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March/April 2022 | Issue 62

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Safety concepts for battery energy storage systems

**Fire protection and explosion
safety of lithium-ion battery
energy storage systems**

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IPAF Launches targeted safety campaign.

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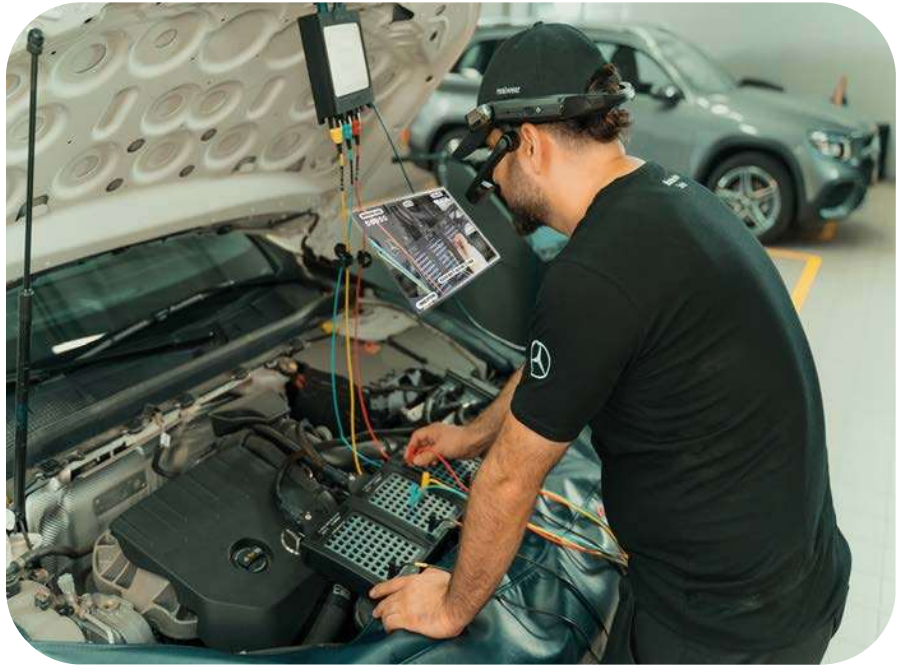
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Safety concepts for battery energy storage systems

Fire protection and explosion safety of lithium-ion battery energy storage systems

Lithium-ion batteries are now an essential part of our everyday lives. They have proven themselves for many years due to their high efficiency as rechargeable energy storage in small appliances such as mobile phones, notebooks, cameras, tools and model making. Lithium-ion batteries have now also made their way into electric cars, bicycles, forklift trucks and battery energy storage systems (BESS).

Alongside the many performance advantages of lithium-ion batteries, safety-related investigations show that battery cells can pose a risk if temperature limits are exceeded. Above corresponding temperatures, strong exothermic chemical reactions can be initiated in the material at a cell level, which can spread to the entire module or even to the entire battery system. This can result in temperatures of up to 700°C within a short time.

These chemical chain reactions at a cell level cannot be interrupted, which is why they also are referred to as thermal runaway. As the thermal decomposition of the battery cell produces ignitable gas mixtures, there is a significant risk of fire and explosion. *Lithium – Batterien – Brandgefahren und Sicherheitsrisiken, Risk Experts, Dr. Buser*

The temperature above which there

is a risk of thermal runaway depends significantly on, for instance, the cell type. According to the literature, lithium-ion cells are not usually designed for operating and storage temperatures above 60°C. *Brandschutz-Forschung, IMK Bericht 175, KIT, Herr Kunkelmann – 2017*

In addition to temperature, there can also be other causes of thermal runaway: for example, internal or external short circuits (e.g. due to quality defects, deformation, external fire load, damaged cells) or to high currents during charging or discharging.

To reduce these risks, high demands are placed on the safety and reliability of battery cells. Manufacturers have to successfully pass through many tests in the run-up to a market launch, including tests that go far beyond normal use (e.g. nail penetration test). Protective measures are also implemented in battery systems in order to avoid a thermal runaway scenario during operation or to identify it at an early stage. The measures include e.g.

- Safety systems inside the cell, such as safety valves or explosion vents
- Battery management systems that monitor, among other things, electricity, voltage and temperatures
- Venting of the battery module housing
- Circuit breaker/galvanic isolation
- Gas sensors
- Ventilation technology
- Cooling systems

Commercial-scale use of battery energy storage systems (BESS)

Thanks to their high storage density, lithium-ion batteries are increasingly being used as battery energy storage systems (BESS) in order to secure the energy supply or balance out fluctuations from renewable energy sources in the power supply. These battery systems – also referred to as battery storage power stations – play an important role in the global expansion of the renewable energy supply. The battery modules in the power stations are mostly installed in large numbers in man-high racks inside 20- or 40-foot

containers. One can imagine the storage systems as an XXL power bank.

Despite the high requirements on safety and reliability of battery cells, which the manufacturers ensure with intensive tests and by implementing extensive protective measures, accidents have taken place in various power storage systems in recent years.

Detailed assessment of the potential risk and possible safety concepts

The residual risk of the thermal runaway scenario – e.g. due to damaged cells – brings with it a high risk of fire and explosion. The chemical chain reactions that lead to these high temperatures can ignite the electrodes (lithium compounds, graphite) and lead to dangerous metal fires.

The electrolyte liquid between the electrodes consists of organic solvents, which vaporise at temperatures above 80°C. DGUV – Hinweise zum betrieblichen Brandschutz bei der Lagerung und Verwendung von Lithium-Ionen-Akkus – 2020. Brandschutz-Forschung, KIT, Forschungsbericht 175, Jürgen Kunkelmann – 2016.

This volume expansion by a factor of 1000, which occurs with a phase transition from a liquid to a gaseous aggregate condition, leads to high pressures within the cells. In order to prevent the battery cells from bursting during thermal runaway, explosion vents or, where applicable, safety valves are present, which “release” the gas into the environment and protect the cells from bursting.

Figure 3 illustrates thermal runaway using the example of a battery module with 24 conventional 18650 battery cells (3.7 volt, 3000 mAh). In a scenario such as this, the fire load is transferred to



Fig. 1 + 2: Damage to a battery energy storage system after an explosion, Arizona Public Service, 2020 (<https://spectrum.ieee.org/dispute-erupts-over-what-sparked-an-explosive-liion-energy-storage-accident>, 11.11.2021)

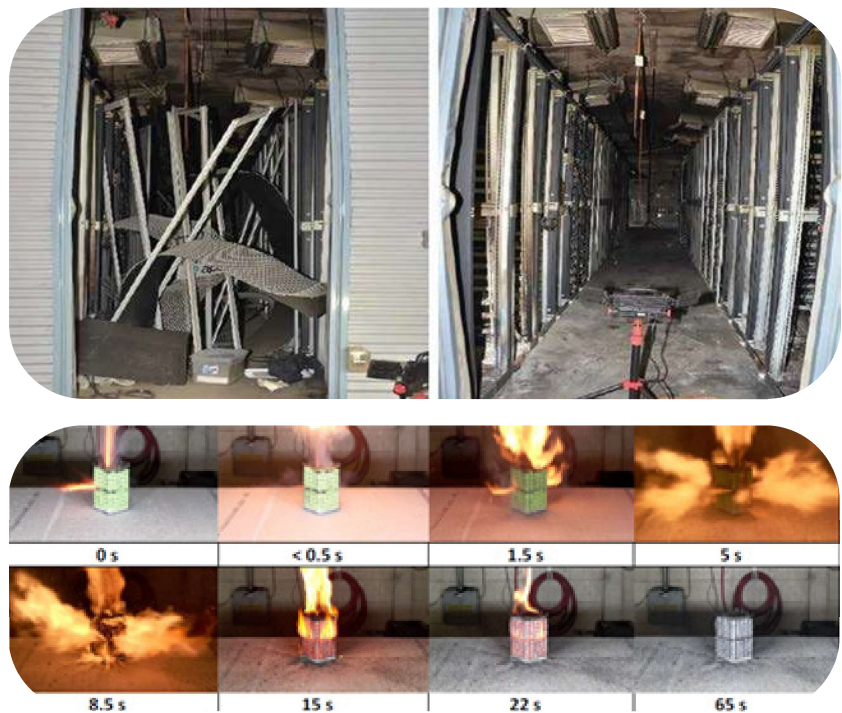


Fig. 3: Spreading of thermal runaway to neighbouring cells

neighbouring cells within seconds. A chain reaction occurs, which is accompanied by cyclical explosive flames from the cells. The explosive flames occur due to the discharge of evaporating, combustible electrolytes. There is also a risk that glowing metal parts and other burning parts of the battery will be expelled. DGUV – Hinweise zur Brandbekämpfung von Lithium-Ionen-Akkus bei Fahrzeugbränden – 2020

Particularly batteries with high power densities, such as those used in vehicles and battery energy storage systems, can release several thousand litres of gas into the environment within seconds – depending, among other things, on the cell type, storage capacity and state of charge. Exponent Inc. – Thermal Runaway and Safety of Large Lithium-Ion Battery Systems – 2015.

These gas mixtures contain flammable components such as hydrogen, hydrocarbon and carbon monoxide, as

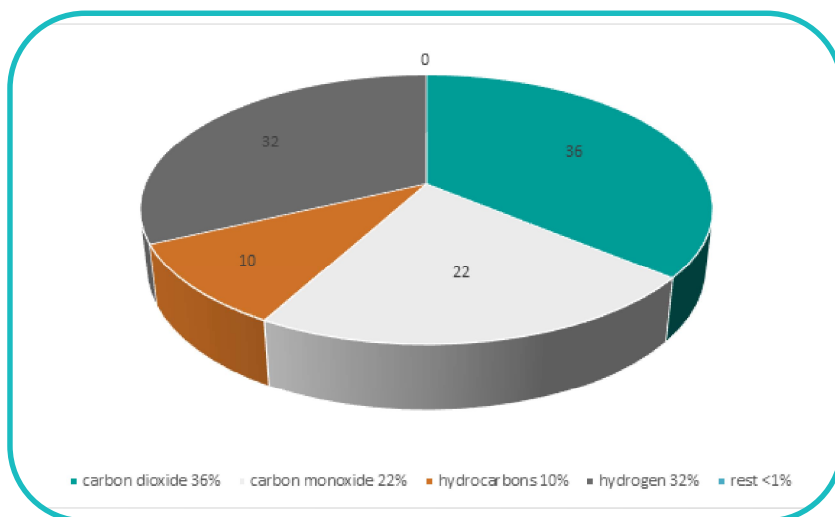


Fig. 4: Representative gas composition for thermal runaway

	Hydrogen H ₂	Carbon monoxide CO
Lower explosion limit LEL	4.0 Vol%	10.9 Vol%
Upper explosion limit UEL	75.6 Vol%	76 Vol%
Minimum ignition energy MIE	0,016 mJ	< 1mJ
Ignition temperature IT	560 °C	605 °C
Temperature class	T1	T1
Explosion group	IIC	IIA
Density	0,09 kg/m ³	1.25 kg/m ³
Max. explosion pressure	8.0 bar	8.2 bar

Fig 5: Explosion parameters of hydrogen and carbon monoxide. BG RCI Magazin – Ex-Zonen für Wasserstoff-Elektrolyseanlagen – 2014.

GESTIS Stoffdatenbank – Kohlenmonoxid

well as toxic flue gases (see figure 4).

ISHPMIE - Explosibility Properties of Gases from Lithium-Ion Energy Storage Battery Thermal Runaways, Adam Barowy – Braunschweig 2020

Hydrogen and carbon monoxide are gases that can form explosive mixtures with oxygen from the air over wide concentration ranges (see figure 5). Both gases have low minimum ignition

energies, meaning that even small electrostatic charges or hot surfaces are sufficient to ignite this mixture. There is a risk of gas explosion when unburned gas accumulates in the environment.

The use of GSME gas sensors is a proven method of identifying thermal runaway. The simultaneous monitoring of numerous pyrolysis gas concentrations, such as carbon monoxide, hydrogen

and hydrocarbons, in the parts per million range offers a detailed insight into the process status. If previously set limit values for the pyrolysis gas concentrations are exceeded, the GSME gas sensor emits an electrical alarm signal, which can be used as a warning and to initiate further measures.

Benefits of REMBE GSME fire gas detectors for BESS at a glance

- Monitoring of gas concentrations (e.g. hydrogen and carbon monoxide) in the case of thermal runaway
- Multi-component detection with sensitivity in the ppm range
- Early alarm to initiate countermeasures
- Compact construction, robust design and simple installation

A major challenge in practice is that thermal runaway cannot be stopped or extinguished using classic fire protection measures. It must, therefore, be expected that the explosive gases can ignite outside of the battery cell/housing and lead to an explosion.

If hydrogen-air mixtures ignite in closed systems, explosion pressures of up to 8 bar can occur (see figure 7). These pressures exceed the strengths of the containers and battery rooms in which the battery energy storage systems are located. In particular, doors have low pressure shock resistance and can represent dangerous weak points.

To prevent bursting or flying debris with explosive flames, explosion vents have proven of use as predetermined breaking points, which vent the explosion pressure into the environment in a controlled manner. Extensive explosion vents that are ready for series production have been developed that also open safely and completely at low burst pressures. This solution offers the advantage that the strength of the housing and doors can be much lower, which brings with it huge cost savings. Explosion vents are recommended as protective measures in many standards and are explicitly required by law in certain regions.

The benefits of REMBE explosion vents for battery energy storage systems at a glance

- Passive, mechanical and autonomous protective systems made from stainless

steel

- Failsafe safety
- Minimal maintenance workload (regular visual inspection)
- Opening pressures achievable from 25 mbar – including for extensive explosion vents
- Permanent tightness throughout the entire life cycle of the battery systems (IP66)
- Isolation cassettes are optionally available to avoid dropping below the dew point

The combination of both products forms the basis for an optimally designed protective system, consisting of preventative and constructive fire protection and explosion safety.

REMBE's contribution towards improving safety

REMBE GmbH Safety + Control is the market leader in the fields of explosion safety and explosion venting and can draw on almost 50 years of experience. The expertise covers the following range of services:

Consulting.

- Support in developing adequate, project-specific safety concepts for battery systems
- Explosion-related calculations (e.g. calculation of explosion venting surfaces) according to national and international standards

Engineering.

- Testing and validation of protective measures at the accredited testing laboratory REMBE Research + Technology Center GmbH, e.g.:
- Fire and explosion tests with prototypes under practical conditions
- Testing of explosion pressure resistance or flame penetration tests for battery housings
- Development of flameless explosion venting systems to prevent explosive flames and flying debris

Products.

- Accredited products according to national and international standards
- Special solutions and dimensions available as series products

Service.

- Maintenance und regular inspection



Fig. 6: GSME gas sensor

About REMBE – the REMBE Alliance introduces itself

Most people associate REMBE with REMBE GmbH Safety + Control, the specialist for explosion safety and explosion venting worldwide. The company offers customers cross-

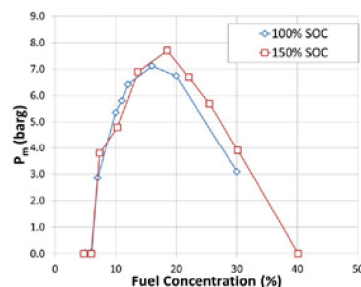


Fig. 7: Max. explosion pressure for combustion in a 20-litre vessel as part of thermal runaway for a 8.7-Wh cell with a state of charge SOC of 100% (Exponent Inc. – Thermal Runaway and Safety of Large Lithium-Ion Battery Systems – 2015)

industry safety concepts for plants and equipment. All products are manufactured in Germany and meet the requirements of national and international regulations. REMBE customers include market leaders in various industries, including the food, timber, chemical and pharmaceutical industries.

The company's engineering expertise is based on more than 45 years of

application and project experience. As an independent, owner-managed family business, REMBE combines expertise with the highest quality standards and is involved in various specialist committees worldwide. Short coordination paths allow for



Fig. 8: Explosion vent with isolation cassette

quick reactions and customer-specific solutions for all applications, from standard products to high-tech special designs. In addition to REMBE GmbH Safety + Control (www.rembe.de) with approx. 280 employees worldwide, headquartered in Brilon (Hochsauerland, Germany), and numerous subsidiaries worldwide (Italy, Finland, Brazil, USA, China, Dubai, Singapore, South Africa, Japan), four other companies operate under the REMBE umbrella brand:

- REMBE Research & Technology Center GmbH (www.rembe-rtc.de)
- REMBE Advanced Services + Solutions GmbH (www.rembe-services.de)
- REMBE Kersting GmbH (www.rembe-kersting.de)
- REMBE FibreForce GmbH (www.argusline.de)

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The same applies to Solid Gear safety footwear which is continually reducing its environmental footprint by using longer-lasting, higher-quality footwear components and taking responsibility for the whole lifecycle of the products – from development and usage to recycling and disposal.

The combined result is environmentally friendly, ergonomically designed workwear and footwear that meet the physical demands that tradesmen and women face at work while reducing their carbon footprint

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keep you dry, they're windproof to keep you warm and breathable to keep you comfortable all day long.

There's a host of AllroundWork and FlexiWork jacket styles and extensive size options available so you can layer your working clothes properly to ensure that your energy and performance levels are as weatherproofed as you are.

For more information on Snickers Workwear's 'Weatherproof Working', call the Hultafors Group UK Helpline on 01484 854788, checkout the website at www.snickersworkwear.co.uk or email sales@hultaforsgroup.co.uk



Radnor Hills Mineral Water has chosen Hart Door Systems to supply a further high-speed door for its **Radnor-based mineral water plant.**

Brian Woodcock, Hart's regional sales manager says, "the order continues an excellent working relationship with the company."

"We have installed several Speedor Minis, so it is good to follow these up with our Speedor Storm variant, designed specifically as an external high-speed door for frequent use in high traffic situations, particularly in exposed areas where exceptional wind resistance is required."

Mr Woodcock adds: "We had a five-star review from the client for our door quality and speed of installation which underscores the Hart ethos.

The continuing performance of Hart's existing doors on site is a great help I am sure but also our bidding process and the excellence of our engineers on site were pivotal."

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Hi-line reveals expanded line-up of class-leading desiccant air dryers

Hi-line Industries, an established and reputable UK manufacturer of high-quality compressed air purification equipment, can today offer a fully featured range of desiccant air dryers. The company's series of class-leading HPSA heatless dryers includes new standard models, the recently launched HPSA-CT (Carbon Tower) version, plus the bespoke HP-HPSA (High Pressure) model. As a result, Hi-line can fulfil the needs of any company that needs dry, clean compressed air or nitrogen, whatever the application.

The Hi-line HPSA (Heatless Pressure Swing Adsorption) series of desiccant dryers features proven technology developed and manufactured in the UK by the company's expert engineering team working to approved engineering stand-

ards. These 'plug and play' units with digital control panels come skid-mounted with their own filtration package (pre- and after-filtration). Available for next-day delivery, all standard HPSA dryers use Dri-Zorb 27 desiccant media that delivers constant low dewpoints while consuming the lowest possible quantity of regeneration air.

In order to meet ongoing industry demand, Hi-line is constantly looking to expand its portfolio, recently en-

hancing the HPSA range with two smaller capacity models. The new HPSA 70 and HPSA 100 bring the total number of standard models to 12, with flow capacity from 75 to 1130 scfm (larger heatless dryers are available if required).

Another recent introduction to the range is the HPSA-CT (Carbon Tower), a three-stage dryer with the Carbon Tower added after the adsorption dryer. Clean, dry air passes through the Carbon Tower and adsorbs gases and aer-





osols dependant on requirements and the zeolites selected. This capability makes the HPSA-CT extremely flexible and suitable for use in many specific applications.

The Hi-line HPSA-CT features pre-filtration sub-micron oil removal and safety valves as standard, as well as an after-filter for particulate removal. A total of 12 standard HPSA-CT models are available with flow capacity from 80 to 1130 scfm. Larger HPSA-CT dryers are available upon request.

Hi-line can also now offer its bespoke HP-HPSA (High Pressure) heatless dryer. This model features the same proven HPSA technology, just running at high pressure.

Control air is at 7 bar, but with elevated pressures up to 450 bar for specific applications such as P.E.T. blowing and moulding, R&D applications, breathing air/diving applications, speciality gas blending and laser cutting.

Every HPSA model in the extensive Hi-line range is a fully automatic, IP65-rated,

self-contained unit featuring HDC1 digital dewpoint controller, stainless steel pipework, independent switching valves, exhaust silencers and a one-year warranty on parts and labour. Options

include the company's AEMS - Automatic Energy Management System (with digital dewpoint readout, high-humidity alarm, and set and demand regeneration), dewpoint to -70°C, and automatic start/stop control.

Further information is available from:

Hi-line Industries Ltd,

Green Street, Burton on Trent, Staffordshire DE14 3RT

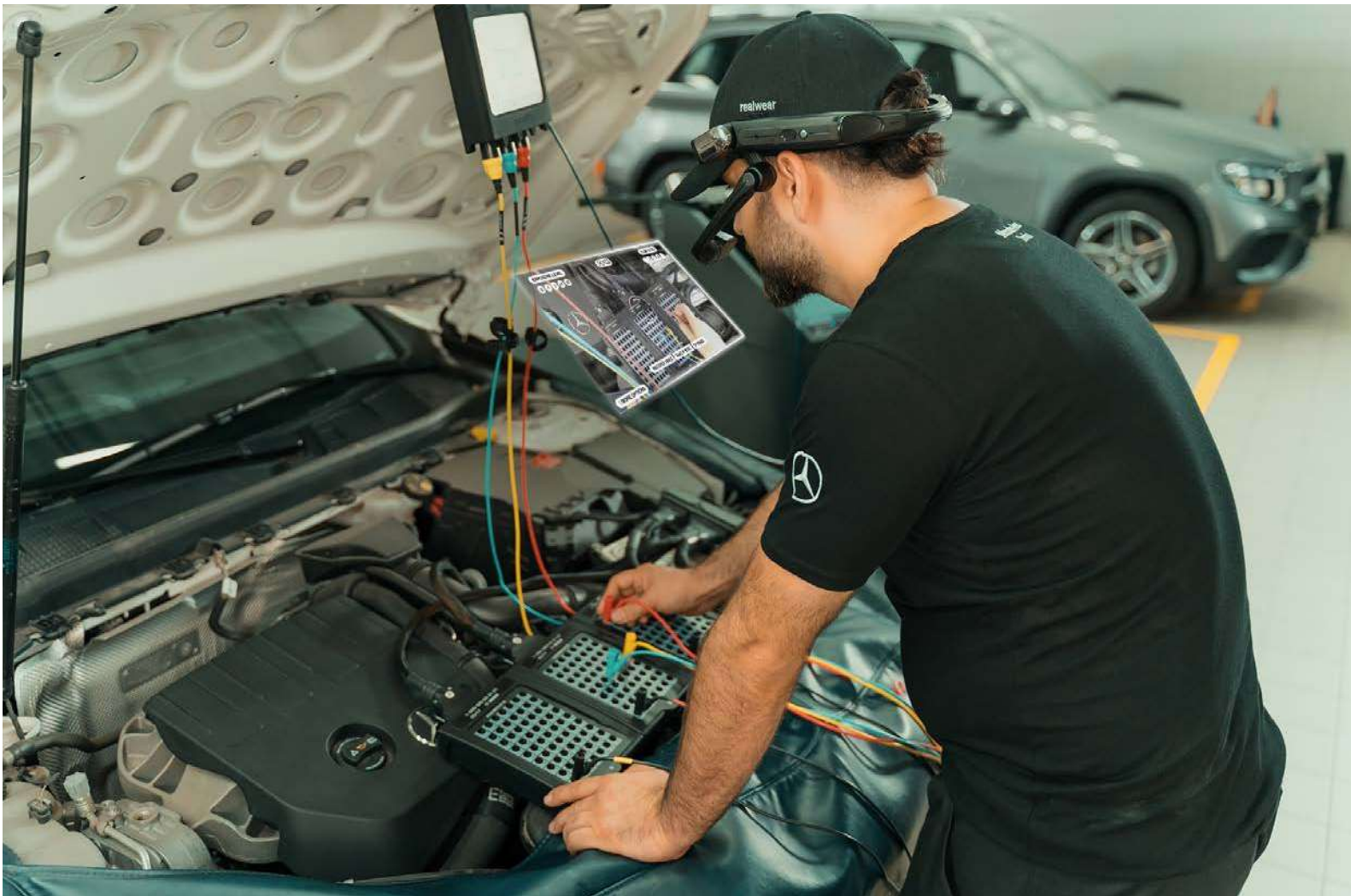
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Mercedes-Benz, Turkey Selects RealWear for Large Scale Deployment **Across All 56 Service Centres with Microsoft Teams**

Mercedes Benz Otomotiv, Turkey is expecting to benefit from an up to 80% performance increase in customer service centre technical problem resolution from the RealWear deployment, and up to an estimated \$100k in cost savings and 500 tons of carbon reduction

London, UK – 22 February 2022 – RealWear, the world's leading provider of assisted reality solutions for frontline industrial workers, today announced that Mercedes-Benz Otomotiv, based in Turkey, has selected and deployed RealWear's rugged wearable devices across all of its 56 authorised service centres.

Prior to its countrywide enterprise wear-

able deployment, the process included hundreds of in-person trips, emails, shared photos and videos and over-the-phone collaboration with subject matter experts. With more than 240,000 customer vehicles on the road and the company's commitment to high-quality service, the RealWear deployment will result in a wide-ranging positive impact from cost savings, carbon footprint

reduction to efficiency and worker empowerment.

For Mercedes-Benz, speed is everything, including a timely response and resolution to its customers. Any issues that could not be resolved required technical support staff to schedule and physically visit the dealership, costing the firm around an expected \$100k and 500 tons of carbon emissions per year.

Since initially deploying the technology, Mercedes-Benz Otomotiv anticipates a 25% jump in ROI for on-part training scenarios and up to an expected 80% performance increase in customer service centre technical problem resolution where expertise from HQ is required. Certain other processes, such as problematic warranty cases and insurance claims have also become far more efficient using RealWear's devices.

"Technologies such as RealWear and Microsoft Teams further increase the service quality and speed of Mercedes-Benz, thus positively affecting our customer satisfaction," said Celal Tuna, Technical Support Supervisor at Mercedes-Benz Otomotiv.

In Search of the Best Enterprise Wearable for Auto Workers

Mercedes-Benz's search for an enterprise wearable for its technicians began in May of 2020 but accelerated during travel-restrictions. The company wanted to safely maintain its high standard

of customer support and resolution despite this challenge. Following conversations with Tofnatech, a gold partner and authorised RealWear reseller, it conducted a four-month pilot project in several of its customer service locations. After seeing initial success, Mercedes-Benz Otomotiv quickly scaled the RealWear devices throughout Turkey. Tofnatech developed a remote training program, and all service centre staff were trained on the new process.

The RealWear HMT-1 is a rugged voice-enabled heads-up display fully optimised with noise cancellation. Those were important features when the crew was near a busy motorway or construction site. The form factor and software frees a worker's hands for the job task.

The RealWear HMT-1 provides the ability for videos and pictures to be taken by the wearer and shared with an expert in real-time, enabling Mercedes-Benz Otomotiv's customer services technical support department to conduct remote assistance to solve problems that require the additional support and technical experience of a remote team.

The rollout of HMT-1s has enabled Mercedes-Benz Otomotiv to connect experts to staff out in the field via live video calls using Microsoft Teams to settle any issues that dealers are not able to resolve. Mercedes-Benz Otomotiv's after-sales engineering/support teams can communicate with the technician with ease and can monitor the environ-

ment through the technician's field-of-view and convey real-time instructions. Commenting on the deployment, Altug Karayel,

Founder of Tofnatech stated: "With its proven performance in Mercedes-Benz pilots, the ability to use Microsoft Teams, with continuous support from Tofnatech, and the many global companies already endorsing the product, meant that a wide-scale rollout of RealWear's device was an easy decision for Mercedes-Benz Otomotiv to make."

"We're delighted to continue to support the automotive industry as they pivot to electric, leveraging our assisted reality technology," said John Arnold, Vice President of EMEA at RealWear. "Mercedes-Benz Otomotiv has reinvented the way in which it conducts vehicle repair and training in a move that highlights the digital transformation taking place in this industry."

The introduction of assisted reality technology into the automotive space is part of the wider digital transformation process that is taking place, as witnessed by the adoption of technologies such as AI and augmented reality.

With the automotive industry changing and shifting toward electric and semi-autonomous vehicles, RealWear is helping Mercedes-Benz Otomotiv stay ahead of the curve with its deployment of assisted reality wearables.

www.RealWear.com

Need to hire a hoist?

Let Hoist & Winch lift the burden

Alongside its wide portfolio of lifting and handling equipment for sale, Hoist and Winch Ltd is currently promoting its extensive know-how and experience in the hire market. The company is an expert in turnkey hire projects involving air- and electric-powered hoists, overseeing installation, commissioning, testing and certification tasks as part of a complete service package that provides genuine market differentiation.

Through its turnkey offer, Hoist & Winch expertly advises customers on the most suitable equipment for their lifting requirements, making precise arrangements to ensure safe and reliable operation. This advice is particularly important for air hoists, where the selection of a portable diesel compressor or the checking of plant air supply is necessary.

Here, requirements will include specifying the optimal operating pressure, air volume, and hose length and bore size, as well as preparing and lubricating the

air supply.

Hoist & Winch completed a notable turnkey hire project over the recent Christmas period. A customer within the building materials industry hired a special 12t swl (safe working load), twin air-powered, trolley-based air hoist for lifting and replacing a large gear weighing 9t. This type of hoist was necessary to spread the 9t load over a greater distance of the monorail beam bottom flange than a standard hoist trolley arrangement would allow.

The project was unusual in that Hoist & Winch had to first load, test and certify the monorail beam using two separate 6t swl air hoists and trolleys to support its uprating from 5t swl to the 9t load. This work was essential before the 9t gear lifts could take place for two reasons.

Firstly, the special 12t swl, twin air-powered trolley hoist was not designed for negotiating the curved monorail beam section present just after the test load pick-up point. In addition, the consultant engineer's calculations showed that the curved monorail beam section was not suitable for bearing the 11.25t proof

test load. As a result, the proof test load travelled past the curved monorail beam section separately and divided equally between the two individual 6t swl air hoists/trolleys. In a further project challenge, all hoist unit side and headroom dimensional clearances were very tight and critical.

From initial consultation and equipment specification - through installation, commissioning and testing - to issuing the LOLER report, delivering handover training and providing maintenance support for the eight-week hire period, Hoist & Winch acted as the technical partner at every stage of the project. This customer, like all of the company's customers, find that the turnkey hire service from Hoist & Winch provides assurance of a high-performance, safety-certified solution delivered on-time and on-budget.

Hoist & Winch points out that the option also exists for customers to hire stand-alone air- and electric-powered hoists for installation by their own competent personnel, if preferred.

Visit www.hoistandwinch.co.uk for further information



Key Differences Between Standard and Intrinsically Safe Torches



Intrinsically safe torches are rated and certified for use in explosive atmospheres and hazardous environments where even the slightest spark can result in an explosion. Standard torches have no consideration for limiting sparks and are extremely dangerous to use in a potentially explosive atmosphere.

Body Materials

Standard torches are generally made from a low-cost ABS (acrylonitrile butadiene styrene) plastic. In contrast, intrinsically safe torches are made from very costly materials like Polycarbonate/ABS Alloy with permanently static dissipative UV stabilized additives. These additives dissipate static electricity that can build up on the surface of the light to prevent sparks and cost twice as much as standard ABS plastic. Additionally, IS torches must possess unique design features to

contain battery leakage and venting for gases produced in the event of a battery malfunction.

Lens Materials

Standard torches are traditionally made out of transparent polycarbonate plastic. Intrinsically safe torches also use transparent polycarbonate but require an additional (and costly) special coating that dissipates static electricity.

Circuitry

Intrinsically safe torches require professional electrical engineers to design and develop circuits specifically created to meet the requirements necessary to pass the strict certification levels for an intrinsically safe rating. This is achieved by designing circuits that prevent or limit spark energy through the use of fuses, redundant circuit paths, diodes, and other components. Standard torches have an on/off switch.

Special Fasteners

Because intrinsically safe torches are rated for use in hazardous and explosive environments, they must remain sealed in and around those areas. This requires that torches not be opened to change batteries even by accident while in a hazardous environment, and thus, a special retention screw or "special fastener" is used to keep the light from being opened. A standard torch is easily opened, usually by unscrewing one end of the light.

Because of the knowledge and expense required to engineer IS-certified products, a limited number of companies can achieve this. Nightstick is a global manufacturer of over 50+ Intrinsically Safe professional, portable LED lighting products. Locate a dealer near you at

www.nightstick.com

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Visit Nightstick.com to find the safety rating you need!

SPOT & FLOOD SIMULTANEOUSLY

Hart Doors reveals its super-advanced security shutter

With a history of developing its own range of advanced industrial doors such as its Speedor high-speed doors, demand from South East Asia has led Hart Doors to develop a new version of its Typhoon security shutters range which can withstand wind speeds of circa 165mph.

"With our knowledge of the intense pressures generated by powerful storms we decided to develop the Typhoon shutter even further, urged on by our contacts in South East Asia," says Doug Hart, Chairman, Hart Door Systems.

"The result has been remarkable. For the purpose of testing we trawled Europe for

a suitable third-party testing facility and found just one that was capable and that was in south west Germany. Given the time, distance and costs that would be incurred we designed and built our own test rig.

"With a steel cage adequate for the pressures, retaining a flexible pressure vessel with a 8m wide and 2.5m high shutter for testing, we were able to sustain pressures at 5050 pascals, equivalent to the pressures generated by a Typhoon blowing at around 165mph."

Mr Hart added: "This is a remarkable achievement. We have been able to design and construct a security shutter that can withstand some of the highest wind speeds

known.

"With the so much interest in the protective qualities of our Typhoon shutters, and now the ability to withstand exceptional wind pressures, we are confident of more demand from parts of the world where storms up to severe Typhoons/Hurricanes are found."

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6X: VEGA's simple radar formula for better processes

VEGA ushers in a new era in level sensing with the radar sensor VEGAPULS6X.

With VEGAPULS 6X, VEGA radar "thinks" in a new way. The result: A new level radar sensor that can measure in virtually every conceivable application. The time when users had to choose their level instrument from a multitude of different types are now history.

Traditionally, the search for a suitable level sensor begins by thinking about things like: what solution would be best for my application, how can I ensure I choose the correct and most reliable device for a successful outcome for my project? Of course radar offers great answers for these questions.

The customer already knows their own process, the details of product properties and processing to be controlled, the temperature ranges involved, the standard needed to be met and installation fittings that are available. But, until now, choosing a radar-based level instrument was a laborious task, matching these process details to myriad radar frequencies, part numbers and options on offer.

Now the process is being completely transformed by VEGA with its new VEGAPULS 6X. One device for all and a new selection and ordering method that is customer-application focused. It enables complete, correct configuration and even pre-calibration of the specific sensor required - for any application, whether for liquids or bulk solids.

"Ultimately, it's not the sensor that counts, but what the users can achieve

with it in their individual processes," says Florian Burgert, who, as a product manager, has been closely involved in product development from the very beginning. "Just knowing that they've chosen the best possible measurement solution and that they'll reach their goal faster with it, makes a big difference in their everyday operations."

Over 1 million instruments in use worldwide. The success story of today's world market leader in radar level measurement began 30 years ago. In the meantime, VEGA's sensors have optimized millions of industrial processes. The story includes milestones such as the world's first two-wire radar instrument and the first 80-GHz radar sensor for liquids on the market, which revolutionised radar level sensor performance for customers. Behind this success are the many people who share a common passion: "At VEGA we don't do a hundred different things, we concentrate on what we do best: Radar", says product manager Jürgen Skowaisa, speaking for all of them.

All-round protection

The new VEGAPULS 6X offers the best that is technically feasible today: a self-diagnosis system that immediately detects damage or interference, that ensures significantly high availability and safety, it also has new radar-chip technology, with expanded application possibilities and simpler operation.

The radar features SIL certification, and the matter of cybersecurity has also been fully taken into account: Compli-

ance with security standard IEC 62443-4-2, which specifies the strictest requirements for secure communication and access control.

The value lies in making it easier for users to select their device and monitor their industrial processes. The ultimate purpose of VEGAPULS 6X is just that - through maximum simplification. It is one sensor that can handle virtually any application.

In the future, the customer will no longer have to worry about the technology, frequency or instrument version. Even setup and commissioning has been reduced to a minimum, requiring now just a few clicks and basic application parameters. In many cases, all application-specific settings can be made in VEGAPULS 6X before it leaves the factory, so it's just left for the user to install, connect, done: It doesn't get any simpler.

www.vega.com/radar



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New Sales Team appointments at Peli Products (UK)

Peli Products (UK) Ltd, distributor of the Peli™ brand of protective cases and professional lighting, is pleased to announce the appointment of Ross Carter to the position of Sales Manager.

Ross has previously been responsible for sales in the South-East of England and has very successfully developed this region.

He will now oversee the Peli team of 10 regional sales representatives who all offer specialist advice on the ranges of protective equipment cases and lighting products, along with the Peli Sales support team. He will play a key part in developing the company's ongoing strategy of offering full protective packaging solutions with custom engineered foam.

"Ross has been with the company for almost 7 years and during that time has been a key part of our success. He has worked tirelessly in difficult times recently and I am delighted for him and very pleased to promote him to this po-

sition," commented Sales Director David Smith.

Paul Wornham

Stepping into the Business Development role in the South-East, is Paul Wornham who joins the company with a background and vast knowledge in the industrial/utilities sectors.

Paul has settled quickly into his role and is very much looking forward to meeting with his customer base.

Sales Director David Smith said "I am delighted to welcome Paul into the Business Development team. His wealth of knowledge across all of our main customer markets is a great asset, and his vast experience in the Industrial sector aligns perfectly with the further development of this important region."

Paul can be contacted on 07784 044839 or by e-mail: paulw@peliproducs.co.uk



CHEMUK 2022 EXPO RETURNS THIS MAY!

VISITOR REGISTRATION IS NOW OPEN

The CHEMUK 2022 EXPO returns on the 11th & 12th May 2022 at the NEC in Birmingham. The event, now established as the UK's only major expo for the UK chemical industries, will showcase 350+ specialist exhibitors and 150+ expert speakers across two co-locating shows; 'The Chemical, Process & Plant Engineering Show', and 'The Chemical Industries Supply Chain Show'.

The Chemical, Process & Plant Engineering Show will feature specialist exhibitors and speakers showcasing and discussing latest innovation covering process, plant & flow technologies; control valves & actuators; thermal technologies; digitisation & automation; chemical metering & dosing, materials handling, filtration & separation... plus lots more

Industry partners supporting this show include BPMA - The British Pump Manufacturers Association, BVAA - The British Valve & Actuator Association, Process Intensification Network; CPI - Centre for Process Innovation, GAMBICA, NEPIC, TSA - Tank Storage Association and the UK Gasket & Sealing Association.

The Chemical Industries Supply Chain Show will present chemical industry supply chain organisations specialising in chemicals, raw materials & ingredients; logistics & transportation; HSE management & regulatory compliance; contract, toll & outsourcing; and business services.

Industry partners supporting the supply chain show include CBA - Chemical Business Association; Chemical Northwest & Chemical Industries Association; BASA - British Adhesives & Sealants Association, BCMPA - The Association for Contract Manufacturing, Packing, Fulfilment & Logistics; Composites UK; CATCH; British Surface Treatment Suppliers Association (BSTSA); SIA - Solvents Industry Association; and UKLA - United Kingdom Lubricants Association.

Show organiser, Ian Stone, comments: "CHEMUK is deliberately set out to be a

total industry meeting point, creating a fusion of cross-sector energies, inputs and connectivity, however we also recognise the contrasting needs of attending 'engineering & plant technical management' and the wider 'industry supply chain' focused attendees, on themes such as supply chain chemicals & ingredients, logistics & outsourcing, HSE, regulatory compliance, R&D management and more....

Separating into two complimentary yet contrasting exhibition shows can only help to get attendees locked into discussions with their primary targets quicker, as well as providing an easy 'under one giant roof' experience to take in the broader trends of the sector"

NEW FOR 2022:

- CHEMLAB Programme - Developing on last year's laboratory related content, CHEMUK 2022 will present the 'ChemLab Programme' showcasing specialist exhibitors providing laboratory solutions & services embracing research & development; testing & analysis; process design & optimisation; and QC/QA laboratory testing.

- Sustainability Stage (sponsored by Uniper) - Hosting panel sessions and feature presentations embracing critical themes such as chemical recycling and sustainable chemical processing, together with 'Green Chemistry' innovation and transition to bio-based products.

- 'CHEM 4.0' Stage (sponsored

by ABB) - Reflecting the tectonic shift towards digitized operations, CHEMUK 2022 will present a dedicated speaker programme covering Digital Adoption Strategies; Process Automation & Robotics; Big Data & Process Data Management, AI & Deep Learning, IIoT/VR, Digital-driven sustainability, and lots more.

- 'Bio- Innovation Poster Zone' - Bringing together illuminating 'poster displays' from start-ups & research groups, from across the rapidly evolving 'biochemical/industrial biotech' landscape. Supporters of the zone include BioVale, BioRenewables Development Centre, BioYorkshire, IBioIc and the Cosmetics Cluster

- Royal Society of Chemistry Member's Event - The RSC will be heavily involved in the show once again this May. We are delighted to announce that the RSC President-Elect, Professor Gill Reid, has been confirmed to keynote on Wednesday. The RSC will also be hosting a member's drink reception on Networking Area 2 at 17:00 on 11th May.

DATES FOR THE DIARY

CHEMUK 2022 takes place on Wed 11th & Thu 12th May 2022

Venue: NEC - National Exhibition Centre, Birmingham, B40 1NT

CHEMUK 2022 Opening Times:

Day 1: 9.30am - 5.00pm

Day 2: 9.30am - 4.00pm

Register for your FREE entry badge at

www.chemicalukexpo.com





Don't Fall For It!

IPAF launches targeted safety campaign

IPAF Summit hears falls from the platform will be focus of 2022 safety campaign

A campaign emphasising the importance of working safely to avoid falls from the platform when using Mobile Elevating Work Platforms (MEWPs) to enable temporary work at height has been launched by the International Powered Access Federation (IPAF) at its annual Summit in London, UK, on 10 March 2022.

IPAF's Don't Fall For It! safety campaign outlines the possible underlying causes of falls from the platform when using MEWPs, which almost always lead to serious injury or death. It offers operators and managers key advice to mitigate the most common risks and avoid accidents of this type, as identified in IPAF's ongoing incident reporting and analysis via the www.ipafaccidentreporting.org

portal.

Peter Douglas, CEO & MD of IPAF, comments: "MEWPs are designed to safely conduct temporary work at height in just about every environment, but every year the most common type of accident we see reported are falls from the platform, which as you can imagine nearly always lead to serious injury or death if they occur while using machines at height.

"We are determined that our new Don't Fall For It! targeted global safety campaign will help to instil safe working practices and remind operators and managers of some fairly basic positive steps they can take to reduce the risk of such incidents occurring. The messaging is really simple – select the correct machine for the job, don't take risks, don't cut corners, and wear the correct

personal fall protection equipment in boom-type platforms."

Brian Parker, IPAF's Head of Safety & Technical, says: "Operators can help avoid this type of accident by focusing on the principles we've set out as part of this campaign. If they are properly trained and familiarised on the MEWPs being used, then hopefully none of this guidance should be new, but we know that complacency breeds contempt, and that too often corners are being cut or fundamental principles of safe use ignored.

"With this safety campaign, IPAF is saying that, if you find yourself tempted to do something different to what you know is the right and proper way to work, or if you are ever asked to do something that you think just isn't safe by a work colleague or supervisor, then

'don't fall for it!' Far better to think twice and save a life – whether it is a work-mate's or your own!"

Key points of guidance in the IPAF Don't Fall For It! global safety campaign include:

- Plan thoroughly – conduct a proper MEWP site survey/assessment, select the correct machine for the work and use professionally trained operator(s) and supervisor(s).
- Know your machine – operators should be trained on the machine type they are using and familiarised on the specific model. Operators should assess that the machine is suitable for the task and conditions, and adequate in terms of reach, articulation, and load-bearing capacity. Machine knowledge includes whether personal fall protection equipment (PFPE) should be used and, if so, what type to use, and how to attach it.
- Clip on – If personal PFPE is required, all occupants of the platform must attach their lanyard to the correct anchor point. Ensure movement within the platform is possible while attached, and do not move the machine or elevate the platform until and unless all occupants are attached.
- Set up and manoeuvre the machine/platform effectively – occupants should never need to over-reach, unfasten PFPE, step or climb on guardrails or otherwise extend the safe working envelope of the platform. Ensure vertical MEWPs are positioned and repositioned as necessary to allow easy access to the

area of work to be undertaken; operators should not overreach or stand on guardrails to access a work area instead of taking the time and effort to correctly reposition the machine.

- Stay inside the platform/attached – the guardrails of the platform form the primary fall prevention and define the operational envelope of the machine being used. Always stay inside the platform. Where there is a requirement for PFPE, you must wear it. Do not exit the platform at height; unclip/exit only on completion of work when safely lowered to the ground.

IPAF offers further guidance on using MEWPs that provides more detail on specific risks and advises on safe operating procedures. For more information on all of IPAF's safety campaigns and links to relevant technical guidance visit www.ipaf.org/safe or see www.ipaf.org/contact to find your nearest IPAF office or representative.

Please visit www.ipaf.org/training and www.ipaf.org/resources for the full range of IPAF training course and the latest safety and technical guidance materials from IPAF.



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DON'T FALL FOR IT!

SAFETY STARTS WITH YOU

Since IPAF began analysing accident data in 2012, falls from the platform have been the most common cause of injury and death when using mobile elevating work platforms (MEWPs).

From 2012 to 2022, there were 239 reports of falls from the platform in 20 countries, resulting in 132 deaths.

IPAF's *Don't Fall For It!* safety campaign identifies key causes of falls from the platform, and provides advice about how to avoid associated hazards.





www.ipaf.org/safe



Contactless switch with customized color settings

Contactless, highly precise and now also individually color-customizable: The new SCHURTER TTS RGB extends the technical finesse of the TTS switch introduced last year with the popular RGB functionality.

The TTS family is getting a new member in the form of a color-

customizable variant, called: TTS RGB. All TTS switches use the highly precise Time-of-Flight (ToF) technology. Light is emitted by a transmitter and reflected by one or more objects. The reflected light beams are then detected and the distance is determined from the time of flight.

Colorful ring illumination

In addition to the pre-programmed bicolor switches, which are available in "Momentary" and "Latching" versions,

the new RGB variant makes things much more colorful. Depending on the wiring, the customer can easily set the ring illumination color as desired.

High reliability

By default, the detection distance is programmed for 20 to 60 mm. This ensures that wiping/cleaning the switch surface will not trigger a signal. An advantage of ToF technology is that this sensor technology has no problems in differentiating dark from light surfaces. White or black objects: this has no effect on detection quality or speed.

Since the TTS has no moving parts, its service life is more than 20 million switching cycles. Thanks to its high IP protection class and the ability to "detect" rain, this switch is also ideally suited for outdoor use.

Application areas

The contactless switches of the TTS RGB family are extremely multifunctional. They can be used wherever contact should be avoided to the greatest possible extent. Examples would be doors, garbage cans, parking systems or sanitary areas.

Unique Selling Proposition

- Contactless switch with optical feedback
- Individual, customized color settings
- For applications in public areas (no smear infections)
- High precision detection

Internet

<https://www.schurter.com/datasheet/TTS>



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Explosion isolation – a must in every safety concept

Explosion isolation is absolutely essential for comprehensive explosion protection.

Without isolation, an explosion safety concept is not only incomplete, but is also a waste of money for operators as:

In almost every production facility, individual plant components are interconnected by means of pipelines.

The purpose of explosion isolation is to seal these pipelines in the event of an explosion to prevent the propagation of pressure and flames, thereby protecting the adjacent plant components.

Precompression and flame jet ignition increase the severity of the explosion in the connected vessels. This leads to secondary explosions that can cause even more catastrophic damage.

Isolation systems prevent an explosion from propagating, thereby reducing the

effects of the explosion to a minimum. Adjacent system components are optimally protected.

A distinction is made between active and passive isolation systems:

Active systems use sensors or detectors to detect an explosion as it occurs by registering the rising pressure or flames as they form and activate the associated isolation device, e.g. a quench valve.

Due to their structural design, passive isolation systems react purely mechanically to a propagation or loss of pressure. The latter also applies to explosion isolation flap valve.

They are kept open during normal mode by means of the currents present in the pipeline. In the event of an explosion, the valve closes due to the propagating pressure front, effectively preventing the further propagation of pressure and flames.

Explosion isolation using quench valves: EXKOP system

The EXKOP system offers safe, economical and simple isolation of explosions, sparks and flames. By closing within milliseconds, quench valves protect interconnected system parts. In the event of an explosion, the EXKOP control system receives a trigger signal.



Fig. 1: Quench valves open and closed

Explosion Protection

The entire system is fail-safe thanks to an integrated pressure accumulator and a self-monitoring control system.

After triggering, the quench valves are ready for use again at the touch of a button. Plant downtimes can thus be reduced to a minimum. The compact design from DN 80 to DN 600 enables flexible integration into your production process.

Explosion isolation due to slide valves

The slide valves RSV and REDEX Slide enable silos, mills and extraction systems to be safely isolated and are also available for challenging CIP, dust or gas applications. Both slide valves are suitable for abrasive media.

Explosions are reliably detected by pressure and/or infrared detectors installed in the plants to be protected and a signal is sent to the slide valve.

This activates one or more gas generators, which close the slide valves. Flames and pressure waves are thus unable to propagate.

Explosion isolation flap valve Q-Flap RX - Isolation of raw gas lines to filters and dust collectors

The explosion isolation flap valve Q-Flap RX is offered in three different designs.

The nominal widths from DN 140 to DN 710 have an inspection flap, while the

largest nominal widths (up to DN 1000) have a modular structure to make maintenance as easy as possible.

The Q-Flap RX is suitable, among other things, for the aspiration lines of filtering dust collectors and the suction lines of mills.



Fig. 2: Explosion isolation flap valve Q-Flap RX

Alongside the stated features, the non-return valve Q-Flap RX allows for high K_{st} values, flexible installation distances and the highest strengths.

Explosion Isolation with chemical barriers



Fig3 : Explosion isolation system Q-Bic

The explosion isolation system Q-Bic registers the emerging explosion and extinguishes the developing explosion flames within milliseconds by applying the extinguishing powder.

The extinguishing powder is optimally distributed in the pipeline via a nozzle

system and guarantees reliable isolation. The chemical barrier is particularly well-suited to applications in elevators and spray dryers.

Conclusion

Explosion isolation systems form part of the measures for explosion protection and are a must in every safety concept for process engineering plants such as silos, mills, filters and conveyors.

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Ashtead launches intrinsically safe dust monitor



Ashtead Technology has added TSI's latest personal aerosol monitor, the SidePak™ AM520i to its fleet of instruments available for both rental and sale. "This is a major addition to our equipment portfolio," comments Senior Sales Manager Josh Thomas. "Many workplaces include areas that contain or produce explosive or potentially explosive atmospheres, and a high proportion of these zones contain risks associated with particulates. So, an intrinsically safe monitor is required to test these areas, and the launch of the TSI AM520i makes that possible with a lightweight instrument that is ideal for personal monitoring."

Potentially explosive atmospheres exist in locations where work activities create or release flammable gases or vapours, such as petrochemicals, VOCs from paint spraying, or in workplaces handling fine organic dusts such as grain flour or wood. Applications for this new intrinsically safe personal dust monitor therefore include a wide variety of workplaces within the oil and gas, petrochemical, manufacturing, processing, aerospace, and bulk material handling sectors, as well as those with confined

spaces such as mining and wastewater.

Employers are responsible for the classification into zones of areas where hazardous explosive atmospheres may occur. Each zone's classification and its size and location, depend on the likelihood of an explosive atmosphere occurring and its persistence. Schedule 2 of the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) contains descriptions of the various classifications of zones for gases and vapours and for dusts.

DSEAR requires employers to eliminate or control the risks from dangerous substances, so monitoring is essential in ATEX zones, and the AM520i is certified for dust measurements in Zone 0. ATEX is the name commonly applied to the two EU Directives for controlling explosive atmospheres; the 'ATEX Workplace Directive' and the 'ATEX Equipment Directive' which necessitates the use of intrinsically safe monitoring equipment for example.

The SidePak™ Personal Aerosol Monitor AM520i is a small, single-channel, battery-operated instrument that provides real-time aerosol mass concentration readings of dusts, fumes, mists, smoke and fog within a worker's breathing zone. Typically, the monitor is fitted to

the wearer's belt, or left in a location of concern. Alternatively, it can be used as a portable monitor providing real-time readings in survey mode.

With a built-in pump and internal data-logger, the instrument can provide continuous measurements, which provide extremely useful temporal information in comparison with gravimetric methods.

Operators are able to select from a choice of inlet conditioners providing size fraction cut points for PM10, PM4 (Respirable), PM5 (China Respirable), PM2.5, PM1 and 0.8 µm Diesel Particulate Matter (DPM).

Summarising, Josh says: "The non-intrinsically safe version of this instrument has been hugely popular for many years, so the technology is well proven, and the launch of this new EX version will mean that anybody with a potential requirement for monitoring in explosive atmospheres, can rent or purchase an instrument that can operate in all areas.

"We are also a TSI Gold Partner, so customers can be assured that we have the resources to ensure that TSI equipment is supplied and maintained in perfect condition."

Protecting flour mills against explosions

~ How electrical connectors minimise the risk of a flour explosion ~

The flour milling industry plays a vital role in feeding the population but it hides an often-underestimated danger. Flour explosions are a risk to flour mills and can lead to the destruction of property and serious harm or death for workers. Here Isaac Noble, product manager at electrical connector specialist PEI-Genesis, discusses the hazards in flour mills and how connectors can be used to minimise the risk of explosion.

Flour explosions are typically caused by the build-up of flour particulates over time. The danger lies when

airborne flour dust comes into contact with a spark from an ignition source, such as a faulty wiring circuit, which ignites the flour in the air. Flour is also 35 times more combustible than coal-dust. It's mostly made of starch, a highly flammable complex carbohydrate that consists of glucose molecules. Only one to two grams of dust per cubic foot of air makes the mixture ignitable.

How can electrical connectors minimise flour explosions?

Preventative maintenance and consistent cleanliness are crucial to stopping dust build-up but plant

operators can also take other measures to avoid incidents. Electrical connectors can minimise dust explosions by ensuring there won't be any sparks coming from the connector to ignite the dust.

Having a controlled and protected area where the wires go into the connector, or where the contacts mate, can reduce the chance of a spark. Connectors also need to be ingress protected to keep dust out of the connector.

Though the materials used to make the connector are important, it's the way it is designed to seal and protect the electrical elements that is critical in minimising the risk of dust explosions.

Potting around the cable wires where they connect with the contacts, for example, can remove the risk of a spark

in this area. This can be done inside an equipment enclosure or within a gland on a cable connector.

Understanding ATEX regulations

In Europe, hazardous areas must follow ATEX regulations to ensure specific equipment reduces the risks associated with explosive atmospheres. ATEX certification dictates how and where equipment can be used and this is clearly labelled on equipment needed in these areas.

ATEX approved connectors, like the Star-line EX and Amphe-EX, are both ATEX certified for Zone 21 hazardous dust environments with an EX tb IIIC rating.

Their manufacturing process and rigorous auditing occur in closely

Explosion Protection

controlled conditions and any design changes are also retested and recertified to ensure they are properly approved.

Plant operators should buy connectors from a reputable source that is correctly approved and tested by a recognised ATEX regulator. The traceability of connectors also needs to be maintained for audit. PEI-Genesis sells all EX-style connectors with an ATEX tag that lists information such as where the connector has been manufactured and what temperature it can be used at along with other compliances.

It's important to note that ATEX approval

cannot be achieved using two connectors from different manufacturers, even if they are both ATEX approved. ATEX approval is based on a mating pair from the same manufacturer, there is a specific flame path that is designed into the connectors which goes through the mating section. Failure to use the same manufacturer will cause a plant operator to run into problems with audit.

PEI-Genesis is committed to ensuring all information is available to its customers through the ATEX tag.

This way customers know who assembled each connector and who manufactured the parts for the

connector, the information is also linked into their system to create a clear audit trail. Though highly explosive, flour is necessary in feeding the population. Choosing the correct electrical connector is one way to reduce the likelihood of an explosion. To find out more about the range of rigorously tested, suitable electrical connectors for ATEX environments, visit the PEI-Genesis [website: **https://www.peigenesis.com/en/connectors/by-series-type/atex-connectors.html?utm_source=Stone+Junction&utm_medium=Blog+post&utm_campaign=PEI043**](https://www.peigenesis.com/en/connectors/by-series-type/atex-connectors.html?utm_source=Stone+Junction&utm_medium=Blog+post&utm_campaign=PEI043)



Online Hazardous Area training courses from Blayds.

Blayds Group are pleased to announce the recent launch of their CPD approved online learning portal, making Hazardous Area learning accessible and affordable for everyone.

There are currently 2 courses on offer: Hazardous Area Basics & Hazardous Area cable Gland Installation and Inspection.

Hazardous Area Basics: This is the ideal course for those just entering into the world of Hazardous Areas. The aim of the course is to provide learners with knowledge and understanding of the basic terminology & main protection concepts used in potentially explosive atmospheres.

Upon completion of the course, learners will:

- Understand area classification basics & the importance of zones
- Understand the basic protection concepts
- Understand the main hazardous area terminology
- Understand ingress protection IP codes
- Understand Temperature ratings & equipment groups

• Understand current ATEX & IECEx directives

Hazardous Area Cable Glands: this course covers the termination of cables via certified cable glands in Hazardous areas. This will explain how the various components of a cable gland are designed to maintain the protection concepts of Exe and Exd protection.

Upon completion of the course, learners will:

- Understand the basic protection concepts relating to cable glands

- Understand the basic hazardous area terminology
- Understand cable gland construction, materials & selection
- Understand the requirements of installation & inspection
- Recognise errors in gland termination

Both courses are CPD (Continuing Professional Development) approved and are delivered online, meaning they are self-paced & can be fit around existing commitments. Prices start at just £69.99. To learn more visit

www.blayds.com/learning

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Ex

What you need for EX & UKCA

Explosive Atmosphere Certification for the UK and EU Markets

Selling products for use in potentially explosive atmospheres in both the UK and EU will now require 2 marks, not just the 'ATEX' and 'CE' mark that was accepted when the UK was part of the EU. If your product previously required, an 'ATEX Notified Body' you will need to now use a UK Government UKCA Appointed Body that has explosive atmosphere certification ('Ex') on its scope.



ATEX Notified Body

ExVeritas ApS is a Notified Body, Number 2804, with full scope for (ATEX) 2014/34/EU Equipment and protective systems intended for use in potentially explosive atmospheres.

Notification can be verified online at the European Commission. ExVeritas ApS are accredited by the National Accreditation Body of Denmark (DANAK) against the EU ATEX Directive, Registration Number 7044.



UK Government UKCA Appointed Body for 'Ex'

ExVeritas UKCA Approved Body Number

2585. The Approved Body listing can be viewed on the UK Government Website and ExVeritas hold UKAS Product Certification, Quality System Certification & Test Laboratory Registration Number 8613.

As ExVeritas are also an IECEx Certifi-

cation Body and Test laboratory, we can conduct 1 project (and one manufacturing audit) and you will get all 3 Certificates (ATEX, UKCA and IECEx) for the widest possible market access.

Quality Audit Requirements

If you previously needed an ATEX QAN you will now also need a UKCA Ex QAN, although it is based on the same audit Standard, there are differences for the UKCA Mark (such as use of UK Designated Standards). Companies such as ExVeritas can conduct just one audit to issue a UK QAN, an ATEX QAN and an IECEx QAR. In addition, we are a UKAS Certification Body for ISO9001 we can also combine that audit to further reduce cost and audit times.

For more information visit www.exveritas.com or email info@exveritas.com



Why use ExVeritas for 'Ex' Certification?

The clue is in the name! ExVeritas are a company that specialises in Explosive Atmospheres, that is why are the best at what we do.

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- IECEx Test Certification Body
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- UKAS ISO9001, UK QAN, ATEX QAN and IECEx QAR
- CompEx Certification Centres Globally

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A 3D rendered image of two workers in a hazardous area. The worker in the foreground is a woman with dark hair, wearing a yellow hard hat with a name tag that reads 'EMMA BREIREM', safety glasses, and large blue earplugs. She is holding a rugged black tablet with both hands. The worker in the background is a man with a white hard hat, safety glasses, and large black earplugs, wearing a yellow high-visibility vest. The background is a blurred industrial setting. The entire image is framed by a large orange semi-circle at the bottom.

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INSTRUMENTS

HACADS Release

Version 1.0

HACADS is an analytical engineering solution software specialized in calculating, simulating, designing, analyzing, optimizing, and automating hazardous area classification studies and systems to eliminate most of the current hazardous area classification issues. It is an integrated platform and the most comprehensive package of corporate solutions.

Alberta, Calgary. – Feb 29, 2021 - HACADS®, the leading provider of intelligent, model-driven hazardous area classification analysis and design solutions, announces the release of HACADS 1.0.

HACADS 1.0 is innovative with advanced functionalities that accelerate compliance & safety studies, improve process safety and loss prevention engineering & design, and reduce project delivery schedules through collaboration.

To increase productivity, and efficiency, organizations across all industries must create an environment that allows engineers, operators, and managers to collaborate, communicate, and design with confidence, as well as industry standards and measurement methods.

HACADS continues to invest in research and development hours for development, expanding on its advanced process safety and loss prevention design & operation solutions with verified & validated engineering and libraries.

HACADS multi-standard solutions help engineering teams design new hazardous area classification systems, maintain business continuity and increase

productivity with interdisciplinary knowledge sharing.

HACADS version 1.0 supports customers with technology and best practices to design and operate hazardous area classification systems in a Safe, Reliable, Efficient and Maintain Compliance.

Highlighted Features & Capabilities

HACADS Software Features

SORS® - Interactive Source of Release Schedule module which includes a class designation, zone designation/zone extensions, zone optimization, equipment management system, document management systems, and technical notes, and more

FMCCA® - Flammable Mixture Composition Calculations and Analysis UFL, LFL, AIT, flammability, gas group, and liquid class by the NFPA 497. Integrated with an interactive component library, stream merge system, and auto-generated technical notes

Auto Ignition Temperature (AIT) - Instantly identify AIT with methods.

FE (Fugitive Emission) - Fugitive Emission estimate per EPA, API RP 505, API RP 500, and EC 60079-CEI 31-35 IEC 60079-10 - Calculates ventilation, zone designation, and zone extension for indoor/outdoor areas CEI 31-35 - Calculation of zone designation, zone extension indoor/outdoor areas in various streams

IGEM/SR/25 - Calculates ventilation and zoning distances for natural gas facilities (Appendix 7 only) for areas API RP 505 - Calculates ventilation, zone designation, zone extension, point source, and figure selection for areas API RP 500 - Calculates ventilation, division designation, div extension, point source, and figure selection for areas NFPA 497 - Studies Smart figure selection for Hazardous area classification designation and zone extension by the matrix diagram

STAND-ALONE APPLICATIONS

Auto-Build - Smart build SORS from equipment and process stream
EPA - Fugitive emission estimation tool per EPA
DM - Document Management system
QV - Quick View
And more...

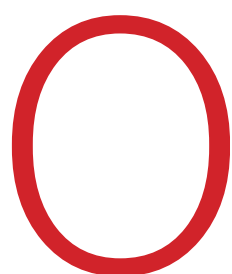
Learn more about all new features & capabilities at HACADS.com

HACADS 1.0 is available for new customers and current users should contact sales@HACADS.com.





Low Shear Atex Pumps for Produced Water Improve Oily Water Separator Efficiency



Onshore 15000 barrels per day.

production of

Oil and Gas is used for the extraction of Oil and Gas

To achieve maximum recovery of oil from wells, water is injected into underground wells, flooding the area, and as oil is less dense than the water, oil is brought to the surface and recovered using Oily water separators.

The water used to undertake this process

is known as produced water, where after recovery it is recycled and reinjected back into wells. Often Saline or Brackish in nature, it can contain dissolved solids, silt and other particles present within a wells environment.

An Oil Extraction company contacted us who were looking for two pumps for their processing facility, to feed an

from reserves deep below ground. Responsible for approximately 2% of total UK supply, it is still a vital source of Oil, producing approximately 14000-

Oily Water Separator, as well as inject produced water into a well.

They required a flow ranging from 50 to 200 Litres a minute with a constant pressure of 8 bar. They were unsure of the best technology to handle the emulsion, as viscosity could vary, solids were present and the pumps needed to be certified to ATEX Zone1 where gas was present.

Initially, when discussing their requirements, they were interested in utilising a high pressure Centrifugal pump, however on review of the project requirements, we felt another solution would not only achieve their desired flow and pressure requirements but also improve efficiency of their Oily Water Separators.

Improving Efficiency of Oily Water Separators

Oily Water Separators separate water and oil firstly by pumping the fluid through filters to capture droplets, but also by using the liquids natural characteristics -its specific gravity to separate oil, with oil rising above the water and sludge settling at the bottom of tanks.

As oil and water do not mix, when it is pumped it forms an emulsion. If this mixture is pumped with high amounts of shear - produced by some pump types such as centrifugal, the droplets can split forming multiple smaller droplets

making separation more difficult.

The efficiency of Oily water separators is improved by utilising progressing cavity pumps, as its design affects oil particles the least due to its low shear movement, meaning separation equipment captures a greater amount of undamaged oil droplets.

Progressing Cavity pumps were rated by the SPE (Society of Petroleum Engineers) in Paper SPE18204 as the preferred pump to use for oil droplets which were found to be disturbed the least during handling against a comparison of lobe, vane and screw technology.



Source: SPE (Society of Petroleum Engineers) Paper SPE18204

Progressing cavity pumps were chosen as the ideal technology for this project as not only do they handle the oil droplets gently but they produce a constant volume of flow at varying pressures, are affected very little by changes in viscosity and can handle solids without issue.

This is important due to the changing nature of the application.

When oil is extracted, initially the produced water content of a well will be kept as low as possible to reduce the

amount of oily water treatment required, with volumes increasing as it becomes inevitable due to the lowering level of oil within a well as it is extracted. The amount of water present within a well is often referred to as oily water cut.

What is oily water cut?

Oily water cut is the amount of water produced in a well compared to the amount of oil or solids present which is often expressed as a percentage, with a 30% water cut meaning 30% of the extracted volume contains 30% water.

We specified and supplied two Horizontal Progressing Cavity pumps perfect for the low shear transfer of Oil / Water Mix, capable of a flow range of 50-200 L/min with a performance and hydrostatic test to 18 bar.

Due to the presence of solids the Stainless-Steel Rotor was hard chrome plated to protect it from abrasion, prolonging its lifespan.

The units were fitted with PT100 Dry run protection sensors, to ensure pumps could not be ran dry, and IP65 ATEX variable speed motors due to the sites exposed location.

If you have an ATEX application and are unsure of the correct solution, contact North Ridge Pumps on 01773 302 660 or visit www.northridgepumps.com to see how we can help.



Maintaining a productive and safe working environment through effective fume extraction

Fume and dust are the enemy of process-based operations. Poor workplace practices, particularly where hazardous materials are being worked, not only present a health risk to employees, they can also significantly impact productivity through downtime and create unnecessary cost for businesses. In the UK, exposure levels to potentially harmful airborne contaminants are tightly mandated through the COSHH (Control of Substances Hazardous to Health) regulations and expressed as workplace exposure limits (WELs). These limits are presented in the Health & Safety Executive's EH40 guidance as time weighted averages for either 15 minutes or 8 hours, in both ppm (parts per million) or mg/m³ (milligrams per m³).

"Employers are under a legal obligation to assess the risk to health created by

work involving hazardous substances, taking account of any relevant WELs," says Joshua Evans, an applications engineer at BOFA International, a global leader in portable fume extraction.

"Potentially harmful airborne contaminants can result from numerous industrial processes, including laser and ink jet coding onto food and pharmaceuticals packaging, soldering, welding, laser cutting and engraving, spraying, and hand and mechanised grinding.

"Health risks are also associated with plastic processing and solvents, which can give off Volatile Organic Compounds. PVC is worth a special mention in this context since it releases hydrogen chloride and small amounts of phosgene when lasered or thermally processed, both of which are very harmful."

The key decision for health and safety managers is to evaluate the most effective means of capturing these potentially harmful emissions and filtering them appropriately, both to ensure operator safety and to contribute to a more efficient production environment.

Typically, these options include captor hoods, which use a capture velocity across the source of the emissions; receptor hoods, which use the movement of particles / vapour towards the device to capture them; partial enclosures, which extract contaminants typically for hand grinding and finishing; and full enclosures matched to the needs of automated processes such as laser coding or PCB manufacture.

"There are also challenges that go beyond capture," says Joshua Evans. "For example, extraction systems linked to

thermal processes need to mitigate any potential fire risks. This is particularly important where a combustible dust has the potential to be drawn into the filtration system."

Under these circumstances, managers should specify a system benefiting from fire-resistant materials for casings and filters and thermal cut-out protection. In the case of BOFA, the company has developed sophisticated Spark Arrestor and FireBOX technology to mitigate the risk of burning particulate entering the fume and dust extraction system.

Filtration technology is also advancing, for example through BOFA's patented DeepPleat Duo pre-filtration, which uses reverse airflow to reduce the velocity of contaminant as it enters the filter chamber. This means that larger particulates fall into the steel drop-out chamber, while smaller particles are drawn into the filtration media. The very smallest particulate passes into the main High Efficiency Particulate Air (HEPA) filter, while vapours and gases are removed via a layer of activated carbon. Once this process is completed, clean air is returned into the workplace.

The other key determinant for optimal productivity is extraction system control. BOFA's Intelligent Operating (iQ) system provides independent filter status monitoring to determine filter replacement in the most timely manner, thereby reducing the risk of downtime. Concludes Joshua Evans: "In short, better information means better extraction performance and the avoidance of unnecessary downtime - and a safe breathing environment for operatives."

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Environmental Hazard Monitoring Expert Casella Announces **2022 Webinar Series on Noise, Air Sampling and Vibration**

Global occupational health and workplace hazard monitoring expert Casella has announced its schedule of industry-leading webinars for 2022.

The schedule of free-to-attend, accessible webinars cover Casella's areas of core knowledge, including workplace monitoring for noise, dust, gas and vapour hazards, as well as instrumentation usage and best practice.

To reach worldwide attendees, two sessions will be run on each date, with one taking place at 10am and a later session at 3pm to ensure learners across multiple time zones can benefit. Each webinar will conclude with a Q&A session to recap.

The webinar schedule is set to run as follows:

13th April - Introduction to Noise at Work
This session will cover the different international workplace noise regulations, offering guidance on employer responsibilities and exploring ways that the use of noise dosimeters and sound level meters can support compliance.

18th May - Introduction to Asbestos Sampling

This session will provide a quick insight into the international use of asbestos, both now and historically, its associated health risks and how to perform air sampling for asbestos. Attendees will be guided through the equipment and accessories needed with best practice advice on how to set up equipment.

8th June - Setting up Air Sampling

Pumps

Setting up air sampling pumps and their associated items is paramount to ensuring accurate exposure data. This webinar covers selecting the correct pump, setting up a 'sample train' and ensuring accurate flow, as well as best practice to ensure good quality data.

6th July - Introduction to HAV Monitoring

Hand Arm Vibration Syndrome (HAVS) is a serious condition that can be prevented with the correct control of exposure. This webinar reviews the terminology around HAV measurement, legislation and exposure limits, as well as how to measure exposure on tools correctly and subsequently calculate exposure levels.

24th August - Environmental Boundary Monitoring in Construction: Best Practice

Boundary monitors can measure dust, noise, ground vibration and wind parameters. Acquiring accurate measurements from these units is essential for reporting quality data and preventing environmental complaints. This session will cover the correct siting and installation of monitoring units to ensure compliance with guidance and legislation. In addition, attendees will gain a best practice understanding of sensor operation and maintenance.

14th September - Introduction to Dust Sampling

This webinar will guide attendees through different facets of dust monitoring using air sampling pumps, including types of dust to measure and the selection of equipment, such as sampling heads or filters. Additionally, the webinar will cover how to calculate airborne concentration and exposure.

19th October - Use of SLM's and Noise Dosimeters

This session will guide attendees through the applications and uses of noise dosimeters and sound level meters, and the pros and cons of each. This webinar will also provide a best practice guide to getting the most from noise monitoring equipment and cover the critical do's and don'ts of instrumentation.

24th November - Introduction to Sampling Gases and Vapours

Personal sampling of vapours and gases requires knowledge to select the correct sampling media and the right accessories and flow rates. This webinar covers sources of information, how to set up a 'sample train', and how to select the correct air-sampling pump and equipment calibration.

To sign up for any of these webinars, free of charge, please visit;

UK & International - <https://www.casellasolutions.com/uk/en/support/training/casella-webinars.html>

US - <https://www.casellasolutions.com/us/en/support/casella-webinars.html>

To find out more about Casella's industry-leading range of monitoring solutions, please visit www.casellasolutions.com





WELTEC BIOPower

Commissions Fourth Biogas Plant in Japan

Biological Service Ensures High Gas Yield of Waste Plant

A biogas plant of WELTEC BIOPower recently went live in Saitama Prefecture, 40 km north of Tokyo. The facility – which is equipped with a 450-kW cogeneration power plant – is the fourth project to be rolled out by the German manufacturer in Japan. In terms of substrates, the

operator makes use of organic leftovers from the vicinity. Since the raw material mix varies, WELTEC ensures a steady biogas output with its biological service. This special service of the biogas specialist also comprises another plant of the same customer.

Even after the reactor accident in Fukushima back in 2011, Japan continues to use nuclear power. However,

renewable energies are consistently expanded and already account for a fifth of the power generated. Above all, leftovers are the preferred substrates in Japan. The biogas plant in Saitama, too, digests some 12,000 t of organic waste into energy.

The substrate mix consists of organic waste and cattle manure from a nearby farm that belongs to the operator. The

largely liquid organics are introduced to the digester by means of a central pump. Solid feedstocks are transported by a dosing feeder with a capacity of 27 m³.

To ensure efficient digestion of this mixture, WELTEC BIOPOWER has set up a stainless-steel digester with a capacity of 2,823 m³. Its diameter measures 25.34 m, and its height is 6.3 m. The upstream substrate storage tank, which is made of stainless steel, has a capacity of 336 m³, a diameter of 9.31 m and a height of 5.03 m. The 525-m³ digestate storage tank (diameter 11.64 m, height 5.03 m), too, is made of high-quality stainless steel.

Finally, the digestate is separated and the solid phase is dried with special technology in order to further reduce the

volume. Most of this residue is used as compost, and some of it as fertiliser. „The Japanese appreciate the custom plant design and the benefits of our modular approach, especially because the plant structure with stainless-steel modules facilitates the consideration of the special risks in areas that experience a lot of seismic activity“, explains Vladimir Bogatov, who is responsible for sales. All in all, WELTEC BIOPOWER has provided the customer with an all-inclusive package in „made in Germany“ quality along with individual after-sales service.

Subsequently, the Japanese operator also entrusted WELTEC with the biological supervision of its other

biogas plant, which had been set up by a different provider in 2017. As this plant's yield was above average, the biology experts of WELTEC had the substrate mix of the old plant carefully analysed by a Japanese lab. Based on the results, the raw material mix and the retention time have been optimised. Due to the constantly changing composition of the waste, WELTEC will continue to supervise the two plants biologically in order to maximise the gas yield.

Further information on the energetic utilisation and use of all types of organic waste and wastewater will be available from May, 30th to June, 3rd 2022 at the IFAT in Munich (Germany), hall A4, stand 217. The specialists of WELTEC are looking forward to meeting you!

<https://www.weltec-biopower.de>





PRESS RELEASE

SBES Space-Bit, the Social Distancing Wrist Band



Introducing the SBES Space-Bit, the wristband which alerts and traces if workers get in each other's safe-space.

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