are used to study sample sizes in the micro-to-milligram range and offer variable set points and heating rates. Many samples can be run easily under controlled conditions. Being able to run a high volume of small samples should result in savings of time and money when scaling up, either to a larger laboratory or pilot reactor.

The paper includes graphs of comparative runs of wood biomass and biomass pyrolyzed at 750 ° in helium at 10 PSI using a CDS 5200 HPR with a proprietary reforming catalyst. Extensive lists of laboratories performing biomass research and published papers on the subject are provided for the convenience of those interested in additional information. The paper can be downloaded from CDS Analytical's website.

For More Info, email: 35781pr@reply-direct.com

NSure: Determine Total Sulfur and Total Nitrogen in a Single Analyser

PAC (USA) announces the next generation of Sulfur and Nitrogen analyser for gas, LPG and liquid samples. Users will be able to measure total sulfur, total nitrogen or both in a single analyser.

With its large installed base, Antek by PAC has proven to be a global leader in lab and on-line elemental analysis instrumentation. Antek pioneered total sulfur and total nitrogen analysis utilising pyro-fluorescence and pyro-chemiluminescence technology.

Leading Technology

The Antek UV-Fluorescence (UVF) spectrometry technology for sulfur and chemiluminescence detection (CLND) technology for nitrogen are fast and accurate, providing determinations from ppb to percent levels within minutes. These methods eliminate any matrix interference problems providing accurate results to even very low levels of sulfur and nitrogen.

NSure uses the same proven technology of its previous model - the 6200 - to ensure lab accuracy with process robustness. By utilising the same technology that labs use to qualify products, NSure enables plants to ensure regulatory compliance while operating as close to the upper limit to maximise profitability with continuous and precise measurements that correlate with the primary test methods.

NSure's innovative design can operate over a wide range and withstand process swings. Its complete combustion of the sample allows for fast response even in difficult process conditions.

"We are excited about the new addition to our process analytics portfolio. Based on relevant industry feedback, we have significantly improved our elemental platform to serve a variety of applications for years to come", said Lisa Houston, General Manager PAC Process Analytics.

Contact PAC for more information: ProcessSales.usa@paclp.com.

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Trend-Setting New Instrument Introduced for Vapour Pressure Testing

AMETEK Grabner Instruments (Austria), a worldwide leader in automatic petroleum testers, announces the launch of a new, highly versatile and portable vapour pressure tester-- the MINIVAP VP Vision. The new analyser features significant improvements in terms of measurement range that allows one instrument to measure gasoline, jet fuel, crude oil, LPG and solvents (without needing to attach a pressure regulator).

The analyser is certified to work in cold as well as hot and damp climates and has a demonstrated ability to withstand vibrations and heavy shocks coming from any direction. It is the ideal tester for mobile laboratories, military applications and harsh, demanding environments.

The MINIVAP VP Vision is the first vapor pressure tester to demonstrate excellence in engineering and quality. It offers an extended pressure range of 0 to 2000 kPa without compromising precision. Long-term testing has demonstrated an unmatched repeatability of less than 0.2 kPa. Grabner's newly developed 2D-Calibration Correction Field (273 points) and exact piston positioning guarantee that accurate and precise results are received over the full measuring range. In addition, the MINIVAP VP Vision features Grabner´s Sampling Pro valve design, which provded during ruggedness testing to be the best-in-class, piston-based design for minimising cross contamination between various sample types.

The MINIVAP VP Vision uniquely combines ease of use with flexibility. A modern, app-like user interface makes it easy to select, start and follow measurements directly on an industry-proven 10" touch screen. In addition, Grabner's Cockpit PC software offers lab managers the utmost in flexibility. The software allows users to consolidate measurement results and statistics from multiple locations at one central lab and to store measurement data at any chosen location via direct Ethernet and LIMS-connection. The software can be accessed through a secure VPN tunnel, allowing true mobile access to instruments from any place at any time.

For More Info, email: 37940pr@reply-direct.com

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How Direct Mercury Analysers can Help the Petrochemical Industry with Mercury Analysis

The accumulation of mercury throughout the petrochemical refinery process continues to cause severe operational difficulties for refineries.

Mercury concentrations vary greatly in crude oil and condensate samples. Sample preparation procedures are labour intensive and time consuming.

Analysing samples for mercury therefore remains a significant drain on resources and time.

The DMA-1 and DMA-80 direct mercury analysers from Milestone, distributed in the UK by **Analytix,** are helping laboratories in the petrochemical industry to optimise their mercury analysis processes.

The DMA-1 is a manual single analysis system that is designed for laboratories with low sample throughput. The DMA-80 is an automatic sample analyser with capacity for 40 samples, designed for larger workloads.

Neither system requires any sample preparation prior to analysis thus eliminating the risk of mercury loss and cross contamination. This also means ease of use, low running costs, and no need for handling and disposal of hazardous chemicals. In addition both systems have the advantage of 'running on air' that removes the requirement for in-house or bottled gases.

Both analysers allow rapid direct mercury analysis of a wide range of sample types that are typically tested in the petrochemical industry, such as fuels, oils and polymers, and inorganic samples such as catalysts. They can analyse solid, liquid, and gaseous samples in approximately five minutes per sample, with excellent sensitivity. There is also no need to calibrate the instrument every day, the calibration curve can be stable for up to several months which greatly simplifies routine analyses.

The DMA-1 and DMA-80 have been used to develop the US EPA method 7473. They are also compliant with ASTM D-6722-01 and ASTM D-7623-10.

Both analysers optimise the analytical workflow from start to finish, improving analytical data quality whilst reducing the time taken to achieve results. Analytix additionally offers a highly sensitive Fluorescence Mercury Analyser – FMA-80 – for mercury analysis in liquids.

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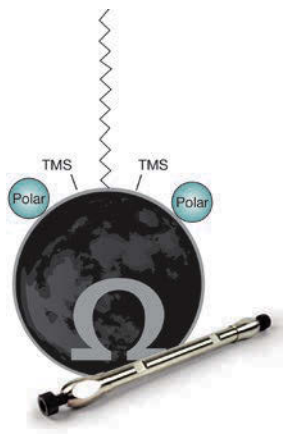
Permeation Tubes for Light Hydrocarbons

The **Kin-Tek** (USA) Trace Source 57 Series refillable permeation tubes extend the range of analyte compounds to include light hydrocarbons and other gases with vapour pressures too high for conventional permeation tubes. The 57 Series tubes are used in the Kin-Tek FlexStream calibration gas generator to produce ppm and ppb mixtures directly from pure gases.

Typically permeation tubes contain a liquefied analyte under its vapour pressure at the operating temperature of the permeation tube. This limits the range of compounds available in permeation tubes. 57 Series tubes use only the gas phase of the compound. Controlling the pressure in the tube allows high vapour pressure compounds such as methane, ethane, or ethylene to be dispensed by permeation. Emission rate is proportional to the compound pressure in the tube. For very low emission rates the compound can be sealed in the tube. For higher emission rates tubes should be used with the FlexStream GF Module to allow for compound pressure control and periodic purge and refill.

Mixtures can also be diluted if the tube is certified for each gas in the mixture. Single step dilution ratios of 1000:1 to over 50,000,000:1 can be attained allowing ppb mixtures to be made directly from the pure analyte compound.

For More Info, email: 35310pr@reply-direct.com



Enhanced Polar Retention with New Polar UHPLC Columns

Phenomenex (USA) has added even more separation power to its novel UHPLC product portfolio with the introduction of the Luna Omega 1.6 µm Polar C18 stationary phase.

The Luna Omega Polar C18 is a novel UHPLC stationary phase capable of providing a unique selectivity within a wide elution window and increased retention for both polar and non-polar analytes. The all-purpose C18 ligand provides hydrophobic interactions while a polar modified particle surface delivers enhanced polar retention and aqueous stability. The ability to get combined retention of polars and non-polars by the Luna Omega Polar C18 means that this column has a very wide applicability and can be used in nearly every industry that depends on UHPLC instrumentation, including those that work with large compound screens, metabolite/impurity profiles, and even unknown natural products.

Compared to traditional alkyl phases, the Luna Omega Polar C18 offers greater polar compound retention. This can broaden the solvent systems at a chromatographer's disposal for method development while also helping to deliver desired resolution between important compounds or even move peaks out of matrix suppression zones to allow for greater sensitivity. Unlike traditional C18 stationary phases, the polar modified surface of the Luna Omega Polar C18 gives it stability in 100 percent aqueous mobile phase conditions. This is useful for methods that may require resolution of problematic polar (acidic or basic) compounds that have poor retention under reversed phase conditions.

The Luna Omega Polar C18 can also be used to upgrade existing UHPLC methods. With a novel and finely tuned manufacturing process, Luna Omega 1.6 µm UHPLC silica is produced at the highest quality and consistency to ensure high efficiency, surface area, mechanical strength, and inertness. These attributes in combination with industry-leading packing technologies and a unique selectivity profile will potentially allow customers to realize lower limits of detection with increases in sensitivity levels as well as efficiency/peak capacity gains that aid in the resolution of closely eluting peaks. Combining the Polar C18 with the previously released fully porous Luna Omega C18 and Kinetex 1.7 µm core-shell phases further expands the options for UHPLC method development and improvement.

Enhanced with 20 years of technology, innovation, and experience, Luna Omega 1.6 µm columns build upon the Luna legacy to provide incredible UHPLC performance and selectivity. Now, with the addition of the Luna Omega Polar C18 stationary phase, the benefits of greater polar retention and 100 percent aqueous stability are also easily within reach.

For More Info, email: 39081pr@reply-direct.com

High-Performance, Near Infrared Analysers for Laboratory and In-Line Measurements

Grabner Instruments (Austria), inventor of and a world leader in vapour pressure testing, has expanded its product offering with the addition of near infrared (NIR) analysis from Light Technology Industries (LTI). Grabner Instruments will market, sell and support LTI NIR process analysers worldwide.

Based in Gaithersburg, MD, LTI has been known for 30 years as an innovator in the field of NIR analysis. With an installed base of over 1000 systems, LTI's products include both in-line process and benchtop analysers, which complement Grabner's in-line and laboratory instrumentation for petroleum testing.

LTI instruments provide solutions throughout the refining process from crude oil to refined fuels. Its instruments offer rapid, non-destructive measurement of chemical properties and help to reduce laboratory costs, while improving process controls in refineries and chemical plants. In all cases, its ability to quickly measure physical and chemical properties easily, accurately and in a non-destructive manner provides significant value for LTI instrument users.

LTI's ParaFuel NIR process analysers are used by national, state and corporate laboratories for octane, pump quality testing and other fuel measurements such as biodiesel content. The analyser provides real-time in-line analysis of crude oil, blended fuels and components, diesel, gasoline, jet fuel, kerosene and other petroleum fractions for a wide range of critical properties, including octane, distillation points, Reid vapour pressure and more. It also is available in a benchtop version designed to improve laboratory efficiency.

For More Info, email: 35994pr@reply-direct.com

Accurate Instrument Calibration for Analytical Applications

AlyTech (France) recently introduced the GasMix version: Zephyr! This two channel dilution system is the perfect companion of the scientist who needs to accurately calibrate an analytical instrument. Whether it is a GC application, elemental analyser or any kind of gas application, Zephyr will produceand deliver multilevel calibration gas material.

Starting from a pure or concentrated gas cylinder Zephyr can automatically decide and prepare up to 10 levels of concentration, including low and trace levels.

The Zephyr software is integrated in a microcontroller with a touchscreen and no computer is necessary. The software offers unique features such as live calculation of incertitude of final concentration and smart sequencing (based on the number of points, the maximum and minimum concentrations of the range). Lightweight and with a very small footprint the Zephyr is easy to move from one bench to the next, keeping up to 10 methods in memory.

For More Info, email: 36097pr@reply-direct.com

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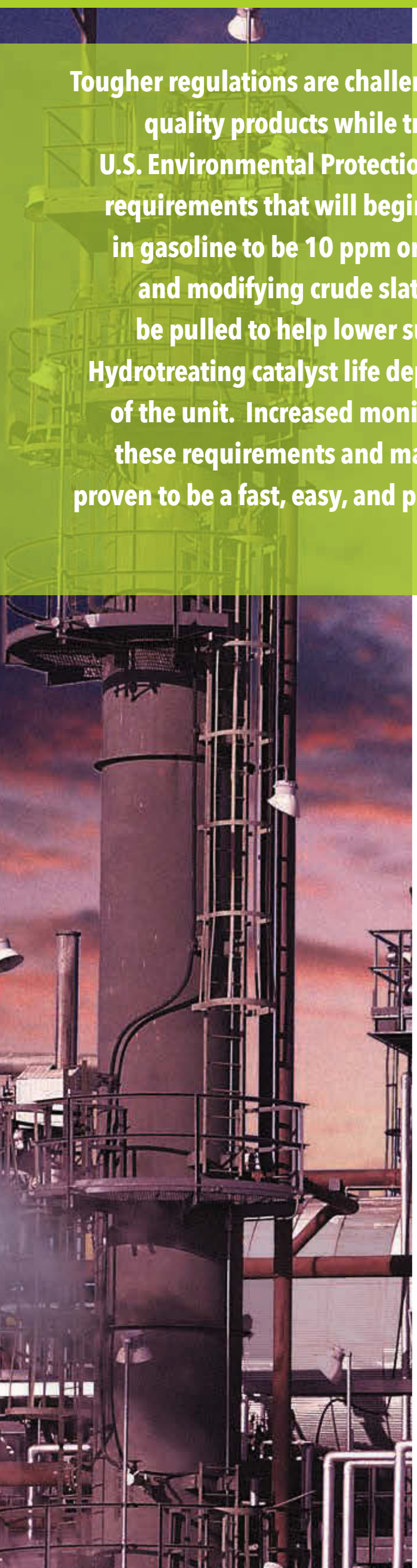
IMPACT OF TIER 3 PROGRAM



Tougher regulations are challenging refiners to produce higher quality products while trying to maximize efficiency. The U.S. Environmental Protection Agency (EPA) is enacting Tier 3 requirements that will begin in 2017 requiring sulfur levels in gasoline to be 10 ppm or lower. Increased Hydrotreating and modifying crude slate are some of the levers that can be pulled to help lower sulfur levels in finished products. Hydrotreating catalyst life depends on the feed and operation of the unit. Increased monitoring will be critical in meeting these requirements and maximizing efficiency. WDXRF has proven to be a fast, easy, and precise method to measure sulfur in hydrocarbon streams.

Beginning in 2017, the EPA will begin enforcement of the Tier 3 Regulations on Gasoline. Current Tier 2 regulations allow an annual average standard of 30 ppm sulfur in gasoline which will be lowered to 10 ppm on January 1st, 2017. In order to meet these lower sulfur levels, refineries must invest in new or upgraded equipment, modify operations or a combination of both. Regardless, it will increase the cost of producing gasoline.

US refiners have had more choices of crude types in recent years. Heavy, sour crude provided cost advantages as these were priced lower. Refiners modified equipment and operations to accommodate the cheaper crude. Figure 1, illustrates the trend of US sulfur content and API Gravity from 1985 through 2015. Crude trended heavier and sulfur content increased as technology improvements were made to suit these cost-effective feedstocks. Advances in drilling techniques led to readily available Light Tight Oils to serve the refining market and lessen dependence on less stable crude sources. Although these feeds were lighter and had little sulfur, they pose other challenges to refiners. Specifically, they tend to be high in waxes and are prone to fouling.

As crude sulfur levels increased, refiners invested heavily in sulfur removal. This was done to capitalize on the cheaper high sulfur crude as well as meet increasingly stringent sulfur specifications on finished products. Between 1985 and 2015, desulfurization capacity nearly doubled from 8.9 Million Barrels per Stream Day to over 17.3 Million Barrels per Stream Day. Figure 2, shows the relationship between US crude sulfur levels and US refinery desulfurization capacity.

For the implementation of Tier 3 regulations, refiners are looking at increasing desulfurization at the fluid catalytic cracking unit (FCCU). The entire feed can be pre-treated or the gasoline can be post-treated or a combination of both. Careful consideration must be given to factors such as hydrogen availability, heat balance, catalyst type, incoming sulfur content, feed nitrogen content, and planned cycle life. Pre-treating feed provides several advantages for sulfur removal. Pre-treating will remove metals and nitrogen, which are poisons to the FCCU catalyst. Additional hydrogenation from pre-treating will increase conversion in the FCC process. Conversely, pre-treating can be very expensive and may not be possible due to heat or hydrogen limitations. Post-treating the gasoline stream may be an easier option, although there is significant reduction of octane in the process. FCCU gasoline contains valuable olefins that contribute to the octane. Post-treatment will reduce the octane number of the gasoline by conversion of valuable olefins, which must be supplemented by reformate.

For every part per million of sulfur removed, a refinery spends significant money on capital, hydrogen, catalyst, and energy. The related downtime to catalyst change out must also be factored into the equation. Catalyst has a finite life, and that length of time is dictated by how the Hydrotreater is operated. By varying temperature, space velocity, and hydrogen partial pressure, sulfur removal and catalyst life are impacted. Crude slate can be modified to reduce total sulfur content and reduce strain on sulfur removal equipment. Crude swaps come at a cost, either in the form of higher purchase price, creating problems on other refinery units, or product yield.

Regardless of what method is utilized to produce gasoline at these lower sulfur levels, monitoring sulfur levels will be critical in controlling costs. Optimization is dependent on knowing the sulfur levels at all times, accurately and reliably.

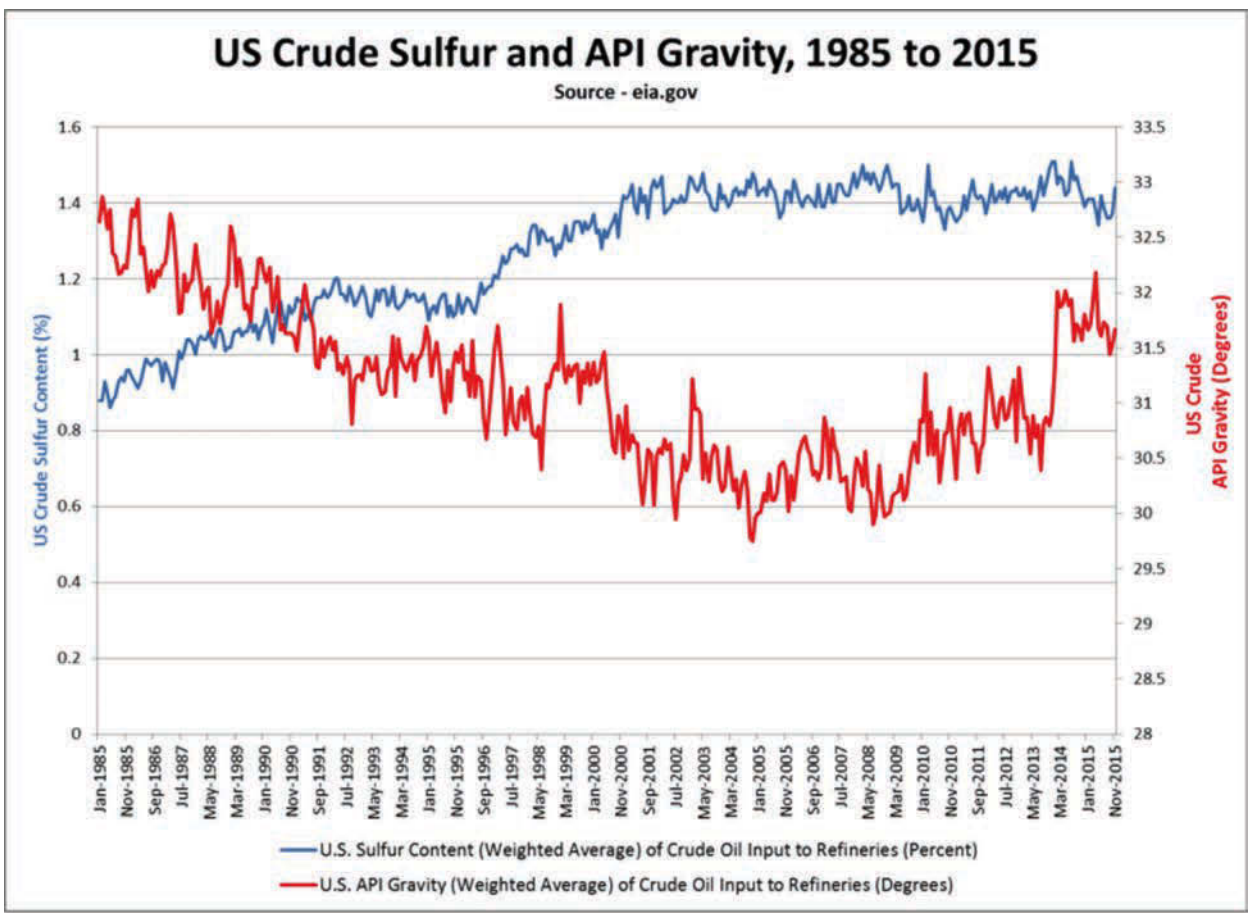


Figure 1. US Crude Quality (Sulfur Content and API Gravity) – EIA.GOV.

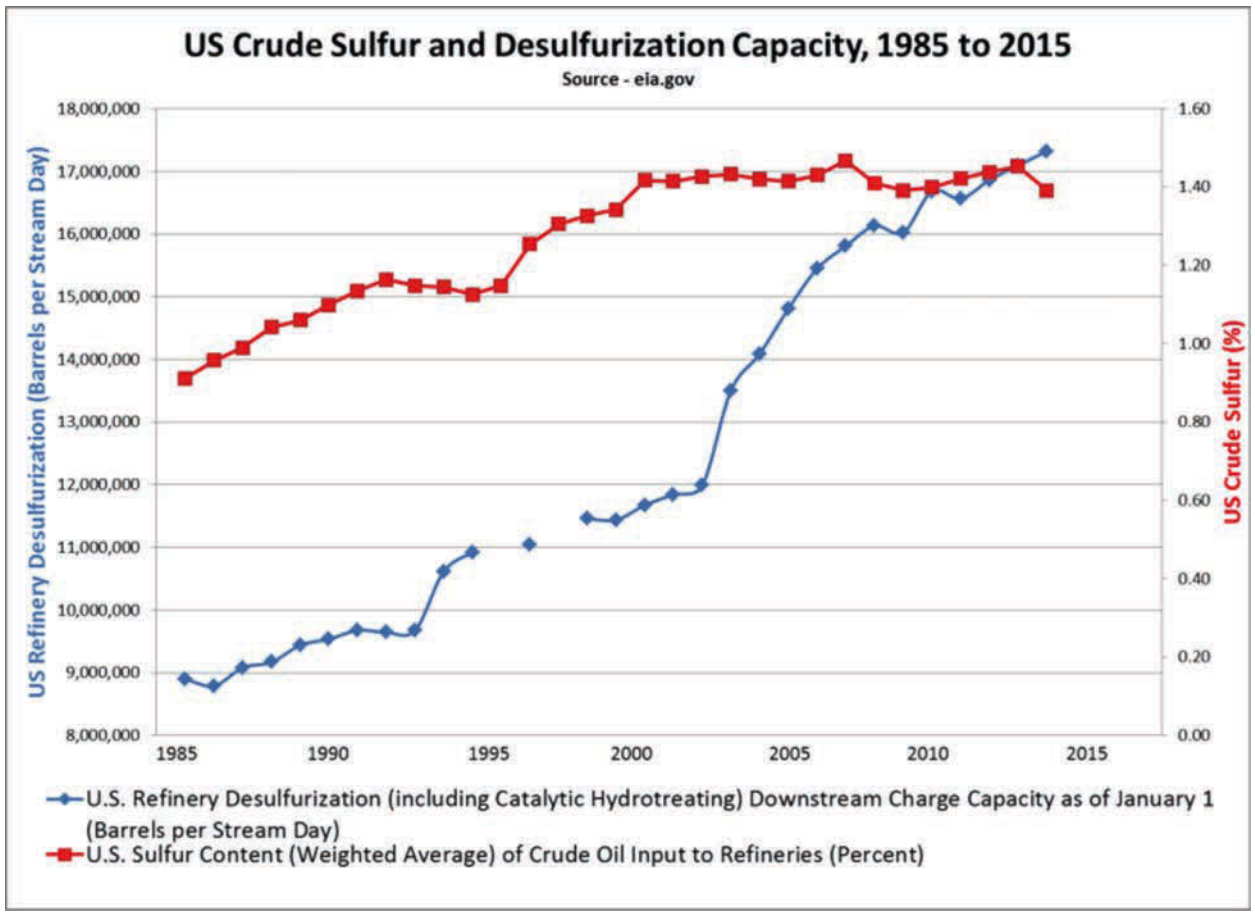


Figure 2. US Crude Sulfur Content and Desulfurization Capacity – EIA.GOV.

Total Sulfur Methodologies and Technologies

There are a number of different technologies available on the market for testing sulfur in liquid petroleum products, due to regulations and requirements around the world. Shown below is a table outlining the different relevant technologies and their correlating methods. Process analyzers based on these technologies typically correlate to the respective laboratory method, or in some cases may have a method of their own.

Table 1. Total Sulfur Methods

ASTM Method	Technology	Range	Scope Fuel Types
D2622	WD XRF	3 ppm - 4.6 wt.%	Diesel fuel, jet fuel, kerosene, other distillate oil, naphtha, residual oil, lubricating base oil, hydraulic oil, crude oil, unleaded gasoline, gasoline-ethanol blends, and biodiesel
D4294	ED XRF	17 ppm - 4.6 wt.%	Diesel fuel, jet fuel, kerosene, other distillate oil, naphtha, residual oil, lubricating base oil, hydraulic oil, crude oil, unleaded gasoline, gasoline-ethanol blends, biodiesel, and similar petroleum products
D5453	UVF	1.0 - 8000 ppm	Liquid hydrocarbons, boiling in the range from approximately 25 to 400°C, with viscosities between approximately 0.2 and 20 cSt at room temperature. Including naphtha, distillates, engine oil, ethanol, FAME, and engine fuel such as gasoline, oxygen enriched gasoline (ethanol blends, E85, M85, RFG), diesel, biodiesel, diesel/biodiesel blends, and jet fuel.
D7039	MWD XRF	3.2 – 2822 ppm	Gasoline, Diesel Fuel, Jet Fuel, Kerosene, Biodiesel, Biodiesel Blends, and Gasoline-Ethanol Blends

In this paper, we will discuss the performance and precision of the D7039 method using MWD XRF technology. This technique utilizes high performing doubly curved crystal (DCC) optics coupled with a low power X-ray tube creating a low maintenance, highly precise technology. MWD XRF is a simplified and highly robust X-ray technique which provides sub-1 ppm sulfur detection. An MWD XRF analyzer engine (Figure 3) consists of a low power X-ray tube, a point-to-point focusing optic for excitation, a sample cell, a second focusing optic for collection and an X-ray detector. The first focusing optic captures a narrow bandwidth of X-rays from the source and focuses this intense, monochromatic beam to a small spot on the sample cell. The monochromatic primary beam excites the sample and secondary characteristic fluorescence X-rays are emitted. The second optic collects only the characteristic sulfur X-rays and focuses them on the detector. The analyzer engine has no moving parts and does not require consumable gasses or high temperature operations. MWD XRF removes the scattered background peak created by the x-ray tube increasing the signal-to-background ratio (S/B) by a factor of 10 compared to conventional WD XRF technology. The S/B is improved by using the monochromatic excitation of the x-ray source characteristic line. Additionally, the focusing ability of the collection optic allows for a small-area x-ray counter, which results in low detector noise and enhanced reliability.

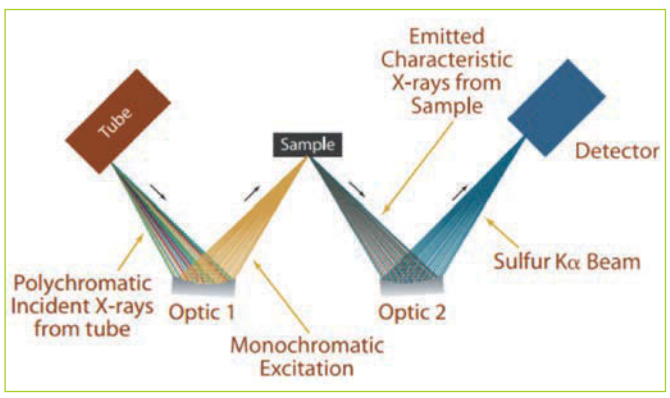


Figure 3. Typical MWD XRF Setup

The WDXRF technique has been accepted practice for measuring sulfur in petroleum liquids for many years. However, when regulations for highway diesel moved to less than 15 ppm at the point of use, mandated by the EPA in 2006, improvements to the analytical instruments and revision to the method was required in an effort to remain competitive with emerging techniques. Similar evolution of the UVF method has taken place while EDXRF has not yet established itself as a viable ultra-low sulfur measurement technique. MWDXRF, on the other hand, was developed specifically to address the need of refiners and petroleum distribution partners for a simple measurement technique, ideally suited for single element, ultra-low sulfur measurements.

The D7039 method (MWDXRF) is essentially a subset of D2622 (WDXRF) with some important distinctions. The excitation X-ray beam of a WDXRF instrument is polychromatic whereas the MWDXRF excitation beam is monochromatic. For both, the output of the X-ray tube comprises the characteristic energy of the target element and the Bremsstrahlung spectral energy associated with the production X-rays by electron acceleration in a vacuum tube. The target element is chosen for a characteristic X-ray just high enough in excitation energy to produce X-ray fluorescence of the element of interest (sulfur) but low enough to minimize background scattering.

WDXRF instruments aim the multi-energy beam at the sample and the resulting beam is typically collimated and aimed towards a diffraction crystal, where it is then diffracted to a detector. Acting as a filter, the diffraction crystal is selected and physically arranged to direct the characteristic X-rays of the element(s) of interest towards the detector. The detector sees a spectral background with distinct peaks associated with the element(s) of interest rising above the background.

MWDXRF instruments, on the other hand, direct the excitation beam to a doubly curved crystal (DCC), selected and aligned such that the maximum beam flux is captured and only the characteristic energy of the target is diffracted towards the sample. Figure 4, below illustrates the Polychromatic (left side) and Monochromatic (right side) excitation beams. With the DCC, the monochromatic excitation is a highly focused, single energy beam incident for the sample. This in turn results in a cleaner fluorescence signal of the sample with far less scattering, which is then directed to another doubly curved crystal for selecting only the characteristic energy of the element of interest to be diffracted to the detector. The end result is a single energy peak with very little spectral background. This is what delivers a signal-to-background ratio improved by a factor of 10 over WDXRF. It also allows use of a much lower power X-ray tube. Figure 5 illustrates the impact of the second DCC.

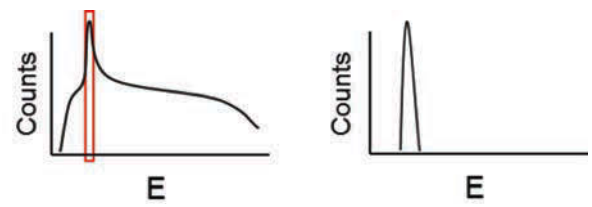


Figure 4. Polychromated (left) and Monochromated (right) Beams

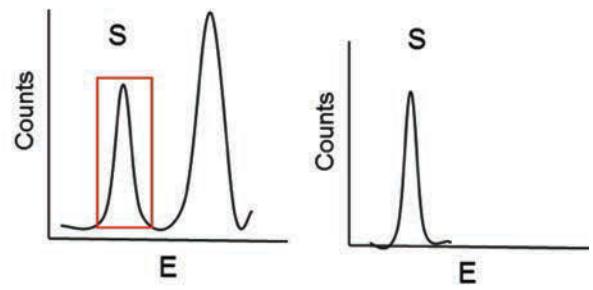


Figure 5. Flourescent Signal Before DCC (left) and after DCC (right)

For both techniques, the detector can be a proportional counter and a pulse height analyzer is required. In the case of MWDXRF, the pulse height analyzer can consist of an integrated pre-amplifier/amplifier/ single channel analyzer, since only a single energy appears in the spectrum.

Value of Precision

American Society for Testing and Materials (ASTM) methods such as D7039 are required to include full precision statements that include a repeatability and reproducibility component. Repeatability (r) is the variation of two measurements within a 95% confidence interval taken on one instrument of the same sample under the same operating conditions. Reproducibility (R) is the variation of running the same sample at different test sites using similar equipment. The ASTM D7039 precision statement was updated in 2013 to include a repeatability (r) for all products of 0.4998 * X^0.54 and a reproducibility (R) for all products of 0.7384 * X^0.54. With process instrumentation, reproducibility becomes critical. If the process can be continuously and quickly monitored, variation can be identified and optimization can be handled. As compared with the other methodologies in Table I, D7039 offers superior reproducibility from 5-10ppm which is critical for the Tier 3 mandate. As seen below in Figure 6, MWDXRF provides better reproducibility at the Tier 3 levels of 10 ppm sulfur in reformulated gasoline. This R value can help a refiner justify the economics of installation quickly when process optimization can be achieved faster.

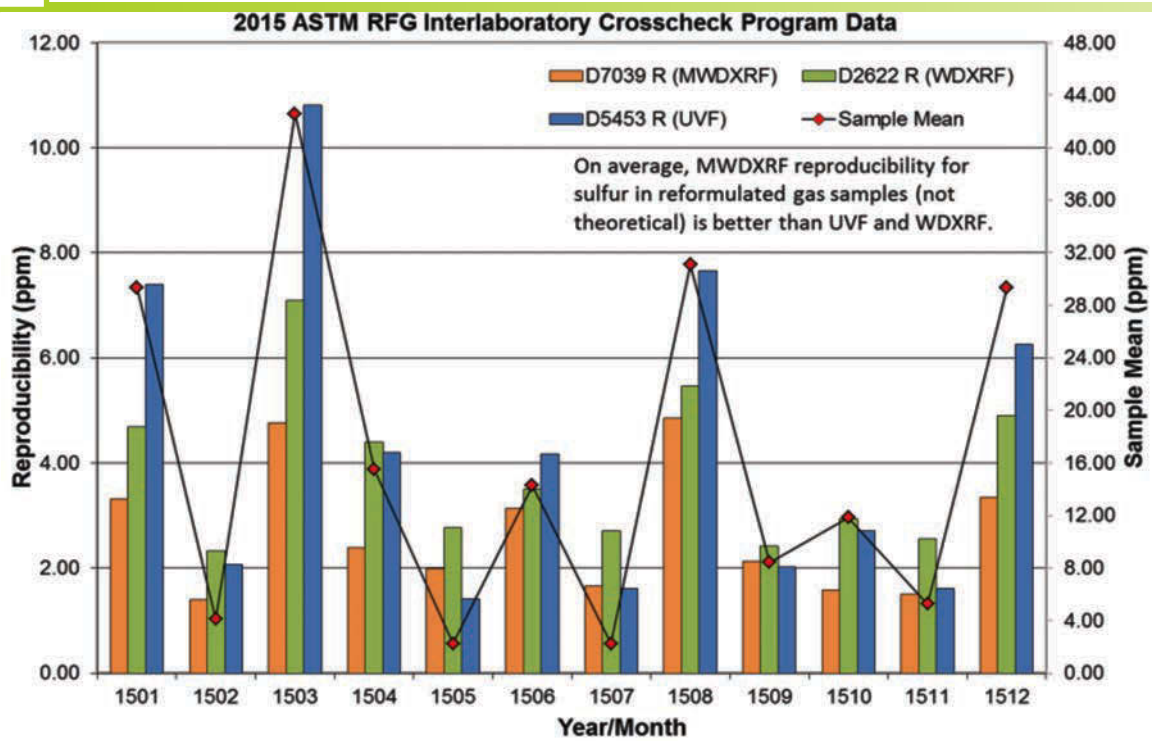


Figure 6. ASTM Interlab Crosscheck Data for Reformulated Gasoline 2015

Note that the precision statements for ASTM D7039 for the MWDXRF technique are based on the range of the method, 3.2 to 2822 ppm, which far exceeds the needs, when interested in measuring sulfur in finished product such as highway diesel or gasoline. If the results of Interlaboratory Study #761, gathered and analyzed in accordance with ASTM D6300 methodology for sulfur samples limited to ≤25 ppm S, it can be shown that the Repeatability (r) = 1.1 ppm and the Reproducibility (R) = 1.3 ppm.

Conclusions

When considering technologies for process analyzers, the most important characteristics of a good analyzer are reliable performance, a high degree of up time, superior stability, and good reproducibility, especially in the range of ≤10 ppm for sulfur. Having the lowest possible detection limit is not as valuable as having good precision at the control target. When used for process control, small biases can be accounted for, as long as the process analyzer operates consistently within the control limits. An analyzer with simple construction, ease of maintenance, and ability to correlate closely with lab methods should be important in the selection process. Also important to remember is that no process analyzer is subject to "laboratory conditions" so the performance of the lab instrument may not be a good indicator of how the process version will perform in the field. A sulfur monitoring solution that minimizes or eliminates moving parts, gas cylinders, and scheduled maintenance and calibration events is ideal for process analyzers that cannot be maintained as frequently as lab equipment. When regulations limit the maximum sulfur concentration, a preferred technique is one that produces repeatable and reproducible results, while reducing the frequency an analyzer needs to be cross checked with laboratory measurements and allows refiners the confidence and flexibility to change process variables knowing that they have a precise measurement of the sulfur content in their process streams. While the EPA has sanctioned WDXRF as the primary testing technology, there is no process analyzer that measures strictly with this technique. However, process analyzers utilizing MWDXRF, a subset of WDXRF, are available and have been in service in the field since 2005. These analyzers were initially used for process control of sulfur in ULSD highway diesel but have since been used on naphtha streams and in gasoline blending. These analyzers have proven to be very reliable, simple to maintain, and correlate very closely with laboratory methods. The method does not require gaseous consumables so the cost of ownership is low. MWDXRF is the only WDXRF solution available for process. Validated in reproducibility tests, it is ready and proven for applications below 10ppm and even further (5ppm).

For additional information about how XOS can help with Tier 3 compliance, please visit our website at www.xos.com or contact us at info@xos.com.

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Intelligent and Standardless Software for Wide Ranging Elemental Analysis

With modern XRF analysis there are two major analytical strategies: conventional calibration and standardless analysis. When working with known sample materials and when highest precision and accuracy are in demand, a standard-based calibration delivers best results. However, almost all labs are faced with unknown samples now and then or with samples for which no reference material is available. In these situations standardless analysis provides an effective tool to analyse elemental composition. This is only possible with powerful standardless software. **Bruker AXS'** (Germany) new SMART-QUANT FP is offered as a fully integrated component of the S2 PUMA's Spectra Elements instrument software package and delivers reliable elemental data from C to U for solid, fused, pressed, powdery or liquid material without the need for laborious calibration.

SMART-QUANT FP uses fundamental parameters to calculate theoretical spectra based on given sample and instrument parameters and detector response. The software then compares the theoretical with the measured spectrum and minimises differences between them by adjusting the element concentrations in its model. This iterative process is continued until a perfect match between the theoretical and the measured spectrum is found. All this is carried out fully automated in the background so that the operator does not have to worry about it. However, if one wishes to do so, the process can be constrained by the input of a variety of parameters to tune the standardless calibration to the application's needs.

To start a measurement in its simplest form, place your sample into the spectrometer, enter a sample name and press 'Start'. That's it. After a few minutes you will have your results. For specific user and application needs measurement parameters can be adjusted to fit the respective analysis requirements. The software allows a wide range of customisations with regards to sample definition, measurement specifications, analysis scheduling, and result presentation. To further tailor the hardware towards your specific applications needs, the S2 PUMA can be ordered with different X-ray tubes, several detector options, and variety of sample handling options.

Nevertheless, SMART-QUANT FP is set up in a 'one fits all' standard configuration to let you start measurements immediately without lengthy adjustments. The intuitive user interface guides the operator through the process from placing the sample through result handling, be it an out-of-thebox standardless application or a more advanced analysis program. Essential results are displayed immediately after the measurement in the 'Loader' tab. More detailed analytical information is provided in the 'Results Manager' (see Figure 2). Every sample is displayed in a dedicated window where all analytical data can be viewed without scrolling. This includes detailed analytical information and measured as well as fitted spectra. The goodness of the fit can be judged on a displayed figure of merit 'R/R0'.

This system offers quick, accurate and precise analysis of unknown samples without calibration. Users will appreciate its analytical flexibility, whether they are analysing solid, fused, pressed, powdery or liquid samples, SMARTQUANT FP can handle all of them. This instrument's operator-friendly user interface guarantees a fast and straightforward measurement setup and an integrated results viewer offers quick and easy data access. Advanced analysis settings allow for customised measurement and preparation conditions to further increase analytical performance. SMARTQUANT FP performs a seamless integrated solution within the spectrometer software with no lengthy installation required.

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Benchtop WDXRF Analyser for Ultra-Low Sulfur (ULS) in Fuels

Designed for ultra-low level sulfur analysis of diesel, petrol (gasoline) and other fuels, the **Rigaku** Micro-Z ULS wavelength dispersive X-ray fluorescence (WDXRF) instrument features a novel design that measures both the sulfur peak and the back-ground intensity. The ability to measure and correct for changes in background intensity delivers a better net peak intensity measurement, resulting in superior calibrations and enhanced real world precision. Rigaku Micro-Z ULS complies with ASTM 2622-10, ISO 20884 and JIS K2541-7 methods.

Rigaku Micro-Z ULS is the ideal solution for sulfur analysis of petroleum based fuels, with a lower limit of detection (LLD) of 0.3 ppm sulfur. Employing robust fixed optics in a vacuum environment, and featuring a specially designed doubly curved RX-9 analysing crystal, the Micro Z ULS delivers consistent high sensitivity measurements. Specifically designed for non-technical users, all operations – from calibration through routine analysis – can be performed via the easy-to-use interface. And the analyser can be powered by any standard "wall" AC outlet.

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On-Line, Real-Time Process Elemental Analysis by EDXRF

Featuring advanced 3rd generation energy dispersive X-ray fluorescence (EDXRF) technology, the **Rigaku** NEX OL represents the next evolution of process elemental analysis for liquid stream and fixed position web or coil applications. Designed to span from heavy industrial through to food grade process gauging solutions, the NEX OL is configurable for use in both classified and non-classified areas.

To deliver superior analytical performance and reliability, the EDXRF measuring head assembly was derived from the established Rigaku NEX QC+ high resolution benchtop instrument. With this proven technology, the Rigaku NEX OL delivers rapid, non-destructive, multi-element analyses – from parts-per-million (ppm) levels to high weight percent (wt%) concentrations – for elements from aluminum (13Al) through uranium (92U). Equipped with a 50 kV X-ray tube and SDD detector – together with a standardised, optimised suite of tube filters – the Rigaku NEX OL is engineered to solve a broad range of process control applications.

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New 5th Generation Benchtop X-ray Diffractometer (XRD)

MiniFlex

The 5th generation **Rigaku** (USA) MiniFlex is a general purpose X-ray diffractometer that can perform qualitative and quantitative analysis of polycrystalline materials. The MiniFlex is available in two variations. Operating at 600 watts (X-ray tube), the MiniFlex600 is twice as powerful as other benchtop models, enabling faster analysis and improved overall throughput. Running at 300 watts (X-ray tube), the new MiniFlex300 does not require an external heat exchanger. Each model is engineered to maximise flexibility in a benchtop package.

Ideally-suited for today's fast-paced XRD analyses, the new 5th generation MiniFlex delivers speed and sensitivity through innovative technology enhancements such as the optional D/teX high speed detector coupled with the new 600W X-ray source. The optional graphite monochromator, coupled with the standard scintillation counter, maximises sensitivity by optimising peak-to-background ratios. If resolution is paramount, incident and diffracted beam slits can be selected to provide the desired resolution. For high sample throughput, MiniFlex is the only benchtop XRD system with an available sample changer. Whether teaching X-ray diffraction at the college and university level, or routine industrial quality assurance, the MiniFlex delivers both performance and value.

For More Info, email: 36339pr@reply-direct.com

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Determination of Trace-level Chlorine in the Presence of Sulphur in Crude Oil

PANalytical (the Netherland) recently announced a new dedicated solution for the analysis of very low chlorine concentrations in crude oils. Epsilon 3^{XLE}, an energy dispersive XRF (EDXRF) benchtop system, has now been equipped to meet the analytical challenges of the petrochemical industry.

Chlorine and sulphur are unwanted elements in crude oil and other petrochemical products. They can cause corrosion in the oil-processing and refinement installations and are harmful for the environment. EDXRF is widely used for the analysis of sulphur in oil; however, the simultaneous determination of very low chlorine concentrations poses an analytical challenge due to the proximity of both elements in the periodic table of the elements. PANalytical's Epsilon 3^{XLE} energy dispersive X-ray fluorescence spectrometer is perfectly able to meet this challenge. The combination of a proprietary chromium-anode tube, excellent resolution and sensitivity of the silicon drift detector and the powerful software enables the system to process high sulfur count rates and at the same time resolve possible line overlaps between chlorine and sulphur.

Crude oil samples are simply poured into disposable cups for liquid samples before being measured by the compact benchtop spectrometer. "The lower limit of quantification for chlorine in the presence of percentage levels of sulfur is below 2 mg/kg (ppm), which makes the Epsilon 3^{XLE} the perfect solution for this challenging task," says Taco van der Maten, petro segment marketing manager. "Furthermore the system caters for variable characteristics of crude oil composition thereby enabling a more robust and accurate determination of chlorine. The possibility to analyse all other relevant elements from Na to Am with similar outstanding accuracy and repeatability, makes it a valuable asset for a wide range of petrochemical applications".

For More Info, email: 39349pr@reply-direct.com

REASON #19:
Built to last

Built to perform in industrial environments, this rugged WDXRF analyzer seals its components to protect them from dust. Simple software for system diagnostics provides for easy reset in case of failure and fast solution of service issues.

www.bruker.com/S8TIGER-19

WDXRF

email: 6467ad@reply-direct.com

New Spectrometers Redefine ED-XRF With Exceptional New Levels of Elemental Analysis Performance

SPECTRO Analytical Instruments (Germany) have announced its new line of SPECTRO XEPOS spectrometers, representing a quantum leap in energy dispersive X-ray fluorescence (ED-XRF) technology and providing breakthrough advances in the multi-elemental analysis of major, minor, and trace element concentrations.

New developments in excitation and detection introduced with the new SPECTRO XEPOS ED-XRF spectrometers deliver outstanding sensitivity and detection limits and yield remarkable gains in precision and accuracy. The analysers excel at critical tasks from rapid screening elemental analysis for environmental and waste sampling to demanding applications in research, academia, and geological science. They support precise product quality control at-line for a variety of applications such as chemical and petrochemical production, and the manufacture of cement, cosmetics, food, pharmaceuticals, and more.

Spectacular sensitivity: Innovations in adaptive excitation plus tube and detector technologies that dramatically improve sensitivity — often by 10´ or more — to boost precision, realise significantly lower detection levels, and deliver a fast and accurate analysis of a wide range of elements, from sodium to uranium. Enhanced with new high-count detector and tube designs, new sensitivity, and minimised backgrounds, the new analysers' proprietary adaptive excitation technology enables exceptionally low limits of detection (LODs) for a wide range of elements.

Unparalleled precision: Unlike most ED-XRF elemental analysers, the X-ray tubes in SPECTRO XEPOS spectrometers remain powered on between measurements to prevent on/off variations from affecting readings. This ensures long-term stability, realises an exceptionally high degree of precision in elemental analysis — up to 3´ better than before, and delivers substantially improved analytical accuracy for concentrations from trace elements to major components.

Faster measurements: For operators who require speed more than utmost precision, SPECTRO XEPOS analyzers can dramatically cut measurement times, while still maintaining precision levels comparable to traditional ED-XRF spectrometers. The system's high speed helps to achieve analyses of most samples within a few minutes.

Redesigned operating software provides proven ease and power, while the unique new TurboQuant II software quickly and accurately analyses practically any unknown liquid, powder, or solid sample. In addition, the new SPECTRO XEPOS spectrometers exhibit a significantly lower cost of ownership than wavelength dispersive X-ray fluorescence (WD-XRF) spectrometers — thus delivering WD performance at an ED price for many applications.

Optional AMECARE M2M (machine-to-machine) support extends the new analysers' self-diagnostic functions with proactive alerts, backed up by direct connection with a remote SPECTRO service expert's PC.

The new line of SPECTRO XEPOS ED-XRF spectrometers is available immediately from SPECTRO Analytical Instruments. Four advanced versions are available, enabling users to prioritise their selection according to measurement speed, ultimate precision, or groups of targeted elements in specific matrices.

For More Info, email: 37500pr@reply-direct.com

New XRF Analyser Designed to Speed and Simplify Metal Chemistry Analysis

Managers, operators and quality control personnel in the oil and gas, power generation, automotive, aerospace and metal recycling industries can now assess the chemical composition of metals with a new analyser that is smaller and lighter than any X-ray fluorescence (XRF) alloy analyser on the market today.

The **Thermo Scientific** (USA) Niton XL5 analyser [http://www.thermoscientific.com/en/about-us/promotions/niton-xl5-handheld-analyzer.html?ca=XL5] is designed to provide results rapidly and with a high level of accuracy. Weighing only 2.8 pounds (1.3 kilograms), the compact Niton XL5 analyser enables operators to access difficult-to-reach areas to maximise test coverage, reducing user fatigue and providing exceptionally low limits of detection (LODs). Other features include a new electronics processor that enables real-time results display and a hot-swappable battery and travel charger for improved operator efficiency in the field.

Since the initial launch of the Niton XL5 analyser in September 2015, Thermo Fisher has added an expanded precious metals element suite. Thermo Fisher designed this feature to allow precious metals foundries and refineries to increase efficiency by determining the quality of incoming raw materials and final end-products with accuracy and precision.

"Precise quality control testing of metal chemistry is becoming increasingly important, especially in the high-growth metals fabrication market," said Mark Lessard, business development manager, portable analytical instruments, Thermo Fisher. "We designed the Niton XL5 analyser to increase user productivity and confidence while providing a powerful solution designed to help our customers achieve increased levels of quality assurance, quality control and analytical performance."

The Niton XL5 platform provides enhanced communication capabilities through WiFi, Bluetooth and GPS connectivity. The Thermo Scientific NitonConnect companion PC software delivers easy data transfer and remote viewing functionality when the analyser is mounted on a test stand.

The Thermo Scientific Niton XL5 analyser also offers a new powerful 5W x-ray tube to provide detection of light elements and micro and macro cameras for enhanced data collection. A new user interface and display that includes a touchscreen with swiping functionality; and improved ingress protection for rugged environments has further enhanced the XL5. Additionally, customisable profiles that can be created for different applications prior to testing.

For More Info, email: 39336pr@reply-direct.com

New High-performance, Direct Excitation Variable Spot EDXRF Elemental Analyser Launched

Applied Rigaku Technologies, Inc. (USA) has announced its launch of the new Rigaku NEX DE VS direct excitation variable spot X-ray fluorescence (EDXRF) elemental analyser. The NEX DE VS analyser is the newest addition to the Rigaku NEX DE Series of high-performance, direct excitation EDXRF elemental analysers.

Each instrument in the NEX DE series is equipped with a 60 kV, 12 W X-ray tube and a high-throughput Si drift detector. This detector supports count rates in excess of 500K cps, resulting in low limits of detection. The instruments were designed for demanding applications or for situations where analysis time or sample throughput is critical, and is suitable for a broad range of applications, including exploration, research, bulk RoHS inspection, and education, as well as industrial and production monitoring applications.

The NEX DE VS analyser is uniquely suited for small spot analysis applications. It features a high resolution camera combined with automated collimators allowing for precise positioning of a sample for the analysis of 1 mm, 3 mm, and 10 mm spot sizes. These features, combined with the advanced Rigaku QuantEZ analytical software, provide unparalleled performance for both bulk and small spot analysis in a single instrument.

For More Info, email: 38352pr@reply-direct.com

A New Hero for Reliable Hot Sample XRF analysis

Oxford Instruments (UK) has launched a unique solution for reliable X-ray fluorescence (XRF) analysis of hot samples, for use with their range of X-MET8000 series handheld XRF analysers. The HERO™ heat resistant protective window allows hot samples of up to 400ºC to be directly analysed for alloying elements including light elements such as silicon.

Positive Material Identification (PMI) inspection sometimes requires the testing of in-service components such as pipes, reaction vessels, etc. that are at high temperatures. When testing hot samples using the X-MET8000, the operator simply swaps the analyser's normal Prolene® window for the HERO heat resistant window. Unlike other solutions available, there is no need for special spacers, shields or tilting techniques, which may have a detrimental effect on the accuracy of the results, especially for light elements. The use of the new window allows the operator to carry out in-service testing, therefore minimising downtime.

Christelle Petiot, Product Manager, Oxford Instruments, said: "This unique solution truly simplifies the task for operators wanting to test in-service, high temperature components, whilst retaining the analyser's excellent performance. Unlike other solutions currently on the market, there is no need for additional accessories or special measuring techniques that may cause results to vary from one user to another. With the use of the HERO window, operators also retain the capability of measuring light elements, which is critical in the testing of low alloy steels and other alloys."

The X-MET8000 series of field portable analysers are fitted with a large-area silicon drift detector (SDD) and high performance X-ray tube, delivering the exceptional speed and superior performance needed for the measurement of trace alloying elements. The X-MET8000 is manufactured with a rugged enclosure and its IP54 rating ensures durability and low cost of ownership making it ideal for use outside. Its large heat sink provides the most efficient heat dissipation ensuring stability and reliability, even in hot environments. Compact and lightweight at only 1.5kg including the battery, the X-MET8000 is fully portable for true on-site analysis.

The X-MET8000 range comprises three models of analysers designed to cover all analysis needs and budgets. The entry level, X-MET8000 Smart analyser is ideal for the routine identification and analysis of common alloys. The mid-range X-MET8000 Optimum model is optimised for high speed grade identification and analysis, from aluminiums to high temperature alloys, to steels etc. The top of the range X-MET8000 Expert provides the ultimate performance for the testing of the widest variety of alloys; with superior light elements (Mg, Al, Si, P and S), tramp and residual elements analysis.

For More Info, email: 39337pr@reply-direct.com

An XRF Safari in Africa

Due to the success of their March 2016 course, **Wirsam Scientific** (South Africa) and Precision Equipment (Pty) Ltd. will be hosting another X-ray Fluorescence Spectrometry training course to be held in Johannesburg, South Africa from the 5th to 9th September 2016.

This is the perfect opportunity to improve your knowledge on XRF and combine it with a getaway to South Africa's most loved game reserves and tourist attractions.

The focus and content will be vendor neutral, and users of all makes of XRF equipment will find it both informative and useful.

Lectures and practical sessions will primarily be given by renowned speaker and authors Emeritus Prof James Willis and Dr Clive Feather, amongst other experts, on the theory and practice of both wavelength, energy dispersive XRF spectrometry and sample preparation.

The course is divided into two distinct parts – XRF theory and practical XRF.

The theory section covers: radiation safety; X-ray physics; WDXRF spectrometer components and selection of analytical conditions; XRF sample preparation (primary preparation, pressed powders, fused beads, metals, liquids and special samples); X-ray statistics; mass absorption coefficient theory; XRF calibration theory; EDXRF spectrometers; XRF quality control; an introduction to "standardless" analytical methods; fault finding tools; trouble shooting; XRF maintenance; and XRF laboratory services and environment requirements.

The practical section covers: hands-on sample preparation of pressed powders and fused beads; selecting instrument conditions, qualitative analysis (XRF spectra) and quantitative analysis using WDXRF and EDXRF of samples prepared by participants; calibrations and analysis of "unknowns" for both major elements (using fusion beads) and trace elements (using pressed powders) by WDXRF and EDXRF; a practical demonstration of EDXRF semi-quantitative analysis, the use of drift monitors, correction for background and spectral overlap, and different methods of correction for inter-element matrix effects (absorption and enhancement).

The emphasis will be on the application of WDXRF and EDXRF to geological materials, but applications in the cement, metals and other industries and in environmental analysis will also be discussed. XRF calibration and trouble-shooting workshops are also included.

Wirsam Scientific can arrange a package that includes a 5-day course, accommodation, transfers, tours and safari.

For More Info, email: 39289pr@reply-direct.com

BRUKER

Why the **S8 TIGER**?

REASON #23:
Quality components

Core technologies, including X-ray generator, goniometer, X-ray detector and analyzer crystals, have been developed by Bruker, specifically for use in the S8 TIGER WDXRF.

www.bruker.com/S8TIGER-23

WDXRF

email: 6467ad@reply-direct.com

GRP IECEx & ATEX Xenon Strobe Beacons Launched at CIPPE

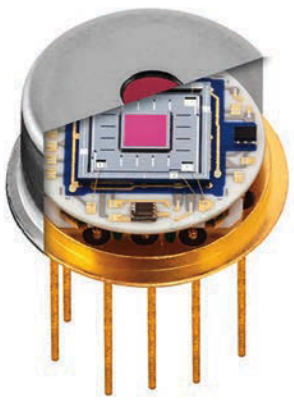
E2S Warning Signals (UK) recently launched its new GNEx GRP Xenon strobe beacons on Booth W1002E at CIPPE 2016 in Beijing.

The new products add visual signalling to the explosion proof and corrosion resistant GNEx family. Suitable for all Zone 1, 2, 21 & 22 hazardous location applications the GNEx beacons have extended temperature range with IECEx and ATEX Ex d approvals. For high ambient light or long distance signalling the GNExB2 beacon is available in 10, 15 and 21 Joule variants producing up to 902cd - a very high output Xenon strobe. The smaller sized GNExB1 is available for where a 5 Joule (up to 117cd) unit meets requirements. Three flash patterns and second stage, set by user, are a standard feature with all GNEx beacons, depending on base model and power (DC or AC) supply. On-site removal and replacement of the lens filter, such as for colour changes, is simple. Polycarbonate, UV stable lenses are available in Amber, Blue, Clear, Green, Magenta, Red and Yellow as separate spare parts. Installation time is minimised by design with the GRP enclosure featuring a threaded flame path, multiple cable entries and a large termination area.

Complementing the GNEx range is the GNExJ2 Ex d junction box, which, having multiple cable entries and terminal configurations means suitability for many other applications. Both 15 and 21 Joule versions can be supplied as a plate mounted assembly configured with up to four Xenon strobe beacons with a junction box or five beacons without a junction box. The new Xenon strobe beacon visual signals broaden the GNEx family which includes alarm horn sounders, PA loudspeakers and manual call points for activation of fire alarms, gas detection and emergency shutdown systems.

For More Info, email: 37685pr@reply-direct.com

Fast and High-Resolution Gas Sensors for the Energy Industry



Changes in the energy industry have generated a great need for affordable, high-resolution sensors for the measurement of the energy content of natural gas and other fuel gases. At the same time, the demand for more efficient appliances for routine monitoring and leakage detection has also increased.

In order to quickly and accurately measure this, a new infrared spectrometric sensor was developed as part of the joint "SIRKO" project, which has significantly improved properties when compared to previous methods. Involved in this development was Dresden-based **InfraTec** (Germany), who presented this detector XFP-3137 at SENSOR+TEST 2015 for the first time.

The core of the innovation is a tunable micromachined Fabry-Pérot filter (µFPF). By using a higher order of interference, the spectral resolution could be improved from 60 nm to about 25 nm in the wavelength range of (3.1 … 3.7) µm. The dynamics of the filter was significantly improved by optimising the electro-mechanical design and enables scan frequencies of up to 10 Hz. As an additional option the simultaneous measurement of carbon dioxide in the wavelength range to 4.3 µm will be possible in the future by using the dual-band sensor.

Infrared spectroscopy is a physical sensing principle to determine gas concentrations accurately, selective and long-term stability. In particular, the accurate and rapid analysis of gas mixtures, such as hydrocarbon gas mixtures or the composition of natural gas, can be carried out using the detectors developed in the project with integrated µFPF.

This technology can be used to analyse gas compositions such as hydrocarbon mixtures or the composition of natural gas. These detectors can not only be used in large power plants, where even small improvements in the efficiency can bring enormous benefits, but also in cogeneration, natural gas fuel cells and small firing systems.

The name SIRKO stands for "Fast infrared spectrometer for the analysis of hydrocarbons". The joint project was part of an initiative promoted by the innitiative "KMU-innovativ: Optische Technologien" by BMBF. Started in early March, 2012, the SIRKO project was successfully completed in February 2015.

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Orders Flood in for Oxygen Monitor Following Successful Launch

Servomex (UK) has seen a rush of orders for its upgraded SERVOTOUGH OxyDetect life safety oxygen monitor following a successful launch.

Now available as a hazardous or safe area version with updated communication relay options, the OxyDetect offers a highly accurate oxygen measurement without the sensor deterioration that degrades the performance of traditional electrochemical sensors used in competitor detectors.

The OxyDetect utilises the market-leading performance of Servomex's Hummingbird Paracube Paramagnetic sensor, whose industry-leading levels of linearity, accuracy and reliability have ensured its use as a trusted oxygen sensor for the OEM medical market.

As the sensor never depletes and the measurement remains accurate, OxyDetect avoids false readings and false alarms caused by depleted cells, as well as the serious safety risk caused by life safety systems being turned off or ignored because of constant false alarms.

This gives users a considerably lower cost of lifetime ownership, with the costs associated with replacing electrochemical cells, as well as the problems of cell degradation when kept as a stock item, eliminated.

With an output range of 0-25% $O^{w\ w}$, OxyDetect can be used for indoor environments ranging from 5°C-45°C. Integration is simple using an isolated 4–20mA output with linear measurement, and mains-rated relay outputs for instrument fault, low alarm one and low alarm two. An optional Ethernet output is also available.

Potential customers have responded well to a video showcasing all the advantages of the Oxydetect, available to view at Servomex's website.

Matthew Halsey, Product Manager - Process Oxygen, Zirconia and Oxygen Deficiency at Servomex, said: "The OxyDetect is both reliable and easy to use. You can just switch it on and be confident that it will keep on working, making sure your people and plant are safe."

"It has a measurement performance you can trust, while reducing ongoing maintenance and replacement costs."

For More Info, email: 39455pr@reply-direct.com

New Generation Smart Gas Detector

Kimessa, a Swiss gas detection manufacturer are pleased to announce their new 'Smart' Ex Gas Detector (ATEX & IECEx) for a wide range of combustible or toxic gases.

Ex certified for IR, Catalytic, Electrochemical and Semiconductor sensors, featuring a built-in Zener barrier for the Ex ia toxic gas version. Low range toxic gas sensors may be incorporated to monitor for PH3,HCHO, BR2, Hbr, F2, H2O2, SO3, etc

Outputs include analogue 0-20mA, 4-20mA, digital CAN-BUS or Modbus RTU with optional relays (3). 24Vdc as standard with optional in-built power supply (85-265VAC).

The digital CAN BUS output option facilitates interfacing the Smart detector to the Kimessa CM gas monitor expandable for use with up to 128 detectors. Touch Screen displays with data logging, relays cards and the Kimessa web server for online monitoring, may also be added to the CAN BUS network, offering a comprehensive data suite to the client.

Replacement sensors are pre-calibrated and easily replaced in the field. An intuitive menu on the OLED display facilitates non-intrusive calibration via Hall Effect sensors and a magnet.

Michael Baumann, technical manager at Kimessa outlines the key benefits of the new Smart Ex detector.

"We have addressed key end user criteria such as reliability, simplicity of use, reduced installation costs, low cost of ownership, on line options for real time data display with logging and a comprehensive technical support team with a trained distributor network.

30 years interacting with our clients has guided us in the development of this new generation gas detector," said Michael Baumann.

For More Info, email: 37009pr@reply-direct.com

Explosion Proof Gas Detector Heads

N.E.T. Srl (Italy) introduces a new range of stainless steel flameproof enclosures housing gas sensors, dedicated to fixed gas detectors in industrial applications.

While standard NET heads are certified as component, the new NETC heads have been tested and full conformity certified as complete instruments according to the ATEX and IECEx normatives.

NETC2: are completely sealed devices that can house a pellistor, electrochemical cell or NDIR sensor. Connection with the gas detector with ¾" or 1" thread and a M35 front thread that will allows easy fit for accessories (splash guard, calibration cap and additional filter for GD and IP65 protection)

NETC3: these bigger heads can be opened to replace the sensor at the end of the sensor's life. They can house any gas sensor for flammable, toxic and refrigerant gases. Connection with ¾",1" or M20 thread and additional M46 front thread for accessories.

NETC3 Cyber Heads: same features as NEC3, in addition they also include a smart transmitter board which is calibrated at the requested fullscale and provides linear 4-20mA output, digital communication and fault indication. SIL2 approved (software and hardware).

For latest news and full technical specifications, please visit the website. For specific questions and offers, you can contact N.E.T. directly.

email: 38623pr@reply-direct.com

Multi Gas Detector Runs Two Months on One Charge

Gas Clip Technologies (USA) has developed the most technologically advanced portable multi gas detector on the market today. The Multi Gas Clip (MGC) is the first portable multi gas detector with a two month continuous run time without recharging. The extended battery life comes from the utilisation of low power photometric infrared technology for LEL measurement, which replaces archaic pellistor technology. No need to frequently calibrate as it is immune to catalytic poison and fails to safety. Each detector is 100% quality control tested to ensure complete customer satisfaction.

email: 33840pr@reply-direct.com

New Multi Gas Detector Ensures Simple, Effective and Reliable Worker Safety in Hazardous Zones

GAZOMAT (France) have added Gazotrack 4, a multi-gas detector with smart infrared sensor technology for hydrocarbon applications and electrochemical sensors for toxic and odourant gases, to their family of optical NDIR gas detectors.

This hnd-held device can simultaneously detect 4 gases with a 100 ppm sensitivity limit for methane, and meets all international safety and performance criteria in a wide range of industrial applications. ATEX and IEC-Ex Zones 0, 1 and 2 certified, the Gazotrack 4 ensures worker safety whether testing for explosive or toxic gases in potentially hazardous scenarios such as atmospheric assessment indoors or outdoors, borehole monitoring, checking gas pipelines when purging and filling, network monitoring of storage and transportation depots, or measuring odorant gases.

The Gazotrack 4 also provides means to ensure measurement reliability and accuracy: an in-built thermal compensation device offsets any temperature fluctuations and prevents condensation formation, and the long life IR sensor is immune to poisonous compounds.

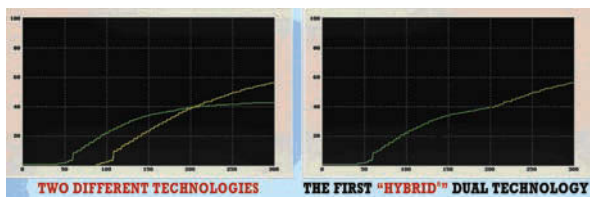
Gazotrack 4 is compact, light and rugged. Users will appreciate the simple interface with 4 control buttons, its rapid start-up within 30 seconds, with no need to set up or adjust the instrument. An embedded set of failsafes makes sure that the instrument will always clearly signal any faults, and changing sensors and filters is simple and requires no recalibration. Incidents are logged and can be reported via Bluetooth, whilst the instrument will emit an audible signal and show a visual flashing red LED display when a hazardous gas is detected.

Available in a methane version only, the Gazotrack 4 detector includes several user modes that can be defined at the time of purchase. Switching between modes is automatic or can be done manually from an on-screen menu.

Affordable, reliable, easily portable, the Gazotrack 4 multi-gas detector is a step forward for worker safety in the gas industry.

For More Info, email: 38949pr@reply-direct.com

Innovative Hybrid Gas Detector



Sensitron (Italy) has developed the innovative Hybrid gas detector, Atex and SIL2 (3) approved. In the gas detection for tough environments is now available an innovative alternative which compares the signals received from two different sensors (Pel+IR) installed in a single head setting the improper alarms apart. The Sensitron's SMART S-IR is an innovative concept in the gas detection for the Premium Safety market. The detector uses a hybrid technology sensor (Pel+IR) installed in a single head. The behaviour of the sensors is constantly monitored by a microprocessor and the incoming signals are compared in order to supply an output corresponding to the worst situation revealed in the shortest time: it guarantees the highest accuracy with false alarm conditions close to zero. The other important features of the SMART S-IR are: a non-intrusive calibration; 3 wires 4-20mA output with a further three relays output and the HART communication module (optional). The SMART S-SS and the SMART S-MS belong to the same family. The SMART S-MS is a double-head detector and two different sensors (Pel-IR; IR-IR; Pel-Electrochemical; Electrochemical-Pel) can be installed on it. It guarantees two different independent outputs that can be compared. The detectors are SIL 2(3) certified in compliance with EN50402/EN61508. Visit our website at www.sensitron.it

For More Info, email: 17774pr@reply-direct.com

email: 5643ad@reply-direct.com

CorDEX

LIGHTING UP THE DARKNESS, INTRINSICALLY SAFE WORKLIGHTS, REAL OR NOT?

Performing routine maintenance and inspection tasks in low light can be daunting, but they are critical in keeping any plant running.

Now add to this the restrictions required of personnel operating in potentially hazardous (explosive) atmospheres, and a seemingly simple function like creating a well-lit work space becomes a difficult challenge to overcome.

FIRST THINGS FIRST, HOW MUCH LIGHT DO WE NEED?

Enough to do the job! This is the correct answer, but how do we quantify that?

Lighting solutions are measured in lumens and range from relatively low power torches and flashlights with just a few lumens, to more powerful worklights with outputs measured in hundreds of lumens.

The more lumens, the more light is being provided by the luminaires, which in turn makes the job site safer and easier to work within. Obviously, light output is proportional to power usage, which in turn defines what is referred to as "runtime".

Todays high-end lighting solutions tend to lean towards LED technology rather than filament bulbs. LEDs offer much better efficiency which in turn increases runtime.

BATTERY OR MAINS POWERED?

No matter which lighting option we choose, the source of power will always be a major, limiting factor, in particular where it applies to the runtime of a luminaire when compared with the anticipated amount of time a particular task requires to complete.

Mains powered lighting solutions have the benefit of being constantly powered, so no need to recharge batteries and provide as much light as the job requires for as long as it is needed. Mains powered lighting is the obvious solution for fixed luminaires and also for long-term construction projects, although to refer to them as Intrinsically Safe is probably in the majority of cases untrue. Mains powered systems tend to use Flameproof (Exd) as a protection concept, although this is by no means exclusively the case.

However, for unscheduled or limited time maintenance work, installing temporary cables for mains powered lighting is generally deemed overkill. So, in this instance, battery powered systems are the obvious choice. Unfortunately, battery powered systems have their own limitations, two in particular;

1. weight – Battery packs are generally heavy which means the lighting solution being powered is also heavy which in turn restricts the areas battery powered systems can be deployed to.
2. runtime – Batteries provide power yes, but as we all know, in time, batteries become depleted. At this stage, the battery either requires changing and/or charging, but herein lies the problem. To change a typical battery pack, the luminaire must be physically removed from the hazardous area, have its pack removed and a fully charged one installed before being taken back to the worksite, that is if the pack is removable at all.

The ideal solution to this problem would be the versatility of a battery powered luminaire without the restrictions associated with returning to the safe area to replace or recharge a battery pack. What is needed is a portable lighting solution with the ability to "hot swap" its batteries in situ.

WEIGHT AND TRANSPORTABILITY

Not all tasks are performed at ground level, or in locations easily accessible. Access restrictions affect both mains and battery powered alike but in different ways.

Mains powered systems have to be "plugged in" to a supply of some kind, ultimately located in a safe area which could mean cable runs measuring hundreds of meters if not more. Not to mention the weight and ungainly design common with many mains powered systems means that such systems are not the obvious solution for job sites in areas that are not immediately accessible.

As briefly mentioned, battery powered lighting solutions can indeed be heavy. Traditional systems tend to incorporate sealed lead acid batteries, also referred to as SLABs, or large banks of small Nickel Metal Hydride (NiMH) cells which can provide adequate capacity but at the cost of being heavy and comparatively large.

CONCLUSIONS

"Ex" lighting solutions are arguably the most important tool choice for any engineer operating within a potentially hazardous environment. Why? Simple, in most parts of the world, it gets dark every day but we cannot limit unscheduled failures or repairs to daylight hours.

In certain geographical locations, the absence of natural light for most of the day is the norm rather than the exception. As such, making the correct choice for your Ex lighting solution will pay dividends in the long run, ensuring maintenance, repair and operations can continue day or night.

Large, heavy, mains powered luminaires are the obvious choice for fixed and or long term lighting requirements but what about unscheduled failures or the need for short term scheduled lighting during operations? In this instance a battery powered, transportable solution makes perfect sense. Unfortunately, traditional SLABS or banks of Nickel Metal Hydride (NiMH) packs are both bulky and heavy. High energy density Lithium Ion packs which combine capacity with small form fit are the ultimate in portable power. The issue of removing the pack either for charging or replacement means a sometimes lengthy trip back to the safe area to perform a battery change which takes only seconds when the entire time, the job is halted due to zero light.

Runtime is also key for a battery powered solution. The balance between light output and runtime is a constant battle for luminaire designers. The only real solution is LED technology. LEDs provide a high level of light output for comparatively little by ways of power consumption. White light LEDs tend to perform better than "warm white" LEDs, providing a greater level of contrast to the work site.

Finally, weight. Carrying one or more luminaires to high levels, or across extended distances means weight is key. One person lift is essential as a minimum when in reality, a luminaire weighing in at less than 2kg is a must for a transportable solution.

The logical conclusion therefore is a lightweight luminaire which has the ability to have its battery pack changed within the potentially hazardous area, a process known as "hot-swapping". A high energy density lithium ion pack provides the best power to weight ratio. Such a luminaire would ideally utilise Intrinsic Safety as opposed to the heavier flame-proof and incorporate multiple white light LEDs as the light source.

email: 38757pr@reply-direct.com

Fig 1.0. A typical Intrinsically Safe Worklight with LED array.

Fig 2.0. A lithium ion I.S. battery pack being hot swapped

Fig 3.0. A lightweight, transportable I.S. worklight

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Fixed Continuous VOC Monitor for Maximum Plant & Worker Safety Launched

Ion Science (UK) has announced the launch of its Falco series of fixed continuous VOC (volatile organic compound) monitors for the on-going protection of workers operating in potentially hazardous industrial environments, such as refineries, petrochemical plants and laboratories. Incorporating first of a kind 'typhoon' technology for added reliability, Falco is specially designed to work in condensing atmospheres and extreme weather conditions.

Reinforcing Ion Science's position at the forefront of gas detection instrumentation for occupational health and the environment, Falco boasts fast response times and several innovative design features. The instrument's 'typhoon' technology prevents condensation forming on the sensor and removes the risk of the system short circuiting - making it ideal for use in harsh weather conditions.

The new PID (photoionisation detector) is simple to operate while an externally located, IS (intrinsically safe) sensor facilitates quick and easy servicing without the need for a hot work permit.

Ion Science Managing Director, Duncan Johns, comments: "Falco will set a new benchmark in fixed VOC monitoring for hazardous areas and help ensure plant-wide safety and on-going protection of employees likely to be exposed to VOCs. The 'typhoon' technology was developed as a result of feedback from customers who said that similar monitors had failed in extreme weather conditions. Our R&D team discovered that where ambient air quickly changes from cold to hot, it generates condensation in the sensor which adversely affects performance. The new 'typhoon' technology enables the system to cope with these sudden fluctuations."

Falco is operated via an intuitive user interface with OLED display and five magnetically activated switches – up, down, left, right and enter – which are back lit to help confirm the correct button is being pressed.

For added convenience and ease of use, brightly coloured red, amber and pulsing (optional) green status indicators are clearly visible in sunlight allowing checks to be conducted from a distance.

Incorporating Ion Science's market-leading PID technology with advanced patented fence electrode system, Falco's three-electrode format ensures increased resistance to humidity and contamination for ultimate reliability and accuracy in the field, as well as considerably reduced drift issues and extended run time.

Falco utilises a diffusive sample technique resulting in less contamination issues compared to pumped systems, reducing lamp cleaning and servicing requirements. Pumped models are available for applications where a sample needs to be drawn to the unit.

There are eight models in the Falco series offering detection ranges as low as 0 - 10ppm with ppb sensitivity or as high as 0 - 10,000ppm. Customers can upgrade to a unit with a higher detection capacity by purchasing a different electrode and simply recalibrating.

Duncan continues: "Falco underlines our commitment to designing gas detection technology that provides both flexibility and cost benefits. A customer normally purchases a fixed VOC monitor based on its detection range. Previously, choosing the wrong model by mistake meant they would have to purchase a completely new system. With Falco, they can easily and cheaply upgrade by buying the relevant electrode."

The Falco's flame and explosion proof enclosure is certified to EX d IIC T4 II and the external sensor to EX ib IIC T4 Gb II. A 4 – 20 mA analogue output enables Falco to be easily integrated into a DCS control system to give warning or control of high VOC levels in the working environment. Two relay outputs means it can be connected remotely plus RS485 output with Mobus protocol included as standard allows the instrument to be connected to a network.

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New Software Reduces Alarm Rationalisation Time and Cost

One requirement of Pipeline Operational Excellence in the control room is the implementation of an Alarm Management Plan, including rationalisation of all safety alarms to reduce alarm flood as required by the PHMSA CRM rule.

The cost of implementing an Alarm Management Plan can reach $300,000 or more. However the biggest component in this cost is not the software, it is the time and cost that company personnel spend rationalising each safety alarm. The result of rationalising each alarm is to define its alarm priority – critical, high, medium, or low and to create an alarm response sheet to guide the controller's actions. Typical alarm rationalisation exercises involve 5 or more people sitting around the table discussing what caused the alarm, how to confirm the alarm, what happens if the alarm is ignored, and what action to take to prevent "bad things" from happening. If each alarm takes 15 minutes of conversation, and you have 2,000 safety alarms to rationalise that results in 5+ of your key people spending up to 12 weeks, or 2,500 man/hours on this exercise.

Is there a better way? We think so and you prove it to yourself – request information on the **EnerSys** (USA) POEMS Alarm Management software (ALMgr) and get the FREE Alarm Rationalization Cost Estimator.

For More Info, email: 39222pr@reply-direct.com

Advanced Multifunction Gas Detection System

The GALILEO SMS (SIL Multisystem), from **Sensitron** (Italy), is an advanced multifunction gas detection control panel designed to comply with the SIL (Safety Integrity Level) requirements, according to the European Standard EN 50402 and IEC 61508 on Functional Safety. The functional safety is aimed at supervising and managing the behaviour of an overall system in case of failures.

To assure a full redundancy, the control unit's main board is designed around 2 powerful microprocessors that communicate to each other the monitored data, ensuring the complete availability of all main board functions even in the case of a failure in one microprocessor. A broad range of self-testing facilities are implemented to detect and localise possible faults.

The redundancy offered by every module being part of the system, added to the possibility to communicate with remote input/output modules via a redundant closed BUS, makes this system comply with the Functional Safety requirements up to SIL3.

The GALILEO SMS consists of a control unit, used for monitoring and controlling, connected to an optional number of Analogue Input Modules (AIM), LOOP modules and RELAY modules.

The system will be connected in two digital RS485 (EIA-485) type closed loops capable of accommodating a maximum of 256 gas detectors connected as addressable gas detectors type SMART3G or SMART3 "S" connected via 32 input loop modules or analogue 4-20mA detectors connected through 8-input AIM (Analogue Inputs Modules), and a maximum of 520 relay outputs connected as 512 programmable relays on the Relay Outputs modules (8-16 relays module, basic and extended respectively).

For More Info, email: 31229pr@reply-direct.com

Advanced NDIR Sensor for SF6 or Refrigerants Detection

The IR series of infrared gas detection sensors, from **N.E.T.** (Italy), use the technique of NDIR (Non Dispersive Infrared) to monitor the presence of SF6 or refrigerants. This technique is based on the fact that the gas has a unique and well defined light absorption curve in the infrared spectrum that can be used to identify the specific gas. The gas concentration can be determined by using a suitable infrared source and by analysing the quantity of energy absorbed from the gas inside the optical path. The IREF-P sensor is equipped with electronics and firmware in order to provide an output that is linearised and temperature compensated. The output is analogue voltage type [0.4 V—2 V] dc (other voltages are available on request). IREF P is now SIL2 approved.

The main features are: analogue voltage standard output, incorporated signal, linearisation and temperature compensation suited for instrument manufacturers without any specialist knowledge in IR technology, standard sensor size 32 mm, fast response, solid, rugged construction, wide operating temperature and humidity range (-20°C +60°C) and new optics "Variable Geometry".

For More Info, email: 30532pr@reply-direct.com

Introducing a New Series of Multi-Gas Monitors

Industrial Scientific (USA), recently introduced the Ventis Pro Series Multi-Gas Monitors. Small, rugged, and highly configurable, the Ventis Pro Series is backed by the industry's only Guaranteed for Life warranty and offers a wide range of sensor options to detect up to five gases.

The Ventis Pro4 is compatible with four of the following sensors: LEL/CH_4, O_2, CO, CO/H_2 Low, H_2S, SO_2, NO_2, or HCN making it ideal for industries such as fire service, steel, and construction. The Ventis Pro5 detects up to five gases including any covered by the Pro4 in addition to NH_3, CO_2/hydrocarbon IR, CO_2/CH_4 IR, and CO/H_2S. Industries such as oil and gas, petrochemical, power generation, metal and coal mining, gas utilities, and refrigeration, which typically need a larger five-gas instrument, can easily transition to the smaller, lighter Ventis Pro5.

Both the Ventis Pro4 and Pro5 are equipped with a variety of new safety features that raise the bar on worker safety.

iAssign Technology tracks users and sites in real-time using Near Field Communication (NFC) to help safety managers identify and address jobsite gas hazards and improve asset management.

A dedicated panic button and man-down alarm help to alert nearby workers when someone is in distress or has lost consciousness.

Acknowledgeable gas alerts let users know when they are in the presence of gas below the low alarm level enabling them to take safety precautions while continuing to work.

Alarm action messages provide written instructions during low and high alarm events, helping workers to react appropriately.

In addition to being the most advanced multi-gas monitors on the market, the Ventis Pro Series is extremely rugged. It comes with a Guaranteed for Life warranty and is IP68 rated, meaning the instruments have the highest level of protection against dust ingress and can withstand being submerged in water at a depth of 1.5 meters for one hour.

"The Ventis Pro Series sets a new standard for safety, usability, and utility in a wearable instrument," said Justin McElhattan, President and CEO. "It is the ideal monitor to have by your side when you want it least and when you need it most."

For More Info, email: 38858pr@reply-direct.com

Integrated Production Control System Ensures Quick and Smooth System Upgrades

Yokogawa Electric Corporation (the Netherlands) have announced the release of CENTUM VP R6.03, a new version of the company's integrated production control system. CENTUM VP R6.03 will be available from 1st June.

Yokogawa has been continually making improvements to its flagship CENTUM VP integrated production control system as part of its VigilantPlant vision for the control business. As well as providing an enhanced product for new customers, R6.03 offers a smooth upgrade path to existing users of CENTUM CS, CENTUM CS 1000, and CENTUM CS 3000 systems.

CENTUM VP provides an optimum operation, monitoring, and engineering environment for every phase of the plant lifecycle, from initial design, engineering, installation of systems and equipment, and start-up to full operation and the ongoing performance of renovations and modifications, through to eventual withdraw a facility from service.

Over the several decades that a plant will remain in use, upgrades will need to be performed to replace ageing control systems software and hardware, hold down maintenance costs, improve production capacity, and comply with new regulations. To minimise disruptions to production operations, such system upgrades should be quick and trouble-free. CENTUM VP R6.03 was developed to ensure quick and smooth system upgrades, and therefore upgrades of integrated production control systems such as CENTUM also need to be seamless.

Masatoshi Nakahara, a Yokogawa director and executive vice president who heads the Industrial Automation Platform Business Headquarters, comments as follows on this new release: "Yokogawa has continually striven to improve its core CENTUM platform while maintaining backwards compatibility with previous system versions. In the development of CENTUM VP, the following four innovations have been emphasised: Advanced operation empowers operators to make smarter decisions; Smart engineering, a new engineering ecosystem that delivers certainty and confidence; System agility flexibility, adaptability, and extensibility for plant upgrade and expansion, changes in plant operations, and business exigencies; and sustainable plant optimum system performance throughout the entire lifecycle of the plant.

"In keeping with its VigilantPlant initiative, Yokogawa will continue to develop and bring to market new products and other types of solutions that will help our customers realise the ideal plant."

Yokogawa's CENTUM VP R6.03 is designed for use in process industries such as oil and natural gas, petrochemicals, chemicals, and electric power. It is used for the operation, monitoring, and automatic control of process plants.

email: 39188pr@reply-direct.com

Gas Area Monitors Receive CSA Approval

Tyco Gas & Flame Detection (USA) is pleased to announce that the BM 25A and BM 25AW (wireless) have been certified to Canadian Standards Association (CSA) and now carry the CSA mark of approval for use in hazardous areas.

Both the BM 25A and BM 25AW meet CSA Standards as intrinsically safe for use in Class I, Division 1 hazardous locations in Canada and certified for use in Class I, Division 2 hazardous locations in the United States.

The BM 25 is a versatile multi-gas monitoring system that offers exceptional flexibility for a wide range of applications. The system detects up to 5 gases simultaneously and can include up to 30 devices in a mesh network. By using up to 16 BM 25AW (wireless) units in combination with an X40 wireless controller, information can now be centralized at one location, displaying up to 32 measurements in real time.

Using the Sitewatch option, the MX 40 can be accessed remotely via Ethernet or GSM. A web page displays measurements and channel statuses in real time, and is accessible from any computer or wireless phone connected to the internet. This option also allows information to be delivered by SMS or email.

For more information visit www.TycoGFD.com.

For More Info, email: 39344pr@reply-direct.com

Electrochemical Carbon Monoxide and Nitrogen Dioxide Sensors

The NT-CO-F14 and NT-NO2-F14, from **N.E.T.** (Italy), are new electrochemical gas sensors with 3 electrodes for the detection of Carbon Monoxide (CO) and Nitrogen Dioxide (NO2). Designed as a compact and low cost alternative to the standard 20mm sensors, they are targeted to light industrial and commercial applications such as monitoring underground car parks or residential environments, air quality, ventilation control and fire detection. The sensors have industry accepted dimensions and pin-out footprint, making them compatible with a variety of commercially available fixed gas detection systems.

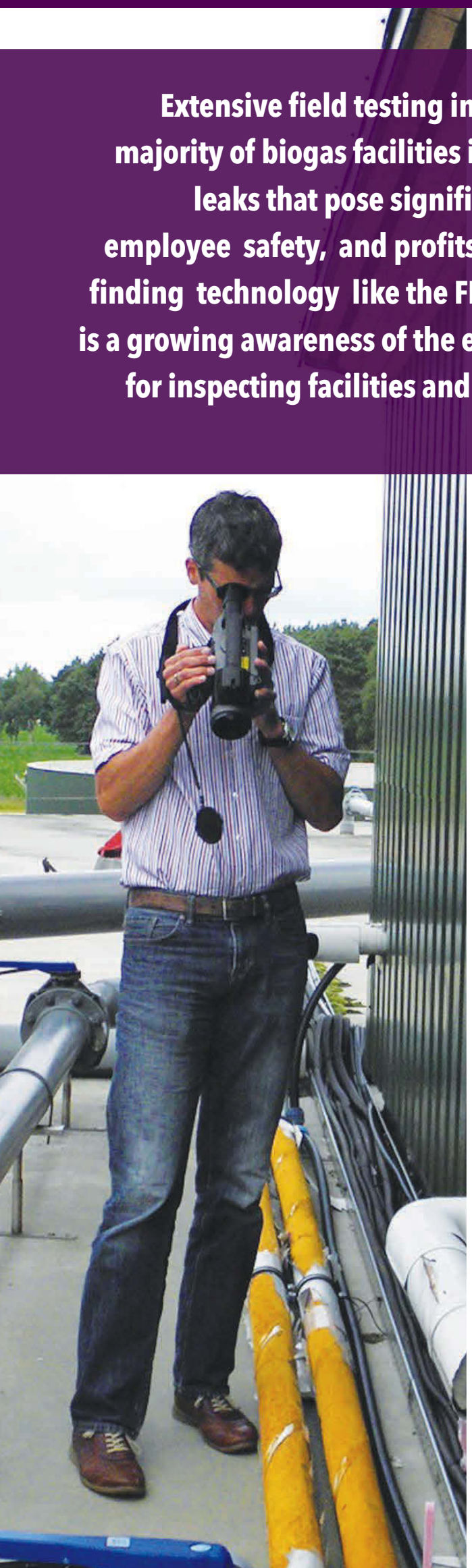
UL Recognised Component in accordance with the requirements of UL2075.

For More Info, email: 36410pr@reply-direct.com

email: 5648ad@reply-direct.com

FLIR GF320 THERMAL CAMERA OFFERS RELIABLE GAS LEAK DETECTION IN BIOGAS FACILITIES

Extensive field testing in recent years has revealed that a majority of biogas facilities in Germany experience methane leaks that pose significant threats to the environment, employee safety, and profits. However, with affordable gas finding technology like the FLIR GF320 thermal imager, there is a growing awareness of the effectiveness of thermal imaging for inspecting facilities and finding hidden gas leaks before they cause significant harm.



Preventing Biogas Leaks

Expanding the use of renewable energy sources has become a major policy issue for Europe countries looking to reduce their dependency on fossil fuels and mitigate the effects of climate change.

The production of biogas (methane), in particular, is expected to play a larger role in the next decade. In Germany, for example, bioenergy represents approximately five percent of the country's current energy production, and the government hopes to double that percentage by 2020, according to official reports.

However, methane is a greenhouse gas that can harm the environment if not contained properly during the production process. Biogas producers face strict regulations regarding how they trace, document, fix, and report leaks of volatile gases.

IBS GmbH, headquartered in Bremen, Germany, specializes in gas leak detection and analysis at major biogas facilities. The company recently purchased the FLIR GF320 thermal imager to provide its clients with the highest quality gas detection. IBS GmbH learned about using thermography to detect leakage of organic gases at a trade fair.

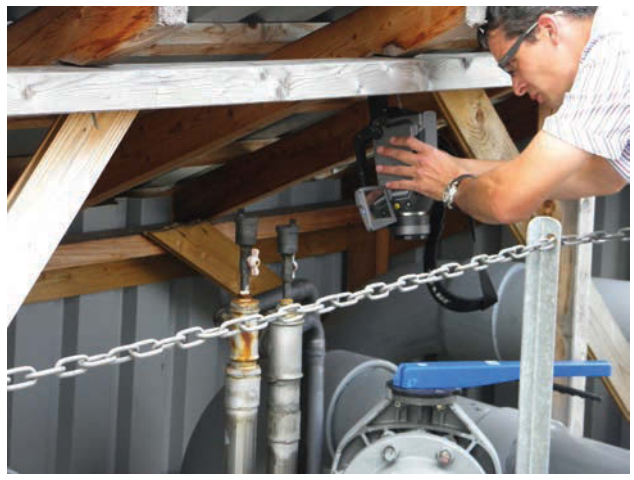
"We then had a FLIR representative who is also an experienced consultant and [GF320] user demonstrate the technology for one of our customers," said Ibeling van Lessen, one of IBS GmbH's managing directors.

The engineer has been using the FLIR GF320 for the past two years, and has examined more than 150 biogas plants to date. The GF320 is part of FLIR's family of non-contact Gas Detection cameras, which can detect dozens of volatile organic compounds in multiple types of facilities, including oil refineries, petrochemical plants, and gas-fired power stations.

"If gone undetected, even the smallest gas leaks can cause serious financial damage over time," van Lessen said.

Conventional Gas Detection Measures are Often Impractical

The sheer size of Biogas facilities can make detecting gas leaks a real challenge. They include huge pieces of equipment, with hundreds of components that need testing. Conventional gas detection involves using leakage spray and gas sensors, known as "sniffers," but these methods are time-consuming, especially in hard-to-reach places. For example, a fermenter roof contains an inner gas membrane, eyelets for submersible mixers, and holes in the tank walls—all of which are difficult to access.



Engineer Ibeling van Lessen looking for gas leaks, which is possible from a safe distance and unusual angles using the FLIR GF320.

As a result, van Lessen was looking for a non-contact method for detecting small leaks from a distance. The FLIR GF320 fit the bill. It was compact and mobile, and can identify small gas leaks from several meters away, and big leaks from hundreds of meters away without requiring equipment be shutdown.

"The camera is so compact that it can be easily carried, even when using ladders," said van Lessen.

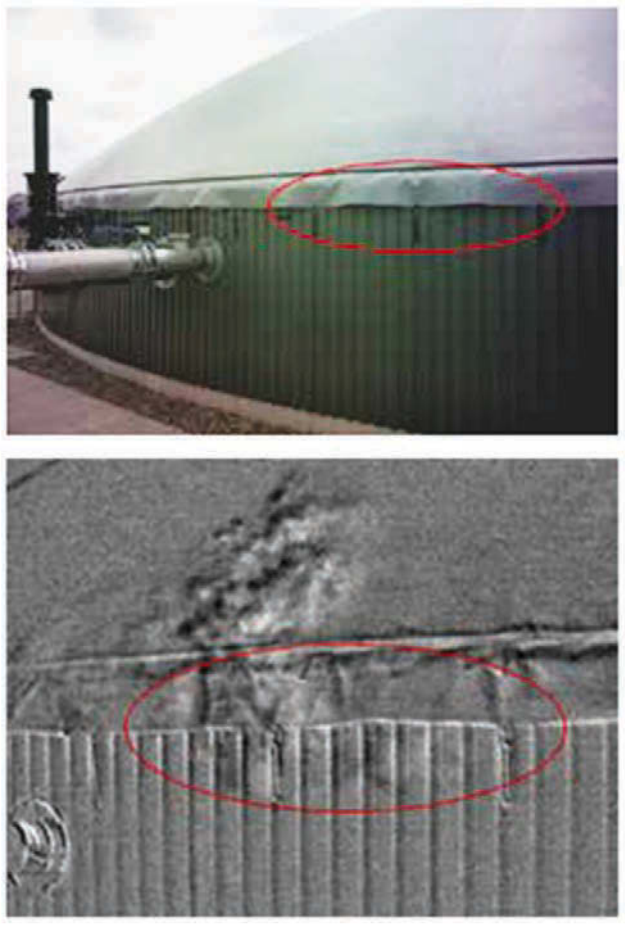
Escaping gases appear like smoke on the camera's LCD viewfinder in real time and can be recorded in the camera for easy archiving. Once a leak is detected from a safe distance, users can move closer and quantify the gas concentration using a secondary method.

Interpreting Gas Leak Footage Requires Skill

The clarity of the GF320's thermal video is due to FLIR's integrated and patented image analysis software. However, it does take some interpretive skill to analyze black and white JPEG images of escaping gas, which is why van Lessen found the user training by the specialist company ITEMA GmbH particularly helpful. He received precise instructions from qualified personnel on how to handle and operate the camera.

"Some experience in image interpretation is necessary to perform reliable leakage localization and assessment," said van Lessen.

FLIR Tools software also comes in quite handy when producing inspection reports. The software allows for sophisticated documentation and is easy to learn in a short period of time. Found leaks can be marked directly in the image and also recorded as a video sequence inside the program. Based on detailed reports, damaged areas can be subsequently repaired by the customer, and then tested again to confirm the leak is fixed.



Gas leak on the terminal strip of the air-supported roof of a fermenter in the visible light spectrum - and in an infrared image made by the FLIR GF320.

Explosion protected areas can be investigated from a safe distance with the FLIR GF320.

GF320 Allows for Maximum Mobility

The decision to acquire the FLIR GF320 was relatively easy for IBS GmbH, because the camera has no real competition in terms of compact size and portability. The GF320 is also less expensive than competing thermal cameras. Finally, the GF320 detects not only methane, but a total of 20 gases, including butane, propane, and benzene.

The GF320 is a versatile tool at each step of the biofuel production process, from the fermentation of agricultural byproduct to the generation of power at combined heat and power (CHP) plants. The GF320 can also detect petrol or diesel fumes, as well as exhaust leaks on the turbocharger. And due to its rugged design, the camera can be used in conjunction with an explosion meter in explosive environments.

"Its light weight allows for ergonomic working in any position, and the ease of use rounds off the gas camera's design," said van Lessen.

Conclusion: Added Value for Users and Customers

The key success factors for bioenergy facilities continue to be safety, efficiency and profitability. When carrying out gas detection, it is of vital importance that inspectors obtain as complete a picture as possible of the condition of a given plant. A FLIR infrared camera like the FLIR GF320 is an extremely important tool for tracking down potential gas leaks. The FLIR GF320 has certainly provided significant added value for IBS GmbH and its customers, ensuring optimized operation and safety.

The FLIR GF320 thermal imager.

For more information about thermal imaging cameras or about this application, please visit www.flir.com/ogi

The images displayed may not be representative of the actual resolution of the camera shown.
Images for illustrative purposes only.

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Leading Global Exhibition for Industrial Valves to be held in Düsseldorf for the fourth time

They are made to work everywhere and still vary widely in size and application: fittings that ensure safety in the oil and gas industries, channel fluids through chemical plants, control the supply and drainage of water, gas or highly corrosive media or regulate the correct flow in the beverage industry.

The entire spectrum of industrial valves will be covered by **Valve World Expo** in three exhibition halls from 29 November to 1 December: the ranges encompass valves, valve components and parts, actuator drives and position controllers, compressors, engineering services and software, associations and publishers.

For three days the exhibition halls 3, 4 and 5 will then become the No. 1 international meeting point for the industry, for valve specialists and expert users from many user industries. Users come from the fields of oil, gas and petrochemical industries, chemical industry, food industry, marine and offshore industries, water and waste water management, automotive and mechanical engineering, pharmaceutical industry as well as power plants.

At this early point in time over 19,600 square metres of net exhibition space are already occupied. 638 exhibitors from 39 countries have registered. Most European companies come from Italy, Great Britain, Germany, Spain, France, Turkey and the Netherlands. Overseas visitors will mainly come from the USA, India, Taiwan, South Korea and China.

The accompanying technical "VALVE WORLD Conference Düsseldorf 2016" will again be organised by KCI in Hall 4. Alongside topics of the future such as material selection, new technologies and processes for the production and application of valves, new energies and the analysis of new services, an in-depth debate about the structure of the industry will be centre stage here.

Lectures, workshops and seminars deepen the content covered by the Conference. Organisers expect experts from all over the world to exchange with conference delegates on innovations from the dynamically growing area of valve technology including its upstream and downstream technologies.

The Pump Summit, the International Exhibition & Conference for Pump Technology, will take place on the ground floor of Hall 7.0 on 29 and 30 November. Here networkers and pump specialists will come together and the producers, distributors and users of pumps, seals and compressors will present their products and exchange expert knowledge.

The Pump Summit will be accompanied by a conference. The agenda features talks and selected workshops on pump and seal applications in a wide variety of industries.

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Launch of MFD Plus Mass Flow Devices at Analytica 2016

Axetris AG (Switzerland) announced an extension to its product range of high-performance mass flow meters and controllers at Analytica 2016. Mass flow solutions [https://www.axetris.com/en-gb/mfd] from Axetris are now available for full scale flows of up to 15 slpm with the MFD Plus range [https://www.axetris.com/en-ch/mfd/products/mass-flow-controller/mfc-plus].

Axetris introduced the Plus range [https://www.axetris.com/en-ch/axetris-news/1604_axag_mfd-plus-new-range/] of mass flow meters and controllers with an unmatched dynamic range. The new innovation from Axetris allows you to use a single mass flow device over a wide range of flow rates, helping you save costs, while taking the complexity out of design and logistics. The range of mass flow devices come in surprisingly compact sizes, enabling compact designs.

OEMs worldwide rely on the Axetris mass flow technology in the fields of gas chromatography, leak testing, thermal analytics, mass spectroscopy, thin film deposition, plasma engineering and more.

Please visit the website for further information: www.axetris.com/mfd.

For More Info, email: 39391pr@reply-direct.com

New Infrared Sensor now available for Sulphur Hexafluoride (SF6) measurement

Sensors Europe GmbH (Germany), is pleased to announce its new Gasmitter product line for SF6 measurement.

Gasmitter is available for Sulphur Hexafluoride measurement in range of 0-1000 ppm for gas leakage detection or in range of 0-100 Vol.-% for Sulphur Hexafluoride fill level measurement.

Gasmitter's smart averaging filter enables a quick measurement for leakage detection meanwhile a stable signal is given for fill level measurement.

Gasmitter comes along with a linear signal output (4-20mA analogue & RS232 digital), a temperature- and pressure compensation as a standard (0-50°C and 800-1200mbar). Its size is minimised to 160mm x 50mm to enable integration in a wide range of handhelds or analysers.

For More Info, email: 39351pr@reply-direct.com

IRNEX-P Low Power ATEX & IECEx certified NDIR sensor for CO^2 or HC detection

The IR series of infrared gas detection sensors from **N.E.T.** (Italy) use the NDIR (Non Dispersive Infrared) technique to monitor the presence of hydrocarbons or carbon dioxide. This technique is based on the fact that the gas has a unique and well defined light absorption curve in the infrared spectrum that can be used to identify the specific gas. The gas concentration can be determined by using a suitable infrared source and analysing the quantity of energy absorbed from the gas inside the optical path. The IRNEX-P Low Power sensor is equipped with electronics and firmware in order to provide an output that is linearised and temperature compensated that is suited for manufacturers also without any specialist knowledge in IR technology. The output is analogue voltage type [0.4 V—2 V] dc (other voltages are available upon request). The IRNEX-P Low Power sensor has been tested and certified according to the ATEX directive and IECEx.

IRNEX – P is now SIL2 approved. It's main features include; explosion proof Ex d IR sensor for surface (II 2G) and underground (I M2) classified areas; analogue voltage standard output; incorporated signal linearisation and temperature compensation; standard sensor size 20 mm diameter; fast response; solid, rugged construction; wide operating temperature and humidity range (-40°C / + 60°C); low power consumption (45mA) range (-40°C / + 60°C) and new 'Nautilus' optics.

For More Info, email: 39364pr@reply-direct.com

New Integration Service Makes Offers a One-Stop-Shop for Process Analyser Solution

Yokogawa Europe (the Netherlands) recently announced the launch of a new service – ASI or Analyser System Integration. This makes Yokogawa a true one-stop-shop for ASI at both green-field or brown-field projects of almost any size, thus helping project owners to simplify their supply chains as they need only deal with a single team for all analytical requirements.

The mature European process industry has many aging plants, with many requiring updates, renovation and modernization. The complex nature of these renovation projects requires the highest quality design and engineering at all stages of implementation. At the same time, project managers need to simplify the procurement process to help manage risk and ensure that there is clear ownership of each part of the project.

Loek van Eijck, business unit manager, analytical solutions at Yokogawa Europe, said: "We're very pleased to announce the introduction of Yokogawa Europe's Analyser System Integration service. This services responds to a growing market demand within the chemical, oil & gas industry, and increasingly in other process industries, to simplify project management of both new installations and renovations. We'll be working with our own analysers and those of 3rd-party manufacturers, but it makes sense for project owners and primary contractors to deal with a single integrator of analytical systems, and for that integrator to be a supplier of instruments being installed."

One of the major issues facing project managers is finding a team with the right skills and experience for specialist areas of project implementation. Yokogawa's ASI service guarantees access to design and implementation engineers with the highest levels of qualification and certification. The highly skilled project management team is fully certified by Project Management Professional (PMP), while the engineering team designs solutions to the explosion-proof standards specified by ATEX, IECEx and all other relevant standards bodies, making design compliance easier to prove. They are backed up by a professional execution team with more than 150 years of accumulated installation experience.

Yokogawa has built a global reputation for quality and innovation, and has now applied this to its ASI service. "We believe this sets our service apart from the competition," said van Eijck. "Yokogawa has earned its reputation through involvement in some of the industry's largest and most innovative projects, and is now able to apply this in Europe to ASI projects of almost any size from any process industry requiring highly accurate analytical instrumentation by sharing know-how with other ASI facilities and developing synergy among Yokogawa Group Companies."

The service provides a full analytical services life cycle from design, fabrication and manufacturing to installation, on-site services and training. Yokogawa ASI also links up to the similar services provided by Yokogawa in its Asian and US divisions providing customers with global coverage – an obvious advantage for international organisations and projects.

The ASI service is based in Madrid, Spain. Almudena Mier, ASI location manager at Yokogawa, said; "We have created an excellent facility here for the new service which offers a great environment for the team and the projects they will work on. Madrid is well served by transport links to the rest of Europe and beyond, and has access to some great local engineering talent as well as being an attractive place to work for staff and customers who come from elsewhere in Europe."

Yokogawa Europe's new ASI service is set to provide a simplified supply chain for the analyser needs of major process engineering projects, ensuring quality of design and implementation, together with reduced project risk and cost, all backed by Yokogawa's enviable reputation for quality.

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General-Purpose Power-Quality Monitor for On-Site Testing and Troubleshooting

The **Yokogawa** (the Netherlands) CW500 power quality monitor, a general-purpose unit for field and on-site testing and troubleshooting, is the latest addition to the company's range of power measuring instruments.

Featuring a range of clamp-on current probes, built-in data logging and measurements conforming to the IEC 6100-4-30 Class S standard, the CW500 is a multi-function instrument designed to aid the inspection and maintenance of power quality in factories, commercial or public facilities. In particular, it will detect, measure and record events such as voltage swells, sags, dips or interruptions, inrush currents, harmonics distortion and flicker which can have an adverse effect on equipment operation or energy efficiency.

The 4-channel instrument can measure multiple power lines in configurations from single-phase/2-wire up to 3-phase/4-wire, and will simultaneously measure AC voltage input on three channels, current input on four channels and DC voltage input on two channels. Parameters measured include the instantaneous, average and maximum/minimum values of voltage, current, DC input voltage, power, power factor and phase angle, along with phase advanced capacitance calculation.

All measurements are displayed on the built-in colour display screen in list, waveform, or trend formats with direct keypad control. The integration values of active, reactive and apparent energy are each displayed by consumption and generation, and demand power value can be monitored continually via graphical screens of power consumption compared to the targeted demand power value. Intermittent anomalies such as voltage swell, voltage dip, voltage interruption, transient overvoltage and inrush current are each recorded as events and marked on occurrence waveforms, with the type of fault listed for each event. Ongoing or continuous faults such as harmonics, flicker and voltage or current imbalance rates are recorded with waveforms displayed as required.

The CW500 operates over an input AC voltage range from 6 to 1000 V and a DC voltage range from 100 mV to 10 V. The current ranges are from 2 A (for leakage current only) to 3000 A, with intermediate ranges of 50A, 100A, 200A, 500A and 1000A depending on which dedicated clamp-on current probe is used. Accuracy for power measurements is 0.3% of reading. Up to 2 Gbyte of memory is provided by an SD memory card, and communication is via a USB interface which allows real-time management of measurements. Built-in PC software (CW500 Viewer) provides analysis of recorded data and report generation including automatic graph creation, as well as simple management of the main unit settings. The CW500 is a compact and lightweight instrument measuring 175 × 120 × 68 mm and weighing 900 g with batteries. Power can be supplied via AC mains or by six LR6 batteries.

For More Info, email: 37042pr@reply-direct.com

An Industry First - In-Line Optical Vapour Pressure Analyser

JP3 Measurement (USA) is pleased to announce the launch of the industry's first in-line, field deployable optical vapour pressure analyser, the Verax VPA™. For the first time, you can measure vapour pressure in condensate and crude oil in-line using first principles that are traceable to ASTM standards. Because the Verax VPA™ measures with probes directly in the pipeline at operating pressure and temperature, no sample conditioning system is required. Using patented Near-Infrared optical spectroscopy and advanced communications, the Verax VPA™ provides real time data, communicates directly to your control system, has no emissions and uses no carrier gases.

JP3 Measurement provides the industry's only field deployable, real time, in-line optical analyser for both liquid and natural gas measurement.

For More Info, email: 34297pr@reply-direct.com

Mass Flow Control for New Physical Vapour Deposition Applications

You know one problem with anodising and bluing? While it prevents corrosion, it can scratch off. Most anodising doesn't strengthen a surface much. Chrome plating has been an alternative, but chrome-6 is toxic, and can still wear, pit and spall. Duralar, a vacuum deposition system manufacturer, wanted to develop a fast, diamond-like coating process using physical vapour deposition that's harder and more durable than either. It would have applications in prevention of corrosion, erosion and wear on metal parts.

Duralar started with a generic vacuum deposition system, but none of the six built-in thermal controllers were calibrated for their special gas, tetramethylsilane (TMS), a vapourised liquid. The fact is, those controllers couldn't change gases accurately, without downtime for a recalibration. So Duralar called **Alicat** (USA). Although TMS isn't on Alicat's standard list, with a bit of engineering they provided Duralar with a corrosion resistant flow controller with a custom gas calibration for TMS.

They retrofitted their system using the Alicat controller—it's a drop-in replacement—and they are now assured that the accuracy of their TMS flow will remain high, whether flowing full scale or turned down to 0.5% of full scale. That's because Alicat's gas selection isn't just a k-factor offset for a single point, it's a complete performance curve based on NIST's viscosity tables. Going forward, Duralar needn't worry about inaccuracy due to changing temperatures or pressures in their factory, since the closed-loop sensor in the controller compensates for volumetric changes—unlike those original thermal controllers.

Next, Duralar wanted to develop a process to deposit this thin coating inside tubes and pipes. With the inside of the pipe coated, you could reduce abrasive wear and corrosion—perfect for flowing abrasive liquids in a pipe, or protecting the inside of a rifle barrel from rust. The technique is clever: seal the ends of the tubes, and the interior of the tube becomes the vacuum chamber. The catch is, you need to be able to vary the location of the plasma-producing electrical discharge inside a narrow tube to get a complete coating. So, more prototyping, more experimentation, and Alicat to the rescue again.

By using an MCS flow controller for the corrosive TMS and just two more Alicat MC mass flow controllers, they were able to change gases at will, selecting from up to 98 built-in types and 20 user-customisable mixes—even more on the corrosion-resistant controller.

Then, they used Alicat's downloadable LabVIEW drivers to build the vacuum process steps, controlling the MFCs and their shut-off solenoids from a remote laptop. In due time, they had perfected the process and begun building coating systems to order. Now, you can order diamond-like coatings for your metal parts—or the systems to provide the service for others—and the vacuum coating is more durable than anodising , while quicker and harder than chrome plating. Thanks to Alicat's flow controller adaptability, physical vapour deposition gets better and better.

For More Info, email: 37904pr@reply-direct.com

Tried and Tested Process Flashpoint Analysis

The FPA-4 flash point process analyser from **BARTEC BENKE** offers rest assured continuous flash point temperature analysis for kerosene, diesel and other refined products with a low sulphur level. The latest version has an extended temperature range of 25 to 180 degrees Celsius. This analyser performs a catalytic oxidization technique which significantly reduces coking of samples on the cell hence reducing maintenance needs. This versatile and cost effective instrument can analyse from multiple streams of samples within ASTM correlation based on catalytic reaction.

Users of the FPA-4 enjoy peace of mind as this analyser incorporates overflow protection, integrated failure diagnosis and self-monitoring, scheduled automatic regeneration. A validation report for quality assurance is available and, like all of the BARTEC analysers, the unit works with Modbus/RTU. Modbus/TCP (bidirectional) interfaces and remote access can be achieved with Ethernet (VDSL or FOC is) and it is can be programmed via digital and analogue inputs.

email: 38510pr@reply-direct.com

The Only ASTM Compliant Capillary Process Viscometer

BARTEC BENKE's VISC-4 is the world's only ASTM compliant capillary viscometer. This analyser can continuously measure kinematic viscosity and density, allowing it to then calculate dynamic viscosity with amazing temperature stability (+_ 0.02K) to make it compliant with ASTM D445 Standard. This makes the VISC-4 it an ideal solution for applications such as lube oil production and fuel oil blending where accurate viscosity readings are paramount. These accurate measurements reduce costs as well as raising quality, so the return on investment is rapid.

Maintenance requirements are minimal because of the temperature control and insulation system and no Hagenbach correction is required. Multi-stream capability, integrated failure diagnosis and self-monitoring and validation reports for quality assurance come as standard features and there is an option of automatic rinsing and draining. As with all BARTEC analysers, the instruments works with Modbus/RTU. Modbus/TCP (bidirectional) interfaces and remote access can be achieved with Ethernet (VDSL or FOC is) and it can be programmed via digital and analogue inputs.

email: 38511pr@reply-direct.com

Reliable Measurements Ensure Process Safety

Bartec's (Germany) Hygrophil F5673 has a proven track record for reliable trace moisture measurement in a variety of liquids and gases. Originally designed for the natural gas market, the Hygrophil F 5673 is furthermore used for to measure trace moisture in an array of liquids and gases in hydrocarbon process streams.

Bartec has patented a measuring principle whereby the trace moisture content in the analyte changes the refractive index of the optical layers found within the instrument's sensor. There is a change in the light spectrum's minimum caused by the presence of moisture, which is then measured by a Polychromator located within the analyser.

The multichannel Hygrophil F5673 and its rugged moisture sensors has been successfully used in the petrochemical industry to measure recycle gas streams, gaseous or liquid hydrocarbons and fuels. It has also made bio and natural gas plants safer places, measuring gas treatment streams, biogas injection plants, gas transport, gas storage facilities and gas dryers. This versatile analyser has also been widely used in chemical plants for performance evaluation of catalysts and process safety and in improving operations and quality control at power plants.

For More Info, email: 38876pr@reply-direct.com

OPTIMIZE YOUR PROCESS

BARTEC BENKE

Flash Point Process Analyzer FPA-4

- Continuous measurement
- Very short lag time
- Capable to handle back pressure on return line
- No coking of measuring cell (reduced maintenance efforts approach)
- Extended measurement range up to 180 °C
- Mobile HMI solution for remote access to the analyzer

The well established Flash Point Process Analyzer FPA-4 remains the best solution to continuously measure the flash point of kerosene, diesel and other low sulphur refinery products. The improved concept offers an extended measuring range up to 180 °C (356 °F). The catalytic oxidation technique significantly reduces maintenance requirements by eliminating carbonization of the sample on the cell.

All major refineries worldwide trust in analyzers from BARTEC BENKE.

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pat@bartec-benke.de
www.bartec-benke.de

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Mobile GC/MS Detects VOCs in Water Using Portable, 3-Pound Purge & Trap

The **FLIR** Griffin 460 GC/MS (Gas Chromatograph Mass Spectrometer) with portable Griffin Purge & Trap accessory provides on-site analysis of BTEX in water in less than eight minutes. In the burgeoning field of petrochemical exploration, such as shale oil/gas and hydraulic fracturing, elevated concentrations of BTEX can be found in groundwater around exploration sites. Public health organisations are concerned with the Maximum Contaminant Levels (MCLs) established by the United States Environmental Protection Agency (US EPA). BTEX components are detected by the Griffin 460 in less than eight minutes to levels below these stated MCLs. The Griffin 460 provides a timesaving advantage by performing on-site water analysis to expedite decision making and remediation efforts. Chemistry happens outside the lab, so should analysis.

The Griffin 460 is a mobile GC/MS well suited for petrochemical applications. Designed for use in a moving vehicle (Figure 1B), it has passed MIL-STD 810G vibration standard testing. Using the Griffin 460 near petrochemical exploration sites or other areas of interest helps prioritise and reduce the number of samples that ship, under chain of custody, to a fixed analytical laboratory.

The three-pound (1.4 kg) Griffin Purge & Trap accessory is installed in only a few minutes with a simple plug-and-play connection to the sampling port located on the Griffin 460, which also supplies the purge gas and power. No other connections are required. The water sample vial attaches to the accessory with a tool-less fitting. The Griffin 460 with Griffin Purge & Trap is an integrated system that rapidly extracts chemical targets of interest from water samples and performs an automated analysis and identification, without any costly consumables or time-consuming sample preparation steps.

For More Info, email: 35552pr@reply-direct.com

Handheld Process Calibrators Offer High Accuracy and Stability

Yokogawa (the Netherlands) has introduced the CA300 Series of handheld process calibrators: a family of three models featuring high accuracy and stability, with each model incorporating a dedicated range of functions for loop diagnosis, thermocouple simulation and RTD (resistance temperature detector) simulation, respectively.

The new models, which supersede the company's existing CA11E voltage/current calibrator and CA12E temperature calibrator, are designed to aid the periodic inspection and calibration of field measurement and control devices in plant maintenance operations.

The accuracy and stability of the new calibrators reflects today's increasing emphasis on the stable and safe operation of plants, where process calibrators are required to be more efficient while offering higher quality. At the same time, the controls themselves are getting more precise, so that the process calibrator has to be more accurate.

The three new models in the CA300 series are the CA310 volt/mA calibrator for loop diagnosis, the CA320 thermocouple calibrator and the CA330 RTD calibrator.

The CA310 is a dedicated process calibrator which is designed to perform transmitter control-loop checks and inspection of the associated devices by providing a 20 mA simulated sink function and by supplying 24 V loop power while simultaneously measuring the output signal precisely. With an accuracy of ±0.015% of reading on both source and measured current and voltage, it is three times more accurate than the earlier CA11E model. A 250 ohm resistance is embedded for HART or BRAIN communication.

The CA320 is a dedicated process calibrator designed for the inspection and calibration of thermocouples and temperature controllers, and again offers a threefold enhancement with a typical accuracy of ±0.5°C for a Type K thermocouple. It is compatible with JIS and IEC standard thermocouples, and also meets the ASTM and GOST-R standards for the inspection and calibration of 16 types of industry standard thermocouples.

The CA330 is a dedicated process calibrator for carrying out inspection and calibration of RTDs. It has double the accuracy of the existing CA12E with a basic accuracy of ±0.3°C, which puts it in the top class of handheld devices for sourcing resistance output and measuring the output of sensors. It is compatible with JIS, IEC and GOST-R standard thermocouples, and meets the standards and regulations for the inspection and calibration of the 14 types of standard RTD.

Each unit measures 90 × 192 × 42 mm and weighs 440 g. A wide range of accessories including power adaptors and a carrying case is available.

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Thermal Imaging Software Tutorial for R&D/Science Users

FLIR ResearchIR 4.2 thermal imaging software provides researchers and scientists with a state-of-the-art tool for viewing, acquiring, analysing, and sharing thermal data.

To enable users to get started, and then gain the full potential of this powerful software package, FLIR Systems has created several informative online tutorial videos that may be viewed on their website.

Available in 20 languages, FLIR ResearchIR 4.2 software provides a comprehensive set of acquisition, diagnostic and data sharing tools as well as customisable, savable workspaces that allow you to arrange how images, data, charts and plots are displayed. ResearchIR4.2 connects directly to FLIR thermal imaging cameras via USB, Firewire, Gigabit Ethernet and Camera Link, enabling fast viewing of thermal snapshots and movie files. The software allows you to control zoom and pan capabilities and performs real-time image analysis with a variety of measurement modes. Software options for preset sequencing and superframing allow researchers to more effectively analyse scenes with large temperature differences or targets with rapid thermal dynamics. An array of enhanced charting and graphing capabilities permits users to create line profiles and temporal plots for all of the measurement tools.

New capabilities for version 4.2 of the software include giving users direct access to their MATLAB scripts within ResearchIR. This allows users to access customised MatLab scripts directly in ResearchIR for specially-tailored image analysis and processing tasks. In addition, ResearchIR 4.2 software provides FLIR R&D/science thermal camera users with UltraMax file support. UltraMax is a proprietary image enhancement technology available on FLIR's Tsc-Series thermal imaging cameras.

For More Info, email: 39300pr@reply-direct.com

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info@pin-pub.com

Flowmeter for Metering Viscous Fluids

Built for metering viscous fluids, such as hydraulic oils used in heavy machinery, at pressures of up to 700 bar and temperatures up to 150°C, the **Titan Enterprises** (UK) OG2-700 bar flowmeter is designed to be fully IP67 / NEMA 4 compliant.

With a standard flow range from 0.03 to 4.0 litres / minute on 30Cstk oil the flowmeter is able to routinely achieve outstanding accuracy (0.5%) and repeatability (0.1%).

Combining robust 316 stainless steel design, durable construction materials and proven technology ensures the OG2-700 bar flowmeter will provide reliable, accurate operation over an extended product lifetime.

For More Info, email: 39220pr@reply-direct.com

New System for Early Warning of Hydrocarbon Leaks though Existing Monitoring Wells

CLH Group, installs an innovative technology developed by **Smart Sensor Technology** (Italy) for early warning of hydrocarbon leaks though existing monitoring wells.

CLH Group has been a pioneer in implementing a new hydrocarbon leak detection system in water using a net of existing monitoring wells. The company has installed its technology in 12 facilities in 2015.

According to CLH Environment and Security Head, Fernando Garcia, "this technology entails a perfect complement to all our efforts to be at the forefront of environmental best practices".

The system consists in a grid of wireless sensors installed in existing monitoring wells. These sensors float in the air-water interface and they broadcast, once per day or the desired period, the signal to be visualised from any computer or mobile device.

The sensors work using a Physical-Chemical reaction to avoid false alerts. The sensor also allows to know the type of contaminant as well as it retains a physical evidence of the contamination.

The devices are ATEX certified and communicate between them in 868 MHz frequency. They are IP68 and they last 10 years with the same battery.

The system is completely wireless and if needed it can use repeaters to cover big distances till it connects to the GRPS control unit. The control unit is installed inside the client's office and connects to the cloud for easy access.

The devices are extremely easy to install. Just drop the sensor inside the piezometer (from 2" and over) and set the transmitter in the top of the monitoring well. The installation takes no more than 10 minutes for each piezometer and no civil work is necessary.

The operating range of the transmitters is about 100m. But if they are below the metallic chamber of the monitoring well the signal strength is reduced to only a few meters. In this case a simple repeater is installed near the emitter in order to extended the signal up to 100m. You can use more than one repeater to reach several hundreds meters.

The control unit is installed in the client's office where it collects raw data from the sensors, finally all this information will be sent to a server in order to be available from any computer and mobile device through a cloud based solution.

According to Alvaro de Fresno, Technical Manager of Grupo Hera Tratesa S.A.U., the installation of 12 sensors across a facility can take 2h approximately in standard conditions.

The technology is very affordable and allows companies to have a very efficient continuous online monitoring system at a fraction of the of other alternative solutions says Santiago Ramas, CEO and Co-Founder of Smart Sensor Technology.

email: 37448pr@reply-direct.com

New Industrial Emission Analyser Introduced

Wöhler (Germany) introduces the A 550 Industrial Emission Analyzer. The portable instrument is designed to be used in tough industrial heat processes, such as boiler and burner testing, heat processes and engine testing. This special industrial environment brings a number of major challenges for the exact measurement and analysis of the flue gas as well as for a simple handling. And the Wöhler A 550 Industrial meets them all.

The analyser is fully equipped with sensors for temperature, pressure, O_2, CO, NOx and SOx. A special probe, the in-stack stainless steel sinter-filter probe, protects these high-tech sensors against heavy dust loads. Together with the battery driven Peltier cooler it is possible to measure even nitrogen oxide and sulfur dioxide emissions with precision and display the readings with a high resolution of 0.1 ppm. Another reason for the superior precision is the high-power pump for negative pressures up to 300 mbar which allows to take fast and representative samples. To measure flue gas velocity and flow rate the Wöhler A 550 Industrial is equipped with a dual port digital pressure sensor.

The handling of an instrument is an important topic within the context of working with boilers and burners. This point was especially taken into account when developing the analyser: On the large and brightly lit 7" color-monitor the readings can easily be read anywhere, even in an environment with difficult lighting conditions. The clear arrangement and the graphical presentation of the readings allow an excellent overview. Because of the touchscreen the individual functions can be launched as intuitively as using a smartphone. With a tap of the finger it is possible to perform a complete analysis and inspection of boilers and burners.

Weighting only 1.25 kg and equipped with magnets, the analyser can be attached to any magnetic object. This feature allows the user to work hands-free. He can run or stop measurement readings when simply holding the probe, because the probe is equipped with a start/stop button.

The Logger option allows to perform long term measurements. The user can configure the logger to the application needs, simply by entering the start date and time, the interval and the total amount of measurements. The analyser will then automatically calculate the ending date and time of the measurement. During long time measurement a peltier cooler ensures accurate readings by removing the condensate from the sample. It is battery-driven which provides more than 4 hours off-grid operation time.

Data management can comfortably be done. The built-in memory of the analyser can store up to 1,000 records. Furthermore there are a number of interfaces available to transfer data: USB, infrared and Bluetooth. The corresponding software allows to store and analyse the measured data on the PC. For documentary purposes another option is to print out the readings directly on-site.

For More Info, email: 39068pr@reply-direct.com

Trial Success for pH Electrodes in LNG Plant

Introduction

At a large LNG plant in Brunei trials have been carried out on the new Refex pH electrodes. Two sets of the Refex electrodes (RM-5810 reference electrode and RM-5610 pH glass electrode) have been retrofitted into the existing Rosemount 381 immersion systems. These new electrodes were installed in the pH measurement of Flocculators A5301 (Tag no. 53-QT-7) and A5308 (Tag no. 53-QT-12) for 90-days trial run. These two existing pH meters were selected for the following reasons: Drifting pH values,
Frequent cleaning of the electrodes,
Frequent calibration of the meter,
Replacement of glass electrodes between 6 to 12 months.

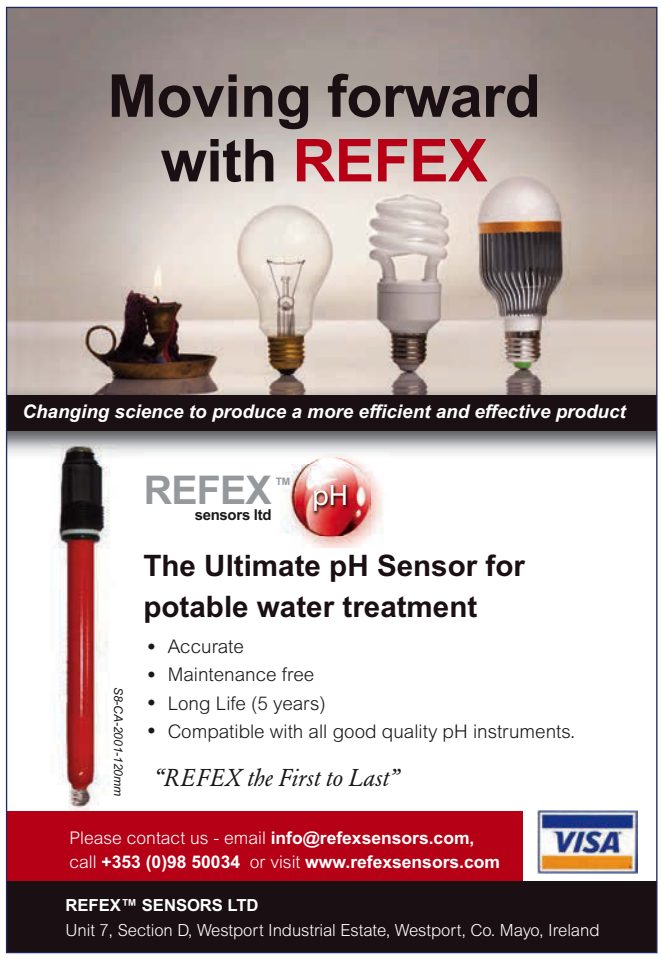
Observation

The Refex RM-5610 pH glass electrode paired with Refex RM-5810 reference electrode was observed to be reliable, accurate and required less cleaning maintenance for the pH measurement for the flocculators. During the trial run, a remarkable reduction in cleaning frequency of the electrodes and calibration was noted. The pH values were found to be within the control limit for both meters, although much of the errors tend to be on the positive side of the deviation which means that there is still a systematic error in the system. Nevertheless, systematic error is not a concern in this electrode replacement.

Conclusion

Although the plant has been using the Refex pH electrodes with its Rosemount 318 assemblies for just three months, the introduction of the Refex electrodes is said to have transformed its pH measurement. Since the introduction of the Refex electrodes into the existing system, the pH measurement was claimed to produce accurate, reliable, stable and less cleaning maintenance and calibration. The LNG plant will continue to use the Refex pH electrodes that are currently still running now. The LNG plant will also be considering the replacement of other conventional pH/reference electrodes throughout the plant to these Refex pH electrodes in the future.

For More Info, email: 38443pr@reply-direct.com



email: 5294ad@reply-direct.com

SCADA System Order Received for Gas Distribution Pipeline Project in Bangladesh

Yokogawa Electric Corporation (the Netherlands) have announced that Yokogawa India has received an order from the Gas Transmission Company Limited (GTCL) to supply a monitoring and control system for the gas pipeline system in Bangladesh. This project will involve the revamping, modernisation, and expansion of GTCL's existing supervisory control and data acquisition (SCADA) system.

GTCL owns and operates a network of pipelines for the nationwide transmission of gas from gas fields that are primarily concentrated in the eastern part of Bangladesh. GTCL is planning to build an integrated SCADA monitoring and control system that will ensure the stable and efficient supply of gas to three of the country's eight administrative divisions: Dhaka, Chittagong, and Sylhet. GTCL plans to increase its gas transmission volume to 550 million standard cubic feet per day (MMscfd), up from 400 MMscfd in 2013.

This order is for FAST/TOOLS SCADA software and a STARDOM network-based control system for pipeline monitoring, DPharp EJA and DPharp EJX series differential pressure/pressure transmitters, other field instruments, a closed-circuit television (CCTV) system, and a telecommunications system for central monitoring and control. Targeting delivery within 22 months, Yokogawa will be responsible for the engineering, installation, and commissioning of these systems.

Yokogawa proposed a bespoke automation solution which was selected because of Yokogawa's reputation for quality and extensive experience in supplying SCADA systems for oil & gas pipeline projects.

Tsutomu Murata, managing director of Yokogawa India, commented "I am honoured to receive this order, which is Yokogawa India's largest project to date in Bangladesh. By carrying out this large project, we aim to help ensure a stable energy supply for the people of Bangladesh."

In accordance with its Transformation 2017 mid-term business plan, Yokogawa is strengthening its efforts to drive up sales by providing solutions for pipelines and other oil & gas midstream applications. Encouraged by its success in winning this order, Yokogawa plans to expand its control business in the midstream applications segment.

For More Info, email: 39288pr@reply-direct.com

Infrared Camera for Industrial & Academic Research

The **FLIR** SC7000 Series is specifically designed for academic and industrial research applications that require a flexible thermal imaging camera with high sensitivity, accuracy, spatial resolution, and speed at an affordable cost.

Designed to address any application in single and multispectral analysis, FLIR SC7000 Series cameras offer researchers a choice between mid-infrared Indium Antimonide (InSb) as well as mid-infrared and longwave infrared Mercury Cadmium Telluride (MCT) detectors. In addition the FLIR SC7000 series comes standard with a removable, motorised 4 position filter wheel enabling high performance imaging of events in a select part of the electromagnetic spectrum.

The SC7000 series can produce high quality infrared imagery in 640 x 512 or 325 x 256 pixel formats with high sensitivity and noise levels as low as 20 mK. Windowing allows a subset of the total acquired image to be selected with user adjustable window size at frame rate speeds of up to 62,000 Hz. Camera integration time on the SC7000 Series is adjustable in nanosecond increments. This smart external triggering feature allows synchronization of the image capture to the most fleeting events.

Benefiting from FLIR's proprietary Hypercal technology, SC7000 series cameras are able to ensure the most accurate temperature measurement with the highest sensitivity. Simply set the desired lower and upper temperature limits and the camera will automatically adjust to the appropriate integration (exposure) time.

Leveraging FLIR unique Superframing technique enables SC7000 Series camera users to sequentially acquire thermal data from up to four user-defined temperature ranges, and then merges those streams into a single real-time video that spans all four temperature ranges, effectively extending dynamic range from 14-bit to 16-bit.

CNUC is a proprietary FLIR calibration process that provides unmatched high quality imagery and measurement stability on SC7000 Series thermal imaging cameras. CNUC allows flexible integration time adjustments without the need to perform non-uniformity corrections. CNUC calibration also produces accurate measurement stability regardless of camera exposure to environment variations.

The FLIR SC7000 Series thermal imaging camera works seamlessly together with FLIR ResearchIR Max software enabling intuitive viewing, recording and advanced processing of the thermal data provided by the camera.

email: 39303pr@reply-direct.com

Inline Viscometers to determine Rheological Properties of Drilling and Fracturing Fluids

Brookfield Engineering Laboratories, Inc. (USA) has successfully provided its PVS pressurised rheometer to leading pressure pumping operations in Canada. The PVS and TT-100 inline viscometers were on display at Global Petroleum June 9-11, 2015.

Well fracturing operations require proper rheology of the fracturing fluid. To optimise fracture operations, the fracturing fluid's viscosity must be high enough under low shear conditions to suspend and carry proppant to the smallest crevices in the fractured rock. In addition, its viscosity must be low enough under high shear rates so that adequate flow to these newly fractured strata is obtained and the proppant is released.

As part of the laboratory development of the fluid, its rheology must be measured, evaluated, and understood over the majority of shear rates likely to be experienced at the well site so that an understanding of the fluid's behavior is known before it is pumped through the system. This requires an easy to use computer based, software driven rheometer, like the Brookfield PVS, that measures viscosity under pressure, and in addition provides the means to test at different shear rates, time spans, temperatures, pressures, and provides data analysis and data recording capabilities.

The TT-100 inline viscometer provides real-time, in-line measurements for gels moving in pressurised lines from the hydration unit before being pumped down-hole. It will continuously verify, at the well site, that the rheology of the fracturing fluid is within established specifications and provide an alarm indication when it is not, thus providing the means for precise, real time, viscosity control along with a complete and accurate record of the fracturing process. The result is reduced costs, less wear on equipment, and lower risk of damage to the formation.

For More Info, email: 34830pr@reply-direct.com

Pre-Calibrated TDLS Modules for a Cleaner Environment

Axetris (Switzerland) offers an extractive TDLS (Tunable Diode Laser Spectroscopy) solution - a pre-calibrated OEM module made for hot-wet measurement of gases such as Ammonia (NH_3), Hydrogen Chloride (HCl), Methane (CH_4) and for humidity (H_2O) measurements. The technology increases performance, reliability and cost effectiveness - or simply enables new opportunities for OEM customers.

The Axetris Laser Gas Detection (LGD) OEM Modules convince with their flexibility, and are built to be integrated in a variety of applications, e.g. Natural Gas Leak Detection, Continuous Emission Monitoring (CEM) or Selective Catalytic Reduction (SCR) / De-NOx process control.

For More Info, email: 37155pr@reply-direct.com

DNV- and GOSSTANDART-Certified Pressure Gauge

The **AFRISO** (Germany) NS 100 (NS 160) is used to measure the pressure of gaseous and liquid media at temperatures of up to 150 °C in the measuring ranges 0/0.6 bar to 0/1000 bar (0/0.6 bar to 0/1600 bar). The robust design with a measuring system that is completely welded to the housing results a shock- and vibration-resistant unit that does not require seals. This keeps the risk of leaks to a minimum and ensures high long-term stability. The pressure gauge features bottom or back bottom process connections G½B – AF 22 (EN 837-1/7.3). Other, customer-specific process connections are also possible. The Bourdon tube pressure gauge for chemical applications is made of stainless steel 304 and tightness-tested with helium; it features laminated safety glass window and a blow-out. The pressure gauge is optionally available with a back flange, a panel mounting bezel, a 3-hole fixing, panel mounting bezel, special scales, electrical contacts and an ATEX version. The Bourdon tube pressure gauge NS 100 (NS 160) is DNV- and GOSSTANDART-certified and suitable for chemical and process engineering applications.

For More Info, email: 39180pr@reply-direct.com

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The main objective of the **Gas Detection and Hazard Zone** at WWEM is to provide visitors with access to all of the available technologies for both portable and fixed gas detection and monitoring. Experts will be available to demonstrate equipment, offer technical help and advice, and will be supported by a comprehensive range of workshops covering subjects such as calibration, SIL plant safety, ATEX and technologies such as electrochemical sensors, NDIR, PID, Ion Mobility and Catalytic Gas Sensors.

Visitors to WWEM will be encouraged to discuss product and service needs with leading manufacturers and service providers. Visitors will be able to participate/attend over 80 informative walk-in and walk-out workshops **free of charge** on standards, legislation, safety, ATEX, new technologies and compliance.

WWEM will be most relevant to visitors from the process,water, food, beverage, petrochemical, manufacturing and environmental sectors.

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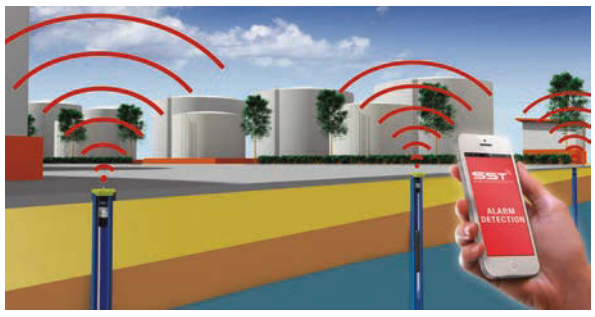
Supporting Trade Associations

New Wireless Hydrocarbon Leak Detection System



Detecting early hydrocarbon leaks has never been that easy. **Smart Sensor Technology** (Spain) has developed a wireless hydrocarbon leak detection system that could be easily installed in monitoring wells from 2" up.

Facilities storing large amounts of hydrocarbons (as fuel stations, bulk storages or refineries) are at risk of suffering leakage, causing environmental impact, risks of fire, and damages in the brand image. All that will definitely have a big impact in the company performance.

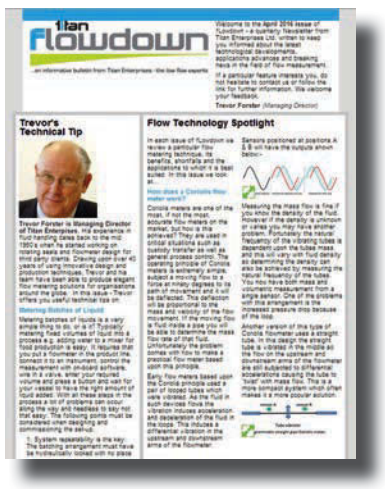
The new device developed by SST works with a wireless sensor that floats in the air-water interface of the monitoring well, and which physical-chemical properties are modified by the presence of hydrocarbons. The sensor is connected to a transmitter at the top of the well that broadcasts once a day (or any desired period). The signal can be visualised in any computer or mobile phone. That way any leak will be detected before it is too late, avoiding expensive environmental remediation costs.

This system features some competitive advantages in: Price: it is affordable, since no civil works are needed; Time: it takes no longer than 10 minutes to get the device installed and working; Reliability: no false alarms, the sensor will only activate the alarm by the presence of hydrocarbons; Remote communication: the system sends communication once a day (or the desired period); No wires: completely wireless installation up to 1 km; Durability: 7 years lasting battery, Proofs: a sample of the contaminating liquid is retained by the sensor, Reusing: the sensor can be replaced and reused; and ATEX certification and IP68 protection.

Smart Sensor Technology (SST) has developed an effective, low cost, high reliability device, that will allow the industry to detect hydrocarbon leaks in its early stage avoiding the costs of environmental remediation, fines and loss of reputation.

For More Info, email: 39297pr@reply-direct.com

Informative Flow Measurement Bulletin


titan flowdown

Trevor's Technical Tip

Flow Technology Spotlight

Titan Enterprises (UK) has published the Spring 2016 edition of its quarterly fLowdown ebulletin which contains a wealth of hints and tips, technological developments, interesting applications advances and breaking news from the field of flow measurement.

Available for download from the popular Technical Tip column looks at the challenges of metering fixed volumes of liquid into a process and offers a 7-point plan to eliminate errors and improve reproducibility.

In each issue of fLowdown, the editors review a particular flow metering technique, its benefits, shortfalls and the applications to which it is best suited. The Spring 2016 issue looks at Coriolis flow meters and provides an informative introduction to this accurate flow metering technology.

Bulletin board previews and gives access to a soon-to-be published article that examines increasing industrial demand for liquid flow measurement systems operating at low flow rates and discusses the technological advances in novel ultrasonic flowmeters that are enabling better measurements to be made.

Also in the Spring 2016 issue is a feature on low cost flowmeter technology development for beverage dispensing, a case study on semi-automated additive application and details of several new product introductions from Titan Enterprises.

email: 39186pr@reply-direct.com

A Cost Effective, Low Maintenance Solution for Flare Gas Monitoring

Galvanic Applied Sciences (Canada) offers high-value, low cost-of-ownership solutions for monitoring of H2S and total sulphur (TS) to assure full 40 CFR 60 Subpart Ja compliance.

Environmental authorities in the U.S. are requiring that process plant operators continuously monitor and record flare emissions and associated flow rates and gas composition. The ProTech continuously measures the feed gas to flare for H2S compliance and where required provides a total reduced sulphur (TRS) or total sulfur (TS) analysis.

Galvanic's ProTech H2S/TS analyser delivers fast, accurate, interference-free results using the most widely accepted analytical method in use today – lead-acetate-tape detection. Rugged and reliable, the analyser has an exceptionally wide measurement range to meet all the EPA monitoring requirements. It exceeds performance standards of GCs, other lead acetate analysers and a wide variety of other detection technologies, but its economic cost of operation make it one of the highest-value H2S analysers on the market. With the ProTech analyser's unique ability to analyse both H2S and TS, operators can use the same analyser throughout their facility, reducing spare parts inventory and lowering costs.

Galvanic's ProTech H2S/TS is a cost-effective, low maintenance, fast and space saving; making it the obvious choice for Flare Gas Monitoring.

For More Info, email: 39259pr@reply-direct.com

Advanced Measuring Products for the Gas Industry on Display at DUG East Conference

KROHNE, Inc. (USA), recently displayed measuring products for the gas industry at the DUG East Tradeshow, which took place June 21-23, 2015, in Pittsburgh, Pennsylvania, at the David L. Lawrence Convention Center, Booth 328.

The OPTISONIC 7300 ultrasonic flow meter which was on display at the booth is an economic solution for low pressure gas measurement, whether the gas is wet or dry. It is an excellent choice for natural gas, shale, and biogas applications, as well as hydrocarbon and process gas vents. OPTISONIC 7300 operates independently of gas density and composition and features an integrated flow computer for pressure and temperature compensation. Available in sizes ranging from 2-inch to 24-inch, the OPTISONIC 7300 is built for long-term use. It features an overall sturdy and robust construction, with no cables or sensitive parts exposed and no moving parts in the flow sensor. The OPTISONIC 7300's wide range of applications and maintenance-free full-bore flow sensor design makes using the device particularly cost-effective.

For More Info, email: 39223pr@reply-direct.com

Leading Flare Gas Meter Enhanced

Fluenta, have announced the launch of a new product, the Fluenta 160X flare gas meter. The Norwegian company, headquartered in Cambridge, United Kingdom and part of $300 million Vista Holding Group, has a commitment to research and development (R&D) investment to match the changing nature of the market.

At the heart of the 160X meter are enhanced transducers which allow accurate measurement of flare gas in more environments, including: extended high and low temperatures (-220°C to 250°C); bigger pipe diameters, or where high levels of CO^2 or hydrogen are present, thanks to a 10x stronger measurement signal; upgrades to existing flare gas meters, whether Fluenta or not, as the new transducers are retrofittable, giving a fast and smooth installation.

Sigurd Aase, CEO of Fluenta, commented: "The new 160X meter will allow companies that flare to up their game, providing not just accurate measurement but the ability to manage and reduce emissions. Industries such as Oil & Gas, chemicals and petrochemicals will now find that they too can benefit from cost and environment saving strategies, while ensuring compliance with all local regulations."

For More Info, email: 39358pr@reply-direct.com

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A New FID System for VOC Analysis

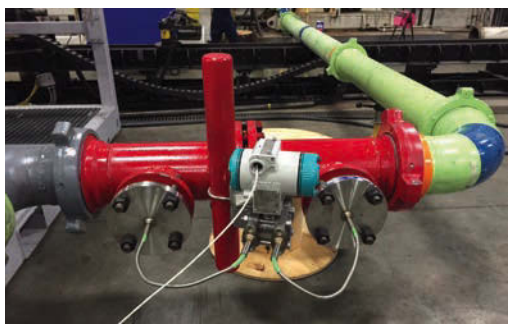
The SmartFID, from **ErsaTec GmbH** (Germany) is a portable heated flame ionisation detector (FID) for measuring total carbon in VOCs e.g. MAC, process monitoring, emission detection etc. SmartFID combines proven technology with new features such as automated ignition, automated calibration, integrated data logger with export function in different formats on USB and remote operation via Ethernet.

Automatic range switchover ensures that the measurements are always carried out in the correct range. The instrument is equipped with a 7" QVGA colour TFT touch screen allowing for user-friendly operation including a help-system. By using the free configurable feature calibration ratio, SmartFID analyses the output of measured value in mg C, mg compound, ppm or % LEL. The necessary air-conditioning is achieved by an integrated catalyser and all relevant interfaces and filters are easy accessible. During operation the device performs auto diagnosis and displays maintenance requirements. Additionally, the operator may use the tendency visualisation to watch the development of the measured value or to look for peaks in the elapsed time period.

In addition to the mobile version SmartFID is also available as a stationary 19" / 4 RU unit.

email: 38077pr@reply-direct.com

High Pressure Multiphase Mud Flow Solution Introduced



Bell Technologies (USA), LLC introduces the MULTIPHASE TORUSWEDGE (MPT) – a high-pressure flow meter for safely measuring multiphase volumetric flow rates for wellbore processes.

The meter is designed to provide high accuracy volumetric flow measurement on drilling rigs and can be used for multiple applications ranging from low to extremely high pressure. The MPT is particularly suited to mud flow where fluid is injected into the well through high-pressure high volume injection pumps. Mud is then returned to the surface through the bell nipple where it flows through the shaker for cleaning prior to being re-circulated back to the wellbore. The product handles demanding applications that require robust performance combined with low maintenance. The MPT will allow operators to confidently monitor mud flow both in and out of the well and ensure long term asset reliability as well as safe operation of the rig.

By monitoring the complete mud flow process, the rig operator will be able to safely control the drilling process and provide a more economically priced wellbore.

For More Info, email: 39216pr@reply-direct.com

Reliable Sulphur Impurity Measurement at ppb Levels in Pure CO_2 Matrices

Carbon Dioxide (CO_2) is currently used in industrial applications such as energy, food, water treatment or for process cleaning. CO_2 must be provided with high quality levels of purity to define its grade. Contamination with hydrocarbons, sulphur compounds or other molecules can occur create a need for an analytical solution to quantify low level of concentration for such compounds.

In the case of sulphur applications, some key players in the energy sector need to separate and quantify at ppb levels and continuously for certain compounds such as H_2S, SO_2, COS, CS_2, CH_3SH, C_2H_5SH and C_4H_3SH. Capabilities to quantify with high speciation in a pure CO_2 matrix at ppb level is a great challenge!

Chromatotec (France) has adjusted its automatic gas chromatographs to provide continuous monitoring capable of tracking such compounds at levels of concentration close to 5 ppb with a high sensitivity level lower than 1 ppb.

A specific configuration offers a turnkey solution based on specific sulphur detectors (SSD) with combined detector solutions (wet cell detector) using autoGC, gas generators, calibration device using mass flow controllers for linearity tests and automatic data validation and multiplexing system for up to 6 streams of analysis (at different stages of the process).

This complete solution fulfills the criteria in terms of separation quality and requested sensitivity. It even allows having redundancy of results for a better control of the process. All the results provided are validated using internal calibration thus avoiding gas cylinder use for calibration and carrier gas.

For More Info, email: 37691pr@reply-direct.com

Flow Meter Measures Hydrogen Gas Accurately & Safely for Process Control

Instrument and plant engineers responsible for managing processes with a wide range of hydrogen gas applications will find the ST100 Series Thermal Flow Meter from US based **Fluid Components International** (FCI) (USA) provides precision mass flow measurement in a no-moving parts instrument featuring compliance with the necessary major safety approvals for the Americas and worldwide.

Hydrogen (H_2) is one of the fundamental building blocks in the petrochemical industries with many applications. H_2 is used is in the manufacture of ammonia, which is an essential component of fertilizers for the agricultural industry. H_2 also plays an important role in the production of methanol, which supports the manufacture of many different polymers. The automotive industry also is developing H_2 as a clean energy source for cars, trucks and buses.

The manufacture of hydrogen gas typically requires the refining of methane or other light hydrocarbons from natural gas or oil. Light hydrocarbon gas is mixed with steam and then the process continues with a complex series of steps that includes heating in a high temperature furnace to create a chemical reaction, which eventually results in hydrogen gas. Throughout this process, accurate flow measurement is essential with a rugged and reliable air/gas meter.

The ST100 Series Flow Meter is ideal for hydrogen gas production processes and supports other industrial applications of H_2. A sophisticated thermal dispersion technology air/gas flow meter, the ST100 Flow Meter combines feature- and function-rich electronics with advanced flow sensors for advanced air/gas flow measurement. Offering direct gas flow measurement, no additional sensors or flow calculating devices are required for measurement. Its no moving parts design also virtually eliminates wear, breakage and maintenance.

The ST100 Flow Meter can be calibrated to measure H_2 or virtually any process gas, including wet gas, mixed gases and dirty gases. The basic insertion style air/gas meter features a thermal flow sensing element that measures flow from 0.25 to 1000 SFPS (0.07 NMPS to 305 NMPS) with accuracy of ±0.75 percent of reading, ±0.5 percent of full scale. With the ST100 meter, H_2 also can be measured safely at high flow rates from 0 to 6,600 lb/hr (0 to 3,000 kg/hr) at 29 to 87 psi.

When selecting the ST100 meter, users have multiple communication options. They can choose from: 4-20 mA analog, frequency/pulse, or certified digital bus communications such as HART, Foundation Fieldbus, Profibus PA or Modbus RS485.

Developed with a graphical, multivariable backlit LCD display, the ST100 meter brings new meaning to the term "process information". Its sophisticated readout continuously displays all process measurements and alarm status for easy on-site viewing by technicians, and it has the ability to query for service diagnostics.

The ST100 meter's electronics include a user selectable and programmable data logger. Readings are stored in a removable, internal micro-SD card. The micro-SD card has a 2 GB capacity capable of storing approximately 21 million readings. Recording time base is user selectable with a maximum rate of 1 reading per second. The logging feature is selectable via the front panel menu or via the serial port and configuration software tools.

The feature-rich ST100 meter utilizes constant power thermal mass flow sensing technology that measure flow with 100:1 turndown in ranges from 0.006 to 1850 SCFM [0.01 to 3140 NCMH]. The transmitter/electronics can be integrally mounted with the flow body or may be remote mounted to 1000 feet [305m] away. The transmitter enclosure is NEMA4X/IP67 rated and available in painted aluminum or stainless steel.

ST100 meters are agency approved for hazardous environment installations. FCI products undergo rigorous agency testing and obtain their approvals on the entire instrument, not just the enclosure. Approvals available for the ST100 Flow Meter include: FM, FMc, ATEX, IECEx, EAC/TRCU, CPA, NEPSI, InMetro, and CE Approved.

Fluid Components International is a global company committed to meeting the needs of its customers through innovative solutions for the most challenging requirements for sensing, and measuring flow, pressure and temperature of gases.

For More Info, email: 39211pr@reply-direct.com

New Portfolio of Four-Wire Coriolis Mass Flowmeters and Transmitters

Yokogawa Electric Corporation (the Netherlands) announces the global release on this date in all markets other than Japan* of ROTAMASS Total Insight (TI), a new portfolio of four-wire Coriolis mass flowmeters and transmitters. This new Coriolis mass flowmeter product platform was developed based on a Total Insight concept that seeks to optimize operations and reduce maintenance costs at all phases of the product lifecycle.

* The Japan release is set for the second quarter of fiscal year 2016.

Of the two main types of flowmeters that are in use today the volume flowmeter and the mass flowmeter the latter is generally more accurate as its measurements are less susceptible to variations in temperature and pressure. Coriolis mass flowmeters are versatile and highly accurate instruments whose utility extends beyond mass flow, inline density, and temperature measurement. They have evolved into multi-functional devices that can measure concentrations, function as net oil computers (NOC), and even measure heat transport. Our customers expect first-class performance from these instruments in demanding process control applications that involve liquids with high viscosity, entrained gas, and two-phase flows.

Rota Yokogawa, a Yokogawa subsidiary in Germany, has been producing and supplying ROTAMASS series mass flowmeters to the global market since 1993. The company continues to refine these products to add more value and future proof the investments that our customers make. By giving our customers greater insight into their processes, our Coriolis flowmeters help them improve the efficiency and flexibility of their operations and reduce maintenance costs at every stage of the product lifecycle.

Designed based on a unique philosophy that emphasises full product lifecycle support, ease-of-use, and reduced total cost of ownership, the ROTAMASS TI product portfolio consists of six new sensor product lines and two new transmitters that can be configured to suit the specific requirements of an application. At the heart of this design is the concept of gaining "Total Insight" into a plant's operations. The new sensor product lines have each been designed for specific application requirements and process conditions, be it high pressure or high temperature applications or highly challenging processes involving hygienic or cryogenic conditions. The new general-purpose (Essential) and high-end (Ultimate) transmitters all come with an AC/DC universal power supply and can be flexibly configured to handle a range of functions.

Andreas Dobratz, the managing director of Rota Yokogawa, offered the following observations about these new products: "Yokogawa's new Coriolis mass flowmeter portfolio, ROTAMASS TI, sets a new standard in the industry. ROTAMASS TI offers improved specifications under real conditions, supporting an increased number of applications. The holistic approach of the Total Insight philosophy supports the customer in all stages of the product lifecycle, significantly improving operations and plant maintenance."

Masatoshi Nakahara, a Yokogawa director and executive vice president who is head of the IA Platform Business Headquarters, commented: "With its Transformation 2017 mid-term business plan, Yokogawa has set forth a number of strategies for its industrial automation business. One of these strategies is to enhance and develop the platform products that are at the core of our solutions. Based on our new Total Insight concept, ROTAMASS TI will generate new value for our customers."

For More Info, email: 39190pr@reply-direct.com

New On-Line Analyser Able to Directly Monitor Kinematic Viscosity at Reference Temperature

Sofraser's (France) Thermoset-KV is a powerful online analyser specially designed to directly measure kinematic viscosity at reference temperature. The measurement principle is based on the vibration at resonance frequency technology developed and patented by Sofraser in 1981. The active part of the measurement is a vibrating rod driven by constant electrical power. The amplitude and the frequency vary according to kinematic viscosity.

Compared to other technologies available on the market, the Thermoset-KV is the only analyser able to directly monitor kinematic viscosity and to provide measures in cSt (up to 500 cSt). Matched with 9731 electronics, the analyser provides an intuitive interface (touchscreen display, virtual keyboard).

With its hazardous area approved design, the Thermoset-KV is really simple to install close to the main process flow line, directly on an existing secondary sampling loop or even on a fast loop. Designed to prevent clogging, it requires minimal extra-installation. The analyser uses a flow-cell that is maintained at reference temperature and in which the product flows along the sensor. Direct kinematic viscosity is then measured in real time on the same product, at the same time and with the same instrument.

In compliance with Oil & Gas industries requirements, the Sofraser's viscosity analyser is directly correlated to ASTM D445. It affords efficient analysis and monitoring of a single control point (one target viscosity point at one reference temperature) while maximising return on investment.

Sofraser's Thermoset-KV is specially designed for kinematic viscosity at reference temperature monitoring of various petroleum products such as crude oils, heavy and light fuel blends, visbreaking etc. Through its various models of analysers, Sofraser offers a solution for any application.

For More Info, email: 38719pr@reply-direct.com

New Handheld Densitometer and Specific Gravity Meter

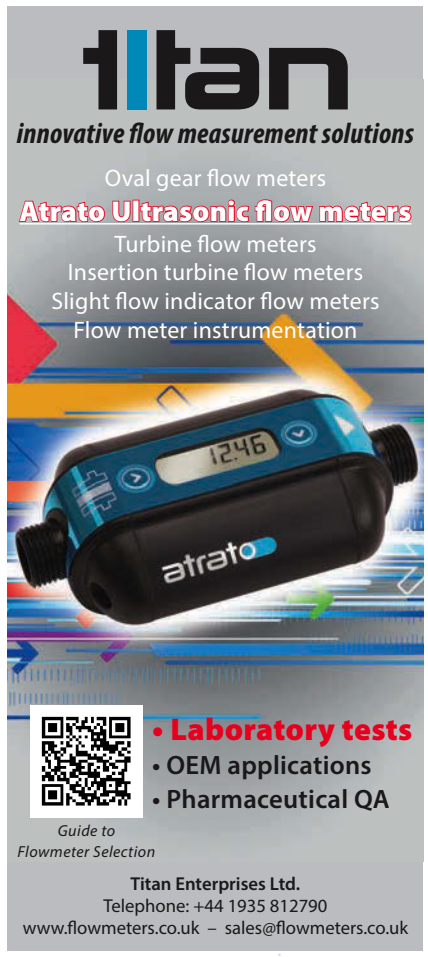
CANNON Instrument Company (USA) touts the new handheld Densi-H Density/Specific Gravity Meter as CANNON's most affordable instrument for measuring density and specific gravity. Lightweight and portable, the Densi-H Handheld Density/Specific Gravity meter offers easy, one button operation and reports results in seconds. Densi-H operates on the oscillating tube principle and is powered by two AAA batteries. Instrument reporting capabilities include density, specific gravity and API degrees, Brix, % Alcohol, % H_2SO_4, °Baume, °Plato and Proof. Built-in API tables (product groups A, B and D) allow API compliant measurement for quality control of crude oil, gasoline, petroleum products and lubricants (ASTM D7777). The Densi-H is applicable to a variety of product areas including petrochemicals (solvents, fuels, fuel oils, lubricants, crude oil), chemicals, food and beverages, battery acids, electroplating/photo, pharmaceuticals and cosmetics.

For More Info, email: 38732pr@reply-direct.com

Easy Dual Pressure Measurement

The **AFRISO** (Germany) DMU 13 pressure transducer with local display, consisting of a transducer with a piezo-resistive stainless steel measuring cell plus mechanical Bourdon tube measuring element, provides dual pressure measurement: The integrated pressure transducer allows for accurate measurements (< ± 0.5 FSO) and delivers a proportional 4-20 mA output signal; the analogue local display (class 1,0) is easy to read and independent of electrical power. Due to this redundancy, the current measured values remain available even in the case of malfunctions. The DMU 13 transducer is supplied with DC 12-36 V; it is available for relative pressure measuring ranges from 0/0.6 bar to 0/40 bar. It provides a bottom process connection G½B – AF 22 (EN 837-1/7.3). Other process connections can also be implemented. DMU 13 features a robust stainless steel 304 safety housing with a baffle wall and a laminated safety glass window. The measuring instrument is optionally available with a filling (paraffin oil), with a chemical seal for process separation or with an electrical contact for switching tasks. A junction box allows for easy electrical connection.

For More Info, email: 39182pr@reply-direct.com



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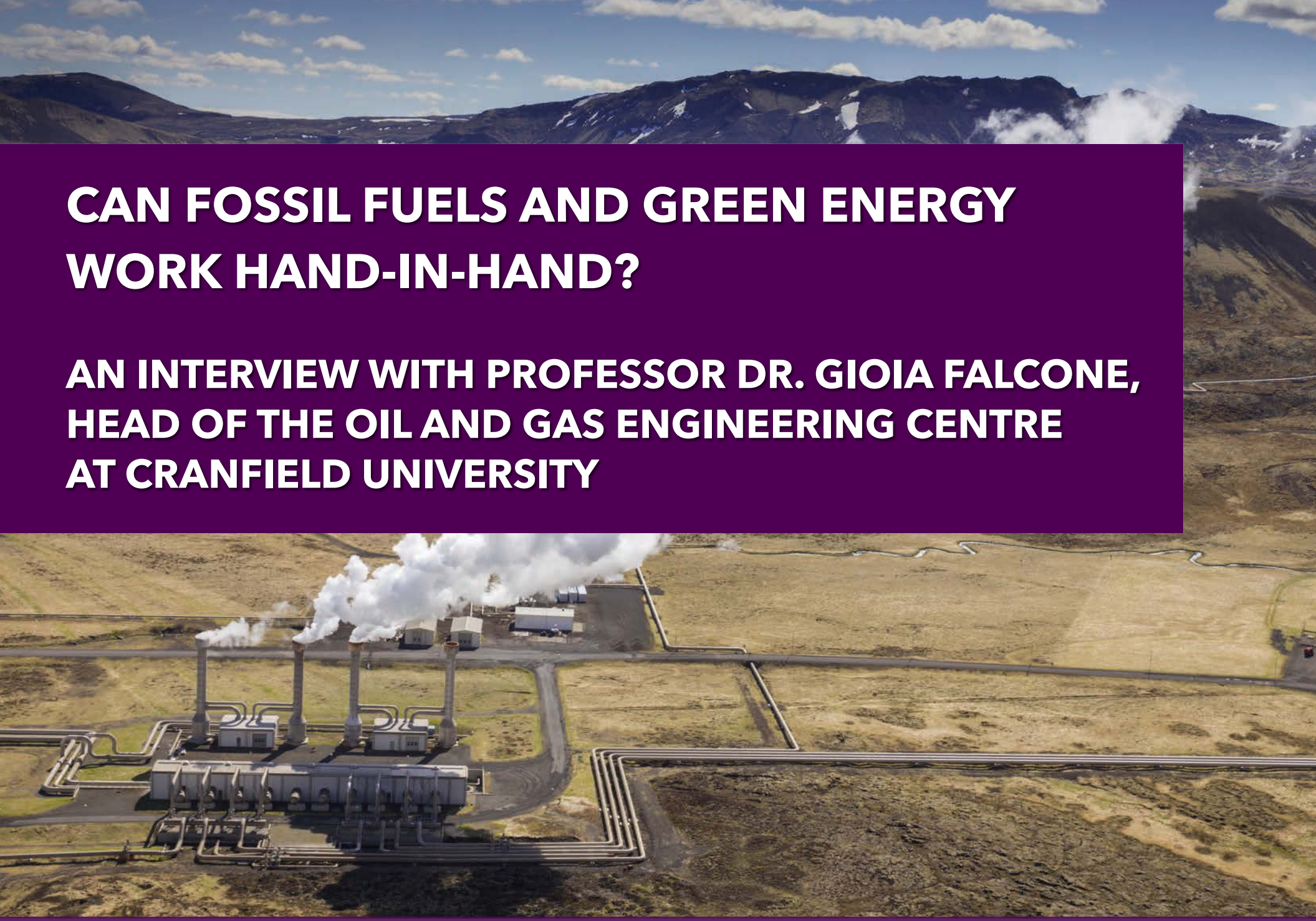

CAN FOSSIL FUELS AND GREEN ENERGY WORK HAND-IN-HAND?

AN INTERVIEW WITH PROFESSOR DR. GIOIA FALCONE, HEAD OF THE OIL AND GAS ENGINEERING CENTRE AT CRANFIELD UNIVERSITY

Gioia Falcone is currently Professor and Head of the Oil and Gas Engineering Centre at Cranfield University. Gioia holds a Laurea Summa Cum Laude in environmental-petroleum engineering from the University Sapienza of Rome, a M.Sc. degree in petroleum engineering from Imperial College London and a Ph.D. in chemical engineering from Imperial College London. Prior to joining academia, she worked with ENI-Agip, Enterprise Oil UK, Shell E&P UK and TOTAL E&P UK, covering both offshore and onshore assignments.
Along with being actively engaged with the Society of Petroleum Engineers (SPE), she is also one of the 21 members of the United Nations Economic Commission for Europe (UNECE) Bureau of the Expert Group on Resource Classification, and of its Renewable Reserves Taskforce. She is the appointed Leader of the International Geothermal Association (IGA)/UNECE working group for the development of geothermal specifications for the UNFC-2009.
She has co-authored over a hundred scholarly articles and one US patent, edited the 2012 Multiphase Flow Metering SPE Reprint Series "Getting up to Speed" and co-authored the 2009 book on Multiphase Flow Metering, published Elsevier.

Rachael Simpson

Q: Tell me a little about yourself and your background in oil and gas.

I am a petroleum engineer by background, and by that I mean by academic training and also by industry experience. I started working in the oil and gas industry back in 1999, where I gained experience working in the North Sea, as well as onshore, with different majors. I have remained in the oil and gas sector, although I decided to move the 'other side', meaning academia, in 2006. Whenever people discuss oil and gas, they invariably end up talking about the United States of America. In this respect, I am no different as I headed west, to Texas, to one of the largest universities in petroleum engineering in the world (Texas A&M), and from there one thing led to another and now I am here at Cranfield University.

Q: Yes, you've recently been appointed head of the Oil and Gas Engineering Centre at Cranfield University – can you tell us about what you will be working on there?

I will be leading the oil and gas engineering centre, where I will lead a team of academics and specialists, ensuring that they have a platform from which to give their best. In parallel, I will be developing new research and activities in the area of petroleum engineering, and also at the interface with renewable energy resources, as I believe that's going to be the future.

Topics that this centre has already been working on prior to my arrival, and themes which I can bring, include multiphase flow systems, flow assurance, computational fluid dynamics, and production optimisation. I want also to expand in the areas of liquid loading in gas wells, and mature fields, which are very important topics particularly in regions of advanced production, such as the North Sea. In addition, we will be working on subsea engineering, automation of sensing and instrumentation, and geothermal energy exploitation.

Q: What makes Cranfield so well-placed for this research and development?

I believe that Cranfield definitely offers something special, and I'm saying this as someone who has worked at several other universities in Europe and the USA. It's because Cranfield is so research-focused, not just fundamental research, which is well covered of course, but more specifically applied research that serves the industry and delivers solutions. I'm an engineer, and engineers are always seeking solutions, so when I came here and saw the amazing facilities of industry scale, and saw people trained and focused on delivering, I knew straight away that Cranfield was a bit different.

Q: You have a strong background in geothermal energy systems– could you give an overview of what geothermal energy is for any readers that may be unfamiliar with this?

My introduction to geothermal energy was a case of 'jumping in at the deep end', as I'm a petroleum engineer and I was happily working for the oil and gas industry. Yet, it is normal in an academic environment to look around for topics where your skills may be applied, and at the time in question, there was a major push towards carbon capture and sequestration (CCS). Also, at Texas A&M where I was working, there was a growing interest in geothermal energy engineering.

CCS and geothermal energy seemed natural areas for me

to develop my expertise as they both have to do with the subsurface. With the former, we want to capture the CO_2 at the surface and inject it underground in what we call a reservoir porous medium. With the latter, we are dealing with "geo", which is the geo-source, and we strive to produce the heat trapped underground and bring it to the surface. The processes involved are very similar to those we employ in the oil and gas industry. For example, we are dealing with the subsurface, the flow of fluids through the underground media, and this flow arrives all the way to surface via wells that are drilled like those for oil and gas production. Having brought these fluids to the surface, we can process them to extract the heat, which is a product we can sell, either for heating or as electricity or both.

When I looked more closely at this global picture from reservoir to surface, I realised that my background in petroleum engineering was an advantage. Yes, there is more to geothermal processes, in that the thermodynamics are a bit different and resource recharge is complex to predict, for example, but we are still dealing with water, steam, some impurities, changes of phase along the way, from bottom to top. So I was able to quickly get up the learning curve and use my skills as a petroleum engineer in the area of geothermal engineering.

Q: Is there scope for an interface between new and existing O&G and geothermal systems? If yes, how can you see this technology evolving and developing?

This is something that I find fascinating, and which may represent a future avenue for mature oil and gas systems. When we produce oil and gas, we are not producing just oil and gas, as water is also being co-produced most of the time. This water is typically from the aquifers that lie beneath or is surface injected water, which is used to increase recovery efficiency by maintaining reservoir pressure and sweeping oil towards the producing wells. These fluids arrive at the surface at a certain elevated temperature, because they are coming from below the earth's surface, so we have hot water associated with the oil and gas produced from petroleum systems, and we often have lots of it. We can consider this abundant hot water as a "geothermal" product that is co-produced with the hydrocarbons. So why not use it?

This is not a new idea, but it is still in its infancy. There have been a few pilots around the world, where small test plants have been able to produce electricity from this associated hot water. So could this concept become an interesting business model for an oil company? It all depends on its commerciality. As an oil producer, I will have sunk capital investment already in drilling my wells and installing processing facilities onsite, so I would have access to a new potential income stream from the co-produced hot water. I could sell electricity by extracting the heat from the water; heat that is currently wasted. Alternatively, I could use the potential income to reduce my normal operating expenditure, by generating my own green electricity, rather than buying electricity from the grid to run my facilities. An added bonus would be if the government encouraged such schemes by offering tax incentives to reward energy efficient oil producers, who are being 'good boys', taking steps to reduce their carbon footprint.

Q: I assume that geothermal energy has its own particular challenges and problems much like any form of energy available to us. Is there anything we have learned from the oil and gas industry that we can apply to geothermal energy systems to improve efficiency etc.?

Absolutely, and vice versa. In the oil and gas industry, we are now able to exploit the gas and condensate from deeper high pressure high temperature (HPHT) reservoirs. This expertise and knowledge from the oil and gas sector is directly transferrable to meeting the challenges of developing geothermal systems, which are typically at greater depths, meaning elevated pressures and temperatures.

Another important area is deep drilling. As the oil and gas industry seeks to exploit ever deeper resources as the shallower 'easy' resources have been depleted, so the geothermal sector has also focused on going deeper. Increased depths mean a much hotter and more hostile operating environment, as we are getting closer to the earth's core of the earth, so deep drilling is a real challenge for both sectors. Drilling deeper forces you to go for slimmer borehole sections; you need to spend a lot more money as you stay on site longer, and you will encounter hard rock formations that consume drill bits very quickly. These are just a few of the transferable areas of expertise from oil and gas to geothermal.

Yet the geothermal world has also led way when drilling in urban environments, showing tact and innovation in its operations in close proximity to the public, with advances in compact modular drilling rigs and noise reduction technologies.

Q: Can you tell us more about the United Nations Economic Commission for Europe (UNECE) Bureau of the Expert Group on Resource Classification – how you are involved, the work and purpose of this group etc.

The purpose of UNECE is a noble one, in my opinion, as it is all about the sustainability of energy. Its premise is that we need to make energy accessible to the world and to ensure that everybody has the same access to energy, independently of their location.

UNECE is developing standards and a framework for comparing, on equal terms, energy resources of different types. For example, consider country A, which would like to understand how many of its oil and gas resources are yet to be produced. Country A would also like to know how much wind energy it could produce, how much geothermal energy it could produce, and how much solar energy it could produce. The government of country A, for security purposes or for independence purposes, could then take a portfolio overview and announce "this is my energy portfolio". Although this concept of resource specification is well established in the mining and petroleum sectors, it is not that well known, nor accepted, in the renewables sector. Yet, being able to compare fairly between these sectors would actually facilitate investment and help prioritise where the money should go. It would also address the questions what energy is available now, and what energy could be available if more R&D were done.

It was completely serendipitous that I got involved with this group. I was presenting at a geothermal conference in Germany just after moving there, and there was someone from UNECE also giving a talk. They heard my presentation and said "Wonderful, we are looking for somebody in geothermal!" and that's how I got invited. UNECE is totally voluntary; we don't get paid for our services, but if funds are available, I can sometimes claim back my travel expenses. Hence, we put a lot of our own time into delivering these documents. You get to know amazing people, work on high level problems, and you have a chance to make a difference.

Q: You mentioned renewable energies such as wind and solar - do you see a future for O&G technologies when so much pressure is on governments and energy providers to move further towards these "green energy" options? Do you think the energy industry can ever be fully separate from oil and gas or should it be hand-in-hand with renewables?

I think the latter for sure. The two sectors can and should co-exist and should proceed hand in hand, and learn from each other. I don't envisage a sudden change to green energy and I think this is now accepted knowledge. Many countries have proposed deadlines of three, five or ten years by which to go fully green, yet these deadlines have already passed and the change hasn't happened, due to recognised challenges. We know that electricity from renewables tends to cost a lot more than electricity generated from conventional energy sources. There is a growing acceptance that renewables are in an extended transition period, and there is a realisation that we have to be more efficient in the way that we use our conventional energy resources. We have to be cleaner and reduce emissions, and this can be done. The oil and gas industry hasn't finished doing its homework, and we certainly don't want to have a Macondo number two. One would like to think the oil and gas companies are able to go into sensitive areas without making a mess, and they do need to be there to provide time for the use of renewables to pick up. If you start thinking about solutions like the one I mentioned earlier, using geothermal energy from oil and gas systems, who knows how things may evolve without any dramatic demise of the petroleum industry.

There are still avenues in the petroleum sector that we haven't fully explored yet, because (at the moment) R&D is limited as the costs are still too high. I could mention gas hydrates, for example, of which there has been a lot of talk, but has resulted in very few pilot studies, with one site test actually producing.

Q: So it's a case of needing more investment then.

Of course we need much more investment in the energy sector, but in a transparent way. Trying to compete by saying, "Give the money to me, not to them", "me" being oil and gas or renewables, is not a win-win situation. I think it's important to say in a given location, "This is what you have, and this is what you should give priority to". Change the country, change the geopolitical situation, and that will change your list of priorities. Diversity is key, and enhancing the variety of energy resources and corresponding solutions is crucial, in my opinion. Offshore, you have one situation, whereas onshore you have another; in a hot country, some solutions work better than others; in a cold country, with environmentally sensitive issues, you may need to consider something else. Not every place is the same, which in my view, is the main problem. At a country level, governments tend to look for the solution for the entire country, which can be thought of as the fabled silver bullet, but this approach is inherently risky. If a government pushes an entire country in one direction, towards a single solution, what happens if that fails?

Q: I'm sure you're aware that the oil and gas industry in the UK is experiencing some difficulties, especially up in Scotland. Do you think the UK/worldwide O&G industry could make better use of newly emerging engineering methods and technologies? Is there a gap in the market that could be exploited more beneficially?

First of all, I'd like to say that I've travelled extensively and this problem is not unique to the UK. I think it's a classic case of an outdated energy policy being perpetuated until it's too late. The question is about being open minded to what the rest of the world is doing, and I do believe that the UK is open minded.

The UK has been a pioneer in the offshore world, and it's climbed a steep learning curve in a relatively short time. From the first platforms in the seventies, to the present day situation, where the UK appears almost resigned to giving up, decommissioning its fields and infrastructure, closing down and walking away, and all within a span of only 5 decades. If you think about how much has been learnt in those relatively few years, the amazing technology breakthroughs that have happened, then why should we underestimate our ability to reinvigorate the North Sea? I think we can come up with new solutions to revamp what we have, to breathe new life into the remaining ageing infrastructure, by working closely with the structural integrity people. We must keep HSE as a priority, which is an increasing challenge in the current low oil and gas price environment. Subsea systems can be worthwhile, as long as we focus on monitoring, inspection, automation of these processes, and by making the systems more affordable – that's what has to happen. Subsea technology must become cheaper and more flexible, so there has to be more openness to swap experiences and knowledge. The UK government needs to keep pushing for this collaboration to happen or it never will. For example, the UK had a fantastic North Sea database that reported monthly petroleum production on a well-by-well basis. This was stopped in December 1999, if I remember correctly. The replacement, a 'dumbed down' system at a holistic field level, doesn't increase understanding of the regional subsurface complexities, it fails to educate investors about the particular risks, and it doesn't help promote research. Government, industry and academia all need to up their game to ensure the North Sea survives (initially), after which we will be in a position to go forward.

I would encourage all countries, and especially the UK, to promote collaboration, access to data, and the sharing of knowledge and expertise. When everything is made open and accessible, you will always find experts, volunteers, practitioners, willing to propose ideas, possibly for free, you never know. If the oil and gas sector remains closed, untrusting, and overly competitive, then it becomes a race to the bottom of the barrel. I'm afraid that niche markets don't survive in situations like we are experiencing now.

Professor Dr. Gioia Falcone.

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Sample Cylinder Service Enhanced to Deliver Client Cost Savings

Intertek (UK), has enhanced its sample cylinders services to provide significant cost savings for clients.

Sample cylinders are used by offshore chemists to transport live crude, gas and water samples from offshore to onshore laboratories for testing. Intertek has invested £180,000 in 200 high-pressure cylinders to meet an increased demand from clients for analysis services.

Fifty cylinders will be specially coated to allow the safe and effective transportation of samples containing mercury and hydrogen sulphide. Both elements can adhere to the internal surfaces of standard stainless steel cylinders, rendering analysis unreliable.

Doug Finnie, Operations Manager for Intertek Exploration and Production, said: "All platforms must undertake sampling and analysis for many different reasons. For example, installations individually monitor their own contaminants, discharges and emissions.

Due to a heightened awareness of the impact these have on the environment and platform infrastructure, legislation and specifications have become stricter, with allowable levels being reduced over time. This has led to an increase in analysis services and a higher demand from clients for these kinds of cylinders.

"We previously rented cylinders from third parties on the clients' behalf, but handling these in-house means now we can add value to the service and create cost savings for clients. For some of our customers, we believe that this could be tens of thousands of pounds per year."

Intertek's independent testing and consultancy services provides a wide range of Production Support laboratory services, including crude oil, gas and water analysis, oil condition monitoring, oilfield microbiology, equipment procurement, offshore manpower provision and laboratory design.

The company also offers a range of related Exploration and Production services, including chemical selection, reservoir souring and modelling and failure assessments.

For More Info, email: 37835pr@reply-direct.com

Handheld Monitors for Measuring pH, ORP, Conductivity and Oxygen in Hazardous Areas

Endress+Hauser (USA) releases Liquiline To Go CYM290 and CYM291 portable handheld multiparameter monitors for use with analogue and digital sensors. Each device automatically detects when any Memosens sensor is connected and switches to the appropriate measured variable. By simply plugging a Memosens sensor into the monitor, a technician can measure conductivity, ORP, pH or oxygen. The battery-powered monitor also displays sensor type, serial number, zero point, slope and date of calibration for the sensor.

Liquiline To Go monitors permit a technician to enter a process area, connect the monitor into any Memosens sensor, read the measured value, transfer all data into the monitor, and calibrate the sensor. This can be especially useful when installing new sensors in the process, when conducting regular maintenance checks, or when performing calibrations in the measuring laboratory. Performing these operations with a Liquiline To Go monitor guarantees full data consistency because it allows the use of the same measuring technology in the laboratory and in the process.

pH, ORP, conductivity and oxygen sensors from Endress+Hauser with Memosens technology have integrated electronics that allow for saving calibration data, total hours of operation, and operating hours under extreme measuring conditions. Once the sensor has been connected to the Liquiline To Go monitor, this data is transferred automatically to the portable monitor and used to calculate the measured value. Because calibration data is stored in the sensor, the sensor can be calibrated and adjusted independently of the measuring point. Data transferred to the monitor can be downloaded into a maintenance management program for further analysis.

Memosens is an inductive, non-contact connection used to connect the sensor to the monitor for maximum process safety. The non-contact connection also eliminates moisture and corrosion issues, and even allows the monitor to be connected under water. The CYM291 monitor is IECEx and ATEX certified for use in hazardous areas up to Ex Zone 0, and both models have IP66/67 ingress protection with pressure compensation.

email: 37625pr@reply-direct.com

Fuel and Aviation Fuel Condition Monitoring Based on IP 577 as part of DEF STAN 91-91

Fuel is less viscous than oil. In low viscous fluids, the particles slump down in the liquid and build a sediment at the bottom of the bottle (sedimentation). Individual particles might also stick together during storage and become agglomerated bigger particles (agglomeration). Before a sample can be analysed via laboratory measurement instruments, it needs to be prepared with applied mechanical energy to re-disperse the particles in the liquid. Before undertaking laboratory particle analyses, the sample thus must be adequately prepared for measurement. In case of online measurement, sample preparation is not at all afforded, as the liquid is directly taken in its original physical state during operation. To avoid phenomena of sedimentation and agglomeration during measurement, particle counters for fuel analysis are equipped with special features, adapting them best to the specific requirements of fuel condition monitoring.

For Jet fuel analysis, **PAMAS** (Germany) has developed the portable particle counter PAMAS S40 AVTUR which can be used both for online and batch sampling. The system is compliant with the IP 577 analysing method of the Energy Institute London and to the DEF STAN 91-91 standard of the British Ministry of Defence.

Beyond Jet fuel, the PAMAS S40 AVTUR is also used for testing diesel and other fuel types.

For More Info, email: 38499pr@reply-direct.com

Is a Digital Probe Better than a Mercury Thermometer for Petroleum Tests?

The mercury thermometer is still the standard device to measure temperature in many manual petroleum tests such as flash point, distillation, viscosity and cold property tests but there are a number of reasons for changing to a digital probe; safety, more reliable and repeatable results and better workflow or data tracking support.

Mercury is toxic to humans and because of environmental and safety regulations, shipping these thermometers has become increasingly complicated in many countries. Digital probes are safe and easy to handle.

The temperature measurement from a mercury thermometer relies on human interpretation which has a direct impact on the reproducibility of results. The use of a digital probe eliminates the operator bias or any possible human error factors and offers more accurate and repeatable results.

A digital probe provides digital data, which can be easily exported to data handling software (LIMS).

ORBIS BV (the Netherlands) are currently developing AirProbe, a small device that clips onto a digital probe, and wirelessly connects to a smart interface (e.g. Apple iPod).

The easy-to-use software app provides full reports that include temperature,time data and even volume point data for semi automatic distillation tests.

AirProbe can be combined with multiple probes for the various test applications, and multiple AirProbes can be connected to one interface in a network configuration.

ORBIS BV welcomes comments, questions and suggestions from readers of Petro Industry News.

For More Info, email: 37900pr@reply-direct.com

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If you have unbiased, applications or product focussed research or findings to share on analytical instrumentation, safety, flow level pressure or measurement and testing, that would be of interest to the readers of Petro Industry News, then we are keen to hear from you.

Please contact the editor, Rachael Simpson -
rachael@envirotechpubs.com

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