

# EMS

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The International Magazine For Maintenance & Engineering Professionals

Dec/Jan 2018

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**6th – 8th February**  
**9.30am – 4.30pm**  
**(3.30pm close Thurs)**

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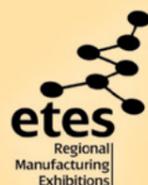
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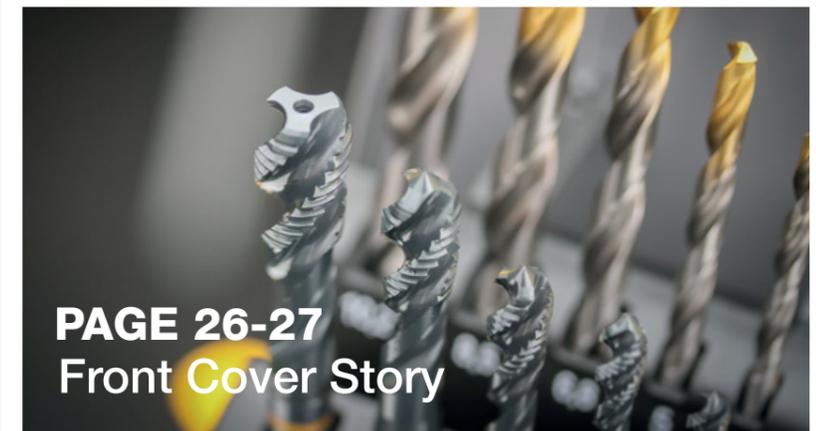
From all of us at MSL Media we wish you a happy Christmas and happy new year!



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# Wireless Money, With Improved Production!

Mechanical failure of motors, drives and other vital electromechanical equipment are among the most common reasons for production stoppages.

Fortunately, recent advancements in vibration monitoring and data analysis have led to condition monitoring systems that can accurately detect a problem before failure, thus reducing costly machine shutdowns and maximizing production output. These systems are installed on the monitored equipment and are typically networked back to a central computer for data analysis and alarm annunciation. Because the machines may be in remote locations where network infrastructure is not available, or on moving platforms where hardwired network connectivity is not practical, wireless communications is a networking alternative that offer installation cost savings, quicker deployment and even improved reliability in certain situations.

## Implementation Challenges

For many industries, the purchase of a condition monitoring system is easily justified with a simple return-on-investment (ROI) calculation. For a relatively nominal cost, vital machines may be retrofitted with condition monitoring to reduce operating failures. However, there are additional costs to consider when network infrastructure is not available or practical. This extra expense can include fibre optic cable installation, conduit engineering/installation, trenching between buildings, leasing phone lines for remote sites, and installation of festooning or slip rings for moving equipment. These additional costs may push the ROI out beyond what management will accept.

If the monitored machine is in a remote location within the factory where network infrastructure is not available, cable installation is necessary. The installation costs of cable in an industrial plant can vary greatly based upon the type of plant and physical configurations. For example, studies have shown that average cable installation in a chemical plant is £40 per foot (£120 per meter), while cable installation within a nuclear power plant can be as much as £2,000 per foot (£6,000 per meter). The actual cable cost depends on the location of the machine relative to existing network infrastructure, type of cable needed (e.g. fibre optic), conduit engineering (if needed), labour cost rates and if trenching is required.

If the machine is in a remote location several miles or more away, then leasing phone lines for

communications is required. Leased phone line costs usually include an initial activation/installation fee and then a monthly fee based upon speed of service. Since vibration monitoring is continuous and typically data intensive, the phone line service must support a high enough speed for continuous monitoring. Phone line service to remote sites such as pump stations are also prone to communication failures due to poor line quality and reliability may be of concern. Wireless cellular services are sometimes an option for remote sites, but are subject to service availability and limited in speed. Cellular data subscription costs may also be expensive.

If the machine is on a moving platform (such as an overhead crane, transfer car or conveyor system), then connecting the condition monitoring system to the plant network is a particular challenge. Depending on the speed and distance that the platform travels, traditional cabling methods such as festooning may be possible. However, festooning is subject to wear and tear, and is itself a reliability concern as cables may break. For spinning platforms, slip rings with Ethernet support are available but are expensive and require periodic maintenance. Some machines may move so fast, that the only practical communication method is wireless RF.

Given the challenges of networking condition monitoring systems, wireless communications offer lower installation costs (shorten ROI time), eliminate phone lines and remotely monitor machines that were not practical before. But wireless technologies and equipment vary widely in performance and reliability in industrial installation. Designing a successful wireless network requires an examination of current wireless usage, RF paths and environmental challenges of the industrial plant.

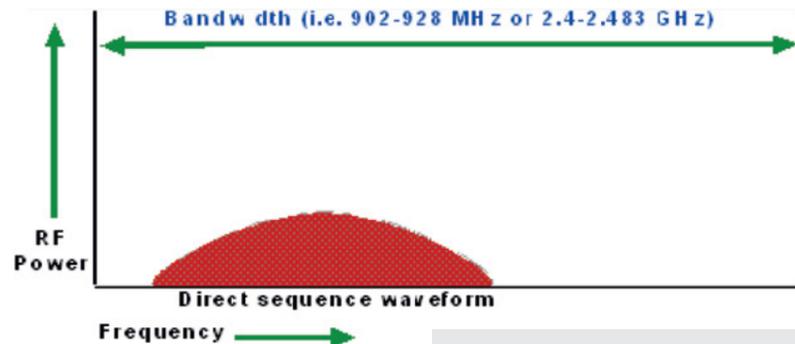


Figure 1.

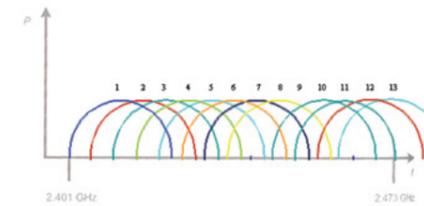
## Industrial Wireless Technologies

The most common approach to wireless Ethernet is RF transmission in the spread spectrum bands. Globally, the 2.4 GHz and 5.8 GHz bands are available for license-free use in most countries.

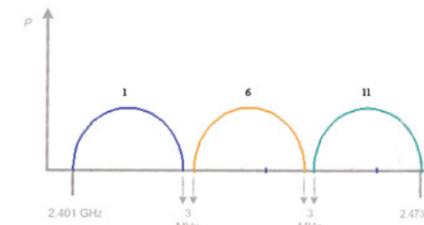
Spread spectrum literally means spreading the RF energy across the entire (or wide portion of the) spectrum. This technique permits relatively high speed communications while being designed to operate in noisy environments where multiple RF systems are present. There are two major methods of spreading RF energy: Direct Sequence and Frequency Hopping. Both methods have advantages and disadvantages for industrial wireless communications.

Direct Sequence uses a wide channel within the band to simultaneously modulate a highly encoded bit pattern (see Figure 1.) Direct Sequence offers the fastest spread spectrum data rates as the wide channel permits transmission of complex modulation schemes. Orthogonal Frequency Domain Modulation (OFDM) is a complex modulation technique capable of fast data rates and is used extensively in the IEEE 802.11g supporting RF data rates up to 54 Mbps.

Direct Sequence is the method used by all popular open Wi-Fi standards today including IEEE 802.11b, 802.11g (both transmitting in the 2.4 GHz band) and 802.11a (transmitting in the 5.8 GHz band). While the wide band modulation offers high speed, it also makes the RF system more prone to noise problems when multiple systems are operating in close proximity. For example, IEEE 802.11b has thirteen



Above: Figure 2. Below: Figure 3.



available channels (only eleven channels in some countries), but only three channels don't overlap (see Figures 2 and 3).

Due to overlapping channels and the popularity of Wi-Fi systems in plants, band over crowding and RF saturation can lead to poor wireless performance.

Frequency Hopping is a very popular technique for industrial systems because it has outstanding noise immunity techniques. Unlike Direct Sequence, Frequency Hopping uses many smaller channels in the spectrum and rapidly changes channels or "hops around" from channel to channel (see Figure 4). By incorporating error correction techniques, frequency hopping offers the best chance for successful data transmission as the transmitter will send the packet over and over again using different channels until an acknowledgement is received.

The disadvantage of Frequency Hopping is that it is slower than Direct Sequence and has longer data latency. Most Frequency Hopping systems are limited to 1 Mbps or less RF data rate. But if the data rate is fast enough for the application, the reliability of frequency hopping is tough to beat especially if more RF systems will be added in the future.

Frequency hopping modems are proprietary, meaning that each manufacturer uses their own technique and vendor X will usually not communicate with vendor Y. While this is potentially a disadvantage for commercial systems, it can be desirable for industrial systems for two reasons: Security and isolation from the wireless IT system.

Because the frequency hopping technique is not based upon an open standard, the manufacturer can use unique authentication processes and sophisticated encryption techniques. While security

has significantly improved in Wi-Fi systems with WPA and WPA2 standards, hackers will continue to look for holes. Many industrial Wi-Fi manufacturers now include an option to hide the access point by not transmitting its SSID beacon. This technique is effective at hiding the access point from potential hackers.

Frequency hopping also offers plant managers the ability to operate their own wireless network separate from the IT department. Because of the popularity of 802.11 technologies for wireless network access, warehouse barcode systems and video surveillance, proprietary frequency hopping systems may be the best choice for industrial systems and keep the peace between department managers.

## Wireless and Condition Monitoring Integration

Most condition monitoring systems have an Ethernet communication option for network connectivity. Ethernet is the most easily adaptable interface for wireless if two considerations are observed: Data rate (bandwidth) and data latency.

These considerations especially come into play when multiple remote machines are monitored. It is important to design an RF network that effectively reaches all remote sites while maintaining adequate data rates. If the number of remote machines is high, then it may be best to install separate RF systems to maximize the performance of each system.

Machine locations and building structures will determine antenna placement and may be another reason to consider multiple RF systems. Many industrial systems also support packet repeating to aid in RF signal propagation while also creating self-healing meshes. Finally, it is very important for the wireless equipment to be designed specifically for industrial installations. Key specifications to examine are RF power output

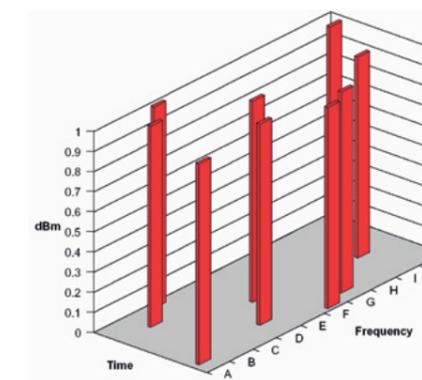


Figure 4.

(higher is usually better), operating temperature, built-in diagnostics, hazardous certifications (if necessary) and, perhaps most importantly, the support staff's level of industrial networking knowledge.

## Wireless Condition Monitoring Application Examples

Remote condition monitoring can benefit just about every industry where electromechanical machines are vital to production. Several applications where wireless condition monitoring is particularly effective include monitoring of pumps in wastewater treatment plants, drives used on oil/gas drilling rigs, drives on assembly lines in automotive plants and overhead cranes in hot metal mills.

One particularly interesting application is power plant cooling fan monitoring. A coal fired power generation plant wanted to monitor their cooling fans located at the base of their cooling towers. The cooling fans are mounted in very harsh areas where hot steam is always present. When a fan would fail, the tower had to be shutdown to allow a technician to repair, thus reducing the power output of the plant, sometimes during peak demand periods. By installing the condition monitoring system, the plant would be able to schedule fan repair during non-peak shutdowns.

The condition monitoring system was relatively easy to install, except that the towers lacked Ethernet network infrastructure. The cost of pulling fibre optic cable was estimated at over \$100,000 and would take more than six months to install.

The power plant investigated using wireless Ethernet and discovered that it would only cost a small fraction of fibre, and could be installed within three weeks. The installation went very smoothly and the system has been reliably operating for over five years.

## Summary

Advances in vibration analysis have led to modern condition monitoring systems that can significantly improve plant production. Unfortunately, the costs of networking these devices can be very high or impractical. Industrial wireless technologies offer an alternative to hardwired networking and can result in lower costs and better reliability. Care must be taken, though, to choose the best technology and wireless hardware to insure a successful system.



Michael Dominguez, Publisher.

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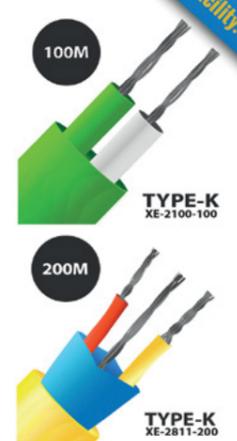
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## SPX FLOW Appoints Vipul Mistry as Global Product Manager for Pumps in the Food and Beverage Markets

SPX FLOW has announced the appointment of Vipul Mistry as its new Global Product Manager for its Pumps business in the food and beverage sector. Mistry has a strong engineering, new product development and business background that will help SPX FLOW further develop its highly successful pumps business.

Vipul Mistry will take on responsibility for the development of the global SPX FLOW pumps business and new pumping product developments for the food and beverage market. He earned an MBA from Queens University in Charlotte, NC as well as his Project Management Professional (PMP) certification. His strong technical background with combined experience in product development and portfolio management comes from a successful career in compression technologies, with his most recent positions at Ingersoll-Rand followed by a move to Gerson Lehrma Group as an independent consultant.

Gerard Lang, VP, Product Management for Food and Beverage at SPX FLOW commented, "Vipul's

appointment is part of our commitment to lead in pump innovation. His in-depth knowledge of compression technologies and experience in portfolio management and development will be a great asset to us. He will help grow an already strong pumps business in a way that will best support the changing needs of food and beverage processors."

Mistry is joining SPX FLOW at an exciting time with the recent launch of its Waukesha Cherry-Burrell brand Universal Twin Screw (UTS) pumps and more innovations in the works to be launched in 2018.

Mistry said, "I am delighted to be part of a world-leading team in food and beverage processing



technology and excited about the potential of the new products that have just been released. SPX FLOW has a tradition of innovation and commitment to research and development and I am looking forward to working with teams around the world to keep us at the forefront of pumping technology."

To learn more about SPX FLOW, please visit our website at [www.spxflow.com](http://www.spxflow.com).

## Safeguarding Employee Health And Safety.

With 12,000 workplace-related respiratory deaths every year, a further 14,000 lung conditions reported, and 400,000\* working days lost annually through breathing problems, effective fume and dust extraction technology is seen as central to safeguarding employee health and safety.

Businesses of every size have a legal duty to assess risks associated with airborne contaminants and, if required, install an effective local exhaust ventilation system to remove potentially harmful particulates, liquid droplets (usually aerosols or mists) and vapours or gases.

Fume particles in the 2 to 3 micron range are of particular concern for respiratory function because these can penetrate into the alveolar lung region, and because particles smaller than 30 microns are not normally visible to the human eye, they present a danger hidden from sight that can only be removed through effective fume extraction.

BOFA International, which recently received a Queen's Award for Innovation, develops fume and dust extraction systems matched precisely to specific processes - from laser and ink jet coding for food and pharmaceuticals packaging to soldering and welding, laser cutting, engraving, spraying,

mixing, and hand and mechanised grinding. Typically, these systems use active air flow control, a pre-filtration stage, use of a High Efficiency Particulate Air (HEPA) filter and a layer of activated carbon to capture contaminants, with extraction performance increasingly optimised through BOFA's iQ operating system, which provides independent filter status monitoring and enhanced system diagnostics.

Says John Horsey, technical manager at BOFA: "Fume and dust are the enemy of process-based operations. Not only can airborne emissions present a significant health risk to employees, they can also impact on productivity by causing contamination to finished products and depositing extraneous matter on process-critical components. This can result in costly downtime, and create additional maintenance and remedial cleaning costs."



For certain hazardous processes there are challenges that go beyond contaminant capture. For example, extraction systems linked to high temperature industrial processes, such as lasers, need to take account of potential fire risks. This is particularly important where a combustible dust can be drawn into the filtration system, so BOFA systems use fire-resistant materials for casings and filters along with triple thermal cut-out protection together with the use of a separate fire detection and extinguishant in line module where necessary.

[www.bofa.co.uk](http://www.bofa.co.uk)  
\*UK HSE Labour Force Survey 2016

# EMS MAGAZINE: What's Coming in 2018?

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- CMMS
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- Seals/Bearings & Lubrication
- Pumps/Valves
- Health & Safety
- Hire Equipment
- Training

## August

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- Boilers & Burners
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- Materials Handling
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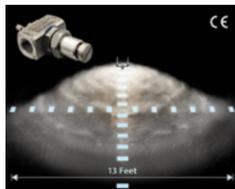
## December

- Boilers & Burners
- Condition Monitoring
- Industrial Cooling
- Materials Handling
- Drives & Controls
- Heat Exchangers

## Large Atomizing Spray Nozzle Covers 360 Degrees

EXAIR's 1/2 NPT internal mix 360 degree hollow circular pattern atomizing spray nozzle atomizes fluid and sprays away from the nozzle in all directions, up to 13 feet in diameter.

These nozzles are ideal where a liquid application is needed in a broad area, such as dust suppression, humidification and cooling. They can also be used to coat the inside of large diameter pipe or duct. By combining liquid and compressed air inside of the air cap these nozzles produce the finest mist of atomized liquid that can be easily adjusted to meet the needs of your application. These spray nozzles provide liquid flows from 10.8 to 150 gallons per hour.



With EXAIR's atomizing nozzles, you can coat, cool, treat and paint a variety of products using compressed air and liquids with a viscosity of up to 300 centipoise. They are commonly used with water, light oils, rust inhibitors, chemicals, paints and dyes.

The stainless steel construction of these atomizing nozzles adds to their durability and corrosion resistance. EXAIR atomizing nozzles are available with 1/8 NPT, 1/4 NPT and 1/2 NPT connections and in a variety of sizes and shapes to meet your needs. Patented No Drip versions, ideal for saving expensive liquids and preserving product finishes, are also available. All models are adjustable, come with our 5 year Built to Last Warranty and are CE compliant. 1/2 NPT Internal mix 360 degree hollow circular pattern spray nozzles ship from stock and are \$681.

For More Information Visit: [www.exair.com/lgat.htm](http://www.exair.com/lgat.htm)

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# SIEMENS OPEN NEW NOTTINGHAM SITE

Siemens opened their new Nottingham offices at Central Park, Lenton Lane Industrial Park. The move of 300 employees to an upgraded 31,000 sq ft building represents the biggest business letting in Nottingham in 18 months, and was officially opened by local MP Lilian Greenwood MP this afternoon.



- 300 employees move to the new business facility at Central Park, Lenton Lane Industrial Park.
- Move represents biggest business letting in Nottingham for 18 months.
- Move seen as a vote of confidence in the city.
- Site formally opened by local MP Lilian Greenwood MP.
- New site opens as the company celebrates 20 years in the city.

The new offices will be home to Siemens Managed Services, an independent provider of a comprehensive range of metering services at national transmission level, as well as for commercial, industrial and domestic for energy and water use.

The company was formed in 1997 and has since grown to become one of the largest independent providers of utility services in the UK and the global centre of competence for the Siemens digital grid business.

Lilian Greenwood MP for Nottingham South, who attended the official launch of Siemens new Nottingham home, said "It's fantastic to see Siemens

make a long term commitment to Nottingham. This investment represents a vote of confidence in our city and its ability to be at the heart of a balanced economy. Siemens employs over 300 people and each of them makes a strong contribution to our local economy, we should use this investment to attract more technology companies to our city centre which is a great place to do business".

The move is set to bring new efficiencies and provide a modern 21st Century working environment for all employees, customers and business partners.

It secures the long term prosperity of the Siemens business in Nottingham that is investing in people and infrastructure to support the transformation

to a digital future connected with smart metering. The new location also has stronger green transport links, reducing travel time for employees as well as increasing access to public transport.

Kevin Tutton, Head of Managed Services at Siemens added "The new site provides a cost effective state of the art facility, creating an environment that encourages innovation and collaboration in support of our customers, employees and partners. Ultimately, this is a vote of confidence and commitment from Siemens in Nottingham."

David Pearson, Director of Partnerships and Membership Services at East Midlands Chamber of Commerce, added his comment to the move, saying "Siemens is one of the biggest companies in digitalisation and business, so these new facilities will help accommodate this, with the new IT infrastructure making a pathway for more success for Siemens in Nottingham."

Councillor Sam Webster, Portfolio Holder for Business, Education and Skills at Nottingham City Council, said; "As we welcome Siemens to their new Lenton Lane premises, where I hope they will continue to innovate, create jobs and contribute to the local community, I would like to take this opportunity to recognise their investment which clearly shows their confidence in building a long term future here in Nottingham

"Nottingham is a city with a large and diverse labour force, integrated, sustainable transport system and a range of attractive business premises. Siemens' investment demonstrates the city's potential to attract leading global companies as well as enabling our own local enterprises to grow."

Further information is available on the Internet at [www.siemens.com](http://www.siemens.com).

# Moving Large Loads

The world record for the heaviest object pulled over 100 feet belongs to a US reverend who pulled a 68-tonne lorry. This is an impressive achievement, but one that manufacturing plant engineers must regularly equal using specialist equipment — with various degrees of success. Here, Hugh Freer, a director of electric tug specialist MasterMover, looks at why these traditional methods are ineffective.



In 2016, Reverend Kevin Fast, otherwise known as the Powerlifting Pastor, achieved the world record for the heaviest object pulled over 100 feet by pulling a 68-tonne lorry over the course. While a load of that weight would be unusual in many factories, manufacturers everywhere face a daily challenge moving heavy tools and parts through their production halls.

Unfortunately, few people in the average manufacturing facility share Reverend Fast's strength, so they keep large parts in one place or rely on methods such as cranes or forklifts to move large loads around the facility.

In many industries, the movement of work in progress, sub-assemblies and tooling provide a challenge. The default answer for many companies

is to use overhead cranes to move large parts through the factory. Not only are these expensive to install, but the process of lifting heavy loads using overhead cranes can be a cause of downtime.

For example, production blockages can occur at one end of the plant while the overhead crane is tied up at the other end undertaking complex lifting operations.

Motorised electric tugs like MasterMover's MasterTug allow for more flexibility when handling objects than an overhead crane, while still moving objects up to 30,000kg.

While an overhead crane can move parts from side to side on the lift bar and up and down on the girders on the factory roof, the part cannot be

moved in all directions or to an adjoining building. However, electric tugs, handled by a single pedestrian operator, can move in all directions and can be used to move objects in between production facilities.

In one such case, a company was using a lorry to move large metal plates from one assembly building to the next. Although the buildings were adjacent, the layout of the factory meant that work in progress was loaded onto a lorry and then driven on a mile long circuit of the plant before being unloaded in the production hall next door.

By using an electric tug, the company virtually eliminated this lost time. A single pedestrian operator could move the load between the two buildings in minutes, using the tug to move a transfer trolley.

Large parts are often objects in the later stages of the assembly process, meaning they are often high value. It is therefore important that plant staff have complete control over the object when it is being moved, but dangling the object from a height over the production line presents obvious risks.

By using an electric tug, which easily connects to the object, the operator can move the part across the plant with complete control. This is without the risk of the object falling from a height, swinging or hitting any other objects while dangling.

By reducing downtime, increasing flexibility and making large objects faster and easier to move across the plant, it is clear to see that an electric tug is a good alternative to the traditional use of cranes.

Unlike Reverend Fast, most plant staff are unable to push large, heavy parts across the plant. It's therefore vital that plant managers choose a method of moving large items that is safe, efficient and effective.

For more information visit:  
[www.mastermover.com](http://www.mastermover.com)

# Birmingham innovation centre builds up head of STEAM

Construction work on the first phase of Birmingham City University's new creative innovation centre commences.



The £3.5 million project known as STEAMhouse will include the refurbishment of a former car dealership in Birmingham's Digbeth area to house the new centre and maker space. By connecting Arts into STEM subject areas (Science, Technology, Engineering and Maths), STEAMhouse will provide support to 200 sole traders, start-ups and local businesses with access to expertise and finance for growth.

The refurbishment is being carried out by contractors Paragon Interiors Group and will open a test-bed for ideas next year, running until September 2019. It is a partnership arrangement with Birmingham arts organisation Eastside Projects that aims to bring Arts in line with STEM subjects, encouraging a closer way of working across disciplines and industry sectors.

The initiative will inform a later, second phase of the STEAMhouse project – which has already received £14 million from the Government in the 2016 Budget – and will see the development of incubation and

office spaces, teaching facilities, co-working and maker spaces, and artists' studios.

Professor Julian Beer, Deputy Vice-Chancellor, Birmingham City University, said:

"Our STEAMhouse project will optimise the potential to create jobs, skills, knowledge and alliances between businesses, academics, artists and citizens like never before.

"We are delighted that work is now under way with the first stage of STEAMhouse. We have a great team in place and a fantastic free programme of support for businesses, including research collaborations with our academics, to make every interaction a success."

Due to open on Digbeth High Street in early 2018, STEAMhouse's pilot phase will bring together academics, entrepreneurs, designers, makers, future talent and organisations to foster greater innovation, develop new products, and support economic

growth with a programme of business support. It will house substantial new fabrication facilities with equipment and staffing to support production and making.

Ruth Claxton, STEAMhouse Creative Director and Eastside Projects Associate Director, said:

"We have been able to create really fantastic production facilities within the STEAMhouse maker space. With a range of tools and equipment in digital, wood, metal and print, as well as a team of talented technicians who are able to offer professional advice, we are confident that we have created a fantastic new facility which will transform the way that people are able to develop products and prototype new ideas."

Funded by the European Regional Development Fund and Arts Council England, STEAMhouse will drive innovation and research to create business solutions that fuel long-term economic growth.

STEAMhouse supports the growth sectors of health and life sciences, low carbon, creative and digital technologies and advanced manufacturing across the Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) region, in turn, aiding the development of the Government's Midlands Engine.

Clayton Shaw, STEAMhouse Programme Manager, said:

"There is a growing trend recognising the value of art and the impact it can make when combined with digital technology, engineering and the sciences. We look forward to working across the STEAM disciplines and connecting businesses with the University to apply this new way of working for longer term benefits across the GBSLEP region, as well as nationally and internationally."

For more information visit:  
<http://www.bcu.ac.uk/>

# Starter Kit For Preventive Condition Monitoring

Don't wait until the damages have occurred: that is the objective of anticipatory servicing, also known as preventive condition monitoring. Cracks and breaks come as a result of changed oscillation frequencies, in particular on motor bearings. You simply need to recognise them early in order to anticipate sudden failure and standstills. Sound emission testing based on high-speed data recording serves to recognise damages to roller bearings early and a cost-efficient starter kit is available for this purpose from acceed.

in accordance with the configuration used, in as far as defined thresholds are exceeded. The alarm thresholds can be set freely or in accordance with standards using ISO 10816 (Evaluation of the Oscillation of Machines). Software configuration is fast and simple using graphic analysis blocks which are compiled for the desired function. This also enables more complex multi-task analyses without specific programming knowledge.

The DSA module USB-2405 is fast and intuitively operable. Thanks to USB laptop connection, the power supply is also secured. The four-channel module is suitable for the digitalisation of oscillations from vibration or acoustic measurements with the connection of microphones or acceleration sensors. Its further features include the integrated 2 mA excitation current source without additional signal influence for each channel as well as anti-aliasing filters for the automatic adaptation of the cut-off frequencies to the sampling rate. One sensor is already included in the starter kit, three further sensors can be connected in parallel to the four-channel device.

Conclusion: due to simple software handling for the analysis of acoustic emissions, the starter kit which can be used immediately and mobile can, for example, help to identify the formation of cracks as a result of material fatigue and therefore also enable early predictions of roller bearing damages.

Further information about the company Acceed and all the products and services it provides can be found on the Internet under [www.acceed.net](http://www.acceed.net).



The starter kit for preventive machine monitoring from the manufacturer Adlink consists of an acceleration sensor with a retention magnet and 3 m connection cable, the data recording module USB-2405 (24 bit, 4 channels) as well as the graphic evaluation software Phoenix GM Lite. The kit is ready for operation and only requires a laptop for the software and the USB cable for data and power

connection for mobile field application. The oscillation recording process for preventive condition monitoring the status for rotating elements and bearings is particularly efficient. The software analyses the data recorded from rotating components, monitors the machine status based on the oscillation bandwidth and can emit alarms

# Condition-Based Asset Care: A Three-Level Approach

The sophistication of your condition monitoring should match the criticality of your assets.



Condition-based and predictive maintenance strategies are now widely implemented - particularly by businesses with high-value assets in remote or difficult-to-access locations where routine maintenance visits are either logistically very costly or potentially hazardous to maintenance personnel. These approaches can take a variety of forms, however, and the level of sophistication deemed necessary for a particular application will be dictated by a host of factors, including the cost of implementation, the availability and skill levels of onsite maintenance staff, and the risks associated with the failure of the asset.

With these different needs and demands in mind, SKF has pooled its extensive knowledge of rotating machinery to develop a staged approach to condition-based maintenance. Depending on the criticality of each asset, users can adopt a 'basic', 'better' or 'best' strategy. Whichever they choose, the solution should be affordable, easy to manage and expandable to meet future requirements.

### 'Basic' asset care

The simplest monitoring tools include portable, handheld devices or permanently installed sensors capable of measuring changes in vibration, especially on rotating shafts, or changes in operating temperatures in both mechanical and electrical systems. To help simplify machine maintenance

and prevent costly failures, SKF can supply a variety of basic handheld devices that maintenance technicians can use while carrying out a walk-through machine data collection routine. The latest of these is SKF QuickCollect which monitors both vibration and temperature, transmitting this data wirelessly to a mobile device, where an entry-level app called 'SKF QuickCollect' is used to provide machine diagnostics and analysis.

Where continuous vibration and temperature monitoring of non-critical machinery is desired, the permanently installed SKF Machine Condition Indicator is equipped with LEDs that illuminate when present thresholds have been exceeded to warn operators that further investigation is needed. Internal sensors measure velocity, enveloped acceleration (bearing or gear impulsive vibration) and machine surface temperature.

### 'Better' asset care

Operators work in close proximity to equipment, so they are usually the first to detect even the slightest changes in process conditions and machinery health. However, their observations often go unreported, or are not effectively acted upon, leading to machine failures, unplanned downtime and higher operating costs. A solution developed by SKF, called the Operator Driven Reliability (ODR) programme, enables this valuable source of data to be easily collected, analysed and acted upon.

SKF QuickCollect is a good example of this process in action. More experienced operators can make use of a second app for this platform called 'SKF DataCollect' an ISO maintenance and inspections standards compliant program which extends the diagnostic capabilities of SKF QuickCollect, allowing users to manage and monitor their maintenance tasks and inspection data, as well as giving them the ability to register for, and connect to, the SKF Cloud for access to SKF's remote expert services.

Another advanced condition-based monitoring tool for the experienced user is the recently launched SKF Multilog On-line System IMx-8, a compact 8-channel version of its popular IMx machine health monitoring platform. This versatile, more compact system brings affordable machine health monitoring to a much wider industrial user base and even includes a useful 'Event Capture' feature that is of particular appeal to machine tool users requiring a cost-effective crash detection capability.

### 'Best' asset care

When handheld or periodic data collection instruments are deemed insufficient, the next step is to take your asset and machine health monitoring programme online. In these systems, data is gathered and transmitted via permanently installed sensors, which can either be hardwired to junction boxes or, as is becoming more commonplace, connected wirelessly. In each case, data is normally routed to a centralised computer system running an advanced management and data analysis tool such as SKF's @plitude Monitoring software suite.

The SKF Multilog On-line System IMx-M system, for example, can be used in conjunction with the SKF @plitude software to provide a complete system for the initiation of machinery shutdown, early fault detection and diagnosis. In addition, this system can provide automated advice for correcting existing or impending conditions that might otherwise affect machine reliability, availability and performance.

For more information visit: [www.skf.com](http://www.skf.com)

# Schaeffler Provides Short Term Monitoring Solution For A Cement Tube Mill

By implementing a temporary monitoring solution for assessing the condition of the trunnion drive end bearing on a cement tube mill, Schaeffler has helped Sunstate Cement prolong the operating life of its mill, thus avoiding the significant cost of replacing the bearing and the associated downtime.

Sunstate Cement Ltd. is one of Australia's leading manufacturers and suppliers of high quality cement products to commercial businesses throughout Queensland and Northern New South Wales. With a production capacity of more than 1.5 million tonnes of cement per year, Sunstate Cement has a long history as a major contributor to Queensland's largest and most impressive infrastructure projects for over 25 years.

The plant primarily produces two types of cement: Flyash blend and GP cement. The three Tube Mills at the site each has a production capacity of 60 to 100 tonnes of cement per hour.

During a visual inspection of the trunnion drive end bearing on Tube Mill No.1, Sunstate Cement engineers discovered that the bearing was in a reasonable condition despite 28 years of service. A decision was made to extend the service life by rotating the outer ring by 180 degrees, which is a common practice for this type of application. After this rotation, Schaeffler technicians were asked to provide a condition monitoring solution for the trunnion end bearing in order to assure Sunstate Cement that the bearing was still fit for purpose.

Due to unpredictable operating times and despite the slow speed of the tube mill, the customer considered collecting vibration data. Schaeffler recommended a temporary solution that comprised of two FAG SmartCheck online condition monitoring systems (one axial and one radial), as well as a remote wireless network system for communication, monitoring and diagnostics from Schaeffler's Online Centre in Sydney, Australia.

The two FAG SmartCheck units were configured to suit slow speed bearings and set up only to collect vibration data when the tube mill was operating, which ensured that only relevant data was obtained.

This temporary solution proposed by Schaeffler was accepted by the customer for a period of one month. After this time, a machine condition report was provided by Schaeffler technicians outlining the trunnion end bearing was fit for purpose.

By implementing the temporary FAG SmartCheck monitoring solution, Schaeffler was able to supply a prompt, cost effective monitoring system to assess the condition of the trunnion drive end bearing for continued service. The FAG SmartCheck provided high quality vibration data at slow speeds. Subsequently, Schaeffler technicians analysed the data and made recommendations to the customer for continuation of service for the trunnion bearing. The benefit and value to Sunstate Cement was being given assurance that the bearing was suitable for further operation, thereby avoiding the significantly higher costs of replacing the bearing.

## Customer Benefit

**Cost of a new trunnion end bearing:**  
105,000 euros

**Average downtime cost per hour:**  
1,500 to 3,500 euros

**Average downtime for a bearing replacement:**  
3 to 5 days (min. 72 hours)

**Cost savings for every bearing replacement avoided:** 200,000 euros

In the same plant, two of the three tube mills were already equipped with FAG ProCheck and a remote monitoring service. The customer has since equipped its third mill with a permanent FAG ProCheck monitoring system to effectively continue monitoring the remaining life of its bearing using Schaeffler's monitoring services. FAG ProCheck

can be used to monitor bearing vibration behaviour and other process parameters such as bearing temperature and speed.

Once set up, FAG ProCheck can operate automatically without further intervention from the user, to measure, record, analyse and issue alerts on vibration data from rotating plant. By continuously monitoring a machine or piece of rotating equipment, FAG ProCheck can detect changes in their behaviour early and alert maintenance personnel to a potential problem before it actually occurs. Maintenance teams can therefore improve their planning and scheduling and production downtime is significantly reduced.

The FAG ProCheck system can be easily expanded and customised through an expansion slot system and digital filter algorithms. The unit is therefore easy to integrate into a company's existing production data management system, statistical process control (SPC) system or PLC network.

## About Schaeffler

The Schaeffler Group is a global automotive and industrial supplier. Top quality, outstanding technology, and exceptionally innovative spirit form the basis for the continued success of the company. By delivering high-precision components and systems in engine, transmission, and chassis applications, as well as rolling and plain bearing solutions for a large number of industrial applications, the Schaeffler Group is already shaping "Mobility for tomorrow" to a significant degree. The technology company generated sales of approximately EUR 13.3 billion in 2016. With around 89,400 employees, Schaeffler is one of the world's largest family companies and, with approximately 170 locations in over 50 countries, has a worldwide network of manufacturing locations, research and development facilities, and sales companies.

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## Condition Monitoring

### Monitor the vital signs and avoid unplanned downtime

#### Early diagnosis of machine condition is key to healthy engineering plant and equipment

By monitoring the vital signs, engineers are in control of their plant and machinery and can prevent unforeseen problems turning into costly breakdowns.

Online fixed systems and handheld CM devices from Schaeffler have a proven track record in a diverse range of industry sectors from steel, paper, quarrying and mining to pharmaceuticals, food processing, wind energy and marine. However, the objective is the same: to maximise production output by avoiding unplanned downtime.

Our experienced CM engineers work closely with production and plant personnel to understand and maintain efficiencies and achieve cost savings.

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**SCHAEFFLER**

## If It's A Liquid, Gill Can Measure It.

**Industry:** Noun. 'Economic activity concerned with the processing of raw materials and manufacture of goods in factories'. (Oxford Dictionaries)

A brief definition representing such a broad range of industries it is very difficult to grasp the full range of activities that it covers. Plus from all of those activities come an even larger number of processes required to produce those goods and raw materials.

So if a company wishes to develop a range of liquid level sensors that will measure virtually all the types of liquids to be encountered in industry that is going to need a lot of sensors.

Well, not necessarily.

Because if you break it down a little, there are broadly two types of liquid – water based and non-water based.

Water based includes anything with water content sufficient to make the liquid conductive. That can be fresh water all the way through to liquid waste products which can contain solids, sludge or paper, for example.

Non-water based covers oils, fuels, chemicals and saline fluids that again can be used in the processes of industry or a by-product from it.

The demands placed on industrial equipment means that sensors designed for those applications will need to be reliable, accurate and consistent without requiring regular maintenance or cleaning.

For sensors to achieve those key attributes they will benefit from the use of high quality materials, have no moving parts and an extended operating temperature range. Sealing to IP68/IP69K is another desirable feature along with resistance to shock and vibration, aided by solid state construction.

Additionally, in the case of the water based sensor, it is worth ensuring that any measuring probe does not have any holes or cavities in it to clog or block. A smooth, non-stick surface enabling reliable operation without regular cleaning maintenance, in even the most contaminated liquids, is another feature to look for.

If your process does require regular cleaning or flush through of the manufacturing line a smooth, cavity-free sensor probe will re-assure you that it will not require any additional cleaning.



The other thing to bear in mind is that many tanks and vessels are not always regular shapes, when a half full reading will not mean half the tank volume. Software that allows you to 'map' the shape of the tank and then correlate the output of the sensor to the true volume of the tank eliminates problems arising from misleading readings.

So if you work in industry and have a requirement for liquid level measurement, no matter what type of liquid it is or how difficult and unpleasant it is, you will want to contact Gill Sensors and Controls.

They have two industrial sensors available. The 7010 Industrial Liquid Level sensor is for non-water based fluids, whilst the 7014 Waste Liquid Level Sensor has been designed for all water based liquids, especially high-viscosity, heavily contaminated products that are difficult to measure with conventional sensors.

Visit [gillsc.com/level](http://gillsc.com/level) for more information.

## Why do I need to use phase analysis?

The vibration spectrum can provide clear indication of certain fault conditions, but when you see a large peak at the running speed (1X) what will your diagnosis be?

What if you also see peaks at 2X and 3X? Now, if you are monitoring a large fan with a history of the building up on the fan blades, then you may reasonably conclude that the high 1X peak indicates unbalance. But in the more general case, how do you distinguish between unbalance, bent shaft, looseness, resonance, eccentricity, misalignment, cocked bearing, and other fault conditions? This is where phase analysis is your friend.

Once upon a time phase analysis was difficult to perform because most people owned single channel vibration analyzers. But with a two-channel analyzer, and two vibration sensors, it is very easy to perform phase analysis. By simply placing one sensor vertically on the bearing and one sensor horizontally you can determine if unbalance exists. By comparing the vibration from one end of the machine to the other (in the same axis) you can confirm the unbalance diagnosis and assess whether it requires single-plane balance or two-plane. Comparing phase axially across a coupling, and radially across the coupling can help you diagnose and confirm misalignment.

I could go on and on, but phase analysis the best tool for distinguishing between all of the listed fault conditions and more.

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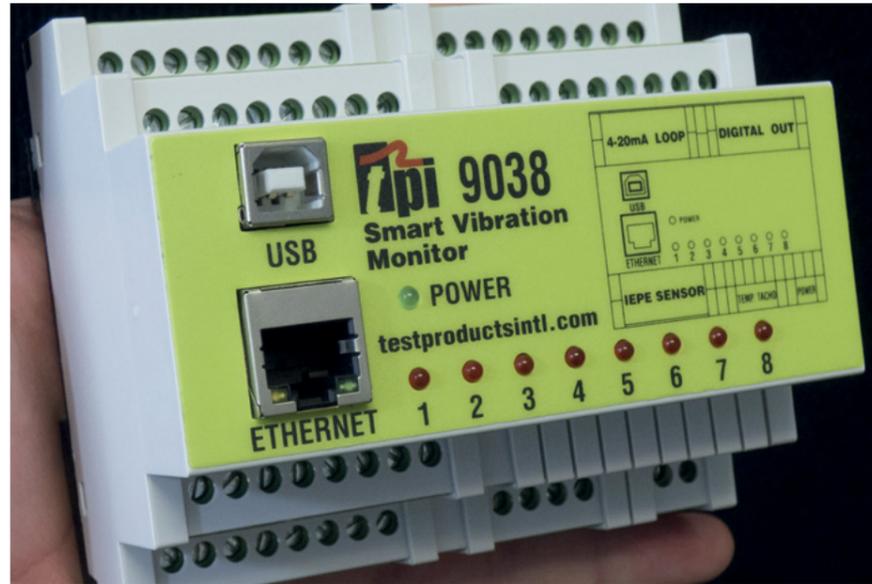
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# TPI Will Keep Your Plant Running & Instrumentation Costs Down!

Test Products International (TPI) of Portland, Oregon has long been regarded as a leading independent manufacturer of high quality yet low cost test equipment.



TPI currently has over 400 product lines including DMMs, clamp meters, manometers, indoor air quality meters and IR temperature guns. Although available to buy through many distributors one of TPI's major strengths is its ability to put together kits of instrumentation products for small, medium and large scale service providers.

Until recently TPI has mainly been known in Europe for its flue gas analyser products, with one UK service provider running a fleet of over 8,000 TPI analysers. However, following the acquisition of UK Condition Based Maintenance (CBM) equipment manufacturer C-Cubed, TPI is now a significant designer and manufacturer of vibration analysis equipment. The TPI CBM range currently includes six hand-held vibration analysers and two fixed installation units.

The simple, yet effective, TPI 9070 hand-held vibration meter has a built-in accelerometer and features a full colour OLED screen displaying vibration values with traffic-light colour coded alarms for overall (ISO) machine vibration levels and bearing wear. It also includes a full frequency spectrum (FFT) with cursor and all for a list price of only £399, or the TPI 9071 with all the great features of the 9070 but

featuring an industry standard BNC connected IEPE accelerometer & magnet for only £495.

The TPI 9080, acclaimed as having set a new benchmark in vibration analysers, uses an industry standard BNC connected IEPE accelerometer and offers on-meter CBM analysis for machine faults such as unbalance, misalignment, looseness and bearing wear, with colour coded alarms and FFT with cursors. In addition it can store up to 1000 machines each with 10 measurement points – i.e. 10,000 separate readings each with an FFT. The TPI 9080 can be used both in simple route based mode where a list of machines is downloaded for data collection or in off-route mode where readings can also be captured and saved for uploading to a PC. The included VibTrend PC trending and reporting software has features normally only found on high end software such as automatic email notification of alarms, automatic report generation, local or remote databases (e.g. accessed over a network), waterfall plots and many other useful vibration analysis tools. At the same time the software is very easy to use and its basic functions such as vibration level trending and alarming are totally intuitive so that the software can be used effectively by both expert and novice users to implement a full CBM strategy.

In-line with TPI's philosophy of being the value leader the TPI 9080 comes at an incredibly low list price of only £750.

Intrinsically Safe ATEX approved versions, the TPI 9075-EX and the TPI 9080-EX, are now included in the range, allowing for Vibration readings to be taken in Hazardous Environments. Starting from £2,300 for the 9075-EX or at £3,200 with the 9080-EX which has all the great route, docking and logging features of the 9080.

At the top end of the TPI range the TPI 9041 Ultra II vibration analyser truly is a vibration analyst's dream and includes a 2-plane field balancer, RFID tagging of measurement points, up to 51,000 line FFTs, phase analysis plus a host of powerful features all for a list price of £5,950. This price also includes C-Trend II, TPI's incredibly powerful PC trending, analysis and reporting software.

Drawing on its more than 15 years of combined CBM experience, TPI is now extremely pleased to offer its latest two fixed installation, on-line CBM products, the TPI 9034 and TPI 9038 smart vibration monitors. At a cost per channel from as little as £125 the TPI 9038 has eight industry standard IEPE vibration sensor inputs, each with a 4-20mA output (suitable for legacy operation with PLCs etc.) and a 24VDC digital output (suitable for switching relays etc.) and can log up to 1500 readings/per channel – with full FFT data for each reading. The TPI 9038 comes with its own easy to use PC software that allows easy configuring of alarms and output channels, as well as being able to display real time vibration data via the 9038's built-in USB and Ethernet ports – even remotely over a VPN link for example. The 9034 & 9038 monitors can also be connected to TPI's C-Trend II software to give full trend analysis with comprehensive reporting (e.g. via email alerts or user defined automatically generated reports).

For more information please contact TPI Europe's head office on +44 1293 530196 or take a look at the website at [www.tpieurope.com](http://www.tpieurope.com) or email [sales@tpieurope.com](mailto:sales@tpieurope.com)



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# BOSCH BACKS CIBSE'S SOCIETY OF DIGITAL ENGINEERING

The Chartered Institution of Building Services Engineers (CIBSE)'s Society of Digital Engineering (SDE) is a step in the right direction according to an industry spokesperson from Bosch Commercial and Industrial.

The Chartered Institution of Building Services Engineers (CIBSE)'s Society of Digital Engineering (SDE) is a step in the right direction according to an industry spokesperson from Bosch Commercial and Industrial.

The society has been recently launched by CIBSE to support anyone involved in bringing digital elements to the built environment, be it designer, manufacturer, or contractor – an approach welcomed by Pete Mills, Commercial Technical Operations Manager at Bosch Commercial and Industrial.

Pete comments: "As building services engineering moves further into the digital world, engineers are increasingly being faced with conducting everyday tasks via a digital platform they may be unfamiliar with. Therefore, adopting digital engineering via platforms like this will be crucial to the future of the built environment, no matter your role in the building process."

With the uptake of Building Information Modelling (BIM) being relatively slow, despite its time in the spotlight, Pete welcomes the SDE as a fresh take on the concept. He comments: "Given the hype around BIM, it's time for industry to refocus and truly unearth what the initiative was about in the first place, which is ultimately, to realise savings by encouraging information sharing and collaboration.

"The SDE offers an incremental process whereby engineers and building services companies can adapt at a steady pace. The society should bring more structure to the BIM process, helping to gain the interest of those that would otherwise have given up due to the perceived pace of change."

To encourage further understanding of digital engineering, education provision through the scheme is a key focus for CIBSE. Following a membership process, engineers will have the opportunity to join a community of like-minded professionals, with access to accreditation and training.

Pete concludes: "There are real tangible benefits to the society, but industry must work together to push it through. The younger generation will be key to the success of platforms like this and in turn, will carry what they learn forward, helping the progression of their companies as well as their own careers.

"Having been officially launched in September, it will be interesting to see how the SDE supports the development and uptake of digital engineering. I believe the new platform offers a great foundation for the industry and have no doubt that it will help cut through the hype of BIM and provide a tangible first step for engineers to adopt what will become essential digital processes in the built environment."

For more information on Bosch Commercial and Industrial, visit [www.bosch-industrial.co.uk](http://www.bosch-industrial.co.uk) or call 0330 123 3004. Alternatively, follow Bosch Commercial and Industrial on LinkedIn (Bosch Commercial and Industrial UK) and Twitter (@BoschHeating\_UK).

# Talking Trash: Why Steam Could Be The Hidden Gem Of Your Biomass Heating System

Imagine being able to use industrial waste to heat a building. Now imagine the ability to use steam to generate electrical power. Waste products may not be the first thing we think of when we look at power, but as the future of fossil fuels is more widely discussed, steam and waste may just become the power couple of the future green economy.

In the world of industrial heating, chicken farmers are sitting on a goldmine. High in nitrates and phosphorus, chicken waste has typically been used as a farming fertiliser. This has, however, come with its own issues, such as water-course contamination from run-off, as well as transportation costs. Now, thanks to advances in technology, chicken waste, or litter, has become the fuel warming the very chickens that created it. Talk about recycle, reuse, reduce.

"Biomass is a significant area of growth for commercial industry," says Angelo Giambone, business development manager for Spirax Sarco UK. "As pressure from government bodies continues to mount, so too does the push towards greener, more sustainable fuel sources."

The biomass industry has developed strongly over the past few years, and as the technologies advance, so too does the number of products that can be burned as fuel for heating.

"Biomass, biofuels, anaerobic digestion – they all encompass the concept of creating energy from sustainable sources, which can include waste products," Angelo says. "Combustion technology is helping to drive this change, as is a rising awareness of the benefits of managing your own fuel source."

The UK government in particular has taken an interest in the potential of biomass to contribute to

the UK's CO2 emissions targets, and has introduced the Renewable Heat Incentive (RHI) to encourage more businesses to invest in biomass heating systems.

"The RHI was first launched for domestic properties in 2014 and is the first of its kind in the world," comments Angelo.

"For chicken farmers, for example, it's like the cherry on top of an already sweet deal. Not only are they burning animal waste as an inexpensive source of fuel, but they also receive money from the government in the form of a quarterly payment."

The RHI is open to businesses and organisations across England, Scotland and Wales but, as Angelo explains, there are a few caveats.

"You can't stick a woodchip boiler in the back garden and claim the benefit. You have to be able to demonstrate that the biomass installation is making a valid contribution to your energy requirements."

## Where does steam fit in?

It's all well and good to have biomass heating a building, but why would you then need steam?

Angelo explains: "Industries that implement biomass have a fantastic opportunity to increase the RHI that

they receive, while generating a small amount of power for their plant.

"Generating steam instead of hot water in a biomass system allows the latest technology in electrical power generation to be used. This production of electricity from a 'renewable' fuel then allows users to claim a doubling of their RHI benefit. Furthermore, once the power is generated, you can convert the steam back into the hot water that you need."

Today, steam plays a vital part in industry worldwide, from pharmaceuticals to clothing, food production to healthcare.

Angelo continues: "Combustion advances and government initiatives have now brought the hi-tech world of steam to a whole new group of users, who stand to benefit in a big way.

"You only have to return to the example of the chicken farmers to see what a difference it can make. They're using animal waste (which they have in abundance) to generate steam that powers a turbine to provide electricity, before being recycled back as hot water to warm the chicken coop. It's a win, win and win situation.

"Any industry can benefit from this. Adding steam to your biomass system is a greener way of turning a good opportunity into an unmissable one."

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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.

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."



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.

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.

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.

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

Packages of ancillary equipment – including feed water tank, blowdown tank, softener and chemical dosing - are available with the Premium Range,

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

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# The Medium Combustion Plant Directive (MCPD) is on it's way and will be transposed into UK law by December 2017

If your company runs any combustion plant from 1MW thermal Input up to 50 MWth you will fall into the MCPD. The emission limits have already been set for the European Union and a number of staging dates set for the various sizes and types of industrial plant.

Having seen on the news the smog in certain Chinese cities, reminiscent of 1950's London smogs here is some information that may indicate the direction of travel in terms of NOx reduction globally.

### SAACKE LONOX UCC System already complies with future Chinese emission limits

Nitrogen oxide emissions < 30 mg/m<sup>3</sup> based on 3.0% dry O<sub>2</sub> certified by the German TÜV

From 2017, particularly strict emission guidelines will apply in selected urban areas in China, such as Beijing. New heat generation plants and power stations will then be subject to a NOx limit value of a maximum of 30 mg/m<sup>3</sup> based on 3.0% dry O<sub>2</sub>, while the regulation enters into force in five years for existing plants. The optimized SAACKE LONOX UCC (Ultra Clean Combustion) System, based on burner technology that has proven its worth over decades, already complies with the future guideline values in all areas – without expensive additives or secondary measures. This was verified by the German TÜV (Technical Inspection Authority) in January 2016, based on measurements at a test facility at the SAACKE research and development location in Bremen.

The new statutory regulations are the Chinese government's response to rising air pollution and smog formation, especially in urban areas. These are the result of released nitrogen oxides, which are unwanted by-products of combustion processes

that use high temperatures in many sectors of industry or are also released by motor vehicles in traffic. "We want to use our technology to contribute to a better climate and better living circumstances for the inhabitants", says Dr. Norbert Schopf, Director Business Development at SAACKE. "The guidelines for new plants may only enter into force from 2017, but they also affect power stations that supply heat. The goal is to be able to commission the first SAACKE Low NOx burners at the start of the 2016/2017 heating period." Plants that are already in operation can also be fitted with the technology, so that they can continue to be used.

### Cost-effective and efficient compliance with limit values

The reduction of nitrogen oxides in industrial processes is generally achieved by cooling the flame temperature in the burner, such as by installing cooling fins or water injection. NOx reduction measures of many SAACKE competitors often lead to a high amount of excess O<sub>2</sub> or a high level of CO. Significant reductions in the released nitrogen oxide can often only be achieved using expensive, catalytic (SCR) or non-catalytic (SNCR) processes. However, all of these options increase fuel consumption, material costs and the use of necessary additives at the operator's expense. By contrast, the SAACKE LONOX UCC System is based on an internally developed technology, whose core elements are a swirled and particularly stable spherical flame as well as a specially-engineered flame control. "This function has proven itself in



practice over many years and has undergone constant optimization", explains Dr. Norbert Schopf. The SAACKE burner fires all gaseous fuels cost-effectively and efficiently in compliance with the limit values of 30 mg/m<sup>3</sup> NOx based on 3.0% dry O<sub>2</sub> – with a low flue gas recirculation rate of < 30%. Specifically, measurements by the TÜV Nord, under low, partial and full load, resulted in NOx values (averaged over half an hour) of < 19 mg/m<sup>3</sup> at an output of 1 MW, < 28 mg/m<sup>3</sup> at 4 MW and < 24 mg/m<sup>3</sup> at 8 MW. The CO value is below 100 mg/m<sup>3</sup>. The SAACKE LONOX UCC System does not require any external measures for NOx or CO, and has a capacity range of 8 to 64 MW, making it suitable for plants with shell boilers or water-tube boilers with capacity ranges between 10 and 80 tons per hour. The burner solution is also ideal for extremely short furnaces due to the special flame geometry.

The SAACKE LONOX UCC System can be customized to customer requirements and the local infrastructure. Besides the test plant at the research and development location in Bremen, a 32 MW demonstration plant is also in planning at SAACKE's Chinese site in Qingdao.

For more information visit:  
<http://cea.org.uk/>

## SOUTHERN 18 Manufacturing & Electronics

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### The UK's must-attend event for every industrial engineering and manufacturing professional

Meet over 800 national and international suppliers under one roof in the brand new Farnborough venue next February at Southern Manufacturing & Electronics (inc AutoAero) 2018.

See live demonstrations and new product launches of machine tools & tooling, electronics, factory & process automation, packaging & handling, labeling & marking, test & measurement, materials & adhesives, rapid prototyping, ICT, drives & controls and laboratory equipment.

Free industry seminar programme online @ [www.industrysouth.co.uk](http://www.industrysouth.co.uk)

The exhibition is **free** to attend, **free** to park and easy to get to. Doors open at 9.30am on Tuesday 6th February.

Pre-register online now for your free entry badge and show preview at [www.industrysouth.co.uk](http://www.industrysouth.co.uk)

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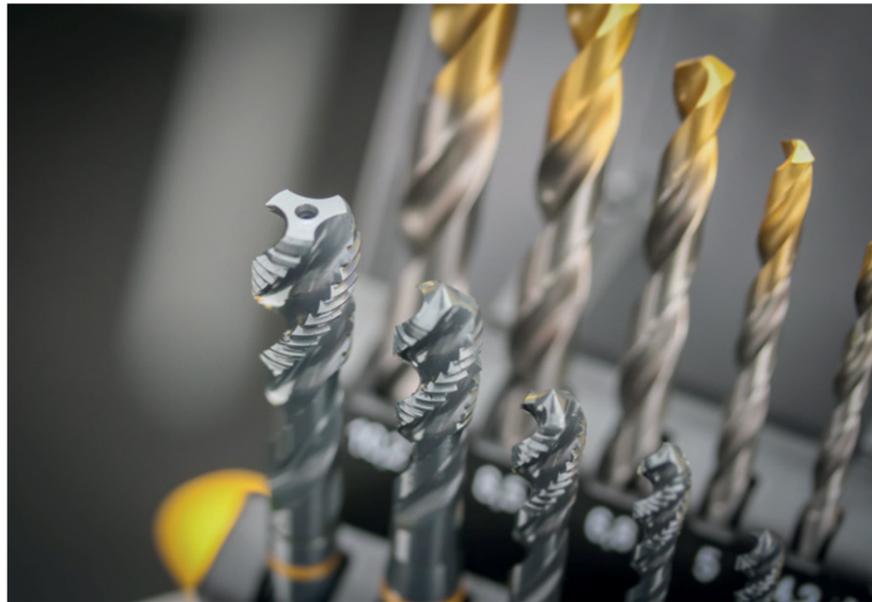
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# A new era for Southern Manufacturing - the UK's favourite engineering show

Southern Manufacturing & Electronics returns to Farnborough from February 6th to 8th 2018 for its 20th anniversary show; an event which coincides with the show's move into a new permanent venue, which now stands on its former site at Farnborough.



The £30m Farnborough International Exhibition and Conference Centre development is the largest exhibition venue to be built in the UK for 20 years. The 20,000m<sup>2</sup> Hall 1 complex, designed by award-winning architects Terence O'Rourke, offers world-class facilities, easy access and free onsite parking for 3000 cars.

While the impressive new surroundings will no doubt draw many admiring comments from visitors and exhibitors alike, for the show itself it's very much business as usual for 2018. The show will follow its tried-and-trusted formula, delivering a huge variety of vendors and thousands of products and services to an expected 9,000 visitors over the three days. With the show all but sold out, visitors can expect to meet around 800 participating firms from all over the UK, continental Europe and the Far East. Southern has grown to be a progressively more significant event with each passing year, particularly following its move to Farnborough in 2008 and the switch to a three day format three years ago. Consequently it attracts an ever-wider selection of participating firms, giving visitors a rare opportunity to meet companies that rarely, if ever, take part in domestic exhibitions.

The selection of products on show at Southern is simply vast and covers just about every conceivable requirement from production to raw materials. As usual, the show features live machinery demonstration from numerous well-known vendors, among them Yamazaki Mazak, Matsuura, Unison, Bystronic, Duggard, XYZ Machine Tools and others. New exhibitor, Rösler, is a leading brand in surface finishing and preparation equipment. On the stand, visitors can see a centrifugal (high energy disc) mass finishing machine in operation. This technology allows rapid finishing of smaller, robust parts. Metal removal rates can be 8-10 times higher than in vibratory machines and therefore process times can be 8-10 times shorter, lending itself to applications where fast, high volume component finishing is required.

Components and sub-assemblies are also a big part of the show, and here too the selection is broad. First time exhibitor Fuji Electric Europe GmbH is one of the big names in inverter and energy management for industrial applications. At the show, Fuji Electric will display high performance inverters that offer automatically controlled motor operations, aimed at

reducing overall energy consumption and minimising operating costs in a wide variety of AC drive applications including conveyor systems, pumps, fans, HVAC and lift applications.

DMS Technologies, an established UK battery manufacturer, will be exhibiting for the seventh consecutive year. The firm produces battery products for markets that demand cost effective quality and reliability. At Southern 2018 DMS will be displaying a range of its small battery packs covering chemistries including NiMH, Li-Ion and LiFePO<sub>4</sub>. Also on the stand will be a new range of portable power products; rugged DC battery supplies for remote operating using both lithium and lead acid batteries. Alongside the UK-built products will also be a range of distributed products including 12.8V Ultralife Lithium battery blocks. These offer a direct replacement to standard lead acid products, with an internal BMS meaning that they are compatible with lead acid charging systems.

Kabelschopp Metool will be highlighting its recently launched Master drag chains, the LEO and LE80, designed to meet the demands of Industry 4.0 applications. The Master drag chains feature the TS3 divider system; its reduced wall thickness allows more interior-space, achieving a vertical space saving of 50% and 37.5% in the horizontal.

Predictive maintenance is the cornerstone of Industry 4.0 and the factory of tomorrow. Igus returns to Southern 2018, showcasing a range of solutions to help improve uptime and reduce maintenance costs. Its smart plastics warn of potential failure in good time before unplanned and costly downtimes occur. At Southern, Igus will be highlighting new and improved smart plastics products, including the isense EC.RC, a new system for monitoring e-chains, the optimised CF.Q module for its intelligent chainflex cables and the intelligent iglidur PRT slewing ring bearings. Gears or plain bearings can be injection-moulded, 3D-printed or machined from bar stock to enable self-lubricating parts to be obtained quickly and cost-effectively. Igus recently introduced a new



process for the production of 3D printed injection mould tools that allows engineers to solve difficult technical challenges quickly. The entire range of 50 iglidur high-performance plastics are available using this new process, including specialists for high load, food contact, underwater or high temperature applications.

For those wishing to see some other examples of 3D Print, GoPrint3D will be exhibiting a range of 3D printers from a number of manufacturers including Formlabs, Markforged, Ultimaker and more. On the stand will also be metal parts printed on a Markforged Metal X. The Metal X uses a revolutionary technique to produce functional, pure metal parts at a fraction of the cost of traditional machining methods.

Industry 4.0 and some of the amazing possibilities of 3D Print are also two subjects that will be covered in greater detail as part of the show's excellent free technical seminar programme, which is open to all visitors. Colin Cater of Tri-Tech 3D, which is also exhibiting at Southern 2018, offers case study examples of the seemingly limitless applications that this new technology brings across all sectors of engineering and the new opportunities it could open. Another session with Dr John Loftus, of fellow exhibitors HMK Automation & Drives, looks at the latest developments in the field of collaborative robots, with thought-provoking examples of industrial applications.

The seminar programme also examines topical business management issues, such as implementing

Lean in the workplace, manufacturing best practice, CE marking and identifying value from intellectual property protection. There is also a compelling look at the implications of the forthcoming GDPR regulations for manufacturers and the latest outlook for manufacturers post-Brexit. Many other technical subjects are tackled in the 34 session programme that runs in two theatres over all three days of the show, including a look at the benefits and drawbacks of lithium ion batteries, implementing ERP and automated storage and retrieval systems. A full list of sessions and the all-important pre-registration form are available at <http://seminars.industrysouth.co.uk>

Plant equipment is another well-represented aspect of the event. Alongside a range of compressors and vacuum pumps, compressed air specialists BCAS, will be demonstrating the benefits of creating nitrogen in-house. Nitrogen generators allow users to produce a reliable, secure and safe source of nitrogen from an existing compressed air supply, thereby making significant cost savings. Kardex is a leading supplier of dynamic and flexible storage solutions for items from the size of a fastener to a 6m long RSJ. The firm will be highlighting its tailored solutions, designed to meet specific workflows. Goods with a total weight of up to 6,000 kgs per location can be efficiently integrated into storage logistic processes. Rebo Systems from The Netherlands will be demonstrating its new SMS R1 colour and cut sign and labelling system. Ideally suited for low to mid-range volume production of technical and electrical labelling, the SMS R1 can produce customised label shapes and sizes

with up to 9 colours on-demand and in-house. RF Solutions will be showcasing its brand new battery-less remote control systems- capable of up to 300 metres range with no additional power source - distances, the firm claims, are yet to be approached by other companies using similar methods. Utilising a secure, high-speed RF protocol, the KAPBOX and KAPTRAP systems have a myriad of possible applications.

These are of course just a small selection of the thousands of products on show at Southern 2018. A full listing of exhibitors and a searchable database of solutions can be found at <http://exhibitors.industrysouth.co.uk> Pre-registered visitors will also receive a free copy of the show's Preview magazine profiling over 100 exhibitors, plus a free copy of the detailed Show Guide.

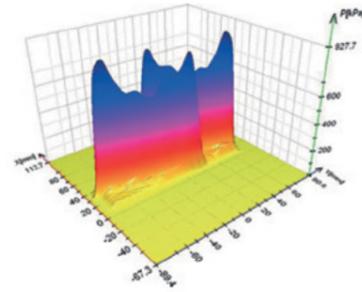
Southern Manufacturing & Electronics 2018 opens from February 6th to 8th. Admission to the show is free. More information and tickets are available from [www.industrysouth.co.uk](http://www.industrysouth.co.uk). Farnborough Exhibition and Conference Centre offers free on-site car parking and is easily reached by road, air or public transport.

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## Heat Transfer Specialist Releases Superior Performance Fluid

Thermal fluid specialist, Global Heat Transfer, has released Globaltherm® J, a thermal fluid specifically designed to work efficiently in a wide range of industrial processes.

Globaltherm® J is an energy efficient, low temperature thermal fluid that is suitable for a range of processes. Its high-performance qualities mean that it works efficiently in both liquid phase and vapour phase.

The fluid is suited to industrial manufacturing applications as it operates at a lower temperature, ensuring thermal stability. This prevents the system from accidentally overheating. Its operating temperatures also ensure that this fluid works efficiently in processes that demand low-temperature pumpability.

"Industrial manufacturing requires a heat transfer fluid that works at a specific temperature for prolonged periods," explained Clive Jones,

managing director at Global Heat Transfer. "With over 25 years of experience in thermal fluid and heat transfer systems, we offer the best advice on how to monitor and maintain fluid for optimum operating efficiency."

This product is the latest release from the Globaltherm® range. The thermal fluids offer a variety of temperatures for different processes while Global Heat Transfer helps manufacturers choose the best fluid for their application.

As the market leader in heat transfer fluid management, Global Heat Transfer works closely with customers to specify the correct fluid for each application. To optimise production and promote proactive maintenance, Global Heat



Transfer provides a thermal fluid maintenance plan, Thermocare. This service ranges from sampling and monitoring to engineering support and understanding DSEAR and ATEX regulatory compliance, helping customers work safely and efficiently with thermal fluids.

For more information on the fluids available at Global Heat Transfer, visit <http://www.globalheattransfer.co.uk/>

# Bosch Backs Cibse's Society Of Digital Engineering

The Chartered Institution of Building Services Engineers (CIBSE)'s Society of Digital Engineering (SDE) is a step in the right direction according to an industry spokesperson from Bosch Commercial and Industrial.

The society has been recently launched by CIBSE to support anyone involved in bringing digital elements to the built environment, be it designer, manufacturer, or contractor – an approach welcomed by Pete Mills, Commercial Technical Operations Manager at Bosch Commercial and Industrial.

Pete comments: "As building services engineering moves further into the digital world, engineers are increasingly being faced with conducting everyday tasks via a digital platform they may be unfamiliar with. Therefore, adopting digital engineering via platforms like this will be crucial to the future of the built environment, no matter your role in the building process."

With the uptake of Building Information Modelling (BIM) being relatively slow, despite its time in the spotlight, Pete welcomes the SDE as a fresh take on the concept. He comments: "Given the hype around BIM, it's time for industry to refocus and truly unearth what the initiative was about in the first place, which

is ultimately, to realise savings by encouraging information sharing and collaboration.

"The SDE offers an incremental process whereby engineers and building services companies can adapt at a steady pace. The society should bring more structure to the BIM process, helping to gain the interest of those that would otherwise have given up due to the perceived pace of change."

To encourage further understanding of digital engineering, education provision through the scheme is a key focus for CIBSE. Following a membership process, engineers will have the opportunity to join a community of like-minded professionals, with access to accreditation and training.

Pete concludes: "There are real tangible benefits to the society, but industry must work together to push it through. The younger generation will be key to the success of platforms like this and in turn, will carry

what they learn forward, helping the progression of their companies as well as their own careers.

"Having been officially launched in September, it will be interesting to see how the SDE supports the development and uptake of digital engineering. I believe the new platform offers a great foundation for the industry and have no doubt that it will help cut through the hype of BIM and provide a tangible first step for engineers to adopt what will become essential digital processes in the built environment."

For more information on Bosch Commercial and Industrial, visit: [www.bosch-industrial.co.uk](http://www.bosch-industrial.co.uk)

or call 0330 123 3004.

Alternatively, follow Bosch Commercial and Industrial on LinkedIn (Bosch Commercial and Industrial UK)

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# Hoists Deliver Special Performance Throughout Industry

The robust nature of Profi TI series air hoists from J D Neuhaus (JDN) ensures their suitability for a whole host of general industrial applications.

JDN's Profi TI series is extensive, but models from TI 3 to TI 25 (providing 3 to 25 tonne lift/load capacity) are ideal for general purpose use, even in continuous working processes. These units can be outfitted with many accessories to meet end user needs. Some of these accessories are various control systems (including remote control) for precise positioning of loads, and a variety of trolleys available to meet specific demands.

Profi TI hoists offer many advantages. These easy-to-operate, low-headroom, lightweight hoists are suitable for hazardous area applications and are impervious to dust, vapour, humidity and working temperatures ranging from -20 to +70°C. Profi TI hoists work uninterrupted with extended duty cycles (100% duty rating), and have fail-safe starting and overload protection.

These benefits are further enhanced by the need for only minimal maintenance to achieve optimal performance. Profi TI hoists utilise a low-maintenance vane motor, and maintenance-free dust proof ball bearings for the chain sprocket, while the patented motor-brake system is designed to produce little wear. The planetary gearbox utilises long-life grease lubrication with all teeth made of tempered or hardened high-grade steel, while the chain and hook are also made from high-quality tempered steels with a breaking strength of five times the nominal designated load. An integrated emergency main air stop for this series, along with the above design features emphasise the fact that safety is the number one priority at JDN and for their Profi hoists.

In total, six models are available for general industrial applications, 3 TI, 6 TI, 10 TI, 16 TI, 20 TI and 25 TI, with the numeral designating the carrying capacity in tonnes. For other applications, Profi TI hoists are available in lighter carrying capacities (from 250kg) as well as in heavier versions (with up to a full 100 tonne capacity). All of JDN's Profi TI hoists are also

available in a hydraulic drive version.

Typical applications include aircraft construction, general assembly lines, dairies, electroplating lines, offshore platforms, paint shops, power plants, refineries, sawmills, shipyards and tempering plants. They are also used in a host of uses in the chemical, explosives, food, furniture, glass, oil storage, paper, textile industries, and other industries.

End users in these markets enjoy strong, fast, silent, oil-free hoist operation with high levels of efficiency. JDN hoists are purpose-designed to offer the industry's most efficient air consumption rates, providing a significant contribution to reducing TCO (total cost of ownership). Profi TI hoists also feature no protruding control hoses or parts susceptible to damage, making them equally suitable for horizontal pulling.

## Company Information

With over 200 employees across the group, J D Neuhaus manufactures pneumatically and hydraulically-operated hoists and crane systems up to 115 tonne capacity from its state-of-the-art facility in Witten, Germany. This globally unique specialisation means that J D Neuhaus has set the quality standard for the market, a move that has seen the company become the established global leader in its technology field with customers in more than 90 countries worldwide.

Resilience and reliability are the key product differentiators, thanks largely to their explosive protection rating which makes them ideal for use even in the most challenging of operating environments. Extreme applications include oil and gas exploration in arctic temperatures as low as 45°C, along with underwater tasks such as ship hull repairs, and plenty of others in demanding sectors like mining, the chemical industry, heavy plant construction and many areas of logistics.



The wide portfolio of services provided by J D Neuhaus includes equipment assembly, inspection, maintenance and general overhaul, along with the supply of customer training courses.

Over 80% of production from the Witten plant is exported, which is why the company has long-established subsidiary companies in France, Great Britain, Singapore and the USA, all of which have helped create a tight-knit global network in collaboration with international partners.

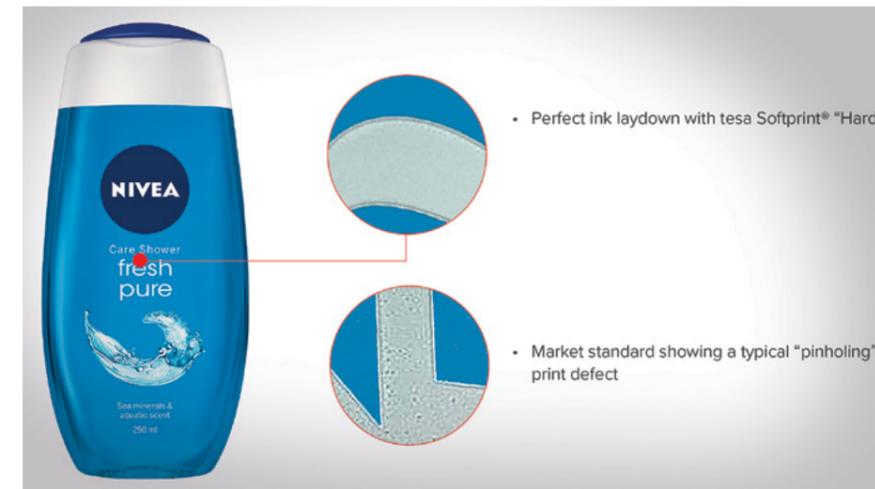
J D Neuhaus has history that can be traced back to 1745, and is now in its seventh generation of family ownership. Visitors to the Hebezeug-Museum (Hoist Museum) in Witten, are able to see for themselves the remarkable history of this progressive company.

Further information is available on request to:  
J D Neuhaus GmbH & Co. KG, 58449, Witten-Heven, Germany

Telephone: +49 2302 208-219  
Fax: +49 2302 208-286  
e-mail: info@jdn-group.com  
www.jdn-group.com

# Plate Mounting Tapes for High Quality “No Label Look” Printing

The ability to adapt to market innovations and trends has always been key in the printing field, and narrow web label producers are currently facing an increased demand to supply premium looking transparent products.



tesa is meeting these market needs with a tailor-made range of high performance plate mounting tapes for label printing applications.

The modern effect of transparent labels, which ensures that information looks as if it was directly printed on the packaging instead of on a label, is a growing demand for customers across multiple industries. A Smithers Pira report from May this year concluded that a “continuing major trend is to achieve a no-label look” and that the label style is “spurring brands to invest in clean graphics that can

stand out from the packaging”.

The perfect “no-label-look” is achieved with a flexo-printed clear on clear label stock – mostly with a thin high clarity face material and a clear adhesive carried on a smooth film liner.

To ensure a brilliant print result, white inks have to be printed as a background to the actual design, ensuring high opacity of the final design and a smooth laydown of the different ink layers. tesa Softprint® Hard is perfectly suitable for all

flexo printers aiming to achieve an excellent print quality when printing solid backgrounds. The foam hardness of this 380 µm (15 mil) plate mounting tape provides optimal cushioning and resilience properties, resulting in optimized ink laydown even at very high press speeds.

Depending on the label motif printed in the second step, the comprehensive tesa Softprint® assortment offers optimal solutions for all design requirements in combination with different plates and materials in use.

In addition to offering the different foam hardness perfectly catering to individual design requirements, tesa offers a range of different adhesive lines within the plate mounting assortment: tesa Softprint® Steelmaster, tesa Softprint® Steelmaster TP, and tesa Softprint® Secure. So that the perfect solution for all requirements regarding mounting, printing, or demounting processes can be offered, meeting individual needs and conditions at a printer.

Richard Eeles, Strategic Segment Manager Print & Web Processing at tesa UK Ltd, says “We offer the most advanced flexo print tape technologies designed to meet increasing requirements for fast mounting, high print quality, and demounting tape performance. We have been able to develop a wide range of product specifications with the consistency of performance that the industry demands”.

For more information visit:  
[www.tesa.co.uk](http://www.tesa.co.uk)

| Product color code             | X-Soft      | Soft        | Medium      | Medium-Hard | Hard        |
|--------------------------------|-------------|-------------|-------------|-------------|-------------|
| Print motif                    |             |             |             |             |             |
| tesa Softprint® Steelmaster    | tesa® 52018 | tesa® 52017 | tesa® 52016 | tesa® 52015 | tesa® 52014 |
| tesa Softprint® Steelmaster TP | tesa® 52118 | tesa® 52117 | tesa® 52116 | tesa® 52115 | tesa® 52114 |
| tesa Softprint® Secure         | tesa® 52818 | tesa® 52817 | tesa® 52816 | tesa® 52815 | tesa® 52814 |

# Gen4 Ionizing Point Delivers Precision Static Elimination

EXAIR's new Gen4™ Ionizing Point delivers a high concentration of positive and negative ions to neutralize static electricity without requiring compressed air.

This compact and shockless static eliminator is the ideal way to eliminate static electricity problems occurring in small spaces. They are ideal to keep small parts or products separate or from sticking to other surfaces. Gen4 Ionizing Points can protect sensors, eliminate improper readings of sensitive electronics, keep powder filling nozzles clear of clogs and prevent jamming, tearing or dust attraction on slitting, winding, rewinding, ink jetting and silk screening applications.

The Gen4 Ionizing Point has undergone independent laboratory tests to certify it meets the rigorous

safety, health and environmental standards of the USA, European Union and Canada that are required to attain the CE and UL marks. It is also RoHS compliant. New design features include a metal armored high voltage cable to protect against abrasion and cuts, a replaceable emitter point, integrated ground connection and electromagnetic shielding.

A new 115V/230V selectable voltage power supply has been designed to operate the Gen4 Ionizing Point. Visit EXAIR.com to see the entire static elimination product line including static eliminating



Gen4 Super Ion Air Knives, Gen4 Super Ion Air Wipes, Gen4 Ion Air Cannons, Gen4 Ion Air Jets and a handheld Gen4 Ion Air Gun for manual operations. Price is \$211.

For more information contact:  
www.exair.com/ip\_pr.htm

# Gratnells Engineering in the fast lane with new Powder Coating line

Gratnells Engineering, The Harlow based company, has recently invested in a new state-of-the-art Powder Coating line that allows for shorter runs than ever before, without impacting on a best-quality finish.

The new machine, which includes equipment built by Surface Finishing Group, has a lengthy 85-meter conveyerised production line and a spray booth complete with electrostatic/Corona guns produced by Gema. The Spray booth contains sensors upon entry that ensures no wastage occurs, as the machine only sprays if metal is present in the booth.

The customer workpiece goes through a phosphate wash, rinse and then is dried in the oven. It will undergo a heating process to cure the item, where the powder will melt into a smooth uniform film, and finally will be cooled to ensure a hard-resilient coating and high-quality finish.

The result is a process that allows for urgent demands to be met thanks to shorter production runs, shorter lead times and higher resistance to chemicals, high temperatures and UV light.

Whilst this increase in speed has obvious advantages to customers, the versatility of the line is also noteworthy. Demands on modern manufacturers mean an adaptable process that can handle various product outputs is often a necessity. Since it's implementation the line has already successfully produced a large variety of items, including railings, doors, windows, automotive parts, industrial machinery, furniture and garden furniture.

The efficiency of the new line means metal can be coated in any RAL or British Standard colour, meaning customer choice is wider than ever. The process is also now more environmentally friendly, especially when compared with standard painting processes.

Loic Jones, Operations Director, says "Gratnells Engineering decided to invest in a state of the art



powder coating line and utilise the latest powder coating technology to enables us to offer short production runs with the best quality finish, to our customer base. This substantial investment will allow Gratnells Engineering to continually support the ever-demanding needs of modern manufacturing clients".

Gratnells Engineering has also recently launched www.gratnellspowdercoating.com, a new website that outlines some of the key benefits of the line and streamlines the decision-making process for customers even further.

# Fluke 1740 Series Three-Phase Power Quality Loggers simplify collecting and reporting of critical utility PQ data

Powerful software automates analysis and reporting of data based on international standards to troubleshoot, quantify energy usage, and analyse power distribution systems.



- One touch reporting: create standardised reports according to commonly used standards like EN 50160, IEEE 519, GOST 33073, or export data in PQDIF or NeQual compatible format for use with third party software.
- Advanced analysis: choose any available logged parameter to create a highly-customised view of logged measurements for advanced correlation of data.

An optimised user interface, flexible current probes, and an intelligent measurement verification function that allows technicians to digitally verify and correct connections makes setup easy and reduces measurement uncertainty. Connection errors are automatically indicated via an amber light on the unit's power button which turns green once corrected. Because measurement and logged data can be viewed using a wireless Wi-Fi connection, the 1740 Series minimises technicians' time in potentially hazardous environments and reduces the hassle of suiting up in personal protective equipment.

The loggers are rated 600V CAT IV/ 1000V CAT III for use at the service entrance and downstream.

Fluke is the market leader in portable power quality instrumentation solutions and the Fluke 1740 is the latest product in a range of products that includes the Fluke 430-II series analysers.

Information about all Fluke products can be obtained via the Fluke web site at [www.fluke.co.uk](http://www.fluke.co.uk).

The measurement, understanding, and reporting of power quality in distribution systems requires capturing large amounts of data and then spending hours to analyse and report. With powerful software that automates setup, analysis, and reporting, the Fluke 1740 Series Power Quality Loggers simplify the collecting and reporting of critical utility power quality trends. More information about the products can be found at [www.fluke.co.uk/1748](http://www.fluke.co.uk/1748)

The compact Fluke 1740 Series Power Quality Loggers are used for studying and monitoring utility power quality and demand to industry standards. They offer advanced data aggregation and analysis that saves time, reduces manpower, and eliminates errors associated with traditional data collection and reporting.

The Fluke 1740 series loggers are fully compliant with the international power quality standard IEC 61000-4-30 and meet Class A requirements. They

are capable of simultaneously logging more than 500 parameters for each averaging period, allowing technicians to analyse power quality in detail and to correlate intermittent events with detailed waveform data to identify the root cause of disturbances.

The included software makes it quick and easy to setup the logger, and automates the complex task of analysing and reporting the data. The software features:

- Easy setup in the field or workshop with PC application software: connect using Wi-Fi, wired Ethernet connection, or USB cable to setup the instrument, download logged data or download directly to USB memory stick.
- Energy Analyze Plus application software: download, analyse and report every measured detail of energy consumption and power quality state-of-health with automated reporting.

# The new Eaton Dynamax EC881 hydraulic hose offers high pressure capabilities combined with unrivalled cycle life and 50% better bend radius than EN standard

Power management company Eaton has expanded its range of hydraulic hoses with the launch of the Dynamax EC881 hose series.



Qualified to 1 million impulse cycles, this new two wire-braided hose has been designed to last and withstand tough applications. Intended for deployment in mobile applications such as compact construction equipment, agricultural vehicles, aerial lift platforms and forestry machines, this hose is also suitable for industrial applications such as hydraulic presses.

In today's productivity driven environment, owners and operators simply cannot afford machinery downtime. It is therefore imperative that OEM designers and engineers design for reliability. Impulse cycle capabilities are a key measurement in terms of life expectancy. Standard EN857 Type 2SC hoses are qualified up to 200,000 impulse cycles. The new EC881 series from Eaton exceeds this standard by five times. This durability helps decrease maintenance costs, improves safety and minimizes downtime.

"To maintain operational effectiveness and productivity it's essential that hydraulic systems operate effectively," said Dimitar Atanasov, product manager, Fluid Conveyance products EMEA. "Operators simply cannot afford downtime in the field. When developing the new EC881 Eaton focused on the main customer pain points and designed a hose that will help combat the common failure causes such as abrasion. Here at Eaton, we are seeing a growing demand on the market for more compact machines and for hoses with a better bend radius, which allows for easier tube routing in tight spaces. What's more, the EC881 is ideally suited to high pressure systems and has been qualified for 1 million impulse cycles, thus increasing in field reliability."

There is a growing demand for OEMs to develop compact machines that have the same operating capabilities as their larger counterparts. This is creating a need for hydraulic systems that can cope with high pressure and high impulse. Thanks to a new generation of inner tube and hybrid plies, EC881 delivers a 35 percent higher pressure capability when compared to standard hoses of standard EN857 2SC. Where expensive four spiral hoses have had been used to cope with system pressures, the new EC881 two wire braided hose can be an alternative hose which helps deliver a direct cost saving for OEMs.

As the need for compact machines grows, OEMs face challenges concerning the routing of hydraulic hoses through tighter spaces. Utilising hoses with standard bend radii ultimately costs more as they take more time to install and greater quantities of hoses could be needed. It is important to note that the increased quantity of hose increases the weight of the machine, thus reducing fuel efficiency. To solve this problem the new EC881 hose has been engineered to feature a 50 percent better bend radius when compared to standard two wire braided hoses. Standard EN857 Type 2SC size 8 hoses are only qualified to 130mm radius, whilst EC881 offers a bend radius of 60mm. This makes the new hose the ideal choice for installation in tight spaces as it delivers increased design flexibility and offers the potential to reduce hose quantity therefore decreasing build / operating costs.

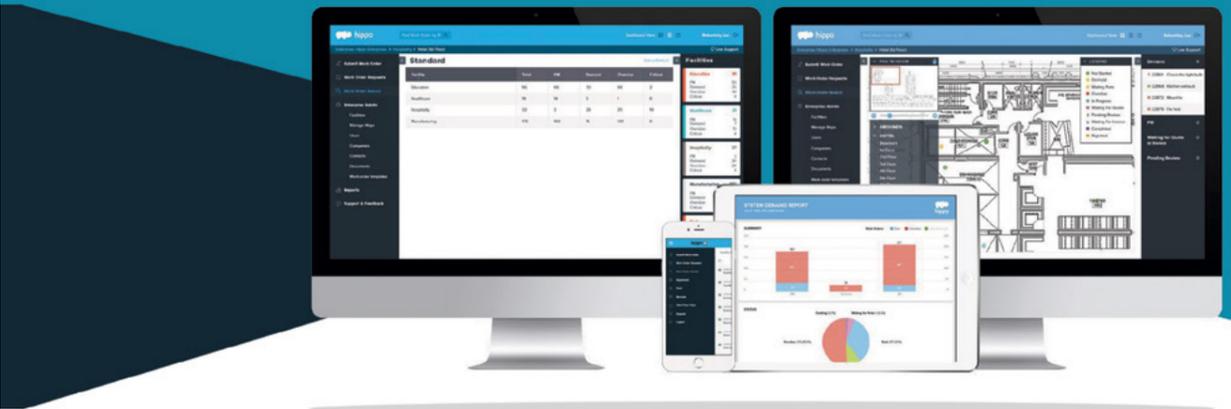
Abrasion is a leading cause of hose field failure and is a problem that needs to be addressed. Featuring Dura – Tuff covers, the EC881 is eight

times more resistant to abrasion than conventional synthetic covered hoses, ultimately leading to less failures and improved machine up time. In extreme operating environments high velocity leads to high temperatures, conventionally rated hoses simply cannot deliver the protection needed and service life times are impacted. EC881 has been designed to offer temperature capabilities up to 126°C, thus mitigating against the risk and ultimately controlling maintenance costs. What's more, inside out failure can be correlated to hose material aging and is a common cause of operational breakdown. Eaton engineers have focused on developing a next generation inner tube that has three times the life span capabilities when compared to standard hose of standard EN857 2SC. EC881's high fatigue resistance and low compression set provides better sealing and leak free performance.

Eaton's hydraulics business is a worldwide leader in supporting companies that want to increase efficiency, reliability and safety within industries including – construction and mining, agriculture and forestry, traditional and renewable energy, manufacturing and processing, oil and gas, transportation and material handling. The global Hydraulics team designs, manufactures and markets a comprehensive line of reliable, high-efficient hydraulic and industrial systems including electro-hydraulics, fan drive, hybrid and steering solutions to leading edge components including adapters, couplings, cylinders, fittings and assemblies, hose and tubing, motors, pumps and valves.

Eaton is a power management company with 2016 sales of \$19.7 billion. We provide energy-efficient solutions that help our customers effectively manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. Eaton is dedicated to improving the quality of life and the environment through the use of power management technologies and services. Eaton has approximately 96,000 employees and sells products to customers in more than 175 countries.

For more information, visit: [www.eaton.com](http://www.eaton.com).



## Hippo CMMS Delivers Simple Solutions for Preventive Maintenance and Equipment Management

Hippo CMMS is a maintenance management software tool for organizations of all sizes. It is a web based solution which is quick and easy to implement. Hippo CMMS offers a customized interface which can be designed to suit users' specific operational maintenance needs.

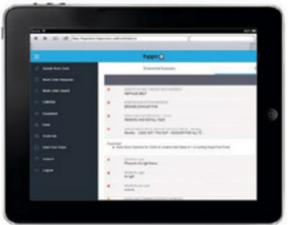
Hippo CMMS has been providing user friendly maintenance software to organizations in manufacturing, healthcare, education, hospitality, sports and recreation, property management, and municipalities since 2004. The software is being used by more than 800 businesses, at over 11,000 facilities with more than 45,000 active users. *Customers include; Prada, Mountain Equipment Co-Op, Arrow Fasteners, Emerson Processing, Chem Plate Industries, Kettering University, Rolls Royce, Shell Aviation among many more.*

The platform is designed with the intention of "making the complex simple." Differentiating itself from other CMMS is that Hippo manages to offer all the essential features and deliver them in a simple, easy to use package. The application can be used by everyone in an organization, tech-savvy, or not.

The application comes with all the necessary modules and features required to streamline most maintenance operations. Core features include;

- ✓ Preventive maintenance
- ✓ Work order management

- ✓ Maintenance request portal
- ✓ Equipment and asset management
- ✓ Inventory and spare parts management
- ✓ Interactive site and floor plans
- ✓ Bar code reading and scanning
- ✓ Equipment downtime tracking
- ✓ Powerful reporting tools
- ✓ Mobile solutions



### Each subscription includes;

- ✓ Unlimited users and maintenance requesters
- ✓ Lifetime technical support
- ✓ Regular software updates
- ✓ Access to training materials (videos, manuals, webinars)

Hippo CMMS onboarding and customer success team see customer implementation through from start to finish and continue supporting them throughout their subscription. Hippo offers a variety of services to ensure that the implementation goes smoothly and is a success;

- ✓ Site audits
- ✓ Data migration
- ✓ Software customization
- ✓ On-site and web conference training

## Energy Efficient Cooling



### 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 | 3500 installations worldwide | Warehouses | Stores | Bakeries | Production Lines | Print Lines | Manufacturing | Telecoms

### Client List Includes

Cummins Diesel | Machine Mart | Print Direct | Matalan | M&S | BT | TK Maxx | Nestle

### 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

### Proven Savings

Energy savings calculator available | Relevant case studies and testimonials can be found on our website.



## Reduce your Operational Cooling Costs and Carbon Footprint

EcoCooling are industry leading manufacturers of ventilation and evaporative cooling equipment, with over 4500 installations worldwide.

EcoCoolers provide a natural, safe and simple alternative to air conditioning which can result in up to 90% reduction in operational cooling costs.

A recent case study with has proven the success and reliability of EcoCooling's evaporative coolers.

A glass manufacturing company approached EcoCooling to design and install a suitable cooling system for the factory around. Due to heat load in equipment such as ovens, temperatures on the shop floor regularly exceeded 45C during the summer months and could get up to 50C on the mezzanine level. Temperatures of this magnitude can result in discomfort for staff which can lead to decreases in productivity due to the extreme heat. In some factories, due to the heat, staff are required to take more frequent water breaks to be able to cope with the heat in the factory.

#### The Solution

A solution was needed to reduce the constant heat in the building in the most environmentally and financially friendly way.

EcoCooling were chosen as evaporative cooling can provide cool, fresh air, under 25C all year round in the UK, while also running on less than 90% of the power of the alternative air conditioning system. In addition to the low power draw, EcoCoolers use water to cool the air rather than refrigerants, meaning the overall environmental impact of the system is reduced significantly.

#### The System

Three large roof mounted powered extraction units were installed to remove the heat from all levels of the factory and shop floor. This ensured that both problem areas were cooled evenly and were delivered the correct amount of air. Each extraction



unit rated at over 25,920m<sup>3</sup>/hr to remove the hot air, cool air was then introduced through the use of four EcoCooling evaporative coolers (EcoCooling ECP units).

The whole system is able provides 160kW of cooling to the shop floor while drawing less than 9kW of power when running at full load.

Managing Director, Michael Croucher stated that the system not only improved the working conditions for his staff but the installation was seamless and didn't cause any downtime in the factory!

For more information, visit: [ecocooling.org](http://ecocooling.org)

## Rittal Offers Users Free Cooling Equipment Survey

Users of Rittal enclosure cooling technology are being offered free on-site inspection surveys to ensure that their production and process critical equipment is being adequately protected.

The offer is available for a limited period and extends to any business with Rittal climate control installations, ranging from top therm, roof mounted fans, to Blue e or Blue e+ cooling units, all of which manage the temperature inside their enclosures. The user does not have to have previously registered with Rittal for their cooling units to qualify.

#### Excessive temperature or overheating in an electrical enclosure means that enclosure cooling is very important for a number of reasons:

- Unplanned interruptions to production due to tripping or failing control components are costly
- Excessive temperature affects the correct operation and service life of electrical equipment
- High temperatures that lead to tripping or failing control components are avoidable

- 80 per cent of control component failures may be addressed with a suitable cooling solution

Marketing Director Simon Kelemen says, "The costs of downtime, loss of production and system shut-down due to equipment running over temperature can easily exceed £10,000 per hour. I don't know any businesses that would be happy to right that off, particularly as it's entirely avoidable."

#### Inspection by Rittal experts

- For businesses with Rittal enclosure cooling equipment installed the process will involve an engineer conducting the review which will provide:
  - Confirmation as to the condition of the devices
  - An assessment of their cleanliness, function and serviceability
  - An asset list documenting status of each enclosure



- A quotation (if required) based on the most appropriate solution for moving forward
- On-going service suggestions and offers, tailored to the site itself.

To book a survey, users can contact the Rittal team via [information@rittal.co.uk](mailto:information@rittal.co.uk) or call 01709 704105 to book their survey.

Further information on climate control solutions at [www.rittal.co.uk](http://www.rittal.co.uk) and [www.friedhelm-loh-group.com](http://www.friedhelm-loh-group.com) or on twitter @rittal\_ltd.

**CONTACT US FOR MORE INFORMATION**  
01284 810586 | [sales@ecocooling.org](mailto:sales@ecocooling.org) | [ecocooling.org](http://ecocooling.org)

# Industry 4.0: The Hour Of Implementation Has Arrived

Increasing demands by consumers for individual, high-quality products at favorable prices are posing new challenges for industrial enterprises which can only be resolved by digitalisation.

"With the Digital Enterprise portfolio, the technical conditions have been created for Industry 4.0. To ensure successful implementation of Industry 4.0, what we now need is an extended model for cooperative partnership based on mutual respect: Large-scale corporations supply platforms and components, medium-sized enterprises develop their own solutions and business models on this basis, and end customers integrate these into their digital value chain," explained Klaus Helmrich, Member of the Managing Board of Siemens AG at the SPS IPC Drives.

Siemens will be showcasing a range of innovations at the show designed to shorten the time to market and to improve flexibility, efficiency and quality in the process and manufacturing industries.

- **New MindSphere Version 3.0 on Amazon Web Services (AWS) provides access to Siemens APIs and AWS cloud services for faster development**
- **Simotics IQ: New IoT concept for motors**
- **New partnership financing service to boost the implementation of Industry 4.0**
- **Study affirms annual productivity increase due to digitalisation of up to 9.8 percent**

They range from the new Version 15 of the Engineering Framework TIA Portal through the IoT concept for motors Simotics IQ to the new Version 3.0 of the open cloud-based IoT operating system MindSphere. Siemens is also offering financing services such as pay-per-use models designed to simplify the implementation of digital solutions, aimed in particular at medium-sized enterprises.

As Siemens will be demonstrating at the show, digitalisation is already helping small and medium-sized enterprises to boost their competitive standing today. Making this possible is the company's Digital Enterprise offering, comprising solutions for the digital twin over the entire value chain, the open cloud-based IoT operating system MindSphere and the world's leading automation portfolio.

Featured on the Siemens booth at the show is the new MindSphere Version 3.0. Now available for the first time on Amazon Web Services (AWS), it links the global scalability of the leading Siemens automation portfolio with AWS, the leading provider of cloud services. The new version features a more efficient development environment with an open API (Application Programming Interface), advanced analytics and extended connectivity, enabling the faster development of robust Industrial IoT solutions.

Also new is Version 15 of the Engineering-Framework TIA Portal (Totally Integrated Automation), with the focus on new practical digitalisation functions to shorten engineering times. These include the integration of handling functions and the connection and programming of robots.

With the introduction of Simotics IQ, Siemens has created an IoT concept for motors. This allows users to transfer data such as the operating and status parameters of low-voltage motors to MindSphere. Based on this data, the Simotics IQ MindApp delivers valuable analytical results and is able to provide useful information such as recommended actions for the timely planning of maintenance work, or rapid response warnings to prevent costly plant standstill. The transparency gained in this way helps enhance efficiency and increase productivity.

The new generation of Simotics SD motors will be the first to benefit from Simotics IQ. Illustrating the convergence between the virtual and the real production worlds at the fair will be an exhibit featuring a high-performance filling and sealing machine for the pharmaceutical industry built by

Bausch + Ströbel. This company plans to use integrated hardware and software solutions from Siemens to achieve a 30 percent improvement of its engineering efficiency by 2020 by consistently applying digitalisation across its entire value chain – from design and layout, simulation and optimisation in the in-house virtualisation center, all the way to commissioning and service.

Study affirms annual productivity increase due to digitalisation of up to 9.8 percent

Manufacturing companies around the world are facing the challenge of financing the digital transformation, in some cases involving significant investment. The enormous gains in productivity made possible by digitalisation are outlined in a new study entitled "The Digitalisation Productivity Bonus: Sector Insights" from Siemens Financial Services (SFS). According to the paper, manufacturers can generate an annual increase in productivity through decreased manufacturing costs adding up to as much as 9.8 percent of total revenue.

This is achieved by automating and digitalising their production systems and so improving manufacturing productivity.

Companies can use this released liquidity to invest in other areas such as new technologies and also to finance them over time. Under its "Financing 4.0" scheme, SFS offers tailored pay-per-use models and financing for software solutions that allow companies to make the long-term transition to new-generation digital technologies.

Further information about Siemens at the SPS IPC Drives 2017 at [www.siemens.com/spc-ipc-drives](http://www.siemens.com/spc-ipc-drives)

# Power quality in HVAC applications Keeping your systems cool when things get hot

Most people can remember a time when they've walked into a room and seen one person dressed for the arctic while the person next to them looks like they're in the Bahamas. Although disagreements over heating like these have led to fights in some offices, for most businesses poor power quality in HVAC systems can do more damage financially. Here, Steve Hughes, managing director of REO UK, explains how to keep your HVAC running cool when things get hot.



Most people can remember a time when they've walked into a room and seen one person dressed for the arctic while the person next to them looks like they're in the Bahamas. Although disagreements over heating like these have led to fights in some offices, for most businesses poor power quality in HVAC systems can do more damage financially. Here, Steve Hughes, managing director of REO UK, explains how to keep your HVAC running cool when things get hot.

Power quality is a term that many people use but few fully understand. Typically associated with a stable supply of mains electricity, power quality covers a range of problems, including the continuity of the supply of electricity, fluctuations and spikes in voltage and current, as well as transients or harmonic currents.

For years, power quality was a problem almost exclusively reserved for industrial applications. When manufacturers began using non-linear, switched, devices like variable speed drives (VSDs) to control the speed of a motor driving a conveyor belt, they

had to pay attention to the effect these devices have on the mains supply.

The use of switch-mode power supplies (SMPS) results in harmonic currents in the electrical supply. Here, the current waveform expands to accommodate multiples of the fundamental 50Hz frequency. This means that the device using power is not only consuming more electricity – sending energy bills through the roof – but it can also cause motor windings and transformers to overheat and lead to inefficiency and possible breakdowns.

In recent years, the popularity of SMPS in computer systems and laptops, as well as in phone chargers and consumer electrical equipment, has created a power quality problem in HVAC applications. Combine this with the fact that most buildings, offices and residential and commercial facilities have some form of heating, ventilation and air conditioning (HVAC) it is easy to see the scale of the problem.

Poor power quality can damage HVAC components including heat exchangers, fans, pump motors,

condensers and furnaces, reducing their lifespan and raising energy costs.

Facilities managers responsible for a building's HVAC system are also obliged to meet industry standards such as EN61800-3, which specifies the limits of electromagnetic emissions, immunity levels and testing methods for power drive systems (PDS) – the parts of a VSD that control driven equipment.

The standard identifies four categories where PDSs can be used in one of two environments. The first environment looks at domestic premises, low voltage networks, houses, apartments and residential buildings. The second looks at industrial buildings and those supplied by a dedicated transformer such as factories and plants. Depending on the category, the standard either lets anyone install the PDS or requires installation by a professional.

According to the standard, a PDS rated at less than 1000V can be installed by anyone in domestic premises. This is already causing problems as the demand for apartment buildings grows. Apartment buildings typically use more sophisticated building management systems, with electronics controlling the heating, lifts, extraction, doors, telecoms and internet-over-mains connections, all of which can be compromised by poor power quality, ultimately hampering the user's experience.

To enable facilities managers to use drives properly in their HVAC system, REO UK has developed an entire suite of products dedicated to eliminating power quality problems in HVAC applications. The REO Unity range comprises electromagnetic compatibility (EMC) filters, mains chokes, output chokes, sinewave filters and powerline filters.

So, the next time you feel like wearing your shorts to the office, make sure your HVAC system is running as cool as you look.

Further information visit: <http://www.reo.co.uk>

# When A Young Chap Becomes A Fellow

When a world leading engineering institution recently announced the appointment of one of its youngest ever Fellows, it is unlikely anyone across the industry would have expected it to be a health and safety inspector.

However, the impressive accolade, bestowed upon 35-year-old Richard Hines, actually honours a long tradition of the Health and Safety Executive (HSE) producing Fellows of the Institute of Engineering and Technology (IET).

From humble beginnings as an apprentice electrical technician, Richard has quickly moved up the ranks to his current position as Principal Specialist Inspector for Britain's national workplace health and safety regulator – no mean feat in a career not yet even spanning two decades. But Richard openly credits this achievement to his day job, saying he has drawn entirely on it to meet the gruelling selection criteria of the Fellowship.

"A lot of the work I have been involved with has been reactive, giving evidence in court, contributing to professional standards, as well as speaking at a number of industry events," said Richard. "The Fellowship is really testament to the support I've had from HSE throughout my career."

Richard's rapid career rise, goes some way to proving the old adage 'if you're good enough, you're old enough.'

He explains: "The Fellowship was always something I'd aspired to but never actually thought I would achieve. I initially thought I was probably too young. Ultimately though, it's not about age, it's about the examples you present to the panel."

"If you meet the standard, and you can demonstrate that, then why should your age present a barrier?" asked Richard. "This achievement confirms I am working at the top of the profession at this age – so why can't others?"

Richard politely dismisses suggestions that he is now held in the same esteem as those old enough to be his parents, talking only of his respect for his

fellow IET alumni.

"It makes me feel really proud to have reached that level this early on, and to stand amongst those so highly-respected in their fields. It's humbling."

An expert in electrical and control system engineering, Richard provides front line support to his regulatory colleagues operating across a wide range of sectors including construction, utilities, agriculture and general manufacturing.

He believes HSE valuing professional body recognition helps it regulate better. "For an organisation to have industry-recognised fellows in it shows it has people working at the highest level. We're proving to the public that we both have the expertise and the resources to tackle the most serious incidents and injuries in engineering."

It also ensures that HSE has a credible voice when it tries to regulate differently, he argues: "The regulator will always have a role in trying to answer very difficult questions when something goes wrong and to understand technically what happened. It is up to us, as the regulator, to make sure those things don't happen again, and ultimately to hold people to account. But I think there is also a big part in our role to encourage industry to be forward-thinking with those that have control and influence. We must be at the forefront of continually driving the whole health and safety regime forward."

Richard's work is also underpinned by globally recognised scientific expertise. "My role covers probably the broadest range of electrical and control systems engineering issues you will find anywhere in the world," he explains. "We deal with the reactive issues, where people have been tragically killed or seriously injured, and build an understanding of exactly how or why this has happened. Not only do we drive national standards, but we also work



on emerging technologies; the things that are not necessarily present today but could be in the future."

Richard notes with interest his age means he will be still be working when these innovations bear tangible outcomes. "We think about some of the developments in power distributions, renewables and energy storage and the things that are perceived as tomorrow's challenge."

"Everything is moving at such a rapid pace that it's exciting to think that I will still be in post and very much working on those things when they finally come to fruition."

But the most important thing for Richard is HSE's clear role and function in ensuring people go home safely at the end of the day – "while many focus on streamlining processes to make them more efficient, our overall objective is always to put people first. We are here to ensure everyone can go home healthy from their place of work – the safety of people is key."

# LATEST HI-LINE COMPRESSED AIR DRAINS OFFER BOTH VALUE AND PERFORMANCE

Hi-line Industries, an established and reputable UK manufacturer of high-quality compressed air purification equipment, has launched its new HTD condensate drain into the UK market.



Featuring an isolation valve for strainer cleaning to 250 micron, the latest-generation HTD offers a 100% ED rated solenoid coil and multi-voltage timer controller to ensure automatic compressed air system drainage.

Although condensate drains are possibly the most inconspicuous components in a compressed air system, they are among the most important. These compact yet innovative products have to function with extreme reliability for the system's filters and separators to do their job effectively. Moreover, compressed air drains prevent moisture carry-over, which can wash away lubricant on motors and bearings found in tools and machinery, leading to premature wear, higher maintenance and greater expense.

Hi-line's HTD is a fully automatic (no maintenance) drain offering a high performance-to-cost ratio.

Described as Britain's best value autodrain, the HTD is based on a high-quality, 16-bar rated brass valve body which is precision machined to fine tolerances. High pressure variants at 40 and 80 bar are also available to order. The valve orifice bore is 4mm in diameter, thus allowing the largest piece of dirt, metal or scale to be removed along with the condensate.

At either end of the 2/2 way direct-acting valve can be found a 1/2" male and 1/2" BSP female connection. The coil is available in 24, 100 and 240V versions, and is 100% ED rated to offer long service life and facilitate operation in temperatures up to 60°C.

To allow use across the full range of Hi-line drains, the solid-state timer controller is multi voltage.

Furthermore, the rugged ABS housing/enclosure is IP65 rated to reflect its suitability for use in harsh operating environments. LED indicators display the operational status of the drain, while a manual test button is also employed.

Timer drains such as the HTD are a popular option based on cost, ease of installation and reliability, particularly if fitted with a strainer on the inlet. Designed for use on filter housings, after coolers, dryers, pressure vessels, air receivers and compressors, regardless of size or capacity, the adjustable interval times (30 seconds to 45 minutes) and discharge times (0.5 to 10 seconds) allow users to make the drain to work at its optimum and become energy efficient.

Further information is available from:

Hi-line Industries Ltd,  
5 Crown Industrial Estate, Oxford  
Street, Burton on Trent, Staffordshire  
DE14 3PG  
Telephone: 01283 533377  
Fax: 01283 533367  
e-mail: enquiries@hilineindustries.com  
Visit: www.hilineindustries.com

# Sustainable Pelleting In A Renewable World

Conversations around renewable energy often overlook biomass, a sustainable alternative to fossil fuels that is proving to be a critical source of energy.



Here, Mark Burnett, VP of the Lubricants and Fuel Additives Innovation Platform at global water, energy and maintenance solutions provider NCH Europe, explores the importance of biomass pelleting and explains why maintenance engineers play a pivotal role in the process.

For several years and on multiple fronts, European countries have positioned themselves as global leaders in renewable energy generation and consumption.

Spain is a prime example of this. The country first pledged to be a global green energy leader in 2007 and, a decade on, the country is making significant progress. Between January and August 2016, just under half of Spain's power was renewable according to figures reported by Spanish electrical operator Red Eléctrica de España (REE).

This is welcome progress, as the EU has set Spain a target of generating 20 per cent of its overall energy

needs from renewables by 2020. Energy companies in the country share this ambition, with Miguel Ezpeleta, boss of Acciona, believing that the country will achieve 100 per cent renewable energy reliance in the future.

Of course, Spain is not alone at the front of the renewable energy revolution. In 2016, Portugal kept its lights on using only renewable power for an impressive 107 consecutive hours — a feat that James Watson, CEO of SolarPower Europe, praised while predicting it "will be commonplace in Europe in just a few years."

These are just a handful of highlights. Countries such as Germany regularly produce the majority of their energy from renewable sources. With solar and wind power also becoming cheaper than fossil fuels for the first time in 2017, the future seems bright for the industry and for the EU's target of 27 per cent of power from renewable sources by 2030.

## The dark side of renewables

Yet the renewables market isn't without its criticism. One notable critic, Spanish economist Gabriel Calzada Álvarez PhD, authored a paper in 2009 that warned of the impact of renewable, or green, jobs on the overall employment market.

One of the key points from the study states there were "2.2 jobs destroyed for every green job created" in Spain between 2000 and 2009. Álvarez claims this totals 110,500 jobs, with another key point claiming "each green megawatt installed destroys 5.28 jobs on average elsewhere in the economy."

While these points can be disputed, they do give rise to concerns about the social impact of renewable energy. As these energies are generated in a significantly different way to traditional fossil fuels, it is difficult to predict the long-term impact of widespread adoption.

However, the Renewable Energy Association (REA) has acknowledged the possibility that renewables will affect employment. In an article defending the UK biomass industry, Dr Nina Skroupska, the REA's chief executive, wrote "we are acutely aware of the potential job losses and changes to local communities that such a shift could precipitate."

This is where the biomass pelleting industry comes into play. Because the generation of power involves the burning of biomass pellets to produce heat and electricity, the process is not too fundamentally dissimilar to traditional fossil fuel power generation.

The key difference is that biomass is more sustainable and environmentally friendly, with plants reporting a significant reduction in carbon emissions of up to 80 per cent.

## The pelleting process

However, obtaining the pellets for the energy generation process comes with its own challenges. According to the UK's National Energy Foundation (NEF), one tonne of wood pellets produces approximately 4,800kWh of heat, or 17GJ of energy, if burned with 100 per cent efficiency. The NEF also estimates that the typical household may require between two and four tonnes per annum.

Making biomass pellets a sustainable alternative to fossil fuels requires the pelleting process to operate effectively and efficiently on a constant basis. To make pellets, the crushed and chopped materials must be compressed under high pressure, at equally high temperatures and with heavy loads.

It goes without saying that these conditions put considerable stress on the machinery and equipment involved, which also increases the risk of breakage due to wear. Vigilant maintenance engineers will regularly inspect this equipment to ensure it remains operational, but this does not

address the underlying issue, which in many cases is lubrication.

The challenge for lubricants used in the pelleting industry is the temperatures they are exposed to. At high temperatures, typical machine lubricants lose viscosity, which weakens the lubricant's ability to create a thin film on surfaces, reduces lubricant longevity and increases wear. Once a lubricant loses too much viscosity, the high pressure of the machinery can displace the lubricant.

Maintenance engineers can prevent this by identifying the signs of frequent wear and specifying an effective lubricant. For the pelleting industry, maintenance engineers must select a high viscosity lubricant, such as NCH Europe's K Nate HV, to ensure protection against abrasive wear under extreme temperatures and pressures.

An effective way of choosing the right lubricant to withstand the operating conditions is to look at its chemistry. For example, NCH Europe uses a calcium-sulphonate thickener, extreme pressure agents and a high-viscosity base oil in its K Nate HV grease. This allows the lubricant to stay in place at high pressures and temperatures of up to 220

degrees Celsius, while also providing anti-corrosion benefits.

Ensuring continuity in the pelleting industry is in the best interests of not only the maintenance engineers and plant managers responsible for the production process, but also for the wider renewables industry.

This is further emphasised by the REA's Dr Skroupska, who believes that the biomass industry offers the job market an opportunity to adapt to the new market. She states that, "using wood pellets is an important measure which will give many communities, businesses and, importantly, the UK's electricity grid a window in which to adapt."

While clean renewable energies such as solar and wind are gaining traction, there is currently an issue of uncertainty, both in terms of the job market and if energy production can meet requirements consistently. Biomass energy bridges this gap. And with EU countries leading the world in wood pellet usage, proper maintenance of machinery will be pivotal in ensuring a promising future for renewables.

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# 1st Class Corrosion Solution for 3rd Largest Oilfield

Located in Southern Iraq near the Kuwaiti border, the oilfield spreads over a 1,800km<sup>2</sup> area. In 2009, a \$15bn service contract was signed for its development.



Above: IPC Package desalter vessel

A group of asset owners have taken a leading role in developing the field with the most advanced technologies of enhanced oil recovery (EOR) by water injection.

## Expansion: Phase 1

In 2011, FEED work has commenced on the Produced Water Re-Injection (PWRI) Project Phase 1. PWRI is an important strategy for deriving value from waste water and is implemented due to increasing discharge treatment costs and the tightening of environmental regulations.

PWRI in turn consists of two packages: Cluster Pump Stations and an Integrated Processing Complex (IPC). The IPC package includes not only the central processing facility for oil, gas, condensate and water separation, but also water treatment facilities. Due to the field's substantial size, there will be two water treatment facilities for re-injection, one in the North and one in the South.

## Process Vessels

New process vessels were required to deliver the IPC package including 10 desalters, 10 dehydrators and 20 degassers. Manufactured in China, design temperature for each of these vessels is 100°C / 212°F with a pressure of 15Bar.

Produced from carbon steel, additional corrosion protection inside these vessels was a must. Alloy 625 cladding was first considered for protecting newbuild vessels as a familiar solution. However, the client wanted to reduce capital investment cost without compromising on quality. They wanted a reliable vessel lining solution, which could be delivered in any part of the world.

## Fast Facts

- Discovered:**  
1953
- Contains:**  
17 billion barrels of oil
- Daily production:**  
1.3 million bpd
- Current situation:**  
Deals agreed to expand operations
- Target production:**  
2.1 million bpd

*\*bpd = barrels per day*

### WHERE ASSETS OPERATE TODAY



### WHERE EQUIPMENT WAS PROTECTED



Above: Process vessels: where they were protected and where they operate



Above: Belzona 1391T application in action

## Experience with Belzona Linings

Between 1996 and 2014, over 830 newbuild process vessels around the world have been protected with a Belzona lining.

Belzona's largest single project to date consisted of lining 143 pressure vessels operating at the oil and gas field off the north east coast of Qatar in the Persian Gulf.

## Belzona Solution for Process Vessels

For these 40 newbuild vessels, Belzona lining was ultimately found to be the most cost-effective corrosion protection solution. Based on the temperatures, pressures, type of media and preferred application method (hand-applied), Belzona 1391T was chosen alongside inserts manufactured from Belzona 1111 (Super Metal) for small bore nozzle protection. More than 800 nozzle inserts were required.

## Application Method

Vessels were internally lined with a two-coat Belzona 1391T system. Small bore nozzles were protected by bonding in preformed Belzona 1111 nozzle



Above: Belzona-protected desalter traveling to the field

inserts. All vessels were coated at the fabricator yards in China before shipment and installation on site.

- In total, 25 tonnes of Belzona 1391T were used.
- The application was completed in accordance with Belzona International standards and fully inspected by Belzona-certified inspectors.

## Application Facts

- Using Belzona internal coating instead of alloy 625 helped the client save 65% of their investment on this major project phase.

For more information visit:  
<http://www.belzona.co.uk>

# Exposure To Vibration: Do You Know The Limit?

Tim Turney, Technical Product Manager at Casella

Approximately two million people in UK workplaces are at risk of developing Hand Arm Vibration Syndrome, commonly referred to as HAVs.

In the engineering industry, many workers are required to operate hand-held power tools and other hand-guided equipment as part of their job, exposing them to potentially high vibration levels. Long term exposure to vibration levels that exceed safety limits puts workers at risk of painful injuries to fingers, hands and arms that may lead to working days lost for both the individual and the business they work for.

Injuries associated with vibration are permanent but the cause is preventable. Employers should implement effective vibration risk assessments and monitoring to help limit exposure and prevent workers from developing life changing conditions.

## Why monitor?

The health issues associated with excessive exposure to vibration, often with agonising symptoms, are divided into three subgroups below:

1. Vibration White Finger (Raynaud's disease) - This is a vascular disorder caused by the restricted blood flow, causing visible blanching of the hands. In 2016, there were 455 new claims for this condition.
2. Neurological Vibration (Carpel Tunnel Syndrome) - This problem causes tingling and numbness in the fingers resulting in a lack of dexterity. In 2016, there were 240 new claims of workers suffering from this syndrome.
3. Muscle and Soft Tissue Damage - This includes conditions such as arthritis, changes to muscles and tendonitis, which can result in loss of grip strength.

Each of these conditions could lead to social and financial implications for workers, as the pain can make it difficult to work and socialise. Any significant time off work due to sickness or injury will have implications on productivity and business efficiency,

as well as potential fines if the risks haven't been correctly identified and managed.

## Case studies

In July 2017, a Cheshire based fabricators was fined £120,000 for failing to protect a worker at its steel component factory. The welder complained to supervisors that equipment was causing him numbness and tingling in his hands but he was told to continue his work regardless.

A second incident occurred in a Rochdale-based plastic and engineering firm that was fined £20,000 and ordered to pay costs of £1,171.00. A worker in the company's trimming department was exposed to vibration from sanding tools, resulting in a HAV diagnosis. An HSE investigation found that vibration risk assessments at the company were not suitable or sufficient.

## How to monitor

The Control of Vibration at Work Regulations (2005) stipulate employers must limit and ultimately eliminate the risks of vibration by ensuring exposure is 'low as reasonably practicable'. Monitoring is essential to identify high risk activities and areas of concern and remain compliant to legislation.

Different jobs emit different levels of vibration and for all jobs where tools and machinery are used, employers must adhere to the government standards of safety, not exceeding the daily exposure limit for vibration (ELV) as 5 m/s<sup>2</sup>. This value is the maximum level of vibration an employee can be exposed to on any single day and if levels exceed this, equipment should not be operated until steps have been taken to reduce exposure.

Employers must also focus on the daily exposure value (EAV), which should not exceed 2.5 m/s<sup>2</sup>. If worker exposure is regularly exceeding the EAV limit, employers must consider if the process can be changed and work can be done in a different way.



## Changing the process

Monitoring enables employers to learn more about the risks from vibration exposure. The HSE provides clear recommendations to employers on reducing the risks and changing work processes accordingly. Advice includes modifying the work to reduce the amount of time using hand tools, switching to better tools with lower vibration levels and training workers to ensure correct processes are followed all the time.

It is important for employers to measure the actual vibration levels of tools on a regular basis, as the vibration levels deteriorate with time. To ensure exposure does not exceed regulations, high powered tools are now designed with estimated vibration levels and employers should use this as a guide, indicating how long workers can safely operate these tools for. Sustained exposure levels to just below the limits still leaves workers at risk of developing health conditions but education and close observations of the tools and workforce can ensure ill-health problems are detected.

In a busy engineering sector, operating tools is an essential part of the job and a daily task for workers. Monitoring provides valuable information to reduce and prevent vibration exposure. Without this data, workers' could suffer the consequences for the rest of their life.

For more information about Casella's monitoring solutions visit, [www.casellasolutions.com](http://www.casellasolutions.com)

# New Local Expert For Food And Beverage Sealing Solutions

Dichtomatik UK Ltd becomes the exclusive local provider for Freudenberg Sealing Technologies' food and beverage sector in the UK.



pieces of fruit and crystallised sugar are a source of seal abrasion and wear.

To exacerbate the situation, food and beverage manufacturing equipment is increasingly operated at full capacity, which requires more frequent product changes and cleaning cycles. With this in mind, Freudenberg offers materials that minimise flavour transfer and reduce the impact of frequent product changes.

Among current examples of the innovation levels available is the Hygienic Usit® washer, which makes hygienic screw connections possible as it offers a sealing design that prevents the formation of a breeding ground for bacteria under the screw head. The Hygienic Usit hermetically closes off the area between the screw head and the surface, using geometry that guarantees excellent cleanability of the connection. The Hygienic Usit is available in three different material variants that comply to all industry specific legal regulations and withstand CIP-/SIP cleaning processes as well as demanding process media and conditions.

All Dichtomatik UK staff are highly skilled and trained on the special sealing requirements of the food and beverage industry. Providing specific product and material expertise locally is a vital part of the co-operation project.

For more information visit: [food-beverage-seals-uk.fst.com](http://food-beverage-seals-uk.fst.com)



Freudenberg Sealing Technologies is the world's leading specialist for high-quality sealing solutions for the food and beverage sector. As Dichtomatik UK Ltd is a part of Freudenberg Sealing Technologies, this enables the company to provide UK customers with local support and local availability, resulting in shorter delivery times and even higher service levels.

As the official UK representative, Dichtomatik UK is now the exclusive source for Freudenberg food and beverage sealing solutions, providing the full range from its purpose-built, fully automated warehouse in Derby. Dichtomatik is also providing technical support and customer service to the UK market.

Outstanding product and material expertise makes Freudenberg the preferred partner for any customer requiring high-performance seals and services for demanding applications in the process industry. Whenever hygiene is a critical factor, the company

offers special product solutions like dead-space-free seals and certified elastomeric and plastic materials that conform to FDA and EU regulations regarding food safety.

The food industry includes a wide variety of applications with distinct requirements. Here, the diversity of products and the use of numerous flavours can have varying effects on sealing materials. For instance, in breweries, seals have to withstand wort, beerstone and the essential oils of hops, while in dairies, they must offer long-term resistance to fatty and protein-rich products. In the production of chocolate, fatty ingredients are sometimes heated to a very high temperature, which again provides a challenge for seals. Likewise, seals used in ice cream production have to cope with extreme temperature fluctuations. Jam manufacturing is another demanding process, where

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