



SUSTAINABILITY TODAY

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energy | water | waste | recycling | sustainability

Residential PV self-consumption is optimum

The simple fact that PV energy generation peaks during the daytime when many homes have low demand has seen the rise of innovative hot water diversion devices and energy storage additions to residential PV arrays.



The makers of the Solar iBoost, Marlec and VARTA Storage have been co-operating to ensure that when users of the VARTA energy storage system also want to benefit from free hot water the two systems work in harmony at capturing excess energy.

Users of these systems save more on their home energy bills for electricity and water heating simply by self-consuming the solar energy generated on site at their convenience, rather than solely as it's generated. With Feed in Tariffs at their lowest and set to end in 2019 homeowners will certainly seek to maximise any investment in rooftop solar, and as it is estimated that homes without any form of storage consume less than half of on-site power generation, storage

systems are rapidly becoming a critical component of PV systems.

Marlec and VARTA Storage have co-operated in trials which have shown that the two technologies operate in harmony where energy storage is prioritised, drawing excess energy to recharge and provide power for electrical appliances when PV levels drop off. On reaching full charge the Solar iBoost takes over any continuing excess energy that would otherwise be exported, diverting it to a hot water cylinder's immersion heater, effectively using water as the storage medium.

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New wide-ranging particulate sensor

Alphasense has launched a new version of its optical particle counter. The new OPC-N3 retains all of the advantages of its predecessor (OPC-N2) with the added benefit of automatic range switching covering PM₁₀, PM_{2.5} and PM₁. With an expanded measuring range (0.38 to 40µm), the OPC-N3 is able to measure the particulate fractions of most interest; from the finest of particles up to larger particles such as pollen.



"This is an extremely important development for manufacturers of air quality monitoring instrumentation," says Alphasense Director, Arthur Burnley.

"A few years ago, the public was generally unaware of the threat posed by air pollution. However, the many thousands of premature deaths that occur every year in almost every country, have finally caused a high level of media coverage and political interest, and this has led to demands for air quality improvement measures, which in turn have created a need for accurate particulate sensors.

"This bodes well for our customers as the demand rises for small, accurate, reliable, cost-effective particulate sensors."

Today's particulate fractions of greatest concern are the finer particles (PM_{2.5} and

PM₁) that cannot be seen by the eye and have to be measured instrumentally. These particles have a major impact on health because they are able to travel deeper into the lungs.

According to the European Commission, some 500,000 people die prematurely in the EU 27 every year; mainly due to exposure to high levels of fine particulate matter (atmospheric microparticles or 'dust' of a diameter of less than 2.5 microns), which originates from residential heating, transport (diesel cars and trucks, ships and planes), agriculture, industrial processes and power generation.

Several studies have demonstrated that smaller particles appear to be more toxic than larger particles. Research is focused on understanding the surface chemistry of smaller particulates and their toxic effect on health. Arthur says, "The ability of the OPC-N3 to measure across a wide range of particle sizes, and to auto-range, is therefore very important because it means

that accuracy and reliability is retained irrespective of the particle size fraction being measured."

The OPC-N2 was originally developed at the Centre for Atmospheric and Instrumentation Research at the University of Hertfordshire. Over the following five years, the product was refined through a collaboration between the University and Alphasense. The sensor has also been proven in the field, including for example, the capture of more than 150 million readings at London's Heathrow airport.

The OPC-N3 measures particulates accurately, repeatedly, and with minimal maintenance using a patented design, providing both particulate matter readings and real-time particle size histograms. As such, the sensor competes in performance with existing analytical units but at a fraction of the cost.

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SWEP 2-stage units chosen for Wembley Park

Ramboll, the consulting Engineers for Quintain's prestigious Wembley Park development, has specified SWEP 2-stage brazed plate heat exchanger (BPHE) units to drive the single heat network that will serve the site.

The Wembley Park development includes residential, commercial and office buildings as well as the iconic 12,500 seat capacity Wembley Arena. When complete the network will serve around 5,300 new homes as well as approximately 65,000m² of commercial and retail space.

Ramboll has designed the district heating system for the development, which is a modern low temperature hot water network (LTHW). The system is based from a single energy centre which feeds 20 separate sub-station buildings, linked through a district heating network of approximately 2.5km in length.

The SWEP 2-stage BPHE units that drive the system combine a preheater and an afterheater, thereby allowing returned water from the radiator circuit heat exchanger to be used to preheat water intended for domestic use. SWEP is delivering the units in collaboration with Frese UK and Fortes Import BV, which is building the components that house the 2-stage BPHEs.

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Discover the shows that make up the series

The Contamination Expo Series, held last year at London's ExCeL from 12-13 September 2018, is a major European exhibition committed to providing the latest knowledge, products, and innovations to professionals working in all aspects of contamination, from spillage emergencies to air and water pollution prevention.

Across two days, the most ambitious and progressive authorities, and innovators from a variety of contamination sectors, gathered to present the latest equipment, products, services, and strategies in managing, preventing, and recovering from contamination incidents.

The exhibition was constructed to provide a platform for the most cutting edge solutions and technology from around the world,

while also delivering a leading educational programme from prominent experts in each field through an exclusive schedule of seminars.

The series includes seven different co-located events: the Land Remediation Expo, the Spill Response Expo, the Clean Air Technology Expo, the Hazardous Materials Expo, the Nuclear Decommissioning and Remediation Expo, the Geotechnical & Geoenvironmental Expo, and the Waste Water Expo.

Co-located with the Series was the Future Resource expo. This was an incredible opportunity to find over 200 of Europe's top suppliers from sectors such as Renewable Energy, Zero Emissions, Water Tech, Energy from Waste and more all under one roof. It was a chance for visitors to take advantage

CONTAMINATION EXPO SERIES

FUTURE RESOURCE

of free consultations and demonstrations of the products that could provide their business with that crucial competitive edge.

The Contamination Expo Series & Future Resource return to Birmingham's NEC this year from 11-12 September 2019. This is our first pick of the best exhibitors from last year's shows, listed here in alphabetical order: Assure 360, BioMinca, Chemtech Environmental, Fermionx, Hazardous Safety Products Ltd, Metasphere, Skyhawk Global & Sustainable Energy Association. Further details can be found on this page & the next.

www.contaminationexpo.com

The need to decarbonise our homes

In a world of finite resources, the Sustainable Energy Association exists to help create living and working spaces fit for future generations. The Sustainable Energy Association's Chief Executive, Lesley Rudd, speaking at the 2018 Future Resources Expo, highlighted that heating of buildings is still one of the largest contributors to carbon emissions but this is masked by emissions from power generation having fallen fast. Lesley noted that many existing buildings leak energy and building new homes that are not energy efficient and have high carbon, fossil fuel heating systems adds to the problem. She stressed the need for a stable policy framework which includes regulation, policy drivers and financial mechanisms.

The Sustainable Energy Association is a technology agnostic member organisation that provides objective, evidence-based policy positions which help shape how we think about, generate and use energy in buildings. Lesley explained, "We are committed to achieving our vision, by ensuring that buildings are energy efficient, low carbon and warm. We recently published a paper 'Next Steps for Boiler Plus' which advocates further improvements to our heating systems and our 'Energy Efficiency - A Policy Pathway' paper recommends interventions to build



a sustainable market for energy efficiency in homes. This year's review of the Building Regulations presents an excellent opportunity to drive significant improvements to our buildings. Our latest report (March 2019) Halving Energy Use of New Homes proposes policies that would help the government achieve its Mission to halve the energy use of new buildings by 2030. The policies outlined would reduce both consumer energy bills and carbon emissions. A win win!"

If you would like any more information, please contact: info@sustainableenergyassociation.com or visit the website at: www.sustainableenergyassociation.com



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HydroEater is an award-winning bioremediation product unique to Skyhawk Global. It was designed specifically to remediate hydrocarbon contaminated soil. HydroEater not only breaks down those hydrocarbons into simple CO₂ and H₂O molecules, but it also activates the natural bacteria at the site to help with the entire bioremediation process, thus restoring the contaminated land to its original state faster and at less cost.

Skyhawk Global specialises in advanced bio remediation and bio augmentation solutions and we have a formula and process for every application. Whether you have an emergency spill or a legacy site, our team has years of real-world experience in land and water bioremediation, hazmat and storage tank



clean-up and waste management and emergency spill responses. Skyhawk Global can guide you in choosing the right HydroEater products and processes for your unique application.

Our HydroEater products have not only undergone vigorous third party testing, but more importantly, have proven themselves in real world applications with over 4,000 bioremediation and hazmat incident clean-ups completed, Skyhawk has streamlined the processes to be the fastest and most efficient solution in the marketplace, saving you not only time but money.

Contact
T +44 (0)1446 731165
www.skyhawkglobal.com
www.hydroeater.com

Green Build News

Bauder to showcase multiple sustainability solutions at Futurebuild

Leading flat roof manufacturer, Bauder, will once again be exhibiting at Futurebuild at the ExCeL from 5th-7th March.

Bauder provides a range of flat roof waterproofing solutions to make buildings watertight, insulation for thermal efficiency, solar PV arrays for renewable energy generation and green roofs to support the environment and create better living and working spaces for people. At last year's show Bauder launched the most recent addition to its solution offerings, BauderBLUE, a method of evacuating stormwater from a flat roof over a 24 hour time period.

The showstopping feature on the stand for 2019 combines a total of four flat roof systems to create one multifunctional solution. Bauder's flagship roofing solution, Bauder Total



Roof System (BTRS), utilises a bituminous membrane to create the waterproofing layer. This is topped with a BauderBLUE, Bauder's rooftop SuDS solution for the attenuation and management of stormwater on a flat roof. The system will be completed with the revolutionary solar PV mounting system for biodiverse or extensive green roofs, BioSOLAR.

Tom Rafferty, Bauder's SOLAR manager, discusses the combinations of systems. "One of the most common questions I am currently asked is whether we can combine a blue roof with solar. BioSOLAR systems



can be very easily combined with a blue roof as long as an extensive or biodiverse green roof is also included. More than any other type of flat roof it is important to avoid penetrations through a blue roof. As the BioSOLAR system sits above the void former there are no risks to the waterproofing and the 3 different elements work seamlessly together."

Bauder's product managers and technical experts will be on the stand to answer all of your questions and discuss any of your upcoming projects. To discover all of our products be sure to visit stand D100.

Can't make Futurebuild? Contact Alex on 01473 261258 or email: a.body@bauder.co.uk to book a meeting with your dedicated area technical manager.



Atkinson & Kirby on trend with design-led aparthotel

Eden Locke is a new design-led aparthotel, located in the bustling and vibrant heart of Edinburgh city centre. Leading flooring manufacturer Atkinson & Kirby was chosen as the preferred supplier to provide a high-end bespoke flooring solution that's not only durable and able to cope with areas of increased traffic, but also with an edge in design and a deep understanding and knowledge of how different types of wood, grain and finish are best suited to compliment different colours and tones.



Around 1,600m² of Atkinson & Kirby's grey stained flooring, created specifically for the scheme, was supplied to the renovation of Eden Locke, providing the perfect solution for the aparthotel's bedrooms, bars and corridors, with the idea of the product being rolled out across more of the Locke developments Europe-wide.

For more information about Atkinson and Kirby flooring, visit: www.akirby.co.uk or call 01695 573234.

IGEM chosen to develop new hydrogen standards

The Institution of Gas Engineers & Managers (IGEM) has been chosen to develop hydrogen standards for the government's £25 million research and innovation programme.

The Hy4Heat programme is a feasibility study into the use of hydrogen for heat in UK homes and businesses aimed at establishing whether it is technically possible, safe and convenient to replace methane with hydrogen in residential and commercial buildings.

As part of this project, IGEM will be reviewing all relevant existing standards and bringing together

a group of technical specialists to identify knowledge gaps, both in the UK and internationally.

This work will help the government to determine whether to proceed to a future community trial. A separate project will look at purity, odourisation and colourisation.

The Department for Business, Energy and Industrial Strategy (BEIS) has appointed Arup+ as the programme management contractor for the Hy4Heat programme to manage and co-ordinate the various work packages, including the standards work.

Three IGEM working groups



will look at the following areas: DSEAR, materials, leakage rate and ventilation; appliance location, fluing, installation and air supply; and installation. The work will be peer reviewed by the Hy4Heat project board, industry experts from the Health & Safety Laboratory, DNV GL, and IGEM's own Technical Coordinating Committee and Gas Utilisation Committee.

For more information, please call IGEM on +44 (0)1509 678150, email: general@igem.org.uk or visit us at: www.igem.org.uk

Metasphere

Metasphere are the trusted telemetry provider to many public sector water, waste water & gas utilities. We specialise in providing remote monitoring and control systems for networks and connected assets. Applications vary from simple schemes monitoring consumption meters on a property through to major Waste Water Treatment works with thousands of data points. Our speciality is monitoring difficult to access underground assets such as Sewers and PRVs and provided over 40,000 devices into the water networks in the UK and Australia.

Metasphere also has experience at provide solutions in the environmental and Meteorological monitoring market with customers such as the Environment Agency & Natural Resources Wales where we are monitoring water levels, rainfall & soil moisture.



We are also at the forefront of technology adoption and are currently taking advantage of the increased communications capability being offered by the NB-IoT and CAT-M rollouts across the UK's cellular infrastructure. Offering integration into existing servers and services or a fully managed and maintained service to ensure our clients get the best possible service.

Metasphere are based in the UK with a full UK supply chain.

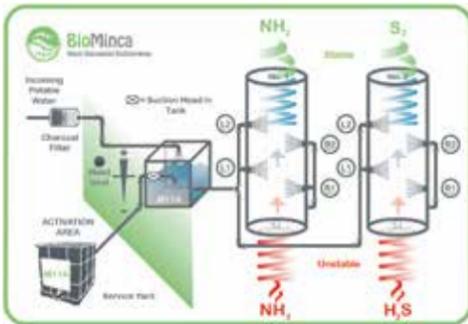
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info@metasphere.co.uk
www.metasphere.co.uk

BioMinca impresses at Contamination Expo

Last year, BioMinca was one of the hundreds of exhibitors showcased at the Contamination Expo. Held during 12-13th September at the NEC, the Contamination Expo brought together hundreds of leading companies, key leaders, and spokespeople, as well as thousands of visitors and potential buyers. Here, the environmental sector displayed their best and latest services, alongside seminars, product demonstrations and much more.

BioMinca, who specialise in organic waste recycling, managed to stand out from the crowd by showing off their highly advanced and complex waste transformation process. Working with sewage and waste water, food waste, fats, sludges and hydrocarbons, the BioMinca team's cleverly designed biocomplex process converts inorganic waste compounds into stable and usable end products, thus reducing waste and landfill levels whilst promoting sustainability.

Odour is another common problem regarding waste, caused by the production of gases such as Ammonia and Hydrogen Sulphide. Plaguing sites and companies around the world, the industry remarked when BioMinca invented a smart solution. Known as 'closing the loop', the process fixes Nitrogen and Sulphur into nitrates



and sulphates which are released back into the environment as fertiliser. Environmentally friendly, ecological and sustainable, BioMinca have proven themselves year upon year as one of the most innovative names in the industry.

If you would like more information on the company and their many solutions, be sure to see below for details.

M 07895 545912
www.biominca.uk
www.youtube.com/watch?v=gMBemAArAUY&t=5s
www.youtube.com/watch?v=L4gmc3suQ1A
www.youtube.com/watch?v=rgUluJhitaA&t=30s

Airbox Sampling Products

Asbestos management becomes an ever-increasing concern, Airbox Sampling Pumps deliver a complete environmental solution in asbestos air monitoring and the management of asbestos contamination. Airbox Sampling Pumps are compact and ergonomic as well as robust enough to stand the rigours of testing in extreme conditions. Their IP65 rating for ease of decontamination means that following air sampling regulations has never been easier.



A must for any company operating to the approved code of practice and control of Asbestos Regulations 2012, our pumps deliver efficient monitoring, accurate results

and traceable output. The Dataflow model provides data capture and a reporting output that can be incorporated into testing reports, for contractor

and customer peace of mind, ensuring a high level of safety and compliance.

Following our success in 2017 as winners of the Asbestos Award at the Contamination Expo, we launched our new Acetone Vaporiser at the 2018 show. Designed to work in the lab or out in the field for instant results, the Vaporiser delivers consistently accurate readings and is built to a robust and user-friendly design.

For further information on our products or to talk to us about how we can help your team manage asbestos testing, contact us on:
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Assure360: Your complete safety and asbestos management system

Assure360 is a simple app, connected to a Cloud database, that offers you a suite of tools to manage health and safety (H&S) auditing and asbestos removal. It covers safety auditing in every workplace and is so flexible it can be tailored to any industry, language or country.

At the core of Assure360 is a construction H&S system that covers auditing, trend analysis, competence, training needs, accidents, incidents, near misses and more. Assure360 was created by a team with more than 20 years' experience in the industry. It can be used on any web browser, and our suite of apps is available via the App Store.

Assure360 is a regular and popular exhibitor at the Hazardous Materials Expo. We used the 2018 show to run a meet and greet for our customers, and as a springboard to launch the most recent app in our suite: Assure360 Paperless.

Paperless addresses one of the biggest challenges in our heavily regulated industry:



the time-consuming and error-prone recording of numerous safety-critical checks. Supporting supervisors and admin teams alike, and saving time and money, Assure360 Paperless is the solution that the asbestos removal industry has been waiting for.

Assure 360: Bringing health and safety innovation into the 21st Century. For more details, to book a demo, or to discover the full range of Assure360 apps, visit us at: www.assure360.co.uk

Contact: Chris Garland, Sales Director
chris.garland@assure360.co.uk

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Hazardous Safety Products

Hazardous Safety Products Ltd attended the Contamination Expo under the hazardous sector in September 2018. The company was only 12 months old at this point and saw the event as a good platform to showcase our manufactured range of products.

HSP manufactures specialist equipment predominately for the asbestos removal industry globally. It was a gamble at such an early stage but ultimately we are pleased to say it was hugely successful allowing our products to be showcased to an international



audience. Such was the success we immediately booked for the upcoming show in 2019.

At the show this year we will be showing our HSP Negative Pressure Unit range, HSP Modular shower range and Blastrac flooring equipment. We will also have information relating to our latest products such as the HSP Decontamination Trailer and our portfolio of consumable products. We anticipate more success from attending the show for the second year running and looking forward to continued growth of our young company.

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setting up Chemtech Environmental to challenge shoddy standards and accepted industry norms.

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Empowering the energy transition

Solar & Storage Live, held at Birmingham's NEC from 16-18 October 2018, is the UK's largest renewable energy exhibition. The UK will see a subsidy free market as we move forward into a new era of energy. Solar & Storage Live brought all aspects of the market together to showcase, analyse and discuss how this energy transition will move forward.

New technologies, business models and entrants will allow for growth and diversity in the market. These additions are needed to help support the changes in generation and supply, moving towards a decarbonised and decentralised power environment.

Over 4,000 visitors attended the 3 day exhibition. The agenda focused on solar, battery & energy storage, EV infrastructure and smart energy including homes, cities, meters, grids and

technology. Residential, C&I and utility scale markets were covered across the UK, Europe and the rest of the world.

100+ exhibitors showcased the latest in breakthrough solar, storage, smart and renewable technologies, alongside industry-leading free content in the theatres.

Solar & Storage Live returns to Birmingham's NEC this year from 17-19 September 2019. This is our pick of the best exhibitors from last year's show, listed here in alphabetical order: Easy Crypto Hunter, Ethical Power, Green Frog Connect, Moixa, Prime Hybrid Energy, Solar Limpets & Waxman Energy. Further details can be found on this page and the next.

www.terrapinn.com/exhibition/solar-storage-live/index.stm



Ethical Power launches sustainable ocean racing team

Ethical Power is one of the UK's most innovative and ambitious renewable energy companies. Since starting construction of commercial solar installations in 2010, it has connected over 140MWP of power generation and has since expanded into other European countries such as Turkey and Spain.

With a proven track record for delivering high quality, high performing assets, Ethical has become one of the UK's market leaders in the design, construction and maintenance of renewable energy projects.

Throughout uncertain times in the solar sector, Ethical Power has remained steadfast, continuously striving to identify new ways

to promote renewables to the finance and industry sectors, and in doing so create a legacy to be proud of. In order to continue to engage and influence, Ethical Power has recently launched a partner company 'Renewable Racing', a sustainable yacht racing team whose long-term focus is on developing innovative technology to promote renewable energy adoption, increase performance and contribute to sustainability.

Conceived by Ethical Power's CEO Tom Kneen's love of the ocean and Conrad Colman, who is the first sailor to complete the Vendée Globe round the world race without reliance on fossil fuels, a desire was born to promote the global transition to renewable



energy through yacht racing. The team will build upon expertise gained from the first ever zero-emissions Vendée Globe and the installation of hundreds of megawatts of solar energy to become the world's most sustainable racing team, in any mechanical sport.

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Renewable Racing
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One of the UK's leading independent connection providers, we design and build safe, reliable and cost-effective high-voltage connections to the national electricity grid.

With excellent working relationships with the UK's major distribution network operators, we are accredited by Lloyd's Register for design and construction of grid connections up to 132kV.

We have constructed nearly 800MW of gas and diesel peaking power plants which, together with our ICP grid connection services, means we have connected over 1,500MW to the grid.

Our services include:

- ▼ Commercial and industrial import and export grid connections
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- ▼ LV, MV & HV balance of plant supply
- ▼ Construction of grid-scale battery



- energy storage power plants
- ▼ EV grid infrastructure support programmes
- ▼ Gas and diesel peaking power plants
- ▼ 'Behind the meter' energy generation and storage

For further information, please contact **Mark Baker, Business Development Manager, on +44 (0)7802 322750 or email: m.baker@greenfrogconnect.co.uk**

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Moixa

Moixa is a leading domestic smart battery company and platform for managing storage services. We develop our Smart Battery hardware and GridShare software to facilitate smart energy storage and sharing. Moixa works with a variety of customers across utility and networks as well as property managers and installers. Moixa Smart Batteries have already helped thousands of households lower their energy bills, reduce their carbon emissions, and unlock the full potential of their solar energy.

Moixa Smart Battery benefits:

- ▼ The Moixa Smart Battery uses artificial intelligence to optimise the battery to adapt to household needs
- ▼ Right-sized battery for the UK market
- ▼ Compact size (2kWh & 3kWh: H: 50.5cm x W: 34.5cm x D: 24.5cm; 4.8kWh: H: 70cm x W: 50cm x D: 20cm – available for pre-order)
- ▼ Helps to reduce household carbon footprint
- ▼ Personalised Moixa Dashboard for users to see their real time energy generation and use

Why work with Moixa?

- ▼ Competitive pricing
- ▼ Simple Smart Battery installation process for both retrofit and new solar customers
- ▼ Free 1 day Moixa Accredited training for installers
- ▼ Bespoke partnership opportunities

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Removing graffiti with the TORNADO ACS

Removing graffiti gently and without harming the environment

Large cities pay up to one million euros a year to have graffiti removed from public areas. And it is estimated that this costs smaller cities pay up to 200,000 euros a year at least. Municipal decision-makers, service providers and employees of housing associations are looking for an easy, reliable, gentle yet environmentally-friendly method of removing unwanted graffiti.

With its Tornado ACS, the company systeco is offering an integrated, all-in-one solution based on the vacuum-blasting method.

The unit uses a blasting agent specially selected for each surface which is applied to the area to be cleaned. The paint particles are removed from the substrate and separated from the abrasive by a filter. The abrasive can then be used on the surface again to remove the paint.

The Tornado ACS is a closed system. No paint residues or solvent get into the waste water, so that there is less harm to the environment. No equipment for collecting paint residues is required.

A suitable abrasive can be selected for each type of surface to be cleaned. For example, nut shells can be used for both plastered facades and removing



An all-in-one system for removing graffiti without harming the environment, Photo: systeco

graffiti from paintwork.

Graffiti can also be removed from a composite insulation system (ETICS or ETICS systems). As no water which might get into gaps is used, there is no major danger of mould forming.

Since the system is kind to surfaces, it even meets the high standards for protecting monuments. Old places, fortresses and other architectural monuments can be cleaned according to legal requirements. The process is also suitable for sandstone.

The equipment can be set up in only a few minutes and can be safely operated in busy locations, pedestrian zones, footpaths and in road traffic. Elaborate barriers are not necessary.

systeco distributes the Tornado ACS via a well-established dealer network. The dealers provide expert advice on the equipment, its maintenance and, if necessary, repairs at short notice. The cleaning machines can be leased to buy on a long-



term basis and low-cost rental plans are available for short jobs.

systeco Vertriebs GmbH

systeco, which is based in Berlin, guarantees the high quality of its products used to clean soiled exterior and interior surfaces without harming the environment. With the patented vacuum blasting process of the Tornado ACS system, the company has developed an innovative, future-oriented cleaning technology. Its distinctive features are environmental friendliness, safe operation and high cost-effectiveness. systeco continues to develop the vacuum blasting process in order to find better solutions for environmentally-friendly cleaning.

Tornado ACS Cleaning Systems

Using its many years of experience, systeco has produced four cleaning systems for different customer requirements. The Tornado ACS Top system consists of the basic components: the vacuum blasting unit, wearing parts and accessories. It also includes 60 litres of various granules in six 10-litre containers, which is sufficient for cleaning surfaces of about 450 square metres. The warranty is valid for two years.

In addition to the basic components, the Tornado ACS Premium system includes additional wearing parts and accessories, eight containers of abrasive and a four year warranty.

In addition to the basic components, the Tornado



ACS Elite system includes an even larger selection of wearing parts and accessories, ten containers of abrasive and a six year warranty.

The Tornado ACS Elite Plus system includes the basic components, a further expanded range of wearing parts and accessories, 16 containers of abrasive and an eight year warranty.

info@systeco.de
www.systeco.com



Removing graffiti from paintwork, Photo: systeco

Solar Limpets

Designed by an installer for installers, and with nearly a million units installed since 2012, Solar Limpets are a unique innovation in hook technology. Offering economical, simple and fast installation, the revolutionary design will save up to 80% on installation time and reduce breakages by a staggering 90-100%.

- Suitable for 10 x 6 cement and clay tiles plus natural and artificial slate of all sizes
- 360° adjustment: up, down & sideways
- Suits all roof conditions
- Automatic adjustment copes

- with a variable pitch roof
- Adjustable even after the panel has been fitted!
- Suitable for both portrait and landscape installations
- No lattice rails required for landscape installations
- 100% a weatherproof installation for tile and slate elevations
- Does not cause tiles/slates to kick up
- No tile or slate cutting, slate removals or flashing required
- Simple, safe and weather tight cable entry to the loft area
- Does away with roof ladders, etc,



normally required
Reducing tile and slate breakages by 90-100%

Find out more of what you are missing and stop struggling.

Go to: www.solarlimpets.co.uk and click on: SOLAR LIMPET ADVANTAGES.

Waxman Energy stays strong despite difficult climate

While the UK solar market has been very challenging in recent years, leading to solar PV companies closing left right and centre, Waxman Energy shows no sign of folding – instead, opting to increase its product portfolio and expanding into the EV Market.

Part of the Waxman Group, with over 50 years in the distribution industry, Waxman Energy has grown to become one of the UK's largest distributors of solar PV modules, battery storage, and mounting solutions – offering its customers a 'one-stop-shop' for both residential and commercial solar installations.

In 2019 alone, Waxman has partnered with both Tigo and Myenergi, with the introduction of 'Zappi' – an eco-smart charge point manufactured in the UK. Its 40,000ft² of warehouse space enables it to hold extensive stocks on site allowing for next day delivery on hundreds of items.

With a strong and growing team lead by Sam Waxman, Waxman Energy understands the challenges that lay ahead post FiT cuts, and offers training days combined with extensive technical support, giving installers an opportunity to adapt to the industry at its ever-increasing speed.



Despite a difficult climate, Waxman Energy sees a long-term potential in solar and looks to the future as it pushes ahead within the PV, battery storage and EV charging markets.

T 01422 374114
info@waxmanenergy.co.uk
www.waxmanenergy.co.uk

What's the point of solar? Has solar finally lost its shine?

The green benefits of installing and using solar energy are undeniable. But wait!! NO more feed in tariff. So has solar lost its shine?

Well the answer in short is, almost. What is actually required to combat this shortfall, is a secure and reliable energy supply 24/7. As the sun and wind change throughout the day, the only way to truly provide 24/7 energy is with battery storage.

If a homeowner installs battery storage they can benefit and use more of the power they have generated from their solar panels rather than sending it back to the grid.



Well say hello to Prime Hybrid Energy: www.primehybridenergy.com

Prime Hybrid Energy is quite

possible the leading battery storage product on the market currently. Award winning and designed in the UK by a team of industry experts, it makes impressive reading.

The ace in the pack is that Prime can now offer this solution to registered social landlords for FREE. Prime will supply and install all the systems and the tenant will get the benefit of all the energy that is being produced for the PV system. They get the whole system maintained for 20 years. This saves the tenant thousands and more importantly helps fuel poverty in this vulnerable market space.

www.primehybridenergy.com

Are you frustrated with...

Constrained farms wasting energy?
Inadequate battery storage solutions?
Incredibly low feed-in tariff rates?

Use generated energy to power GPU Cryptocurrency Mining Rigs

Our renewable energy customers received up to a 67% ROI (that's gop per/kWh) over a 6 month period in the bear market of 2018.

Utilise the heat generated by the mining rigs to heat your air volume.

Potentially claim your VAT back on each mining rig and account for it as a capital allowance.

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Problems locating a sewer pipe? Call in the drain detectives

Drainage engineers at Lanes Group plc are often called upon to investigate and trace sewers, drains and culverts even before planned drainage maintenance can be considered.

For example, drainage engineers from the Lanes Birmingham depot were called in to trace a culvert alongside the M54 motorway in Telford after a new pedestrian bridge was built.

Contractors ignore the chance of there

being hidden drains at their peril. They may undermine the structures being built. Inadvertently covering and damaging water utility pipes is likely to be a costly mistake.

The culvert along the M54 is a case in point. Contractors needed to be sure that the bridge foundations did not affect the culvert. The drainage survey report was needed as part of the asset handover process.

Lanes' drainage and professional services teams use a range of techniques to locate,

investigate and accurately map drainage systems. The first rule is often not to trust the plans, if there is the luxury of having them.

Because of that, the first step is often a lot of basic drain detective work, walking the site, and using technical knowledge and experience to find manholes, which can turn up in the oddest places.

Manholes are often buried or lost in undergrowth. Then, comes the task of identifying how the drainage system

connects up, where the water flows to and from, and where the drainage outfalls are located.

Alongside the legwork, Lanes can deploy sophisticated drainage survey equipment to trace underground pipes, map their connections, assess their condition, and now pinpoint them in space to within a few millimetres.

T 0800 525 488
www.lanesfordrains.co.uk



CPL trebles carbon reactivation capacity

Wigan-based CPL Activated Carbons has dramatically increased its capacity for reactivating 'amber list' spent carbons from industrial purification processes, following a major expansion of its Immingham production facility.

Activated carbons are used in a wide range of gas and liquid phase filtration applications, such as air treatment, water purification and numerous other environmental protection applications. When carbons are 'spent' and no longer achieving the required level of filtration, they need to be replaced. In most cases, spent carbons can be regenerated by a process called thermal reactivation, which involves passing the spent media through a high temperature rotary kiln to restore its filtration capability.

Spent activated carbons from the various



purification applications are generally categorised into two broad types, which dictates how they are subsequently handled and re-processed. Spent carbons from industrial applications such as air and biogas filtration, waste water and remediation projects are referred to as 'amber list' materials. Carbons that have been used in drinking water or food grade applications

are referred to as 'green list' materials. CPL's carbon regeneration facility is located at the group's UK manufacturing site in Immingham, Lincolnshire, where it has been successfully reactivating 'amber list' spent carbon filtration media from industry since 2013.

Following a major investment by the parent organisation, CPL industries, the company has dramatically increased its capacity for treating these 'amber list' spent carbons, with the installation of a brand-new, state-of-the-art rotary kiln at the Immingham site. The kiln, which is the largest 'amber list' regeneration facility in the UK, and one of the largest in Europe, has a sophisticated thermal oxidiser and scrubber system to ensure full environmental protection and compliance.

T +44 (0)1942 824240
www.activated-carbon.com

China deployment, July 2018

Cheshire-based Arvia Technology Ltd. completed the first deployment their ground-breaking Nyx™ industrial wastewater treatment system to Tianjin, China in summer 2018.

The Nyx™ technology removes hard-to-treat COD (chemical oxygen demand) and colour from wastewater, enabling it to pass China's strict regulations of between 30-50mg/L COD for safe discharge.

The company have since experienced further traction in China and are revisiting Shanghai in February 2019 to conduct their third treatability roadshow in the country. Treatability testing will be conducted on real samples

of wastewater to prove the concept of the tertiary technology on the client's own sites. Nyx™ has already been applied across various industries in China, including pulp and paper, chemical, pharmaceutical and steel manufacturing, as well as landfill leachate which all produce some of the most challenging wastewaters.

Mike Lodge, CEO, said, "Industrial manufacturers are under extreme pressure to meet effluent regulations in China and are keen to do so in the most cost-effective and environmentally considerate way possible. We are delighted at the positive feedback we are receiving on the Nyx™ systems from our clients in China."



The company is based at The Heath Business and Technical Park in Runcorn.

T +44 (0)1928 515310
info@arviatechnology.com
www.arviatechnology.com

EMEX Review Top 20

EMEX: Reduce your energy use

Energy is a cost to most organisations that has grown as a proportion of overall expenditure in recent years. And yet, there is considerable potential within most organisations to make large energy cost and carbon emission savings through the installation of energy efficiency measures.

EMEX, held at London's ExCeL from 21-22 November 2018, connects all industrial and commercial energy consumers with leading experts, policy makers and suppliers. EMEX is more than just an event.

It's a platform where practitioners and experts from various backgrounds and sectors are coming together to share their knowledge and experiences from successful implementations of energy efficiency strategies.



Whatever the size of your business there is an opportunity to find more efficiency in your energy use. Applying silo thinking to energy management rarely delivers the maximum savings possible. A far more effective approach is to focus on the whole operation and identify the interdependencies between each function.

With this broader view, it is possible to develop and implement solutions that deliver greater cost reductions by increasing

energy efficiency across multiple facilities, reducing maintenance costs, reducing water consumption, decreasing production downtime, removing supply chain costs, delivering a return on investment, increasing business assets value and enhancing workplace productivity.

Next year's EMEX takes place from the 27 and 28 November 2019 at ExCeL, London. This is our pick of the best exhibitors from last year's show, listed here in alphabetical order: Ampower, arbnco, EDF Energy, ESB, LaminaHeat, Optima Energy Systems Ltd, SMS Plc, Space4Climate, 2G Energy, VERDE LED & VINCI Facilities. Further details can be found on this page and the next.

www.emexlondon.com

Innotech Omni Controllers

The new benchmark for native BACnet BEMS? Omni's innovation provides savings from project engineering, installation and commissioning, right through to ongoing facility management. Omni is the complete BEMS solution for single controller applications to total native BACnet BEMS networks.

Innotech FOCUS software used to program the devices. No licence fees! Small footprint and large number of programmable I/O points make Omni an ideal candidate for retrofit projects as well as new works.

▼ ALL Points are fully programmable

(UI/O) with self-diagnostics for incredible flexibility & no wasted I/O

- ▼ Omni C40 and Omni C20 can be expanded to 90 and 70 points respectively with Omni U10 Modules
- ▼ Innotech protocol plus native BACnet & BTL Listing
- ▼ BACnet Routing, BBMD & live BACnet commissioning
- ▼ Cross Platform web server with real-time monitoring
- ▼ On-board data logging, maximum 180 million records, gives approximately 12 years of data logs (example given = 40 points @ 15 minute intervals)
- ▼ Real-time clock & battery backup for fail-safe critical applications



- ▼ Email & SMS Alarm notification
- ▼ On-board or remote HMI
- ▼ Compatibility with existing Innotech BEMS networks
- ▼ Expansion capabilities for enhanced flexibility & savings
- ▼ Free online training academy available to Innotech System Integrators
- ▼ Comes with 3 year manufacturer's warranty

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www.innotech.com

omni.

The new benchmark for native BACnet BEMS?

- Omni is the complete BEMS solution for single controller applications to complete native BACnet BEMS networks.
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INNOTECH

EUROPE

Measuring real driving emissions 'spikes' and associated urban air pollution hot spots

One of the most challenging aspects of modern Real World Driving Emissions (RDE) measurement is the unexpected and often quite harsh transients associated with driving in the urban environment. Most modern and middle aged vehicles emit very low levels of pollutants when travelling at a constant speed, but a drivers negotiation of road intersections, congested traffic and especially of speed bumps can cause significant 'spikes' of emissions (often within a fraction of a second) to be emitted from the tailpipe of vehicles.

Cambustion's fast response emissions analysers have millisecond response times and are specifically designed to measure such emissions spikes. Such events cannot be resolved properly by standard Portable Emissions Measurement Systems because their sampling location and response time are approximately 1,000 times slower.

Such fast response emissions data when combined with high resolution GPS location data results in pollution hot spot accuracy of ~15cm at 30mph vehicle speeds, which is useful for those requiring accurate spatial and concentration starting conditions for pollutant dispersion models.

The data resulting from driving around urban routes can also be useful for those researching improvements in smart traffic management, traffic flows and road planning.

The establishment of Clean Air Zones (CAZ) and Low Emission Zones (LEZ) can benefit from analysis of likely pollution hot spots to such accuracy, plus the impact of bus emissions (which can cause significant tailpipe NOx emissions when



Repeat section of Guildford City Centre NOx hotspots

manoeuvring bus stops and urban traffic) in such sensitive zones can be identified.

The fast response analysers have been used since 1987 to aid engine calibrators to adjust their engine control parameters and to more effectively control vehicle tailpipe emissions. Generally, problem spikes of emissions are identified on-road, but the transient manoeuvre is recorded and replicated in an engine test cell to provide full analysis on why such emissions are occurring. Reasons for transient NOx emissions can include: catalyt systems which are too cold, poor air/fuel ratio control, EGR control problems and fuel injection issues.



London Bus



Effects of speed bumps on NOx emissions in West London urban environment



Cambustion Fast Response NOx Analyser in on-board configuration for RDE use

www.cambustion.com

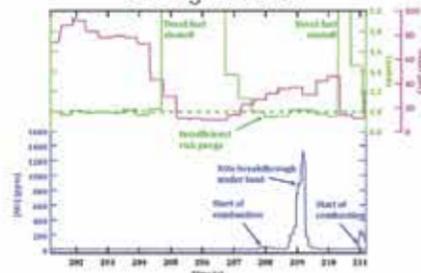
CAMBUSTION Tools for Engine & After-treatment Development

Fast-response Gas and Particle Analyzers

Gases: HC, CO & CO₂, NO_x, ...ideal for RDE optimization



Deceleration fuel shut-off NOx breakthrough at engine restart



Effects of speed bumps on NOx emissions in West London urban environment



* some applications require additional hardware

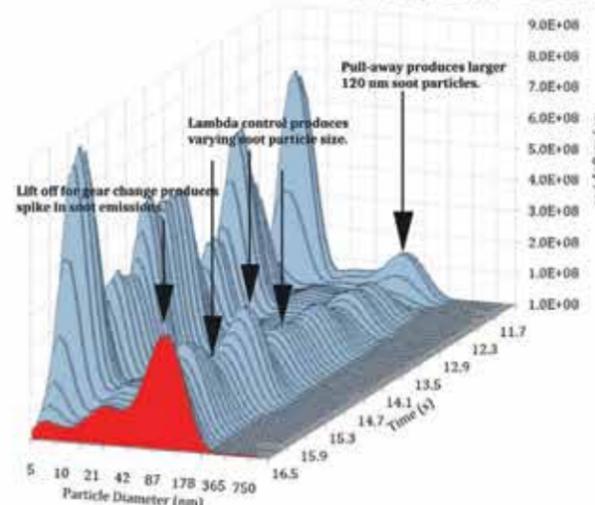
Gas analysers easily configurable* between test cell and in-vehicle use for RDE

Advanced DPF/GPF Test System



Light to Heavy duty development and QC applications:
Soot load, back-pressure, regeneration, filtration & ashing testing,
Filtration efficiency measurement, Catalytic activity testing...

Particulates: Rapid response PM measurement for transient engine-out optimization and DPF/GPF soot models



For technical papers produced with Cambustion equipment by our customers, visit: www.cambustion.com/publications

Water, wastewater and environmental monitoring

WWEM 2018, the 8th in the Series of International Water and Wastewater Monitoring events took place at The International Centre, Telford from 21-22 November 2018.

WWEM comprised a two day conference run with industry partners including SWIG (Sensors for Water Interest Group), and The Royal Society of Chemistry. It's an exhibition of over 150 companies who provide instruments, equipment and services to monitor, test and analyse water and wastewater, plus over 80 free technical seminar sessions on applications and case studies. Visitors to WWEM were able to source the latest products from laboratory analysis to process monitoring to testing out in the field as well as information on working in hazardous areas and gas detection.

In 2018 WWEM once again ran side by side with AQE 2020 (The 11th International Conference and Exhibition on Air Quality and Emissions Monitoring). Visitors to WWEM and AQE were able to enter both these complementary events free of charge and benefited from attending two industry shows at one time under one roof showing a full range of products and services for environmental monitoring.



The biennial event returns to Telford's International Centre from 11-12 November 2020. This is our pick of the best exhibitors from 2018's event, listed here in alphabetical order: Chelsea Technologies Group, Fuel Cell Systems Ltd, Leco Instruments, PROFIBUS, RSHydro, SouthWestSensor Ltd & SWAN Analytical Instruments. Further details can be found below.

www.ilmexhibitions.com/wwem

SouthWestSensor Ltd

SouthWestSensor Ltd, developer of a ground breaking platform technology for autonomous low-cost monitoring of water nutrients and pollutants, is going from strength to strength, following a first successful outing at the WWEM Water Conference and Water Exhibition in November 2018.

The University of Southampton spin-out has developed a proprietary nanodroplet based platform technology that allows for normally laboratory based wet chemistry testing to be performed continuously with small deployable sensor probes. A key advantage is the ultra-low volumes of reagents required which allows for autonomous monitoring operations for months, thereby greatly reducing maintenance requirements and cost.

CEO, Dr Oliver Hofmann, commented, "We are very encouraged by the positive response so far and being named one of the Top 10 exhibitors at WWEM. It seems like the water industry is looking for next generation technologies to make water monitoring more efficient and that is exactly what we are offering. Partnering



discussions have already started and we hope to complete them this year."

The company is currently preparing for the launch of its first product, a nitrate & nitrite sensor and has started to work on pipeline products.

Potential customers are encouraged to contact the company at: admin@southwestsensor.co.uk

Chelsea Technologies Group

Chelsea Technologies Group is delighted to report successful attendance at WWEM 2018 last October, where significant interest and new opportunities were generated in the company's range of robust high performance in-situ water sensor solutions for the real-time monitoring of Algae, CDOM (Organics), Bacteria, BOD and Hydrocarbons.

The Chelsea Technologies 'Lux' series of sensors are all part of a family of sensor products which benefit from commonality and share the same interfaces for both stationary and portable systems. The sensors themselves offer flexible data output options for connection to existing systems, and are suitable for integration to SCADA type systems within water treatment plants, monitoring within the network and into river and coastal remote monitoring stations.

Both portable handheld display/loggers (Chelsea Technologies 'Hawk') and fixed monitoring display/loggers (Chelsea Technologies 'Watchkeeper') were demonstrated with the 'Lux' sensors.

Of particular interest were Algae, Hydrocarbon and CDOM monitoring solutions, with enthusiastic



responses also expressed in the new V-Lux interference immune multi-channel fluorometer as well as the FastBallast Portable compliance monitor for treated ballast water, with its detection limits of <1 cell/ml, applications within the water industry for such tools were recognised.

Contact: Justin Dunning, Sales and Marketing Manager
jdunning@chelsea.co.uk

Fuel Cell Systems Ltd

Fuel cells provide an all-weather solution to the need for ongoing, remote power. They are emissions-free, quiet, have few moving parts and can operate for several weeks or even months without human intervention.

When coupled with an appropriate enclosure, a fuel cell can give you these extended runtimes whatever the location or climate conditions.

The FCS Rapid Deployment Case has been specially designed by Fuel Cell Systems in the UK, to house an EFOY Pro Fuel Cell, a lightweight LifePO4 battery and 16.5kWh of methanol fuel.

It has been used by the BBC to power cameras for its Winterwatch series in the Highlands of Scotland, by an acoustic consultancy to power noise monitoring equipment, by the Environment Agency to power flood monitoring equipment and by police forces across the UK.

The Rapid Deployment Case can communicate data on its status using FCSL's StackWatch remote monitoring



system. The system can therefore work independently for several weeks, whilst you remain in control of the information it provides.

T 01488 507050
info@fuelcellsystems.co.uk
www.fuelcellsystems.co.uk

Proteus water quality sensor

The Proteus is the world's first scientifically proven sensing unit that can provide real-time BOD data alongside traditional parameters (pH, conductivity, etc.), thus incorporating environmental sensing needs into a single, easily deployable, low maintenance monitoring platform. The savings associated with the Proteus are comprehensive and include reduced laboratory costs, reduced likelihood of fines and reputational damage, energy savings through process optimisation and additional cost savings associated with BOD sampling. The Proteus is set to change globally the way reactive organic matter loads are monitoring, improving reliability, accuracy and resolution.



Designed for its ease of use, reliable data and economical operation, the Proteus also has a robust build quality with stainless steel and Delrin outer casing. In addition, it benefits from being self-cleaning with an integral wiper, intuitive software, can be easily integrated with telemetry/SCADA systems and other data logging devices and is fully serviceable in the field requiring almost no maintenance.

Power can be provided by an optional internal lithium battery pack or an external power source (battery, mains or solar power). The Proteus is the first instrument globally that has the potential to measure bacteria/coliforms in drinking water in real time.

T +44 (0)1527 882060
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Industry leading GCMS analysers you can trust

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The smart way to Industry 4.0 with PROFINET based technologies

Organised by PROFIBUS & PROFINET International (PI UK) and the European Interreg Project INCASE ('Industry 4.0 via Networked Control Applications and Sustainable Engineering'), this free-to-attend seminar addresses the key practical issues of digital communications in automated manufacturing, with particular attention to Industry 4.0.

Covering key application areas such as logistics, robotics, automotive engineering, electrical and electronics assembly and control systems, it will be accompanied by hands-on demonstrations and will be of great value to Designers, Production/System Engineers, Instrument Technicians/Engineers involved in design, operation and maintenance of modern automated factories.

Topics will include:

- Overview of current and developing technologies for Industry 4.0
- PROFINET basics
- Ethernet's copper physical layer finally unveiled
- IO-Link for the 'last metres' communication
- Network Safety & Security
- Cybersecurity
- EMC for networks
- PROFINET diagnostics
- Redundancy for PROFINET networks
- Designing & virtual commissioning: co-simulation



with Siemens NX
PROFINET's 'oversampling' and 'I-Device' features: industrial cases for control and signal processing

The event will provide delegates with an excellent networking opportunity and the ability to discuss technical issues with our experts.

For further information, please email: admin@profibus.org.uk or phone 0207 193 8018.



Water quality parameters control

Based in Switzerland, SWAN sets the standard for the control of many water quality parameters. Precision, reliability and excellence are qualities which make SWAN an ideal partner. Every sensor and every instrument have been produced at SWAN's headquarters and each step, from the machine part to the final assembly, undergoes rigorous and severe quality control procedures so that no instrument leaves the company without final testing under real conditions.

SWAN has recently developed the robust AMI Sac254 to monitor organic material by measuring UV absorption at a wavelength of 254 nm. For more information, go to: <https://sac254.swan.ch>

With the introduction of CHEMATEST 30, SWAN broadens its range of applications for handheld



water quality testing devices. In addition to potable water treatments and public pools, this successor model to the well-proven CHEMATEST 20/25 photometers is now qualified for use in pharmaceutical production and food processing.

For more information go to: www.swan-analytical.co.uk or to discuss a free evaluation please get in touch either by emailing: sales@swan-analytical.co.uk or calling 01780 755500.