EMS
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There Are Conditions!

In this issue, we aim at examining some of the latest tools, techniques and case studies used in the World of predictive maintenance and condition monitoring.

Condition based maintenance (CBM) is a maintenance strategy that monitors the actual condition of the asset to decide what maintenance needs to be done. CBM dictates that maintenance should only be performed when certain indicators show signs of decreasing performance or upcoming failure. Checking a machine for these indicators may include non-invasive measurements, visual inspection, performance data and scheduled tests. Condition data can then be gathered at certain intervals, or continuously (as is done when a machine has internal sensors). Condition based maintenance can be applied to mission critical and non-mission critical assets.

Unlike in planned scheduled maintenance (PM), where maintenance is performed based upon predefined scheduled intervals, condition based maintenance is performed only after a decrease in the condition of the equipment has been observed. Compared with preventative maintenance, this increases the time between maintenance repairs, because maintenance is done on an as-needed basis.

The goal

The goal of condition based maintenance is to spot upcoming equipment failure so maintenance can be proactively scheduled when it is needed – and not before. Asset conditions need to trigger maintenance within a long enough time period before failure, so work can be finished before the asset fails or performance falls below the optimal level.
There are many advantages to a well-rounded condition monitoring strategy.

- CBM is performed while the asset is working, this lowers disruptions to normal operations
- Reduces the cost of asset failures
- Improves equipment reliability
- Minimizes unscheduled downtime due to catastrophic failure
- Minimizes time spent on maintenance
- Minimizes overtime costs by scheduling the activities
- Minimizes requirement for emergency spare parts
- Optimized maintenance intervals (more optimal than manufacturer recommendations)
- Improves worker safety

The Condition Monitoring Toolbox:

- Vibration analysis – rotating equipment such as compressors, pumps, motors all exhibit a certain degree of vibration. As they degrade, or fall out of alignment, the amount of vibration increases. Vibration sensors can be used to detect when this becomes excessive.
- Infrared – IR cameras can be used to detect high temperature conditions in energized equipment
- Ultrasonic – detection of deep subsurface defects such as boat hull corrosion
- Acoustic – used to detect gas, liquid or vacuum leaks
- Oil analysis – measure the number and size of particles in a sample to determine asset wear
- Electrical – motor current readings using clamp on ammeters
- Operational performance – sensors throughout a system to measure pressure, temperature, flow etc.

Data collection

Data can be collected from the system by two different methods:

- Spot readings can be performed at regular intervals using portable instruments
- Sensors can be retrofitted to equipment or installed during manufacture for continuous data collection

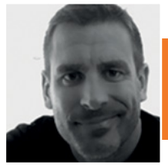
Critical systems that require considerable upfront capital investment, or that could affect the quality of the product that is produced, need up to the minute data collection. More expensive systems have built in intelligence to self-monitor in real time. For example, sensors throughout an aircraft monitor numerous systems while inflight and on the ground to help identify issues before they become life threatening. Typically, CBM is not used for non-critical systems and spot readings suffice.

Challenges of condition based maintenance

Condition based maintenance requires an investment in measuring equipment and staff up-skilling so the initial costs of implementation can be high.

- CBM introduces new techniques to do maintenance, which can be difficult to implement due to resistance within an organisation.
- Older equipment can be difficult to retrofit with sensors and monitoring equipment, or can be difficult to access during production to spot measure.
- With CBM in place, it still requires competence to turn performance information from a system into actionable proactive maintenance items.

We hope that our advertisers and contributors can offer you solutions that can aid you in this key area of maintenance best practice.



Michael Dominguez, Publisher.

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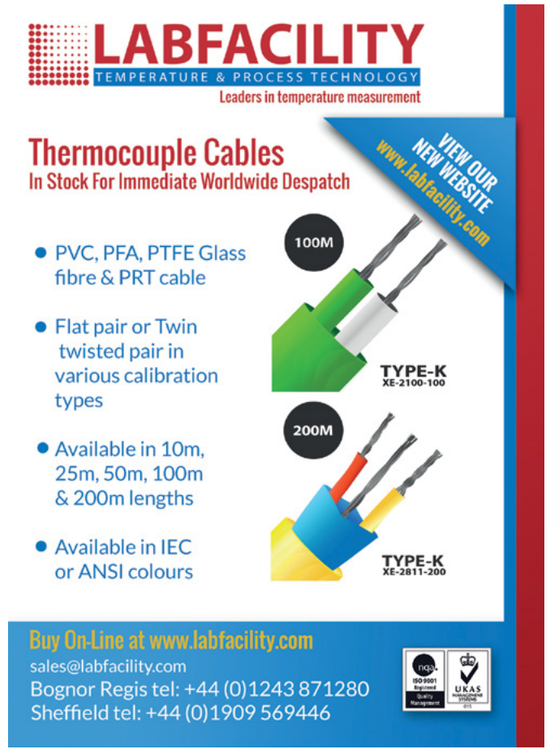


NEW CATALOG: EXAIR's New Catalog 31 Features new Safety Air Guns, Static Eliminators, Atomizing Nozzles, Air Operated Conveyors and Digital Flowmeters

EXAIR's new Catalog 31 is our best catalog yet; a full color technical guide offering solutions to common industrial conveying, cooling, cleaning, blowoff, drying, coating and static electricity problems.

The greatly expanded Catalog 31 introduces new VariBlast Compact Safety Air Guns, Gen4 Static Eliminators, 1/8 NPT Atomizing Nozzles, Sanitary Flange Air Operated Conveyors and Digital Flowmeters with wireless capability.

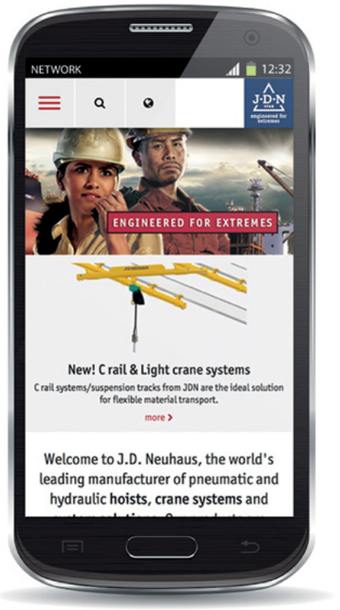
VariBlast Compact Safety Air Guns allow you to use just the flow you want with trigger control. New Gen4 Static Eliminators have increased performance and the Gen4 Power Supply has selectable voltage, allowing you to choose 115VAC or 230VAC as needed. Atomizing Nozzles are now available in 1/8 NPT, 1/4 NPT and 1/2 NPT, allowing you an even greater selection of nozzles for your coating or cooling applications. Sanitary Flange Line Vac Air Operated Conveyors are now available, with easy disassembly and cleanup when frequent or mandatory cleaning is required. Monitoring your compressed air consumption can now be done wirelessly with these new Digital Flowmeters.

EXAIR products help companies conserve compressed air, reduce dangerous noise levels and eliminate harmful dead end pressures. Detailed technical explanations, performance data, application photos and dimensional drawings are provided for each product. A price list is also included.

For more information contact:
EXAIR Corporation
E-mail: techelp@exair.com
www.exair.com/cat31.htm

NEW J D NEUHAUS GROUP WEBSITE

As the leading German manufacturer of pneumatic and hydraulic hoists and crane systems, the J D Neuhaus Group (JDN) has improved their innovative website. Their well-known address www.jdngroup.com incorporates many improvements.



It is more user-friendly, more informative and better structured, while being technically and graphically optimised, to represent state-of-the-art operation.

Conversion to a responsive web design enables the content to adapt automatically to the size of the screen being used, and the whole content can now also be viewed more efficiently on tablets and smartphones. The horizontal navigation has also been reduced to emphasise the menus for Products, Service and Company.

As the Service and Company sections of the site had already been re-launched towards the end of 2016, the website now presents itself with a modern look, feel and operation in a full screen mode. Also new is the News Slider on the homepage and underneath, the most important image themes of the JDN Group will be presented.

Company Information

At its state-of-the-art facility in Witten, Germany, J D Neuhaus produces pneumatically and hydraulically-operated hoists and crane systems with over 200 employees across the group. Thanks to this globally unique specialisation, J D Neuhaus have not only set the quality standard, but are also the world market leader with customers in more than 90 countries around the globe. The products particularly set themselves apart with lift capacities of up to 115 tonnes and their resilient and reliable operation, including protection against explosions even in the most extreme operating conditions. Typical examples include oil and gas exploration in arctic temperatures as low as -45°C; the undertaking of underwater repairs on ships; as well as in mining and the chemical industry, together with heavy plant construction and in many areas of logistics. J D Neuhaus supplies around 70 branches in total worldwide.

Production takes place exclusively at their Witten plant. The broad range of services provided includes equipment assembly, inspection, maintenance, and general overhaul, as well as running courses for customers. For distribution, JDN companies located in France, Great Britain, Singapore and the USA have created a tight-knit global network, and in collaboration with international partners, have supported an export rate of over 80%.

The founding of the company goes back to the year 1745, and it is now in its seventh generation of being family-run. At the Hebezeug-Museum (Hoist Museum) in Witten, one can see the history of this company as a living part of the business culture.

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ABB Drives Help Metal Component Maker To Cut Out Stoppages

Variable speed drives bring greater control and efficiency to production line for Samuel Taylor.

Above: ABB drives are helping Samuel Taylor to cut out stoppages on its production line

A specialist manufacturer of bimetallic strips has improved the reliability of its production line by retrofitting two applications with ABB variable speed drives (VSDs).

Samuel Taylor produces precision metallic components for the aerospace and automotive industries at its plant in Redditch near Birmingham. One of its product lines is bimetallic strips, which it makes by forming a groove in a coiled length of copper. This groove is then inlaid with silver.

The production line consists of a leveler, grooving and inlay machines, a bonder to permanently join the two strips, and a riler. The recoiler is under torque control and recoils the strip on leaving the bonder.

The recoiler originally used a DC motor but the need to replace the commutator brush gear meant that this motor was often in for repair. The motor had been rewound and both motor and drive were over 20 years old.

Samuel Taylor asked Adford CNC, a specialist in CNC machine tool servicing and repair, to retrofit the recoiler with an AC motor. The original motor was changed for a 5.5 kW AC force fan-vented motor, controlled by a 7.5 kW ABB general purpose drive, ACS580.

Alan Bolton, proprietor of Adford CNC, says: “As a modern, digital AC drive, the ACS580 offers many parameters to enable the commissioning engineer to precisely set or adjust the drive to suit the motor and application. This is far more than was available in the old style analogue DC drive unit that had variable or fixed resistors to set drive limits or match the drive to the motor characteristics.
“With the old DC drives, this meant that only certain parameters could be altered. The new ABB drives offer digitalisation of parameters and a digital display, which helps make programming much easier. We also chose ABB because of the excellent support and service provided through its authorised value provider, Sentridge Controls.”

A second ABB general purpose drive was installed on the bonder, which has an arrangement of compression rollers in which the gap between them can be adjusted using a motor-driven screw thread. The existing 11 kW motor was replaced by a 15 kW version.

“The direct-on-line (DOL) motor was prone to blowing fuses because of the high initial mechanical resistance. We fitted a 15 kW ABB general purpose drive to control the maximum current drawn when starting the motor and overcoming the inertia of the drive train,” says Bolton.

“Using the ABB drive allowed us to control the maximum current, overload capability on starting and the acceleration and deceleration ramps.”

Adford also made some mechanical modifications, mainly to the drive pulley to account for the new motor’s different shaft size.

“The client is very satisfied as this has completely cured the problem,” says Bolton.

Both projects were completed with the support of Glen Hickman of Sentridge Controls. “This is the first time we have worked with Sentridge and we cannot praise them enough,” says Bolton. “Their technical staff are excellent and they gave us faultless support, both in person and over the telephone, throughout the project.

“We had not had backup that complete before and although this is the first time we had retrofitted an ABB VSD, we were certainly won over to using ABB for all future jobs.”

For further information please visit:
www.abb.co.uk/energy

Success at UPA Drives Further Investment

United Powered Access (UPA) has announced further investment in both machinery and people, which has enabled the business to expand and grow to meet market demand.

The company, which specialises in modern, reliable and cost effective access platforms, on short or long term hire, was set up to provide quality machinery for a multitude of industries throughout the UK.

Jason O'Brien, Hire & Operations Controller at UPA, explained: "The business has gone from strength to strength over the past few years. Our four-hour rapid response service has proven extremely popular and it is in this area that many of our new machines will be put to work. Our customers really appreciate having access to the latest machinery backed up by a reliable support team which is always on hand to offer any necessary guidance."

New additions to the rental fleet include: Manitou masted fork trucks, fuel bowsers and Pop-Up IQ10s (a small, portable unit), as well as the Skyjack 4740 – the very latest in electric scissor lifts, which can exceed the previous reach and capability on offer.

The business' diversification into fuel bowsers was a response to the demands of building site clients looking for reliable rental of fuel storage kit. UPA responded by adding 900 litre fuel tanks and 2000 litre fuel stores to its inventory.

To compliment this expansion of the rental fleet, UPA has upgraded all delivery and service vehicles, including plant trailers. A recent, company-wide rebranding exercise has further enhanced the look and feel with a new website, liveried vehicles and branded workwear. All the latest news and offers will be shared via the company's new Twitter account.

O'Brien concluded: "In order to manage the increased workload, whilst maintaining the level of service our existing customers have become accustomed to, we have strengthened the team adding a new LOLER Engineer and an additional Sales Account Manager to the ranks. These are really exciting times and we look forward to continuing to develop meaningful partnerships with reliable manufacturers in order to provide the highest level of service to our end clients."

UPA is part of the CA Group of companies. CA Group Limited was founded in 1983 and is one of the UK's leading metal and cladding systems manufacturers and contractors for the industrial, commercial and public sectors, and refurbishment markets. Strategically based at Lymm Service Station, off the M6, UPA is well positioned to be able to quickly react to customer need.

For further information about United Powered Access visit: www.upa-uk.com

NEW NATIONAL DISTRIBUTION MANAGER FOR HI-LINE INDUSTRIES

Hi-line Industries, UK manufacturer of high-quality, energy efficient, compressed air purification equipment, have appointed Damien Oxlee as their new National Distribution Manager.

Damien joins the company at a time of strength as the company continues to grow year on year with record turnover for their previous financial year.

Damien has a wealth of experience within the engineering industry having been Group Sales Manager at Western Business Publishing since 2010, working on titles such as Air User and Industrial Plant & Equipment. Prior to that, he worked as Publication Manager at Datateam Publishing for six years and has known and worked alongside Hi-line for many years in his previous publishing roles.

Damien is married with two children and will look after Hi-line's interests throughout England and Wales. Amongst his many hobbies are sports cars, food, golf, football, travel and cycling including recently riding to Amsterdam from Kent raising money for Demelza Hospice Care for Children.

A member of the British Compressed Air Society and carrying ISO 9001:2008 certification, Hi-line's UK headquarters are situated in Burton-upon-Trent where they manufacture some of the most energy-efficient compressed air dryers in the world as well as bespoke and 'off the shelf' heat regeneration zero loss adsorption dryers. Their products are used throughout industry and general manufacturing including areas such as medical, dairy, textile, breathing air, packaging and the automotive sector. The company's Nitrogen and Oxygen O2 generators are recognised as the best value for money in the UK food and beverage industry.

Hi-line are proud to be part of the "Made in Britain" campaign promoting the best of British manufacturing, and has built up an enviable reputation for the innovative design, manufacture and supply of their compressed air purification equipment. All Hi-line products are designed and built to the highest standards of quality by experienced and qualified engineers, while their service department employ some of the most experienced compressed air treatment service personnel in the industry, together with engineers trained in all aspects of compressed air and gas generation.

Further information is available from:
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Fax: 01283 533367
e-mail: enquiries@hilineindustries.com
www.hilineindustries.com

NEW UNIVERSAL BRUSH STRIP CABLE ENTRY SYSTEMS

The latest KDR-BES-U brush strip cable entry product range from icotek has been developed specifically for applications with Rittal TS8 enclosures and is available in the UK from M Buttkereit Ltd.

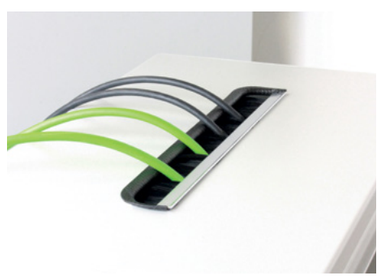
Above: The versatile KDR-BES-U cable entry system to accommodate easy installation or removal of cabling including pre-terminated products.

The icotek KDR-BES-U cable entry system which facilitates both horizontal and vertical brush installations.

These versatile products however, are suitable for applications with virtually any current cabinet or enclosure on the market, including panels, server racks and walls or sheet metal cladding associated with both static or mobile equipment.

The brush strip products are supplied with innovative clamp strips attached, providing easy 'slide-on' attachment to metal sheets or enclosure base plates of 1.5 - 2mm thickness. The clamp strips are available in optional 90°mountings which can also be easily removed if an existing original enclosure gland plate mounting is already available for the brush components.

These KDR-BES-U products ensure fast, simple and tool-free mounting while the brush components can be remounted at any time typically for utilisation with alternative location options. Standard brush lengths are available to match closure aperture lengths of 600, 800 and 1000mm, with optional or alternative brush lengths also available on request. Brush division bars can also be utilised to achieve enclosure lengths in excess of 1000mm up to 1500mm. The clamp strip mountings are aluminium and the brush strip assembly is suitable for operating conditions from -20°C to +90°C. Brushes are manufactured from black Polyamide and can accommodate the repeat pass-through and removal of cabling, including those pre-terminated with 10/16/20-pin industrial connectors (up to 36 x 112m in size).



Left:The latest icotek KDR-BES-U brush strip items to facilitate multiple cable entry options typically for Rittal TS8 enclosures.

These versatile split brush plate items also provide some thermal protection by separation of cold/warm air conditions as well as minimising the effects of dust/drafts.

Further information is available on request:
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Fax: 0161 969 5419
e-mail: info@buttkereit.co.uk
www.buttkereit.co.uk

Experience the Sulzer Difference at Asia Power Week 2017

This year Asia Power Week will return to Thailand, where speakers and exhibitors will showcase the latest innovations and discuss solutions to the challenges facing the power industry.

Above: Sulzer offers turnkey solutions for the repair and maintenance of gas and steam turbines.

As a leading independent repair specialist and pump manufacturer, Sulzer will be highlighting its pumps and systems for power generation as well as the range of services on offer to operators of gas turbines and other rotating equipment.

2017 sees the 25th anniversary of the Asia Power Week, with more than 8,000 industry professionals expected to attend. Hosted at the Bangkok International Trade & Exhibition Center (BITEC), the conference and exhibition will be held between September 19 and 21. Sulzer experts will be available to discuss the latest repair solutions for rotating equipment and your best choice for pumps within the power generating sector on Stand E9.

Visitors to Sulzer's stand will be able to gain a better understanding of the company's capabilities within the power generation sector and see what sets it apart from the competition. This can be achieved by talking with the staff on the stand as well as using the Sulzer Solutions – Power touchscreen app. Through a single point of contact, Sulzer can deliver pumps for all types of power stations as well as a complete range of services for rotating equipment.

Sulzer offers fast, flexible and innovative solutions for the maintenance of equipment in the power generation sector. Working in partnership with its customers, Sulzer can increase efficiency, productivity and service life whilst also minimizing downtime for maintenance.

Sulzer also offers a great deal of maintenance expertise in the gas and steam turbine sector with experienced personnel dedicated to the support of the F-class gas turbine market, including the GE, Siemens and Alstom fleets. Steam turbines used in the geothermal power generation and generators from hydro power plants can undergo a rapid turnaround with minimized disruption using our innovative service solutions. World class facilities create products such as turbine and compressor blades to the highest specification. To increase output Sulzer provides improved winding geometry and insulation material. All coils are produced in the dedicated manufacturing shop.

Above: Extensive workshop facilities around the world provide rapid turnarounds for the power generation sector.

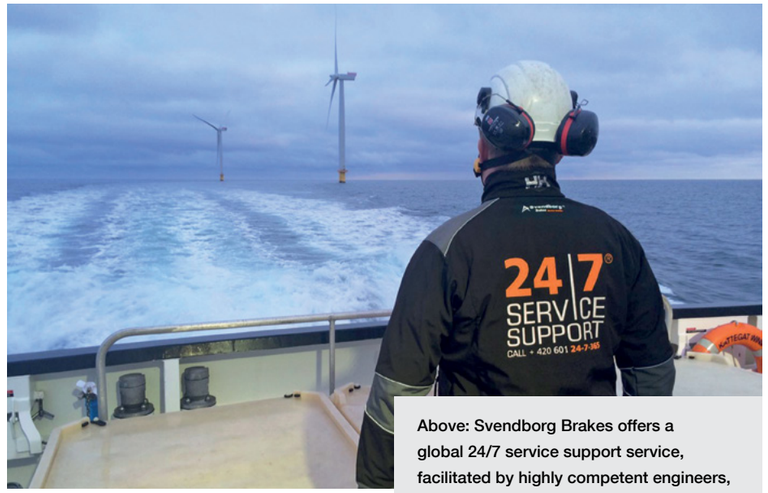
With a worldwide network of service centers, Sulzer is a leading service provider for all brands of rotating equipment including pumps, compressors, turbines, generators and electric motors. These are supported by design, manufacturing and engineering centers that can offer turnkey solutions for the entire power generation market.

Visit Sulzer at Stand E9 – Asia Power Week 2017 at the Bangkok International Trade & Exhibition Center, September 19 - 21.

For further information visit:
www.sulzer.com

Svendborg Brakes Global Service Solutions offers brake users turnkey maintenance support

When providing high performance braking solutions for heavy duty applications in the renewable energy, offshore, mining, oil & gas and steel sectors – reliable maintenance support is of the utmost importance to reduce downtime and increase profitability.



Above: Svendborg Brakes offers a global 24/7 service support service, facilitated by highly competent engineers, who utilise specific knowledge on individual systems to enact customised maintenance strategies, or react quickly to emergencies.

Svendborg Brakes, a part of the Altra Industrial Motion Corporation, meets these requirements with its Global Service Solutions Support package, which provides the reliability of service required to support these installations.

While brakes play an important role in controlling the motion of industrial equipment - offering a truly successful maintenance package for these products requires an innate understanding of the associated components within the machine. In addition, specialised strategies are required to service the varied needs of designers, OEMS and end users. Due to these factors, Svendborg Brakes offers a global 24/7 service support service, facilitated by highly competent engineers, who utilise specific knowledge on individual systems to enact customised maintenance strategies, or react quickly to emergencies.

Intimate knowledge of applications allows Svendborg Brakes engineers to accurately predict specific types of wear on brakes. This enables Svendborg Brakes to warn operators when components will need checking or overhaul. The result is a much more proactive approach towards maintenance, with preventative measures in place to guard against downtime and reduce repair costs. For most customers, Svendborg Brakes will store system attributes which can be referenced at any time, offering its maintenance engineers a continuous reference for effectively maintaining equipment in a cost effective manner.

As with any maintenance partnership, trust between end user and provider is essential. With many applications in heavy duty industries required to work flawlessly to protect fine profit margins, extended downtime is entirely undesirable. Svendborg Brakes utilises a fast response approach on a global scale to ensure that end users can be assured of a swift presence on site. Branches are in continual contact with users, monitoring situations and providing local knowledge centres.

Users can contact Svendborg Brakes experts anytime for free by phone or e-mail via the 24/7 support service. The brake manufacturer offers the dedicated Svendborg Brakes Service Support App for iOS and Android, which offers instant communication with a highly qualified technician around the clock, anywhere in the world. A wide choice of communication options for end users ensures increased responsiveness in worst case scenarios.

Svendborg Brakes strives to provide its customers with more than just a market leading product, as is embodied by the training offered to operators of its products. The Svendborg Brakes Academy aims to educate a full range of brake users, incorporating highly trained specialists and newcomers. By increasing familiarity with the product, Svendborg Brakes helps to increase vigilance regarding maintenance procedure, allowing operators to spot issues with an installation with increased speed, so maintenance teams can be dispatched at the optimum time.

Working with brakes also incorporates assessing associated components and specialist systems on-site. These systems incorporate highly complex electronic control or devices which require the attention of skilled engineers. Luckily, Svendborg Brakes doesn't confine its approach to solely brakes, instead evaluating an entire system to provide the utmost reliability overall. As a result, Svendborg Brakes Service Support goes far beyond ensuring the performance of one aspect of the system.

Trust, reliability and responsiveness are key to supporting industrial brake maintenance in incredibly challenging applications. However, by selecting a highly proficient specialist such as Svendborg Brakes, end users directly benefit from a deeper understanding of the product. Familiarity with machinery, and taking the approach that brakes form part of a much larger interconnected installation, ensures that increased reliability and cost effectiveness are not mutually exclusive.

For further information visit:

www.svendborg-brakes.com

Darian celebrate 30 years at the forefront of Global Sourcing.

Darian are proud to be celebrating 30 years in business and invite you to visit their stand to discuss how you can share in their success by choosing them as your strategic supply partner.

Darian supply a wide range of custom manufactured components to leading OE manufacturers in the UK and Germany. They specialise in the supply of castings, forgings, CNC machining, pressings, stampings and fabrications as component parts or sub-assemblies.

Darian operate globally in various locations across Europe, Turkey, India and the Far East with locally employed staff supporting the activities of the UK based head office.

Darian can add value to your business without any additional cost.

Why choose Darian to help with your business needs ?

Darian M.D Liz Samandi speaks from experience "For many companies, global sourcing could be a significant cost saving – if they get it right. Darian have seen the pros and cons first hand. Without the right guidance, companies can experience serious supply problems and unexpected costs – but these

are certainly avoidable. In fact it's quite possible to improve quality and cut costs if you know where to look."

For further information visit:

www.darianglobalsourcing.co.uk

Northern Manufacturing & Electronics 2017

Northern Manufacturing & Electronics, the North's top industrial technology and electronics show, returns to EventCity, Manchester on September 27th and 28th for the fifth consecutive year.

Once again, the show gathers together an impressive list of leading firms covering a wide spectrum of engineering activities, together with the latest production hardware, components and consumables in a single, free-admission show.

Situated close to Manchester city centre, the show's location puts it at the centre of the UK's most productive region in terms of manufacturing output. Along with a substantial slice of the UK's aerospace and automotive sectors, process industries such as pharmaceuticals, electronics components, food & beverage and oil & gas all have a significant presence in the North West, making maintenance one of the key aspects of Northern Manufacturing. Around 30% of visitors to the show in 2016 were directly concerned with works management and maintenance. The diversity of vendors gathered under one roof makes it an excellent opportunity for engineering maintenance and procurement professionals to solve multiple sourcing issues in a single, time-efficient visit.

The outsourcing of maintenance and works management is a common practice amongst many of the larger manufacturing firms, and Northern Manufacturing provides the ideal platform for service providers to showcase their capabilities. This is especially true for firms that have developed specific "local knowledge" of the prevalent industries in the region, giving them a well-honed insight into both the problems likely to be faced and their solutions. Exhibiting at Northern Manufacturing 2017, MES (NW) Ltd is one such firm. The service provider utilises both electrical and mechanical engineering resources to provide a wide range engineering support services to satisfy diverse customer requirements and expectations. The firm has recently been awarded a five-year facilities management contract with a blue chip automotive client. Services available include machine relocations, bespoke engineering solutions, fabrications & materials handling, project and facilities management.

UNIS Group – EMR provides a professional service to further the life of equipment by offering a number of repair and replacement solutions. As equipment becomes older it can become unreliable; preventative maintenance can identify potential failures before they become critical. Founded in 1984, the company specialises in the repair and sale of industrial electronics and motors. Its repair facility is centrally located in Northampton where repair technicians, with the support of extensive testing and measuring facilities, are able to repair all types and brands of electronics, new and obsolete alike. The electronics are cleaned, repaired and tested in accordance with strict quality standards. Every year the company completes more than 41,000 repairs. An extensive range of stock parts enables the company to identify and resolve defects in order to expeditiously reduce downtime, with all repairs carried out on a 'no fix, no fee' basis and backed by a two-year warranty on repairs, sales and exchanges.

Components, both electrical and mechanical, are also a big part of the show and the range of vendors exhibiting at Northern 2017 is impressive. Regular exhibitor igus UK returns with a range of components designed very much with the concept of predictive maintenance in mind. The firm believes that predictive maintenance is the cornerstone of Industry 4.0 and the factory of tomorrow. Its smart plastics warn of potential failure in good time before unplanned and costly downtimes occur. New and improved smart plastics on show this year include the isense EC.RC, a new system for monitoring e-chains, the CF.Q module for its intelligent chainflex cables and the intelligent iglidur PRT slewing ring bearings.

Also highlighted will be a new process for the production of 3D printed injection mould tools, allowing engineers to solve difficult technical challenges quickly and efficiently. The entire range of 50 iglidur high-performance plastics is available using the process, including specialists for high load, food contact, underwater or high temperature applications. Depending on the iglidur material chosen, the mould is either SLA or SLS printed and then used immediately in the injection-moulding machine. Parts are ready for shipment within days. The material structure of the printed injection mould ensures that it can withstand high temperatures during injection moulding, which means that one mould can produce prototypes and small batches up to 500 pieces cost-effectively and quickly.

Lemo UK will highlight its high performance Anglissimo range of rotatable, right-angled connectors. This versatile range of push-pull connectors offers users the ability to configure cable exit angles during installation and therefore can minimise system costs with simplified assembly and a consolidation of the connector variants required. Another top connector vendor exhibiting this year is Fischer Connectors, showcasing its push-pull circular connectors and cable assembly solutions, many of which are designed for harsh environments and demanding applications. Mechanical components and systems on show include pneumatic components from Flow Technology, an established manufacturer and supplier of stainless steel and high nickel alloy components to various markets including oil & gas, power, pharmaceutical and hygienic applications.

Leybold UK, one of the leading suppliers of vacuum equipment, returns with a wide range of products led by its recently introduced Trivac T series, which the firm says is a new cost-effective OEM solution. Other products on show will include the central vacuum station Vacube and claw pump Clawvac, together with high vacuum solutions, vacuum measurement and the Phoenix range of helium leak detectors. Micronel will showcase a recently launched addition to its range of high-performance radial blowers; its most powerful model yet, the U85MX radial blower, capable of producing up to 16000 pascals of static pressure and up to 1000 litres per minute free blowing airflow all in a package size under 85mm in diameter.

Among the cabling specialists exhibiting in 2017, CIE Connectivity highlights its 'design-to-delivery' solution for both manufacture and installation applications. Other firms include Widen Electronic Solutions and Turner Electronics, one of the UK's leading distributors of cable preparation and SMT equipment from suppliers such as Schleuniger, Z&F, WDT, Autotronik, Mechatronika, DDM Novastar, and GLW. New this year is the Brady Wraptor labelling system for Schleuniger cut & strip machines. Advanced manufacturing is also well represented. Laser Lines, a Stratasys Platinum Partner for UK & Ireland, offers a portfolio of over twenty 3D Printer and Rapid Manufacturing systems, together with industrial lasers for cutting, welding, marking and cladding. On display will be a compact laser marker, together with a mechanical marking system. Also exhibiting is Tri-Tech 3D, offering a complete package of services from initial specification and supply of 3D printing hardware and software, to onsite 3D printer installation, staff training and full product support. Rob Pitts of Tri-Tech 3D is also one of the presenters of the show's free technical seminar programme. In his Introduction to 3D Print Rob will be sharing case study examples of the limitless applications that are being discovered for this new technology across all manufacturing sectors and the new opportunities it could open up.

Running over both days of the show and open to all visitors and exhibitors, the seminar programme for 2017 sees the welcome return of several of the most popular presenters giving contemporary insights into their specialist areas. Advanced manufacturing and Industry 4.0 are subjects that attract wide interest from every sector of manufacturing. Alistair Williamson, Managing Director of Manchester-based Lucid Innovation provides an introduction to how connected networks of objects offer opportunities to collect, exchange and exploit the value of data in more efficient and sustainable ways.

As a management tool, Lean has something to offer every business looking to eliminate waste and maximise performance. Presenter Tim Scurlock spearheaded the introduction of Lean concepts into General Motors' business over a ten year period. Through case study examples, delegates will identify some of the methods, tools and concepts to successfully introduce Lean and the pitfalls to watch out for. Further insight into improving efficiency and profitability is offered by Ailsa Kaye, Managing Director of Onsite Insights, who will reveal the factors behind the success of some of the UK's best companies.

In perhaps what will be the busiest session of the programme, the new General Data Protection Regulations, which come into effect next May, will be examined from the viewpoint of manufacturing SMEs. Nearly all businesses will be affected in some way by the new regulations, which carry extremely harsh penalties for non-compliance. Yet, over a third of UK businesses remain unaware of the new law or what they need to do. Sessions running on both days of Northern Manufacturing 2017 will attempt to address this knowledge gap, briefing delegates on how different organisations will be affected and how can you make sure your company is fully prepared for the introduction of GDPR. This one session alone would make a visit to the show worthwhile!

All seminar sessions at Northern Manufacturing & Electronics 2017 are free, but pre-registration is strongly urged. Full details on all sessions and how to register can be found at www.industrynorth.co.uk

Northern Manufacturing & Electronics 2017 is free to enter. EventCity is easily reached by road and offers free on-site car parking for 3,000 cars. Access by public transport from Manchester city centre is also very straightforward.

To register online for free tickets simply visit www.industrynorth.co.uk
Visitors can follow all the latest news from the show at linkedin.industrynorth.co.uk, or on its blog page at:
http://blog.industrynorth.co.uk

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Dixon – Impact Resistant Sight Glass

Dixon are pleased to introduce the new compact impact resistant sight glass.

This new sight glass is used widely in food, dairy and beverage hygienic processes to view products and fluids. This design is perfect for hoses and high traffic areas due to its Lexan™ glass and a stainless steel body construction. Ideal for arduous applications, heavy manual handling, high traffic and high activity areas to provide site added protection and asset security.

Features

- Easier to clean than bolted styles
- Less cost to repair than bolted styles
- Clamp connections standard
- Sizes available: 1”, 1½”, 2”, 3” & 4”
- Maximum temperature: 200°F (93°C)
- Maximum pressure 100 PSI (6.9 bar)

The sight glass is available as one of the many hygienic hose fittings complementary to Dixon’s extensive hygienic hose range which now includes Heat Traced, Hot Water Thermal and Duplex hose assemblies as part of the standard range along with a range of rubber, silicone, PVC and PTFE hose assemblies which can be custom made to exact requirements with accessories including wash down guns and steam lances.

For further information on the impact resistant sight glass or the range of Dixon products please contact us on:
01772 323529.

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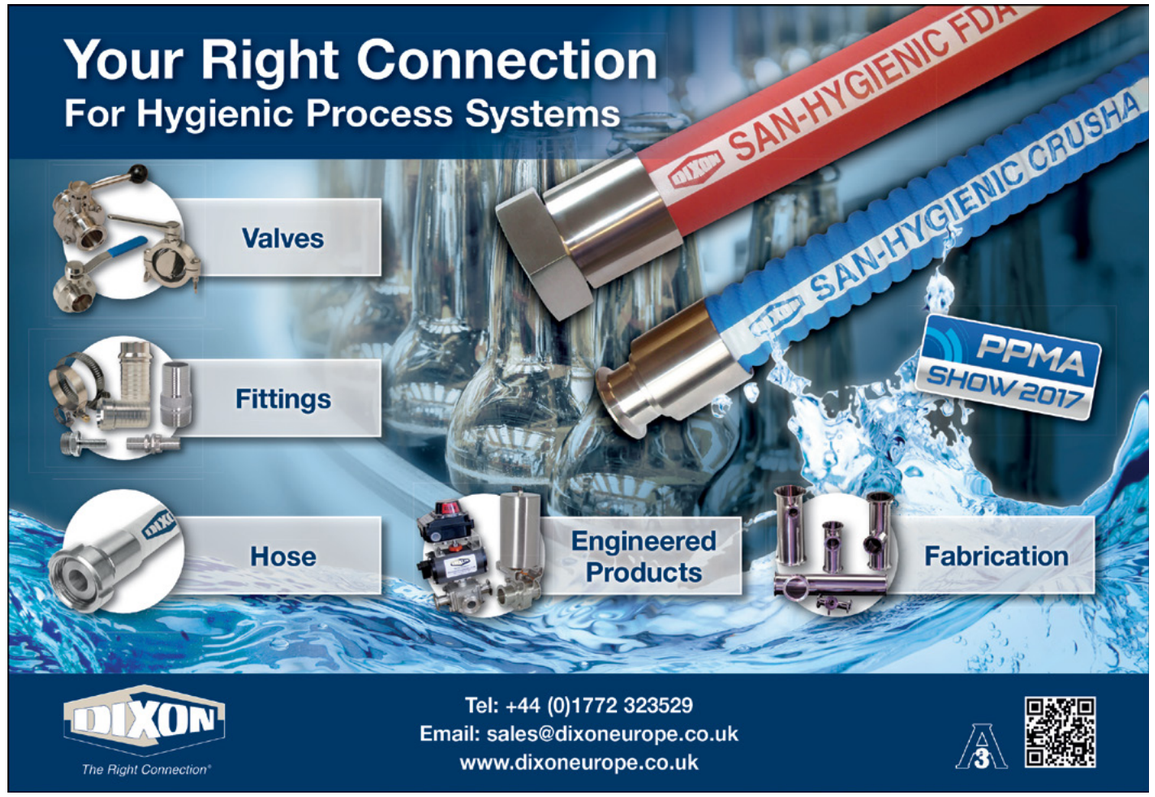

Impeller Restoration Extends Biomass Production Lifetime

Among the renewable energy sources available today, generating biofuels from algae is a relative newcomer to the industry but one that has grown exponentially.

In fact, the algae products market is anticipated to only increase further, with projections indicating a potential $44.7 billion valuation by 2023. Algae-based biofuels make up approximately a quarter of this estimate and point to the vast possibilities of this aquatic organism for the energy industry.

Because of its simpler compound structure and suspension in nutrient-rich solutions, algae can multiply rapidly in comparison to other traditional biomass crops, such as corn. This means that it can be continually harvested, with typical growth cycles for aquatic algae ranging between one and ten days. Meanwhile, it also benefits from a higher yield potential versus these other forms of biomass (in some cases as high as 20 times more) and requires a smaller surface area for cultivation. As a result, this makes algae production both highly sustainable and increasingly attractive in terms of future development and investment.

The process and its potential problems

In order to cultivate this form of biomass effectively, there are several different stages of the algae's development. These include algal ponds, as well as photobioreactors, between which the nutrient-and carbon-enriched fluid is transferred and exposed to necessary sunlight. As the fluid is transferred between each area, it is prevented from settling by maintaining a highly turbulent flow within the reactor, using either a mechanical pump or an airlift pump. This turbulent flow can exacerbate issues such as erosion and corrosion damage, which traditionally trouble pumps and can result in faster rates of metal deterioration.

In addition, the algal biomass requires a contaminant-free environment, rid of any microbiological matter which could affect the algae's growth or quality. Many producers will use high-strength chemicals to eliminate any unwanted growth, as well as chemical cleaning agents to disinfect the process equipment. When combined, this can take a significant toll on the lifespan of process equipment.

Disruption to algae production

This problem had significantly impacted Portuguese bioengineering company A4F (Algae for Future), who focus on the production of algae for a variety of different purposes, including biomass and biofuel generation. In 2014, their production process was continually being affected by the need to replace damaged pump components. With the pumps being cleaned on a weekly basis, the frequency of harsh chemical contact and erosion-corrosion caused by the fluid handling had resulted in severe metal loss on the impellers. The damage reached such an extent, that the company required a complete overhaul of three damaged impellers after just one year in service.

Polymeric solutions maintain green energy progress

To minimise downtime and avoid future replacement costs, the bioengineering company were in search of an alternative solution to their pump troubles. As a result, they contacted Belzona's Portuguese Distributor, Belzona Portugal, with regards to using their cold-applied, polymeric materials for the repair and protection of pumps. Belzona Portugal had considerable experience in the restoration of process equipment and therefore suggested suitable solutions to repair and protect the impellers. These systems would be able to not only rebuild the metal loss, but also enhance the pump's longevity against chemical attack and erosion-corrosion.

Following confirmation, all three pump impellers were cleaned and gritblasted to achieve the correct surface profile. This revealed the extent of the metal loss, which had resulted in complete deformation of the impeller blades. Fortunately, this could be rebuilt to its former design using a combination of wire steel mesh and Belzona 1311 (Ceramic R-Metal), a paste-grade metal repair material. Once the shape was restored, the impellers were coated using Belzona 1321 (Ceramic S-Metal) to provide additional protection. Together these materials provide enhanced erosion-corrosion resistance versus the original metal, whilst also providing outstanding chemical resistance to combat the aggressive cleaning agents.

Above: Pump Impeller Coated

Three years in service

In 2017, the pump impellers were revisited and found to still be in exceptional condition after three years of service. Compared to the short lifespan and excessive damage when unprotected, the Belzona coating had improved the longevity of the component significantly, much to the satisfaction of the client. As an additional precaution, the customer requested a further application of the coating, simply to ensure the successful protection was continued. Due to the overwhelming success of these applications, Belzona has been chosen to coat four new impellers in 2017.

For further information visit:

www.belzona.co.uk

Barrick Pueblo Viejo Mine Strikes Gold with Belzona Solution

"Belzona products have been very effective in the applications, in addition to the excellent service technical support and the time they invested in us."

The Mining industry is notorious around the world for its difficult operational conditions which require specialist equipment to suit the environment. This can include both big, heavy machinery for extracting ores and minerals, and also complex equipment to process and purify them. To maintain the integrity and longevity of these assets, specialised coatings are applied to machinery and equipment.

Barrick Gold mine - Dominican Republic

The world's largest gold mining corporation, Barrick Gold Corp., recently turned to Belzona solutions to repair and protect a slurry tank in their Dominican Republic mine, Pueblo Viejo. The slurry tanks are a crucial part of the separation and purification process of gold from the mined ore. This particular tank was used to neutralise acidic sludge to a higher pH but was performing inefficiently due to its high levels of erosion-corrosion.

Corrosion was developing from a number of sources including the tank's high temperature, abrasion (from rocks and abrasive sludges in the slurry), bacterial attack and chemical attack. Ultimately, the mine's Corrosion Engineers did not know how to counter all of these damage mechanisms. Moreover, time was of the essence as some of the other slurry tanks' flooring were already failing due to similar circumstances.

Repair options

One option considered was to install a rubber lining to the slurry tank's interior, however, logistically this was far from a simple application. It was then that a Belzona system was suggested to the Corrosion Engineers as an alternative solution.

This system comprised:

- Belzona 1121 (Super XL-Metal) – a versatile, paste-grade, epoxy material for rebuilding the damaged areas of the slurry tank
- Belzona 1381 – a solvent-free material designed to operate under continuous immersion of up to 95°C (203°F) which would be used to coat the tank and provide ongoing erosion resistance and protection

Not only did this system meet the operational conditions but it was also three times less expensive than the cost of the rubber lining. Beyond this, the Belzona 1381 could be spray applied, making it easy and quick to coat the whole 940m² (10,118ft²) surface.

The Pueblo Viejo Mine was no stranger to Belzona, having previously used several solutions to repair pumps, secondary containment areas and damaged concrete. Therefore, they knew they could rely on Belzona materials' capabilities and durability.

Another reason Belzona was chosen was because the mine's Engineers had never performed such a large spray application before, and therefore it was decided that members of Belzona's Technical Department would be present throughout the project.

Application details

Beginning on the 8th of April, Belzona was given a 20-day time frame to complete the specified application. This began with grit blasting to prepare the tank's surface, however, soon heavy rain prohibited blasting because there was a risk it would cause the metal to rust. Additionally, one of the mine's security protocols stated that every time there was lightning, work was required to be halted immediately for two hours.

The fast cure times and ability to be complete within 20 days was one of the main selling points of the Belzona system and so the members of the Technical Department on site were eager to complete the application. But continuous stormy weather meant that only minimal amounts of work were possible at a time.

Another issue arose when it was discovered that the base and floor of the tank had experienced more severe pitting and deterioration than previously expected. However, because of Belzona 1381's excellent protection against erosion-corrosion, when coating the second layer, only a thicker build was applied near to the damaged areas to restore them.

When the weather finally cleared on the 24th of April, the spray application was able to commence. With only four days until the 28th of April deadline, the entire slurry tank was sprayed including the areas where a second coat was required.

Barrick Mine's response

After the application, the customer was highly impressed with Belzona both in terms of the materials and support from the Technical department. Despite the problems faced, the system was installed within the 20 allotted days thanks to the fast spray application and is so far performing perfectly.

Noelia Diaz Tavarez, an Asset Integrity Engineer at the mine, stated that: "For technical support, Belzona has been one of our best partners to date on information, support, improvements and applications. In this particular case, these were key factor for the execution of the work on time. As of August, we are fully confident in the products."

Going forward, the Engineers at the gold mine have stated that Belzona will be their first choice for repair and protection projects, and already a second slurry tank has been coated with a Belzona system. The Mining industry can be a difficult industry to protect against but once again Belzona has proven itself to be a golden solution.

For further information visit:

www.belzona.co.uk

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For further information visit:
www.ibhs.co.uk

Fulton launches the most radical change to boiler design in nearly 70 years

Fulton's all-new heat transfer solution, the VSRT Series, is claimed by the company to be the most radical change to vertical steam boiler design since they pioneered the vertical tubeless boiler in 1949!

By adopting a systems engineering approach to design and using its own 'PURE' technology, Fulton's VSRT Series challenges the heat transfer and mechanical design principles of traditional vertical steam boilers.

With over 30 worldwide patents pending, the new vertical boiler's spiral-rib tubeless design is a world first that has enabled Fulton to create a compact boiler with the industry's smallest footprint. In fact, compared to the equivalent 30hp model from the company's renowned J Series, the VSRT Series is an impressive 40% smaller.

Using a combination of in-house modelling with computational fluid dynamics and finite element analysis, the 'PURE Optimised' design of the VSRT Series makes the new boiler durable and reliable in operation; and with up to 6:1 turndown and featuring a fully-modulating burner, the VSRT also boasts industry-leading performance with an 84.5% Gross (93.5% Net) thermal efficiency and 99.5% steam quality from a fully-water-backed design with no refractory.

The VSRT Series features patented, self-compensating stress relief architecture that virtually removes longitudinal stress and deflection absorption. It is CE marked and complies with anticipated EU regulations, with its combustion technology being reconfigured and the mesh burner and furnace designed as a single component, resulting in NOx emissions of less than 40mg/kWh.

For further information on the VSRT Series, call Fulton on 0117 972 3322, email sales@fulton.co.uk
or visit www.fulton.co.uk.

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New Babcock Wanson Premium Range - High Specification Steam Boilers At An "Off The Shelf" Price And Delivery

Babcock Wanson has launched its new Premium Range of fire tube steam boilers designed to provide customers with a boiler that meets the very latest safety and operational guidelines at an "off the shelf" price and with shortest practicable delivery time.

The new Premium Range is based around Babcock Wanson's NBWB and BWD fire tube boilers that use their latest generation of burners for exceptional quality and performance. Natural gas fired fully modulating burners are fitted to the majority of the range covering outputs from 250 to 6000 kg/h with a 12-15 barg design pressure, making them ideal for the majority of process steam users.

Premium Range boilers are highly competitively priced and are aimed at the steam user who wants fully automated control with the minimum of boiler house manning. Supplied complete with all standard boiler mountings including options of automatic TDS control and timed bottom blowdown, the Premium Range boiler meets the requirements of modern industry without the need for expensive up-front engineering.

With the exception of the two smallest sizes, all Premium Range boilers are fitted with the Babcock Wanson BW3DAYS unattended boiler operating system. This system can be set at commissioning for daily or three day checks depending on a risk assessment of the customer's steam process and their degree of monitoring of the water treatment system employed - all in accordance with the latest BG01 Guidelines. Once set up for unattended operation, all the user needs to do is monitor for any operational alarms and undertake a very simple check every three days, which is completed without interfering with boiler operation and is acknowledged to the boiler control system thereby ensuring the tests are completed to the operating schedule. This system exceeds the requirements of BG01 Arrangement 2 for unattended operation and can also readily meet BG01 Typical Arrangement 3 with the addition of boiler house monitoring equipment thereby allowing a user to operate their steam system safely and with the minimum of attendance.

Packages of ancillary equipment – including feed water tank, blowdown tank, softener and chemical dosing - are available with the Premium Range, designed to be simple to order through the use of a single ordering code per package. The equipment is also extremely easy to install as it can be supplied as standard skid mounted packages which further reduce site installation costs and time.

"For the majority of our fire tube boiler and steam generator customers we provide process heating solutions based on our existing product ranges, but adapted to meet their often complex energy and process requirements" states Chris Horsley, Managing Director of Babcock Wanson UK. "We have built our business on this and have an enviable reputation for the quality of our product, engineering expertise and ongoing customer service.

"However, not all customers need this level of bespoke design. We have introduced the Premium Range of fire tube boilers for customers with less complex steam requirements. These boilers are supplied as standard packages making them very cost effective and quick and simple to fit. They are highly cost-effective as no engineering time is required in processing an order. It fills a gap in our offering, enable our customers to benefit from an excellent quality product with high integrity controls at a highly affordable price."

Babcock Wanson offers a complete range of products and services for boiler houses and other process heating needs, from steam boilers, thermal fluid heaters, rapid steam generators and hot water boilers to VOC and odour treatment by thermal oxidation, water treatment or process air heating solutions. The company aims to help optimise customer's energy production with high quality products and efficient service.

For more information, please contact Babcock Wanson on 020 8953 7111 or info@babcock-wanson.co.uk or go to www.babcock-wanson.co.uk

Riello introduces low NOx versions to popular RS series

Riello has introduced low NOx (<80mg/kWh) 'blue flame' versions to all sizes of its RS range of burners. This is achieved through the use of a low NOx combustion head to ensure emissions conforming to EN 676 Class 3 in capacities from 3,600 kW to 6,250 kW.

The RS series of high-power monoblock burners is characterised by the advanced technological developments that have contributed to its design and energy-efficient performance, delivering high power levels whilst minimising size and weight. Dual fuel RLS low NOx models will soon also be available, featuring a dedicated pump motor to ensure a long life for the oil pump, combined with energy-savings.

RS models 310, 410, 510 and 610 are available in various air-fuel ratio control configurations, with the option of mechanical cam or electronic cam for modulation control. Variable speed drive technology ensures both low noise and electrical power savings.

Easy access to internal components through a hinged panel facilitates speed of commissioning and maintenance.

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New white paper examines complimentary condition monitoring technologies.

Gill Sensors & Controls have produced a white paper which examines how oil condition monitoring can complement vibration monitoring, providing a comprehensive set of tools to help maintenance engineers achieve an in-depth view of machinery health.

The introduction of a predictive maintenance (PDM) strategy can equip the engineer with the data to help them identify and rectify problems before they can lead to failures causing unplanned downtime. The use of PDM can eliminate those recurring reliability issues leading to improved machinery availability KPI's.

The strategy relies on monitoring the health of the equipment using a number of techniques, which can include fitting sensors to provide continuous, real-time measurement to identify potential problems. The sensors offer a range of different measurement parameters, including vibration, Ultrasound, Lubricant analysis, Acoustic, Thermography and Video analysis.

The type of condition monitoring sensors and techniques that would be used will be guided by the equipment to be monitored and its application. It may well be that to provide the data necessary to provide a complete picture of the machinery's condition, more than one type of measurement technique needs to be used.

Vibration monitoring is one of the most commonly used condition monitoring techniques and in their whitepaper, Gill examines how partnering oil condition sensors alongside vibration measurement can provide the engineer with a picture of machinery health, comprehensive enough to eliminate the many causes of reliability issues.

This complimentary approach between vibration and oil condition provides in-depth insight into the primary root causes of machine failure; balance, alignment, looseness, lubricant quality and contamination. By having the ability to monitor these five key failure modes provides engineers with the tools to help achieve maximum machinery availability while keeping down maintenance costs.

The conclusion of the whitepaper? Vibration and oil condition sensors are complimentary, not competitive.

Read the whitepaper here https://www.gillsc.com/oilcondition, contact us at support@gillsc.com or give us a call on +44 (0) 1590 613900

Alternatively our partners PCMS Engineering (pcmseng.co.uk) will be happy to advise you on their range of reliability services.

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ATEX certified condition monitoring made simple

Now ATEX and IECEx certified, the Machine Sentry® condition monitoring system can now be used in a diverse range of industries from hazardous oil and gas applications right through to pharmaceutical and food and beverage.

The Machine Sentry® predictive technology platform integrates a wide range of condition monitoring techniques as well as watchkeeping data into one easy to access database (fully inclusive of thermography, oil analysis, vibration, visual inspection, planned maintenance, process parameters and lubrication management). It provides the first fully integrated and effective Condition Based Maintenance (CBM) solution to the industry today. This enables effective maintenance planning and reporting.

Utilizing the power and accessibility of the internet through Wi-Fi and mobile networks, data can be easily acquired and accessed anywhere in the world from any web enabled device. Use of hazardous area certified Android tablets or smart phones, means Machine Sentry® can now be used in the harshest environments making it the most versatile, user friendly and cost effective solution for condition monitoring for expert and inexperienced users.

The wireless tri-axial vibration sensor is up to five times faster than other solutions. With a 60 hour battery life this enables even most frequent user to take vibration and temperature readings from the same easy to use sensor. Correct positioning can also be assured with a base plate attachment and with a simple to follow diagram prompt on the data collector. Designed to endure the test of time, the sensor is IP67 rated, and can survive a 1m drop.

Additionally, with the power of Bluetooth technology, access to previously inaccessible vibration measurement points is now possible with no need for awkward cables leading to much improved ease of use and manipulation for safer operation in the most difficult to access areas.

Machine Sentry® also boasts an automatic fault diagnosis assistant to help identify potential issues with rotating equipment and support the most inexperienced users. This, combined with access to AVT's team of condition monitoring experts, provides the platform necessary to deploy an effective condition monitoring strategy regardless of whether the user is a proficient condition monitoring engineer or complete beginner. The flexibility of the tool and software makes it scalable and versatile enough to suits the needs of all.

Frederic Thomas, Managing Director, AVT Reliability said, "AVT Reliability is delighted and proud to bring this new solution to the market. The ATEX and IECEx accreditation was a natural progression and complement to our current product range. We believe this is the most effective tool on the market today which will revolutionise the approach to traditional condition monitoring provisions being deployed without having to trade off any technical abilities."

To support the new classification, AVT Reliability also supplies data collection devices suitable for use in hazardous areas as defined by the ATEX Workplace Directive.

For more information on Machine Sentry, visit www.machinesentry.com.
To find out more about AVT Reliability, visit: www.avtreliability.com.

Condition Monitoring Expert Tip

One technology is not enough There is no doubt that technologies such as vibration analysis, oil analysis, ultrasound and infrared are very powerful.

They can tell you a great deal about fault conditions in rotating machinery, electrical systems, and more. But if the criticality warrants it, you will be in a much stronger position if you have multiple technologies indicating that a fault condition exists rather than relying on just one.

For example, if vibration analysis indicates there is a problem in a gearbox, oil analysis can confirm the fault with the presence of wear particles. In the case of vibration analysis, you can utilize high frequency analysis, spectrum analysis, time waveform analysis, and phase analysis to enable you to validate your diagnosis.

There can be a great deal at stake when you make a diagnostic call on a piece of equipment. More so if it is critical equipment. At the very least, a false diagnosis may lead to equipment failure (if you miss the fault condition) or it can lead to unnecessary work and downtime. What's more, your reputation is at stake. Sadly, people often forget when you make the right call, but it can take years for people to forget when you make the wrong call.

This tip is provided by Jason Tranter, Managing Director of Mobius Institute.

For more visit: mobiusinstitute.com

Mobius Institute hosts honorable Keynote at IMVAC Orlando: Major Brian Shul, Vietnam War Veteran

Mobius Institute is hosting the International Machinery Vibration Analysis Conference (IMVAC) featuring presentations on Vibration, Ultrasound, Motor Testing, Align/Balancing, Infrared, and Lubrication in Orlando, Florida November 6-9, 2017 at the B Resort and Spa in Disney World.

Bonus fourth day November 9th including two plant tours, two workshops, and two certification exams. Condition Monitoring is foundational to a sustainable reliability program, topics on Condition Monitoring have become rare and practitioners have few opportunities to learn from others in the field outside their own company. IMVAC is specifically for vibration analysts, condition monitoring specialists and reliability professionals. We want to share the successes of practical examples and inform practitioners of the new innovations available to manage equipment condition.

We are honored to have Major Brian Shul, Vietnam War Veteran as our Keynote address. During the Vietnam War Brian flew 212 close air support missions as an Air Force fighter pilot. Brian was shot down near the Cambodian border, was unable to eject, and forced to crash land his plane into the jungle. Severely burned in the ensuing crash, he was given up for dead. Rescued by Special Forces, Brian endured one year in military hospitals where he underwent 15 surgical procedures and was told he would never fly again.

After much physical therapy, Brian miraculously returned to active duty flying. He flew the A-7D, was an instructor in the A-10, and went on to teach at the Air Force's Top Gun School. He culminated his Air Force career by flying our nation's Top-Secret spy plane, the SR-71 Blackbird, the fastest aircraft ever built. Brian flew covert missions in the Blackbird for four years and was the pilot who provided President Reagan with detailed photos of Libyan terrorist camps in 1986. During that time, he became the only SR-71 pilot in history to fly three missions on three consecutive days. He is also the only man to fly extensively with both the Navy's Blue Angels and Air Force Thunderbirds. Brian is a Spirit of Freedom Award winner, a Paul Harris Fellow, has appeared on the History Channel, and in 2011 was inducted into the Air Force Legends Hall of Fame.

Mark your calendar to come and see Major Brian Shul's keynote address at the International Machinery Vibration Analysis Conference (IMVAC Orlando) powered by Mobius Institute featuring Condition Monitoring presentations on Vibration, Ultrasound, Motor Testing, Alignment/Balancing, Infrared, and Lubrication. IMVAC will be held in Orlando, Florida November 6-8, 2017 at the beautiful Lake Buena Vista B Resort in Disney World Florida.

As a SPECIAL THANK YOU TO OUR MILITARY (active and retired), we would like to offer all Military personnel a special discount of 50% off the current registration rate.

Visit our website:
www.vibrationconference.com,
call (+1) 206-842-4000 ext. 3,
or email Kaitie at:
kaitie.conly@mobiusinstitute.com.
Hope to see you there!

Wireless Monitoring of the Toowoomba Second Range Crossing

'Climbing the range
your ears pop like champagne...'
You can smell the peace up here.
The proportion, the narrowness...'
'It moves, but oh so slowly
you would have to sleep years,
waking suddenly once in a decade
to surprise it in the act of change.'

The Provincial City by Bruce Dawe

The Toowoomba Region is an area located in Queensland (Australia). The region was established in 2008 and brought together 8 districts, the largest of which is called Toowoomba City. It is the sixth largest in Queensland and the is known as the "Garden City" as it has over 150 public parks and gardens. The dramatic landscape and the city itself are on the edge of an escarpment 700-800m above sea level. The city inspired the poet Bruce Dawe to write about his homeland in The Provincial City poem.

The area is steeped in a rich Aboriginal history with the indigenous tribes of the Jagera, Giabal and Jarowair inhabiting the area and the foothills of the escarpment for over 40,000 years before the first European settlers arrived. The roots of the city itself go back officially to relatively recently in comparison, it was only between 1860-1887 that it was recognised as a town. However, it was first established by Thomas Alford in 1852 when he decided to squat on some land north of Dryton, called 'The Swamp'. He called his property Toowoomba, which either means 'The Swamp' or refers to a variety of melon and reed that grows on the banks of the swamp. The name is actually thought to be a mixture of several Aboriginal words; Tchwampa – the swamp, Choowoom – native melon and Woomba Woomba – 'reeds in the swamp'.

The town started to expand rapidly after a train station was built in 1867 and it remains the oldest surviving masonry station building in Queensland. This listed heritage railway station serves the Western railway line between south-east and south-west regions of Queensland and is approximately 810km long. The line was pivotal in the development of southern Queensland by European settlers. The adjacent highway has slowly developed over the years and now replaces the train line as the dominant mode for transporting passengers, although there is still a twice weekly service. The train line does still carry cattle, grain, freight and most recently 1-2 tonnes a month of coal from a newly opened mine. Part of the track is no longer in service after a truck, carrying ammonium nitrate, exploded and severely damaged one of the railway bridges.

The Toowoomba Second Range Crossing is the largest Australian Government funding commitment to a single road project in Queensland's history. The cost is over $1.6 billion, jointly funded by the Australian federal and Queensland state governments, across 41km of terrain and will take 3 years. The crossing is a bypass route which takes heavy road traffic around the steep terrain of The Great Dividing Range instead of through it. This benefits the area by taking 80% of heavy freight away from the central Toowoomba area, bypassing up to 18 sets of traffic lights and reliably reducing travel times by 40 minutes.

The new route is planned to cover 41km of bypass, a cutting at the top of the range, 24 bridges, 6 interchanges, 9 creeks and an 800m viaduct going over two rail lines. The route also carries a toll road, pavements, cuttings, structures and underground services.

In August 2015, Nexus Infrastructure (comprising of Plenary Group, Cintra and Acciona Infrastructure Australia) successfully won the contract to design, construct, operate and maintain the Toowoomba Second Range Crossing. Position Partners,

Above: Goods train at the Toowoomba railway station (1890)

Australia's leading provider of geospatial solutions, was brought on board to provide monitoring technology on this grand project.

Due to the abundance of nearby rock the Toowoomba Second Range Crossing is being built using a process called 'cut and fill'. The process involves cutting into the earth using excavators, scrapers and blasting (depending on the material) and then moving it to fill a space, build up an embankment or create a completely new area. Controlled blasting is only to be used as a last resort on the higher strength rock and can be unpredictable at times due to the constantly changing conditions and the geological make-up of the region. Safety is of the utmost importance and if blasting is used, then notice is given to motorists and local residents. A big concern is that the blast shock and other ground works can affect the rail tracks
situated nearby and also could potentially cause a land slide. After a full survey of the area and review of all of the different construction works around this vast site, Position Partners quickly recognised that a highly accurate system was required to monitor the Brisbane-Toowoomba Railway and its surrounding embankments and various precarious large boulders during early earthwork, piling and blasting activity.

Position Partners had recently become the Oceania partners to a leading wireless remote condition monitoring company called Senceive. Senceive, although based in London UK and with 12 years of successful deployments on UK infrastructure, are expanding rapidly globally, on the back of recognition that wireless asset monitoring is quicker, easier, cheaper and safer in the rail and construction industry. Their FlatMesh™ wireless solution was selected as it is specifically designed for challenging and remote locations, is completely wire and mains power free and has up to 15 years battery life. With little/no planned maintenance, they can also be quickly and easily deployed to other areas as work progresses.

Above: Senceive wireless tilt nodes monitoring the rail track and a retaining wall. A solar powered 3G Gateway.

The initial monitoring area was located directly under the bridge path where two rail lines ran. 42 wireless tilt nodes were positioned on the sleepers of the two tracks, measuring cant and twist. These were positioned at 3m intervals on one track and at 9m on the other. The reporting rates of the nodes could be easily adjusted remotely and were initially set at a 30 minute rate.

The data was then relayed to back to solar powered 3G Gateways. These Gateways were connected to the mobile network and the data could be easily viewed anywhere in the world using the Senceive WebMonitor™ software, and with the option to be seen through other software packages if required. A further 21 tilt nodes monitored the embankment next to the tracks, a retaining wall and multiple boulders on the side of the valley in order to identify any suspicious movement towards the tracks.

After several months, the first phase of work was finished and monitoring was now required several hundred metres to the south to monitor a blasting cut. 58 of the tilt nodes were easily relocated and reconfigured in only a few hours to monitor a larger portion of tracks with different specifications. These were placed at 5m spacings and the bracketry was changed to suit the new application.

In addition to providing highly stable, easy to view reliable readings (a resolution of 0.001° and repeatability of ±0.003°) which helped keep the public and site workers safe, Senceive was able to provide the Toowoomba Second Range Crossing project with a bespoke, quick and easily adaptable system. The easy to install, innovative FlatMesh™ system saved on cost and time as well as eliminating the need for any maintenance. Most importantly it provided the flexibility, reliability and accuracy of data focusing on the safety and reassurance that the project expected.

The whole project is due to be completed during 2018 and now that construction is in full flow, every week yields a breakthrough achievement. Just last month the first of 22 sections of the viaduct were successfully put in place, which will eventually make up the 800m long bridge over the historic Queensland rail line. This momentous occasion was marked with a visit from the Queensland Minister for Main Roads and Road Safety, Mark Bailey, as well as other federal dignitaries such as John McVeigh of Groom. Lastly, we would like to wish a very happy 150th birthday to the Toowoomba train station, which has always been at the heart of the Queensland rail line, which itself is truly the backbone to southern Queensland and the route to its successful growth.

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Proven Unparalleled Wireless Tilt Sensing

- Launching new easy to deploy sensors
- Uses the existing/proven FlatMesh™ platform
- Tens of thousands of sensors already deployed

The FlatMesh™ Nano range has its own unique miniature form and is explicitly designed for Rail and Construction sectors to provide unbeatable tilt sensing. This easy to deploy tilt sensor node has no external aerial and a durable shell (IP68 rated) that can withstand the harshest environments.

The Nano's discreet form and wide range of simple fixings allow for extremely quick installation to any surface using glue, screw or magnetic mounting. Its innovative design allows the Nano to be installed in any orientation and is ideal for tunnels, bridges, buildings and on retaining walls.

With reporting rates possible even down to a few seconds, the Nano has a resolution of 0.0001° (0.0018mm/m), and repeatability of ±0.0005°. The Nano's unrivalled specifications make it the true future of wireless tilt sensing.

Visit
Senceive on stand C1.020 between Sept 26th-28th at Intergeo, Berlin

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Wireless condition monitoring
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Top 6 Water Treatment Tips For Lasting Chiller Performance

Chillers are the backbone of commercial and industrial cooling systems across the country. However, they are not a 'fit and forget' solution, and there are some easy ways to look after your chiller to ensure it lasts 10 years and more.

Water treatment is a fundamental part of a chiller's operation and maintenance. Most maintenance engineers know that if a chiller's water and glycol mix is incorrect, the effects can be rapid and disastrous, leading to corrosion, system deterioration, and leaks, as well as the build-up of rust, scale, algae and debris. However, having a simple 'watch list' will help to avoid a crisis.

Here, Brent Hall, Technical Manager at temperature control specialists ICS Cool Energy, offers his top six tips for prolonging a chiller's life and help keep it performing as efficiently as possible.

1) Don't forget inhibitors

Glycol is an essential element of any heat transfer fluid used as part of a chilled water system, as it allows the fluid to be sufficiently chilled without freezing. However, an uninhibited glycol system can pose even more of a risk than plain water due to the highly corrosive nature of most glycols, so inhibitors must be used at all times.

For those operating in areas where there is a risk of incidental human contact, such as the food processing industry, the wrong inhibitors in an MPG solution creates a serious contamination risk, but an NSF-accredited glycol overcomes that.

2) Take regular water samples from various parts of the system.

Corrosion and degradation can happen anywhere within a system and it's not enough to take water samples from just one location. Samples need to be taken from available access points around the system and especially from high risk areas such as heat exchangers, cooling jackets and any other sensitive product-fluid interfaces.

3) Test fluid pH levels

Not taking pH level readings as part of routine water sampling can have a major negative impact on a system's performance. While chiller pH tolerances will vary slightly depending on the materials used, I would recommend limits of 8.0 – 8.5. Incorrect pH levels may indicate that either not enough inhibitors have been used, or the glycol levels are too concentrated. Both scenarios can very quickly cause high levels of corrosion throughout a system if left unchecked, leading to costly maintenance bills and unplanned downtime.

4) Check the clarity of the sample

Not all tests are as in-depth as pH level, and one of the most obvious signs that a chiller system is degrading or corroding internally is when there's visible debris in the water sample. A water sample from a chiller operating correctly should be clear and if it's not, then there's already some internal system damage. This needs to be addressed immediately as the debris can soon lead to blockages in key areas of operation such as the heat exchanger, which will rapidly decrease the chiller's efficiency.

5) Chemically flush your system and chiller immediately after installation

As soon as a new chiller is installed, the whole system should be flushed immediately to ensure the fluid is completely free from contaminants and at the highest quality possible, with no legacy debris or surface contamination present to cause damage to the fluid, the pipework and the new equipment. This golden rule should be followed whether it's a permanent or temporary installation for planned or reactive maintenance.

6) When in doubt, consult the experts.

Given the intricacies of taking a thorough and correct chilled water system sample, sometimes it pays to call in an expert. Regular water sampling and off-site laboratory analysis is available as part of some chiller manufacturer's aftersales and servicing packages – including Planned Preventative Maintenance Packages (PPM) from ICS Cool Energy.

For more information about ICS Cool Energy, please visit www.icscoolenergy.com
email info@icscoolenergy.com
or call 0800 774 7426.
Follow ICS Cool Energy on Twitter @icscoolenergy.

Advances In Evaporative Cooling Controls Can Further Reduce Cooling Costs For Industrial Facilities

Save up to 90% on your cooling costs using EcoCooling

Everyone is aware that simple ventilation can provide a perfectly satisfactory solution to cooling many industrial and commercial premises. However recent advances in fan technology, controls and evaporative cooling have now taken this principle to a new level of performance.

Electrically Commutated Fans

At the heart of any ventilation system is the fan. For both room temperature management and efficiency, fan speed control is essential. This is also demanded by local regulations and European Energy Directives. Traditional fans have induction motors typically controlled using variable frequency inverters or voltage control. This approach has now been replaced with Electronically Commutated (EC) fans which have significant advantages over the traditional AC fans. An EC fan uses both AC and DC voltages. AC is supplied directly to the fan motor and internal electronics convert this to DC to power a fixed magnet DC motor. This provides a very efficient motor with very precise speed control. An EC fan will approximately follow a cube rule for energy consumption which means running an EC fan at half speed uses only 12.5% of the full speed power. In addition to this, capital cost and complexity is reduced relative to AC fans through avoidance of external speed controllers.

Direct Evaporative Cooling

For many buildings ventilation can service all of the cooling needs for over 90% of the time. In warm weather a refrigeration based cooling system is often used to reduce internal temperatures. This is both expensive to install and to operate. In many applications the refrigeration element can now be replaced by direct evaporative cooling, where the hot air is passed over simple wetted filters and the air is cooled by evaporation. Evaporative cooling supplements the ventilation system providing cool air only when the outside temperature goes above a given set point. In the UK this process can provide a supply air temperature below 20°C for 99% of the time and never go above 24°C. Direct evaporative cooling normally operates at 10% of the energy use of a split air conditioner. Modern direct evaporative coolers have integrated water control systems to maintain hygienic and efficient operation which complies with or exceeds all legionella regulations.

Programmable Controllers

A new generation of low cost Programmable Logic Controllers (PLC's) are now available which provide a simple method to manage ventilation systems. The controller typically takes inputs from temperature, relative humidity and carbon dioxide sensors and produces control signals to operate fans, dampers and control valves using internal logic. Inputs and outputs are either digital (on/off), analogue (variable) or instructions sent over a network. These controllers will communicate with all the components of a ventilation system to optimise heating, cooling and fan energy use. Some PLC manufacturers provide open licence software for the user to develop their own solutions using simple logic programming tools.

PLC's can operate in isolation or as part of a network. Whilst network protocols can be complex the modern PLC can communicate using Modbus or TCP/IP based systems. This allows completely integrated solutions for building management. A further opportunity exists with the availability of affordable touch screens or Human Machine Interfaces (HMIs). These provide a straightforward solution to providing the end user with set point management, data and event logging and mimics together with email notification. Many HMIs also incorporate remote access with the ability to view and control the ventilation system remotely.

Above: EcoCooling ECP08 Side discharge Industrial Cooling Installation

Smart Control – Cost effective solutions revolutionise industrial adiabatic cooling

There have been a number of developments in control systems recently that have opened the door to broader applications for this technology. While previously the advanced control system was only applied to IT scenarios, new hardware has allowed EcoCooling to provide a cost effective version which is now available for industrial and warehouse cooling. Benefits include:

- Closer control of temperature and energy monitoring
- Remote access
- Real-time analysis of temperature and humidity from tablet devices
- Touchscreen interface
- Can be used for combined ventilation, cooling and heating projects
- Easy connectivity - Modbus and Ethernet (For BMS/Fire suppressant systems etc.)

Above: Large Data Centre Cooled Using 60kW Modules

Some examples of how these technologies are applied in different sectors shall now be explained.

Computer Room Cooling

All IT equipment in server rooms and data centres requires cooling. A ventilation system supplemented with direct evaporative cooling can reduce the cooling energy bill by over 95%. Because there is normally extra cooling capacity for redundancy the fans run at slow speed which further reduces costs. Master and Slave PLC arrangements also provide a resilient solution to cooling. Direct evaporative cooling is only employed for <10% of the time. HMI's and PLC's can be remotely monitored and programmed for commissioning and day to day support.

Pharmaceutical Warehouse Cooling

Many locations can maintain MHRA compliant conditions by using only 'free cooling' (fresh air). Multiple EC fans can be connected directly to simple temperature controllers giving the simplest of automated solutions. PLC's can be used where more stringent conditions have to be met or when heating and cooling systems need to be integrated. Data capture can be extended to provide Mean Kinetic Temperature analysis which can be used in demonstration of compliance.

In conclusion –Ventilation coupled with evaporative cooling and modern controls can provide industrial and commercial premises with a sophisticated air handling system that can compare with any air cooling refrigeration system at a fraction of the energy cost and provide a high level of control of the environment.

SPOTLIGHT CASE STUDY Leading Retailer, Industrial Cooling.

A leading retailer was experiencing temperatures of more than 40°C during the summer months in their UK distribution centres, with staff describing the working conditions as unbearable. The high temperatures also resulted in staff having to take regular water breaks. There was no choice but to look for a feasible cooling solution for the facility.

The cost of conventional air conditioning for the whole centre would have been unrealistic. EcoCooling's evaporative cooling and air handling solutions has provided the cooling they required to maintain bearable temperatures for a cost effective installation and at a sensible operating cost.

Performance:

The EcoCooling system provided fresh air spot cooling to the extreme areas while also gently cooling the rest of the centre. The new system has made more comfortable and happy staff and is costing the company less in water and break time and has provided a promising response from the Health and Safety committee.

Based on the success of the initial installation, this retailer has since commissioned an additional 4 sites with EcoCooling systems.

Would you be interested in a free site survey for your warehouse, data centre or commercial building? Contact us on the details below:

Contact Details:
Sales@ecocooling.org
www.ecocooling.org
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Save 90% On Cooling Costs With EcoCooling

Energy Efficient Cooling

EcoCooling
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Ventilation and Evaporative Cooling

Use outside air most of the year in the UK | Energy efficient natural cooling for the warmer days | No refrigerants | 3500 installations worldwide | UK based

Industrial and Commercial Cooling

Utilises free cooling up to 90% | Energy efficient natural cooling | No refrigerants | 3000 installations worldwide | Warehouses | Stores | Bakeries | Production Lines| Print Lines | Manufacturing | Telecoms

Data Centre and IT Cooling

Achieve PUE of <1.1 | ASHRAE Compliant | ROI in 1 year | Telecoms | Data centres | IT and server rooms | UPS rooms | New build and retrofit

Low Cost, Resilient Control Systems

Remote monitoring | Versatile connections to BMS and fire systems | In-built resilience| Touch screen interface | Energy monitoring | Email alarm options

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Energy savings calculator available | Relevant case studies and testimonials | Clients include Premier Foods, Butchers Pet Foods, Subway, Marks and Spencers, Cott Beverages, Diageo, Cummins Diesel, TK Maxx, Rolls Royce and BT |

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Climate Control In The Food Industry

Climate control of enclosures using water cooling is highly efficient, especially if there is already a central cold water supply available in the production plant.

The new Hygienic Design air/water heat exchangers from Rittal are ideally suited to the food industry, where hygiene standards are exceptionally stringent.

Hygiene is an absolute must in the food industry: machinery, plant and components must readily withstand daily cleaning with pressure washers and jet steam cleaners. All surfaces must also be easy to clean, and/or designed to prevent contaminants from adhering to them.

Use water cooling to dissipate heat

Liquid cooling of enclosures offers a number of benefits: Because water has a higher thermal capacity than air, liquid cooling can dissipate large quantities of heat. What's more, industrial environments often already have a central cooling water supply available that can be used for enclosure cooling. All that's left to do is to mount suitable air/water heat exchangers on the enclosure. With Hygienic Design, it is particularly important that no air exchange takes place between the enclosure and the environment.

Rittal has revamped its air/water heat exchangers, and can now offer its clients in the food industry two variants of Hygienic Design. Air/water heat exchangers for wall mounting can supply cooling outputs of either 0.65 kW or 1.2 kW. The hygienic design reduces the risk of contamination in the food industry, thus helping to ensure product safety.

Modified design

Rittal has modified the design of Hygienic Design in a number of respects.

For example, the attachment to the enclosure wall using threaded bolts and nuts has been designed so that the screw fastening is not visible from the outside. The enclosure is made from stainless steel with a brushed grain size of 400, producing a surface roughness Ra of less than 0.8 µm. The smooth surface finish is easy to clean and disinfect. There are no hard-to-clean gaps where contamination could collect.

The silicone seal between the enclosure and the case prevents the transfer of colourants, flavourings and unwanted odours. The seal eliminates gaps between the air/water heat exchanger and the enclosure which would be difficult to clean.

The seals are available as spare parts, and are easily replaced in the event of mechanical damage. The seals are dyed blue in accordance with FDA Guideline 21 CFR 177.2600, making them clearly distinguishable from contaminants such as food residues. The flat seals on the water connection fittings are likewise dyed blue, and geometrically designed to sit flush against the shape of the fitting. A metal end stop prevents compression of the seal, so that edges cannot protrude and allow contaminants or micro-organisms to accumulate.

Tested hygiene

The top of the enclosure tilts forwards by 30 degrees. This prevents objects from being placed on top of the enclosure, while at the same time ensuring that liquids, such as detergents and disinfectants, run off quickly.

Air/water heat exchangers have protection categories of IP56/59, meeting the demanding requirements of pressure washing and steam cleaning.

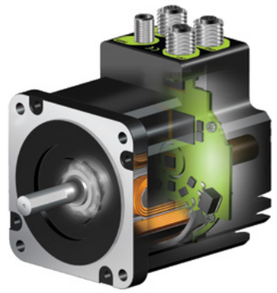
The air/water heat exchangers have C-UR and CSA approval, making them suitable for international use.

The Hygienic Design was tested by the DGUV Food department testing and certification agency in accordance with GS-NV 6 (test principles for hygiene). The devices comply with standard DIN EN ISO 14159:2008 and are suitable for use in the food sector in conformity with DIN EN 1672-2:2009.

Further information at www.rittal.co.uk and www.friedhelm-loh-group.com
or on twitter @rittal_ltd.

Closed-Loop Integrated Stepper Motors Feature Magnetic Or Absolute Encoder Feedback

JVL presents a new innovative closed-loop stepper motor technology for its NEMA 23 & 34 integrated stepper motor range from 0,1 to 12 Nm.



JVL, the European leader in the development of integrated servo and stepper motor technology, has now again developed a new and unique product in the field of integrated motor control.

Smart digital design and very high update rates (36 MHz) means there is no need of any manual adjustment or setup. It works like a perfect stepper motor benefitting from the servo motor technology.

New Innovative Technology

JVL closed-loop integrated stepper motors, QuickStep®, provide higher torque, faster acceleration, torque control, stall free operation and quieter movements than traditional step motor systems. QuickStep do this with greater efficiency and less motor heating because motor phase current are regulated up and down according to need. Performance of JVL closed-loop steppers are similar to servo motors, but with higher torque and often without need of gearbox, resulting in a more inexpensive solution. Design safety factors have always been high for stepper motors to ensure stall-free operation – now with QuickStep closed-loop control design can be very close to the limit resulting in even lower costs. QuickStep is a true closed-loop control system that compensates step angle errors during a movement and correct errors within a full step. If load becomes too high speed is lowered and position errors will always stay within two full-steps.

Advantages compared to open loop stepper motors

- Position feedback and control
- Fast and easy commissioning. No tuning needed
- No stalling. No step losses at all
- Torque control
- Much faster positioning and more cycles per second
- Increased efficiency and thereby much lower temperature
- Shorter settling time
- Controls higher inertias than open loop steppers
- Higher load tolerance
- More quiet operation (lower acoustic noise)
- Longer lifetime due to lower temperature
- Correct positioning without overshoot and oscillation

Advantages compared to servo motors

- Very high Torque at low speed. Often 3-4 times higher in same motor flange size
- Very high ratio-of-inertia, often up to 40:1
- Faster commissioning. No tuning needed
- Lower price. Same price as open loop steppers
- Totally stiff at standstill. Full holding torque
- Direct drive without gearbox (better and more precise torque control)
- Correct positioning without overshoot
- No oscillation
- Very short settling time

Benefit in these application from closed-loop stepper motors

- Multiple axis applications (RS485, CANopen)
- Industrial Ethernet: Profinet, EtherNet/IP, EtherCAT, Powerlink, Modbus TCP, SERCOS III
- Magnetic or Absolute Encoder Feedback
- Positioning tasks with load changes
- Applications that require quiet operation, short settling times and precision positioning

Applications include

- Winding applications
- Belt drives (start/stop, positioning)
- Dosing pumps and filler systems
- Semi-conductor mounting
- Wafer production
- Textile machines and industrial sewing machines
- Robotics
- Testing and inspection systems

Further information
Email: sales@electromate.com
Visit: www.electromate.com

Product Spotlight

Manufacturing Tube Cleaning And Maintenance Equipment For A Wide Range Of Customer Applications.

For over 40 years Goodway have been manufacturing tube cleaning and maintenance equipment for a wide range of customer applications.

Our experience and expertise have allowed us to develop a wide range of maintenance solutions and tools to ensure that your HVAC system, Boiler and Plant Machinery remains in the best possible working condition. A well maintained system will not only save you time but money too.

We're able to offer a wide range of equipment from Tube Cleaners, Industrial Vacuum Cleaners and Cooling Tower Maintenance; As well as a wide range of spares and accessories from Tube Brushes, Spare Hoses, Buffing and Scraping Tools as well as Coil Cleaning chemicals.

These are challenging times for industry, particularly with increased energy costs and heightened environmental concerns. Goodway has been saving energy costs to the benefit of both customer and the environment long before it became the current vogue.

Our advice to customers has always been the same, take a look around your facility both on the energy consumption side and in your production areas. Do you find tubes, that if cleaned regularly (and with less down time), that you could not only save money on fuel but would increase production output? We also advise that you take a look at how you currently clean and at what cost. It costs nothing to talk to us and we are always happy to discuss customers concerns and to give confidential advice on any tube cleaning requirements.

We've always been green! While the rest of the world is just catching on, Goodway has been committed to greater energy efficiency since we started. Our products will help keep your equipment running at peak efficiency, saving energy, money and producing less pollutants.

Exclusively distributed by us within the United Kingdom & The Republic of Ireland.

For further information visit:
www.goodwaytubecleaning.com

New Video Guide to WCB Universal Twin Screw Pumps

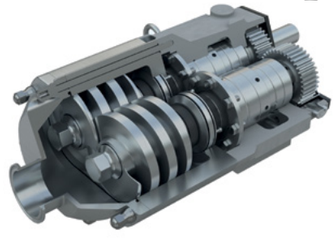
SPX FLOW has created a series of maintenance video tutorials to help users efficiently and correctly maintain their equipment.

The latest of these covers the new hygienic Waukesha Cherry-Burrell (WCB) Universal Twin Screw (UTS) Pump range.

DELAVAN, WI, USA August 15, 2017 – SPX FLOW is committed to providing excellent support and ensuring customers get the most from their equipment. As part of this regime, a series of maintenance videos have been created which provide clear, step-by-step guides to the correct maintenance procedures for SPX FLOW pumps, valves and other products. Properly maintaining equipment is an essential part of keeping processes running smoothly and reliably. The videos are designed to help ensure customers optimize product performance throughout the lifetime of their investment.

The WCB UTS pump is designed for enhanced reliability and productivity. It offers gentle product handling and hygienic performance across a wide range of applications in the food and beverage, dairy, pharmaceutical, cosmetics and chemical industries. By using a special non-galling “Waukesha 88” alloy, the pump is designed with tight clearances without the risk of seizing. The resulting operation provides excellent performance and reliability with low slip pulse even in applications with low inlet pressures. Other benefits of this pump include the flexible application with a wide range of operating speeds, low noise, reduced pressure fluctuations and bi-directional flow capability which may reduce the total number of pumps required for a process.

The new WCB UTS maintenance video provides an easy to follow guide to help technicians carry out efficient disassembly, maintenance and re-assembly of the unit with confidence. It includes inspection and replacement of gaskets and seals either with or without removing the pump body. The video covers standard maintenance steps as well as the process for timing of the screws on re-assembly for continued smooth operation. It highlights the variances between different models in the range along with specific safety guidance and the tools required to complete the maintenance process.



The clear instructions and images provided in this latest video will help ensure maintenance of the UTS pump is carried out both correctly and efficiently. Following this guide will help to properly maintain the pump in order to maximize its operating life and keep processes running smoothly and reliably.

The service videos are available online and are part of SPX FLOW’s commitment to helping customers get the most from their investment. The new WCB UTS pump maintenance video can be found on YouTube: www.youtube.com/watch?v=PomlLSOOPYc

For more information about the benefits of the Universal Twin Screw pump or any other SPX FLOW solutions, please visit www.spxflow.com

Elesa at SPE Offshore Europe Exhibition, Aberdeen, 5th – 8th September, Stand No: 3A200

Elesa are excited to display their offshore related standard elements at the forthcoming SPE Offshore Europe Exhibition in Aberdeen this September, 5th – 8th.

The Elesa stand will focus especially on their new ATEX range of hydraulic accessories plus a variety of oil level indicators and stainless steel components – from handwheels to levelling feet.

The Elesa ATEX range of hydraulic accessories is designed to help manufacturers meet regulations for dealing with potentially explosive atmospheres. This is expected to include many pumps, anti-spark installations, oil and gas, water and sewage and petrochemical plants, as well as mines and flour mills.

The ATEX rated GN 743.6 oil level indicator is suited for use up to 150°C while the GN 743.3 and 743.5 come in brass and stainless steel with scratch resistant glass. Elesa also have the oil and glycol column level HCK range – and their HFLT/E series is easily customisable by adjusting the length of the float rod.

Further information regarding Elesa products may be found at: elesa.com or follow them on twitter: twitter.com/ElesaUK.

Do your machine tool operators blow coolant and swarf back into the workshop?

Once parts are removed from a machining centre, operators often use an airline and blow off the excess coolant and swarf.

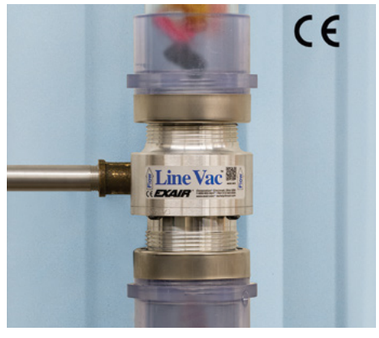
The coolant vaporises and returns to your workshop. Our BD blowdown bench is designed to prevent this problem. It’s self-contained, runs only from compressed air, and captures coolant before it can be recycled. AirBench BD - Blowdown Station for Coolant and Swarf Once you’ve fitted coolant mist filters to your machine tools, BD helps you finish the job of preventing atmospheric MWF contamination.

We are always happy to visit you. Just reply to this email if you would like a demonstration of our products at your site and an assessment of your application.

for further information visit: www.airbench.com

EXAIR’s Threaded Line Vac Makes it Easy to Convert Standard Pipe Into a Powerful, High Volume Conveyor

EXAIRs new aluminum 2-1/2 NPT and 3 NPT Threaded Line Vac Air Operated Conveyors convert ordinary pipe into a powerful conveying system for parts, scrap, trim and other bulk materials.



Their larger size makes them perfect for conveying bigger parts and large volumes of material over long distances. The Threaded Line Vac is designed to attach to standard plumbing pipe couplers, making it easy to build a complete system using pipe and fittings available from any home center, hardware store or plumbers supply.

Threaded Line Vac Conveyors eject a small amount of compressed air to produce a vacuum on one end with high output flows on the other. Response is instantaneous and regulating the compressed air pressure provides infinite control of the conveying rate. Applications include scrap trim removal, material conveying, part transfer, fiber tensioning and filling operations.

Aluminum Threaded Line Vacs are CE compliant and meet OSHA pressure requirements. Smaller sizes down to 3/8 NPT are available in stock. Threaded Line Vac models are also available in type 303 and type 316 stainless steel for more demanding high temperature, corrosive and hygienic environments. Line Vacs also come with smooth ends for use with hose and tubing and Heavy Duty Line Vacs provide abrasion resistance while producing maximum power for high bulk density material. If a secure pipe connection is required where the Line Vac will be frequently removed for cleaning, Sanitary Flange Line Vacs are also available. Aluminum Threaded Line Vac prices start at $110.00.

For more information contact:
EXAIR Corporation
11510 Goldcoast Dr.
Cincinnati, OH 45249-1621
Phone: (800) 903-9247
Fax: (513) 671-3363
E-mail: techelp@exair.com
www.exair.com/al_tlv.htm

Fujifilm Speciality Ink Systems selects Mainsaver CMMS

Spidex Software is pleased to announce that Fujifilm Speciality Ink Systems has selected Mainsaver CMMS to support best-practice management of maintenance at its manufacturing site in Broadstairs, UK.

Fujifilm SIS develops and manufactures inkjet systems for a wide variety of processes. Over the last decade the company has extended its product offerings from the heritage analogue range on which its reputation was founded, to pioneering precision UV curing digital inks.

The company's state-of-the-art facility at Broadstairs has won "Process Plant of the Year" at the Best Factory Awards on four occasions and is viewed as an exemplar of world-class manufacturing performance.

Until recently, Fujifilm was using legacy maintenance management software (CMMS) that had been in place for some years. The CMMS was, ironically, generating significant quantities of paperwork because it required each work order to be printed out.

CMMS project lead Adam Murrell recalls "At the end of each day there was often a bustle of engineers around the PCs, each of them trying to enter work order data into the CMMS that they'd already logged on paper."

As a Continuous Improvement specialist, Murrell could see the flaws in the workflow. And he wasn't the only one. "There was certainly a feeling among the engineers that time spent double-entering information from worksheet to computer could be more productively spent on the tools."

Having decided to evaluate other CMMS options, Adam Murrell requested an online demonstration of Spidex's Mainsaver solution. Impressed with what he saw, he next arranged a more detailed functionality run-through on site.

"From an efficiency perspective, we liked the options Mainsaver gave us for mobile paperless working, the way users can locate an asset by clicking on a schematic layout of the site and the live real-time performance dashboards."

"Spidex also offered a highly structured and detailed implementation plan, which accurately reflected our own view of the project's importance."

Another important factor - as throughout modern manufacturing industry - is the increasing number of audits the company is required to undergo.

Adam Murrell: "We are continually assessed by external bodies for compliance within a range of regulatory frameworks including health & safety, environmental and ISO standards. Each of these audits demands a very high standard of record-keeping for traceability, and those records must be available for examination for years afterwards."

"Compliance is a hugely important aspect of 21st century manufacturing. It's no exaggeration to say that our CMMS requirement was as much about audit performance as process improvement and we are looking to Mainsaver to underpin activity in both areas."

Spidex Managing Director Jonathan Starling commented: "Fujifilm Speciality Ink Systems is a genuine best-in-class manufacturer that continually strives for perfection. It is a privilege to be working with such an exciting, forward-thinking organisation."

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twitter: www.twitter.com/SpidexSoftware

Industrial Gas Accreditation Scheme Courses Available

I-GAS have launched the Industrial Gas Accreditation (I-GAS) Scheme in 2016 and we are now taking applications and bookings for Level 1, Level 2 & Level 3 courses.

The I-GAS Scheme has been designed to take the operatives who may be relatively new to the gas industry or already experienced gas operatives through three levels of Industrial Gas Qualifications, Levels 4 and 5 are currently under development.

Level 1

Industrial Gas Portfolio, Introduction to the requirements of the Gas Safety (Installation & Use) Regulations 1998

Level 2

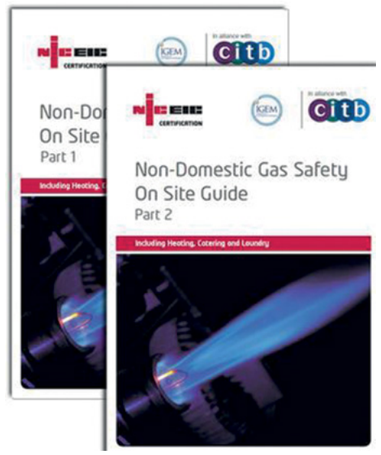
Industrial Gas Maintenance, For maintenance operatives working on gas pipelines & components within premises that are outside the scope of the Gas Safety (Installation & Use) Regulations 1998

Level 3

Industrial Gas Technician, For technicians working outside the scope of the Gas Safety (Installation & Use) Regulations 1998

I-GAS Accreditation is not a legal requirement but is a test of a person's competence in relation to their current knowledge and experience at the time their assessment is completed. It is only one possible component that may help an organisation to demonstrate their corporate responsibility to provide suitable training for employees under the Health and Safety at Work Act and help prove competence.

I-GAS is not a substitute for Gas Safe qualifications which are needed for work on gas installations in a wide variety of domestic and commercial premises and other locations such as hospitals.



To apply for Level 1, 2 or 3 or for any other enquiries please contact the CEA office either by phone or email on
Tel: 01740 625538 or
Email: info@cea.org.uk.

Easy Handling Of Large Quantities

BEUMER Group at the international mining exhibition EXPOSIBRAM 2017 in Brasil

At the international mining exhibition EXPOSIBRAM 2017, which takes place from 18 to 21 September in Belo Horizonte, Brasil, BEUMER Group will present their system solutions in conveying and loading technology at booth Y40.

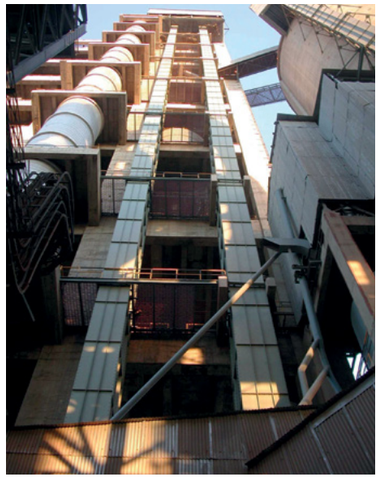
The portfolio includes the complete engineering and the construction of curved troughed belt conveyors and Pipe Conveyors, blending beds, circular stockpiles, as well as transshipment terminals.

BEUMER Group offers curved belt conveyors, used for the transportation of various raw materials like coal or ores over long distances and through rough terrain. These conveyors are designed as open troughed belt conveyors or closed Pipe Conveyors. Material transport with belt conveyors is generally faster, more cost-efficient and environmentally friendly than trucking.

BEUMER offers stackers and bridge scrapers for warehouses with blending bed systems for homogenising large quantities of different types of bulk material efficiently, which ensures the regularity of the raw materials used. Coarse, highly abrasive material can be conveyed to silos by the heavy-duty belt bucket elevators of BEUMER Group.

BEUMER bulk loading heads, which can load large quantities of bulk material fast and virtually dust-free into bulk transporter vehicles, will also be featured. If bags are to be loaded in ships or wagons, various telescoping loading systems are available. The loading system BEUMER autopac stacks filled bags automatically on trucks, without using pallets.

BEUMER at EXPOSIBRAM 2017: booth Y40



For further information visit:
www.beumergroup.com

150 Welders Die Every Year

Welders, and other workers in the manufacturing industry, are suffering from cancer, pneumonia and other lung related illnesses due to lack of protection from poisonous fumes and gases.

New shocking statistics have been released by the Health & Safety Executive (HSE) who are working on a initiative with BOHS (The Chartered Society for Worker Health Protection) called 'Breathe Freely', to raise awareness of the deadly risks present to workers in the manufacturing industry. Out of the 190,000 workers who carry out welding activities each year, 150 of them die from cancer caused by welding. Other statistics released are equally concerning such as 2,200 annual deaths from cancer caused by past work in manufacturing industries and 4,000 people suffering from breathing and lung problems caused or made worse by their work in manufacturing.

It's alarming that we are still seeing statistics that prove business owners are not doing enough to ensure its workforce is protected from the processes that are undertaken in order to produce the goods they sell. Worryingly, regular news of hefty fines costing businesses hundreds of thousands of pounds doesn't seem to be enough of a deterrent to make companies take the necessary action to protect its people.

In support of the campaign, Impact Technical Services are offering a FREE site assessment to all companies within the manufacturing industry, in which the working environment will be assessed and suggestions made to include or improve local exhaust ventilation (LEV). Our efficient and effective solutions suit a wide range of budgets and scenarios, to ensure that LEV solutions are available to businesses of all sizes and turnover.

Tony Bosworth, Operations Director of Impact Technical Services commented:

"We visit many different workplaces, all over the UK, and less than half of them have adequate extraction systems in place to protect their staff from the harmful dust or fumes created by the processes in which they work. We have seen some systems that haven't been installed properly therefore not working effectively, systems that haven't been tested in years, and even workplaces that have no extraction in place whatsoever creating an extremely dangerous working environment. Simple measures can be taken to ensure staff are protected and such measures cost a lot less than the fines employers could be issued with.

This is why we see it so important to offer businesses a free site assessment. We will look at their current methods of dust and fume extraction and assess whether they are effective and efficient enough to actually protect workers. We will also make suggestions on different methods of effective extraction to suit all budgets, to ensure staff are protected in all cases".

Impact has over 25 years of experience providing solutions to many processes within the manufacturing industry such as welding, grinding, sanding, casting, moulding, plating and many more. They are armed with the necessary qualifications and skills to offer you the most effective solutions with the best after care service on the market.

Impact's simple to install solutions such as Downdraught Benches, Wide Pivotal Extraction Hoods and Extraction Arms all provide excellent extraction of harmful dusts and fumes and are extremely cost effective compared to their competitors (and the fines you may face if you don't protect your workforce!). Impact also provide all dust and fume extraction services such as LEV testing, system design, installation and maintenance, air quality testing, fan servicing, and much more.

The HSE make random unannounced visits to businesses every day to ensure adequate protection is in place and working effectively. Don't get caught out, protect your staff.

For more information about Impact Technical Services, please visit:
www.impactairsystems.com

Upbeat Mindset In The Indian Economy

India Day at the EMO Hannover 2017 will be showcasing potentials for production technology and capital investment

Are Modinomics fuelling an industrial renaissance in India? This question will be addressed during the India Day hosted by the VDW (German Machine Tool Builders' Association) at the EMO Hannover 2017 on 20 September. Investors and rating agencies on the Indian stock exchange, at least, are anticipating good business opportunities in the medium term. Jeremy Leonard, Director of Global Industry Services at the British research institute Oxford Economics notes that "More scope for proactive economic stimuli when it comes to the refinancing costs of the commercial banks, plus the planned tax reform for goods and services, could unleash some accelerated dynamics."

A view that's confirmed by V. Anbu, Director General & CEO of the Indian Machine Tool Manufacturers' Association. "Game-changing initiatives such as 'Make in India', opening up of strategic sectors to foreign direct investments, and the implementation of 'One nation, one tax' for goods and services have spurred manufacturing growth", is his firm conviction.

India's economy is growing

India's economy is indeed expanding, as is its industrial production output. In the machine tool industry, the nation ranks 8th among the world's largest markets, with a volume of most recently 1.7 bn euros in 2016. This corresponds to growth of eleven per cent in euros. For 2017/2018, too, a continuingly moderate increase in consumption is predicted. India imports around 70 per cent of the machine tools it needs. In 2016, these were worth approximately 1.2 bn euros.

The EMO's India Day aims in particular to elucidate the perspectives for the mechanical engineering, automaking and aviation user sectors. Dr. Andreas Wolf from Bosch Ltd., for example, sees potential in the automotive industry. "Triggered by the new legislation in regard to vehicle safety and emissions, we're going to be seeing rapid implementation of modern-day technologies," he says. Milind Madhav Shahane, Member of the Board of Directors at Tata Advanced Materials Ltd., sees major opportunities in the growing importance of privately owned companies: "Since the turn of the century, India's aviation industry has been experiencing dynamic

growth at privately managed companies, supported by large conglomerates and their engineering expertise." This is one of the main reasons why United Grinding has opened a subsidiary in Bangalore and set up a technology centre. "This enables us to perform meaningful tests on customers' components and to offer realistic training for machine operators," says C.R. Sudheendra, President India Operations of United Grinding.

India's government keen to attract investors

The EMO's India Day will also be supported by the Indian government. We shall be honoured to host Shri N. Sivanand, Joint Secretary of the Department of Heavy Industry in the Ministry of Heavy Industry & Public Enterprises. He will be spotlighting the government's initiative for boosting the manufacturing sector. We shall also be welcoming six delegations of high-ranking Indian entrepreneurs, which will be organised and accompanied by various Indian customer associations and the staff of the VDMA's liaison office in Kolkata.

"We are particularly gratified to note that it will be almost exclusively Indian speakers or pundits who are thoroughly familiar with the country from their own career experience there who will be presenting their expertise on the India Day," says Gerhard Hein, who is the co-organiser of the India Day at the VDW, who are hosting the EMO. "So we're expecting an exciting event, offering exceptional added value to everyone involved."

More information: Gerhard Hein, VDW, Tel. +49 69 756081-43
g.hein@vdw.de,
Klaus-Peter Kuhnmünch, VDW,
Tel. +49 69 756081-37
kp.kuhnmuench@vdw.de

At a glance

When:

Wednesday, 20 September 2017,

10.00 a.m. to 1.00 p.m.

Where:

Hanover Exhibition Grounds, Convention Centre, Hall 3 B

Programme:

Shri N. Sivanand, *Ministry of Heavy Industry & Public Enterprises*

Government Initiative for promoting manufacturing industry in India

Jeremy Leonard, *Oxford Economics*

Current Situation of the Indian Economy, Outlook on Industrial Production and Investment Activities in Key User-Segments

V. Anbu, *Indian Machine Tool Manufacturers Association*

Overview of Machine Tool Industry in India including technical requirements

Dr. Andreas Wolf, *Bosch Ltd.*

Challenges, Threats and Opportunities from the perspective of an Automotive Supplier in India

Milind Madhav Shahane, *Tata Advance Materials Ltd.*

Potential of Aerospace Industry in India

C.R. Sudheendra, *United Grinding*

Best Practice: Market Activities and Strategical Positioning of United Grinding

Attendance fee: 185 Euros plus VAT (Early booking: 155 Euros plus VAT)

Registration: www.emo-hannover.de

TM Robotics exhibiting at Motek 2017

TM Robotics showcasing SCARA robot series in Germany

Industrial robot specialist, TM Robotics is exhibiting at Motek in Stuttgart, Germany from 9 to 12 October 2017. The international trade fair is the world's leading event in the realm of production and assembly automation. TM Robotics will be exhibiting alongside Swiss automation expert, Elmotec, in exhibition hall seven, booth 7202.

At the event, TM Robotics will be showcasing the Toshiba Machine THL SCARA robot, part of the company's latest line of cost effective and lightweight SCARA robots. The complete THL robot series consists of eight SCARA robot models. The smallest in the range is the THL300 and the largest is the THL1200, with corresponding arm lengths of 300mm to 1200mm respectively.

TM Robotics offers a comprehensive range of Toshiba Machine 6-axis, SCARA and Cartesian robots. At Motek, the company will demonstrate a THL SCARA robot working in collaboration with the TAD bowl feeder. In addition to the TM Robotics stand at booth 7202, the company will also be supporting American automation company, ASG Screw. ASG Screw will be exhibiting in hall five, stand 5422. ASG will be demonstrating its ASG screw feeder.

Motek is the only trade fair to focus on such a broad range of processes in the mechanical engineering and automation sector. The nature of the show provides exhibitors with a consistent target group of manufacturers from the automotive, machinery, electrical, electronics, medical engineering and solar production industries, as well as metal and plastic processing companies.

"The THL SCARA robot series is our low energy robot range," explained Nigel Smith, founder and CEO of TM Robotics. "The series was developed to provide low energy consumption at a light weight. It is also ideal for price-conscious manufacturers, end-users and systems integrators that are looking to incorporate automation into their processes without breaking the bank.

"The range provides a model for any size of application, with eight different sizes, each with varying arm lengths and handling payload. Regardless of the size of the model, the environmentally friendly THL range offers a reduced weight and energy savings of up to 50 per cent more than other robots in the SCARA series."

TM Robotics is exhibiting at Motek in Stuttgart, Germany from 9 to 12 October 2017. TM Robotics will be showcasing the Toshiba Machine THL SCARA robot. Pictured: THL700. **REF: TMR072**

Visitors should register their attendance and book a ticket for Motek in advance. Tickets can be acquired on the Motek website, which also provides directions to the venue and a full exhibitor list to plan your day.

To find out more about TM Robotics, or contact the team in advance of the event, please e-mail sales@tmrobotics.co.uk or call the European headquarters on +44 (0)1707 290370.

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Guiding The Industry

Konrad Lorenz won the Nobel Prize in Physiology and Medicine in 1973 for his experiments with animal behaviour.

Lorenz discovered the principle of imprinting, where a bond is formed between a new born animal and a caregiver. This is the mechanism where an auditory or visual stimulus is used to induce the young to follow its parents. In industry, automated guided vehicles (AGVs) use environmental stimuli to follow a specific route.

Here, Jonathan Wilkins, marketing director of obsolete industrial parts supplier, EU Automation, discusses how automated guided vehicles have advanced from simple materials handlers to intelligent autonomous robots.

Automated guided vehicles are mobile robots that follow markers or signals during navigation. The first AGV was introduced in the 1950s by Barrett Electronics, and performed a simple towing action, with its position guided by a wire in the floor. Since the 1950s, the market has rapidly increased and AGVs are used across numerous industry sectors.

Why AGVs?

Automated guided vehicles are predominantly used for materials handling purposes. This can include a range of tasks from on time delivery of parts to the production line, to round the clock transit. If the vehicle is equipped with a clamping mechanism, positioning fixtures and tool attachments, it can perform a range of functions.

Depending on the application and requirements, AGVs can function in isolation or in fleets. This makes the use of AGVs scalable according to need, so a plant manager can make a specific decision on the number of vehicles in a facility.

AGVs can be equipped with sensors for traceability, so that the plant manager can monitor the position of each individual vehicle and therefore track the movement of materials around a facility. Pick-up, transit and delivery of items can be time stamped as part of this process to further improve tracking. This information can be integrated into the company's enterprise resource planning (ERP) or materials resource planning (MRP) systems.

Depending on the application, there are different types of vehicle navigation methods. A plant manager can opt for a very simple system, similar to the earliest AGVs, or can choose more advanced navigation methods.

Navigate

The earliest AGVs were guided around the factory by a wired method. To navigate in this way, a wire is embedded into a slot in the floor, and transmits a radio signal, which can be detected by a sensor on the AGV. The AGV is then guided around the facility following the wire. Though this navigation technique is still used today, there are a variety of other methods for plant managers to choose from.

Some AGVs use guide tape that is either magnetic or coloured to navigate. Sensors on the AGVs detect the tape and this is used to guide the vehicle. Guide tape is also used in laser target navigation, where reflective tape is mounted on walls, poles or machines and the AGV calculates distance using a laser transmitter and receiver. This has an advantage over the wired method, because it is easier to change the route of the vehicle as the process of relocating the tape is more straightforward.

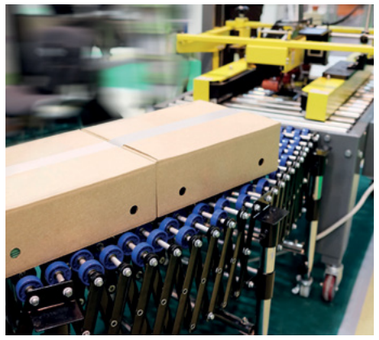
In inertial navigation, reference points are embedded into the factory floor at x,y coordinates. The AGV uses information from a sensor, a gyroscope and a wheel encoder to determine location. Changes can be made to the pathway by simply altering the reference points, making this method more flexible. However, some change to factory infrastructure is still required, and the vehicle cannot make independent route planning decisions.

The next step from inertial navigation is open path navigation – this means the vehicle can move independently from one place to another, moving from a guided vehicle to a self-driving vehicle.

From guided to self-driving

Traditional AGVs perform defined, pre-programmed movements around a facility. This means there is some difficulty changing the vehicle's route once specific infrastructure is in place. Recently, more flexible and intelligent vehicles have been introduced, which are able to make decisions in situations that they haven't encountered before.

This new breed of vehicle can overcome one of the key problems for AGVS – encountering something unexpected. In a changing environment, a self-driving vehicle may be a better fit. This type of vehicle operates independently from a driver or a fixed pre-programmed input directly controlling the steering, acceleration or braking. Laser-based perception and navigation algorithms can be used to dynamically navigate around a factory.



An on-board programmable logic controller (PLC) can be integrated to reduce errors and make decisions. By connecting to the central control system, the vehicle can analyse the reliability and efficiency of its routes and adapt them accordingly. The vehicle can use machine learning to be more efficient across new situations.

Self-driving vehicles can use an on-board computer and increased numbers of sensors to complete more complex tasks, including decision making. Independent and intelligent navigation methods can even mean the plant manager does not need to modify factory environment or infrastructure. One such navigation technique is natural feature guidance, where the vehicle can record and store images and calculate its position in relation to existing features.

An example of an autonomous AGV is Clearpath Robotics' OTTO, a self-driving vehicle that can move up to 3,300 pounds at 4.5 mph. OTTO can adapt to take the best route, avoiding collisions as it moves.

The vehicles can also use vision-based guidance systems, using cameras to act as eyes. An additional benefit of this is that plant managers gain a 3D virtual view into the environment the equipment is operating in. This means if the AGV does come across anything unplanned or unusual, the operator can easily find the explanation and correct it.

As more factories are upgraded and new facilities are built, advancing AGVs will prove to be a core component of the smart factory. With improving sensor technology and increasing autonomy, AGVs are becoming smarter and more dynamic, moving from guided vehicles following a set path, to autonomous independent decision makers – much like Konrad's animals will as they grow.

For further information visit: www.euautomation.com

Get straight into the action! Register online for Sensors & Instrumentation 2017

Sensors & Instrumentation, the UK's only national sensors show sponsored by industry giant Mouser, is creating an early buzz with hundreds having already registered to attend ahead of this year's event at the NEC Birmingham on 26 & 27 September.

Visitors can register online at sensorsandinstrumentation.co.uk to get their free badge, allowing them to skip the queues on the day and get straight into the thick of the action! Plus, Sensors & Instrumentation is operating a one-ticket policy with co-located events Interplas, PPMA Show and TCT Show, meaning visitors will have access to the UK's largest group of industrial events with just one badge.

In line with the ever growing nature of the show, opening hours have been extended to 9am-5pm on Tuesday 26 and 9am-4pm on Wednesday 27, allowing visitors plenty of time to explore the vast range of products and technology being exhibited by over 80 market-leading suppliers including Binder, Bronkhorst, Charcroft Electronics, Dewesoft, DJB Instruments, Huba Control, Innovec Controls, Keller (UK), National Instruments, PR Electronics, TechniMeasure, VEGA Controls and many more.

As well as providing a one-stop shop for all test, measurement and control requirements, Sensors & Instrumentation 2017 will give visitors the opportunity to gain a wealth of knowledge via the brand new feature areas, Connecting Industry LIVE and the Drone Zone, and the well-established Micro|Nano|MEMS pavilion.

The ever popular CPD accredited seminar programme is shaping up to be one of the most successful to date, with a host of prominent industry figures having already been confirmed to present on contemporary topics and issues.

Sebastian Amos, head of process, instrumentation & control at GAMBICA, will follow the impact of instrumentation within the first three industrial revolutions and examine how the instrumentation industry is engaging in a world of digital data and forensic analytics to meet the challenges presented as we enter the 'fourth industrial revolution'.

National Instruments has been confirmed to participate in the seminar programme on both days of the exhibition. The presentations will explore the accuracy of data acquisition (DAQ) systems and will offer practical advice for building DAQ systems.

Neil Hamilton, vice president of business development at Thingstream, will delve into the hot topic of the moment; Internet of Things (IoT). With the increasing prominence of IoT solutions in business, Hamilton will explore the importance of sensors to this $25bn industry with a view to give more kudos and margin to sensor manufacturers who often place themselves on the edge of the ecosystem when they should be the driving force.

PR Electronics gears up for an outstanding show

Sensors & Instrumentation boasts an exemplary line-up of sponsors, including PR Electronics who will be providing the Formula 1 Car Simulator. Proven to be a visitor favourite, the car simulator provides the perfect backdrop for networking whilst bringing a competitive edge to proceedings.

Lea Montague, general manager at PR Electronics UK, says: "As a leading technology company, we at PR Electronics see Sensors & Instrumentation as a great opportunity for raising awareness for our products."

PR Electronics will also be exhibiting their latest developments on Stand D13. Montague continues: "We want to show our wide range of signal conditioning products and present some of our latest product releases, such as the 3186B Output loop-powered current isolator and the 7501 Field mounted HART temperature transmitter in stainless steel."

To get your free badge, or for more information visit: www.sensorsandinstrumentation.co.uk

The Future Of Maintenance Engineering

What is the role of the maintenance engineer in the factory of the future?

The music industry has experienced rapid change in the last 20 years. We've seen the decline of cassettes, the rise and fall of CDs and the move towards digital music downloads.

The manufacturing industry is no different, having increased its digital processes, changing the way the industry operates and work is done. One role that is changing significantly is that of the maintenance engineer. Here, Jonathan Wilkins, marketing director at obsolete equipment supplier EU Automation, discusses how Industry 4.0 is changing the way businesses approach maintenance.

Maintenance engineers ensure machines and processes in a facility run smoothly. This relies on both preventative and emergency maintenance to keep operations running with as little system downtime as possible. This often involves periodic inspections, commissioning or recommending of system upgrades, troubleshooting equipment and repairing or installing replacement parts. If a problem is found, it is commonly the responsibility of the maintenance engineer to prevent the problem from reoccurring.

Proactive vs reactive

With the onset of Industry 4.0, manufacturers are moving towards more a proactive approach to maintenance. The sector has been particularly receptive to automated and smart technologies because of their ability to reduce downtime and improve productivity.

A traditional reactive approach to maintenance revolves around waiting for equipment to fail before performing maintenance. The obvious downside to this is that the company is not prepared for unplanned stoppages, which can lead to downtime and the waste of raw materials. For example, if batch production is halted on a food manufacturing line, it can lead to the fouling of ingredients and in some cases damage to the system.

The risk of downtime means that maintenance engineers need to make sure equipment is kept functional. As factories have become smarter, so too has maintenance. By using data from sensors on the factory floor, maintenance engineers can plan a schedule and use predictive maintenance to tackle any equipment problems before it causes downtime.

The increasing number of connected sensors in manufacturing facilities means that maintenance is now performed with a data-based approach. Condition monitoring equipment that uses techniques such as vibration analysis and infrared imaging allows the maintenance engineer to perform preventative action.

Looking forward

In the highly automated manufacturing facilities of the future, machine-to-machine communication, sensor developments, big data and analytics will change the relationship between the factory and the maintenance engineer. Systems could be able to self-diagnose any part failures, order replacement components from a supplier, and install them with minimal human intervention.

More data will be available for maintenance engineers to analyse, which steers staff time away from manual data input and towards high value roles such as updating and monitoring the plant's digital twin — a real-time simulation of the plant in operation.

Just as the way we listen to music is evolving, so is the role of the maintenance engineer. The factory of the future will require human staff to oversee maintenance and monitor and analyse data from the factory floor to maximise productivity.

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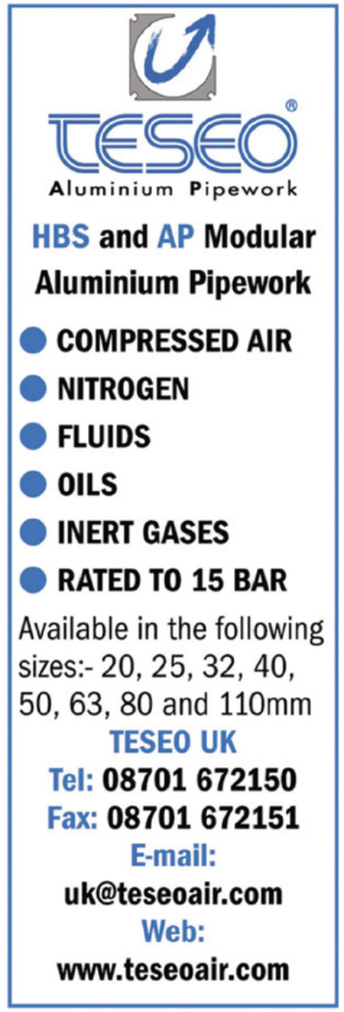

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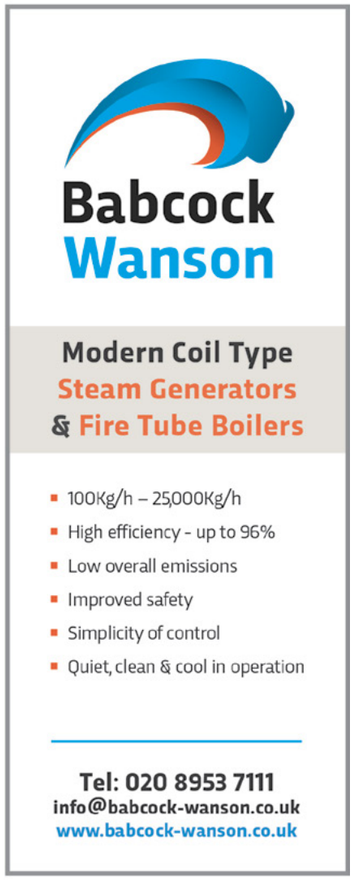

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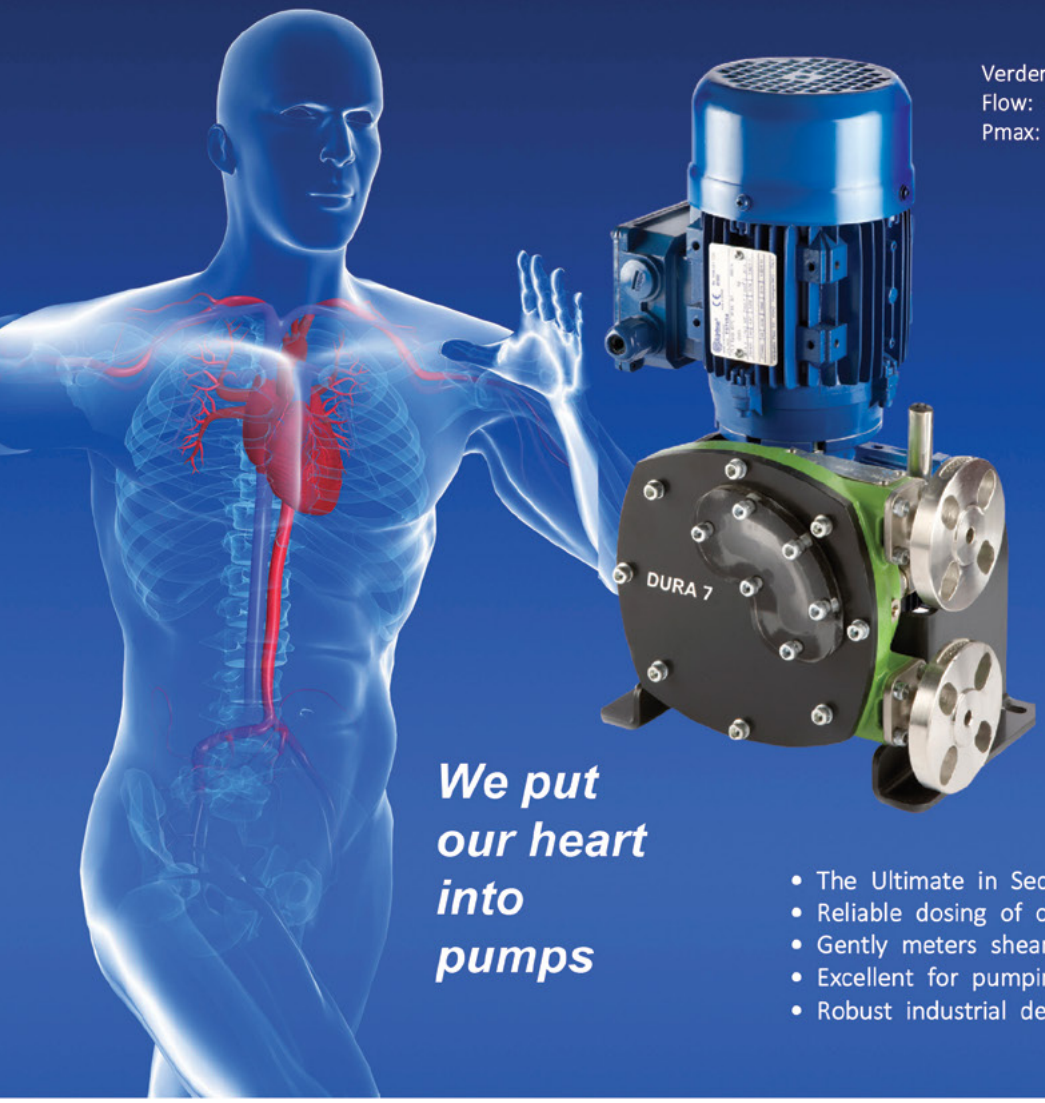
- Superior secondary containment and viscous performance.

In addition to the above advantages, the simple to use Verderflex Dura 5 and Dura 7 provide scalable performance and low maintenance. They are an excellent chemical dosing solution for water-treatment, brewing and food industries with much lower operating costs!



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