ERIKS

KNOW + HOW

ISSUE 37

AGGRESSIVE ENVIRONMENTS

It's not just external surroundings that contribute to an aggressive environment, materials that are being processed and what goes through your equipment can also put assets under strain.

We take a look at some of the issues you face on a daily basis and how to mitigate some of the risks.

ERIKS IN ACTION:

Adding Value to Valves

From periodic maintenance to re-certification and from refurbishment to a complete new flow control solution.

IN FOCUS:

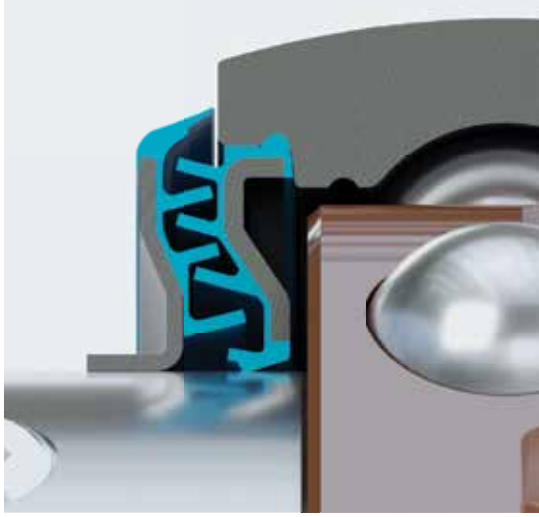
What really gets up you nose at work?

Breathing in dust while you're at work could be doing as much harm to your lungs as passive smoking, discover how Bosch can help.

DEBATE:

Back to the Future

Reminiscing about old times can be good for business, but when it comes to manufacturing is too much holding us back?



Rethinking food safety

SKF Food Line ball bearing units - Blue Range: Proactive food safety

For food producers, hygiene and proactive food safety take top priority in asset design. However, bearings can be a potential source of serious food contamination.

SKF, with microbiology experts from RISE (Research Institutes of Sweden), have discovered that bacterial contamination can build up inside bearing units during operation, and even during hygienic cleaning.

If bacteria can get in, they can also get out! The answer is a hygienically-designed, fully sealed bearing unit.

The new SKF Food Line ball bearing units - Blue Range is a relubrication-free solution that supports your proactive food safety processes. Sealed from both sides and filled with allergen-free grease, they allow you to actively reduce food safety risks by combining hygienic design, relubrication-free technology, corrosion resistance and food grade components. Coming from SKF, they also provide outstanding bearing performance!

Request your NEW 124-page catalogue today!

Call: 01582 496662 or visit:

Food safety risks: https://ter.li/video

The solution: https://ter.li/catalogue

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Welcome

When it comes to 'aggressive environments', what images immediately spring to mind? And which industries would you associate them with? Chances are, they'll be heavy industries such as steel, mining and quarrying, or oil and gas.

But 'aggressive' can represent a very wide spectrum of conditions. It's not just the external surroundings that contribute to an aggressive environment; materials that are being processed and what goes through your equipment can also put assets under strain. This means that industries that are less obviously aggressive also have to manage their assets to minimise deterioration and avoid contamination, such as food and drink producers or waste water treatment plants.

That's why this edition spans a number of industries; we are more focused on how to give your assets a fighting chance throughout their arduous life cycle. Specifying correctly for the job in hand is a good place to start, and we take a closer look at why this matters with our In Focus article 'Fit for Purpose'. We drill down to more detail and hone in on the chemical industry with 'How's your concentration,' and how particular offerings can meet your needs no matter how tough conditions get.

Of course, not only do aggressive environments increase the risk of failure in assets, but also the chance of causing injuries for people too. It's impossible to eliminate all risks, but it is possible to take all measures necessary to prevent accidents, so we also discuss how this can be done, particularly when choosing hoses. Specifying the right equipment for your needs still pays dividends if your business operates in kinder environments. Indeed, it is part of ensuring that best practice is adhered to. We take a look at other approaches to keeping your assets at their optimum too, with advice on how to lower the total cost of your couplings, how to maintain belts, finishing with a selection of our Problem Solvers.

Last but not least, we pose the question of whether UK manufacturers are too nostalgic in this issue's Debate. We'd love to hear what you think, and if you would like to share your opinion on this or anything else in the issue, drop us an email or tweet us @ERIKS_UK.

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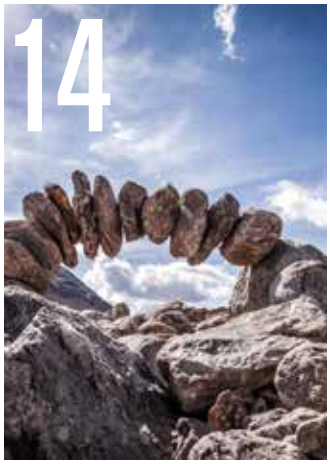
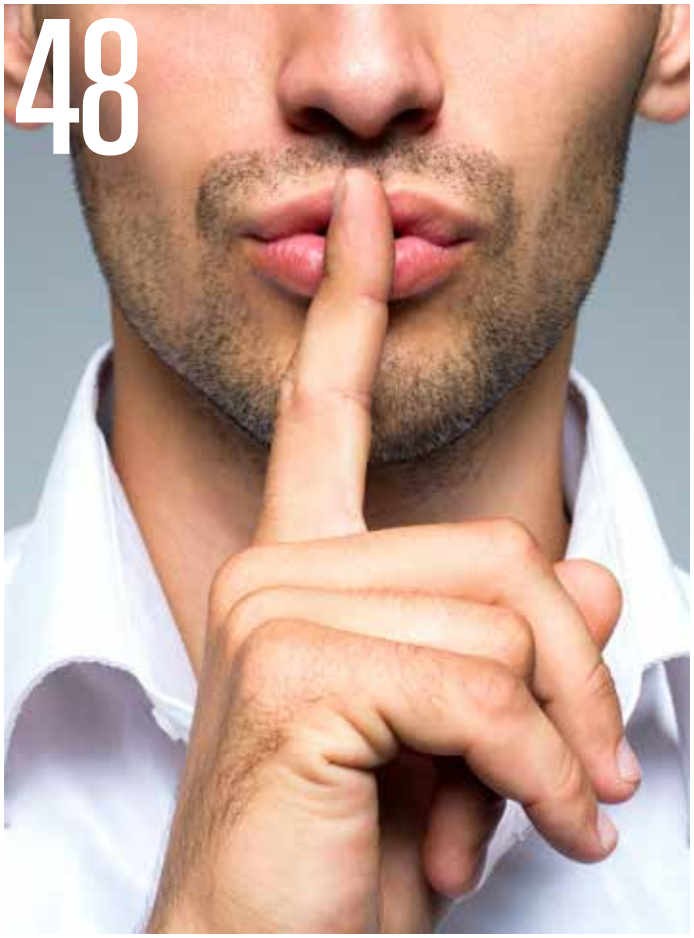


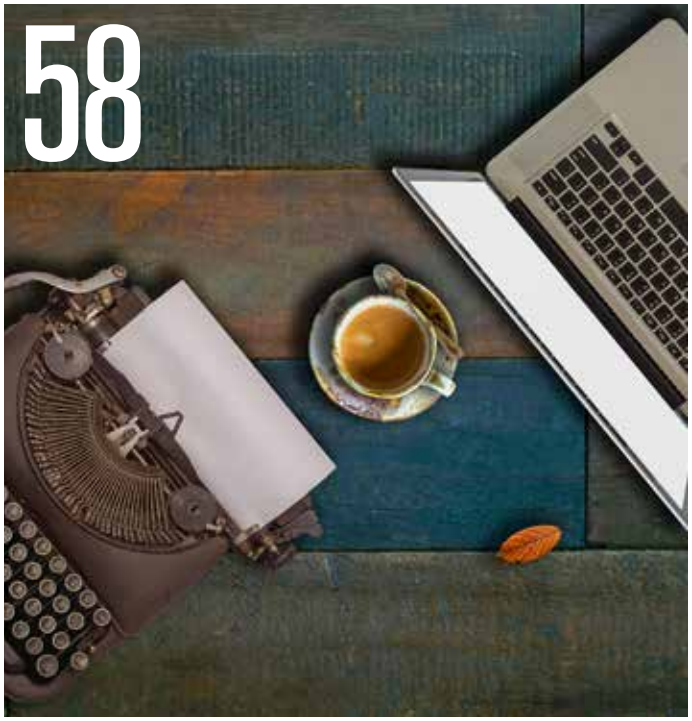
Latest News

Technology Update

ERIKS in action

In Focus





LATEST **NEWS** AND **TECHNICAL UPDATE**

RMIT RESEARCHERS PAVE THE WAY FOR **SOLID STORAGE OF CARBON**

A research team led by RMIT University in Melbourne, Australia, have shown that it's possible to convert CO_2 back into carbon at room temperature using liquid metal as a catalyst. The process is efficient and scalable, opening the way for carbon to be buried as a solid rather than liquid.

The implementation of current carbon capture and storage methods has been hampered by technical challenges, issues around economic viability and concerns about possible leaks from the storage sites. Although more research needs to be done, this new technique could provide an alternative way to safely and permanently remove greenhouse gases from our atmosphere.

UK DEEMED THE **BIGGEST CUTTER OF CO_2 EMISSIONS** SINCE 1990

The UK's CO_2 emissions have declined by around 38% since 1990, faster than any other major developed country according to detailed analysis carried out by the Carbon Brief.

Emissions have declined from around 600m tonnes of CO_2 (MtCO2) in 1990 to 367MtCO_2 in 2017, due to a cleaner electricity mix based on gas and renewables instead of coal. Falling demand for energy across homes, businesses and especially industry, has also significantly contributed to the decrease.

It is predicted that the factors driving emission reductions will likely continue into the future as the UK's remaining coal use is phased out by 2025.

£35M RESEARCH HUB SET TO TRANSFORM STEELMAKING

A £35m research programme has been set up with the aim to increase UK iron and steelmakers' productivity by 15%, boost jobs in the sector, cut waste and turn it into a carbon neutral and zero-waste industry by 2040.

Led by Swansea University, partnered with the Universities of Sheffield and Warwick, the SUSTAIN network involves over 20 partners across the UK steel industry including companies, trade bodies, academic experts and research organisations.

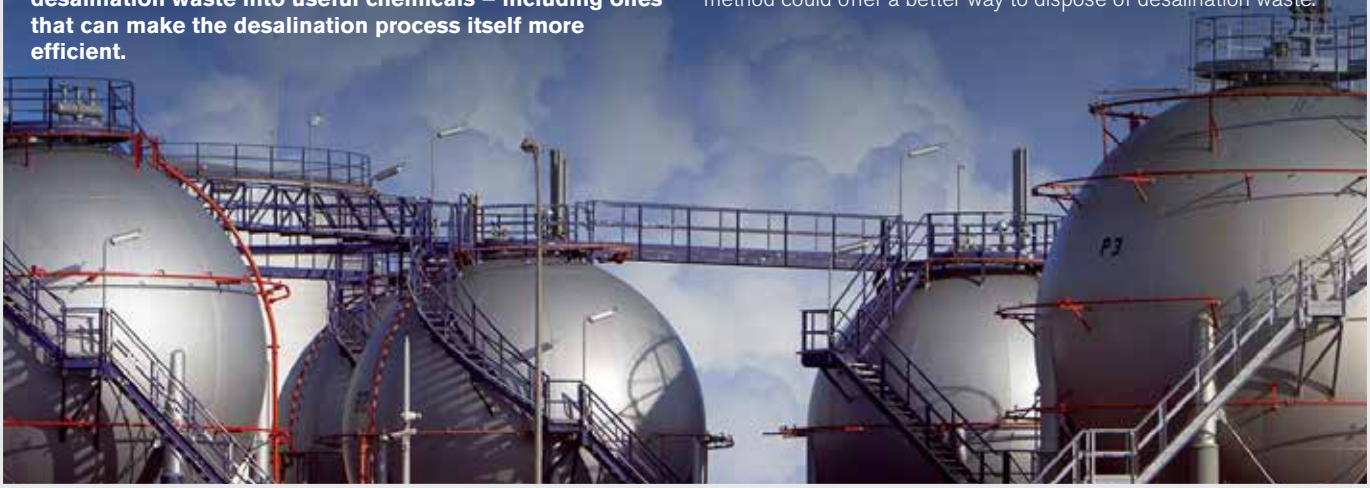
The seven-year programme will look at energy harvesting, capturing carbon emissions and re-processing waste streams. Opportunities to improve efficiencies along the steel sector's entire supply chain using data will also be investigated.

ENGINEERS AT MIT TURN **WASTE BRINE** TO **CRUCIAL CHEMICALS**

Engineers at the MIT, US, have found a way to turn desalination waste into useful chemicals – including ones that can make the desalination process itself more efficient.

Their new study shows that the waste brine can be converted into caustic soda and hydrochloric acid using a fairly simple process. The former can pre-treat seawater before desalination to prevent fouling of the membranes used to filter out the salty water — a major cause of interruptions and failures in typical reverse osmosis desalination plants. The latter can be used for cleaning parts of the desalination plant or sold as a source of hydrogen.

Desalination produces water for drinking and agriculture in arid coastal regions. But the highly concentrated brine left behind is usually disposed of by pumping it back into the sea. The proposed method could offer a better way to dispose of desalination waste.



REPORT HIGHLIGHTS **GAP BETWEEN AWARENESS AND IMPLEMENTATION** OF DIGITAL MANUFACTURING TECHNOLOGIES

Results from The Manufacturer's Annual Manufacturing Report (AMR) show that whilst many businesses understand the benefits of digital technologies, they are holding back from investing in plans.

Although the majority of respondents recognised that these technologies can improve design and production processes, or streamline internal processes, one in four currently have no plans to incorporate them into their businesses.

26% have it on the radar but are unsure how to implement it.
Cara Haffey, Industrial Manufacturing and Automotive Leader at PwC, said: "Aside from the obvious issue of investment, the main blockers appear to be a lack of coherent digital strategies and the inability for organisations to understand what practical applications some of these technologies offer within their organisation."

"The UK has a tremendous platform to capitalise on these technologies, but adoption needs to be accelerated," she continues. "It will require clear leadership and a desire and culture for organisations to be braver in disrupting their existing business models."

PICK UP A **PERFECTLY PORTABLE PARTICLE** COUNTER

Weighing just 10kg, the next-generation LPA3 portable particle counter from MP Filtri gives you lab-standard hydraulic health check capability, even out in the field.

Simple to operate via a programmable 10.1" full-colour touch-screen, the LPA3 can provide a 100ml sample test in approximately one minute. It reports to the standard you choose (ISO 4406, NAS 1638, AS4059, GBT14039 and many more) and can also be tailored in terms of sample volumes, flush sizes and the number of tests run concurrently.

Its sophisticated software is easy to master without any formal training, and its innovative optical and photodiode technology gives you complete 8-channel measurement. Results are instantly downloadable via USB, and up to 4,000 tests can be stored in the LPA3's memory.

This state-of-the art particle counting capability is contained in a robust, durable, co-polymer case, and is powered by a long-life lithium ion battery. So you can take it further, use it longer, and get faster, more accurate results.

CUTTING COSTS WITH MARTOR

On many industrial sites, knives are used for cutting many different kinds of materials. Safe and effective cutting with a properly specified and selected knife from MARTOR can ensure user safety, as well as increasing productivity and reducing costs.

The recently launched SECUPRO 625 from MARTOR is a general purpose knife with a patented auto-retracting blade. While the blade stays securely extended in use, as soon as it's disengaged from cutting it retracts for safety.

Built to the highest specifications, the knife is ideal for use in heavy and light industry, warehousing and transport, facilities management and construction.

If your site has more than 30 knife users, MARTOR can carry out a free knife survey, to identify the most suitable knife for each application. As well as ensuring greater safety for users, this can also help to improve productivity.

The right knife for the job will not only cut better and more effectively, but can also reduce costs if it leads to less accidental damage to materials from knife cuts or scratches.

To book your free knife survey, contact your local ERIKS service centre.

THE CABLE THAT **CHECKS ITS OWN HEALTH**

There's cable, and there's intelligent cable. And cable doesn't get more intelligent than an igus cable with a CF.Q sensor system.

The CF.Q module checks and evaluates cable health in real time, and makes timely recommendations for maintenance or replacement.

Whether the cable has been damaged by tight bending or extreme loads, as soon as the predefined values of the electrical parameters change as a result, the CF.Q module will switch an NC contact to let the user know.

Using the cable and module in combination with isense adds even more intelligence, by increasing digitalisation and networking capabilities. With an integrated SD card slot and serial interface, the modules can log and output data, and connection to the isense-online system offers precise insight into the measured values. So you don't only know what they are, but also what they mean for your cable's health.

Intelligent igus cables with CF.Q modules make it easier to maintain the health of your cabling, and plan its maintenance and repair for increased efficiency.

FENNER® GRANTS THREE WISHES WITH TRIFLEX COUPLINGS

Do you want drive trains with resistance to shock stress? With silent operation? Or do you want the capability to adjust your couplings to compensate for misalignment? The new Fenner® TriFlex Couplings give you all three.

Designed with vulcanised-in interior cord inlays (known as Tenpu® fibre technology) the couplings use the tension force principle to create an efficient, cost-effective alternative to traditional compression couplings.

The cord inlays dampen torque peaks to absorb start-up impacts, and the rubber not only supports and protects the cords, but also isolates noise.

In addition to allowing easy and precise oscillatory tuning of the complete drive train, the ATEX-certified couplings are also highly adaptable, thanks to their reinforced cord construction. For special projects, the stiffness of the cords can be individually adjusted in all directions, to compensate for radial, axial or angular misalignment.

The result is a compact coupling around one-third the weight of a traditional compression coupling, ideal as a flexible connecting element for a wide range of drive train applications. From fan, pump and compressor drives, to agricultural, construction and marine machinery, Fenner TriFlex couplings provide a shock-resistant, quiet, flexible solution.

THE LONG-RANGE FORECAST FROM IFM

With their long operating range of up to 8m, the new M30 ultrasonic sensors from ifm are far and away the best solution for detecting distant objects, or for continuous level monitoring.

This exceptionally long sensing range is particularly suited to long-distance object detection. However the M30 sensors are also ideal for continuous level monitoring, for two reasons.

Firstly, as ultrasonic sensors, they are unaffected by colour, transparency or surface shine of the bulk materials or liquids being monitored. Secondly, their sound beam can be set individually according to the application, to avoid the faulty measurement results which can occur in limited spaces such as holding tanks for liquids, due to unwanted reflections.

The adjustment to the width of the sound beam is easily made using IO-Link. There's also a teach button to guide users through the process.

Engineered with a high-grade stainless steel housing, the M30 also features a vibrating sound transducer, which reduces dirt deposition – making the ultrasonic sensor a robust solution as well as a long-range one.

ERIKS IN
ACTION

ADDING VALUE TO VALVES

What can you add to a valve to increase its reliability and efficiency, optimise its service life, and lower its Total Cost of Ownership? 3,000m^2 should do it.

ERIKS

Andy Silver
Director Flow Control

That's the size of the new purpose-built ERIKS Flow Control facility for valve repair, test and certification, supported by £1.5m of stock. There are other valve service and repair facilities, but none backed by such a huge stockholding. There are valve certification centres, but none with state-of-the art repair workshops. And there are valve suppliers with limited stocks – but none with such a vast choice, plus in-house fabrication expertise and system-build capability.

So whatever you need for your valves – from periodic maintenance to re-certification, and from refurbishment to a complete new flow control solution – now you can find it all in one place, together with unparalleled ERIKS engineering know-how.

"SUPPORTED BY £1.5M OF STOCK"

The new ERIKS facility in Whetstone, near Leicester, has all the latest equipment and all the expertise for a comprehensive valve offering, including:

- **Testing**
Nitrogen and water testing capability, at pressures up to 700 bar. Tests take place in a fully armoured enclosure, and are remotely monitored by CCTV.

- **Cleaning**
Chemical and shot blast cleaning.

- **Repairing and refurbishing**
Sometimes the decision whether to repair or replace a valve is not straightforward, so ERIKS make it as easy as possible.

"NOW YOU CAN FIND IT ALL IN ONE PLACE"

Every valve is given an initial inspection and test before disassembly, then digital images are taken of the stripped-down valve. These are supplied to the customer together with a report detailing the work required and the cost, and the cost for the alternative of valve replacement from stock. In the unusual event that a valve has to be ordered-in, the customer is told the cost and lead time. With all necessary data to hand, it's easier to make an informed decision on which route to take.

If the decision is made to repair and refurbish, the valve will be cleaned, restored to as close to as-new condition as possible, and – for pressure or safety valves – tested and certified.

Alternatively, if the valve is too damaged to repair and too costly to replace like-for-like, ERIKS Flow Control engineers can make a site visit to survey the existing valve set-up, and propose a cost-effective upgrade.

- **Hygienic area**
Valves from food and beverage and pharmaceutical sector customers will be repaired in a dedicated, hygienic, controlled environment.

- **Asset management**
Every valve coming into the Flow Control facility will be placed on a dedicated asset management database. To ensure valves remain compliant and meet all applicable health and safety standards, automatic notification will be provided when re-testing and re-certification are required.

Building bespoke solutions

With the in-depth and comprehensive in-house expertise and equipment available at the ERIKS Flow Control facility, complete bespoke skids – comprising motor, pump, gearbox, valves and actuators – can be designed with CAD, manufactured and assembled, tested and certified (if required), then installed and commissioned at the customer's site.

Specialist dosing and mixing applications, incorporating PLC control, instrumentation, load cells and gauges can also be produced.

"COMPREHENSIVE VALVE OFFERING"

Learn from the experts

As part of ERIKS' commitment to engineering Best Practice, a training facility is being established at the Flow Control site, offering valves and pumps customers a combination of classroom and hands-on learning.

Demonstration models will be provided for disassembly, rebuilding and testing under expert guidance from experienced ERIKS Flow Control engineers.

With education, expertise, and state-of-the-art equipment all under one roof, ERIKS Valve Repair and Testing facility is the one-stop shop for all your valve needs. Whether your valves need repair, refurbishment, replacement or redesign, ERIKS will be able to provide a solution for the optimum whole-life outcome every time.

Every valve, every requirement, under one roof

The service, repair and supply capabilities at ERIKS' new, dedicated, Flow Control Valve Repair and Testing facility cover the following valve types:

- Pressure Reducing
- Pressure relief
- Safety Relief
- Non-Return
- Globe
- Wedge Gate
- Parallel Slide
- Ball
- Plug
- Pinch
- Butterfly

LOCTITE®

LOCTITE Air Leaks are not a Game.

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Whether you need adhesives, sealants, cleaners, tapes or sprays: LOCTITE offers a wide range of reliable solutions that raise your profitability, keep your equipment running smoothly and ensure the highest safety standards.

Thread Sealant Adhesive – LOCTITE 577
- General purpose, 100% seal
- Fast curing for coarse threads
- P1 NSF, DVGW, drinking water approval
- Ideal for metal parallel & taper fittings

Gasketing Sealant – LOCTITE 518
- Ideal for use on rigid iron, steel and aluminium flanges
- Replaces need to hold multiple gasket stocks

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- Solvent-based general parts cleaner
- Ideal for use prior to adhesive bonding and sealing applications

Emergency Repair Tape – LOCTITE SI 5075
- Non-sticky, self-fusing multi-purpose wrap
- Seals instantly
- Stretches to three times its size

Thread Sealant Cord – LOCTITE 55
- Immediate full pressure seal
- Allows re-adjustments of fittings
- DVGW, KTW, WRAS
- Use on metal & plastic taper fittings

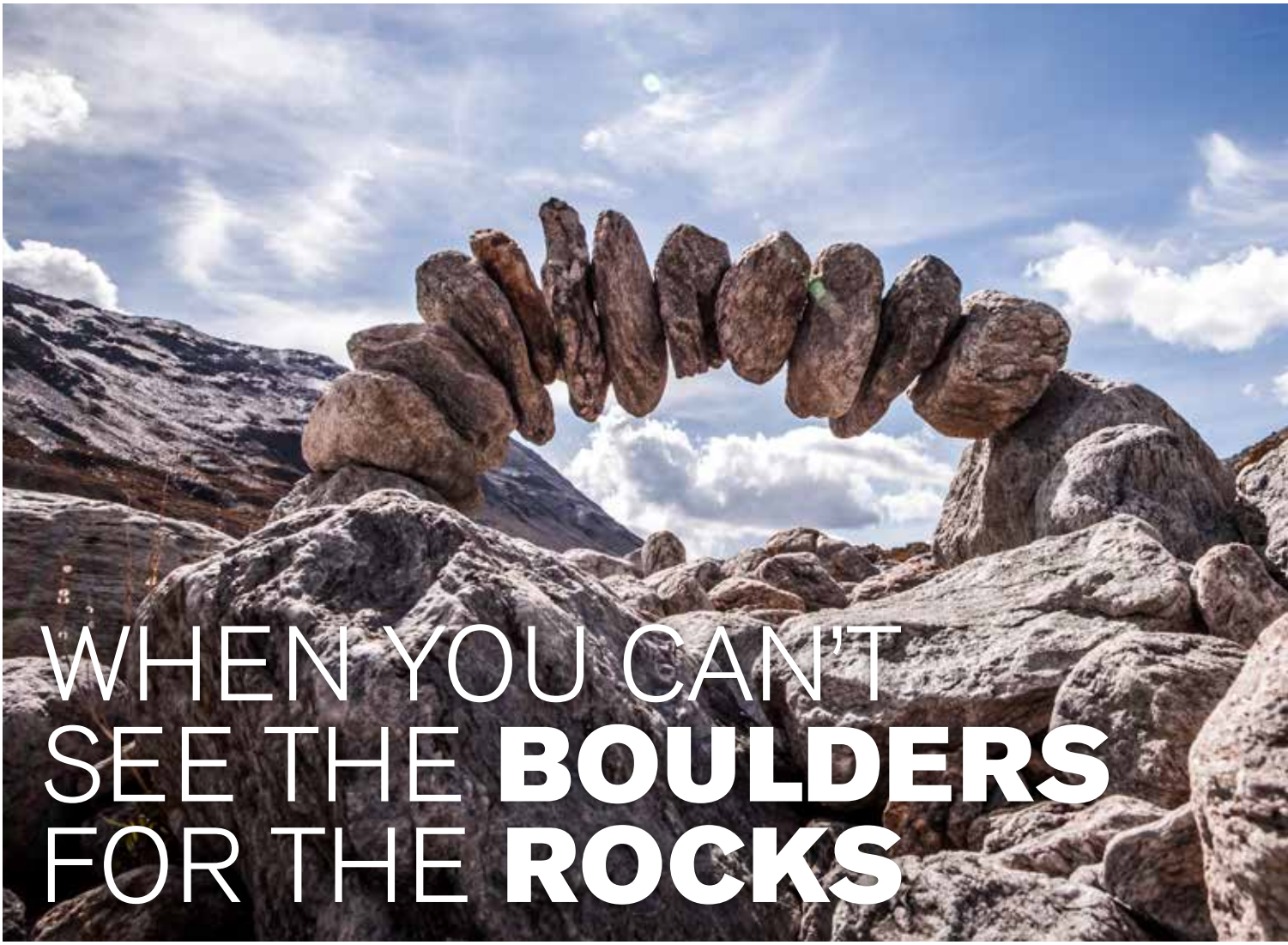
Thread Sealant Adhesive – LOCTITE 542
- Ideal for fine threads as used in hydraulic, pneumatic & general fittings
- 100% seal
- Ideal for metal parallel & taper fittings

Thread Sealant Silicone – LOCTITE SI 5331
- Ideal for use on threaded plastic or plastic/metal fittings carrying hot or cold water

Leak Detector Spray – LOCTITE SF 7100
- Produces bubbles at leakages
- For all gases and gas mixtures except oxygen
- Suitable for iron, copper and plastic pipe work

For more information, visit www.loctite.co.uk/airleaks
or call us on 01442 278100

Henkel



WHEN YOU CAN'T SEE THE **BOULDERS** FOR THE **ROCKS**

ERIKS

David Carmichael

Senior Project Engineer
Bearings

ERIKS

Chelsea Crompton

Service Centre
Manager

ERIKS' bearings and belts experts were called to the site when the mill classifier failed for the second time due to a collapsed bearing. Close inspection revealed that the bearing problems were only symptoms of larger issues. In fact the machine, only commissioned around 6 months earlier – had never been able to run at full output.

Sometimes it's easy to miss the big picture because you're focussing on the small details. That's why a failing mill classifier – essentially a "rock sorter" – caused so many problems for a plaster and plasterboard manufacturer at their site in Nottinghamshire. At least it did until ERIKS know-how sorted the problem.

"SYMPTOMS OF LARGER ISSUES"

This second bearing failure also only just stopped short of a health and safety disaster.

The 45kW motor – weighing over 300kg – was ripped off its mountings, but fortunately hung on by a thread instead of dropping 20 feet to the ground, where a large hole would have been the least of the outcomes.

Bigger, not better

In discussions with the German OEM, it came to light that the asset was a larger version of an otherwise identical machine already in use elsewhere. However, the specification had simply been upscaled, without considering resulting increases in forces and stresses on individual components.

Compounding the problem were a number of installation errors spotted by the ERIKS engineers.

Firstly, the spherical roller bearing at the lower end of the shaft, and the spherical roller thrust bearing at the upper end, were fitted at the opposite ends to where they should have been.

> "THE OEM HAS CHANGED THE MACHINE'S DESIGN, BASED ON ERIKS' RECOMMENDATIONS"

Severe radial load on the spherical roller thrust bearing was causing its inner ring to "climb" up the outer ring, placing extreme edge loading on the outer ring and cup. At the same time, the spherical roller bearing at the opposite end was experiencing severe axial load to the top set of rollers, which was causing spalling and – ultimately – bearing failure.

Meanwhile, because the bearings were not sitting properly in their seats, they had been over-greased: treating the symptoms rather than the cause. Flooding in grease resulted in an increased running temperature, made worse still by the incorrect positioning of the grease escape holes at the top of the bearing arrangement.

Power mad

The last weak link in the chain was the power arrangement. Although the drive was only rated for 30kW, it was being driven by a 45kW motor, controlled by an inverter to run at half speed. The drive was also operating 8 budget belts which were under-rated for the power, though the OEM's engineer was proposing to reduce these to 5.

With the current set-up of the asset, this would only have lead to more problems and an even greater risk of failures.

After their inspection, and after running the specification through the Fenner® Drive Designer, ERIKS' engineers came up with the following recommendations:

1. Swap the relative positions of the bearings, to ensure the right bearings were taking the right loads.

2. Place a radial bearing above the spherical roller thrust bearing to take the radial load, relieve the thrust bearing of belt tension, and stop it "climbing" out of its cup.

> "COMPOUNDING THE PROBLEM WERE A NUMBER OF INSTALLATION ERRORS"

3. Fit the bottom spherical roller bearing as non-located, allowing the shaft to expand freely without affecting the top bearing arrangement.

4. Reduce the belts from 8 budget belts to 5 Quattro PLUS belts – comfortably accommodating the drive power and speed, but also lowering the end loads to reduce stress on the bearings. Using standard wedge belt drives has the added advantage of reducing lead times for belts from two weeks to two hours (from stock).

5. Relocate the lubrication escape holes to prevent flooding of the bearings.

Finally, when a fault developed on a Saturday due to a warped nut, an ERIKS engineer attended immediately and set up sensors to determine if vibration had caused the nut to loosen. When the monitoring proved this was the case, affected nuts were swapped for replacements which actually tighten through vibration.

That the customer is now getting full production from their asset with no drive issues is one testimonial to ERIKS know-how. The other is the fact that the OEM has changed the design of the machine, based on ERIKS' recommendations.

GETTING THE **BEST** FROM YOUR HOSE

ERIKS

Andrew Dawes

Product Manager
Hydraulics

ERIKS

Mark Carpenter

Product Manager
Industrial Hose

You can get more out of your industrial and hydraulic hose than fluids and hydraulic oil. When they're correctly specified, monitored and maintained, you can also get longer life, greater efficiency, higher productivity and lower total cost of ownership.

Although it's a fact that is often overlooked – like the hoses themselves – hoses are assets like any other. And like any other, they repay proper asset management in a number of ways. The key is not to treat them as an afterthought, but to ensure they have specialist care from experts. Like the kind of care and maintenance provided by ERIKS Fluid Power, Transfer and Control Hose Integrity Management service.

"HOSES ARE ASSETS LIKE ANY OTHER"

Across the whole range of hose applications – chemicals, air, food and beverages, and hydraulic oils – the ERIKS Hose Integrity Management Service helps you to maintain your existing hoses, identify reasons for failure, repair, replace, test and validate your hoses, and otherwise manage your hose assets in every way, for optimum return on investment.

"COMPLETE ASSEMBLIES CAN BE MANUFACTURED ON SITE"

Know your hose

It's impossible to manage your hoses if you don't know what and where those assets are.

That's why the first stage of engagement for ERIKS' hose maintenance services is an identification of all hose assets on your site. This will be used to create a hose registry containing full details of all industrial and hydraulic hoses, including their location and type. With all hoses on site barcoded, QR coded or RFID tagged, once the registry has been completed it can be used as the basis for a comprehensive cloud-based digital database.
This makes it easier for all those involved at a local level – from Maintenance Engineers to Plant Directors and even Procurement – to access the complete hose inventory via any smart device, identify any hose on your site, and see its full specification.

With all your hose assets identified, the next step is to establish their current condition. This inspection takes different forms for industrial and hydraulic hoses.

Industrial hose inspection and testing

Ensuring your industrial hoses are fit for purpose and compliant with all relevant legislative requirements demands thorough, comprehensive, periodic hose inspections. ERIKS Hose Integrity Management Service provides for on-site inspection at least annually, depending on the hose criticality and your KPIs.

The inspection comprises of a:
- condition assessment
- pressure test
- static electricity conductivity test
- internal visual inspection using an endoscopic camera, to check for failing internal walls and popcorning in steam hoses.

Following the inspection, our engineers will advise of hose condition, and offer a replacement hose for those which have an issue. All inspection and test results will be recorded on the hose asset registry for future reference.

Hydraulic hose inspection and on-site testing

A thorough external inspection of your hydraulic hose assemblies, with the hoses assessed against set criteria, will identify any problems or potential problems. Hoses which require replacement will be identified with a red tag, while hoses which are considered in good enough condition to operate safely until the next annual inspection will be tagged with a green tag.

The visual inspection will take into account: Safety implications of hose failure. Ease of accessibility for replacement, implications of loss of production through unplanned hose failures and expected life span of the hose assembly within the current operating environment.

You will then be quoted a price for replacement of red-tagged hoses, which can be installed immediately from stock held on the engineer's vehicle. Complete assemblies can also be manufactured on site if required.

"ENSURE YOUR HOSES ARE ALWAYS COMPLIANT"

A safety review will also be carried out at the same time, assessing your hydraulic hose assemblies in line with current British Fluid Power Association best practice for hose routing etc.

By carrying out regular scheduled expert inspections of your industrial and hydraulic hose assets – and replacing hoses when issues are identified – the ERIKS Hose Integrity Management Service will ensure that your hoses are always compliant with all relevant legislation. Our engineers will also advise on whether any hose assets not originally supplied by ERIKS meet COMAH regulations for safe operating on site and meet the required EN or ISO specifications. If not, we will recommend replacement as soon as possible.

Why wait for failure?

Failure of any hose will have some impact on productivity. Failure of a hydraulic hose in particular could have critical safety implications if, for example, oil under pressure is released: risking operator injury or product contamination.

"PREDICT AND PREVENT FAILURE"

ERIKS can help you to predict and prevent failure, by identifying failure modes and looking for repeat patterns. The engineers can then make recommendations to avoid further failures: whether that's an alternative hose or hose assembly, or employee education and training to reduce hose wear and tear from mishandling.

The result will be less hose-related downtime, longer hose life, and a lower total cost of ownership of all your hose assets. The sooner you take advantage of ERIKS Hose Integrity Management Service, the sooner you can expect to see all those benefits coming down the pipeline.

What flows from your hose?

Well-managed hose assets will deliver:

- **Lower risks** – mitigate health and safety issues, reduce insurance premiums, and ensure legislative and regulatory compliance
- **Higher availability** – optimise reliability to avoid unplanned failures and minimise downtime
- **Lower costs** – reduce the costs of lost production, emergency call-outs, clean-ups
- **Greater CSR** – the release into the environment of certain substances from a faulty hose can have serious reputational and financial implications. Effective hose management reduces the risk.

IN **FOCUS**
AGGRESSIVE ENVIRONMENTS

FIT FOR PURPOSE

Aggressive operating environments can drastically shorten the life of plant equipment. Humid and corrosive conditions, as well as extremes of temperature can quickly deteriorate assets, which ultimately impact on production. Here, we discuss the importance of specifying component parts that are better suited to harsh environments.

In the industrial world, machinery can be exposed to some of the most extreme conditions. High or low temperatures, chemical vapours, condensation, dust and gases can all conspire to degrade the materials that make up essential machine parts. When combined with wear and tear from the production process in which it is deployed, this can result in premature failure, which, when not anticipated can cause production to grind to a halt.

Certain industries are particularly prone to conditions that put increased strain on your equipment. For example, steel production is particularly arduous for equipment. The process inherently creates a corrosive environment, with copious dust accumulation, combined with a cycle of very high and low temperatures.

The thermal expansion caused by widely varying operating temperatures creates a challenge especially for electric motors and gearboxes. Bearing clearances and lubricant viscosity can change throughout the production cycle, reducing their performance and lifespan. The perpetual exposure to corrosive elements will damage surface finishes, which can complicate any remedial work when that plant is overhauled.

> "UNPLANNED DOWNTIME WILL WIPE OUT ANY COMPONENT COST SAVINGS"

Electrical equipment is particularly vulnerable to harsh environments. Condensation can build up to deposit water inside high voltage equipment – with obvious consequences, whilst high ambient temperatures impede the equipment's ability to keep delicate parts running at a safe temperature. Corrosive gases have an appetite for the copper tracks on circuit boards – manifesting in the sudden death of complex systems.

Food processing is another arduous environment. Whilst far different to the steel processing sector, different operating conditions can create challenges for your equipment. For instance, milling processes create a lot of dust that contaminate lubricated surfaces, causing problems for bearings, chains and gears. Other processes, such as frying will contaminate equipment with sticky oil – with similar effect. Even the wash-down process is problematic – as a mis-directed high-pressure water jet will force water past sealing faces, filling equipment with water, or pushing the grease out of where it should be.

Whilst it is often not possible to avoid these challenging conditions, they don't have to cause a problem. Let's take a look at the best practices that should be adhered to, to ensure that machinery is fit for purpose.

Specification is key

Choosing the right products might sound like an obvious consideration, but it isn't always the first choice. Often, equipment specifiers might overlook better specification, in favour of a lower purchase price. However, the true cost of this might not be understood without considering the total cost of ownership. The cost of unplanned downtime will wipe out any component cost savings very quickly.

> "CONSIDER LIVE DATA ACQUISITION"

In aggressive environments, special consideration needs to be given to the individual components, and the materials from which they are made. Manufacturers will have a detailed understanding of how their products will operate in different applications, and throughout each environment – so it is important to get advice early on.

> "POOR PRODUCT SELECTION CAN HAVE DANGEROUS CONSEQUENCES"

For example, hoses are constructed from a wide range of materials, including rubber, PVC, polyurethane, silicone, PTFE, and various metals. Each material will have different chemical compatibility, but also a different range of temperatures that it is suitable for. Without expert guidance, selecting the cheapest 'hose that fits' might be tempting for some – however, there is a lot to go wrong.

With the appropriate guidance, the less obvious pitfalls can be addressed – such as PVC not being suitable for sub-zero temperatures, and its tendency to become more elastic in higher temperatures, or whether the substance that the hose is carrying will cause the walls to break down or not.

Complete view

It is important to have a full picture of an application, including the environment, and the materials being processed.

> "RESULT IN PREMATURE FAILURE"

There are cases where poor product selection can have dangerous consequences. Some chemicals which are inert at low temperatures, may become hazardous as they heat up. This consideration includes the material that the hose is made from. For high temperature processes, the right elastomer must be employed, to prevent contamination of the product – which may become carcinogenic.

For this reason, it is important to provide the datasheets relating to the production process and raw materials involved. This helps ensure that parts and equipment specified, are fit for purpose, and ensures that hazardous materials are contained.

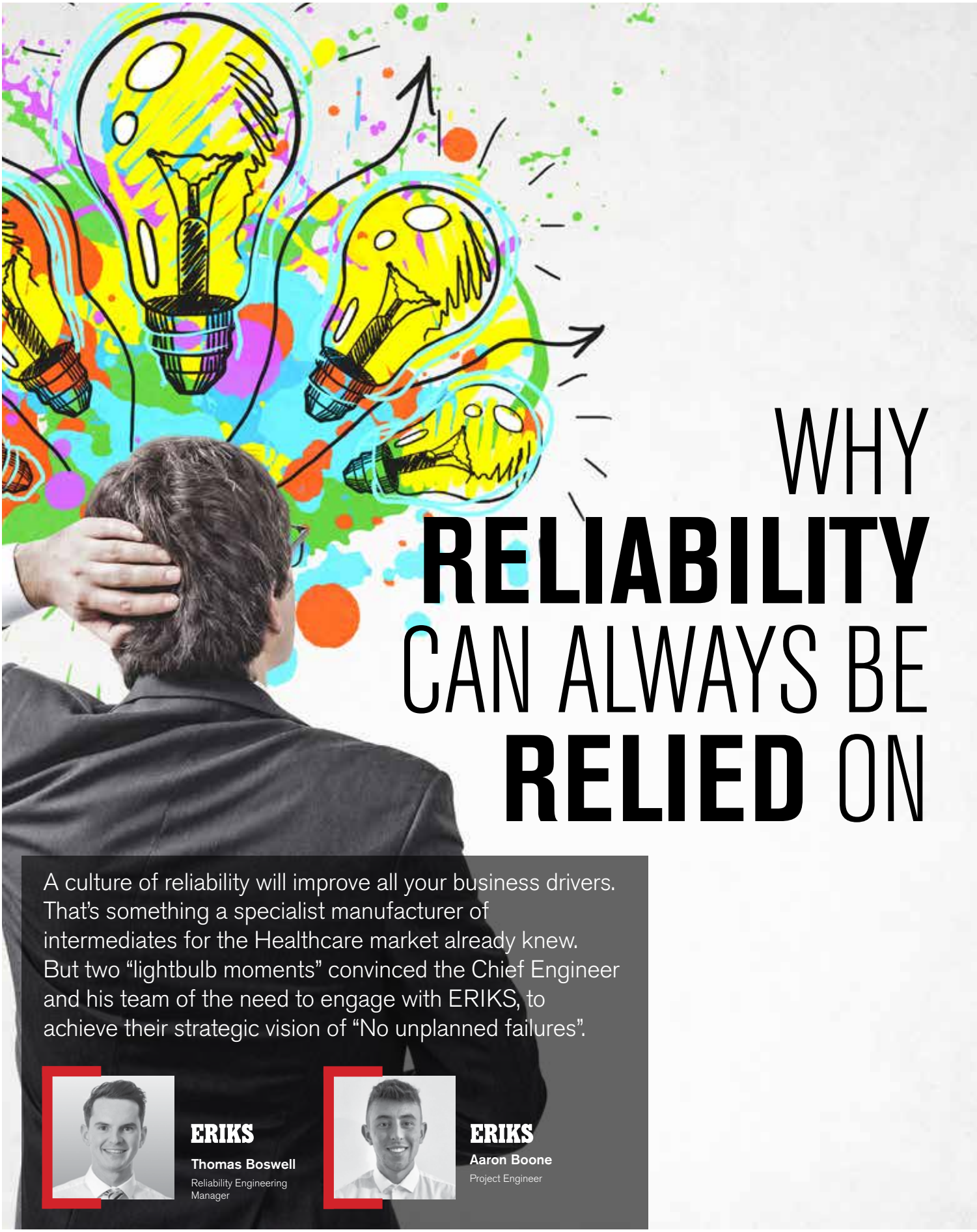
For ERIKS to get sufficient information and determine the best possible solution, we ask lots of relevant questions about the operating environment, and materials being processed, in addition to the standard selection criteria. This is an important step to ensure that products are suitable, reliable, and safe to use.

Ongoing assessment

If your equipment is correctly specified to suit the environment and the materials handled, what else can you do to maximise reliability and reduce downtime? Due to the sharp failure curve within aggressive environments, traditional maintenance and periodic monitoring might not be effective.

Instead, you should consider live data acquisition through real time online monitoring. Systems are available that continuously gather the information needed, to provide advanced warning of impending failure, along with datalogging, and threshold triggered alerts.

Across a huge range of industries, continuous production hinges on the performance and reliability of individual parts. In aggressive environments, these parts can suddenly and unexpectedly fail. By specifying the correct products and systems, the chances of failure can be drastically reduced. When combined with ongoing data analysis, plant managers can get the ultimate peace of mind.



WHY **RELIABILITY** CAN ALWAYS BE **RELIED** ON

A culture of reliability will improve all your business drivers. That's something a specialist manufacturer of intermediates for the Healthcare market already knew. But two "lightbulb moments" convinced the Chief Engineer and his team of the need to engage with ERIKS, to achieve their strategic vision of "No unplanned failures".

ERIKS
Thomas Boswell
Reliability Engineering Manager

ERIKS
Aaron Boone
Project Engineer

The first lightbulb moment was reading the ERIKS Challenging Obsolescence White Paper. The second was attending an ERIKS Reliability Masterclass. He already had the desire to measure asset reliability, with the aim of improving reliability and reducing obsolescence. Now these expert inputs inspired not one, but three initiatives.

Firstly, to develop a strategic vision for reliability at the plant. Secondly, to develop a plan to implement the vision. And lastly, to develop a reliability Best Practice document for their manufacturing group. The ultimate aims of this process would be to accelerate reliability-centred initiatives within the plant, mitigate risk exposure to critical spares gaps, increase productivity, obtain an insight into the assets' status, and enable smarter replacement thanks to optimised monitoring methodologies.

> "DEVELOP A STRATEGIC VISION FOR RELIABILITY"

With expertise in asset monitoring, asset maintenance and asset and inventory management, ERIKS was the natural choice of partner to help.

Assessing your assets

It's impossible to develop a reliability-centred strategy for your assets unless you know what assets you have, their relative criticality, and their failure modes. So ERIKS' first step at the customers plant was to carry out an assessment of criticality and monitoring technology – initially a scope of 300 rotating assets.

> "CARRYING OUT UNFORESEEN REPAIRS IS USUALLY MORE HAZARDOUS THAN SCHEDULED MAINTENANCE"

Ultimately, the survey expanded beyond rotating assets to a total of 700 different flow assets, heat exchangers, steam traps and valves. A stores survey was also carried out, and the surveyed assets were then cross-referenced with the stores inventory.

The asset survey not only recorded the asset nameplate details, but also assessed their individual operating environments. The plant runs a semi-hygienic, clean operation manufacturing process, and is a Tier 3 COMAH (Control Of Major Accident Hazards) site, with some explosive atmospheres present.

Once the assets and their operating environments were defined, the assets could be ranked for criticality, based on their rating under five criteria:

Safety
The effect of equipment failure on human safety ("[recent] data indicates that 25-30% of manufacturing industry fatalities in Great Britain were related to maintenance activity. Carrying out unforeseen repairs… after sudden breakage or failure… is usually more hazardous than scheduled maintenance" – HSE)

Line Output
The effect of failure on the production process and productivity

> "REDUCE THE MEAN-TIME BETWEEN MAINTENANCE INTERVENTIONS"

Maintainability
The length of time a particular failed asset takes to fix

Cost
The effect of equipment failure on maintenance costs

Product Quality
The effect an asset failure has on the quality of the products being produced

Foresight and insight

With the assets and their criticality identified, ERIKS' expertise came into play in understanding the failure modes of the critical assets, and in recommending technology or services to help mitigate against failure.

This included defining a maintenance strategy based on individual assets' attributes and failure modes, rather than on OEM recommendations. Introducing a non-intrusive surveying and monitoring regime can help to reduce the mean-time between maintenance interventions, because maintenance takes place only when required, not to a fixed schedule regardless of whether or not the work is required.

With this Best Practice reliability strategy in place – combining preventative, proactive and predictive measures – managing asset risk, condition and lifecycle becomes much easier and much more efficient.

In addition, using ERIKS' inventory management capabilities, once the repair and maintenance parts in the stores had been assessed it was possible to optimise the inventory and introduce a level of standardisation. This can have a significant effect, since ERIKS' figures show that 10% of store costs are tied up in obsolete items, and 15% of downtime is caused by lack of spare parts.

Ultimately, the introduction of the reliability-centred maintenance strategy has enabled this speciality chemicals company to:

- intervene smarter
- mitigate risk
- optimise productivity
- decrease planned and unplanned downtime.

You can rely on ERIKS to do the same for you. maintain, repair or replace assets. To keep your whole system operating at optimum efficiency at all times.

HOW'S YOUR CONCENTRATION?

MUNSCH
Plastic Pumps for Aggressive Media

Christian Steinbrecher
Sales

Choosing the right chemicals pump is a matter of concentration. While everyone knows that sulphuric acid, for example, is exceptionally corrosive, its corrosiveness depends on its concentration and temperature. So which material to choose for a pump when sulphuric acid is the pumping medium is not as simple as it might seem.

If the sulphuric acid is being pumped for a particular process, you'd presume the concentration would be consistent. But the truth is very different. For example, simply cleaning the process equipment may leave some residue of other liquid, and when the acid starts to flow through the system again its concentration will be changed through contamination.

> "SULPHURIC ACID BY-PRODUCT CAUSED PROBLEMS WITH PUMPS"

Suddenly, the material the pump is made from – selected to be resistant to a certain concentration range – will become unresistant, and the pump will start to corrode. Even worse, if the pump is metal and the surface corrodes, the corrosion will build-up until it is washed off or falls off. This leaves a fresh surface for the corrosion process to start all over again, and again, and again. Now corrosion turns to erosion, as the material – and the pump – are gradually eaten away.

Clearly, choosing the right material to cope with the correct range of concentrations at a given temperature is essential. And when an international chemical group made the wrong choice, they paid the price in more ways than one.

Nothing to smile about

Titanium oxide (TiO2) is a pigment used to make products such as toothpaste look whiter and shinier. It's manufactured by hydrolysing titanium oxide sulphate to produce TiO2 and H2SO4 (sulphuric acid).

For the chemical company producing the titanium oxide, it was the sulphuric acid by-product which caused the problems with their process pumps.

The pumps are required to run continually at a temperature of 110°C, pumping sulphuric acid at 30% concentration. However, the Hastelloy nickel-based steel alloy pumps were failing frequently due to corrosion and erosion, and the cost of downtime was compounded by the high cost of replacement Hastelloy parts.

In their search for a solution they approached Munsch to assess the possibility of replacing the metal pumps with plastic.

> "DOWNTIME COSTS COMPOUNDED BY HIGH COST OF REPLACEMENT PARTS"

"PLASTIC PUMPS RESISTANT FROM 0-98% CONCENTRATION"

Putting the "P" in pumps

As specialists in plastic pumps, Munsch offer their NP range in a choice of polypropylene (PP), polyethylene (PE) and polyvinylidene difluoride (PVDF).

Whereas most metals are only resistant to sulphuric acid corrosion across a narrow concentration band, Munsch plastic pumps are resistant from 0% to 98% concentration. Whilst PP and PE materials are chemically similar, PE provides better erosion protection, but with an upper operating temperature limit of 85-90°C. PVDF provides slightly less protection against erosion, but is suitable for the operating temperature of 110°C in this customer's application. And since it eliminates corrosion, it also prevents erosion.

The customer installed the recommended NP pump in PVDF for a trial period, after which they added a number of identical units. All the pumps have now been running for several years with no signs of corrosion or erosion, and can be expected to run for as long as 20 years without failing.

Simply, the best

The design philosophy behind Munsch pumps is all about simplicity.

Designed to be as easy as possible to assemble and disassemble, there is literally only one way to put a Munsch pump together. This means there's no risk of a leak from a wrongly-assembled pump.

The non-metallic mechanical sealing system is also simplified for flexibility and cost-efficiency. A single mechanical seal can be operated in single, double, shutdown flush or continuous flush operating modes, and the same seal size will fit all Munsch pumps. Again, this eliminates the risk of error in assembly, as well as reducing inventory costs and simplifying repair and maintenance.

By concentrating on manufacturing simply the best plastic pumps, Munsch leave their customers free to concentrate on their processes, without fear of pump failure.

Optimising efficiency and reliability

Through a combination of operational reliability, mechanical stability and hydraulic efficiency, Munsch achieve leading efficiency for plastic pumps, at 86%.

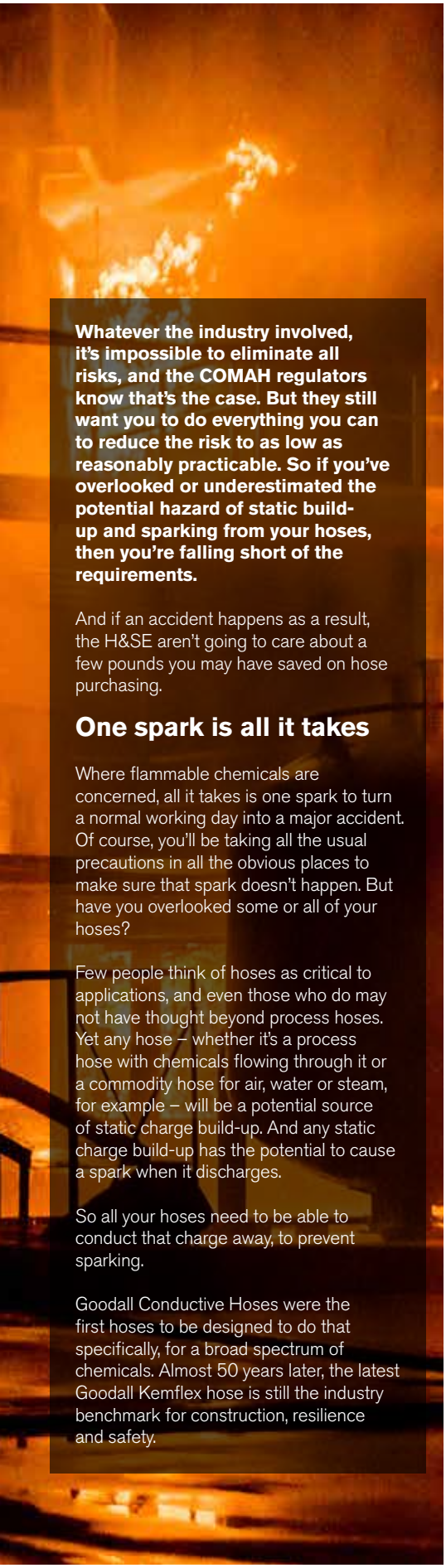
In the case of the titanium oxide manufacturer, pump efficiency was less than maximum, but resistance to corrosion was optimised, and erosion was eliminated.

- Pump: NP
- Medium: sulphuric acid and titanium oxide
- Flow rate: 60m3/h
- Pressure: 4.3 bar
- Temperature: 110°C
- Rotational speed: 1,450rpm

MAJOR ACCIDENTS. MINOR CAUSE. HAVE YOU OVERLOOKED YOUR HOSE?

ERIKS
Mark Carpenter
Product Manager
Industrial Hose

Anyone working in the chemicals industry will know about Control of Major Accident Hazards (COMAH) legislation. You'll also know it requires you to take "all measures necessary" to prevent accidents. But you may not have realised that can include carefully considering your choice of hoses.



Whatever the industry involved, it's impossible to eliminate all risks, and the COMAH regulators know that's the case. But they still want you to do everything you can to reduce the risk to as low as reasonably practicable. So if you've overlooked or underestimated the potential hazard of static build-up and sparking from your hoses, then you're falling short of the requirements.

And if an accident happens as a result, the H&SE aren't going to care about a few pounds you may have saved on hose purchasing.

One spark is all it takes

Where flammable chemicals are concerned, all it takes is one spark to turn a normal working day into a major accident. Of course, you'll be taking all the usual precautions in all the obvious places to make sure that spark doesn't happen. But have you overlooked some or all of your hoses?

Few people think of hoses as critical to applications, and even those who do may not have thought beyond process hoses. Yet any hose – whether it's a process hose with chemicals flowing through it or a commodity hose for air, water or steam, for example – will be a potential source of static charge build-up. And any static charge build-up has the potential to cause a spark when it discharges.

So all your hoses need to be able to conduct that charge away, to prevent sparking.

Goodall Conductive Hoses were the first hoses to be designed to do that specifically, for a broad spectrum of chemicals. Almost 50 years later, the latest Goodall Kemflex hose is still the industry benchmark for construction, resilience and safety.

"HAZARD OF STATIC BUILD-UP AND SPARKING"

Conductivity at the core

At the core of the Kemflex hose lies a compound incorporating highly-conductive carbon black particles. These create a pathway for the safe dissipation of any static charge built up during use, and so reduce the risk of a spark.

This Ultra High Molecular Weight Polyethylene (UHMWPE) central tube is surrounded by high tensile braids. These offer more resilience than a spiral construction, as well as enabling flexibility and providing resistance to kinking. Around this central tube is an EPDM outer cover, that's resistant to abrasion, chemicals and ozone.

Exceeding the European norm EN 12115, Kemflex is tough and long-lasting – helping to reduce your Total Cost of Ownership. But above all, it meets the demands of COMAH and your requirement to take "all measures necessary" for safety.

Single pass, or fail

Another important safety consideration for hoses is, of course, the avoidance of leaks. So for their Metal Visor hoses, Goodall have developed an innovative manufacturing technique which reduces the risk.

"STILL THE INDUSTRY BENCHMARK"

Most metal hoses are welded once for crimping then welded again to attach the fitting. Each time the hose is heated for welding, micro-fractures and impurities are introduced – both of which are a potential source of weakness, fracture and leakage. At the same time, every heating event extracts chromium from the stainless steel, which reduces its corrosion resistance. Once the chromium content falls below 12%, there's a real risk of oxidation and corrosion, leading to leakage or hose failure.

Goodall Metal Visor hose overcomes all these problems by using a single-pass welding technique, which reduces the amount of heating, as well as avoiding gaps and burrs between the hose end and fitting.

"INNOVATIVE MANUFACTURING TECHNIQUE"

Perfect fit for purpose

Because Goodall manufacture not just the hoses but the ferrules and fittings too, leak-free fitting and complete compatibility between hose and accessories are all a part of the package.

Goodall service also includes expert advice on matching the fitting to the hose, for leak-free performance whatever your application.

Perhaps your hoses have never been a major consideration. Or you've simply repeat-ordered, or ordered on price alone. But unless you can be sure your hoses are the safest choice available, can you really be sure you're taking "all measures necessary"?

Goodall

YOU ONLY NEED ONE TOOL FOR ANY JOB. THE **RIGHT** ONE.

ERIKS

Emma Hunt

Product Manager Tools and Consumables

Apologies to engineers across the country. But depending where you work, you'll know that a Birmingham, Glasgow or Manchester screwdriver is another name for a hammer. Though sometimes, using the wrong tool is not a joke, but a deadly risk.

When working in an ATEX zone it goes without saying there are strict safety requirements. Electrical and mechanical equipment must be ATEX-approved and the correct PPE should be used, but were you aware you could just be holding an explosion-risk in your hands?

Hand tools are not within the scope of ATEX regulations. Yet in the right – or should that be wrong? – atmosphere, they could cause the spark that ignites the explosion that leads to minor damage or even major fatalities.

In a sector like the chemical industry, choosing the right tool for the job is a serious business.

One spark is enough

When flammable gases, mists or vapours –or combustible dusts – are present, if enough mixes with air, one spark could ignite an explosion. And that spark could come from a hand tool.

Knock a traditional steel alloy spanner against the nut you're loosening, drop a wrench onto metal flooring, or let your screwdriver slip as you're tightening a screw with a standard 'steel' hand tool, and that could be the last thing you do.

"HOLDING AN EXPLOSION-RISK IN YOUR HANDS"

Fortunately, there is a solution that's easy to get your hands on: non-sparking tools.

Usually made from Copper-Beryllium Alloy or Aluminum Bronze Alloy non-sparking tools greatly reduce the risk of a spark. However, selecting the right tool is very important but non-sparking tools should never be the only preventative measure in a hazardous environment.

Create a better atmosphere

Sparks are only a danger if the atmosphere is explosive. Preventing that atmosphere from developing is the most effective step you can take.

This means taking isolation, ventilation and purging measures to prevent build-up of flammable vapour-air mixtures, and organic dust clouds such as flour or coal dust. Combine those practices with the use of non-sparking tools, and you reduce the risk of explosion to a minimum.

It's also important to use and care for non-sparking tools in the right way, to enable them to provide the most effective protection.

They need to be kept clean, free from ferrous and other contaminants which could compromise their non-sparking properties. And they need more frequent redressing than ordinary tools, as they're made from softer materials.

"CHOOSING THE RIGHT TOOL IS A SERIOUS BUSINESS"

Staying stainless

Unlike a dangerous spark, contact corrosion is not a health and safety risk. But with the increasing use of stainless steel in construction and many other sectors, it's a growing potential problem that can also be resolved with the right tool.

In this case, the right tool for stainless steel is a tool made from stainless steel.

"A FOOT IN THE DOOR FOR CORROSION"

When friction occurs – when tightening a nut, for example – even the hardest steel tool will leave small steel particles behind on the surface it's in contact with. If that's a stainless steel nut, this residue is a foot in the door for corrosion to start.

The stainless steel begins to corrode, lose it's "looks", and negate the value of its extra cost.

Use a stainless steel tool, on the other hand, and contact corrosion is prevented, the stainless steel items remain corrosion-free, and the additional cost for a better appearance and longer life is fully justified.

So whether you're working in Birmingham, Glasgow, Manchester, or anywhere else, it's well worth thinking carefully about your tool choices.

Pick the right tool for the job and – whether or not it's a hammer – you'll hit the nail on the head.

Safety is in your hands

Over future issues of Know+How, we will be looking at tools best practice and tool safety solutions – such as safe storage tool cabinets, tool safety options, procedures when working with tools at height, and more.

Meanwhile, always remember the 5 basic rules for tool safety:

1. Keep all tools in good condition with regular maintenance.
2. Use the right tool for the job.
3. Examine each tool for damage before use.
4. Operate according to the anufacturer's instructions.
5. Provide and use the proper protective equipment.

ERIKS

Mahesh Patel

Engineering Manager
Power Transmissions

The only way to understand the scale and challenges of some engineering jobs is to compare them with things we can all relate to. ERIKS' refurbishment and remanufacturing of Unloader Number 3 at the Tata Steel Port Talbot plant was one of those jobs.

BUSES, BUGATTIS, PLANES AND CRANES

MEASURING-UP TO ONE OF ENGINEERING'S BIGGEST CHALLENGES

There are 3 harbour cranes on the dockside at Port Talbot, unloading cargoes of iron ore and coal. Unloader Number 3 has been operating since the 1960s, during which time it has lifted around 1.6 million tonnes a year, in 50-tonne buckets, with 20-30,000 bucket lifts every 12 months.

The crane's four legs are mounted on a total of 10 carriages, running on railway lines along the dock. As the crane weighs around the same as two and a half Airbus A380 aeroplanes (900 tonnes), the carriage wheels need to be able to withstand up to 44 tonnes of load when storm conditions strike. That's the same as five and a half fully-loaded double-decker buses. At the same time, the drive produces 27,500Nm of torque per carriage, which is the equivalent of 22 Bugatti Veyrons, or 72 two-litre VW Golf Mk VII TDIs.

"NO HALF-MEASURES AND NO ROOM FOR ERROR"

With the crane operative high above the ground, dozens of people working beneath, and a ship in the harbour alongside, this is a piece of engineering demanding no half-measures, with no room for error. In other words: the perfect job for ERIKS.

Shock and ore

The operating environment on the dockside is tough for both men and equipment.

Iron ore and loose coal frequently fall from the crane buckets onto the train tracks, where the dust is picked up by the carriage wheels and makes its way into the mesh of the carriage's spur gears. This can cause the crane to stall in motion, damaging not just the gears but – thanks to the shock load – other drive components such as the gearboxes, brakes and bearings.

"ENGINEERING AN EFFECTIVE REFURBISHMENT SOLUTION"

Together with over 50 years' wear and tear, and sea water corrosion, the result was frequent drive failures, high maintenance costs, and occasional fines for ships delayed in dock waiting to be unloaded while the crane was out of action.

Engineering an effective refurbishment solution was the challenge ERIKS faced. However this was made even more difficult by the need to remove two operational – rather than spare – drives to refurbish. Tata Steel would only allow the crane to be out of action for two weeks, and a test dismantle, re-weld and remanufacture of a single carriage proved this was an impossible timescale.

However, ERIKS believes in achieving the impossible. In this case, by offering to manufacture two new carriages from scratch, to keep the crane operational while the remaining carriages were refurbished.

Heavy lifting

Much of the project's "heavy lifting" fell on the Swansea Electro-Mechanical Services division, and the Pensnett Product Business Units, all under the project management of Engineering Manager Mahesh Patel.

Even with 28 years' WYKO and ERIKS experience under his safety helmet, this was Mahesh's biggest project to date.

The project's scope grew over time, until ultimately ERIKS, in conjunction with SKF and Fenner brands, was responsible for:

- a new drive, eliminating the high-maintenance open spur gears
- a Fenner P Series gearbox of greater efficiency than the worm gearbox drive previously in use
- an IP65 enclosed electromagnetic brake system to replace the calliper brake system, which was highly susceptible to contamination and corrosion
- more cost-effective SKF spherical roller bearings to replace existing taper roller bearings
- new wheels, which are over 100kg lighter

"REAL ADDED VALUE"

The complete package

ERIKS' complete design, engineering and manufacturing capabilities across a whole range of components not only made it possible to complete the task successfully. They also enabled real added value: a new, lighter wheel design, a more reliable electromechanical braking solution, and two completely new carriages to keep Tata Steel's dockside operations up and running throughout.

The scale and complexity of this project was something few other companies could have taken on. For ERIKS, it was business as usual.

Savings on a massive scale

Before the ERIKS upgrade, maintenance and repairs to Unloader Number 3 were costing Tata Steel over £1,200 a week in labour alone.

Together with the cost of replacement outrigger bearings, labyrinths, pinion and intermediate gears, and repairs to the gearbox, gearbox coupling and motors, total maintenance costs for the unloader's 10 drives were running at approximately £184,000 per annum.

Since the completion of the upgrade, savings of over £500,000 have been realised.

PUMP REPORT, DATELINE 2023

When a UK manufacturer of high-quality steel products looks back in 5 years time, what will they have to say about the high-pressure boiler feed pumps installed for them by ERIKS in 2018?

ERIKS

Adrian Megson

Business Development Manager, Pumps

One thing they will definitely remember is the issues they were having with their original multistage pumps – installed back in the Fifties and now causing increasing problems. Through a combination of reverse engineering, careful maintenance and ERIKS know-how, their Mean Time Between Failure had been extended from 3 months to 12, but it was becoming clear they were no longer fit for purpose.

"FRIGHTENINGLY SHORT MTBF"

The 8-pump system was the most critical on site, intended to supply up to eight boilers at 42 bar pressure, with variable demand. But their hydraulic design was so inefficient, that as well as a frighteningly short MTBF they were also struggling to meet the 42 bar demand. In addition, they were expensive to maintain, and obsolete, with parts no longer available. It didn't really need a pump specialist to diagnose that the whole system was at the end of its life.

Under pressure to perform

Looking back from 2023, the second thing that will stand out is the first part of ERIKS' solution. Namely: just turn off two steam pumps.

The customer believed that these pumps were supplying the base load, and the electric pumps were kicking-in as required to top up. ERIKS' investigation revealed that in reality, the steam pumps were never reaching the required header pressure to overcome the non-return valve. They were simply wasting high-pressure steam while the electric pumps were doing all the work.

Turning off the steam pumps would have no negative effect at all, but would save £103,000 a year on high-pressure steam costs.

Efficiently simple. Simply efficient.

The third thing which will still be remembered 5 years on is the efficiently simple solution to the problems with the electric driven pumps: replace them.

Energy – and money – saved

Original Feed Pumps:

EF 10, 2 off, x 109 KK + 2 off EF20. 2 x 169kW = 556kW/hr.

New Caprari Feed Pumps:

Shaft power at comparable status = 264kW/hr.
Annual kW saving is 556kW - 264kW = 292kW
Annual Cash Energy Saving is 292kW x 24hrs x 365 days x £0.065 = £166,264.80

"SAVE £103,000 A YEAR ON HIGH-PRESSURE STEAM"

Variable speed pumps were required, able to cope with a variable demand of 80T/hr minimum and 275T/hr maximum. Out of proposals from three manufacturers, Caprari pumps were chosen for their value-for-money, plus their overhung shaft-to-bearing ratio which results in a more rigid shaft and less shaft deflection.

The three new pumps (designed to run as duty and assist) cope with the variable demand by using inverters to control pump speed, which provides constant pressure in the header. The pumps also have energy-efficient IE3 motors, and – in place of the outdated white metal bearings and packed glands of the old pumps – feature ball bearings and a mechanical seal.

5 years MTBF

So why is the customer looking back from 2023?

Because that's the earliest the new pumps installed in 2019 will require a major overhaul. With ERIKS continuing support since installation – including monthly vibration, flow and pressure checks – it could be even later. And in the intervening five years, the customer has also seen lower repair costs as a result of the increased MTBF.

"ENERGY-SAVINGS QUICKLY BECAME CLEAR"

But less frequent failures are not the only benefit since 2019. The customer has also realised significant savings above and beyond repair and maintenance.

The inefficiency of the original pumps arose partly from their hydraulic design, which required significantly more energy to achieve the same pressure as the Caprari pumps. These new pumps use only half the power to achieve the duty, and the energy-savings quickly became clear [see the savings above].

Looking back, the customer must be wondering why they waited so long for such a cost-effective, energy-efficient, reliable pump solution. But at least they can look forward with confidence to many more years of energy-saving, money-saving performance.

Roll on 2029.

"LIKE PUTTING A STICKING PLASTER ON A BROKEN LEG"

How long can you limp along with a patched-up solution before radical surgery is required? A major utilities company had tried to make the best of a bad situation. But with the risk of penalties running into millions of pounds if plant failure affected water quality, it was time to call in ERIKS know-how.

ERIKS
Steve Parry
Senior Applications Engineer, Bearings and Lubrication

ERIKS
Tony Wilson
Application Engineer, Power Transmission

The waste water recycling plant with the sticking plaster solution serves a major conurbation and a sizeable area of the surrounding county. The problem which faced ERIKS' Bearings and Drives engineers lay in the Orbal aerator tanks. And after an initial inspection, it was the ERIKS engineer who described previous attempts at repair in terms of a sticking plaster.

The more you discover about the earlier engineering efforts, the more you can see he has a point.

Stress under pressure

Orbal aerators use discs mounted vertically above football pitch-size tanks of waste water. The discs rotate to aerate the water, encouraging cleansing bacteria to thrive.

However, with the aerator discs arranged in line, at this plant only the first was functioning and the others were failing to turn.

It was clear that at least one of the urethane coupling elements had failed, but since a large crane was required to lift out the shaft, it wasn't cost-effective to replace the couplings until all of them had failed.

In addition, when the 125mm bearings in the arrangement had failed initially, the drive shafts were machined down and smaller bearings installed. Then when the drive shaft snapped, it was repaired with a weld.

The result, identified by ERIKS, was stress cracks running right through the shaft, which was effectively supporting a 1½ tonne gearbox and motor. Now a complete plant failure, with associated water quality risks and potential penalties, was a real possibility.

> "COMPLETE PLANT FAILURE WAS A REAL POSSIBILITY"

Going back to basics

It was clear another sticking plaster solution would not be good enough this time. Not only would it simply postpone inevitable catastrophic failure, but it wouldn't resolve some basic design issues highlighted by ERIKS.

These included:

- the method of gearbox mounting, which placed unwanted weight on the bearings
- the need for a large crane to lift out the entire shaft to replace couplings
- health and safety issues with access for lubrication inspection and maintenance

It was time for radical surgery.

Balancing act

One of the first steps was to redesign the configuration, which had the gearbox and motor balanced at the end of the shaft.

> "RESOLVE BASIC DESIGN ISSUES HIGHLIGHTED"

The gearboxes were remounted independently on a new mounting plate, to remove the weight burden and stresses from the shaft and bearings, with laser alignment used to ensure the installation was perfect.

Using Falk Wrapflex couplings eliminated the need to remove the gearbox in case of coupling replacement. Thanks to the "replace in place" wrap-around design, replacing the elastomeric element between the drive hubs (the most likely component to wear) is simply a matter of sliding the hubs along the shaft to release it. A change can be made quickly, and certainly with no crane required.

Naturally the fractured shaft was also replaced, then the whole assembly was fitted with a Simalube remote lubrication system for the bearings, sleeves and so on. This removed the need for manual lubrication maintenance, and the associated health and safety risk. Previously, a lubrication inspection of all four Orbals had taken half a day, and involved accessing the aerators from below.

Now it could be carried out remotely and safely from a control panel mounted at waist height on a handrail, taking no more than 15 minutes.

> "REPLACE IN PLACE' WRAPAROUND DESIGN"

The final piece of the puzzle was to ensure bearing uniformity across the enter installation, with consistent bearing arrangements and same-size bearings – fixed, floating or internal – throughout. This reduced inventory, increased cost-effectiveness, and made maintenance and repair far simpler.

After the eight-week refurbishment and upgrade project, the plant was back in operation, and 18 months on the Orbal process is still fully functional, with no failures reported. In other words, no longer limping along, but running at full speed.

NAILING THE SOLUTION TO WATER HAMMER

In commercial and industrial fluid systems. In small dental surgeries and large manufacturing facilities. In mobile water-carrying equipment (like street sweepers). And in industrial processes using pressurised water. In all these places, water hammer hits hard. Think of it as “hydraulic shock” and you can begin to understand how it can cause serious damage, and why you need to deal with it.

IMI BUSCHJOST

Neil Lamb
Business Development Manager

The shock is caused by a pressure spike or surge, when fluid in motion through the system is forced to a sudden stop. In process applications, the stop can be caused by a fast-acting valve closing a pipe while fluid upstream is still moving. The water hits the closed valve, bounces back, and creates a wave throughout the upstream system.

Pressure spikes from these waves have been measured at up to 5 times higher than normal water pressure in the pipeline. That's far above typical UL safety ratings, and enough to cause serious damage to seals, gauges, pipes, hoses and other fittings. If it happens repeatedly, the over-pressurisation and vibration can result in anything from premature wear to catastrophic component failure.

"UP TO 5 TIMES HIGHER THAN NORMAL WATER PRESSURE "

The hammering noise that water hammer creates is hard to ignore. The problems it can cause mean it shouldn't be.

Solutions under pressure

Engineers have come up with many different solutions to water hammer, but their ideas all crack under pressure.

Fitting a regulator upstream of the valve will lower the surge pressure, but it also reduces the flow rate, which can reduce system performance and productivity. Upstream check valves can reduce the shock's impact, by stopping the pressure spike from travelling throughout the whole system. A pressurised accumulator can be installed, to divert the excess fluid until the pressure spike abates. Or a shock absorber in the form of a water hammer arrestor can be added to the upstream system.

These will all be more or less effective. But they will also add more cost and more complexity to the system. And more complexity means more points of potential failure.

"CLOSE QUICKLY, BUT ALSO SMOOTHLY AND GENTLY"

A more radical solution is to modify the whole system design, adding elbows and loops to the piping to try to slow down the surge velocity. Again, this increases system complexity and potential for failure, and adds to the cost – as well as requiring more space.

IMI Buschjost's approach is different. It's the closure of the valve that causes the problem, so they looked at the valve for the solution.

"MORE COMPLEXITY MEANS MORE POINTS OF POTENTIAL FAILURE"

A better valve beats hammer

Fluid systems using 2-way valves need the valves to close rapidly, for safe, effective operation. But that's also the cause of water hammer.

The answer from IMI Buschjost is a choice of 2-way solenoid valves – the Series 82410 and the Series 82740 – that close quickly, but also smoothly and gently. Their proprietary internal design means they can close in a quarter-second, but produce only one-fifth of the pressure surge typical of other similar valves.

Comparative testing against three other best-selling, directly comparable valves highlighted the difference.

When the power was shut-off and the valves moved to their closed position, the upstream pressure was measured every 100 milliseconds. Two of the competitor valves hit pressure peaks of 1440psi, and one reached 1101 psi (approximately 100 bar and 75 bar respectively). Two of the valves also created not one but two pressure spikes, before the pressure finally returned to normal at 87psi.

In contrast, the pressure of the single spike caused by the IMI Buschjost 82410 was more than 80% less, at just 265psi (18 bar).

The valves are available in brass (IMI Buschjost 82410) and 316 stainless steel for more aggressive operating environments (IMI Buschjost 82740). Used in a new system, their compact size gives engineers more design flexibility and more control of their equipment footprint. Used in an existing system as an upgrade, the valves can be a straight swap for those they're replacing.

Water hammer, hydraulic shock or pressure spike: whatever you want to call it, IMI Buschjost have solved it where it starts. At the valve.

IMI Buschjost products form part of the process control valve offering from IMI Precision Engineering and complement a wide range of pneumatic motion and control technologies within their IMI Norgren product range.

WHAT REALLY GETS UP YOUR NOSE AT WORK?

The boss, the hours and the pay, we can't do much about. But for something far more harmful – and hard to see – Bosch can help.

BOSCH
Invented for life

Simon Twiss
Key Accounts Manager

Hopefully you wouldn't inhale a lungful of air when you're standing by someone smoking a cigarette. But breathing dust while you're at work could be doing as much harm to your lungs as passive smoking. And just as passive smokers get all the risks with none of the pleasure, if you're close by – or even just passing by – a job that's generating dust, you get most of the dust with none of the protection of a PPE face mask.

The only effective answer is stop the problem at source. Which is exactly what a Bosch Wet and Dry Dust Extractor does.

Suck it up

The closer to the source you remove the dust, the less that escapes into the atmosphere and potentially into someone's lungs. So a dust extractor mounted on the tool itself is the ultimate extraction solution.

> "STOP THE PROBLEM AT SOURCE"

The Bosch GAS35MAFC, for example, is effective with the majority of dust types and has several important built-in features.

Continuously variable suction power adjustment enables increased suction when more dust is being produced. Automatic filter cleaning uses a reverse airflow to clean the filter every 15 seconds – so suction power always stays high. And when the maximum fluid level is reached, the tool is automatically shut down, so there's no danger of believing you're protected when you're not.

"THE ULTIMATE EXTRACTION SOLUTION"

Do a better job, safer

Extracting the dust as you work is not just about health and safety. It's also about doing a better job and being more efficient.

With no dust in the way, you can see the work piece and work surface clearly at all times, so you can work accurately, quickly, and steadily. Then when the job's done, there's no clean-up to waste your time.

No dust in the atmosphere also means no dust collecting in your tool's motor, or on the accessory you're using. That means a longer life for your tools and accessories, and lower costs for you.

Lastly, a cleaner workspace looks more professional, particularly when you're working at a customer's site. So you're doing a better job, safer, and a safer job, better.

Click & Clean

To make life easier as well as cleaner, the Bosch Click & Clean System brings together everything you need to work efficiently and effectively.

The system comprises tools, the wet/dry dust extractor, extractor accessories, and L-Boxxes (weighing up to 15kg) which can be attached to the top of the machine for convenient tool storage. All these system components are precisely matched with each other, to help you get the most from your Bosch tools and accessories.

Now all you have to do is choose the correct specification Bosch extractor for your job – which largely depends on the type of materials being worked on.

Bosch dust extractors are categorised as dust class L or M, in accordance with the EU standard1. "L" dust particles come from softwoods (spruce, fir, pine etc.) and Corian, while "M" dust is from hardwoods (beech, oak, ash etc.) and from concrete (containing quartz).

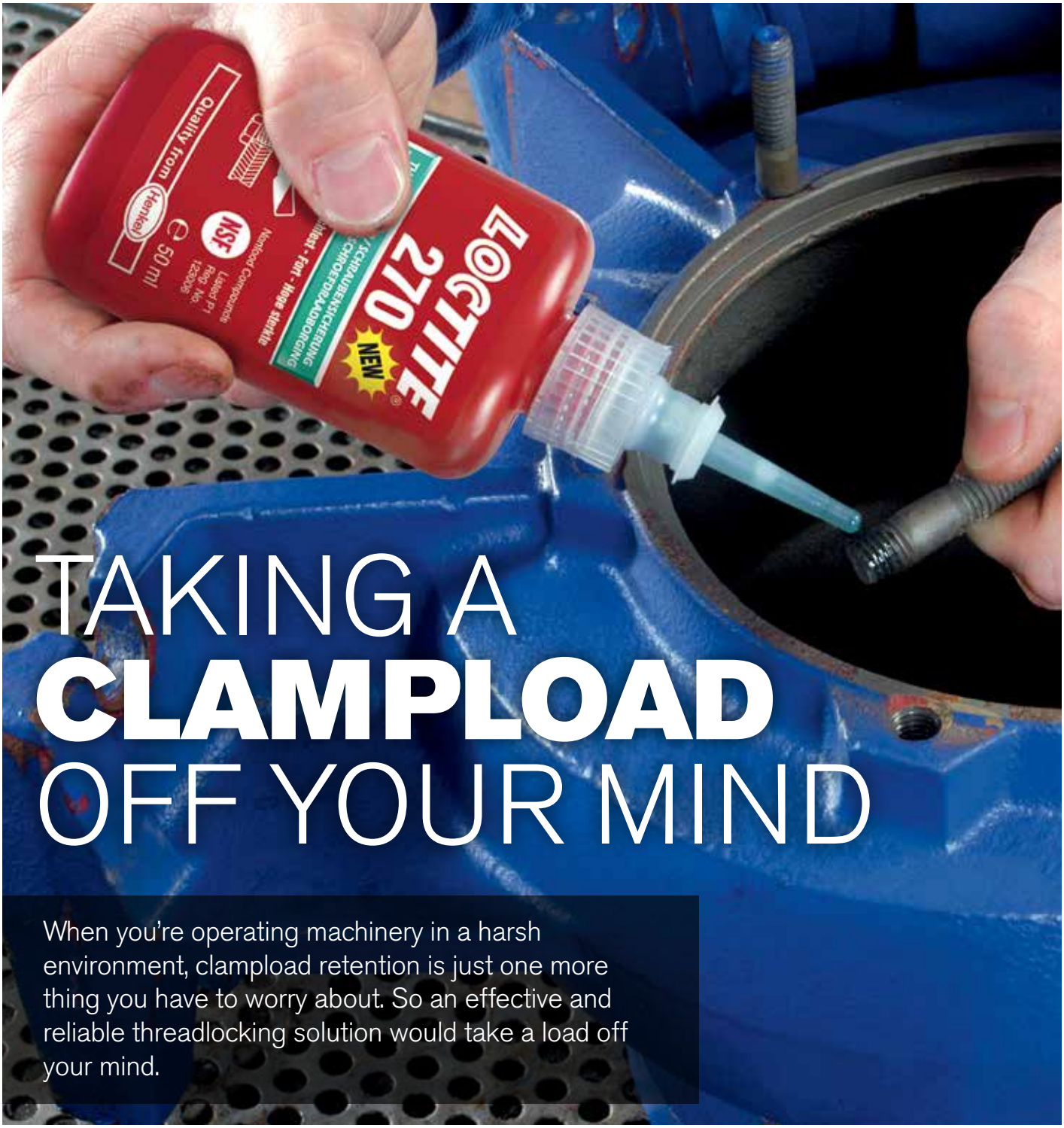
Of the seven extractors in the Bosch range, the four most powerful [see below] have 1380W suction turbines, producing a high vacuum pressure of 254 millibars. Some have automatic filter cleaning (AFC), some semi-automatic (SFC), and all have a container capacity of 35 litres.

"A LONGER LIFE FOR YOUR TOOLS AND ACCESSORIES"

Weighing from 11.6 – 16.2kg, with a 7.5m power cord and 3m or 5m suction hoses, the extractors are easily manoeuvrable on non-marking wheels, and allow a large work radius.

So you won't be hauling heavy machinery around, and you won't need to stop for a breather.

Specifications	GAS 35 L SFC+ Professional	GAS 35 L AFC Professional	GAS 35 M AFC Professional	GAS 55 M AFC Professional
Max. power input (turbine)	1380W	1380W	1380W	1380W
Container volume, gross	35l	35l	35l	55l
Max. vacuum pressure (turbine)	254mbar	254mbar	254mbar	254mbar
Max. airflow (turbine)	74l/s	74l/s	74l/s	74l/s
Dust class	L	L	M	M
Weight	11.6kg	12.2kg	12.4kg	16.2kg



TAKING A **CLAMPLOAD** OFF YOUR MIND

When you're operating machinery in a harsh environment, clampload retention is just one more thing you have to worry about. So an effective and reliable threadlocking solution would take a load off your mind.

LOCTITE

Bob Orme
Senior Technology Specialist

There's no shortage of threadlocking methods, because threaded assemblies inevitably relax tension and loosen. In a harsh environment that can be an even bigger problem, with no margin for error if you make the wrong choice.

So it's important to consider all the alternatives. And once you have, it's even more important to choose the right one.

> "TAKING THE PLACE OF TRADITIONAL MECHANICAL LOCKING DEVICES"

Strengths and weaknesses

Mechanical devices such as split pins and tab washers are really only designed to prevent the loss of nuts and bolts, rather than to maintain an effective clampload.

Friction devices are designed for the job but, while they offer some resistance to vibration, under extreme conditions they fail to perform well enough.

Locking devices, as the name suggests, do provide threadlocking capability. But they also bring their own problems. These tooth- and ribbed-flanged bolts, nuts and washers prevent self-loosening, but are expensive, can damage the contact surface, and require larger flange-bearing surfaces.

No wonder threadlocking adhesives are increasingly taking the place of traditional mechanical locking devices.

Under the hammer

Threadlocking adhesives – such as the latest from LOCTITE – are the state-of-the-art solution for clampload retention in even the most extreme conditions.

As free-flowing liquids or semi-solid adhesives, they fill the gaps between mating threads of fasteners and joints. And once in place, even when the going gets tough they prevent unwanted movement, loosening, leaks and corrosion, and resist vibration – as independent testing proves.

LOCTITE submitted its threadlocking adhesives for comparative testing in a transverse shock and vibration machine. This uses pneumatic hammers to force relative movement of stressed parts, while the existing pre-stress force is measured for the number of load cycles. The characteristic clampload retention curves of the various threadlocking methods were then charted in figure 1, below.

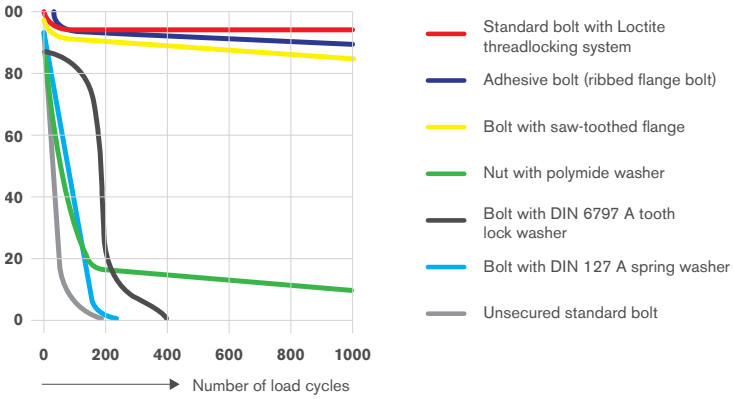
As you can see, the LOCTITE threadlocker achieved better clampload retention than all other options.

> "STATE-OF-THE-ART SOLUTION FOR CLAMPLOAD RETENTION"

The ribbed flange bolt came close, but its cost, the relatively large amount of space required for the flange bearing, and the damage it causes to the surface of the clamped parts around the bolt bearings, all make it a less attractive choice.

The graph also shows the bolt with a saw-toothed flange performed well. What it can't show is that the flange teeth penetrated the bearings surface of the clamped material, and the head and nut were damaged during loosening.

Figure 1



Results for Rail and Rally

- The Crossrail tunnel boring machines use LOCTITE 243 to secure threaded assemblies. These assemblies have to resist massive pressure as the machines eat into the subsoil.
- The high-performance Local Motors' Rally Fighter off-road racing car is jarred, vibrated and shaken as it tackles tough terrain at speed. A LOCTITE threadlocker ensures tightened bolts and screws stay tight, whatever the conditions.

> "PREVENT UNWANTED MOVEMENT, LOOSENING, LEAKS, CORROSION, AND RESIST VIBRATION"

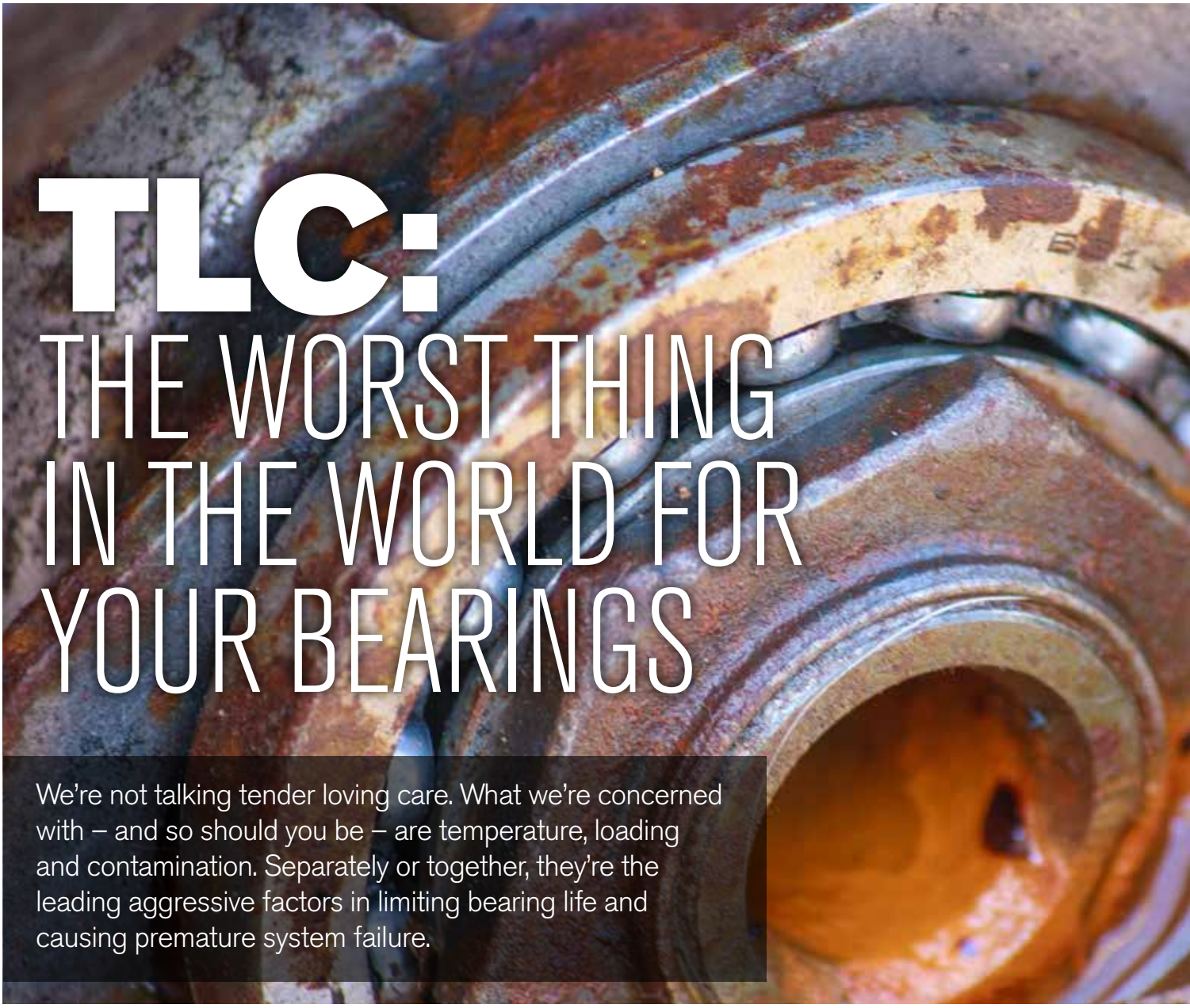
This limits its application to parts with hardened surfaces that can't otherwise be reliably connected. The LOCTITE threadlocker, on the other hand, can be used on any threaded assemblies, and cuts costs by replacing expensive special locking bolts or nuts – so less costly standard assemblies can be used.

No compromise – anywhere

Available as single component, semi-solid adhesives in a choice of viscosities and strengths, all LOCTITE threadlockers cure at room temperature to a hard, solid thermoset plastic, when applied between steel, aluminium, brass and most other metal surfaces.

Low-strength formulations are available for adjustment and calibration screws, meters and gauges, and thread sizes up to M80, and medium-strength options for machine tools, presses, pumps, compressors and gearboxes. For applications where frequent dismantling is unlikely, high-strength formulations are available.

LOCTITE threadlockers are being continually developed to extend their range of applications, and they're now more effective than ever on passive substrates such as stainless steel. They also have greater oil tolerance so they're less sensitive to improperly cleaned parts. All this – without compromising any of their other key properties, such as chemical resistance and shelf life – means they really do take a load off your mind.



TLC: THE WORST THING IN THE WORLD FOR YOUR BEARINGS

We're not talking tender loving care. What we're concerned with – and so should you be – are temperature, loading and contamination. Separately or together, they're the leading aggressive factors in limiting bearing life and causing premature system failure.

MOTION & CONTROL
NSK

Robert Bryan
Aftermarket Key Account Manager

While modern engineering reduces the size and weight of assets, and increases their compactness, operating speed and energy-efficiency, the trade-off is higher-temperature operation. The excess heat may be generated internally – from the motor, for example – or externally from adjacent components in the same equipment or assembly.

The heat is on

When operating temperatures rise above 100°C, the effect on standard bearings can be significant. Dimensional changes can cause the bearing ring to rotate slowly in relation to its seating – which can result in scoring, noise, vibration, wear and ultimately, premature bearing failure.

At these high temperatures, seals and lubrication also degrade rapidly. Standard Nitrile rubber seals used in deep groove bearings have a maximum operating temperature of about 110°C, and standard lubricant greases often have a similar limit.

NSK's solution is a package of measures. To reduce the potential for inner ring creep, NSK offers two grades of heat-treated steel

> "IMPROVE BEARING DIMENSIONAL STABILITY AT ELEVATED TEMPERATURES"

which improve the dimensional stability of the bearing at elevated temperatures. X26 for operation up to 150°C, and X28 for applications up to 200°C.

Complementing these steel grades are two NSK rubber seals – made from Fluorine and Silicone – and metal shields, offering excellent performance up to 200°C. Used in conjunction with specially-developed NSK high temperature greases (reliable up to 250°C) they ensure that however heated things get, NSK bearings keep their cool.

Loads longer life

High radial loads reduce bearing life. So NSK has developed a range of High Performance Standard (HPS) spherical roller bearings.

> "OPERATING LIFE UP TO TWICE THE INDUSTRY STANDARD"

Ideal for use in aggressive loading conditions, these bearings resist seizure and wear, in spite of constant vibration, misalignment and shock loads. They maintain dimensional stability, and can support not only high radial loads but also moderate axial loads.

> "80% OF FAILURES RESULT FROM CONTAMINATION AND POOR LUBRICATION"

Performance enhancements include extremely tight radial clearance tolerance, extra precision on the bore and outside diameter, and super-finished, specially heat-treated rollers with superior shock load capacity.

The result is an operating life of up to twice the industry standard and up to 20% higher limiting speed.

Talking dirty

80% of premature bearing failures are the result of high contamination levels and poor lubrication.

Contamination is introduced to a bearing system either as dry particulates or part of a fluid – usually water. These contaminants are particularly prevalent in the kind of aggressive environment found in the mineral preparation, separation and enrichment industry, and NSK has been driving innovation for machinery in the sector.

Advances in sealing and material technologies – from high-performance DDU rubber seals to Molded-Oil solid lubrication – help to create NSK bearings which resist contamination ingress, and the spalling, flaking, wear and seizure caused by contamination damage.

If you operate machinery in an aggressive environment where temperature, loading and contamination are issues, then perhaps a little TLC– in the shape of NSK bearing solutions – won't go amiss.

A clean sweep on contamination

Two diverse plants suffering contamination issues leading to bearing failures turned to NSK for effective solutions.

- Bearing failures within a rotary screen were causing frequent breakdowns at a biogas plant. Rotary screens with two wheels per screen had two Deep Groove Ball Bearings mounted within each wheel. On average the bearings failed every six weeks, taking an hour to replace each time, incurring a significant loss of production. The bearing failures were due to contamination ingress behind the seals. NSK engineers performed an Application Review and recommended replacing the existing bearings with NSK Stainless Steel Molded-Oil Deep Groove Ball Bearings, with DDU seals. The customer achieved an annual saving of £17,000.
- Frequent bearing failures on a premium snack processing company's potato wash application were causing significant downtime and reduced production. Bearing failure analysis by NSK revealed water ingress and soil contamination. NSK's solution was to replace the standard ball bearing with bearings lubricated with NSK Molded-Oil, which cannot be washed from the bearing and provides a continuous supply of lubricating oil. The result was a doubling of bearing life and an annual production cost-saving of £20,000.

MAKING INDUSTRY **WORK BETTER**

PRIORITISING **PRODUCTIVITY** FOR THE YEAR AHEAD

A radical new bearing design addresses the key challenges the food and beverage sector is facing in 2019/20.

David Oliver
Channel and Platform Manager

The most recent annual survey of the food and beverage industry by accountants BDO found that 89% of manufacturers thought productivity improvement was a critical priority for the year ahead. And when this sector sneezes, the rest of the economy can expect to catch a cold.

The food and beverage industry is, after all, a quiet economic powerhouse. Larger than the country's automotive and aerospace sectors combined, it accounts for around a fifth of all manufacturing, and contributes almost £29 billion to the country's economy. Annual food and drink exports alone are worth more than £22 billion.

Like other industries, however, the sector is currently wrestling with critical challenges, including a shortage of labour. There's a real struggle to find the skilled people it needs to fulfil manufacturing roles, and with a third of its

> "PRODUCTIVITY IMPROVEMENT A CRITICAL PRIORITY FOR THE YEAR AHEAD"

400,000 workers coming from other countries within the EU, Brexit uncertainties are creating additional pressures.

Then there are commercial challenges, such as volatile ingredient prices, fast-changing customer preferences and rigorous operating standards.

Against this background, it is no wonder that the vast majority of food and drink manufacturers are striving to ramp up their productivity.[1]

> "A RANGE OF BEARINGS SPECIFICALLY FOR THE FOOD AND BEVERAGE SECTOR"

Food and beverage manufacturing systems must undergo regular, thorough washdowns to guard against the build-up of bacteria and material residues, and to avoid cross-contamination between batches. But washdowns are a drain on productivity, a cost in terms of time, labour and resources, and can also affect the longevity and reliability of equipment frequently doused with water and detergent.

Cleaning products which find their way into bearings will shorten the life of lubricants and accelerate corrosion. Yet managing those issues with more frequent lubrication and maintenance, or dealing with early component failure and unplanned downtime, can drive up maintenance costs.

Clean sheet design

It was with these issues in mind that SKF recently set out to design a range of bearings specifically for the food and beverage sector. The company went back to the drawing board for the new range, building up a design component by component, with the express purposes of improving:

- hygiene
- performance
- compliance with food safety regulations.

The new SKF Food Line bearing range is the successful result, incorporating a host of innovations that address many of the long-standing issues associated with conventional bearing units.

The end cover also uses a patented locking mechanism to prevent accidental dislodging.

The geometry of the entire housing is designed to eliminate crevices and recesses where bacteria might establish themselves. Angled surfaces and a smooth surface finish reduce material accumulation and ensure liquids drain away easily, regardless of bearing orientation.

Inside, a special multi-lipped sealing arrangement (another patented innovation) keeps lubricant inside the bearing and keeps contaminants out. The corrosion-resistant stainless steel bearing rotates in long-lasting, high performance food-grade grease – a factory-installed lubricant designed to last for the full life of the bearing. This eliminates the need for regular re-lubrication and the associated material, labour, clean-up and disposal costs.

> "LONGER SERVICE LIFE THAN CONVENTIONAL COUNTERPARTS"

For food and drink manufacturers, the new Food Line bearings are a game changer. Their smart external design cuts by 33% the time, water and detergent required for washdowns. Eliminating the need for re-lubrication removes at a stroke a major source of downtime and maintenance costs.

Yet significantly, these benefits don't mean a compromise in terms of longevity. In fact, thanks to advanced materials and sophisticated sealing technology, the Food Line bearings achieve a longer service life than their conventional counterparts.

Washing-away profits

In any manufacturing sector, machinery and productivity are closely linked. However, in the food and drink sector, the characteristics of machines when they're not running are almost as important as their performance when operating at full capacity.

Innovation inside and out

The housings of the new bearing range use an over-moulded rubber base seal that prevents contamination and bacteria growth between the unit and the mounting frame. At the same time, a special back seal and end cover prevent process material from entering the bearing from either side.

Designed for efficient recycling, when the bearings eventually wear out, no components need go to landfill. So productivity is prioritised, but other essential features are certainly not forgotten.

1: http://www.bdo.co.uk/getmedia/e29fd8c2-4ff7-4c9f-a047-4b307aeebe70/BDO-Food-and-Drink-Report-2018.aspx

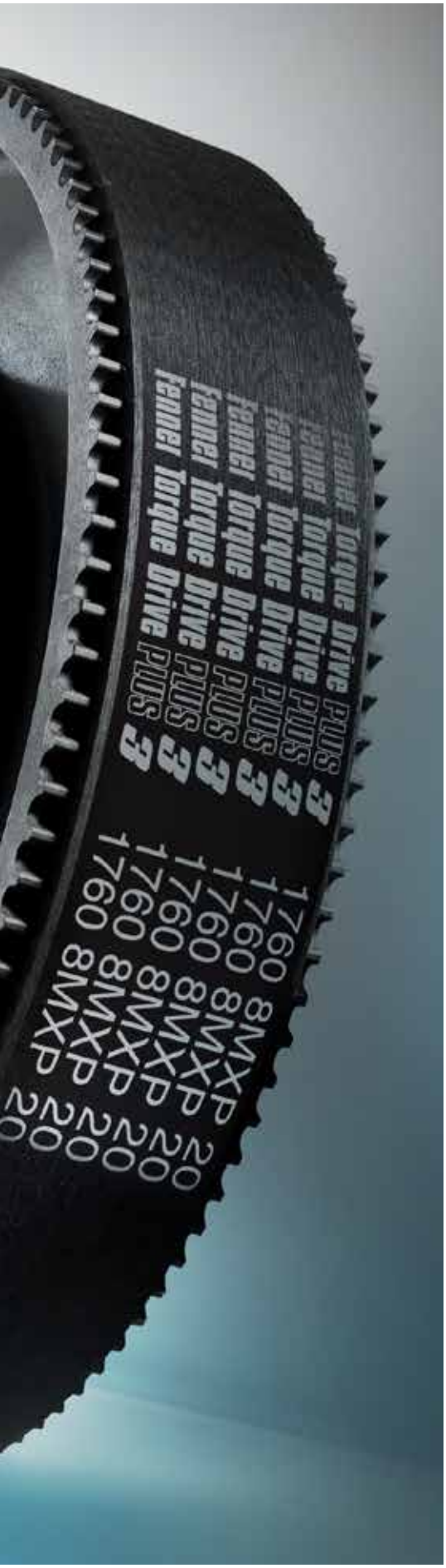
A QUESTION OF TIMING

98% of belt failures are the result of incorrect selection or poor installation or maintenance. So maybe it's time to forget friction belts and chose timing belts – which can be maintenance-free for life.

ERIKS

Gary Price

Regional Product Manager,
Power Transmissions



Though friction belts are the traditional choice, engineers are coming to realise that timing belts have several advantages in many applications. Not least the fact that friction belts and pulleys wear during use, so need re-tensioning 3-4 times during their average three-year lifetime. Each re-tensioning demands downtime, and also leads to a drop in efficiency.

"FITTED, TENSIONED AND FORGOTTEN"

Fenner® Timing belts, on the other hand, can be fitted, tensioned, and forgotten. They never need re-tensioning, and maintain 98-99% efficiency for their whole three-year design life.

For new applications, it can make financial sense to choose timing rather than friction belts. But if you're already using friction belts in an existing application, you may be wondering if you can justify the cost of changing to timing belts.

The real question is: can you justify the cost of not switching?

Three times better

Belt drives are a relatively low-cost, easily replaceable, yet crucial component. So it's essential to specify the correct belt for the application and the operating environment, to reduce the risk of failure and optimise performance.

Specify the wrong belt and even installed correctly and maintained perfectly it won't perform efficiently or effectively and won't last as long as it should.

"TIMING BELTS OFFER THREE KEY ADVANTAGES"

Fenner® timing belts offer three key advantages. Firstly, reliability. Secondly, excellent performance. And thirdly, efficiency. They also offer specific advantages for specific applications.

For example, a food and beverage manufacturer was having difficulties with repeated failures of a chain drive. The need to use oil on the chain caused hygiene issues, frequent washdowns washed out the lubrication, and the wide temperature variations within the factory – from 20° during idle times to 2° during production – were causing problems with the chain.

Switching to a timing belt solved all the problems: reducing breakdowns and maintenance and – as an added benefit – lowering ambient noise levels.

Fenner® timing belts are better suited than chains to a wide range of operating conditions, such as high humidity, or arduous, dusty environments such as quarries or flour mills.

Payback time

Converting your friction or chain drives to timing belts can be straightforward. A drop-in replacement will immediately start to improve efficiency, as well as eliminating the need for retensioning. If you choose a timing belt you will also need to replace the pulley – but that could lead to additional gains. For example, one timing belt can deliver the same power as five friction belts, saving on pulleys and space.

"PAYBACK IN JUST 3-4 MONTHS"

In most cases the reduced maintenance costs, reduced downtime and lower energy requirements should provide payback in just 3-4 months. And that's the financial return only.

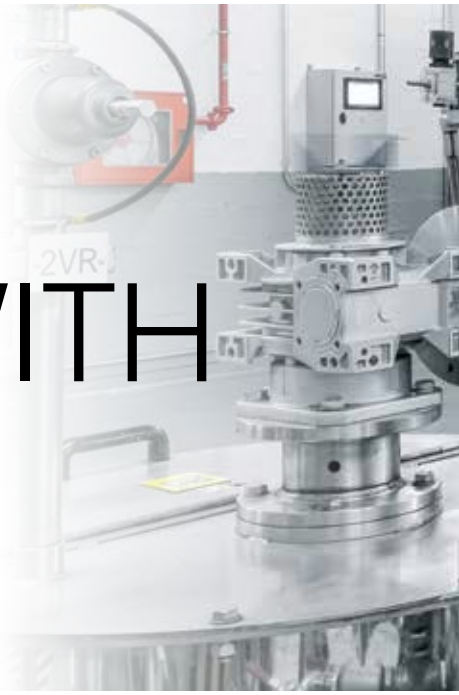
The quieter running of a timing belt also leads to a better working environment, and reduced maintenance around heavy rotating equipment means lower health and safety risks too.

But whether you opt to save money and increase efficiency by choosing Fenner® timing belts, or you stick with friction belts for the time being, be sure to follow the Best Practice outlined below to optimise their efficiency.

Getting the best from your belts

- Never fit a new belt on a severely worn pulley. It will last less than 1,000 hours compared with its 25,000 hours design life.
- Slacken the tension when fitting the belt. Never lever it on with a screwdriver or crowbar, as this risks damaging the belt and / or the drive.
- Belt tension is critical to efficient performance. Always check the amount of belt deflection at installation.
- For friction belts: fit, tension, run for a short period, then recheck and retension if required.
- For timing belts: these are designed to run for 25,000 hours. Replace after 24,000 hours for trouble-free, maintenance-free operation.

DELIVERING **ENERGY EFFICIENCY** WITH COMMERCIAL VEHICLES



FESTO

Richard Causley
Relationship Development Manager

While many vehicle manufacturers focus on energy efficiency and reduced emissions on the road, IVECO heavy commercial vehicles go further. Thanks to innovations at their Madrid production plant – and a customised solution from Festo – CVs from IVECO are more energy efficient even while they're being manufactured.

In 2017, the vehicle plant achieved World Class Manufacturing Gold Level for its integrated management of production systems and processes. These have helped to drive a drop of 53% in CO_2 emissions for every single vehicle produced, alongside an increase in recycling rates at the plant, which now stand at up to 99% of all waste materials the facility generates.

However IVECO are not content to cruise along in fourth gear. In the latest move towards accelerating their energy efficiency during the production process, the company has introduced a Festo energy efficiency solution for compressed air.

A mixture of benefits

The IVECO plant includes a mixing chamber where automotive coatings are mixed before being sprayed onto the vehicles. There are both manual and robot paint booths at the plant, and both are supplied with coatings from the same mixing chamber.

It's in the chamber that compressed air is used in the mixing process.

> "AUTOMATICALLY CONTROLS AND REGULATES THE COMPRESSED AIR SUPPLY"

Before the Festo solution was introduced, the compressed air supply had a number of deficiencies. One was a constant pressure build-up whether the system was operating or not, which was highly inefficient in terms of energy use, and the other was maintenance. Leakages were costly both in terms of lost production and because they necessitated having a team of engineers permanently dedicated to maintenance.

Now the customised solution resolves those issues for IVECO. Closely based on the standard Festo MS9 series service units, the module functions in the same way as the energy efficiency module MSE6-E2M, but with higher flow rates to suit the application.

Automatically intelligent

As Plant Maintenance Manager Miguel Ángel Daganzo explains: "The module automatically controls and regulates the compressed air supply. We save energy because the intelligent device permanently monitors the amount of air consumed, and automatically shuts off the air supply when the system is in stand-by mode."

That's not the only benefit.

> "ENABLES ENGINEERS TO REACT QUICKLY TO A LEAK"

"As soon as the system detects a drop in pressure," says Miguel, "it sends a notification." This enables engineers to react quickly to a leak as soon as they're required, without having to wait around until they are.

Industry 4.0-ready

For IVECO, as for many other manufacturers, the future of energy- and cost-efficient production lies in adopting Industry 4.0 strategies and techniques, based on gathering, analysing and utilising as much production data as possible.

Miguel considers the Festo energy efficiency module to be "condition monitoring with a view to Industry 4.0", since it enables continuous monitoring of relevant process data. Access to this data, not previously available, has helped to produce a noticeable increase in the energy efficiency of the plant's pneumatic components.

The data collected by the module can be delivered to smartphone or tablet for quick and easy access, which enables similarly quick and easy identification of any faults. This shortens engineers' response times, reduces downtime, maximises uptime and optimises efficiency and productivity.

> "CONDITION MONITORING WITH A VIEW TO INDUSTRY 4.0"

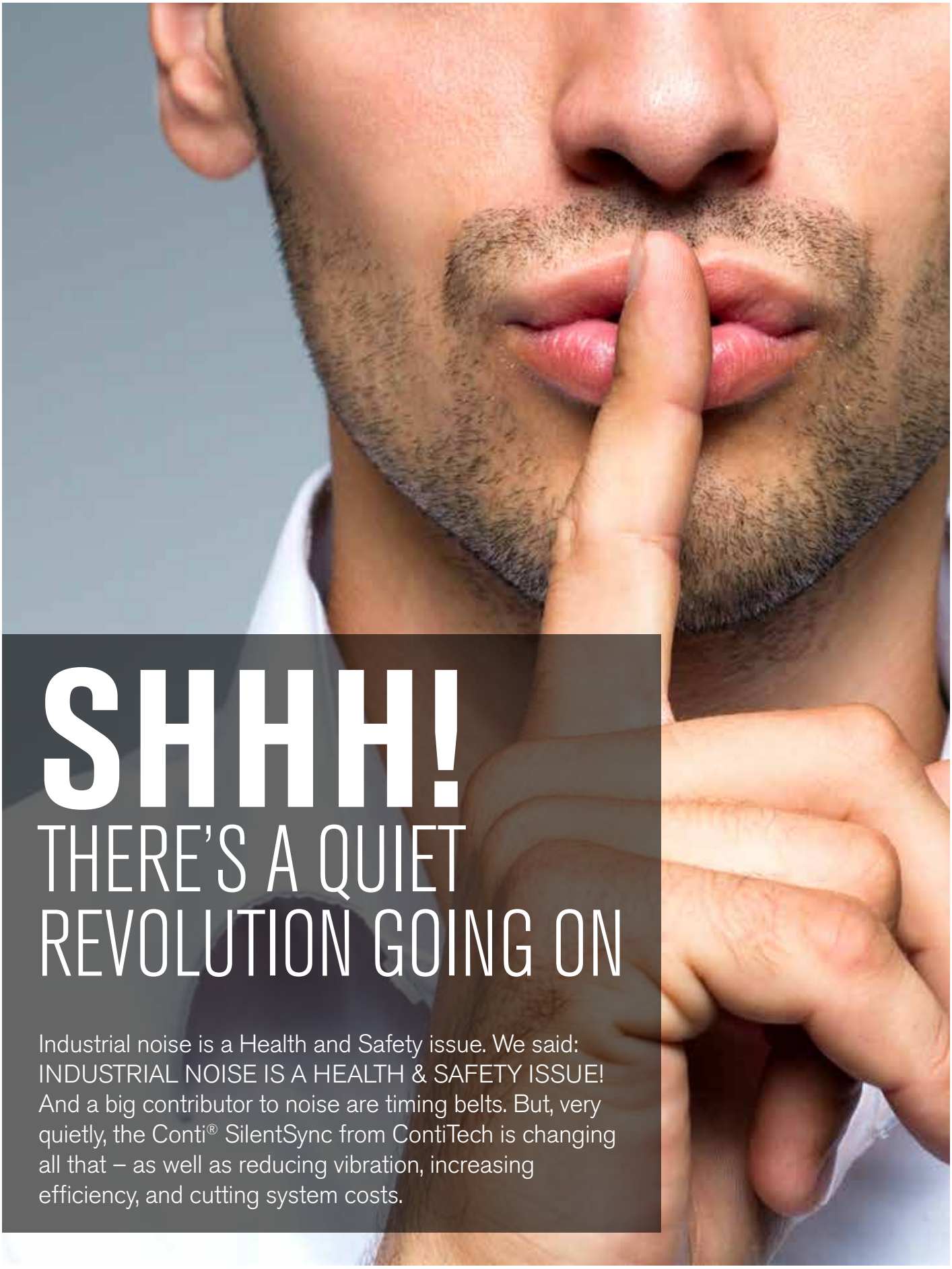
Safer savings

Control of the energy efficiency module is managed in the plant itself, using a CPX terminal with a touchscreen.

The compact size of the module has allowed it to be installed in an ATEX cabinet – as is the terminal. The mixing chamber has a potentially explosive atmosphere, so this double safety precaution is important in complying with the EU ATEX directive.

The plant is already realising sustainable energy savings from the module. Now, with the Madrid plant representing IVECO's benchmark for energy efficiency, the company is considering introducing the Festo solution in other facilities.

All vehicle manufacturers are, quite rightly, striving to reduce the on-the-road emissions of their products. But with Festo's help, IVECO have gone further. By ensuring their vehicles have a reduced environmental impact and create energy savings and efficiencies even before they leave the production line, they have moved energy efficiency in automotive production into the fast lane.



SHHH!
THERE'S A QUIET REVOLUTION GOING ON

Industrial noise is a Health and Safety issue. We said: INDUSTRIAL NOISE IS A HEALTH & SAFETY ISSUE! And a big contributor to noise are timing belts. But, very quietly, the Conti® SilentSync from ContiTech is changing all that – as well as reducing vibration, increasing efficiency, and cutting system costs.

ERIKS

Gordon Smith
Product Manaer
Open Drives

When noise is a problem in an industrial environment there are two ways to resolve it: mask it or eliminate it. Masking noise is very costly to achieve effectively – but you may think eliminating noise is more difficult. In fact, it's not.

And if you eliminate it by changing to the Conti SIlentSync belt, you'll achieve other benefits too.

No chattering teeth

One of the leading sources of noise from ordinary timing belts is when the teeth on the belt engage with the sprockets on the pulley. The Conti SilentSync belt counters this, by using a helical offset tooth profile.

> "UP TO 19DB DIFFERENCE IN NOISE LEVELS"

While conventional synchronous belts engage with the pulley in steps, which leads to vibration and noise, Conti SilentSync effectively "rolls" into the pulley in a continuous engagement, which is not only much quieter but also more efficient. The offsetting of the teeth also increases the smoothness of the engagement, which again helps to reduce noise.

The difference in noise levels between Conti SilentSync and a conventional belt is up to 19dB. Given the logarithmic nature of the decibel scale (e.g. a 3dB reduction is actually 50% quieter), you can see – or rather hear – the difference a SilentSync belt can make. In an environment such as robotics, where high-speed drives and people are in close proximity, this is a major contribution to health and safety, and to creating a more pleasant, less tiring, and therefore more efficient workplace.

Shaking-up efficiency

Another source of timing belt noise – and of reduced efficiency – is vibration. Again, the Conti SilentSync belt overcomes this – and not just by a small margin. In fact the SIlentSync delivers up to 20% lower vibrations, and 98% efficiency. That's 5% more efficient than conventional V-belt drives.

Reduced vibration is also an advantage in drive applications where high-precision is a requirement. SilentSync enables very accurate operation, and its self-tracking capability ensures the belt engages with the pulley without moving from side to side. The profile also prevents back-and-forth movement – or backlash – which again increases accuracy.

In addition, the precise belt alignment, increased ratcheting resistance, increased horsepower rating and improved stress distribution all help to withstand the shearing action of high-output drives, and to reduce wear.

The strong silent type

While conventional belts have a fibreglass tension member, the Conti SilentSync features an exceptionally strong aramid cord. This will show no signs of aging and little appreciable elongation, so generally no retensioning is required yet absolutely synchronous power transmission is assured.

> "DELIVERS UP TO 20% LOWER VIBRATIONS, AND 98% EFFICIENCY"

The belt backing is made of the same material but with a polyester fabric incorporated, making it highly flexible. It's even suited to reverse flexing if needed. The belt teeth are moulded from synthetic rubber, then made wear-resistant with a specially-treated polyamide fabric. The material is resistant to oil, coolants, ozone and heat, with an operating temperature range – depending on the application – from -40°C to +95°C.

It's also very strong, at up to 80% stronger than conventional synchronous belts, and up to 50% stronger than raw-edge premium V-belts of the same width. This offers the opportunity to reduce the width of V-belt systems without reducing their output – saving on system real-estate, and cutting costs.

> "UP TO 80% STRONGER THAN CONVENTIONAL SYNCHRONOUS BELTS"

Colourful combinations

For easier belt selection, Conti SilentSync uses a unique colour-coding system.

With two pitches (8mm and 14mm) and seven widths (16mm, 32mm, 64mm, 35mm, 52.5mm, 70mm and 105mm) the range is colour-coded (yellow, white, purple, blue, green, orange and red respectively), for easy recognition and identification, and to ensure belts can be quickly matched for replacement.

When a product has so many advantages, you may be surprised if you haven't heard of it before. In fact it's such an improvement on traditional belts, you'd expect the manufacturer to make a big noise about it. But for a belt as quiet as Conti SilentSync, that probably didn't seem appropriate.

HOW TO LOWER YOUR TCC*

*TOTAL COST OF COUPLINGS

The most important factor in determining the TCO (Total Cost of Ownership) of couplings is often the amount of downtime experienced. In demanding applications couplings face numerous challenges, from impact loading to dust and temperature extremes. Maintaining uptime against the odds can be the difference between a cost-effective coupling and a costly one.

REXNORD

Dominic Dempsey
Area Sales Manager

The uptime performance of Falk Steelflex® Grid Couplings from Rexnord has made them the industry standard for demanding applications, specified in operating environments such as cement and coal handling facilities, and mines from the desert to the Arctic.

With misalignment and high-impact and vibratory loads being the two leading causes of coupling failure, independent tests on Falk Steelflex Couplings have shown they outperform the competition against both these threats.

"MAINTAINING UPTIME AGAINST THE ODDS"

Common risks, uncommon performance

Misalignment combined with high-impact loads on conveyors, shredders and mixers – and vibratory loads on high-speed applications such as pumps or compressors – will all test a coupling's durability.

Unfortunately, since equipment is often pushed to design limits, and misalignment is almost always present due to human error or natural settling, these risks are typical in most of the operating environments where couplings are found.

However, third-party tested under extreme conditions, Falk Steelflex Couplings proved to be up to 16 times more durable than the competition in impact-loading applications, and capable of surviving up to twice the stated misalignment limits.

They can also reduce the impact of loads on equipment by up to 30%.

Fitted more, replaced less

With performance like that, it's not surprising that Falk Steelflex has the largest installed base of any grid coupling in the world. And once installed, a Falk Steelflex Coupling has proven to last longer than competitive makes.

> "UP TO 16 TIMES MORE DURABLE THAN THE COMPETITION"

The longer-lasting grid elements mean fewer replacements, and less engineers' time spent on inspections. Fewer grid failures also mean less wear on hub teeth, which means far fewer hub replacements and all the time and cost they entail: heating components, moving equipment, realigning shafts.

There's also a specially engineered Long-Term Grease (LTG) from Rexnord, recommended for extending the life of the coupling. Installed with LTG, your Falk Steelflex coupling won't need a lubricant replacement for the next five years.

Going beyond a brand

Some competitive couplings are manufactured using bought-in and re-branded components. For Rexnord, building a brand you can rely on is about more than just the name. It means designing, engineering and building all the components too.

> "NO LUBRICANT REPLACEMENT FOR FIVE YEARS"

Rexnord has specialised manufacturing equipment for machining and treating all the components which make up every Falk Steelflex Coupling. Strict in-house quality controls ensure all products live up not just to the name, but also to customers' expectations – offering consistency in materials used, reliability and performance.

And cycle tests prove that it's an approach that pays off.

Many competitors have copied the Falk Steelflex design, and claim their components are "fit for fit". However, although the dimensions are the same, the quality of engineering and components are not. Which is why replacing a Falk Steelflex grid element with one of the leading competitive grid elements has been shown to reduce durability by 87.5%.

More than a couple

With so many demanding applications which can benefit from fitting Falk Steelflex, a comprehensive range is essential. So Rexnord offers a wide choice of bores, speeds and torque capacities.

Available in 25 sizes, there are 11 Falk Steelflex models, including high-speed, spacer, flywheel, brake and controlled torque. Bore capacity goes up to 20" (508mm), torque capacity up to 8,250,000 inch-pounds (932,126Nm), and speed up to 10,000rpm.

For your peace of mind, whichever size and model you choose, if it's lubricated from the start with Rexnord LTG, it will be covered by a five-year heavy-duty warranty.

Total care

Reducing your total cost of ownership of the coupling starts at the very beginning, with careful product selection.

Rexnord's Customer Care Team has over 80 years of product design expertise and experience behind it, to help you choose the right coupling for your application from the extensive Falk Steelflex range.

Make the right choice with their help, and you can expect outstanding value for money, dependable performance, and the lowest total cost of ownership for your couplings, however tough your application.

WASH YOUR HANDS OF ONE OF INDUSTRY'S **MOST SIGNIFICANT HEALTH THREATS**

There are six times as many cases annually of work-related ill health as there are work injuries.
Of the 30.7 million workdays lost every year, 87% are health related[1], 1% of all working days lost (268,000) are associated to skin disorders[2].

SC Johnson PROFESSIONAL
A family company

Paul Jakeway
Marketing Director

Largely affecting the hands, occupational skin disorders cost to an employer £6000, on average, for each reported case[3]. And this excludes potential compensation claims. It's time to get your hands on the solution.

Poor skin conditions don't have to be part of everyday working life. By following a skin care routine integrating hand creams with appropriate cleansers, and education, it is possible to prevent occupational skin disorders before they become a problem.

The right choice of hand soap is essential for maintaining healthy skin. The different workplace environments, contaminants and the frequency of hand washing means that if the wrong hand cleaner is being used then the skin can be damaged.

"HELP PREVENT SKIN HEALTH PROBLEMS"

Even in some cleaner, light industrial working environments – like warehouses – workers wash their hands up to 12 times a day. With that much washing, the choice of soap is critical. On the one hand, if it's too harsh it can be abrasive and dry the skin. On the other hand, too gentle and it can fail to clean effectively so a worker ends up using lots of shots of the gentle 'not fit for purpose' soap which is not efficient or cost effective.

'It's a daily hand washing dilemma, but Deb, the Skin Care division of SC Johnson Professional™, has developed the perfect answer with Power Foams.

Foam goes further

Before Deb introduced the first foam soap system over twenty years ago, soap in the workplace washroom was either a bulk fill lotion dispenser or a slippery tablet that was often as grubby as the hands it was meant to be cleaning. Both were inefficient and often unhygienic.

Deb's foam innovation was groundbreaking, not only was it more pleasant to use but it lasted longer and the system was easy to maintain.

"WORKERS WASH THEIR HANDS UP TO 12 TIMES A DAY"

Now twenty years on, Deb has taken foam soaps even further.

Formulated after extensive product testing and trials, Deb Power Foams have been proven to provide twice the cleaning performance of traditional washroom soaps and hand cleaners[4].

And it's not just about getting hands clean, but also keeping them cared for to help prevent skin health problems.

Handier than ever

Estesol® FX™ and Solopol® GFX™ are the two new Power Foam solutions from Deb Skin Care, in two new dispensers – making it easier to identify, choose and use the right one every time.

Estesol® FX™ in the blue dispenser is specially formulated for lighter industrial environments, to tackle general dirt and grime. 73% of workers tested in real life conditions said it left their hands feeling conditioned after use[4].

Solopol® GFX™ in the purple dispenser includes grit, making it ideal for washing hands exposed to oils, grease, carbon black and lubricants. In tests, 87% of workers preferred it to their existing hand cleanser, and 78% agreed it left their hands feeling smooth and cared for[4].

Having both Power Foams available in the washroom, in their clearly identified dispensers, means it's easier for employees to look after their skin.

One: they can use whichever Power Foam is appropriate, depending on the level of cleaning required. Two: the dispensers ensure just the right amount of foam used, with one press of the pump.

Power Foams also help cut costs and protect the environment. Estosol® FX™ lasts up to twice as long as traditional washroom soaps in light duty environments, and Solopol® GFX™ delivers 43% more handwashes than traditional heavy-duty cleansers[4]. For cleaning staff who have enough on their hands already, that means less refilling of dispensers.

Caring for the environment too, Power Foams have achieved EU Ecolabel certification, having illustrated their reduced environmental impact.

In fact, Deb Power Foams are the ideal hand cleaning solution for your employees and your business. To help stamp out skin health issues in your workplace, make sure you get your hands on them.

A helping hand

Skin care best practice, and a working environment that's better for skin health, require the right training as well as the right products. SC Johnson Professional and Deb Skin Care can help, with:

- Worker training modules for group or one-to-one training, and self-learning
- Management training modules helping managers and supervisors implement best practice
- Worker prompt materials - simple, visual prompts promoting skin health and reminding workers to follow

"HANDS CAN BE BETTER CARED FOR"

1. www.hse.gov.uk/statistics/dayslost.htm
2. www.hse.gov.uk/statistics/causdis/dermatitis/skin.pdf
3. Journal of Environmental Medicine
4. Based on laboratory testing and end user trials. Deb Group 2018

DON'T LET YOUR DISTRIBUTOR SYSTEM BOX YOU IN

As the demands of technology rapidly develop, finding a distributor system that meets your needs is harder than ever. The new VARIABOX by Bals is as adaptable and versatile as your requirements are changeable.

CEE NORM

Luke Carter
Project Sales Manager

Available in S, M, L, XL and XXL versions, as a wall-mounted or mobile combination unit, VARIABOX can be individually configured with standard or switched interlocked sockets, as well as network data sockets suitable for integration with RJ45, HDMI or USB ports.

Yet despite the range of options and variants, the VARIABOX is still a one-man assembly, easy to install distributor system.

70% quicker installation

Bals' industry-leading QUICK-CONNECT screwless, spring-clamp system technology can save up to 70% installation time. As well as being fast and reliable, correct conductor connection is ensured, thanks to colour-coded conductor terminal entry. The connection is also maintenance-free, and insensitive to shocks, vibrations and temperature fluctuations.

"ADAPTABLE AND VERSATILE"

The quick cable entry faceplates can be designed to your requirements, with a choice of plain or threaded, and with threading at the top, bottom or both. M12, M20, M25, M32 and M40 entries allow use of industry-standard glands.

The VARIABOX has a hinged lid feature with a one-touch close mechanism for more efficient installation, commissioning and maintenance. The lid is manually opened upwards, then locks open to leave the installer with both hands free. Slight pressure on the folding window closes the lid and locks it automatically, ensuring the VARIABOX is never left open, and preventing dust, dirt and water from entering.

If you need to expand VARIABOX systems that's easy to do. They have been designed modularly to be connected to one another, even

VARIABOX by Bals

Choose VARIABOX for more choice

- 63A rated system input / output 110-400V
- Available in IP44 or IP67 variants
- High impact strength (IK09)
- High-grade, impact-resistant PBT polyester housing
- Modular expansion on all 4 sides
- Protective Devices / Circuit Protection arranged below transparent, lockable operating window with user-friendly one touch close mechanism
- CEE sockets with screwless, maintenance-free QUICK-CONNECT technology
- Top- / bottom-entry via blanks or multi-option threaded entry flange plates
- Standard internal or external fixings
- Left- or right-hinged front cover
- Multi-tool front cover screws with internal and external hex plus slot
- Pre-moulded front face plates for socket mounting

when you're using large cable cross-sections, as they feature generous internal cable bushings. So, from satisfying your initial design requirements to meeting your system expansion or changing specification needs, VARIABOX allows you to easily configure the power distribution you want.

"EFFICIENT INSTALLATION, COMMISSIONING AND MAINTENANCE"

When the going gets tough

Safety and durability are key features of the VARIABOX. Robustly designed in high-quality, durable PBT polyester, it's reliable even in difficult conditions and aggressive environments.

PBT polyester is self-extinguishing and fracture-proof, with excellent electrical insulation properties, as well as being resistant to:

- chemicals
- UV
- extreme heat/cold
- saltwater
- aging.

But it's not just the operating environment that's challenging. The growth of the Internet of Things is generating more and more connected devices, that demand seamless connectivity and reliable performance at all times.

Bals are developing the VARIABOX distributor system to work with this cutting-edge technology, so you can expand your network of devices, grow your business capabilities, and increase the efficiency of your workforce.

Still at development stage, this future

"EASILY CONFIGURE THE POWER DISTRIBUTION YOU WANT"

VARIABOX options will allow you to make better-informed decisions, fuelled by real-time data feeds from the VARIABOX. The result will be increased efficiency, reduced downtime, and yet another reason to choose VARIABOX.

PROBLEM SOLVERS

Not every problem solved by ERIKS demands a complex engineering solution. Sometimes a simple component change – or even a change of cleaning methods – can deliver surprising, and cost-saving, results. Here are some simple but effective answers to some recent industry issues.

CONCRETE ANSWER

MOTION & CONTROL™ NSK

PROBLEM

Bearings on the blade support of a concrete pipe-slotting machine were failing regularly – leading to 8 hours of downtime with each failure. A team of engineers – all part of the service with NSK's AIP Added Value Programme – was called in to scrutinise the application and determine the root cause of the problem.

SOLUTION

The engineers soon discovered that fine concrete dust, produced when the concrete pipes were being cut or slotted, was penetrating behind the bearing seal and contaminating the lubricating grease. This then led to serious damage to the standard shielded deep groove ball bearings fitted to the pipe-slotting machine. NSK's engineers recommended changing to **NSK Molded-Oil bearings** with a DDU seal, which are more effective at preventing dust ingress. The change has resulted in a quadrupling of bearing life, from 2-3 months to 12 months, and savings of over 38,000 per annum in downtime costs alone.

WASTE NOT, WANT NOT

Kimberly-Clark PROFESSIONAL™

PROBLEM

Using rags to clean equipment was proving costly for a general engineering firm. They were using on average 32 bags of rags every month (384 bags per annum), with each bag containing approximately 80 pieces of rag and weighing around 10kg in total. After use, the rags were classed as hazardous waste and had to be placed in a dedicated container ready for disposal. Approximately 3.84 tonnes of waste were being disposed of each year, at a cost of £650 per container.

SOLUTION

ERIKS conducted an onsite assessment of rag use, then recommended **WypAll® X80 Cloths** for an extended trial. Supplied in a large roll format of 475 sheets, and dispensed from a floor-standing dispenser, the cloth is made from Hydroknit®. This is not only tear-resistant and tough enough to clean even the roughest surfaces, but is also fast absorbing. The change to WypAll® X80 Cloths across the site reduced cleaning materials usage from 32 bags of rags per month to 5 rolls of cloths. The WypAll® Cloths are also less bulky than the rags, so the amount of waste has reduced from 3.84 tonnes per annum to just 0.59 tonnes – producing disposal cost savings of almost £4,000 a year.

SHOCK TACTICS

FESTO

PROBLEM

A manufacturer of customised conveying systems for the automotive industry was developing a new metal sheet stacking system, and was looking for a solution which would reduce its downtime, increase its productivity, and reduce commissioning and maintenance times. One of the main causes of lost time was the need to manually adjust the end-of-stroke cushioning to reduce shock impact.

SOLUTION

ERIKS recommended the **Festo DSBC-PPS** cylinder, which features self-adjusting PPS cushioning. This completely eliminates the need for manual adjustment, and – because the self-adjustment is always perfectly accurate – it cushions effectively against each individual load, which greatly reduces the effects of shock on the cylinders. This means less wear, which in turn means an increased service life. Maintenance and commissioning times are also reduced by 70%, cutting downtime across the whole production line.

BELT UP-TIME

Fenner®

PROBLEM

Failures of V-belts on the primary crusher drives at a large Welsh quarry were causing lengthy unplanned downtime. Adverse effects on the drives were causing the belts to stretch unevenly, leading to belt slippage and – ultimately – resulting in the belts jumping from the pulley grooves.

SOLUTION

To overcome the problem, ERIKS' application engineer supplied new **Fenner® Quattro PLUS TW** wrapped belts. They're constructed using state-of-the-art wrapped chloroprene rubber, plus high modulus polyester cord to reduce elongation. They also feature a unique 2-ply asymmetrical weave outer jacket, which is highly abrasion-resistant but still flexible enough to wrap closely around even small diameter pulleys. As the belts now stay more securely in position in the pulley grooves, the customer has experienced less downtime, increased uptime, and savings on belt replacement costs.

BACK TO THE FUTURE

Reminiscing about old times can be good for business. Tickets to see reformed bands often sell-out in minutes. Vintage goods can fetch a premium. It doesn't matter that the band members are now a bit wrinkly and have lost their youthful good looks. Neither is it a problem that the retro item has been used, because reminiscing about the past often brings back fond memories.

But when it comes to manufacturing, too much reminiscing is holding us back. One economics editor of a Sunday newspaper said in a recent article "It is [also] true that there is probably too much nostalgia and wishful thinking about manufacturing."

BA manager of a robotics company said in a recent media roundtable that UK manufacturers "are proud of keeping old machines running", echoing the sentiment that reminiscing about the past is not healthy. The aforementioned editor hammered home the point, saying "[But] we will never go back to a time, as after the war, when Britain accounted for a quarter of global manufacturing exports," and that "we should aim to do better than preside over its genteel decline."

That said, our little nation still punches above its weight compared to some of our bigger competitors such as the US and China. But to make sure that UK manufacturing remains competitive, we need to stop living in the past. Great British innovators such as James Watt didn't develop the steam engine whilst daydreaming about bygone days. His business partner, Matthew Boulton, didn't become an industrial entrepreneur by sticking with hand tools and basic machines.

It might seem contradictory to hail historic figures whilst saying that we should move on from the past. But it's not their inventions I want to focus on here. It's the desire and drive to innovate and adopt new technologies, and as a result, transforming how manufacturing is done, that should push us forward today.

"TOO MUCH REMINISCING IS HOLDING US BACK"

We are not short of research and development (R&D) resources to support industry in the UK. The government is aiming to raise investment in R&D to 2.4% of GDP by 2027 as part of its Industrial Strategy. Many cross-industry exchanges and collaborations are enabling academia, business and institutions to share knowledge and turn research learnings into practical applications.

The question is – are businesses ready and receptive to implementing new technology? ERIKS' own research into whether maintenance managers and technicians truly understand Industry 4.0 showed high levels of knowledge of how connectivity and Big Data can improve manufacturing productivity and maintenance practices. However, in the rush to promote Industry 4.0, the practical difficulties of implementation have been almost completely overlooked.

"CONNECTIVITY AND BIG DATA CAN IMPROVE MANUFACTURING PRODUCTIVITY"

Responses revealed a significant amount of reluctance to share machine or production data with OEMs and third party maintenance suppliers. Without access to data, remote monitoring, predictive maintenance, condition monitoring and other progressive maintenance techniques are, at best difficult and, more likely, practically impossible.

This inertia is preventing businesses from reaping the rewards offered by greater collaboration and information sharing. Manufacturing in countries such as Germany are already further ahead on the road to digital transformation. If UK manufacturing is to remain competitive in the global economy in the future, we must move on and move quickly to catch up, before competitors take an unassailable lead. There is much work to be done and that work must start now.

FESTO

You need perfect compressed air.
You want maximum reliability.
We are your compressed air experts.

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A large product range, highly functional components and a great variety of services: the MS series from Festo offers an all-embracing concept for compressed air preparation. For standard as well as application-specific solutions which demand the highest levels of quality. Also with safety functions and for energy-efficient solutions.

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Design, Build, Solve

- Design and customised engineering solutions
- On-site installation and maintenance services
- Flexible supply and kitting
- Predictive and preventative maintenance
- Root cause failure analysis
- Impartial repair/replace/upgrade

Saving time and money,
each and every day.
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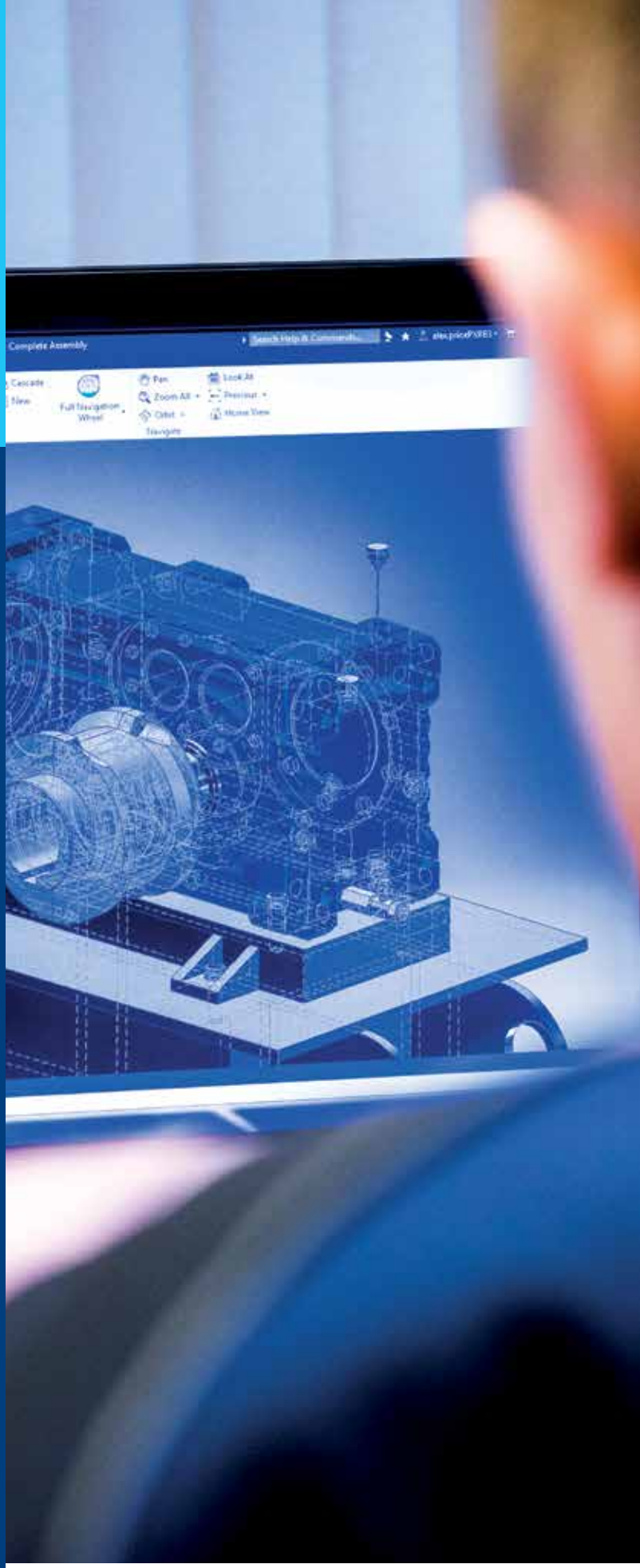

Let's make industry work better ERIKS