

MOTION DRIVES

POWER TRANSMISSION & INDUSTRIAL MOTION MAGAZINE



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Additive Manufacturing *of the* Industrial Component



+ Salim Haffar
EUROTRANS



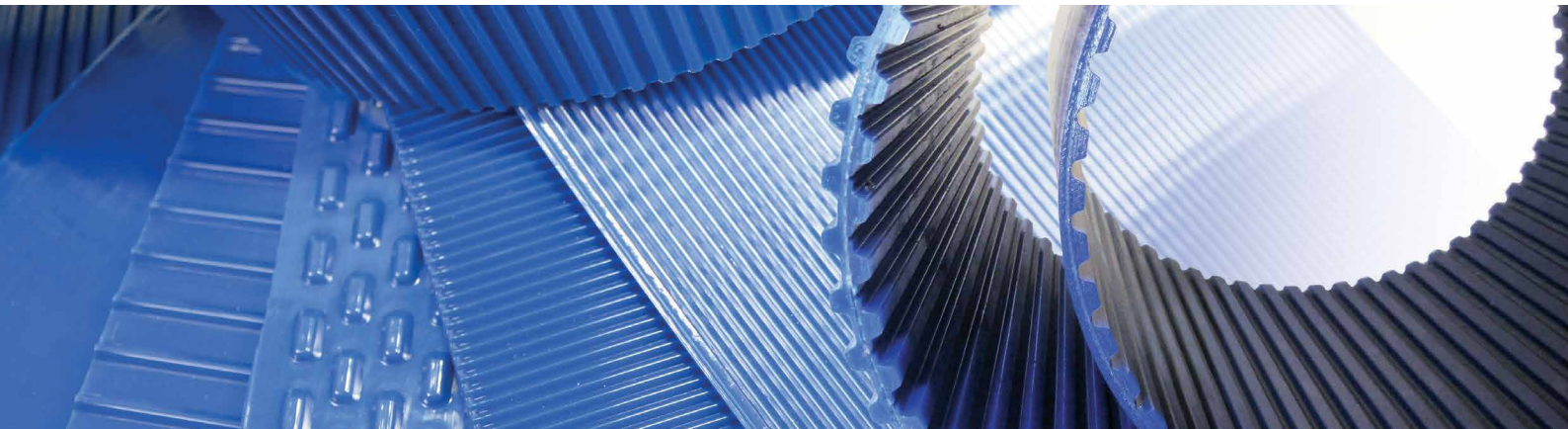
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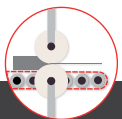


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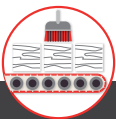


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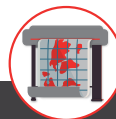
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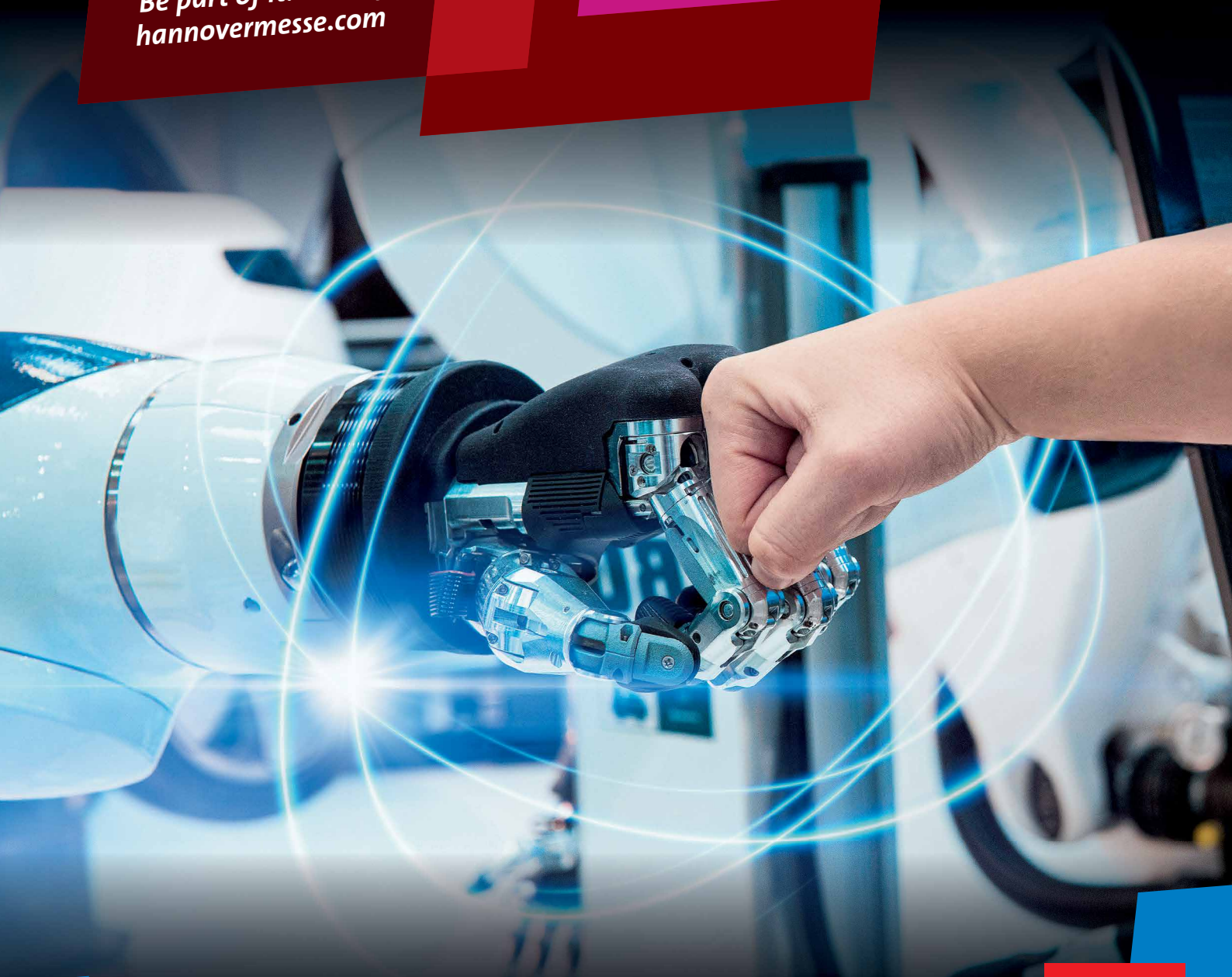
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Additive Manufacturing Technologies help re-imagine production of Industrial Components



Mike Brandt
Editor-in-Chief

This new edition of Motion + Drives Magazine enters an intriguing new technological domain that is driving positive change within manufacturing and distribution. First, rather than replacing traditional processes, 3D printing, and additive technologies are complementing existing manufacturing methods. This extremely powerful yet intricate approach to processing aims to change the way parts are produced.

Next, understand the foundation of automated warehouses. Global warehousing has been undergoing a period of immense change due to recent surges in online ordering. Read how automation is becoming fundamental in maximizing reliability and productivity.

Further in this issue, innovative solutions are rapidly shaping our day to day lives, and data centric ecosystems are helping to build an

intelligent world. Systems designed to support evolving technologies are ensuring reliable data transfers for greater efficiency.

What's in Motion...

What's in motion for the PT industry. Learn details about key companies, trends, and advanced product solutions specifically for high-power density motors, collars, couplings, and timing belts. Read about new energy efficient drive systems, state-of-the-art repair tooling, and AI infused remanufacturing strategies. All this and more can be found in this new edition of Motion + Drives Magazine.

I hope that you will enjoy it.

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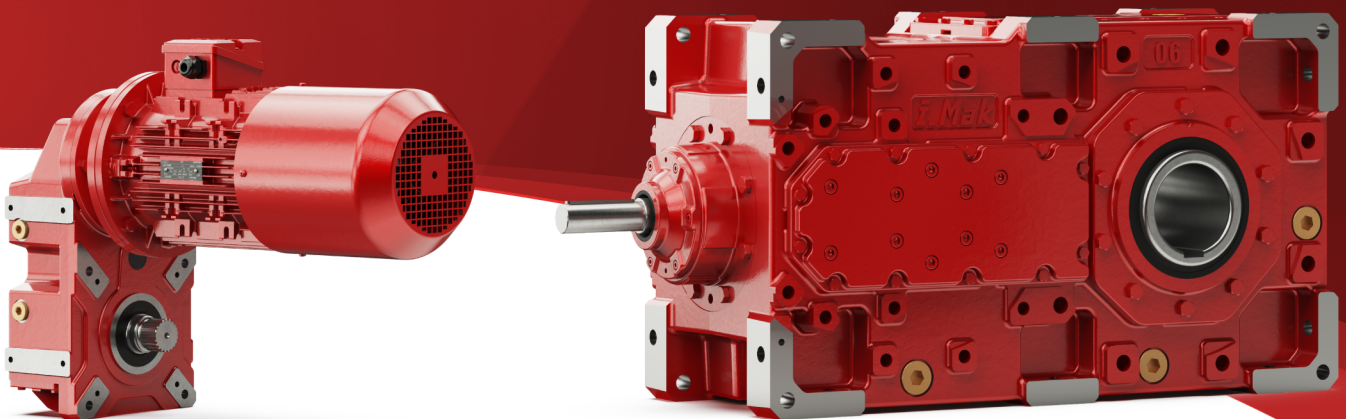


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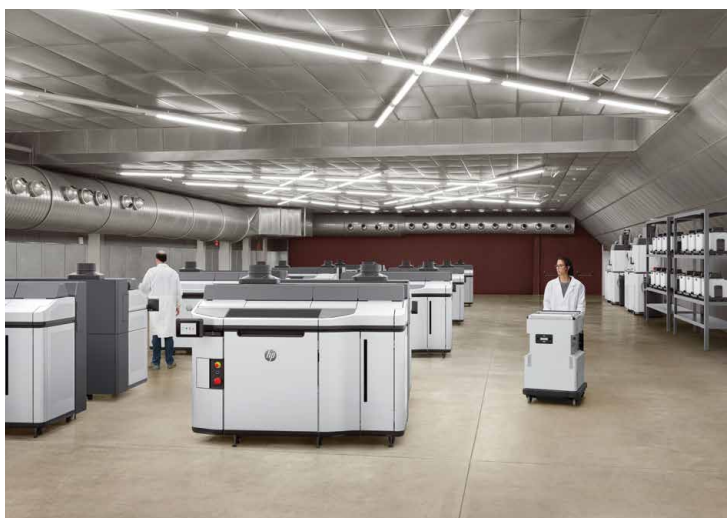


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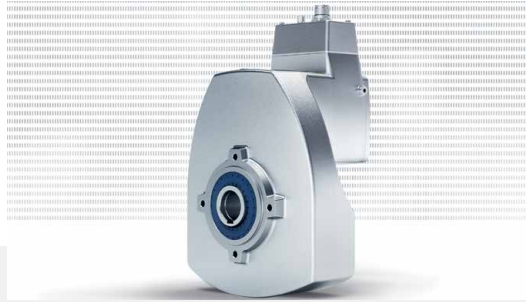
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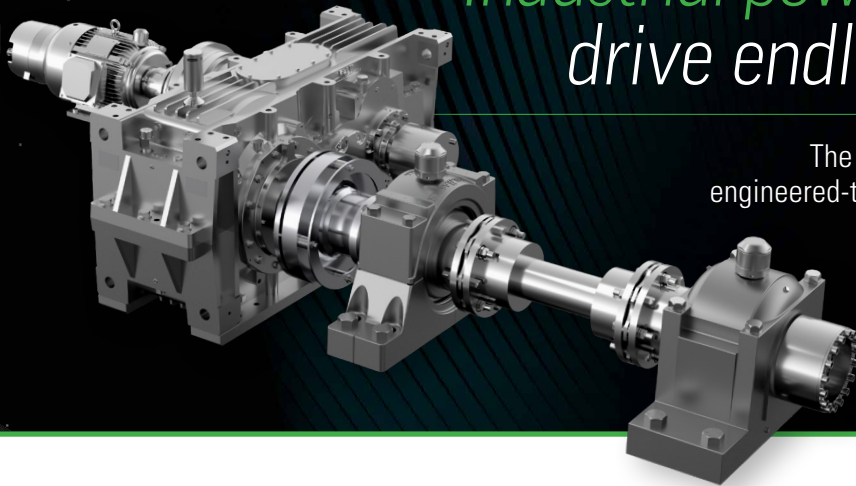
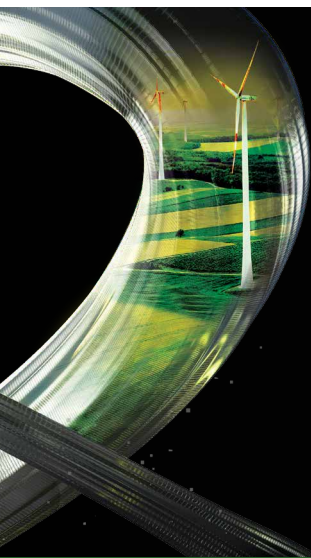
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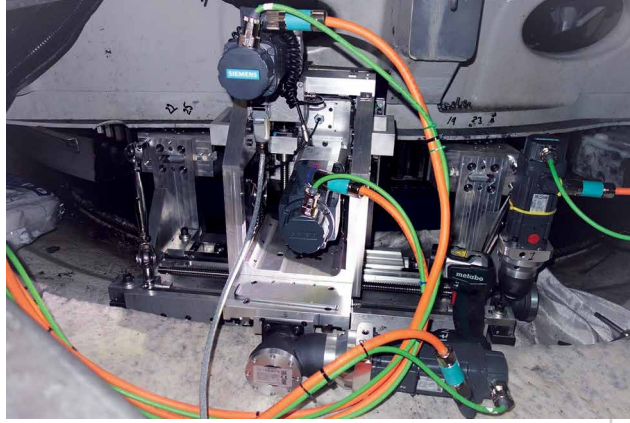
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— New yaw ring repair method **makes wind turbine lifetime extension viable**

+ + + + +

- + Patented system makes yaw ring repairs economically feasible
- + Danish company CNC Onsite's method can extend wind turbine life
- + Repair versus replacement represents a significant CO2 reduction
- + New tool is portable, compact and separable to allow in-situ uptower repairs



A new invention for repairing yaw rings in-situ is expected to make a major contribution to extending the lifespan of wind turbines. Developed by Danish machining expert CNC Onsite, the patented system means the yaw ring does not need to be replaced, eliminating the expensive, time-consuming and potentially detrimental disassembly of the rotor and nacelle.

A crucial component in securing maximum power production from a wind turbine, the yaw ring, also called a “yaw gear rim”, is complex to replace. Yaw ring replacement costs are so high that broken or worn teeth can leave operators of older wind turbines with little choice other than scrapping them.

“This inspired us to develop a repair method as an alternative,” Søren Kellenberger, Sales Director, CNC Onsite.

“We can now offer a repair service for both onshore and offshore at a fraction of the cost of replacing the entire yaw ring, and that makes it viable to keep perfectly good wind turbines operating for longer,” he added.

Patented portable precision tool

The CNC Onsite method employs a portable precision machining tool to repair any broken or worn yaw ring teeth. Operated by a specialist engineer, the tool applies the patented method, working at extremely fine tolerances, to remove and reinsert machined teeth. The patent for the system covers the milling process by which the damaged teeth are excised, and the bed created for the new part, as well as its particular insertion method.

“The process we apply when creating new yaw ring teeth for a wind turbine is similar in principle to a new dental crown that is first copied precisely then fitted by

a dentist using precision tools,” Kellenberger said. “The aim is the same, and it should last for a long time.”

The machining tool has been designed to break down into component parts with a low weight that allows them to be transported in the tower elevator to the work area. After reassembly in the nacelle, the compact tool can be operated in the confined working space around the yaw ring.

Not weather dependent

The repairs are carried out inside the wind turbine tower so can be completed irrespective of weather conditions.

“As long as it is safe to travel to and access the wind turbine, we can carry out the repairs. So there are far fewer days when we cannot work. This is also good for both work schedules and costings,” Kellenberger explained.

Scale of the problem

Mounted at the top of the wind turbine tower, the toothed yaw ring is a gear that engages with motors mounted on the nacelle to align the rotor blades with the wind. CNC Onsite estimates that turbines on some 5 to 10 percent of wind farms will experience damage to their yaw ring teeth during their service life. Typical causes include unpredictable wind events or uneven loads sustained over time.

Replacing the yaw ring requires the entire nacelle to be detached using a crane and specialist labour – a process that is expensive for onshore turbines and perhaps uneconomic for offshore. Across the lifetime of a wind turbine, maintenance can represent up to a quarter of all costs incurred, and decisions such as choosing a cost-effective yaw ring repair versus replacement are set to become an important trend.



CO2 savings

The system developed by CNC Onsite can usually carry out yaw ring repairs within a few days. This not only reduces downtime, but results in significant CO2 savings too.

“We’re eliminating the need for manufacturing a new yaw ring and above all the huge logistical effort required to transport a yaw ring to the site, deploy cranes, which is particularly tricky offshore, and replace it,” Kellenberger said.

“Such an operation requires a significant number of people and a lot of equipment with all the associated CO2 emissions. With our repair method, this is no longer required,” he added.

“The fact that whenever you take down the nacelle there is a potential risk of damage to it and especially to the blades which is another factor that cannot be ignored,” Kellenberger concluded.

The yaw ring repair service offered by CNC Onsite has

already been used on a range of turbines in wind parks, both offshore and onshore, since it entered the market in 2019 following many months of endurance tests, proving that the replaced teeth are robust over time.

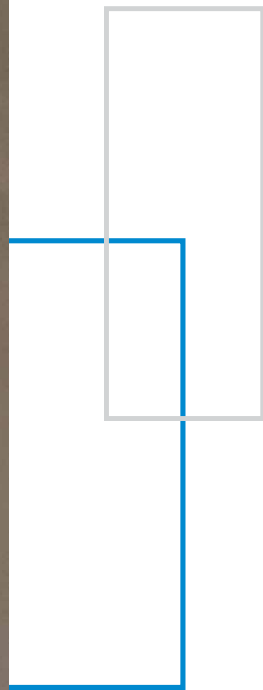
The patented process and technical details

The CNC Onsite’s patented method consists of three steps:

- + Milling away the damaged yaw ring teeth
- + Cool down the replacement yaw ring segment
- + Mount and fix the new segment in place

The company’s milling machine tool, which is also patented and is designed to be attached to the yaw ring, is a full CNC (Computer Numerical Control) machine, producing the required very precise milling in the limited space.

The milling machine is split into three assemblies for easy transport to and up the wind turbine.



with corresponding indents, to be inserted like a jigsaw puzzle. This mechanical design improves the mechanical strength and will help prevent displacement of the replacement teeth, both axially and tangentially.

Cooling pre-produced part

The new segment due to be inserted into the pocket is first cooled down to marginally reduce its size, aiding the fitting process. Once re-expanded in the pocket, this further adds to the mechanical strength of the repaired structure.

Slotting and fixing new part

The new part is slotted into the pocket by the technician who then fixes it in place, using bolts in the threaded holes, created during the milling process.

The new pre-produced yaw ring part is produced in advance by CNC Onsite. The parts match the profile of the yaw ring for that particular wind turbine brand

Precise machining tool

CNC Onsite's machine has extremely fine tolerances of a few hundredths of a millimeter. This is a huge advantage as it allows the new part to be fitted with great precision, which ensures longevity and reliability.

If required, CNC Onsite can repair all teeth on a single yaw ring. Compared to more conventional methods like welding and grinding, no heat is introduced to the yaw ring, meaning that there is no risk of changes in material properties, as well as being intrinsically safer by avoiding "hot works" in a confined space.

A successful weld repair depends strongly on the experience and skills of the welder whereas with the CNC Onsite method, the machining is done automatically, and the teeth are prefabricated to high tolerances. The result is a repair with an expected lifetime of 10 years.

About CNC Onsite

Headquartered in Vejle in Denmark, CNC Onsite designs and delivers high precision mobile machining for wind turbines including offshore foundations. Machinery built by CNC Onsite are designed to be flexible using its proprietary "building blocks" approach, which means machinery can be built to match a range of tasks. CNC Onsite serves the onshore and offshore wind energy sector delivering as standard solutions: machining of large diameter steel flanges and blade root ends; specialized repair services covering yaw ring, inserts in blade root, rotor lock, generator shaft, bearing housing and threaded holes. Removal and replacement of worn and broken bolts round off the offering.
website: www.cnconsite.dk

Milling process and pocket design

The machining tool is mounted to and aligned with the wind turbine's yaw ring and is preprogrammed with all relevant parameters like dimensions of yaw ring and teeth.

Once mounted to the yaw, the milling machine automatically identifies and cuts out the damaged area precisely, creating a pocket for the replacement teeth. The milling machine is designed to work sideways - part of the patent - on either inward or outward-facing yaw teeth, not from above as often there is often not enough room within the tight nacelle area.

The machined pocket has precise dimensions that fits the exact size of the new segment to be inserted. The shape of the pocket is designed to hold the replacement part in place through grooves and ridges.

The pocket structure also includes threaded holes, which are used to fix the new part in the next step of the process. Additionally, several raised ridges are created in the pocket which allows the new segment, equipped





Reliability & Productivity: The Foundation of Automated Warehouses



The logistics and warehousing industry has been undergoing a period of immense change, most notably in recent months due to the coronavirus pandemic. Demand for online deliveries has gone skyward, and retailers have had to adapt rapidly. Customers are shopping online all over the world and automation is becoming fundamental to the warehousing and logistics industry - particularly for online retail products sold in volume.

What type of automation is used in warehouses?

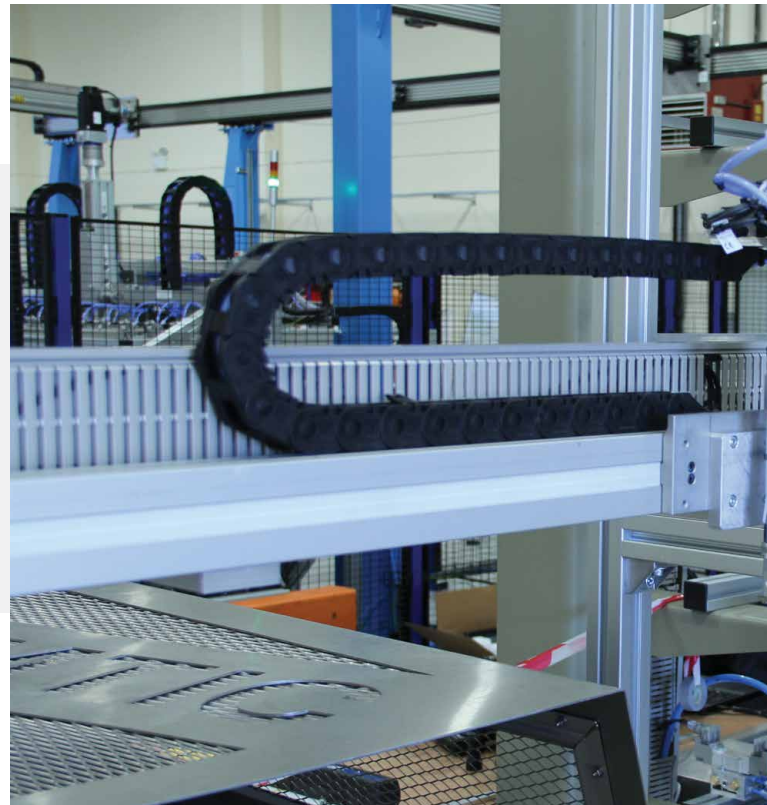
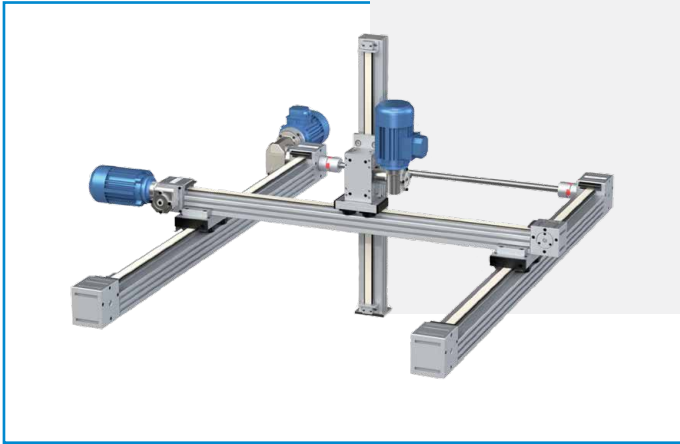
Automated warehouses are efficient, fast, flexible and reliable. They allow for improved warehousing, goods distribution, and optimum material flow. An automated warehouse uses a few key pieces of technology, such as an automated storage and retrieval system, which consists of a variety of computer-controlled systems for automatically placing and retrieving loads from defined storage locations. Central to these systems are the components that guide and transfer a component around the system. Whether it's a linear actuator to vertically retrieve a part from high racking or a ring system to rotate an autonomous picking robot, linear and rotary products play a key part.

Automated Storage Systems; think vertical

As with nearly every industry, space is a premium and a key benefit of an automated warehouse is its utilisation of space. Only a small footprint is needed as space

is used in a vertical capacity, with high rackings going up to the ceiling. Whereas pick and place operators are limited by their height to reach products un-aided, automated storage and retrieval systems are limited only by the size of the system designed, thereby increasing the storage capacity. Whether it's a rack driven system transporting boxes vertically or a robot climbing shelves to collect orders, space maximisation is easily achieved.

Indeed, one of the global leading online retailers use HepcoMotion's DLS4 belt driven linear actuators to vertically transfer products through a food filling station. Comprising belt-driven linear modules, an AC motor/inverter package and a range of compact planetary gearboxes for use with servomotors, Hepco's DLS4 saves hours in design and specifying time. Here, a belt driven carriage unit vertically transports boxes up to a height of 4 metres to transfer a product, and then back down again. This process is repeated up to 300 times an hour. Working with food items and a required operating temperature of between -5° to



+40°, this is a challenging environment requiring a corrosion resistant actuator; Hepco's corrosion resistant DLS4 (CRDLS4) was specified. A high duty application, with longevity of utmost importance, Hepco is able to provide an impressive 10 year life span for this application.

This system required a height of 4m, but any desired height can be achieved with the DLS4s. Hepco's DLS4 are supplied in sections in any length to 8m as standard, and can be butted together to the required height. Any size warehouse space can therefore be accommodated, ensuring space is maximised. The system can also easily grow in a modular way – a key benefit to ensure future-proofing.

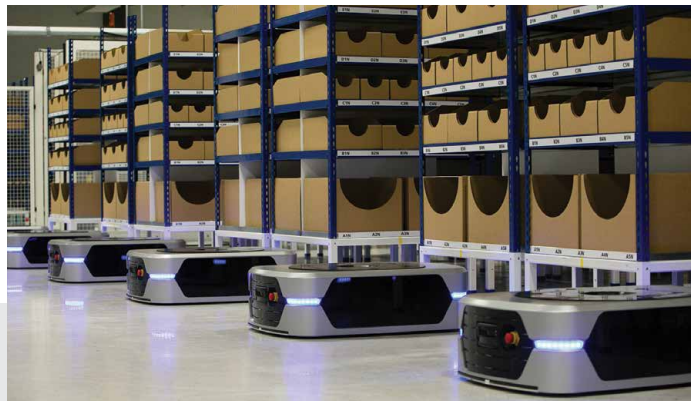
Automated Storage Systems; think modular

Traditional static warehouse solutions can struggle to cope with the changing needs of the industry. Scalability, adaptability and flexibility are at the very core of Dublin-based Eiratech Robotics, innovators of a mobile goods-to-person robotics automation platform. In the Eiratech warehouse environment, autonomously guided vehicles (Eirabots), operated via a wireless network, bring racks containing the required product to the picking station where the product is picked and packed. Minimal infrastructure is required; the system can be easily installed, extended and moved.

At the centre of the system (quite literally!) is Hepco's heavy duty ring guide. The HD ring is used on the turntable of the robot to rotate the robot in different directions. Specified to handle millions of rotations in its lifetime and the ability to work with axial loads up to 700kg, the ring also has to manage radial and moment loads in order to accelerate and decelerate a top-heavy rack. A slewing ring could not be used as an open centre was needed to enable a camera to read a barcode placed on the underside of the payloads. Having worked together before, HepcoMotion was the first choice for Eiratech. A custom HepcoMotion HD ring was used, with a bespoke outer gear. Maximising efficiency and improving accuracy, Eiratech offers an enticing automated solution for warehouses.

Reliably reliable

With the focus on speed and consistency to achieve quick orders, reliability of components is crucial. The introduction of so-called dark factories, run entirely by robots with no need for artificial light or human presence further compounds the need for reliable systems. Unplanned downtime can be a manufacturer's worst nightmare, potentially causing a backlog of products that can cost the company thousands. If a customer places an order with a next day delivery expectation, being just a day late is extremely damaging to the company.



HepcoMotion's proven V guide technology is consistently used for this very reason; reliability. Used across a broad range of industries and applications from harsh, dirty environments, to clean room environments and everything in between, HepcoMotion's durable products provide a long system life. Celebrating its 50th anniversary this year, Hepco has a strong heritage built on a wealth of experience. Reliability has been proven time and time again with over half a century of applications. A further benefit is that spare parts are available for old systems - even those bought 50 years ago - providing much-needed longevity to investments.

Keep downtime down

Consumers now expect their online purchases to be delivered faster than ever before, which means those responsible for shipping and delivery need to operate around the clock. As such, many warehousing operations operate a 24/7 schedule. Minimising downtime is therefore key. Systems that can deliver continuous operation, without the need to be regularly stopped for routine maintenance such as re-lubrication, are highly valued by designers and production engineers the world over. Hepco's V guide system has far longer re-lubrication intervals than ball rails for example, which means less frequent maintenance and less downtime required to keep them running. More so, even in the event of no lubrication, the V guide system will not fail catastrophically if it ends up running dry. Whilst this will

reduce the system life, it is a useful feature that provides essential peace of mind in case a re-lubrication interval is delayed or overlooked for any reason.

With regards to bearing maintenance, speed is again key. When Hepco products show signs of wear, the process is simple and does not impinge too much on production time. The eccentric adjustment facility of the V bearings can be used to quickly and simply remove any play that has occurred. Moreover, when the V bearings reach the end of their calculated life, they can be replaced individually, and not as an entire set, saving both time and money.

Coronavirus has caused behavioural shifts in consumer habits that has strong implications for the warehousing sector. The rise of online shopping has undoubtedly fuelled growth, placing new demands on the warehousing sector with a greater focus on efficiency and productivity. Automation is a crucial component in the future of this industry, providing an agile and effective response to logistical challenges. With over 42 major product lines with thousands of individual components, Hepco's range of products can meet practically any warehousing requirement. Designed to offer high reliability to facilitate maximum productivity, HepcoMotion's range of products are well-placed to serve this demanding, high duty industry.

— Additive manufacturing *of the Industrial Component*



When talking about manufacturing, various methods can be grouped into the three big families of methods: Subtractive manufacturing (e.g. machining), formative (e.g. molding) and finally **additive manufacturing**: this last one involves adding material in layers, in order to create the final product.



Some of the main benefits of additive, especially when compared to subtractive and formative manufacturing, can be:

- + **Customization:** components can be highly customized in an economically viable way and with low turnaround times.
- + **New and complex designs & flexibility:** The potential to create complex structures without impact on the cost to manufacture is a trademark benefit of 3D printing. Without the limitations injection molding or CNC machining, users are able to create intricate designs that do not depend on tooling suppliers or MOQ
- + **Cost and time savings:** as mentioned, though elimination of molds, additional equipment and tools that are both expensive and require some lead-times to be manufactured and delivered. Also, any design change can be done almost in a click and the new edited batch of parts can be good to go in days or a week, instead of weeks or months.

Obviously, even among different 3D Printer providers, the **selection** of the right technology is one the main drivers for success: in order to manufacture very

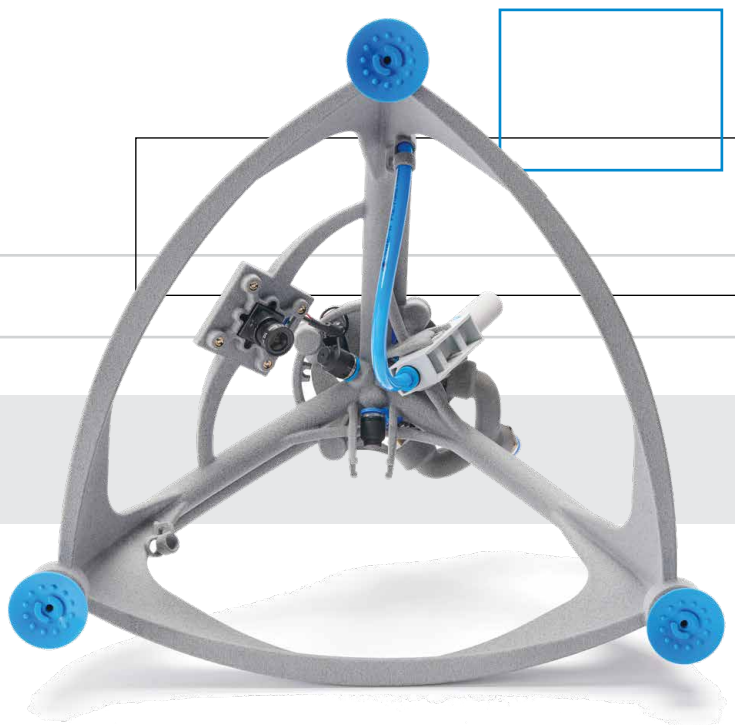
large parts, like end-of-arm-tooling or big jigs and fixtures, the technology with the sufficient capacity must be sought out. And a similar consideration must be done regarding very small parts that need very high dimensional accuracy, like small needle bearing cages, where the margin of error must be minimum. Not all technologies will be up to the task!

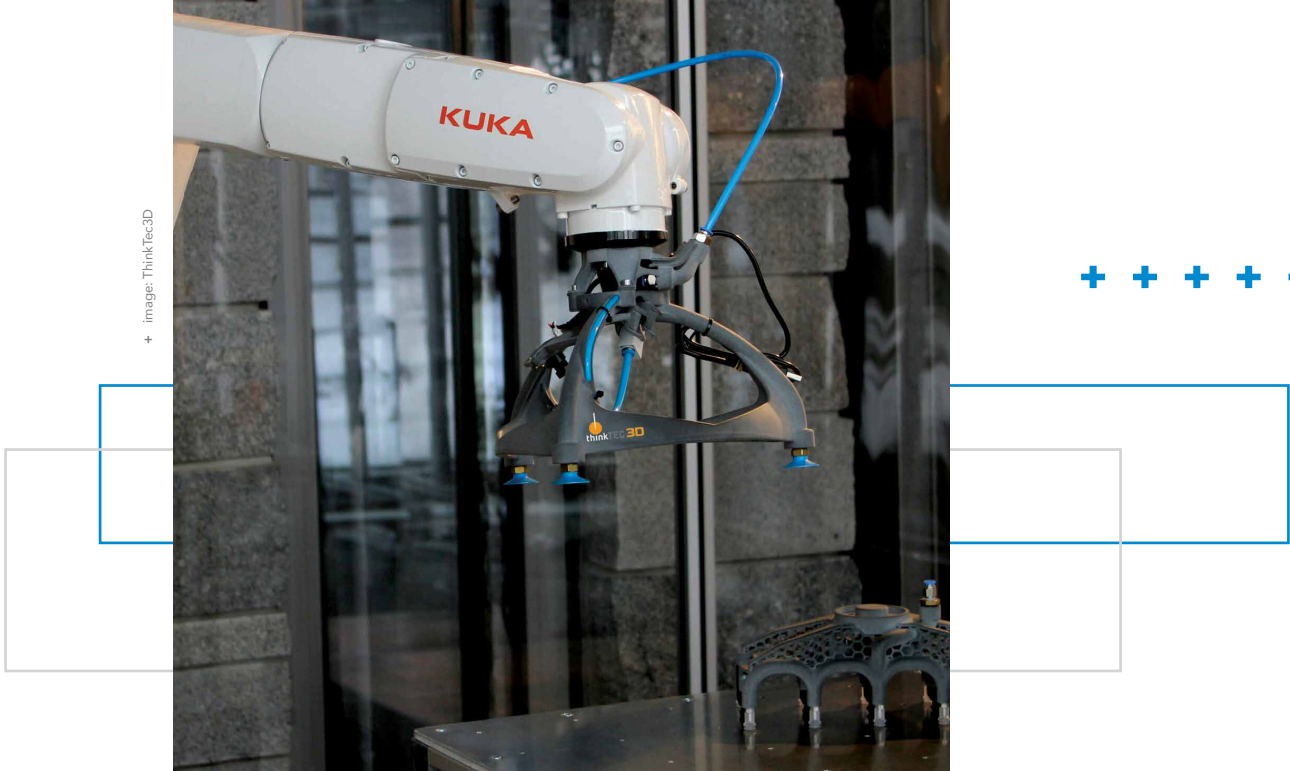
If the focus is on **final parts** with a need for high **quality** and **precision**, or components that will be used consistently, a powder bed technology might work better, because it allows lower margins of error, and most importantly **flexibility** in terms of **productivity**.

That is because powder bed technologies allow as many parts as can fit on the same surface to be placed into the building area, and the print job (per layer) will take the same time as only printing one. Moreover, parts can be **stacked** one over the other inside the build unit and the user can control at what distance, **monitoring heat** and **temperature**, everything can be set based on specific requirements or needs. Finally, managing to stack parts without filling the unit to the top will reduce the hours needed to print the job.



+ image: ThinkTec3D





What most of HP 3D Printing's users do after installing the technology in their facilities, is to look at parts which were designed for CNC Machining or Inject Moulding and try to switch those designs to 3D. But, of course, parts designed for traditional manufacturing technologies will have shapes and properties that are different from what one would come up with if it were to directly design a part for additive. So, at that point, parts' designs are normally made **hollow**, or **lattice structures** are introduced, which are both very effective methods in reducing material usage and, consequentially, weight of the parts as well as the cost.

But as users get more comfortable with 3D printing technologies, what happens is a more intricate approach towards design. A typical upgrade from traditional design to additive is **part consolidation**: when an assembly of parts is re-designed in a single component, which allows savings in terms of assembly times and costs for the tooling, and is a very effective way to reduce the risk of liquid or air leakage. Any junction from a component that is supposed to be fluid tight can be dangerous for the performance of the part: by transitioning to one component this is obviously not a concern anymore.

And as they become experts in the technology that they use, parts start being directly and specifically designed for 3D. Not adapted, but **re-imagined** starting from design to final series production.

But 3D Printing does not stop at the end of the printing phase: to complete the manufacturing process, there are several **post-processing** options. When considering HP Multi Jet Fusion Technology,

parts that come out of the printer need to be cleaned through sand blasting or any option that will remove the excess unused powder still attached to them, reaching a clean, rough-surfaced, grey part. Then, depending on requirements, there are different options:

- + Enhancing scratch and colour resistance for frequently handled parts through dyeing and graphite blasting;
- + Applying a gloss finishing through the technology of chemical polishing;
- + Customizing with any graphical pattern that will not shrink, will be weatherproof and will eliminate cutting edges through the process of hydrographics;
- + Protecting parts against corrosion, improving electrical conductivity, reducing friction or preparing a surface for better paint adhesion with electroplating.

And many more.

In conclusion, when talking about 3D Printing and additive manufacturing, it is important to mention how this method is only extremely powerful when paired up with the right material, the right technology and the right partnership; nevertheless, its objective isn't to replace other technologies outright, but to **complement the traditional processes** and is going to **change the way that we produce**. Therefore, it is crucial to be aware of the different additive technologies on the market and become familiar enough with them to actually take advantage of the benefits they enable.

Prevent premature bearing failure with simatec maintenance products

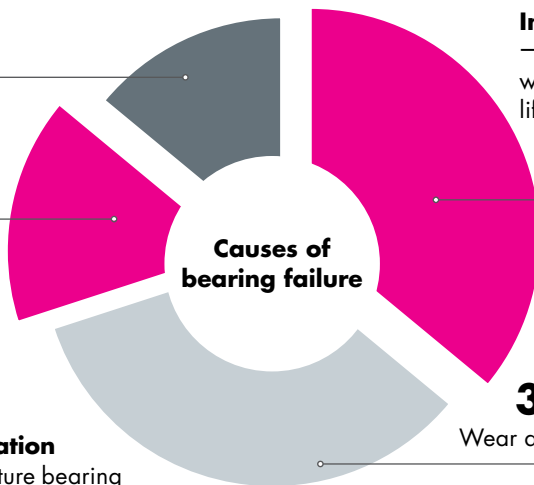


14%

Contamination from outside

16%

Improper installation
→ Prevent premature bearing failure with simatool tools and simatherm induction heaters



36%

Incorrect lubrication

→ Continuous lubrication with simalube ensure a longer lifetime of the bearing

34%

Wear and tear

More information on p.119



- **High power density motors create new opportunities for machine builders**

+ + + + +



- **High Dynamic Performance (HDP) motors have been upgraded to offer even higher power density and a broader scope for machinery applications**
- **Motors are offered as part of a complete package with variable speed drives (VSDs) for precise control and maneuvering capabilities**

ABB has upgraded its extensive range of High Dynamic Performance (HDP) induction motors. This creates new opportunities for machine-building OEMs seeking motor and drive solutions with excellent dynamic response and high power density. The motors are typically used in plastic and rubber extrusion, injection molding, winders, lifting, conveyors, test benches and machine tools.

The upgraded HDP motor range enables ABB to offer machine builders frame sizes between 80 and 400, and output capacities up to 2 megawatts (MW) – as well as alternative variants such as high-speed and water-cooled motors. The motors are designed for use with a VSD and ABB can provide matching motor and VSD packages across the frame-size range.

“ABB is well known for its optimized motor and VSD packages that provide precise motor control and maneuvering capabilities in a wide variety of general industrial applications,” said Marcus Westerlund, Product Manager, Special Motors at ABB. “The HDP motors now bring the same advantages to machine builders who need the extra boost in power provided by a high-torque design and exceptional power density.”

High power density benefits both retrofits and new build machinery

Machine builders can capitalize on the high power density of HDP motors in two ways. They can retrofit an existing machine with a more powerful replacement motor to boost performance; or they could select a more compact, yet equally powerful motor when designing a new machine to reduce its footprint.

Low inertia and high overload capacity

HDP motors are designed to enable fast motion control and high maneuvering precision due to their low inertia and high overload capacity. Low-inertia motors are ideal for applications requiring fast changes in rotational direction to enable, for example, faster back-and-forth machine motion.

Easy installation

ABB has prioritized ease of installation as an integral element of the HDP design. That makes it easy to install a replacement HDP motor into an existing machine without excessive engineering work. Furthermore, ABB has considered simplicity in everything from accessible connection points to installation of accessories, such as cooling fans, encoders and brakes, whether from ABB or a third party.

Customization

The upgraded HDP motor range includes all the commonly-requested frame sizes and technology variants such as water-cooled, high-speed and megawatt-class alternatives to allow ABB to meet most machine-building requirements without extended delivery times. Should the standard design not meet a machine builder’s specific needs then it can be customized.

HDP motors are compliant with the IEC 60034 standard and suitable for unrestricted global use. Worldwide technical support is provided to OEMs and end users through ABB’s global services organization.

To learn more about ABB’s high dynamic performance motors: <https://new.abb.com/motors-generators/iec-low-voltage-motors/high-dynamic-performance-motors>



- **A smarter second life for industrial bearings**



SKF is finding ways to make remanufacturing even more cost effective and environmentally sustainable.



Remanufacturing is a fundamental pillar of the circular economy and it has since long been part of SKF's offering to its industrial customers. When industrial bearings are removed from a machine during repairs or routine overhauls, they can be sent to a specialist SKF Services Centre to be disassembled, inspected, and restored to operational condition.

Compared with the production of a new bearing, remanufacturing uses less material, consumes less energy, and generates less carbon emissions. A remanufactured bearing reduces the carbon footprint compared to a new one by up to 90%.

Transforming remanufacturing

Like any other industrial process, remanufacturing has its own costs and environmental impact. Bearings must be shipped from the end user to a dedicated facility, and the operations used to restore the bearing require energy and materials. The choices about when, where, and how to remanufacture a bearing can have a significant effect on the economic and environmental benefits of the process.

Such choices can be tricky to get right. For example, waiting too long before sending a bearing for remanufacturing means excessive wear or damage, which might make the remanufacturing impractical. Acting too early generates unnecessary costs and emissions. Once a bearing reaches the SKF facility, the company's remanufacturing engineers must choose the most cost-effective and energy-efficient remanufacturing steps to restore the performance of the bearing. Those critical decisions are usually made relying on the skill and judgement of end-user maintenance specialists, SKF's application engineers and remanufacturing experts.



A major R&D program currently running at SKF aims to transform remanufacturing planning and execution bringing new insights into bearing performance, improved analytical rigour, and incorporating the power of artificial intelligence (AI) to the process.

Choosing efficiency

SKF REPaIR (Rotating Equipment Performance aided by Innovative Remanufacturing) is a multi-pronged R&D effort that looks at the complete remanufacturing value chain. Innovation begins at the customer plant, with an automated machine vision system that can evaluate bearing damage using digital photographs. The system uses AI, in the form of a deep neural network image recognition algorithm, which has been trained to detect and classify specific damages in bearings.

AiVision-FM Model alpha-1



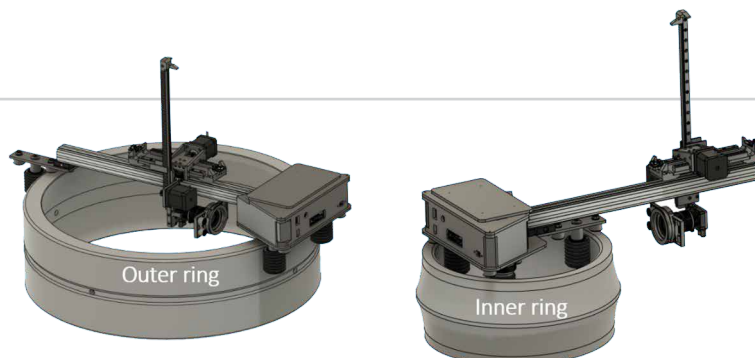
to assess the health of the bearing material. But historically, the main way to confirm that the material is in good condition has been to look at the sub-surface structure through a microscope, a process that requires cutting the bearing.

Unlike older machine vision approaches, SKF's AI vision system has been designed to operate in real-world conditions, where images may be obtained on the factory floor or in the field and tight control over lighting and composition are impossible. The system can identify the bearing surface even if the image is captured in suboptimal conditions.

SKF's system is in the future expected to provide an initial "go/no-go" evaluation of a bearing which would indicate to the customer whether the component is suitable for remanufacturing or not. In the latter case, it is probably more cost-efficient to responsibly recycle the bearing locally. This new AI vision system is explained in detail in a recent EVOLUTION article "The future of bearing failure analysis is here" (<https://evolution.skf.com/the-future-of-bearing-failure-analysis-is-here/>).

Once a bearing is selected for remanufacturing and transported to the nearest SKF Services Centre, it is disassembled and cleaned ready for detailed inspection. Here, the REPaIR team is developing a new opto-mechanical inspection device based on machine learning technology. The images generated by this device will be processed by an AI system, which has been trained to identify and classify common bearing defects. Ultimately, the highly consistent images generated by the device will allow the AI tool to generate a comprehensive report on the condition of the bearing, including recommendations on the most appropriate sequence of remanufacturing steps. Remanufacturing inspection could offer the opportunity

The team is also exploring the use of novel non-destructive techniques to analyse the state of the material below the surface of the bearing. "The ultimate life of a bearing is determined by the fatigue life of the sub-surface material, but most bearings fail much earlier due to surface damage", says Hannes Leopoldseder, Business Unit Manager Industrial Services Centre at SKF. "Remanufacturing restores that surface, so the user can benefit from the full potential life of the bearing." Non-destructive methods could allow the true remaining useful life of a bearing to be quantified for the first time



“Light-touch” remanufacturing

SKF strive to find the most efficient processes for their remanufacturing, the ones that favour a lean and light touch approach over multi-step routes that characterise ‘heavy’ remanufacturing. To this end, the REPaIR team is running an extensive test program to compare the operating life of damaged bearings at different reprocessing levels.

By testing dozens of bearings to failure on accelerated life-testing rigs, the team aims to unlock opportunities for new “light-touch” remanufacturing strategies. For example, one common form of damage is the result of hard contaminant particles entering a bearing during use. As these particles are trapped between the rolling elements and the raceway, they can be pushed into the surface, causing damage.

This type of damage usually appears as a pit or dent in the surface of the material, creating material displacement. “These situations are of particular interest to us because the traditional remanufacturing approach in this situation would focus on removing the entire pit in the bearing surface. Eliminating that may require the removal of a lot of material,” says Sebastien Blachere, R&D scientist at SKF. “Removing only the main stress raisers is much easier, and our early tests have shown that doing this could be all you need to do to restore the full bearing life in some situations.”

The life after remanufacturing

The test program will give the REPaIR team a much clearer picture on the effectiveness of the different

remanufacturing strategies. Data generated by the program will also be used as input for new calculation models for bearings that have been remanufactured. “All the elements of the analysis program will help end-users, says Hannes Leopoldseder. “The first question many customers ask is ‘how long will a remanufactured bearing last in my application?’ With this programme, we want to give them a quantitative comparison between a new bearing and a remanufactured bearing, in order for them to make remanufacturing decisions with confidence.”

This new ability to provide to the customer a life estimation after remanufacturing comes from two sources. The first one is a better understanding of the actual operating conditions in the application, for instance offering a more accurate estimation of the level of contamination. The second one is the precise knowledge of the actual conditions (surface and sub-surface) of the bearing parts after remanufacturing. These two sources are then the input of a predictive model based on current SKF high expertise in bearing performance modelling (GBLM Generalized Bearing Life Model).

A bridge between R&D and business

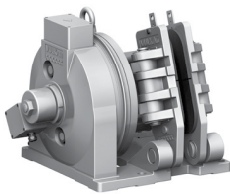
The REPaIR program is then paving the way towards new remanufacturing offers fulfilling high-end customer expectation on planning and performance, together with environmental sustainability. Its ambitious objectives and its promising intermediate findings are the results of a close collaboration between SKF researchers and direct actors of the SKF remanufacturing business. This efficient way to anchor R&D programs into direct business targets is showing excellent results towards SKF costumers and high motivation within the various project teams.



AN AERIAL VIEW CAN MAKE EVERYTHING LOOK SMALLER – OR OUR SYSTEM SOLUTIONS EVEN BIGGER.



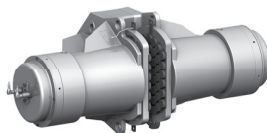
FLUID COUPLINGS
Power rating up to
3.700 kW



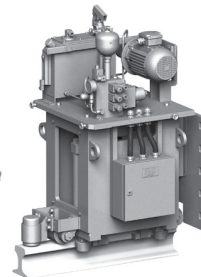
E-MAGNETIC BRAKES
Braking Torque up to
12.450 Nm



E-HYDRAULIC BRAKES
Braking torque up to
29.900 Nm



HYDRAULIC BRAKES
Braking torque up to
400.000 Nm



RAIL CLAMPS
Clamping force up to
400.000 N



BACKSTOPS
Torque up to
578.000 Nm

VULKAN
DRIVE TECH

TORQUE FOR HEAVY DUTIES

VULKAN Kupplungs- und Getriebbau
Bernhard Hackforth GmbH & Co. KG
Heerstraße 66 | 44653 Herne/Germany
Phone + 49 23 25 922-0
info.vdt@vulkan.com



Quick clamping shaft collars for packaging applications



+ Ruland offers quick clamping shaft collars in a wide variety of sizes, styles and materials for packaging equipment. Quick clamping shaft collars require no tools for installation, adjustment or removal.



Ruland quick clamping shaft collars require no tools for installation, adjustment or removal, making them a convenient and efficient choice for a variety of packaging equipment and applications.

Designers and operators of packaging machines such as wrappers, bundlers and cartoners benefit from the faster, tool-less adjustment of quick clamping shaft collars.

Ruland offers two types of quick clamping shaft collars: collars with cam levers and collars with clamping levers. Quick clamping shaft collars with cam lever have an integral lever that sits flush with the outside diameter and is finger actuated. The design features a tension-adjustment screw that can be adjusted to tailor axial holding power to application needs. These collars are one-piece clamp style and require shaft end access to be installed properly. They are best suited for light duty and low rpm applications with frequent change-outs of items like guide rails or other setup fixturing.

Quick clamping shaft collars with clamping lever feature a Ruland manufactured shaft collar combined with an adjustable clamping lever that replaces standard hardware. The final assembly is a shaft collar with a ratcheting handle that can be easily installed, removed or repositioned without tools. They have the benefits of traditional Ruland shaft collars such as not marring the shaft, tight controlled face-to-bore perpendicularity (TIR of $\leq .002$ inch or 0.05 mm), and a fine burr-free finish, allowing them to be used in a wide variety of packaging applications. These shaft collars with clamping levers are offered in one- and two-piece clamping styles and with outer diameter flats and holes for easier mounting of other components.

Quick clamping shaft collars with cam levers are manufactured from 6061 anodized aluminium bodies and 6063 aluminium handles with bore sizes from ¼ inch to 3 inches and 6 mm to 75 mm. Quick clamping shaft collars with clamping levers are offered in standard materials including 1215 lead-free steel with black oxide or zinc plated finish, 303 and 316 stainless steel, high strength 2024 aluminium,

and engineered plastic. The lever is sourced from JW Winco and features a zinc plated handle with a stainless steel threaded stud and internal components.

All Ruland shaft collars are manufactured from select North American bar stock in Ruland factory in Marlborough, MA, under strict controls using proprietary processes. Full product information, 2D and 3D CAD files, installation videos, and more are available on ruland.com.

Summary

- Quick clamping shaft collars require no tools for installation, adjustment or removal
- Two types available: with integrated cam lever and with removal clamping lever
- Quick clamping shaft collars with clamping lever are available in a variety of materials and styles to fit a variety of packaging applications
- RoHS3 and REACH compliant
- Carefully made in Ruland's Marlborough, Massachusetts factory and available for immediate delivery

About Ruland

Ruland Manufacturing Co., Inc. is a privately owned family company founded in 1937. Ruland has carefully and responsibly manufactured high performing shaft collars, rigid couplings, and motion control couplings for the past 40 years. Ruland's product line was recently expanded to include a variety of machine components from select manufacturers that align with Ruland's performance and quality standards.

Couplings in construction machinery powertrains



+ Spring coupling from Torsion Control Products

Spring couplings from Torsion Control Products (TCP) are ideal for use in construction machines powered by modern diesel engines. Thanks to their special torsional elasticity, these durable, robust couplings damp the vibration from the powertrain and remain serviceable even under the harshest operating conditions. Torsion Control Products is part of the US manufacturing corporation The Timken Company. Within the organisation of roller bearings specialist Timken, a division was created for further powertrain components, including the Torsion Control Products brand couplings as well as couplings and components from PT Tech und Lovejoy. These are now presented here for use in the powertrains of mobile construction and process machines.

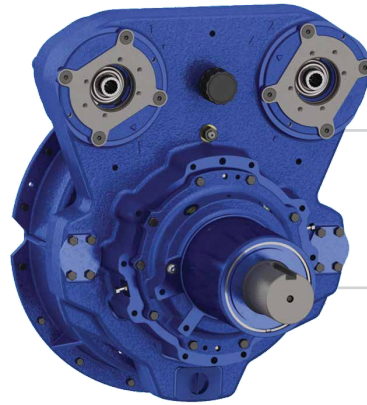
"The variety of different powertrains fitted in construction machines is enormous," says Dr.-Ing. Peter Jaschke, head of Business Development at Torsion Control Products in Werdohl, Sauerland.

"As a rule, the objective of every construction machine manufacture is to develop a long-lasting powertrain that is perfectly compatible with the construction vehicle and its work process, and that functions reliably in the harsh operating conditions. This requires working side by side with a partner which not only knows and can deliver a component, but also develops, manufactures and distributes many different products. This makes it possible to derive added value from the very beginning when developing a powertrain, through professional consultation and the technical implementation of customer requirements."

Using the example of a conceptualised powertrain, Dr. Jaschke presents a few core competencies of the brands cited above. Torsional vibration is certainly generated by the diesel-engine drives in construction machines, but also by many process machines such as the milling drums in road planers, the chipper drum



+ UJT torque limiter from PT Tech



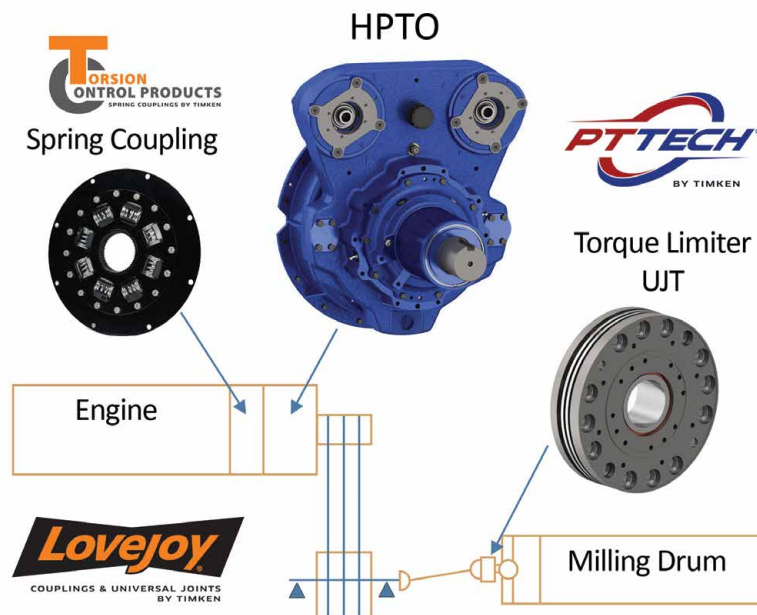
+ Hydraulic Power Take-Off (HPTO) from PT Tech

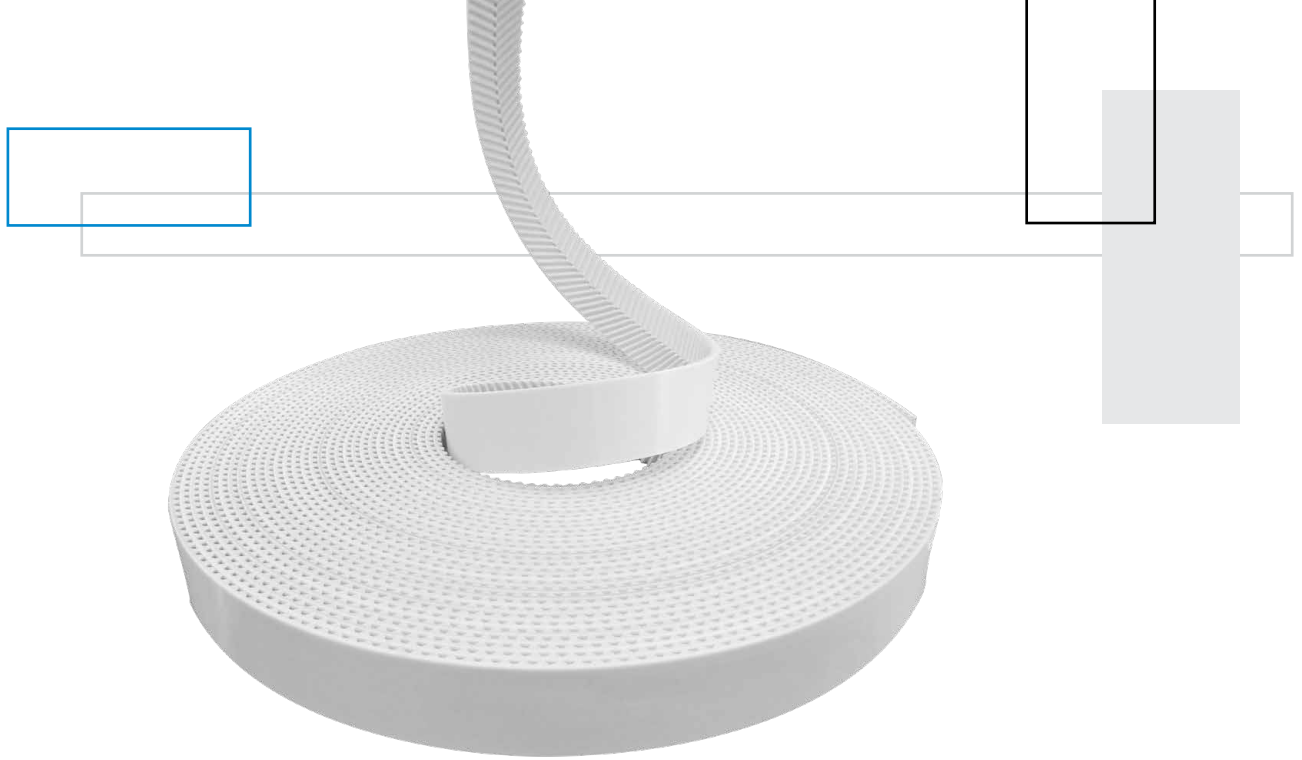
in wood chippers, or even crusher drives. "The aim is to influence these vibrations in such a way that none of the powertrain components suffer any damage. The steel spring couplings from Torsion Control Products are ideal for precisely this purpose." They can be adapted to the specific requirements through a wide range of different configurations. Particularly the spring characteristic and the damping property are important in this context, and an optimised selection is made on the basis of a torsional vibration calculation. The Smart Damping technology is especially effective here in suppressing undesirable transmission chatter.

Hydraulic Power Take-Offs (HPTO) from PT Tech engage the power take-off. "Besides the sophisticated design of their vanes, they are also equipped with a specially developed controller, which enables them to accelerate high moments of inertia without causing the vanes to overheat," says Dr. Jaschke. If hydraulic pumps also need to be driven, the HPTOs can also be fitted with up to four additional power take-offs. Special adapters are available to enable the pumps to be connected directly.

If the drive has to be protected from high overloads, Dr. Jaschke recommends torque limiters from PT Tech, or – depending on the specification – shear pin couplings from Lovejoy: "It is most important, particularly in the case of overload couplings, to ensure that they function reliably and protect the powertrain. The torque limiters operate on the basis of spring-loaded friction discs. Presettable spring assemblies allow the pressing forces to be applied extremely precisely over long periods of time, thereby ensuring an even mode of action."

As part of Timken since 2017, Torsion Control Products has been developing, producing and distributing a wide range of torsionally soft couplings for mobile machinery for more than 30 years. The spring coupling series is available in various variants, and covers a torque range from 27 Nm to 27.000 Nm. Besides construction and roadbuilding machinery, typical application areas include agricultural vehicles, transmissions, hydrostatic pump drives, powershift transmissions and hybrid drives in mining machinery and industrial plants.





— Megadyne Megalinear

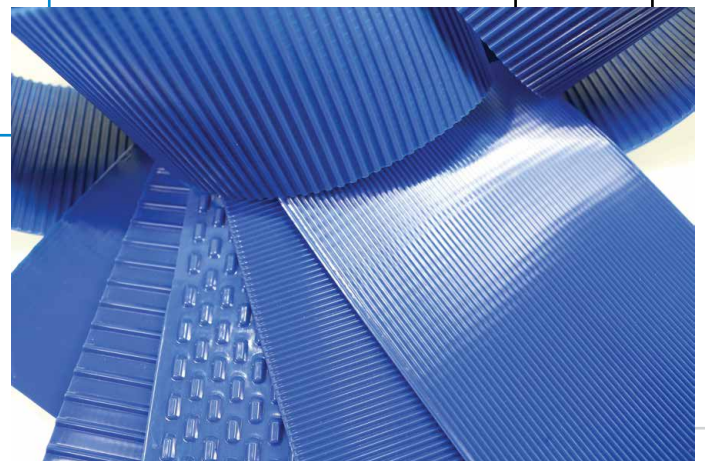
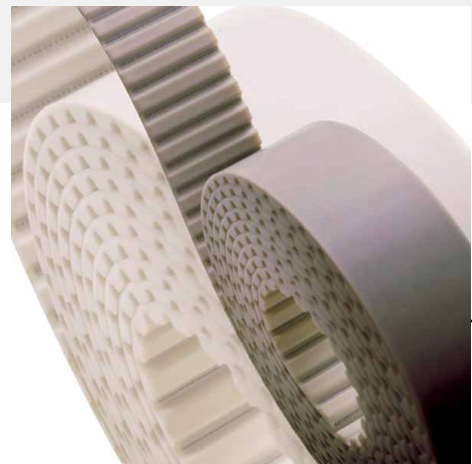
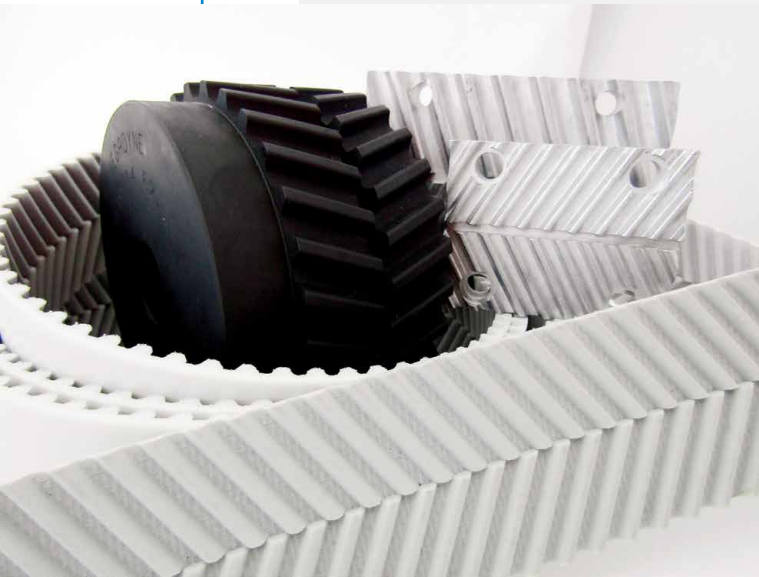
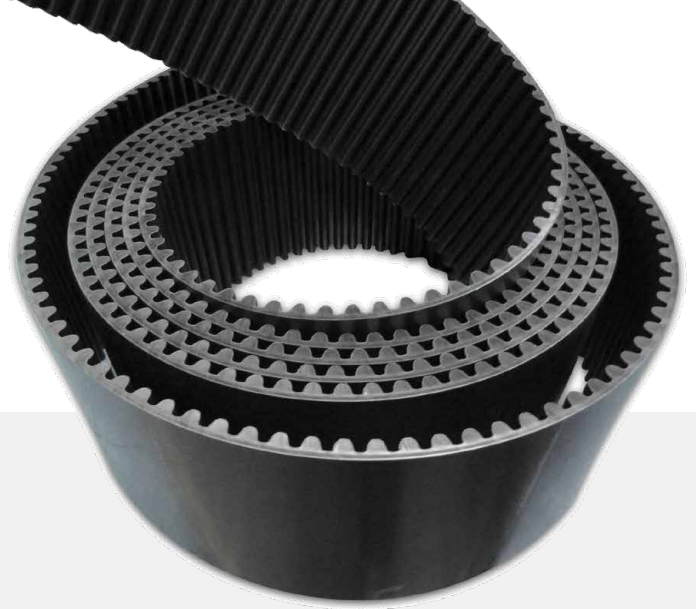
Megalinear open end timing belts are made of thermoplastic polyurethane for superior wear and abrasion resistance. A wide range of different cords (zinc-coated steel, Kevlar, stainless steel, High Performance, High Flexibility) offer exceptional operational characteristics, even under high tractive loads. Normally used in linear motion drives, Megalinear belts can be supplied as open end rolls or as endless jointed belts; they are particularly well suited where positioning accuracy, dimensional stiffness, high linear speed, low noise generation and long maintenance-free cycles are key requirements.



Endless possibilities

Megalinear belts are high-performance durable belts specifically designed to run quietly and maintenance-free, even in high-force applications. High-strength S and Z parallel zinc-coated steel or Kevlar tension members and a main body of thermoplastic polyurethane characterized

by high levels of wear and impact resistance, help them perform demanding tasks accurately and reliably over a long working life. Their greatest feature is their versatility; with an impressively wide range of component and cover options, Megalinear belts can be tailored to perform optimally on any number of challenging applications.



Meet the Family...

The Megalinear Family is available in all common profiles: Imperial, Metric, Parabolic and Flat. The range also includes the Megalinear QST, GW, FC and the new Megalinear MEGAC4T™. Megalinear QST is uniquely designed to reduce noise levels generated during high-speed operation, is completely self-tracking and provides high torque capacity. Megalinear GW is a thermoplastic polyurethane belt with high-tension steel zinc-coated cords and featuring high tooth-shear strength for greater transmittable power under continuous high loads. Megalinear FC is a new range introduced specifically for the food processing industry, meeting both FDA and EU food grade standards. Megalinear MEGAC4T™ (Adaptable Cleats For Transport) is perhaps the most versatile belt ever: easily interchangeable profiles allow use in a wide variety of applications, transporting goods of different shapes on a single conveyor system with a minimum of downtime.

...in a wide industry applications

Megalinear belts are used in packaging lines, sliding doors and lifts, robotic systems as well as in many other industries: wood, textile, chemical, pharmaceutical, glass, stone and marble, tobacco, paper and carton.





+ Dr. Johannes T. Grobe, CSO for the KHS Group



Reliable and close to the customer: **KHS presents future-proof line and packaging systems at Anuga FoodTec**

+ + + + +

- + InnoPET BloFill ACF-L block system for aseptic filling
- + Standardized data interchange between IT systems and machines
- + Holistic packaging systems for greater environmental protection

From April 26 to 29 the KHS Group will be presenting its entire portfolio of modern filling technology and environmentally-friendly packaging systems at Anuga FoodTec in Cologne, Germany. With its efficient InnoPET BloFill ACF-L block system the systems provider looks to the future of aseptic filling. A further focus will be on the new standard interfaces for communication between KHS machines and customer IT systems. The turnkey supplier also continues to devote itself to saving on resources and protecting the environment with its holistic packaging systems.

“ Efficient and economic filling and packaging processes make great demands of today’s lines and machines. The intelligent KHS systems we’ll be presenting at this year’s Anuga FoodTec satisfy these requirements on all counts. ”



+ InnoPET BloFill ACF-L // With the InnoPET BloFill ACF-L stretch blow molder/filler block KHS provides a system solution for sensitive beverages in PET bottles that is especially low on space.

For the filling of sensitive beverages in a hygienic environment the turnkey supplier provides an extensive portfolio of environmentally-friendly systems for various container designs and materials. With the InnoPET BloFill ACF-L stretch blow molder/filler block the Dortmund engineering company presents a further development for sensitive beverages in PET bottles that is especially low on space. The new system scores with a multitude of innovations, one being its new switching valve. This controls the volume of the inflow to the actual filling speeds. Bottle volumes both large and small with varying viscosities can be perfectly processed on this machinery – with extremely low foaming an added bonus. The filling process is stored in the product recipes; there is no need for manual conversion. This makes for a reproducible filling quality and improves filling accuracy. The result is a stable output of beverages with different properties, in turn boosting efficiency and the flexibility required to fill a wide assortment of products.

Reliable data transfer through new standard interfaces

As part of its Basic Line Monitoring process KHS has developed new standard interfaces for line monitoring and order control. The respective modules facilitate communication between KHS machines and beverage producers' IT systems. Furthermore, regular updates and new versions ensure a high, reliable quality of data. With this new standardized approach the systems supplier's and customer's own IT environments can be connected up to the machines even better and even more economically than before. This renders previously required time- and cost-intensive customized harmonization and programming superfluous.

+ Packaging systems // In addition to its modern filling technology and various digital solutions the KHS Group will be exhibiting its entire range of future-proof packaging systems in Cologne.





+ **Innopack CNP** // Cardboard clips or toppers are positioned on cans before a wheel clamps their "claws" under the rim of the can and erects the top.

+ **Innopack series** // Thanks to their modular design Innopack packaging machines from KHS can be converted or retrofitted without any great effort being involved.



Environmentally-friendly packaging systems

In addition to its modern filling technology and various digital solutions KHS will be putting its broad range of future-proof packaging systems on display in Cologne. "We're consistently working to save on resources and use a higher percentage of recycled materials in place of new ones. Our customers worldwide benefit from our over 40 years of expertise in plastic containers for beverages, liquid food and homecare products," states Grobe. KHS continues to build on its decades of expert knowledge in secondary packaging, too. Film made of up to 100% recyclate can now be used to wrap containers, as can paper or cardboard.

The newly developed Innopack CNP or Carton Nature Packer turns beverage cans into stable packs using toppers or clips made of corrugated cardboard or solid board. Packs of four, six or eight standard and sleek can formats holding between 250 and 580 milliliters can be produced at an output of up to 108,000 containers per hour.

Another packaging alternative is Nature MultiPack. This resource-saving system joins beverage containers together with dots of adhesive to form a stable pack and saves up to 90% in materials by doing away with

the secondary packaging. Nature MultiPack is now also available for the high-performance range, with throughputs of up to 108,000 containers per hour possible when running at overcapacity. Depending on the format, the machine manufactures up to 450 packs of four a minute.

Simple retrofits on existing packaging machines

Moreover, KHS offers extensions for existing Innopack machines. The new alternative that wraps beverage cans in paper instead of film is one such retrofit, for instance. Customers can opt for more flexibility by switching between film and paper packaging as required or permanently switch to paper.

Johannes T. Grobe and his team are very optimistic about the upcoming Anuga FoodTec trade show. "We're looking forward to finally again being able to present our technologies to the expert community in person – while observing all of the relevant hygiene and protection rules, of course!".

For more information go to: www.khs.com/en/media



We're looking forward to finally again being able to present our technologies to the expert community in person – while observing all of the relevant hygiene and protection rules, of course

Dr. Johannes T. Grobe,

CSO for the KHS Group of the upcoming Anuga FoodTec trade show in Cologne, Germany.





– Nord Drivesystems *at* Anuga Foodtec 2022

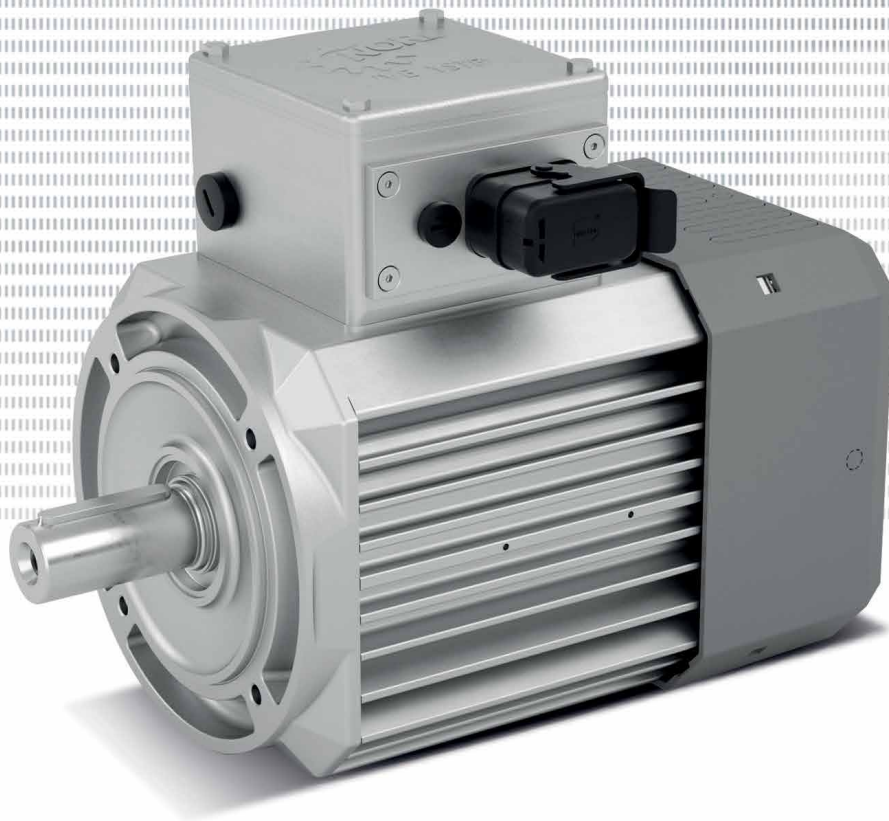


NORD DRIVESYSTEMS will exhibit at ANUGA FOODTEC. With the IE5+ synchronous motor, the company is setting new standards with regard to energy efficiency of drive systems in the food industry and intralogistics. The high-efficiency IE5+ motor has now been integrated into a singlestage helical gear unit – thus further optimising system efficiency – and is also launched in the next size.

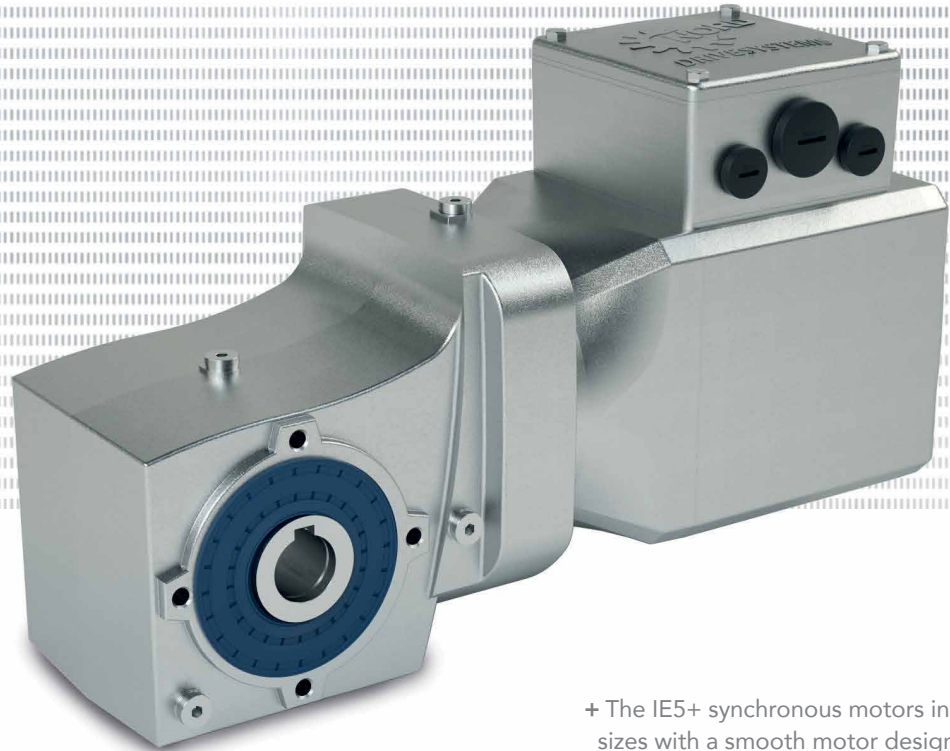
+ By installing the motor and the gear unit in one single housing, DuoDrive is very lightweight and compact, coupled with very high power density.

The new DuoDrive geared motor features high system efficiency and a consistent version reduction paired with a smooth, unventilated and compact design. Elimination of many wearing parts results in lower maintenance. In combination with the simple commissioning of the complete solution via plug-and-play, this results in a significant decrease of the Total Cost of Ownership

(TCO) compared to existing drive systems. DuoDrive is suitable for use in the food industry as well as intralogistics. With the IE5+ synchronous motor, NORD DRIVESYSTEMS is setting new standards again: The new motor is now available in ventilated or smooth surface versions for powers from 1.1 to 4.0 kW with a continuous torque of 6.8 to 18.2 Nm.



+ The new IE5+ synchronous motor is now also available for intralogistics applications in a ventilated version up to a power of 4.0 kW



+ The IE5+ synchronous motors in two sizes with a smooth motor design are ideally suited for wash-down applications in food and pharmaceutical industries

Consistently taking integration to the next level

DuoDrive is a NORD DRIVESYSTEMS' revolutionary integrated geared motor in hygienic wash-down design where the IE5+ synchronous motor and the single-stage helical gear unit are installed in one single housing. As a system, the very compact DuoDrive concept achieves a significantly higher energy efficiency than the already proven combination of IE5+ synchronous motor and NORDBLOC.1® bevel gear unit. At up to 92%, DuoDrive currently offers one of the highest efficiencies on the market for geared motors in this power class, and achieves its very high systems efficiency even in the partial load range. It is thus future-proof and a real cost reducer. The first available DuoDrive size covers gear unit speed ratios of $i = 3.24$ to $i = 16.2$ and is designed for torque ranges of up to 80 Nm and speeds of up to 1,000 min⁻¹. As it is easy to clean, corrosion-resistant and wash-down capable, DuoDrive is also ideal for use in hygiene-sensitive and harsh environments, and ensures higher system availability and lower cleaning costs through lower cleaning effort. If required, the motors are provided with a very smooth surface or the nsd tupH surface treatment.

nsd tupH surface treatment: An alternative to stainless steel

In case of stringent requirements on surface and corrosion protection, nsd tupH surface treatment is the technology of choice. Thanks to a special method, the surface is made corrosion-resistant and harder and makes aluminium behave like stainless steel with regard to corrosion protection. This is not a coating, but a surface treatment that creates a protective layer which is permanently bonded to the substrate material. So nothing can detach or flake off. Damage remains locally restricted and does not spread. The drives are easy to clean and largely resistant to acids and alkalis. It is even possible to use high-pressure cleaners or apply aggressive media. nsd tupH treatment is available for most of the aluminium products in the NORD modular drive system, and ideally suited for hygienically sensitive applications in the food sector.

You can find NORD DRIVESYSTEMS in Hall 7.1 on stand A030.

iMotion meetings

industrial motion hybrid meetings
for PT/MC Buyers & Suppliers

March - December 2022

6
Events
in 2022



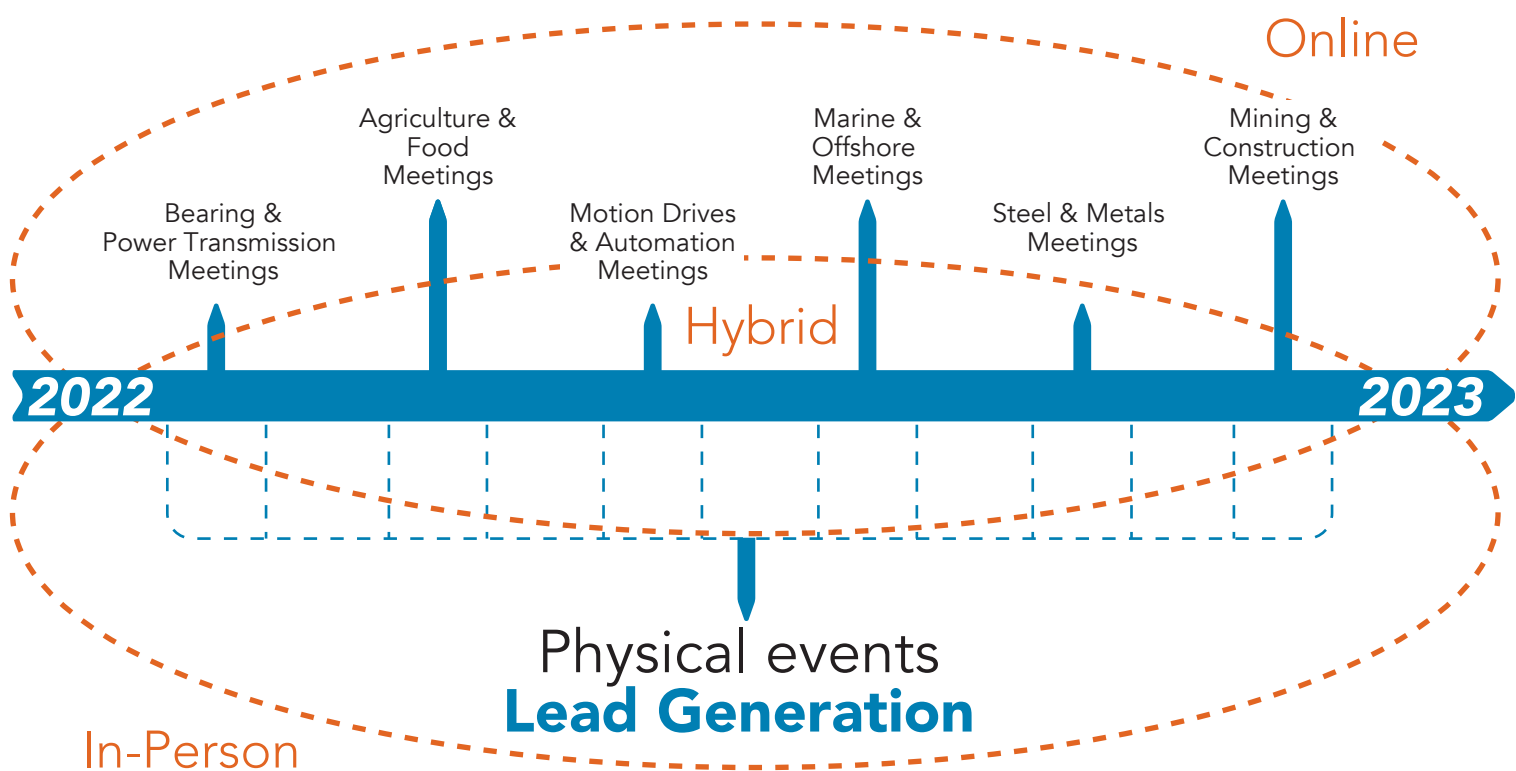
www.imotion.events

What is Industrial Motion Hybrid Meetings 2022

Best of the In-Person and Virtual Networking Experience

iMotion Events Hybrid Meetings is a unique event structure that will encompass a full year of virtual meetings across 20+ physical events audience within 15 different industries. Working globally through local teams and activities within the selected events, participants will be able to connect with PT/MC professionals, end-users, manufacturers and distributors worldwide. Operating before, during, and after physical events, the online matchmaking meetings will significantly augment trade show capacity and allow participants to return to virtual portions of their market at their convenience. Overall, iMotion Events Hybrid Meetings is offering a community building strategy with the opportunity to reach visibility among 100,000+ industry peers.

Full Year Hybrid Meetings



6+ Online Events in 2022

The iMotion Events Hybrid Meetings will host 6+ online events, with focus on the power transmission solutions, and in connection with the audience from 20+ physical events. The main online events and matchmaking meetings will be as following:



Bearing & Power Transmission Meetings

21 - 23 March 2022



Agri Machinery & Food Production Meetings

23 - 25 May 2022



Motion Drives & Automation Meetings

20 - 22 June 2022



Marine & Offshore Meetings

10 - 12 October 2022



Steel & Metals Meetings

14 - 16 November 2022



Mining & Construction Meetings

05 - 07 December 2022

**Additional online events can be added to the planning during the year.*



Full Year Online Matchmaking

The online matchmaking and event platform of iMotion Events Hybrid Meetings will be available for a whole year during 2022, and accessible with one single account. The platform will feature pre-scheduled meeting, matchmaking, exhibitors area, sponsor presentations, networking, Q&A sessions and many more features...

Connect with 20+ Physical Events Globally

Apart from the online matchmaking and industry events, iMotion Events Hybrid Meetings will conduct a whole list of activities before, during and after 20+ physical events, covering more than 15 different industries where power transmission and industrial motion solutions will be the center of attention.

Why Industrial Motion Hybrid Meetings 2022

The Future of Events and Networking is Hybrid

Hybrid events are here to stay, and it is safe to say these changes are permanent. In order to understand why, it's important to first comprehend the structure of a hybrid event. In a basic format, hybrid events incorporate features from both in-person and online event structures with a shared experience for all participants. The utilization of technical capabilities will allow participants to reach their specific audience on a magnified level, increasing the productivity of events, while also socially engaging face-to-face.

Top 10 Reasons to Join

- 1 Connect with the global power transmission industry peers for 1 year
- 2 Pre-schedule meetings with potential leads and partners [in-person or virtual]
- 3 Market your product in 15+ different industries
- 4 Present your solutions within 20+ physical events in 2022
- 5 Organize your customized company event within the community
- 6 Expand your brand visibility worldwide, in print and digital
- 7 Find new suppliers
- 8 Receive monthly international event reports and contacts
- 9 Keep track of your ROI
- 10 Reach 100,000+ industry peers

— Who Will Attend?

160+
Exhibitors

2,400+
Attendees

35+
Speakers

6+
Events

15+
Industries

60+
Countries

More than 2,400 participants have attended our industrial motion events since 2016, both in-person and online, connecting 160+ exhibitors and 35+ speakers with power transmission and motion control industry peers globally

Exhibitors Profile

- Power Transmission Companies
- Component Manufacturers
- Distributor Companies
- Lubrication Companies
- Equipment Manufacturers
- Industrial Machinery Companies
- Solution Providers
- Engineering Companies
- Associations and Service Organizations



BEARINGS



BELTS &
BELT DRIVES



CHAINS &
CHAIN DRIVES



CLUTCHES &
BRAKES



CONTROLS &
SENSORS



CONVEYOR
COMPONENTS



COUPLINGS



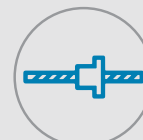
INDUSTRIAL
ELECTRONICS



GEARS &
GEARBOXES



FLUID POWER



LINEAR MOTION



MAINTENANCE
PRODUCTS



MOTORS



ROBOTICS &
AUTOMATION



SEALS



OTHER
PRODUCTS

Attendee Profile

- Original Equipment Manufacturers
- Distributors
- Service Providers
- Mechanical Engineers
- Reliability Engineers
- Lubrication Engineers
- Maintenance Engineers
- Machinery Engineers



Lubrication



Mining



Agriculture



Gearboxes



Robotics
& Automation



Food & Beverage



Distribution



Lifting



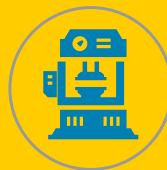
Automotive



Textiles



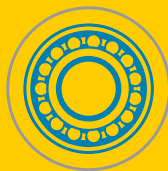
Wind Power



Machinery



Railway



PT Components



Offshore



Engineering



Machine Tools



Off-Highway

Job Functions

- Design Engineers
- Purchase / Procurement / Sourcing Management
- Technical Teams
- Owner / MD / President
- Sales & Business Development
- Marketing
- Maintenance Engineers
- R&D
- Project Management

Connect with all your industry peers through one-single platform

iMotion Events participation is free of charge for Design Engineers, Sourcing Teams, Procurement Professionals and Students.

Contact marketing@imotion.media for your full-year free access to the online events.

www.imotion.events



+ PET line // On UCB's PET line water and soda pop are filled into four different sizes of bottle – here the 330-milliliter variant.

– Key role for quality

KHS supports beverage producer UCB from Cameroon in implementing its ambitious sustainability goals



On the booming beer market in Cameroon one local brewery isn't simply out to make a few fast bucks – or francs – but is instead going for sustainability, high-quality products and future-proof technology. This strategy is proving extremely successful and has made the company the market leader in major cities.



+ Packaging section // View of the line's packaging section: in the center is the labeler, with the packer to the right and the conveyors with buffer segments in front of and between the two.

Fast urbanization and a rapidly growing middle class are turning large swathes of the African continent into a dynamic market that holds great potential. With their sales markets in North America and Europe stagnating or declining, this is something international breweries especially are profiting from and where they see new opportunities. Consumption is rising every year by 5%; in 2015 experts from the Deutsche Bank already forecast that by 2025 more than a third of the growth in worldwide beer sales would be attributable to sub-Saharan Africa.

This trend is also evident in Cameroon, whose gross domestic product has more than doubled over the last 15 years. However, it's not just the big international names that are quenching the increasing thirst of the population here. One local business is also in the same top league as the major players: Union Camerounaise de Brasseries (UCB) based in the port of Douala ranks second on the Central African market between two big global breweries. With its traditional King Beer and Kadji Beer and K44 brands UCB is very popular in Cameroon. The company is also heralded as something of a pioneer. A considerable amount has been invested

in new technology since 2016: this includes two new returnable glass lines, for example, for which KHS supplied the entire packaging and palletizing sections in 2019 and 2020. Furthermore, in May of 2021 a KHS PET line – UCB's very first – was commissioned for the relatively new segment of soda pop and water. It has a capacity of up to 20,000 bottles per hour and comprises a stretch blow molder/filler block, labeler, packaging machine and palletizing equipment. At the time of writing UCB is also considering filling its beverages into cans; in keeping with its role as a trailblazer, this would make it the first brewery in Cameroon to operate its own can filling process.

On schedule

The coronavirus pandemic caused a number of delays among sub-suppliers responsible for preceding work, particularly in 2020, that could be largely compensated for as both the packaging and palletizing sections of the second glass line and the new PET line were more or less fully implemented by the KHS subsidiary in Nigeria. This meant that installation and commissioning were completed within the given time frame.



+ Innoket Neo // The KHS Innoket Neo roll-fed labeler dresses the PET bottles on the line with labels.

Many other KHS projects currently in progress in Cameroon illustrate that the country is booming and steadily becoming an attractive market for the Dortmund systems supplier. In the past, the French-speaking countries of Africa especially imported a large percentage of their beverages. However, more and more local retailers and bottlers are now asking themselves why they should ship beverages in from Europe when they could bottle them themselves in their own region.

In the following interview, Whalen Kadji, project manager for the Kadji Group and one of the brewery founder's grandsons, gives us an insight into his company's philosophy and sustainability strategy and talks about its cooperation with KHS.

How would you describe UCB's corporate philosophy?

Our company is characterized both by the deep roots it has in the culture of Cameroon and by our wish to become better and better. Founded in 1972, we've always put quality before quantity and have thus been able to retain our expertise and individuality. As proud Cameroonians we still stand for perfect craftsmanship in brewing and believe in only using the best ingredients.

Quality seems to be an important factor for your

brewery. How do you establish and maintain your high standards of quality?

Our core values are creativity, integrity and courage. Quality also indeed plays a key role for us – in our processes and in our dealings with our partners, both in Cameroon and abroad. With the help of a dedicated system of quality management, with precise planning and strict methods of measurement we achieve top performance at practically every point in the value chain.

What have been the most significant success factors in the almost 50 years of your company?

For us, people have always been the key to our success. Our founder Joseph Kadji Defosso envisaged a company that would become one of the best in its field. Besides this vision he also had the will and determination to achieve this goal. Now, under the leadership of Nicole Kadji Defosso, his daughter, we're constantly on the lookout for first-class employees whose professional attitude and qualifications satisfy the highest standards and who are able to tread in Joseph Kadji's great footsteps.

If we now turn to the bottling of your products, which container segments are most important in Cameroon? And what role does sustainability play in this context?



+ Innopack Kisters SP // The line at UCB includes an Innopack Kisters SP, a shrink packer that wraps and bundles the packs in shrink film.



+ Excellent service // A KHS service employee shows UCB operators how to change reels on the Innoket Neo for roll-fed labeling.

On our home beer market the returnable glass bottle definitely has the lion's share. Beer can be pasteurized in this type of container, meaning that it keeps longer. What's more, the glass acts as a CO₂ diffusion barrier, thus ensuring long-lasting quality on the shelf. Moreover, bar proprietors and owners of small stores find it of great benefit that the empties are collected from their properties. Finally, for our part we procure our bottles from a local glass factory that can also recycle glass. This therefore means that this is a tried-and-tested and sustainable material for container manufacture on all counts.

Which trends and developments do you see emerging in relation to beverage packaging in Cameroon?

PET has enjoyed a rise in popularity in conjunction with carbonated soft drinks and water for some time now. Unfortunately, we don't yet have a bottle-to-bottle recycling system in Cameroon, however. At the moment plastic bottles are merely pressed, shredded and sent to a PET materials manufacturer. In view of their rapidly increasing use and the subsequent growing amount of plastic waste, the PET recycling process still needs to become established here. Cans and kegs made of aluminum could be an alternative to this material but at present this is still a very small segment, albeit one that's growing. This is based on the premise that these containers are made locally,

however. Cameroon needs to catch up here.

Is plastic waste a big issue in your country? What are the state and the economy doing to prevent it?

Plastic and especially PET waste is indeed a big problem. We do have a few state regulations and levies in place but they have very little impact. One major reason for this is, for example, that empty PET bottles are often reused for a totally different purpose, although there are repeated warnings not to do so. For the Kadji Group, which UCB is part of, the protection of the environment has a high priority. We've thus entered into partnership with a number of startups that invest in PET recycling. Among them is a company that makes school bags and pencil cases from recycled PET and another that presses and bundles returned bottles and sends them to recyclers in Europe. We're also planning on building our own recycling plant in the near future. PET is a great opportunity for the African market. After all, we all want to act sustainably.

Why was it necessary to make the most recent investment in your production technology?

With our former, extremely old lines we could neither meet the growing demand nor adhere to production standards. In order to stay competitive and satisfy our customers, we thus had to invest in

UCB and KHS // Long-term partners UCB and KHS: Benedict Jatto, sales and marketing manager for KHS Machines Nigeria, Alexander Fuchs, managing director of KHS Machines Nigeria and Whalen Kadji, project manager for the Kadji Group, which UCB is part of (from left to right).





new plant engineering. We looked for robust, reliable technology that gives us the right product quality at the right time. In opting for KHS we made a very good choice.

What particular challenges did you face regarding economic and ecological sustainability and what results have you achieved?

If you want to stay competitive and cut costs, you have to optimize your use of resources and learn how to produce more intelligently and more sustainably. KHS showed us just which factors pushed our production costs up in the past; accordingly, machine availability was one of the key criteria that prompted us to award the contract to the company from Dortmund. After installing our new glass line our performance increased by 50%, with our CO₂ consumption dropping by almost 40% at the same time. We were even able to halve the amount of product loss.

How would you describe the relationship between UCB and KHS?

We've worked with KHS and its predecessor companies since our founding almost 50 years ago. Although we were only a small business back then, our concerns were always given the greatest attention. Historically speaking, we thus have a very strong relationship. Whereas in the past we usually did business with KHS contacts in France or South Africa, KHS now has a young, dynamic and flexible team in Lagos, Nigeria, with well-trained technicians and engineers. For us, our most recent investments prove that machines are one thing but that having a trusting partnership with access to extensive technical support is at least just as important.

What role does after-sales service play for your company?

A system of technical support with reliable maintenance and service is a crucial aspect for us. KHS already gave us top-quality service many years ago. And today we can also still rely on receiving unlimited assistance at any time of the day or night. The availability of spare parts presents a particular challenge: here, KHS scores on all fronts with its West African service hub in Lagos, Nigeria.

How did the corona crisis affect the installation and commissioning of your new lines?

Managing projects during the pandemic was an

enormous challenge. During the first lockdown last year, lots of people were really worried about coming to work or traveling. We were also initially concerned about having engineers come to us from Europe that was much more heavily affected than many parts of Africa. This was further complicated by the fact that PCR tests were hard to come by. There was only one test center in the capital of Yaoundé which is about four hours from us. And even those who managed to get tested still had to quarantine for two weeks. We therefore decided to postpone the entire installation of the glass line until the end of 2020.

What future strategic goals does your company have?

We've been in the beverage industry in Cameroon and Central Africa for almost half a century now. We'll continue to supply high-quality products and act sustainably in the future, too. In maintaining and intensifying relations with our business partners we'll foster growth and at the same time reduce the negative impact of our line of business on the environment. Dealing with Covid-19 has heightened our awareness of the future opportunities open to us across the entire continent.

Family firm – The Kadji Group

In order to pool his diverse range of entrepreneurial activities, back in 1960 Joseph Kadji Defosso founded the Kadji Group. The conglomerate, that today employs around 1,500 people and is still under family ownership, includes companies from a broad spectrum of industrial sectors. Besides the UCB brewery, plastics manufacturer Polyplast is also a member of the group, as is a flour mill (SCC) in the port of Douala. The Kadji Group is also in insurance with Assurances Générales du Cameroun (AGC) and has a real estate company that is responsible for the development and operation of a number of high-rise buildings as well as the famous Kadji Square shopping center. The group also operates in areas such as logistics, transport and the hotel and hospitality industries. Last but not least, the Kadji Defosso Foundation is the group's pillar as far as charity and social actions are concerned, geared towards excellence and giving constant support to communities.

For more information go to: www.khs.com/en/media
Subscribe to our newsletter at:
www.khs.com/en/media/publications/newsletter.html

— Precise Environment Detection

— Continental Develops a Left-turn Assist for Agricultural Machines



+ Continental sees environment detection as a decisive topic for the automated future of agriculture.



- + Digital solutions for agricultural environment detection ensure greater safety on the road and more efficiency on the fields
- + Turn assist, panoramic view camera systems and more – Continental customers are already benefiting today from developments for autonomous agricultural machines
- + WiFi cameras equipped with a magnet end the era of restricted fields of view

The technology company sees environment detection as a decisive topic for the automated future of agriculture. “We use our in-depth know-how in passenger cars and trucks as the technological springboard for making agriculture fit for the future. As part of our Off-Highway initiative, we’ve gone into the agribusiness application field holistically – and we have adapted, further developed and rethought solutions,” says Gilles Mabire, Head of the Commercial Vehicles & Aftermarket Business Unit, where Continental bundles electronic and digital products for commercial vehicles and mobile machines. “We are on a direct path towards autonomous agricultural machinery and we’re using the knowledge we gain to enable our customers to benefit from our research today. The left-turn assist is a very good example of this.”

Focus on human safety

According to the statistics portal statista, there were 55 fatalities in accidents involving agricultural tractors in 2018, and the official road traffic accident statistics of the German Statistical Office tell us that 57% of road deaths in 2018 were caused by accidents on country roads. Industry experts believe that the left-hand turn of agricultural machinery vehicles on public roads is particularly risky. After all, around a third of these vehicles’ operating time is spent on these roads – although they were not designed for this purpose,

since they often have different dimensions than other road users in terms of length, height and width. Agricultural machines also have wide blind spots and fewer light sources on the vehicle, so their signals are often difficult to see. Other road users must also adapt to their low speeds.

Left-turn assist warns drivers in the event of an emergency

Continental is meeting this challenge with its new left-turn assist: The system warns the agricultural machine’s driver of obstacles on the left side of the vehicle by means of an acoustic or optical signal. The system can detect approaching vehicles at a distance of up to 250 meters. This is made possible by radar technology. The system is based on 77 gigahertz technology, which captures the vehicle environment in a significantly higher resolution than before. “Earlier technologies used mirrors and cameras. The radar technology is new to the market for this application and it offers many advantages,” says Ulrich Roskoni, Head of Technical Product Design for Special Vehicles in the Continental Independent Aftermarket Business Segment. “Radar sensors enable precise distance control; the sensor can ‘look’ back and determine the speed of the oncoming vehicles and the distance between them and the agricultural machine.”



+ Continental's left-turn assist can detect approaching vehicles at a distance of up to 250 meters and warn the driver.

More advantages: Radar sensors are independent of weather and lighting conditions, the Continental system is easy to install, and it does not overload the driver with information. "The driver doesn't need a monitor; he's only warned in an emergency. This is in line with our Continental philosophy for the human-machine interface, which is to always give the driver only the information he really needs," emphasizes Roskoni.

Turn assists soon with combined radar and camera technology

To develop the left-turn assist, Continental is working together with a major original equipment manufacturer for agricultural machinery. Technologically, the company is relying on proven devices: in this case, it is the right-turn assist for trucks, which will be mandatory for all new EU vehicle types from 2022. "There is currently no product on the market that can compare with the left-turn assist. In addition to the rear and side mirrors used previously, the current products are usually based on camera technology. These systems are limited to certain distances and are not able to warn the driver on their own, so radar is a more appropriate technology in this case. However, camera technology

also has its strengths and we're working to merge radar and camera technologies, which would give us even better information," says Roskoni.

This benefits the driver, who cannot have his eyes everywhere and whose field of vision is restricted by the dimensions of his vehicle. In the long term, the camera, radar and lidar sensor types will detect the environment together – completely and redundantly. The information obtained in this way serves as the basis for autonomous machine decisions.

ProViu 360 Surround View system for a clear picture of the field

This sensor fusion, initially of radar and camera information, will also be applied to the digital camera system ProViu 360 in the future. Production of the ProViu 360 is scheduled to start in 2020, and a total of four 1.3 megapixel cameras will be used, giving the driver a bird's eye view of his machine. This enables the system to deliver sharper images in HD resolution, displayed on a 10-inch HD touch display. The next step will then see ProViu 360 becoming intelligent. Markers, icons and texts will be placed on the camera image as augmented reality.



+ The second generation of the intelligent ProViu 360 surround view system will provide the driver with a panoramic bird's eye view of the machine in HD resolution on a touch display.

WiFi and magnet: Retrofitting cameras without cable clutter

The magnetically fixed and wireless WLAN cameras that Continental is currently developing are of particular interest for retrofitting agricultural machinery. Due to their small, 7-centimeter diameter, these round cameras with fisheye lenses can be mounted in previously impossible or too complicated locations – on the shovel of a wheel loader, for example, or on the back of a trailer. With its protection class IP69K, the camera is more or less immune against external influences and its batteries are inductively charged without any exposed contacts. The painted surface of the vehicle is protected by the camera's rubber jacket. The neodymium magnet and an acceleration sensor ensure enormous flexibility. The magnet can be attached to metallic surfaces and withstands all rough usage – but at the same time it ensures that the cameras can be easily dismantled and placed elsewhere. Thanks to the acceleration sensor, the image aligns itself automatically, but the operator still has the freedom to pan or zoom the image thanks to the 12 megapixel resolution of the image sensor. Drivers who are familiar with their own usage scenarios can also attach holders to the important spots on their machine. With a short connection to the next live cable, charging is automated, and thanks to an RFID chip, the camera immediately recognizes which machine it has been attached to, and the field

of view is automatically adjusted.



+ The magnetically fixed and wireless WLAN cameras that Continental is currently developing are of particular interest for retrofitting.



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PT Applications
from **Agriculture to**
Food Manufacturing



In today's world of nearly 8 billion people, food production looks very different than it did in the recent past, and many immediate changes are directly correlated to the Covid-19 pandemic. From growth to harvest, to packaging and transport, food producers depend on reliable PT applications to meet changing consumer needs and growing population demands.



Currently, there is a greater importance on the efficiency of global agriculture and food production. According to the Food and Agriculture Organization of the United Nations, the Covid-19 pandemic may have pushed an additional 83-132 million people into chronic hunger in 2020 alone.¹

Increased demand, material shortages, and rapidly changing consumer behaviors have driven food production to the maximum. There is now an intensified focus on healthier, immune-boosting food

options, cleanliness, and bulk foods purchased for at home meal preparation. Additionally, crippled supply chains have created a strengthened desire to source locally, a concept that parallels re-shoring efforts taking place in other industries.

While the homogeneous link between agriculture and food manufacturing is on full display in the wake of the pandemic, global food producers are accustomed to constant increases in demand, acclimation to societal trends, and meeting higher food safety standards.



Some 50 years ago, the global population numbered 3.8 billion, and today that figure has more than doubled.² In 2019, global crop production yielded a staggering 9.4 billion tons, an increase of more than 53% from the year 2000. Within the same time period, production of vegetable oils more than doubled, and at 337 million tons, meat production rose 44%.³

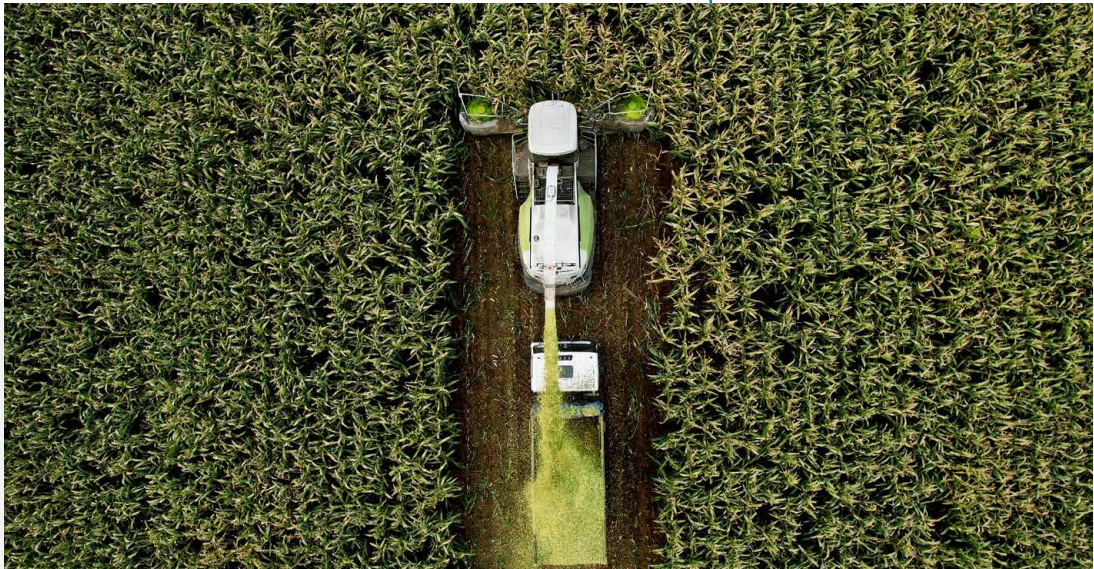
In conjunction with heightened demand, sustainability has been an imperative element. The UN general assembly released the 2030 Agenda for Sustainable (Global) Development, and to no surprise, food production is at the heart of the plan.⁴ An emphasis on sustainable production requires PT solution providers to supply high performance, energy efficient products that reduce environmental footprints, while simultaneously meeting performance requirements.

Farms that use heavy machinery for production are embracing autonomous electric vehicles and robotics, alongside the evolving changes within transportation. Processing facilities are implementing new material requirements that need minimal servicing, including improvements to stainless steel components, composite and epoxy coated PT systems, motors, controls, and gearing.⁵ Conveyor

solutions are moving to operate without lubrication, and many more innovations are on the horizon.

With continuous population growth and richer diets, the food you eat today can follow a supply chain for thousands of miles, and the emergence of biotechnology has led to significant investment by the private sector. Growth in food engineering and agricultural R&D are creating more options for consumers.⁶ It can be expected that alongside the implications of the Covid-19 pandemic, food demand will continue to rise, sustainable production will remain at the forefront, in turn increasing the need for new innovative PT solutions that support production.

As agriculture and food manufacturing intersects every corner of the globe, buyer and supplier connections are an integral part of the future. To help meet the spike in recent demand and promote healthy growth, iMotion Events is organizing the Agriculture & Food Production matchmaking meetings. On April 13-15, Power Transmission and Motion Control professionals will connect globally, through a carefully designed hybrid event structure that aims to maximize both online and in person matchmaking opportunities.



Resources

1. *FAO organization:* www.fao.org/sdg-progress-report/2021/en
2. *World bank:* data.worldbank.org/indicator/SP.POP.TOTL
3. *FAO:* www.fao.org/3/cb4477en/online/cb4477en.html#chapter-2
4. *United Nations:* www.un.org/ga/search/view_doc.asp?symbol=A/70/L.1&Lang=E
5. *RegalRexnord:* www.regalrexnord.com/tools-resources/ip69k-washdown-solutions/5-ways-food-beverage-manufacturing-has-changed
6. *FAO Organization:* www.fao.org/3/md883E/md883E.pdf

Rickard Gustafson
CEO and President at SKF





SKF® Enters a New Era *with* **Rickard Gustafson**



Bearing industry leader, SKF, recently welcomed Mr. Rickard Gustafson to the position of CEO and President. The BearingNews editorial team had the distinct pleasure of sitting down with Mr. Gustafson to candidly discuss his new role. In this exclusive interview, readers are provided a unique opportunity to hear directly from one of the industry's most prominent new leaders.

Mr. Gustafson brings a breadth of professional experience to SKF. Having held previous leadership roles within several well-known organizations, he is most notably recognized for his decade long tenure as CEO of SAS. Now, with a keen understanding of the bearing industry, Rickard Gustafson weighs in on current trends, objectives, and future insights, with particular attention dedicated to the utilization of technology, the importance of sustainability, and finally, the capacity to navigate today's rapidly evolving world.



For scope 1 and 2, we will be net zero by 2030,
and as of today, some of our facilities are already net zero.
For Scope 3 are aiming for net zero by 2050.





Q: First of all, we would like to congratulate you on your new position at SKF. Can you tell us more about your background? Who is Rickard Gustafson?

It's my pleasure to be a part of this very iconic company, SKF, a company with such a global footprint. I have an engineering background, (a long time ago) I graduated in 1989 from the University of Technology in Linköping Sweden. I joined what is now known as Accenture for 7 years, back then it was Anderson Consulting. Following this role, I spent 10 years with GE and GE capital in various positions, and eventually I became the CEO of a property and casualty insurance business here in Scandinavia called Codan/Trygg Hansa where I spent 7 years running that company. I was recruited to lead the flag carrier here, Scandinavian Airlines, SAS, and I did that for 10 years. And since June 1st I'm here at SKF, so I'm delighted. It's a new industry for me and a new company.

Q: You are remembered for your sustainability initiatives at SAS, which became the starting point for a new era in the entire aviation industry. May we expect a similar trend and change within the bearing and power transmission industries?

I do hope so, I think within any industry we all need to do everything we can to transform our businesses towards a more sustainable future, and I will be keen to do whatever I can to ensure that SKF is perceived as a leader within our industry and think there are number of things we are already doing. We have set very ambitious targets for ourselves. For scope 1 and 2, we will be net zero by 2030, and as of today, some of our facilities are already net zero. Such as the one here in Gothenburg for example. For Scope 3 are aiming for net zero by 2050 and the reason why we need a longer time is because we need to transform the steel industry so that we can source green steel and that is going to take a bit longer. So those are things that we do. But our products, they also serve our customers well in order to help them to transform their businesses towards a more sustainable future.

Because the whole idea of the bearing is to increase energy efficiency and reduce friction, it's a natural thing for us to support our customers. And we do that through innovation. I'm excited about the activities we have now for remanufacturing of bearings to create a circle, rather than a constantly re-buy and re-make. You can actually re-manufacture the bearings, I think that's exciting. I also think it's exciting to see our leading technologies in some industries such as magnetic bearings, which will be vital for hydrogen conversion. Hydrogen will require a lot of compression, and



magnetic bearings fit very well into high-speed rotation which will be required in compression. So, there are a number of things we do both internally and then of course to help our customers by using our products to become even more sustainable. So long answer to your question, but the short answer is yes, you should expect the same.

Q: What will be your strategy for a profitable growth and sustainable development for SKF in the coming years?

We have initiated a rather comprehensive strategic review process that is not yet completed. We aim to announce in the beginning of 2022. Basically, what we



have done is that we are taking a very holistic view on our business, looking into the big mega transport, how they will impact our customers and thereby us longer term. We are scrutinizing our portfolio looking into the profitability and potential in all parts of our portfolio, and based on this, we will articulate a strategy going forward. Even though I can't go into many details, I think some key components that will be part of that. We do see some industry segments that are likely to grow very rapidly in the years to come. And of course, we want to be there. And most of them are linked in some shape or form to the ongoing transformation to a more sustainable future. Wind, rail, electric vehicles and so forth. So, we are going to play there.

I think it's also going to be a lot about ensuring that we connect digitally, the entire supply chain. I think that is going to be key to come close to our customers and even closer to the customer needs, and we understand that. And the journey that we started a few years ago and the trends that we see that would, what we call "region for region". You need to have a manufacturing footprint so that you're fairly close to your customers in different regions, and that will be part of our journey going forward. So again, I need to ask for your patience, you will get a more comprehensive story from us in early February next year, but we do see a number of exciting opportunities for SKF going forward.

“

The buzz word digitization will become a reality.



”

Q: What are currently the biggest challenges for manufacturing industries?

Short term is obvious, the challenge we foresee related to logistics, related to cost inflation, we have experience in raw materials, now its energy costs that are going up. Costs for logistics are extremely challenging and now we are starting to see the cost for labor is increasing across different regions. So, those tactical things, and our ability to actually deliver to our customers, it's something that we are wrestling with every day, but hopefully those are short term issues. Longer term, there are a few key things that we need to get right, one that I mentioned is to transform the footprint, so we have the right footprint in each region. And it's not just to build the manufacturing capacity in the different regions, but we need to build very robust supply chains in all regions, so you can source your entire supply chain in a robust and effective way in those regions that you plan to operate. This is a massive work that will be undertaken in the years to come from most industrial companies to rebuild some of those capacities.

Q: Do you foresee that the reshoring of manufacturing will speed up back in Europe, the US, or other regions?

Broadly across the board, but depending on your starting point, it might look a bit different. For us, we have a long history and a rather large footprint in Europe that also supports other regions, so for us, our European challenge will be rather how do we automate, and how do we consolidate our capacity in Europe. In other regions, such as Asia or North America, we focus partly on consolidation, but it's more about building new capacity to replace some of the capacity that is being sourced from Europe to be sourced more locally. The journey will look bit different depending on your starting point.

Q: New technological innovations are creating, more than ever before, fully integrated systems, with various benefits such as production automation,

energy saving, and machine learning. How do you see this trend evolving in the coming years? How will this shape the future of manufacturing?

I do see that this will significantly change a traditional manufacturing company. Today, when you walk into a facility that has been upgraded to the latest technology it's a completely automated environment, highly robotized, it's hard to distinguish a traditional blue-collar job from a white-collar job. They blur because those colleagues of ours that man those production lines, are primarily monitoring the whole digital flow and also making adjustments, digital adjustment to the equipment, rather than working at the machines themselves. That's the starting point. Going forward, I think we are going to see much more sensors coming into this, we capture a lot of data, in the whole manufacturing footprint. How we leverage that data is going to be important for predictive maintenance, for quality enhancement, and so forth, that's going to be key.

Related to sustainability, traceability is going to be key over time. The end product needs to be marked so that you can fully understand and have an audit tract on the footprint (CO2) of that component all the way from the steel that went into it how it was manufactured when it was manufactured, in what batch and so forth. Again, that is going to be one thing. And that whole thing I mentioned about remanufacturing is going to be bigger, how we are going to integrate some of those loops. Again, when we have sensors out with our customers, we should be able to, in a much smarter way, provide predictive maintenance, so we can do the re-manufacturing when they have their planned stops in their own production lines for their maintenance, so we can avoid un-planned stops or breaks in our customers production environment. So again, the buzz word digitization will become a reality, not just a buzz word. But truly how we use data, and integrate that through our value chains and in our production lines going forward will be important.

Making the world run more smoothly

“Clean Metal” for a sustainable future

“Clean Metal” takes lubrication-free plain bearings to the next level. Copper alloy is sintered onto a steel back and impregnated with fluorine-based polymer to achieve a low coefficient of friction. Despite its simple structure, various materials with focus on low friction, high load or fast rotation are available and can be selected according to desired application. Clean Metal is compliant with recent environmental regulations and contributes to a sustainable future.



We support the sustainable development goals “Responsibility Consumption and Production” and “Climate Action” recommended by the United Nations.

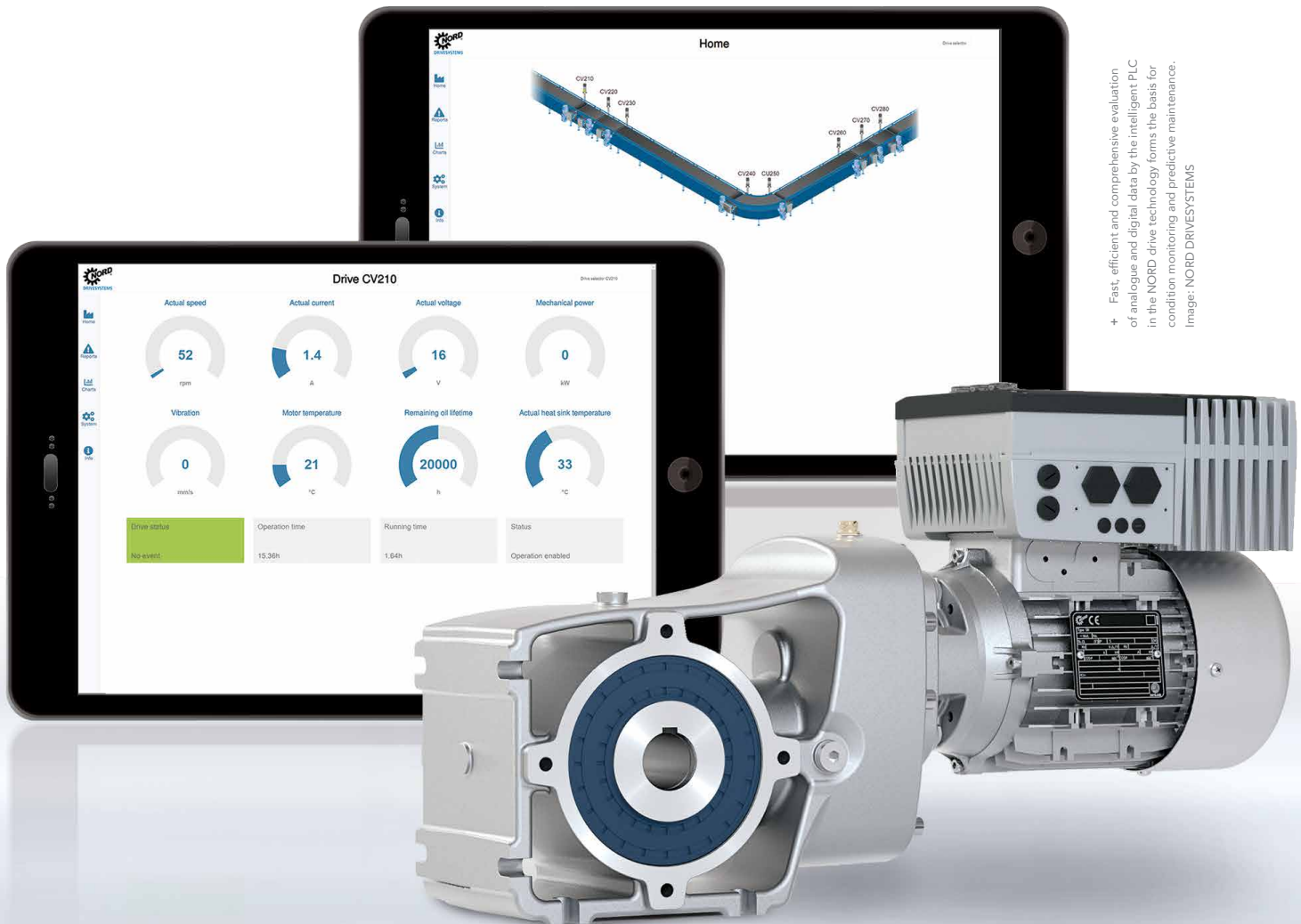
Senju Metal Europe GmbH

www.senju.com/en | Kirchnerstrasse 6-8 60311 Frankfurt am Main Germany
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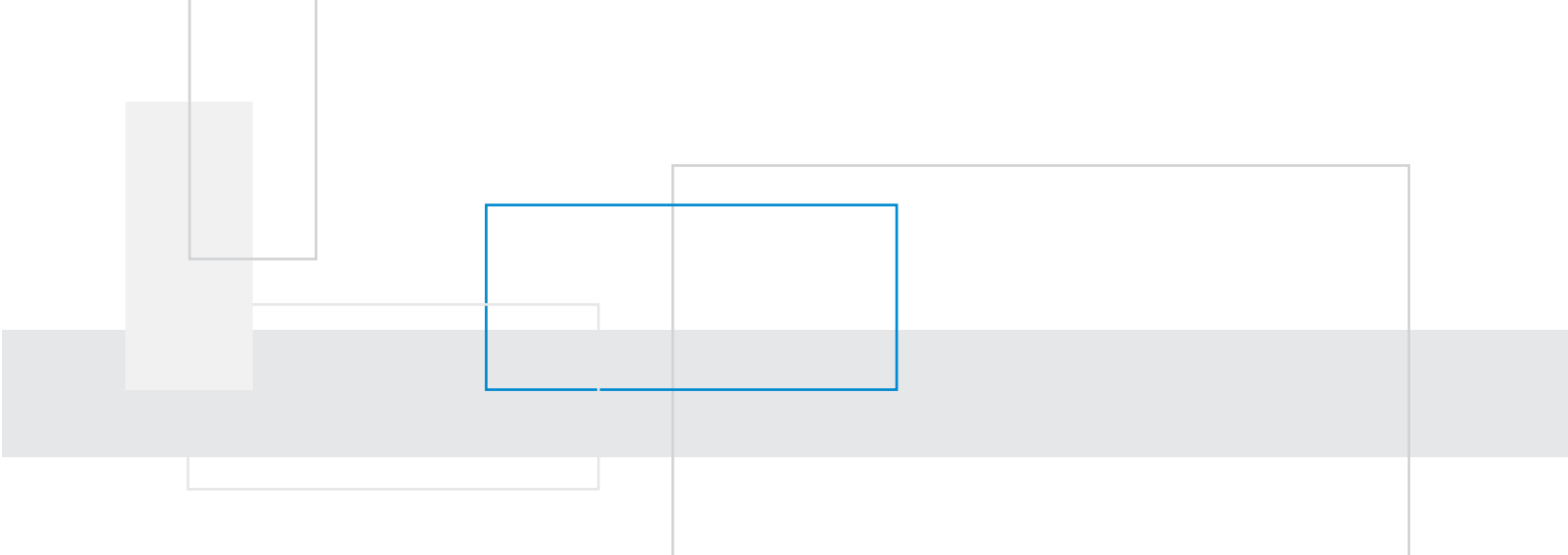
- Digitalisation in drive technology:

Customer added value from drive data Saving Transmission Belt System

How intelligent drives from NORD DRIVESYSTEMS improve availability



+ Fast, efficient and comprehensive evaluation of analogue and digital data by the intelligent PLC in the NORD drive technology forms the basis for condition monitoring and predictive maintenance. Image: NORD DRIVESYSTEMS



Predictive maintenance is the systematic continuation of condition maintenance with the aim of proactively maintaining machinery and equipment and detecting changes, reducing downtimes and increasing the efficiency of the entire plant. A status-oriented maintenance replaces the traditional time-based maintenance.

Especially for drive systems in demanding production environments where industrial gear unit installations are usually used in sensitive applications and their failure can cause severe damage, for example in intralogistics, the food industry or the heavy duty sector, condition monitoring supplements the triad of gear unit, electric motor and frequency inverter with improved safety and reliability. This is where condition monitoring for predictive maintenance comes into play: Based on intelligent algorithms and software in an IIoT environment, the networked drive units can collect their condition data in the inverter's own PLC and pre-process it together with data of connected sensors and actuators. The result of the pre-processing or the complete data can be optionally transmitted to an edge device. There, data of all subsystems is managed and evaluated. It is then available as pre-selected and edited smart data for further use and clear visualisation.

Data analysis instead of just data reading

A concrete application example is the sensorless determination of the optimum oil change time based on the oil temperature. This is based on the fact that the oil temperature is a key factor for oil ageing in gear units. This information in combination with available gear unit parameters and specific operational parameters make it possible to precisely

calculate the oil change time. A physical temperature sensor is not required. The pre-processing of drive data takes place in the NORD frequency inverter's integrated PLC that is used as an evaluation unit. The customer can access the calculated data via all common interfaces.

The right PLC software architecture for each solution

The drive equipment can be optionally extended and adjusted to the respective automation task. Customers can select what tasks (drive monitoring, drive control, process control) they want to directly shift into the drive. In smaller production areas, this scalability offers the possibility to gain first experiences before reorganising the plant. There are three configuration levels available. At the first level, the drive unit PLC only performs the drive monitoring. The drive parameters are pre-processed in the PLC and communicated to the higher level control system that is responsible for drive and process control. At the medium level, the PLC integrates the drive control and also runs drive-related functions. At the higher configuration level, the inverter PLC completely replaces the higher level control system. Apart from the communication to a control unit, a local data management without internet connection can optionally apply the data.



— VULKAN

How it all Began...



Founded in 1889, VULKAN started to produce first clutches for lifting machinery, hoists and reverse gearboxes. Fast forward to the 50's, VULKAN set a milestone by producing the first highly flexible torsional coupling. By combining application know-how, cutting-edge technology and professional competence, over the years, VULKAN became synonymous with torsional couplings. It was not until recently that VULKAN started to develop internal technology and know-how either by producing elastomers for its products in-house or diversifying its own business.

Today, VULKAN counts on three major branches, which are VULKAN Couplings (linked to the primary marine market), VULKAN Drive Tech (the industrial unit of the VULKAN Group), and VULKAN Lokring (market leader for braze-free tube connections in refrigeration systems).

VULKAN Drive Tech operates in different industrial markets such as oil & gas, steel mill, energy, bulk material handling and mining to provide high-grade solutions for industrial drive. VULKAN Drive Tech has been setting standards in terms of performance and reliability in the harshest conditions. The horizontal integration of its portfolio creates added value for the customer: torsional flexible and rigid couplings, hydrodynamic couplings, brakes, backstops and resilient mounts are all available from a single source, perfectly integrated and works in tandem as a standard solution as well as individually tailored.

Uniting Tradition and Innovation

Adopting a holistic approach to producing drivelines components for the heavy duty industries, VULKAN Drive Tech is guided by a mission to serve as a system solutions partner, preferably a simple products supplier. As international strategic partner for industrial transmissions accessories, VULKAN Drive Tech is driven by the goal to guarantee the utmost integration for different components in industrial drives, such as couplings, brakes and backstops. At VULKAN Drive Tech, we take care of the design, development, manufacturing, and most importantly, testing of all our products in-house. All product performances published in our technical literature have been calculated and tested in our in-house laboratories on a real 1:1 scale either statically or dynamically.

VULKAN Drive Tech engineering team is focused on guaranteeing that all the products installed on the same drivetrain, can properly perform and correctly interact with one another. This proves to be of great advantage for clients as they can now count on just one partner as the main source of all power transmission components and braking system.

Since preventive maintenance to reduce operational costs is also a mandatory requirement for the industry, VULKAN Drive Tech is engaged in developing innovative products to enable its clients to monitor product performances and operational status in real-time properly. For instance, VULKAN Drive Tech new power supply for electromagnetic brakes V317 can be remotely operated via the VULKAN app "V Connect", to check the main parameters of VULKAN Drive Tech electromagnetic brakes and, if necessary, reprogram the brakes' main functions remotely.

With its innovative offerings, VULKAN Drive Tech successfully optimizes its clients' product performances and reduces associated costs along the way. As a result, it has amassed an exemplary reputation among its clients.

What steers VULKAN Drive Tech ahead of the competition is its relentless pursuit to continuously improve and extend its products portfolio offering with new cutting-edge solutions which can, in the best possible manner, meet the continually evolving and changing requirements of main customers such as OEM and end-users. Furthermore, VULKAN Drive Tech optimizes its sales organization through a global presence of the company with 17 wholly-owned subsidiaries worldwide.

VULKAN Drive Tech guarantees value retention and high customer benefits for its clientele. To this end, it is always a step ahead of the competition. The basis of this is the reliability of the products and optimization of cost-benefit ratio against the backdrop of the high market requirements. Based on customer requirements, VULKAN Drive Tech engineers an integrated system solution consisting of couplings, brakes and backstops, which will fulfil the customers' initial technical and commercial requirement and therefore optimize products performances and associated costs.



– Garlock GUARDIAN®

labyrinth seals, the perfect solution for mechanical engineering applications, such as machine tools and milling machines, to avoid bearing oil leakage and debris inclusions.



Lubricant contamination is a common issue in mechanical engineering applications. Labyrinth seals offer good possibilities to avoid these problems.

A major advantage of labyrinth seals is that they are mostly wear-free and thus particularly durable. They also function safely and reliably: Moisture, dirt and dust get caught in the zigzag labyrinth paths of the seal due to flow resistance. Leaks, which can become a hazard to employees and the environment, are avoided.

The labyrinth profile consists of radial and axial spaces that give a recirculating effect during rotation, resulting in reliable protection. The labyrinth is constructed to give a non-contact seal without wear parts - for long service life and with reduced drag on the shaft.

Machine builders are often on the lookout for a suitable solution for their specific applications. In the process, many aspects must be considered.

To give an example: A company, that develops, designs

and sells 3-spindle Machine Tools was looking for sealing solutions to avoid bearing oil leakage and debris inclusions. They offer over 3 times greater productivity with a single robot and its 3-spindle system ensures much lower running costs, saving on space, energy and specialist intervention. These are unique machines with a high degree of specialization and specific requirements. Garlock GUARDIAN® labyrinth seals have been installed between the housings and their spindles. Bearing oil leakage and debris inclusions were eliminated. The company specified GUARDIAN® in all machines of a special model replacing the original labyrinth seals. The introduction of GUARDIAN® simplified the overall design and related installations. Machine reliability increased reducing the total cost of production.

As a second example, consider the following case: A company, that offers milling solutions designed for the



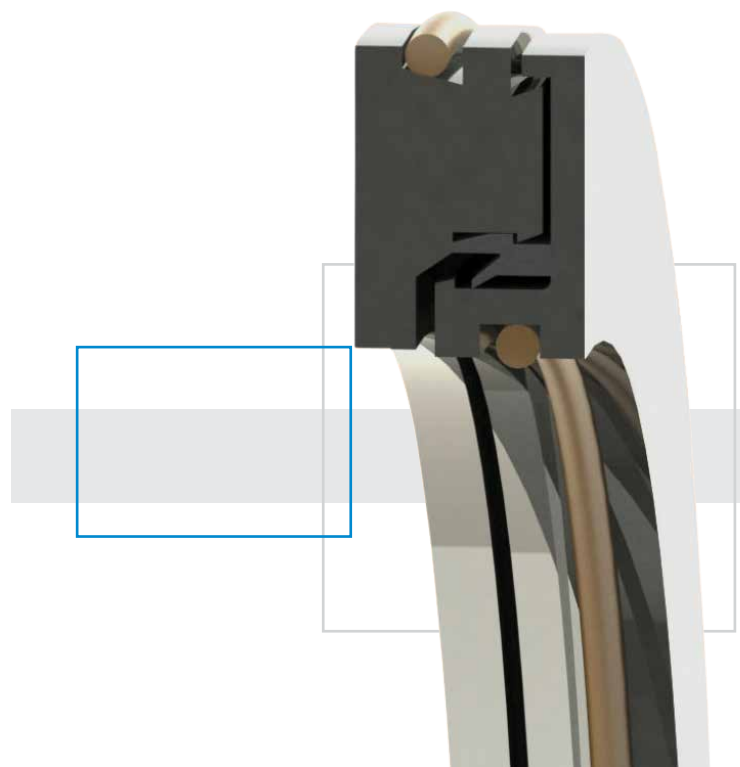
most demanding production environments, such as the power generation, automotive, aerospace, and railway industries, introduced new milling heads in their 5-axis machines and were looking for a specially designed bearing isolator. By offering the widest range of milling solutions on the market, including bed machines, gantry machines, floor type machines and machines with a T-shaped configuration, the demands were high. As it was a 5-axis machine, orientation of the head was constantly changing. Additionally, it is critical that the bearing isolator does not increase temperature in the bearing chamber as this could impact in the performance of the bearings. Garlock GUARDIAN® bearing isolators have been selected for the ability to provide a specially designed isolator, adapted to the customer's new heads and for its great performance after intensive testing. GUARDIAN® protects a high speed 6000 rpm / 80 mm diameter shaft (25 m/s) of their new milling heads, avoiding turbulent air-oil mist flow to get into the grease-lubricated bearings. GUARDIAN® mastered the requirements of the 5-axis machines and their heads and did not increase temperature in the bearing chamber. Prototypes were successfully tested in their test heads for several months. The customer has specified GUARDIAN® for their new head design, which is being introduced in all their new machines.

Garlock GUARDIAN® labyrinth seals are general-purpose seals designed to reduce downtime. The bi-directional seal provides both inlet and outlet protection. GUARDIAN® applications include auxiliary equipment in dirty, dusty, and wet environments. Split GUARDIAN® are fitted without dismantling the equipment. When uptime and mean time between repairs (MTTR) are critical, split seals are the right choice.

About Garlock

Garlock, an Enpro Company, is one of the leading international companies in the field of sealing technology and is regarded as a specialist for the sealing of critical and demanding media in innovative mechanical and plant engineering. More than 1,500 employees work for the company worldwide, of which around 240 work in Europe. Garlock is also represented by sales partners and specialist dealers in over 90 countries. Garlock supports a wide range of industries with an integrated range of services. In addition to standard seals, Garlock primarily develops and produces special solutions for customer-specific applications.

More information about Garlock solution can be found at www.garlock.com or by contacting garlockgmbh@garlock.com



Mr. Salim Haffar,
President at Eurotrans



– Adaptive measures help drive the European Power Transmission industry forward



EUROTRANS is the leading organization that represents the interests of the European power transmission industry. The federation supports a network of more than 600 enterprises that combined account for an annual production of over 40 billion euro and employ more than 160,000 people. At the forefront of this esteemed group is elected President, Mr. Salim Haffar.

Motion + Drives magazine had the distinct pleasure of interviewing Mr. Haffar in an effort to gain key insights into EUROTRANS' efforts to support of the Power Transmission industry, future trends, dynamics, as well as perspective surrounding the impact of current events, such as COVID-19.

First of all, we would like to congratulate you on your role within EUROTRANS. Can you tell us more about your history at EUROTRANS, as well as your background and current activities?

I am of French / Moroccan nationality, having lived seven years now in Turkey and working as the International Sales & Strategy Manager at I-MAK Gearbox manufacturer in Istanbul. EUROTRANS is the Federation of European Power Transmission Associations and Industries. I have been representing the MIB (Turkish Machinery Association) and Turkey at EUROTRANS for the past three years.

I had the chance to attend the EUROTRANS meeting in Belgium and Germany before the start of the pandemic. Last year I was elected president, and Mr. Andre Thuswaldner from Switzerland was elected as the Vice-President, by the Board of Directors of EUROTRANS. Due to my activities at EUROTRANS and I-MAK, I have the opportunity to interact with associations, organizations, universities and companies all around the world. This is a unique opportunity to follow the trends and dynamics of our sector on a global level, gaining key knowledge to serve the interests of our members.



How did the pandemic impact the activities at EUROTRANS so far? Which challenges have been faced since the start of the outbreak?

Thanks to the very high-profile professionals attending our meetings at EUROTRANS, we had the chance to switch immediately to online meetings. We could adapt and organize at an early stage. Our first online board meeting and even my election was done online. The main challenge with the virtual meetings was to adapt the training programs to the virtual world. One of the main missions of EUROTRANS is to prepare high level trainings for our member associations and member companies. We could manage to organize our first online trainings this year as well, with professionals attending from several countries.

The other challenge regarding online meetings for EUROTRANS is the annual meeting and networking events, where we discuss the latest trends and dynamics of our industries. The EUROTRANS International Drive Technology Meeting will be held for the first time online, this year on 30th September, with the participation of member companies, associations, and institutions from all around the world.

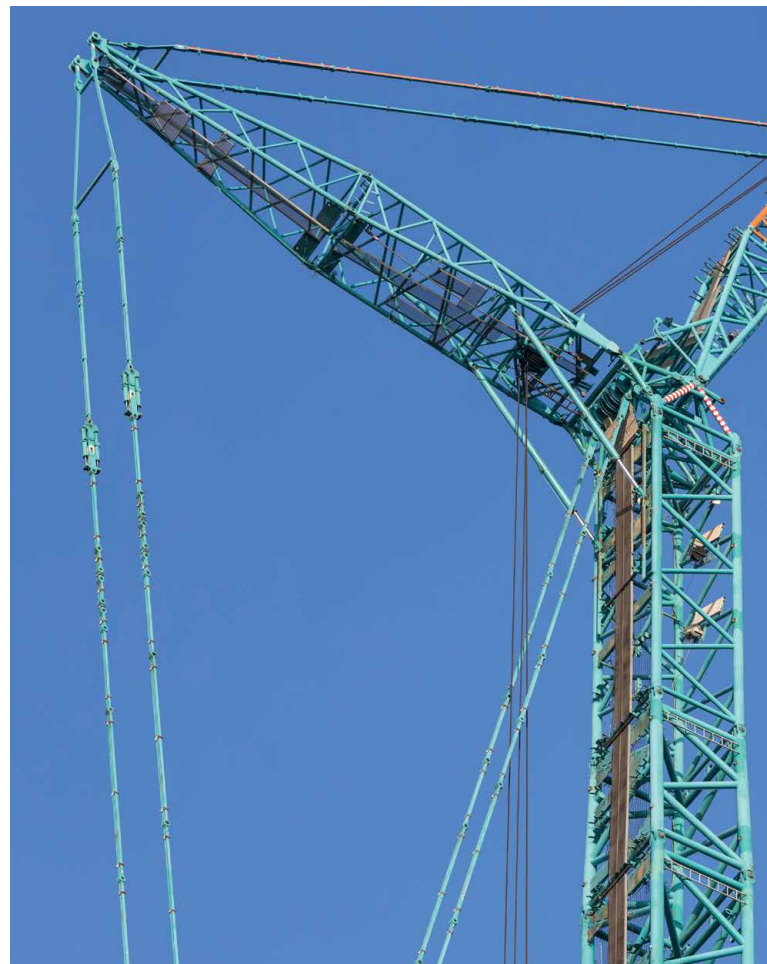
Did the recovery from the pandemic already start for the power transmission companies? What are the biggest challenges that companies will face during this process?

As per our regular discussing and internal surveys, the recovery already started for the majority of our member companies. Most of them are currently full of orders, production, and a positive provision for the future. Despite the travel restrictions, most of the companies continued their international sales operations. Most of our members show a great adaptability to the new digital reality.

As per today, the biggest challenge for the PT industry is the lack of raw materials and general cost pressure. As mentioned in our reports, many member companies struggle to receive their raw materials on time. The second challenge is from the logistics perspective, as the shortage of containers continues to impact multiple industries.

How do you see the future of the power transmission and motion control industries for the coming years ahead?

We are very positive for the future of the Power Transmission industries, as our sector continues to power, drive and contribute to many other industries



and sectors worldwide. Most of the EUROTRANS member companies manage to gain a good share in the changing energy sector, securing a new pool of growth for the future. It is also important to remember that Power Transmission components and equipment are used in most of the products in our daily life. When the growth is back again, as in the post-pandemic world, our member companies will benefit from the boost again. Wherever there is movement, there will be Power Transmission.



We are very positive for the future of the Power Transmission industries, as our sector continues to power, drive and contribute to many other industries and sectors worldwide.



Do you see the reshoring of manufacturing back in Europe speeding up with the current economic conjuncture?

The pandemic, with the travel restrictions and the increases in logistics costs, has forced many industries to either look for an alternative, or reactivate the local European supplies. Many of our members are rebuilding some old links and synergies with other Europeans companies to face together the current market pressures. Yet most of the power transmission companies are present on a worldwide level and act global. Their relocation seems too complicated or unnecessary as they already have their own production facilities spread around the world. They will continue to develop their presence in these countries and develop new chains of values.

On a local and European level the main change is

felt by smaller manufacturers and workshops that are facing a unexpected boost after many years of difficulties. The relocation and market difficulties is a unique opportunities for smallest players as major companies struggles to match with delivery time schedules.

You said in an earlier interview that digitalization and sustainability are the two key challenges for companies in the power transmission industry. What can you suggest for companies in regard to the implementation of those two key points?

It's very hard to suggest these to most of our members, since in our network and sector, most companies took very early steps in sustainability. Located in Europe, our members adapted both the production and facilities to more green and sustainable method / style. Some even reached very advanced



levels and are shown as example around the world. At the same time, our members also adapted their products to achieve higher energy efficiency and longer product life. This change started years before the new regulations and laws regarding motors efficiency (Eco design / European regulation (EC 640/2009)), showing one more time that the European power transmission sector is in advance and keep being a leader on the international level.

Regarding digitization, most of our member companies also already took the digitization path. We can suggest to remaining companies that digitization is the key to create added value and that they can become integrated and combine with the products of other companies and industries.

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The electrification of power transmission products become more and more important with the IOT and the necessity to combine all products and components into a whole system that can be managed, optimized and monitored on a single platform.

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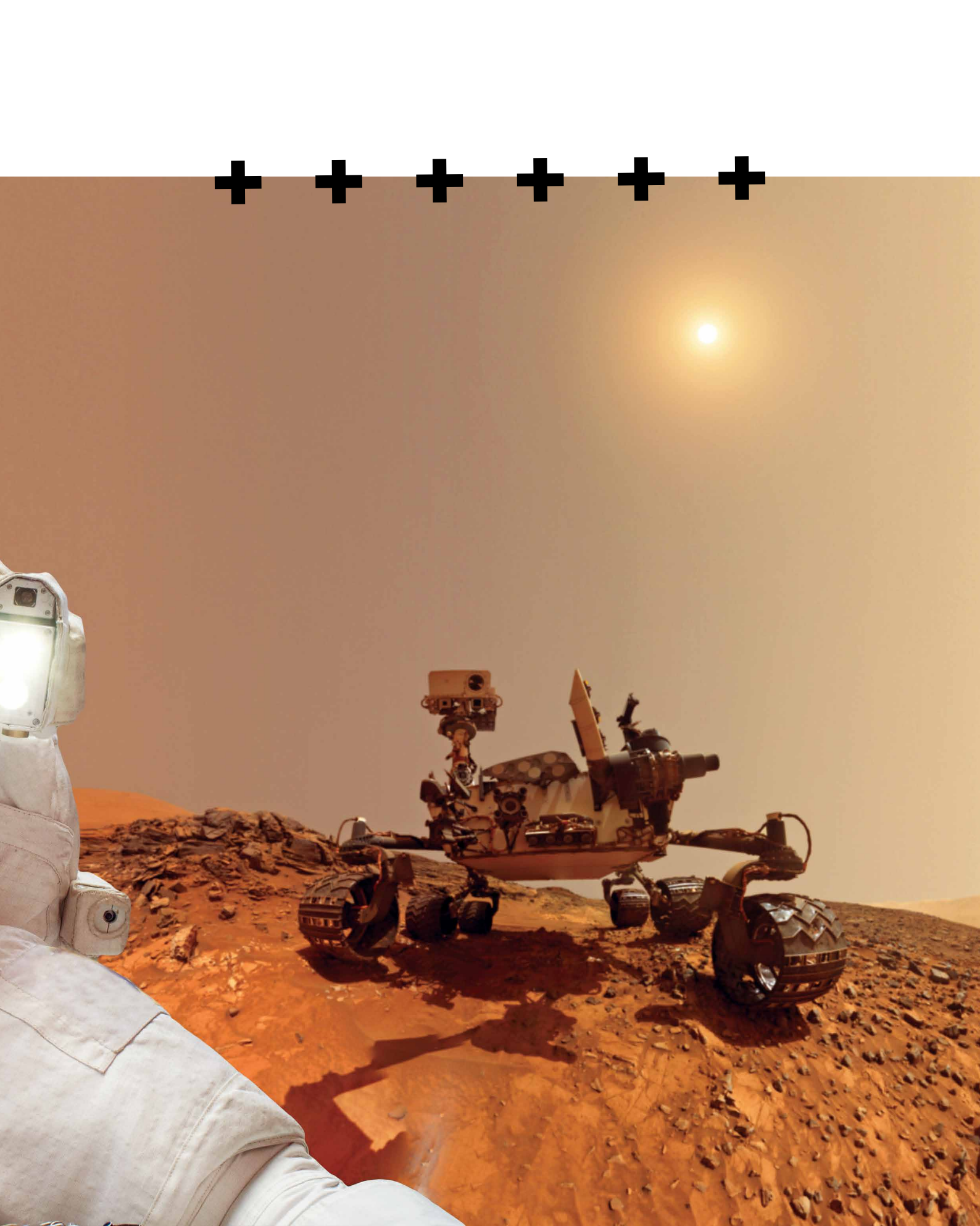
What are your thoughts on the electrification of power transmission components and systems?

Electrification of power transmission equipment actually started more than ten years ago, when the first companies started to propose solutions to track up and follow the performance of their products. Nowadays the electrification of power transmission products

become more and more important with the IOT and the necessity to combine all products and components into a whole system that can be managed, optimized and monitored on a single platform. The electrification is also a unique opportunity to create extra added value on products and keep the technological leadership of our members.

Power Transmission
Operations in Space





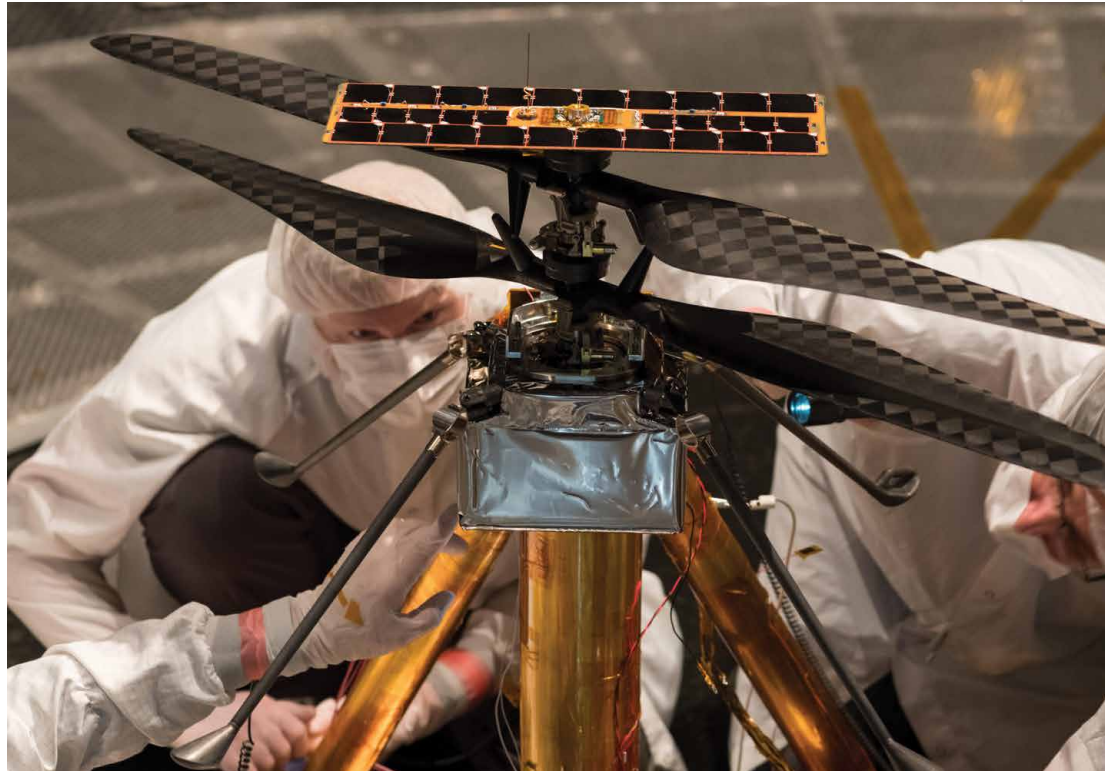
Author: Mike Brandt, editor-in-chief at Motion + Drives magazine

Maximum Function & Reliability

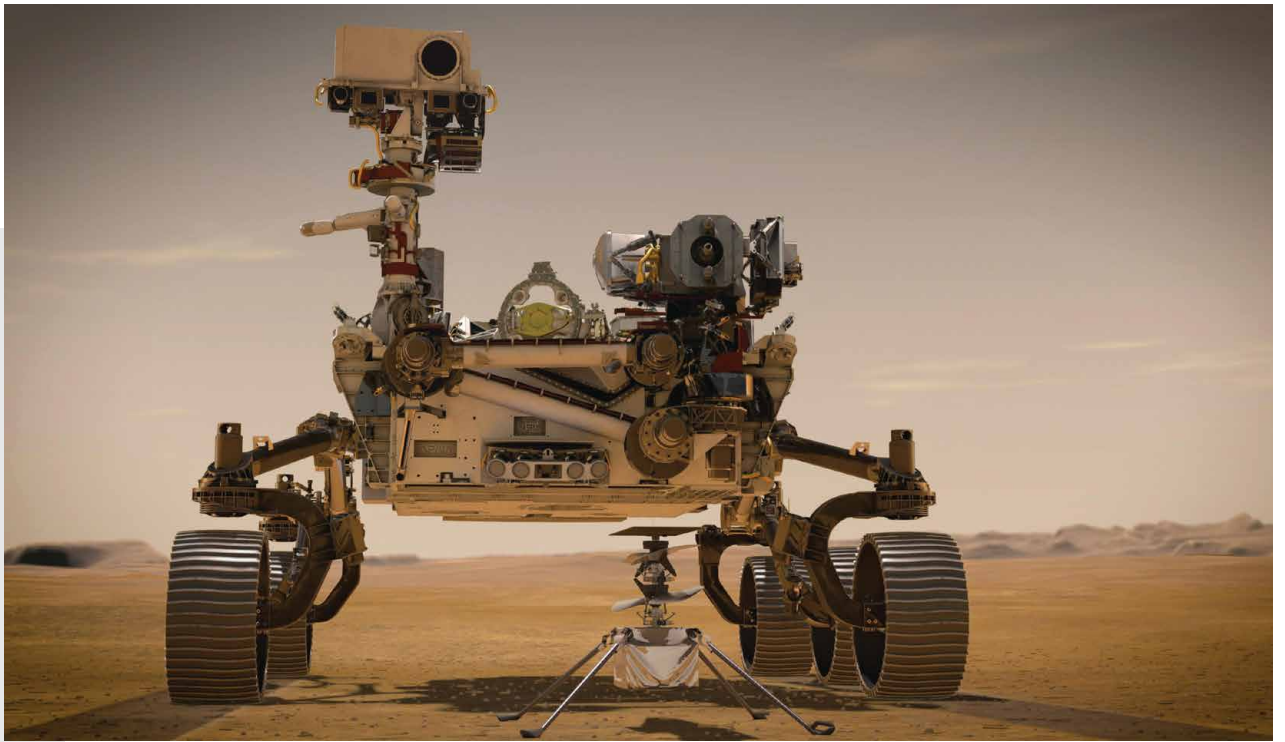


+ Image credit: NASA/JPL-Caltech // A Mars Rover and a Mars Flyer (Artist's Concept)

+ Image credit: NASA/JPL-Caltech // Inspecting Mars Helicopter



+ Image credit: NASA Astronauts on Mars With Helicopter (Illustration)



+ Image credit: NASA/JPL-Caltech // Portrait of Perseverance and Ingenuity (Artist's Concept)



As humanity continues to push the boundaries of space exploration, it has become increasingly apparent that the harsh and unforgiving environments beyond Earth pose unparalleled challenges for power transmission (PT) components. With information provided primarily by NASA's Jet Propulsion Laboratory (JPL), Motion + Drives overviews the uniquely interesting topic of PT applications in space, through the journeys of NASA's Mars Missions.

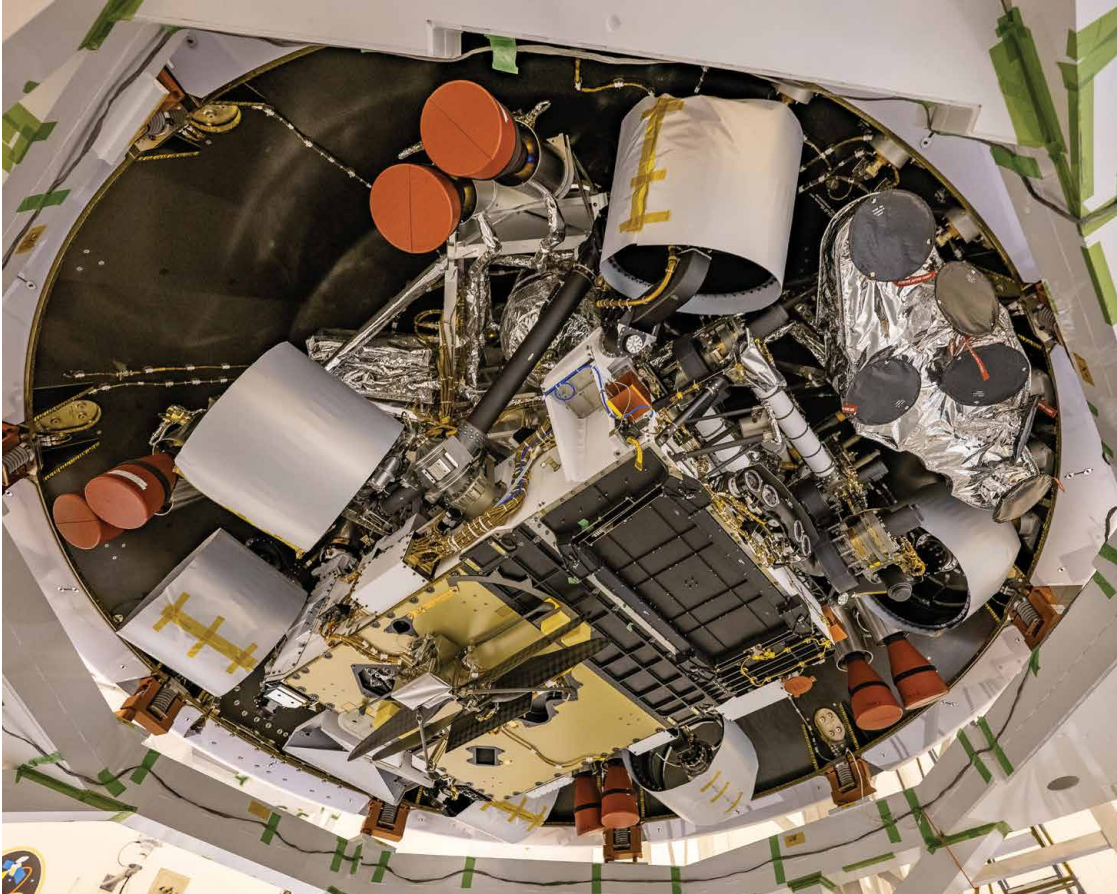
Earlier this year, NASA's Ingenuity helicopter became the first aircraft to successfully conduct a powered, controlled flight on another planet. The 49-centimeter tall, 1.8 kg, rotorcraft flew 3 meters off the surface of Mars, for a grand total of 39.1 seconds. This milestone achievement in flight tested the design limitations

of the helicopter's parts, and further proved that operations in space require an unprecedented level of durability. According to NASA, the battery powered device contains many unique components as well as "off the shelf commercial parts, that were tested in deep space for the first time with this mission."



Blades were required to spin 10 times faster than a helicopter on Earth.





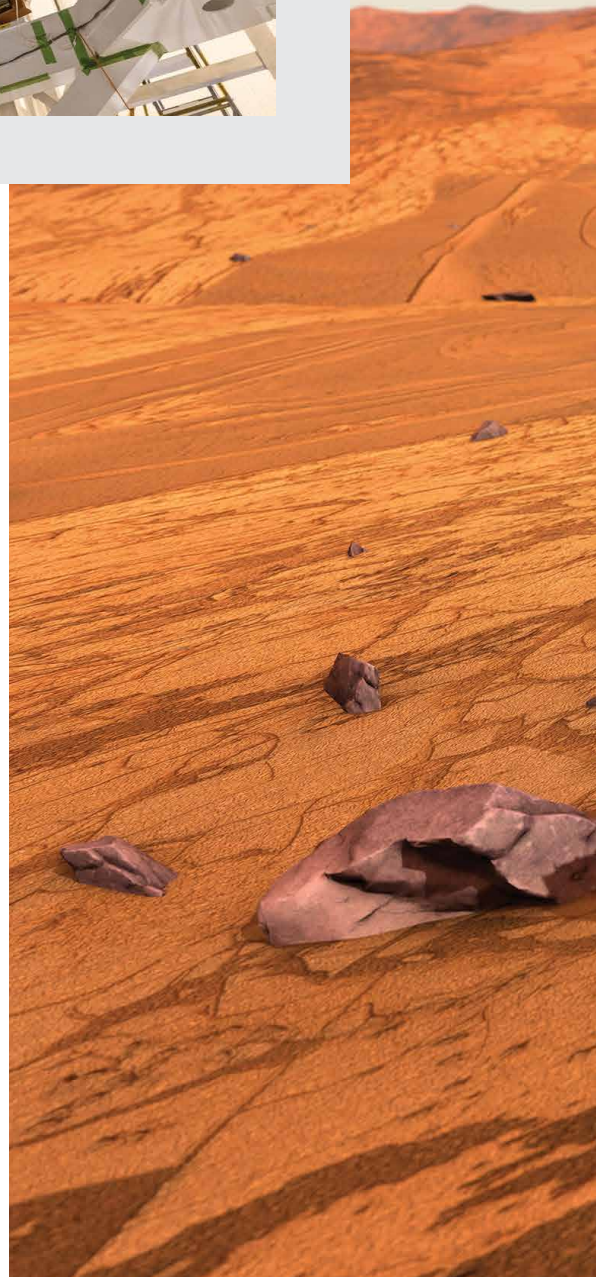
+ Image credit: NASA/JPL-Caltech // Perseverance from Below



More than 5 million pounds of thrust at liftoff, equal to roughly eighteen 747 aircraft at full power. The massive forces at play create a unique set of endurance challenges for parts destined for space.



+ Image credit: NASA // Mars Rover



At the time this article is being written, Mars sits 395 million kilometers from Earth, and NASA asserts that only about 50% of all attempts to land on Mars, by any space agency, result in a success. For Ingenuity, the success of arrival was quickly overshadowed by the next task; survival. Nights in the landing zone, Jezero Crater, can fall below 90 degrees Celsius, testing the resilience of every part on the craft.

In order to create components and systems that will operate in the harsh environments beyond our planet, engineers must fully understand the principles of physics, some of which are purely theoretical. Mars' atmospheric differences created rigorous challenges for the mechanisms of Ingenuity, pushing design further than what is necessary on Earth. This frigid environment has one third the gravity of Earth, and to make matters more complicated, Mars' extremely thin carbon dioxide filled atmosphere is 99% less dense than Earth's. With relatively few air molecules, generating enough lift was a key concern. The 1.2-meter-wide, dual rotor blades were required to spin 10 times

faster than a helicopter on Earth (2,800 RPM), but also needed to be incredibly light and stiff. The blades were ultimately constructed using carbon fiber foam core.

The iconic flight of Ingenuity is only one aspect of a very large and complex set of systems developed to push the boundaries of human design and achievement. Most importantly, for the purposes of Motion + Drives Magazine, it is a celebration for members of the global power transmission community who are routinely contributing to these awe-inspiring efforts. Today's companies are designing, producing, and equipping modern machines with power transmission components and systems durable enough not only to withstand space flight, but the alien environments of other planets.

Extreme Environments

Power transmission components destined for space exploration face their first dramatic test leaving Earth. Ingenuity's famed





+ Shutterstock/Turin, Italy - October 2015: Technicians working on the ExoMars probe module, for a European mission to Mars, at the Thales Alenia Space plants

autonomous Mars flight came after it hitched a ride on the underside of the Perseverance Rover. The equipment was sent into orbit on a United Launch Alliance Atlas V Rocket fueled with liquid oxygen and liquid hydrogen, producing over 860,000 pounds of thrust at liftoff. In comparison, the most powerful rocket by lift capacity is the Falcon Heavy rocket. According to its manufacturer, Space X, the Falcon Heavy produces more than 5 million pounds of thrust at liftoff, equal to roughly eighteen 747 aircraft at full power. The massive forces at play create a unique set of endurance challenges for parts destined for space.

The Atlas V rocket carrying Ingenuity and Perseverance left on July 30, 2020 from the hot and humid space Coast of Florida in the United States. The parts onboard endured the vibration, acceleration, gravity changes, pressure fluctuations, and the extreme heat of ascent before eventually reaching the frigid vacuum of space; an environment that can cause volatiles from materials to release and molecularly contaminate the space vehicle, its payload, in a process commonly known as outgassing.

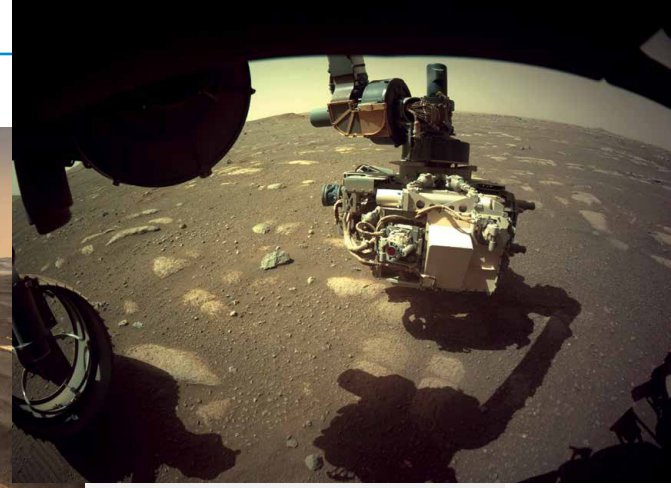
In terms of material degradation however, the most significant factor within Low Earth Orbit (LEO) is Atomic Oxygen (AO), "a product of short wavelength UV

radiation reacting with molecular oxygen. NASA asserts that "AO oxidizes many metals, especially silver, copper, and osmium. AO reacts strongly with any material containing carbon, nitrogen, sulfur and hydrogen bonds, meaning that many polymers react and erode."

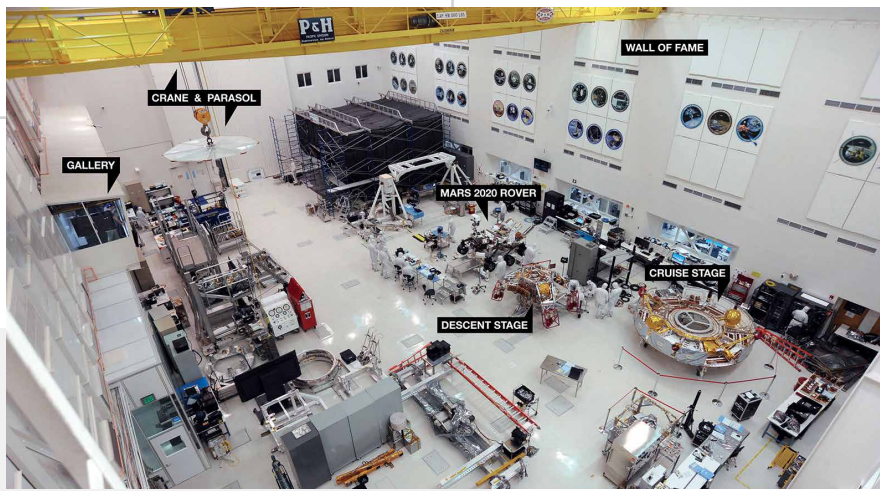
Without the blanketing protection of Earth's atmosphere, objects in space are exposed to the damaging effects of our own Sun. Ultraviolet radiation and dramatic temperature fluctuations are only a small fraction of the challenges our components face. For example, when exposed to the Sun, temperatures impacting the International Space Station (ISS) soar dramatically higher than the hottest temperatures ever recorded on Earth. In 1913, Death Valley, USA, registered a temperature of 56.7C (134.1 F), yet, on the ISS, temperatures can reach as high as 121 C (250F). Alternatively, dark side temperatures plunge to as low as -157 C (-250F), substantially below the lowest recorded temperature of any location on Earth's surface; -93.2 °C (-135.8 °F), recorded on an Antarctic plateau. The dramatic swing in temperature requires materials that won't significantly expand and contract, yet are lightweight, durable, and cost effective. Only a couple common materials regularly apply; aluminum and titanium. In fact, these materials are so durable when mixed with other metals to form an alloy, they are not



+ Image credit: NASA // The Perseverance Mars Rover with the robotic arm



+ Image credit: NASA // The Mars Rover's robotic arm



+ Image credit: NASA // High Bay 1 in JPL's Spacecraft Assembly Facility



An actuator with a titanium gearbox and dry lubricant capable of operating at -135 degrees C without a dedicated heater.



Re-thinking Power Transmission

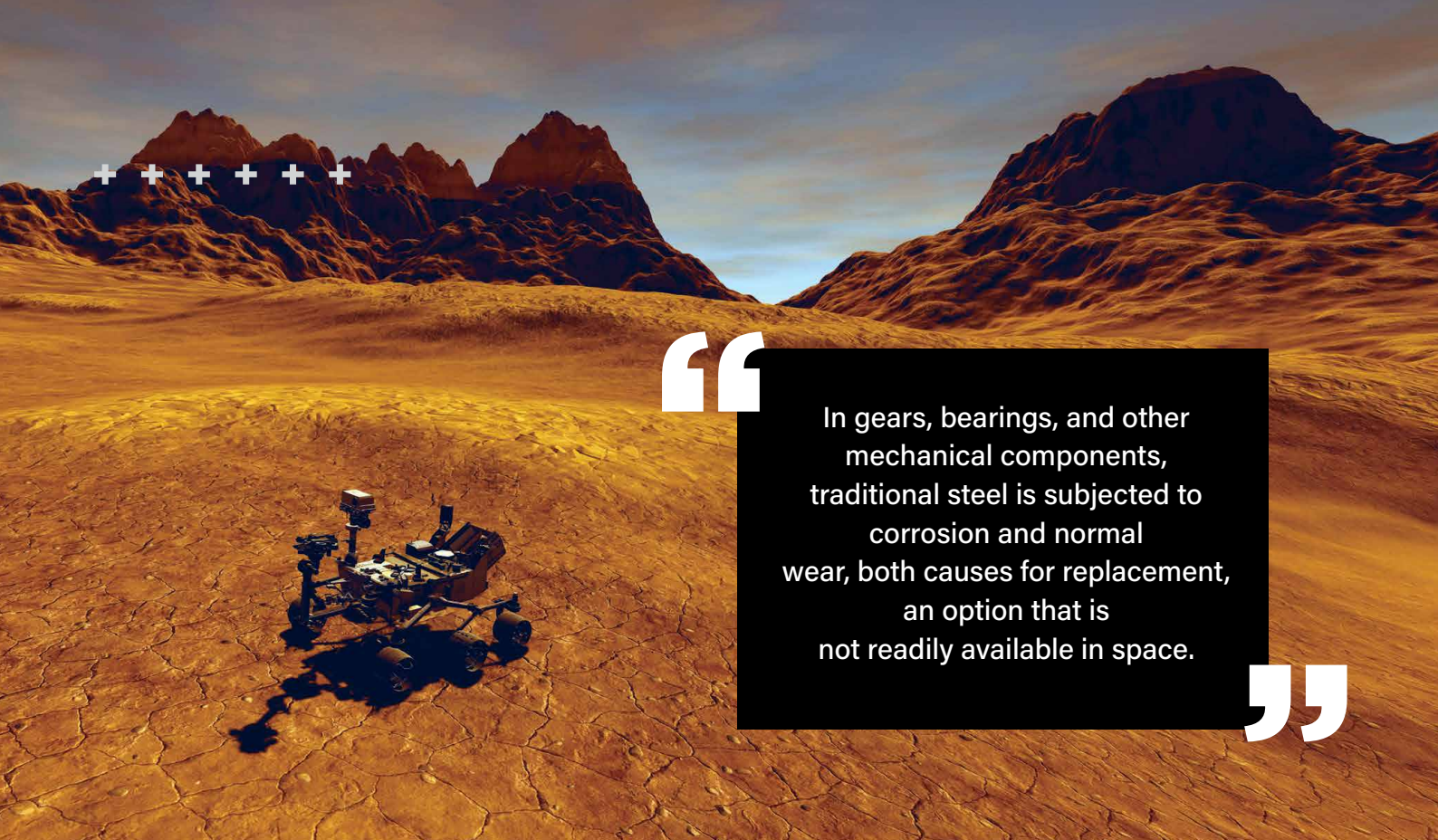
Few industries require the custom design of new mechanisms completely from scratch; however, it is a central theme for space applications, along with reduction of mass and volume. When investigating drive systems in deep space, nothing encapsulates the complexity of space applications quite like the motion control equipment in NASA's Mars Rovers.

The power sources used in deep space missions are unparalleled to common apparatuses here on Earth. Systems are required to operate for decades while withstanding extreme temperatures, and providing heat and electricity to the crafts. NASA's space missions have been dependably powered using Radioisotope Power Systems (RPS); a space nuclear power system which converts heat from naturally decaying radioisotope materials such as Plutonium-238 into electricity. Missions operating on RPS power, such as the Voyager 1 and 2, launched in 1977, continue working to this day, some 44 years later.

Currently, the vehicles operating on Mars are using a variation of RPS called Multi-Mission Radioisotope

only routinely used in satellites, but operate in our deepest space missions. One relevant example are the aluminum wheels of the Perseverance Rover, which are complete with curved titanium spokes for support, along with the rover's titanium tube legs.

Despite all our reliance on available materials and existing component designs, the continued push into harsher environments requires continual research into alternatives. The conditions of space travel require mankind to reconceptualize the materials & designs used in power transmission components here on Earth.



In gears, bearings, and other mechanical components, traditional steel is subjected to corrosion and normal wear, both causes for replacement, an option that is not readily available in space.

Thermoelectric Generators (MMRTG). This power source combined with lithium-ion batteries power the everyday missions of the crafts, and as with any other power transmission application, there is a necessity to convert that electrical input into mechanical motion. NASA's robotic exploration of Mars required the unique challenge of re-imagining and designing proper actuators. Rotary actuators are complex drive instruments comprised of a motor and gearbox, and have the primary function of driving the rover's wheels, as well as operating the scientific instruments such as the robotic arms. "The electric motor provides the energy to move the mechanism, the gearbox reduces the high output speed of the motor to a reduced speed and higher torque at the output shaft." Upwards of 30 actuators are needed to provide motion controls on one rover.

For the initial stages of actuator procurement, NASA acquired 90+ actuators/stand-alone motor units for testing. Mars Science Laboratory (MSL) actuator designs for rover applications called for "an actuator with a titanium gearbox and dry lubricant capable of operating at -135 degrees C without a dedicated heater." However, following 3 life test failures, MSL switched to a heated gearbox design with wet lubricant. Actuator development and production associated with other risk factors delayed the launch of NASA's Curiosity rover for 2 years, further justifying the importance in perfecting the complicated design adjustments. Many of the gearmotors required customization in the form of

nonconventional coatings, and bearings to cope with demanding requirements while catering the end use for the motors.

Still, in the face of new discovery, even our most trusted and tested solutions for one mission require further innovation for others. NASA wishes to use rovers to explore even colder and icier locations such as Jupiter's moon Europa. This requires hardware that can withstand such temperatures without heaters. For the sake of continuity, gearbox applications can run dry and unheated through the implementation of Bulk Metallic Glass (BMG) Gears. The development of Bulk Metallic Glass Alloys specifically for gearboxes "make them tougher than ceramics and twice as strong as steel, with better elastic properties than either...combined with greater wear and corrosion resistance."

These alternatives are defining our capabilities as many of our most recognizable materials do not hold up to the standards needed for deeper space missions. In gears, bearings, and other mechanical components, traditional steel is subjected to corrosion and normal wear, both causes for replacement, an option that is not readily available in space. Therefore, NASA relies on other alternative breakthrough innovations, such as Nitinol 60, a non-magnetic, shape memory alloy. This lighter material does not rust or dent, yet maintains a high degree of dimensional stability with potential to be used in a variety of applications.

For the purposes of our introduction into PT space applications, these intriguing examples only scratch the surface of this topic. The list of new technologies and developments is so vast that NASA offers “Standard Commercial Licensing agreements” for partner companies to produce and ultimately sell products derived from NASA’s patented technologies. This is one way space technology is constantly changing our day to day lives here on Earth.

Closer to home, the private sector is leading the way with new milestone achievements, opening the door to an industry completely devoted to space travel. Computer modeling and artificial intelligence are pushing technological progressions farther and faster than any previous time in our history. Motion + Drives will continue to highlight the variety of topics surrounding

mechanisms in space, and we will investigate companies developing the most technologically sophisticated equipment on Earth. We hope you enjoy it.

Update: *Since Ingenuity’s maiden flight on April 19, 2021, the helicopter is on its 14th flight. Seasonal shifts on Mars are creating less atmospheric density than originally tested, and once again, NASA is approaching unprecedented territory. The rotors will need to spin faster than any of the test flights performed here on Earth, and the entire system including the electrical, will be pushed into unknown territory. The thinner Martian air is just one more example of our ever-changing understanding of space environments along with the maximum reliability functions of our PT applications.*

References

Title on the link	Author	Publication Date	Link
Perseverance is Key to NASA’s Advancement of Alloys for Bearings and Gears	Claire Moore, NASA Glenn Research Center	9.07.2019	nasa.gov/feature/glenn/2019/perseverance-is-key-to-nasa-s-advancement-of-alloys-for-bearings-and-gears
Metallic Glass Gears Make for Graceful Robot	Andrew Good, Jet Propulsion Laboratory, Pasadena, Calif	28.11.2016	jpl.nasa.gov/news/metallic-glass-gears-make-for-graceful-robots
Space Technology Game Changing Development Bulk Metallic Glass Gears	National Aeronautics and Space Administration		nasa.gov/sites/default/files/atoms/files/fs_bmgg_fs_160808.pdf
NASA’s Ingenuity Mars Helicopter Succeeds in Historic First Flight	Karen Northon	19.04.2021	nasa.gov/press-release/nasa-s-ingenuity-mars-helicopter-succeeds-in-historic-first-flight
Ingenuity Mars Helicopter Landing Press Kit	NASA		jpl.nasa.gov/news/press_kits/ingenuity/landing
Tech Specs	NASA		mars.nasa.gov/technology/helicopter/#Tech-Specs
Power	NASA		jpl.nasa.gov/news/press_kits/mars_2020/landing/mission/spacecraft/power
NASA	NASA		rps.nasa.gov
A Step Forward in Reestablishing the Radioisotope Power Systems Supply Chain	Tracy Bishop	27.02.2017	rps.nasa.gov/news/21/a-step-forward-in-reestablishing-the-radioisotope-power-systems-supply-chain
Power for Decades: Radioisotope Generator Helps Voyager 2 Keep Exploring 30 Years After Neptune Flyby	Calla Cofield	22.08.2019	rps.nasa.gov/news/34/power-for-decades-radioisotope-generator-helps-voyager-2-keep-exploring-30-years-after-neptune-flyby
What is a Radioisotope Power System?	Energy	16.02.2021	energy.gov/ne/articles/what-radioisotope-power-system
Space Environmental Effects	National Aeronautics and Space Administration		nasa.gov/sites/default/files/files/NP-2015-03-015-JSC_Space_Environment-ISS-Mini-Book-2015-508.pdf
Staying Cool on the ISS	Steve Price, Dr. Tony Phillips, Gil Knier	20.03.2001	science.nasa.gov/science-news/science-at-nasa/2001/ast21mar_1
Space Environmental Effects	National Aeronautics and Space Administration		nasa.gov/sites/default/files/files/NP-2015-03-015-JSC_Space_Environment-ISS-Mini-Book-2015-508.pdf
Structures, Mechanisms, and Materials	NASA	17.12.2020	nasa.gov/smallsat-institute/sst-soa-2020/structures-materials-and-mechanisms
What Is Mars?	Flint Wild	11.08.2020	nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-mars-58.html
More On Mars	NASA		jpl.nasa.gov/news/press_kits/mars_2020/landing/more_on_mars
NASA’s Goddard Space Flight Center Licenses Gear Bearing Technology to Bahari Energy LLC for Urban Wind Power Generation	Sara Blumberg	6.03.2018	nasa.gov/press-release/goddard/2018/nasas-goddard-space-flight-center-licenses-gear-bearing-technology-to-bahari-energy
Mechanical And Fluid Systems	NASA		technology.nasa.gov/patent/GSC-TOPS-12
Multi-Mission Radioisotope Thermoelectric Generator (MMRTG)	National Aeronautics and Space Administration		mars.nasa.gov/internal_resources/788
MSL Actuator Design Process Escape	NASA		llis.nasa.gov/lesson/11501
Mars Science Laboratory Rover Actuator Thermal Design	Keith S. Novak and Yuanming Liu, Chern-Jiin Lee, Steven Hendricks		trs.jpl.nasa.gov/bitstream/handle/2014/4/5084/10-1371_A1b.pdf?sequence=1
Space X			spacex.com
Licensing Our Technology Patents	NASA		technology.grc.nasa.gov/licensing
Flying on Mars Is Getting Harder and Harder	Håvard Grip, Ingenuity Mars Helicopter Chief Pilot at NASA’s Jet Propulsion Laboratory	15.09.2021	mars.nasa.gov/technology/helicopter/status/334/flying-on-mars-is-getting-harder-and-harder
Media Usage Guidelines	NASA		nasa.gov/multimedia/guidelines/index.html - Media Usage Guidelines



+ SMART Induction
Heater Betex SLF 303

- Safe mounting and dismounting of bearings and other drive components



There can be many reasons for bearing failure, and one of them is improper installation. It is estimated that improper installation accounts for at least 18% of the defects. Traditional mounting methods can be press fitting, oil baths, even torches are used to heat parts in order to shrink fit them onto shafts. Most bearing manufacturers recommend induction heaters as a safe and controlled heating method to mount bearings. Induction heaters have been around for a long time. Early heaters were analog. They simply worked with an on off switch and had no control over the heating process. They just heated. When the digital generations were introduced, additional functionalities were added such as time and temperature control and automatic demagnetization. Induction heaters increase efficiency and reduce risk of damage and contamination.

As the development of digital systems is advancing, so are the possibilities with induction heaters. Bega Special Tools has introduced new intelligent BETEX® heater generations that are capable of both mounting and dismounting.

Developments are aimed at improving the service life of bearings and other parts, and at working damage-free

to allow parts to be reused. New features are:

- Easy to use touch screens
- Log function to store data or export to a USB-stick
- Double temperature measurement (Delta T) for perfect control and tension free heating
- Creating proof of work reports

+ Crank shaft with inner ring and the Betex MF Quick-Heater

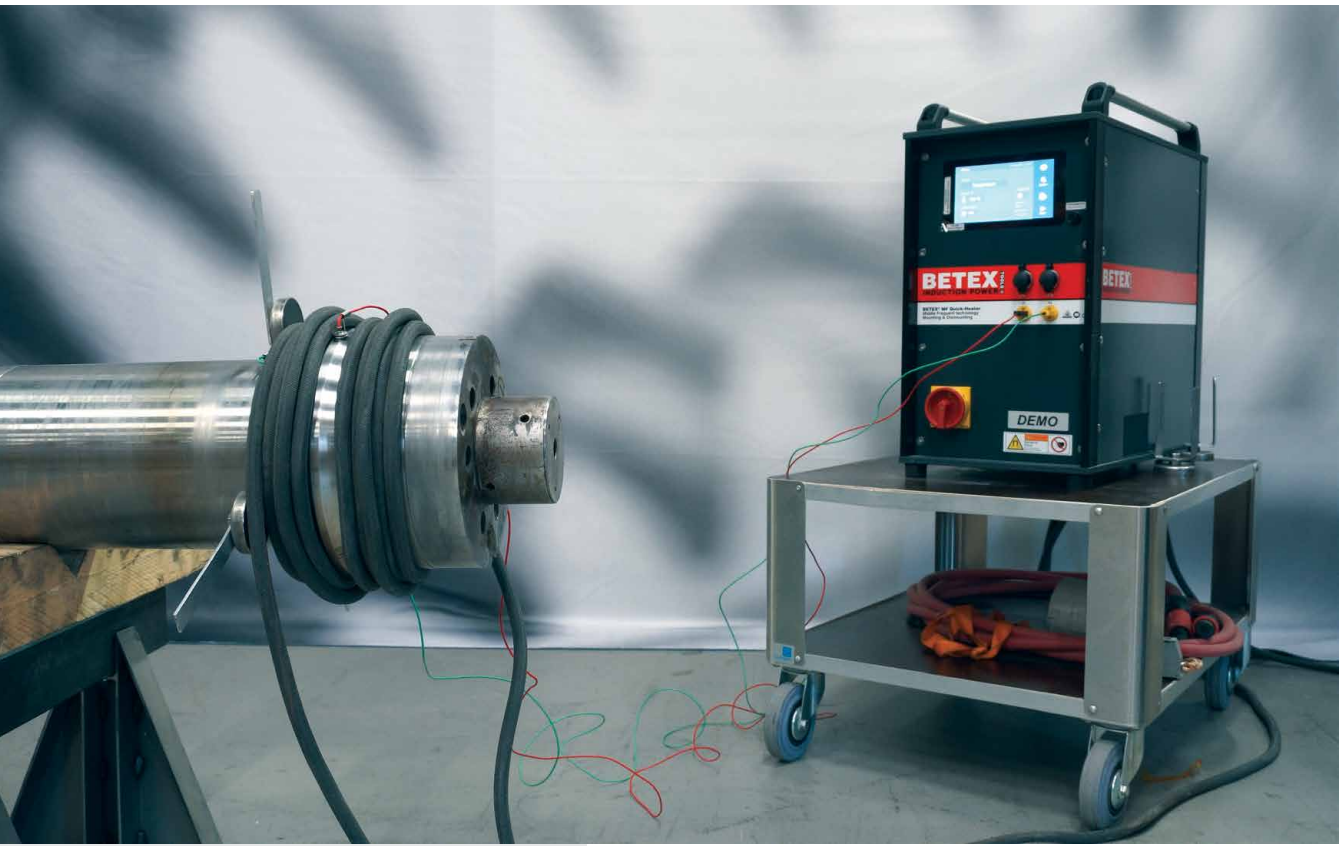


The new generation of “quick-heaters” in particular offer remarkable solutions for both mounting and dismounting. Especially the latter can cause problems during maintenance jobs where stuck parts can cause long delays. Working with grinding wheels or with gas burners is very common in workshops, with all its consequences: time consuming, damage to shafts and parts, pollution of the working environment. By using induction heating, technicians achieve a clean, damage free disassembly of stuck parts, for example due to rust or glue. In addition, induction heating contributes to a much higher level of safety for the users. There is no open fire, no noise, smoke or smell, no chance of flying steel splinters that can cause serious injuries.

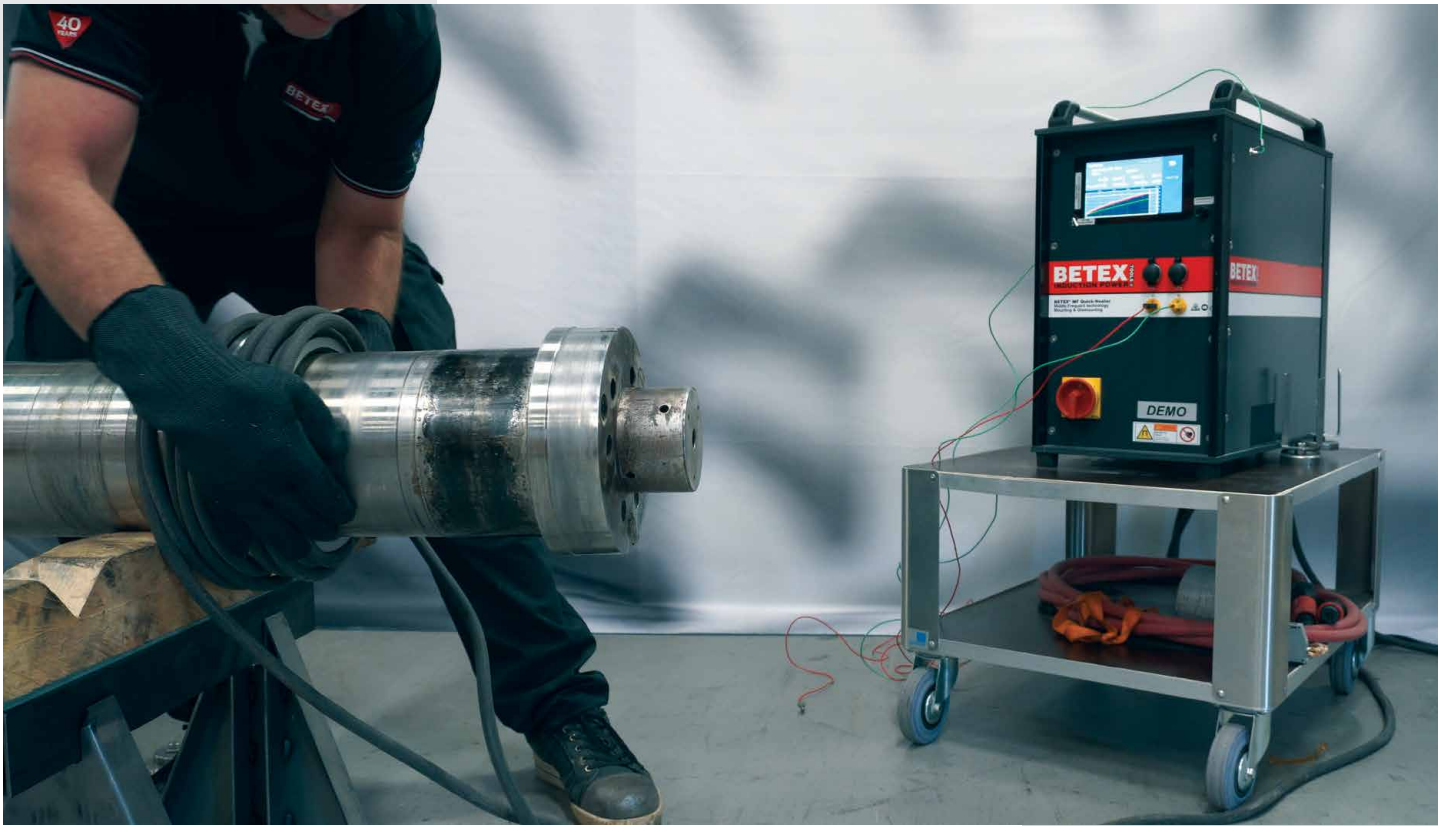
Betex MF Quick-Heaters consist of a generator used in combination with a fixed or flexible inductor. Fixed inductors are suitable for serial mounting or dismounting of labyrinth seals, bearings etc. Flexible inductors come in various lengths and diameters and can be placed around and/or in a part. Shape or size are virtually unlimited.

Technicians are pleasantly surprised when they experience how easily they can work with these devices and how quickly they can move them into position where they need to do the job. A recent project involved a manufacturer of pellet presses. For maintenance work, they have to remove inner rings from a crank shaft. Normally they would grind them off. At the customer’s request we ran some tests with a BETEX MF Quick-Heater 22 kW, with a flexible inductor. Within 1 minute, the inner ring was heated to 150°C and could be pushed off the shaft without any extra force. The customer was so pleased that they sent us other parts to test, all of which were carried out successfully. The time savings were amazing! The heater had proved its versatility so the decision to purchase it was quickly made. The dirty and noisy work of grinding off the rings is now history, much to the delight of the workers who were responsible for doing this. Also, collateral damage to the shafts is now a thing of the past.

For further information visit www.begaspecialtools.com or call +31 578 668000



+ Crank shaft with inner ring and flexible inductor



+ Crank shaft with inner ring dismantled in 1 minute





The perfect solutions for **Roller Conveyor Manufacturers**



Hutchinson designs and produces customized materials and connected solutions to respond to the needs of its global customers, on land, in the air and at sea. As global leader in vibration control, fluid management, sealing system technologies, and belt drive systems, our Group stands out with a multiple market offering spanning multiple areas of expertise and delivering synergies and value-added. Hutchinson reported revenues of €3.800 billion in 2020 and has more than 40,000 employees in 25 countries. Our ambition is to contribute to safer, more comfortable, and more responsible mobility for the future.

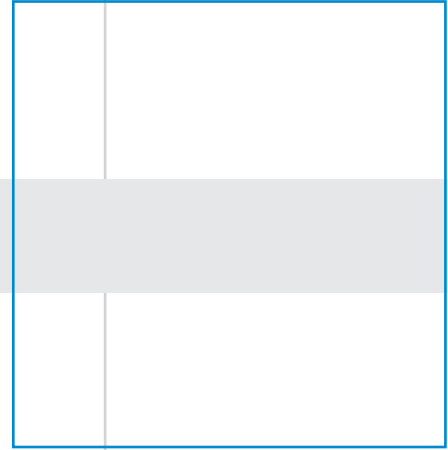
Hutchinson designed the Poly V rubber belt, as a recognized worldwide specialist in rubber Belt Drive Systems. Since 1962, Hutchinson develops and manufactures complete Drive Systems incorporating ribbed belts, linear tensioners, thermoset pulleys, idler rollers.

As a market leader, the company works with the largest OEMs in automotive, appliance, conveying, HVAC, pumps, energy supply, heavy industry, small appliances, food processing, agriculture and gardening, quarrying, mining, and building. In response to industrial customer needs, and as designer of conveyor elastic belt technology,

Hutchinson has developed the Conveyxonic® belt for roller conveyor manufacturers and is a key partner by providing innovative solutions with added value, economical and reliable solutions.

ConveyXonic® rubber belt

To meet the needs of the roller conveyors manufacturers, Hutchinson has specially developed the Conveyxonic® elastic belt. This belt is now used worldwide by all the roller conveyors manufacturers and millions of Conveyxonic® belts are fitted on thousands of conveyors kilometers each year.



The Conveyxonic® is the «6 in 1» belt capable of transporting loads from 1 to 2 tons, as well as replacing up to six transmission systems used in the conveyor assembly (flat belt, round belt, chain and timing belt, twisted belt, and tangential belt).

The belt's elastic properties allow for at least 30% reduction in costs by using 1 motor for 50 rollers while improving life span and absorption of shocks and vibrations.

The Conveyxonic® is available in two profiles to cover a power range from 55 to 550W and a linear speed from 0.10m/s to 3m/s:

- + The Conveyxonic® PJ «Light loads» easily outperforms round polyurethane belts, with its transmission ratio 4-times higher.
- + The Conveyxonic® PJ «Medium and Heavy loads» can replace a chain drive system.
- + The Conveyxonic® PK belt can be used to replace chains for very heavy loads up to 2 tons.

With the Conveyxonic® belt, you can save at least 30 % on your global roller conveying system cost, reduce inventory costs and cut your budget on maintenance.

It is easy to use, and includes the following features:

- + Universal standard shelf product, automatic or semi-automatic installation
- + Worldwide product line availability
- + Simplified installation thanks to the products elasticity
- + Technical Performances:
- + Power transmission 4 times greater than a round belt
- + Rapid and smooth package flow (up to 3m/s)
- + Antistatic belts compliant with ISO 1813

Benefits:

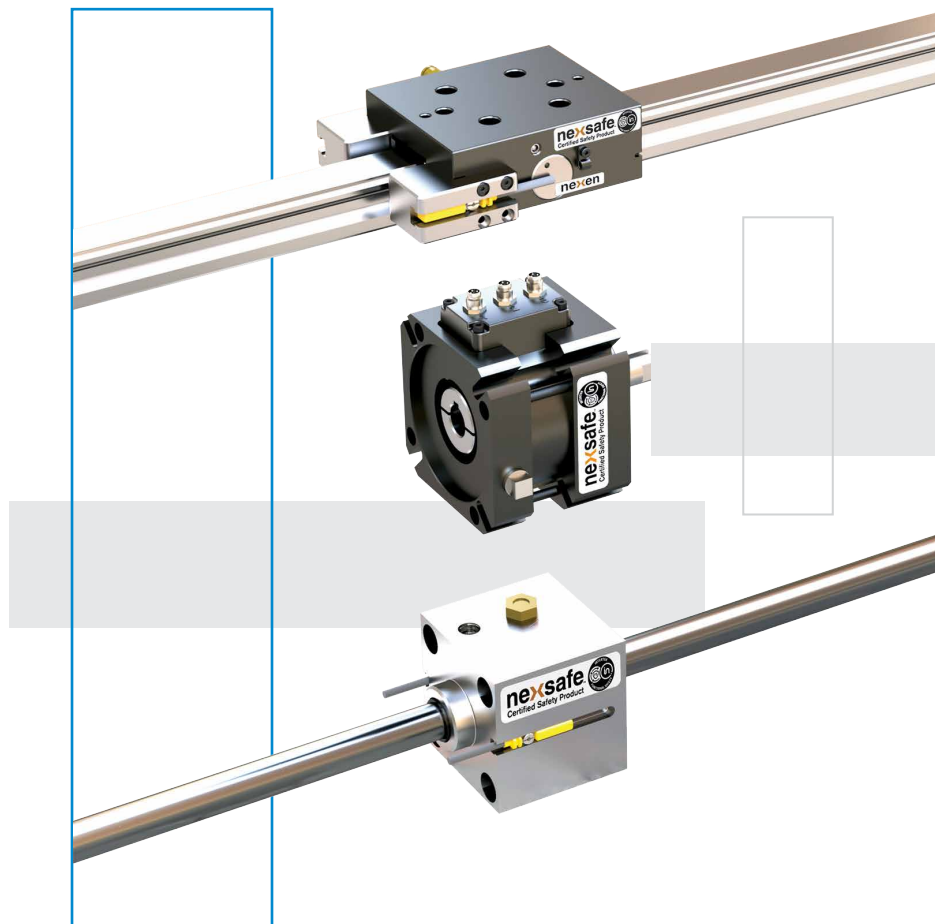
- + Durable and clean
- + Reliable and quiet
- + Guaranteed efficiency and ROI
- + Iso standard 9982
- + Free of maintenance (no grease necessary)

To help you to define your Conveyxonic® belt for your roller conveyor in a few seconds, Hutchinson has also developed the CONVEYXONIC® WIZARD APP. Do not hesitate to connect to the App and order your Conveyxonic® belts at www.hutchinsontransmission.com/resource-center/online-calculation-softwares/wizard-conveyxonic or find Hutchinson products and solutions for all markets on the company website www.hutchinsontransmission.com

Making safety a priority: NexSafe brakes with functional safety certification

+ + + + +

Nexen Group, Inc. now offers three of its brakes products with functional safety certification under its NexSafe trademark name. NexSafe functional safety certified rod locks, rail brakes and servomotor brakes can be used for machine operations such as holding, emergency stopping or positioning. They are ideal for applications where safety is a priority.



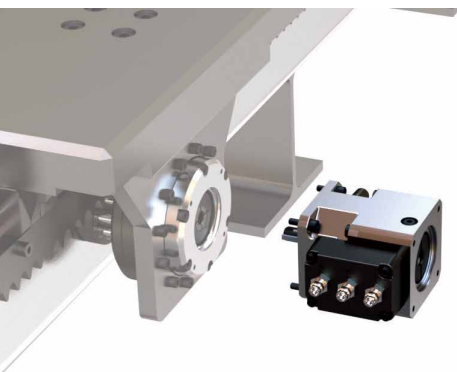
+ From top to bottom: NexSafe rail brake for installation on profiled guide rails on linear axes; NexSafe servo brake for installation between servomotors and their gearboxes; NexSafe rod lock for installation with or on pneumatic cylinders.

Functional safety

Functional safety reduces the risk of injury posed by the use of machinery in the face of operator error or mechanical failure. Building functional safety requires the design and fabrication of protective features responding to human errors, hardware failures, operational or environmental stress. ISO 13849-1 is a safety of machinery standard that assists in the design and integration of safety related parts of control systems or machines. This standard includes a system of categorizing the risk a machine poses, and the safety functions to mitigate that risk.

Certification program for industrial automation

Intertek, a company headquartered in London, provides assurance, inspection, product testing and certification. In July 2020 Intertek launched its Functional Safety Conformity Assessment Program for industrial automated machinery and robotics. The program offers manufacturers design evaluation, testing and certification with the Intertek Functional Safety (FS) Mark to signify compliance with rigorous standards for product safety and performance. The first products in North America to earn the FS Mark are Nexen's NexSafe rail brakes, servomotor brakes and rod locks.



+ The NexSafe servo brake has failsafe mechanical connections with the servomotor and gearbox; patented frustoconical friction-facing structures with tapers on both the outer and inner surfaces for simultaneous engagement with two mating surfaces; and optional sensors for feedback.

Emergency stopping and holding applications

NexSafe functional safety certified brakes provide a verified, reliable solution that machine builders can depend on. With ISO 13849-1 Functional Safety Certification, NexSafe rod locks, rail brakes and servomotor brakes are ideal for operations such as holding, emergency stopping or positioning. They are an ideal fit for applications where safety is a priority. Optional operating mode sensors further ensure NexSafe products are a fit for safety channels designed for ISO 13849-1 categories B through 4 and performance levels PLa through PLc. In addition, NexSafe brakes are certified to meet IEC 61508, ISO 12100, ISO 13850, and ISO 4414 standards.

Rail brakes: compatible with most profile guide rails and carriages

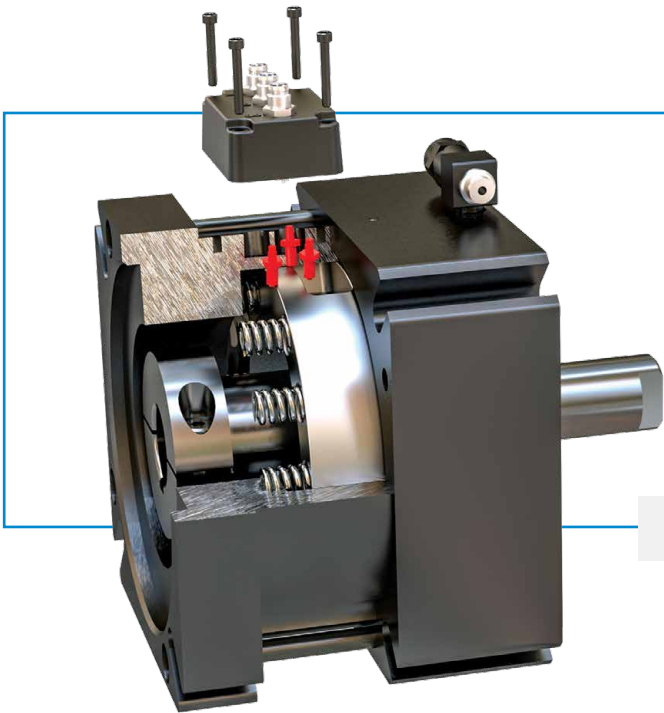
Rail Brakes grip and hold profile guide rails in linear motion systems. The NexSafe rail brake is a compact, powerful brake compatible with most profile guide rails and carriages. Rail brakes can be equipped with sensors to detect engagement and disengagement. Guide rail brakes with mounted sensors are ideal for E-stop and redundant safety braking applications such as gantry axis braking, industrial door open/close locking, medical equipment and hospital beds, primary and secondary packaging, and window and door manufacturing.

Servomotor brake: powerful high torque brake between servomotor and driven load

Servomotor brakes have been developed for braking on the shaft end of a servomotor or between a motor and gear reducer. The NexSafe servomotor brakes stop the load quickly and enhance safety with bidirectional braking capabilities. Typical applications include the production of automotive parts, cyclical operations, food production (IP67) and packaging, gantry routing, robotics, and semiconductors.

Rod locks: precision holding with guide rod systems and pneumatic cylinders

Rod locks can operate on round rails, linear rods, round shafts, and linear guide systems, or they can be mounted directly to an NFPA and ISO pneumatic cylinder. They are designed to grip and hold the piston rod of a pneumatic cylinder or a guide rod with extremely low backlash. They meet IP67



+ + +

+ The NexSafe servo brake shown here can include up to three sensors to monitor the disengagement condition, engagement condition, and wear. This feedback helps the brake satisfies the requirements for functional safety certification and deliver IIoT connectivity.

standards and can be equipped with sensors to detect engagement and disengagement. Rod locks are used for applications that require precise holding, fast engagement, and high cycle rates over millions of cycles such as automotive production, cyclical operations, food production (IP67), gantry routing, and platen presses.

Functional safety features

Brake features to help achieve high levels of functional safety include multiple engagement springs that default to lock. The friction surfaces are equipped with a proprietary friction facing, tapered on both the inner and outer friction surfaces. Those surfaces apply the braking (locking) force via springs concurrently to both the rotating shaft and brake housing to hold the shaft from rotating, all with zero backlash. To ensure safe emergency stopping and holding, there are up to three operating-mode sensors for feedback. These are essentially inductive proximity sensors to sense three different brake conditions: First, disengagement: the proximity sensor in the brake activates when rated air pressure enters the brake's the piston circuit to essentially pull the friction-facing pair apart, for a disengaged (free-running motor torque) axis condition.

Second, engagement: the proximity sensor in the brake activates when the piston and facing friction-surface pair move into engagement and application of braking (stopping) torque. Third, wear: this proximity sensor in the brake activates when the brake is engaged but the friction facing is worn enough to necessitate replacement.

Time-tested technology, Industry 4.0 ready

With spring-engaged, air-released functionality, NexSafe devices default to the locked position, making them ideal for holding a load in position or for emergency stopping situations. They can be used in any orientation. Nexen has manufactured thousands of rail brakes, servomotor brakes and rod locks for a wide range of applications. NexSafe builds on that experience, retaining form, fit, and functionality, while seeking enhanced safety. Industry 4.0 is a standard option all on NexSafe devices. More information about Nexen solutions can be found at www.nexengroup.com

About Nexen Group, Inc.:

Nexen Group, Inc. is a worldwide leader in power transmission, linear and rotary motion, and tension control components. Nexen holds 120 US and international patents. A privately held company, Nexen traces its origins back to 1902. For 50 years, Nexen has been producing industrial brakes, clutches, torque limiters, overload protection devices and control systems for a variety of industrial applications ranging from packing equipment to sawmills and automobile conveyor systems. Nexen's customers span every industry – from multi-national corporations to small businesses – and range from design engineers to plant maintenance. Headquartered in the USA and with its European office based in Wommel, Belgium, Nexen has more 40 sales offices and more than 1,500 distributor outlets worldwide.

The Couplings which you can **Fit and Forget**



+ TCAE-R-2



In its 20-year history, Australian based Thompson Couplings Limited has seen great success with its innovative range of couplings which handle load misalignment and the associated vibration. In stark contrast to the industry-standard method of laser alignment procedures for rotating equipment these couplings with misalignment ability solve many difficult problems involving situations such as soft foot and vibration due to shaft misalignment. Most couplings within the range are **“fit and forget”** requiring no maintenance and take far less time to install and operate compared to traditional shaft couplings.

The Thompson “Alignment eliminator” or TCAE coupling has proven successful with companies such as Pulp & Paper Mills, Steel industries, Gearbox drives and more recently Power Take Off units solving a variety of often difficult installations.

The TCAE range of products can manage misalignment

angles up to a total of 10° and the new V series can operate in vertical applications.

Its distinctive double-jointed hinge mechanism provides the TCAE coupling with high radial and axial flexibility thereby reducing damaging side loads to the supporting drive shafts. As a result, the TCAE is far less damaging to pump seals, bearings and other expensive rotating parts compared to traditional “flexible” couplings when operating with some small degree of shaft misalignment.

In process plants, many pumps are rigidly bound by connected pipework and failures frequently occur with traditional couplings from thermal growth, soft foot and other misalignment forces. By contrast, the TCAE can eliminate these damaging loads by allowing the pump to freely move as the pipework “grows” or as the motor flexes on its mounts.



Tests have been conducted by the Australian group to demonstrate the potential greenhouse emission savings from a reduction in wasted energy compared to traditional “flexible” couplings. The more axially and radially compliant nature of the TCAE coupling means there is significantly less energy wasted when shafts are slightly out of alignment compared to the “stiffer” nature of elastomeric or disc type couplings.

The extensive range of models within the TCAE series can handle un-factored loads of up to 7,000 kW. A carefully developed spreadsheet selection method has also been introduced to allow users to easily choose the appropriate TCAE for their unique application. Since it was first introduced in 2009 the TCAE-R series coupling has become the product of choice for Australia’s largest pulp & paper manufacturers now with hundreds in various process pump applications. Similarly, one of Indonesia’s large paper mills has made the TCAE-R coupling the product of choice for their process pumps and gearbox drives.

The benefits these two companies realise is the “**fit and forget**” nature of the coupling as well as the quick installation and worry-free operation. Furthermore, they are seeing the real cost savings in their maintenance budgets from reduced equipment downtime and quicker time return to line. An Australian manufacturer of open cut gold mining vehicles has recently ordered the thirteenth TCAE-R-2 coupling for the power take off (PTO) drive for a hydraulic pump. Due to the demanding

nature and restricted space available in the engine compartment other shaft couplings were unable to cope with the imposed alignment angle between the diesel engine PTO and the hydraulic pump. According to the design engineer Jake Schliebs *“The TCAE-2 has been a dream – the whole process with working with Thompson couplings has been smooth as butter, so thanks for that – we’ll be in contact in the future for further orders then, since it seems like we’ll have more trucks built before we even need to look at them, cheers”*

Along with the “Regular” TCAE -R series the company has newly released the TCAE-V series range for challenging vertical applications including wastewater process pumps and deep well mining plants. The TCAE-V- series will accommodate up to 5 degrees misalignment angles between the vertically mounted motor and pump.

Another unique product in the company’s line is the Thompson Constant Velocity Joint or TCVJ. Its patented design features a double cardan joint with zero length intermediate shaft and distinctive spherical centering mechanism. This coupling is designed to transmit power at angles up to 20 degrees with the highest efficiency and at true constant velocity. Since its commercialisation in 2005 this product has seen great success as a propulsion shaft coupling in the marine industry. *More information about Thompson Coupling solutions can be found at www.thompsoncouplings.com.*

— Flexacier/ Winflex grid coupling

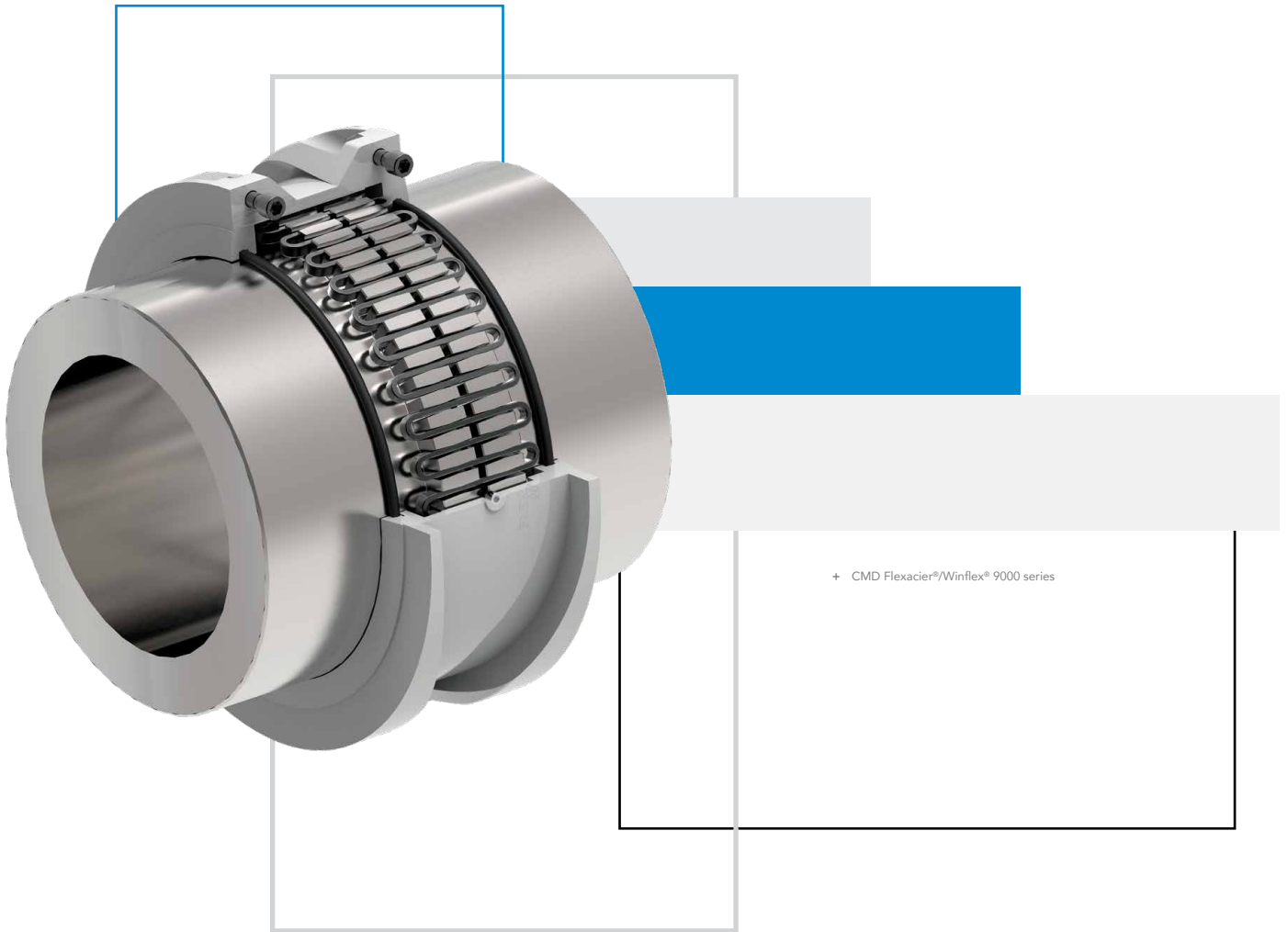
The real
maintenance
free & eco-friendly
coupling!



Today's industries not only rely on investment costs or Capital Costs (CC), but on Total Cost of Ownership (TCO). TCO includes operating & maintenance costs (OMC) in addition to CC. Depending on the period considered, OMC can have a great impact on TCO, therefore reliability & long life of components is vital.

The Flexacier®/Winflex® grid couplings offer this reliability & long life (Flexacier® brand is widely used in french & spanish speaking countries, Winflex® brand is widely used in english & german speaking countries; Flexacier® & Winflex® represent the same grid coupling ranges) ; its 100% compact metallic design, coping with harsh environment, can reach 40000 hours or 5 years between 2 maintenance operations.

Its unique design with the grid progressive stiffness allows to absorb every peak torque & shocks, observed for instance at motor start, and reduces vibration. A good summary of the Flexacier®/Winflex® coupling is that it has the torque transmission capacity of a gear coupling, with the same flexibility as an elastomeric coupling.



Elastomeric couplings manufacturers often promote the ‘maintenance free’ ability of these couplings; In fact, these couplings will require frequent maintenance operations (every 6 or 12 months), with an observed life span of 2 years (maximum 3 years in very smooth environments).

The sketch below provides various TCO’s depending on coupling technology (observed by distributors in France), based on a 9000 Nm coupling rating. Comparison is made between 4 technologies :

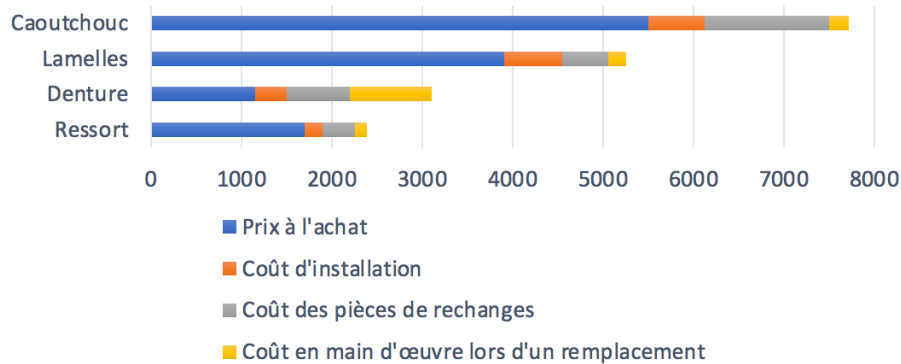
- Elastomeric (Caoutchouc on the sketch)
- Disc (‘Lamelles’ on the sketch)
- Gear (‘Denture’ on the sketch)
- Grid (‘Ressort’ on the sketch)

TCO is calculated by adding Capital Cost (CC) (‘prix à l’achat’, in blue on the sketch), and Operating &

Maintenance Costs (OMC), composed of installation cost (‘coût d’installation’, in orange on the sketch), spares cost (‘coût des pièces de rechanges’, in grey on the sketch) and maintenance staff cost (‘coût en main d’œuvre lors d’un remplacement’, in yellow on the sketch). Additional costs like ‘in service’ operation costs have not been included, as they are non significant on TCO, and technology has no real impact compared to maintenance strategy implemented by a company, so non pertinent for comparison purpose.

The CC indicated on the sketch are based on costs observed for western couplings manufacturers. More exotic sourcing is available today to reduce the CC, but for long enough periods (over 2 years), OMC will be significant enough to come to the same conclusion: The Flexacier/Winflex coupling has the best result for TCO & is the real ‘maintenance free’ coupling.

Coûts d'usage par type de technologie d'accouplements pour un couple de 9000 N.m



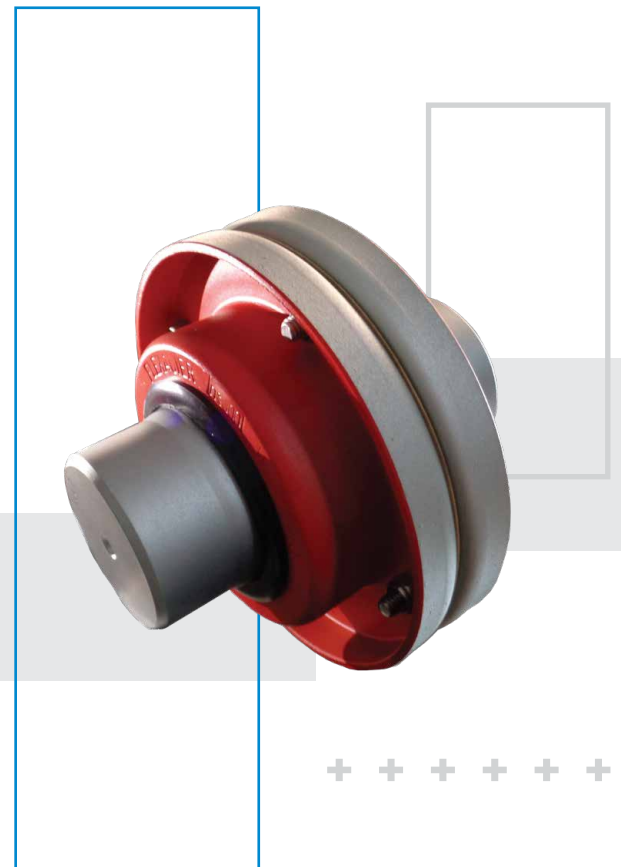
+ OMC comparison for various couplings technology (French distribution)

Another aspect to be considered, is the ability to be 'environmentally friendly'. Companies have more & more concern about their social & environmental impact, thus asking the same from their suppliers.

Being environmentally friendly is directly linked to longevity & reliability, of course, as less maintenance means less spare parts & less energy used. It is also related to recycling & circular economy. Grid couplings are made of metal, 100% recyclable. It uses lubrication of course, so extra care must be taken on sealing (problem is not the lubricant, but the leak), and also lubricant manufacturers make lots of efforts to promote more environmentally friendly greases, sometimes even with ECOLABEL. Worn elastomeric elements might be hardly recyclable.

For instance Grid couplings are now widely accepted for the food & beverage industries, as good alternates to 'non lubricated' couplings, or stainless steel couplings. Anti-corrosion or oxydation coatings, that have long been used for the ports & maritime industries (due to the highly salty & corrosive atmospheres), have proven to be compatible with the particular environment of food & beverage industries (with intense cleansing & washing procedures), with unrivalled torque transmission capacities (compared to elastomeric or stainless steel couplings).

To conclude, the Flexacier®/Winflex® grid coupling, offering unrivalled compromise between torque transmission, reliability & long life, is today the real maintenance free & eco-friendly coupling.



+ CMD Flexacier®/Winflex® coupling
+ with anti-corrosion protection

– Precision Spacers for Gearbox Applications

By Mark Bos, Fenner Drives

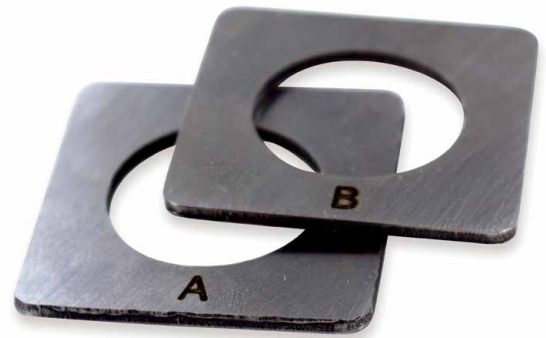


A problem commonly encountered in the manufacturing of gearboxes is filling the last gap in the gear shaft assemblies.

The accumulated tolerances of the many components can result in a range of gaps too wide to be met with a single size spacer. Filling the gap accurately and completely is critical to reliable, long-term operation of the powertrain or gear box.

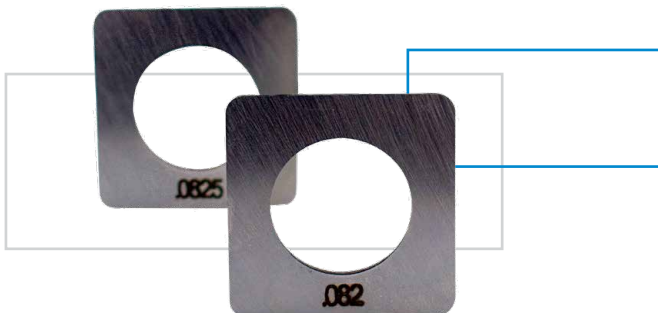
Traditionally the gap is filled with a combination of shims, or the gap is measured, and a thick spacer is ground down to a finished thickness. Both options are time consuming and slow the final assembly rate. They also introduce a significant chance for error.

National Bearings, a product line of Fenner Drives, designs and produces spacers to solve this problem for OEMs and is currently doing so for a major player in the industry. The custom spacers are manufactured in a range of precise thicknesses to fill the last gap with a single spacer, no matter how wide the gap that is produced by the combined components.



Made from stamped steels that are designed for extreme duty applications, spacers can be nearly any shape from a simple round washer to more complex geometries to fit any constraint. They are hardened and ground to precise thickness and flatness tolerances. Finally, the spacers are then laser engraved or color coded for easy and error-proof identification.

The distribution of the gap thickness in gearbox assemblies is usually uneven across the range of component stack ups, with a few specific sizes making up a majority of the usage. Precision ground stampings allow for the cost efficiency of high-volume manufacturing and the wide range of thicknesses usually provided by machining. That way it is possible to order smaller quantities of the infrequently used sizes while taking advantage of the lower pricing of those sizes requiring higher volumes. More technical details are listed below or can be consulted at www.fennerdrives.com.



Technical Details

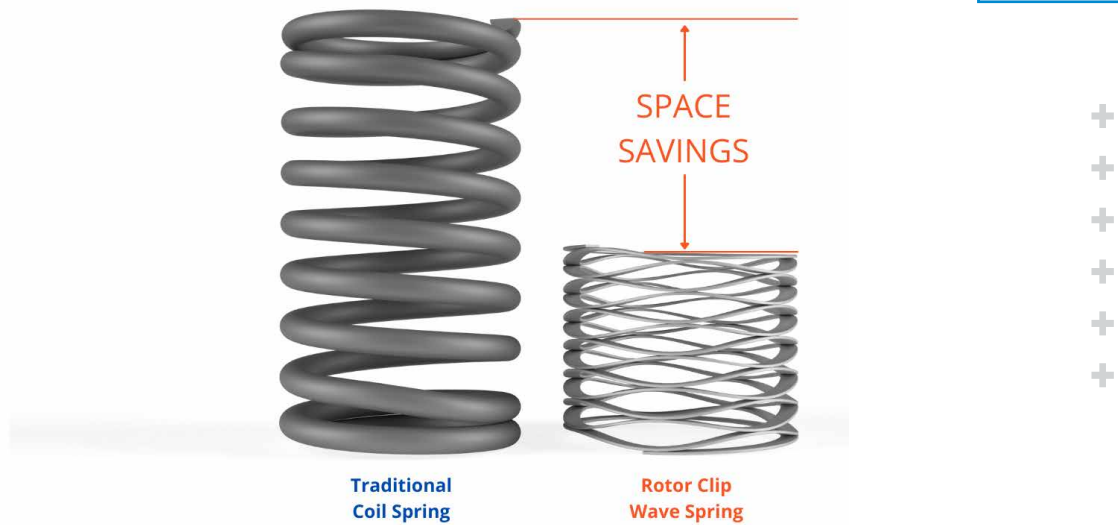
- + Typical materials: Bearing steels such as UNS 1050, 1074, 8620, 52100 or corrosion resistant steels including 302/304, 420 or 440C
- + Hardening up to 60 HRC
- + Surface finishes from .8-.2 micrometer RA
- + Thickness, flatness, and parallelism to .003 mm

– The Wave Spring Advantage



When considering a spring element for your technical application, it is worth comparing the familiar and traditional spring options to another innovative spring element, a wave spring. Most engineers have experience with traditional coil or disc springs, whilst wave springs remain somewhat of a mystery. Flat wire wave springs offer the best balance of size and spring force and in many applications, offers considerable advantages over their more traditional and well-known counterparts.





One of the main reasons to specify wave springs is the impressive force-to-work height ratio as they can produce the same or even greater forces as coil springs, whose work heights are up to twice as large. These axial space savings are perhaps the most immediately visible advantages of flat-wire wave springs. In static applications, a wave spring will typically need just 50% of the work height of coil springs to deliver an equivalent force. In dynamic applications, the work height advantage is typically about 30% less than the static applications, but still substantial. Wave springs can also save space in the radial direction compared to using disc or coil springs with larger diameters.

Wave springs can ensure a largely constant force over a large spring travel. Their deflection curves have wider, flatter linear force region than either coil or disc springs. Spring elements typically exhibit both linear and non-linear force behaviors, depending on their deflection. This linear behavior can be graphically shown on the spring's load-deflection curve. In general, the broader and flatter linear region of the curve, the easier it is to hit specific spring force requirements. Wave springs have a clear advantage in this department. They typically have a linear force between 30 and 70% deflections. Both coil and disc spring have much narrower linear force. Predictable spring forces can be a big benefit in many applications.

Another benefit of wave springs complete elimination of torsional loads. Whenever you compress a coil spring to its work height, loads are not just in the axis of compression but also torsional. These torsional loads can cause the pre-loaded component to rotate in use, potentially resulting in excess wear. Torsional

loads can also decrease the spring working load. Whilst many applications can suffer from this rotational wear problem, wave springs don't have this issue. Their wave forms can only compress axially.

Compared to a traditional disc spring, multi-turn wave springs offer far more travel. One multi-turn wave spring can easily replace the assemblies that use multiple disc springs to achieve the necessary travel. Replacing a stacked disc spring assembly with one wave spring can result in both cost and quality benefits. Not only will the single spring cost less to install, but it also reduces the chance of assembly error.

Wave springs can also be used to preload bearings, eliminate axial endplay, and minimize vibration. Applying a permanent thrust load to a bearing assembly is important for secure and successful installation. The bearing preload process extends component lifetime by eliminating unnecessary clearances, creating high stiffness, and reducing noise and vibration.

Unlike stamped produces, which require tooling, wave springs can be customized by changing the parameters of the coiling equipment. This ability allows you to specify custom wave springs without worrying about cost or delays associated with custom tooling. This capability is yet another cost factor weighing in favor of wave springs.

This unique spring element is the clear winners in a wide variety of engineered systems and in applications with high performance requirements.

For more on wave springs, visit www.rotorclip.com or contact info@rotorclip.com



– Customised Solutions in Chains & Transmission Elements



YUK helps customers developing their projects by offering quality bespoke solutions in conveyor and roller chains, and transmission elements. Since 1964, experience, dedication, development and investment have been the cornerstones of our company. More recently, YUK has been involved in a deep change process, struggling to step up a factory and facilities that meet the expectations of our clients.



Key-figures:

- + Factory adaptation to Industry 4.0.
- + 14.000 sqm fully automated warehouse (Easy WMS Mecalux System synchronized with our ERP on real time).
- + More than 15.000 references representing over 7 million € stocks.
- + Specifically built-in warehouse for raw material storage, in times when supplies may be at stake.
- + New offices, showroom for customers and training dedicated area for employees.

Digitalisation:

- + B2B e-commerce platform with real stock: in English/French/Spanish.
- + Implantation of a new CRM software that will help us put the customer at the very centre of the company.
- + Customer and employee training on Teams.

- + Specific training for LinkedIn Sales & development of LinkedIn Marketing.

Environment protection committed company:

- + Increase of our solar power supply to reduce the use of environmentally harmful energy.
- + Digitalisation process to reduce the use of paper and printing machines and contribute to the safeguard of the environment (Docuware-Project)
- + Facilities for our employees to work in remote mode, to help preserve them from Covid-19 and reduce the impact on the environment, caused by systematic comings and goings from home to the office.

YUK has a strong commitment to become a major player in the European market. You can contact YUK anytime at export@yuk.es or visit the website on www.yuk.es/en for more information.



– New Premium Roller Chain Developed for the After-Market



A new high precision Roller Chain, called EXL Chain, is now available offering superior quality and durability over standard Roller Chain. The new chain is developed by the Hangzhou Donghua Chain Group which is one of the world's largest chain manufacturers who supply their wide range of chain products world-wide.



Short pitch precision roller chains EXL (A&B series)

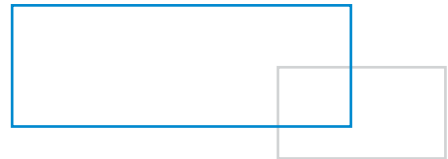
The EXL chain is a premium product positioned within Donghua's new Solution range. The Solution range offers customers a unique solution to problems with chain wear, chain fatigue, corrosion, high speed, lubrication, chain length accuracy and chain strength, whilst being designed for arduous environments.

Aimed specifically for the after-market, EXL Chain is designed, manufactured and tested for unbeatable accuracy and performance in arduous conditions, offering enhanced wear and fatigue resistance and greater precision than their Standard Roller Chain range. By utilising different materials, material treatments and layer



I'm thrilled to introduce this new Chain and our Stockists are keen to see a new design of chain which offers significant benefits over standard Roller Chain.

Bob Wellsbury, Managing Director of Donghua Limited



technologies, EXL Chain offers the best possible quality/price ratio for all applications.

New hardened, shot-peened wide waist plates deliver increased fatigue strength and a seamless cold forged solid bush and roller give full contact between the pin, bushing and roller for higher durability. Optimised cylindrical parts improve sliding contacts which help increase service life.

The chain also incorporates Donghua's unique Easy Break Technology. This unique feature enables EXL Chain to be cut in the field using Donghua's Plate Extractor tools. A video shows how the Easy Break Technology works and can be viewed at <https://youtu.be/UD6rtBEJrkM>.

Bob Wellsbury, managing director of Donghua Limited, said: "I'm thrilled to introduce this new Chain and our Stockists are keen to see a new design of chain which offers significant benefits over standard Roller Chain."

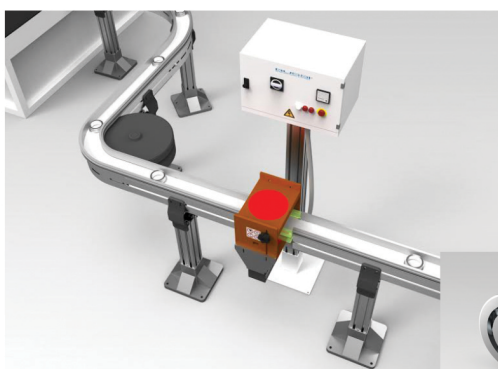
EXL Roller Chain is supplied pre-loaded with 40-50% of the breaking load. Roller Chains can be matched in pairs to close tolerances in Donghua's UK workshop. For chain lengths over 5 metres, the chain can be supplied matched & tagged for fitting in sequence. Pre-lubricated, as standard, using high performance synthetic lubricant ensures high workload performance in arduous and abrasive conditions.

Donghua's EXL Roller Chain is available in standard pack sizes of five metres, reels available on request, and bespoke cut-to-length sizes in British standard 06B to 32B, American standard ANSI 35 to ANSI 160 in simplex and duplex ex-stock. All Donghua Chains are marked with production batch codes for full traceability.

With increased precision, higher wear resistance and greater fatigue resistance, EXL Chain is the new Roller Chain solution of choice.

For more information about Donghua's EXL Chain and to download a catalogue, visit: www.donghua.co.uk/exl-chain

EXTEND BEARING LIFE WITH BUSSI ELECTRONIC DEMAGNETIZERS



During the manufacturing process, the demagnetization, as magnetic pre-washing, is the optimal preparation for the bearing components cleanliness.

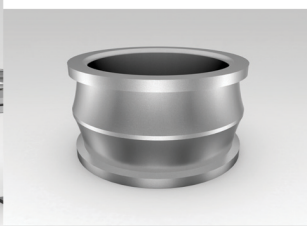
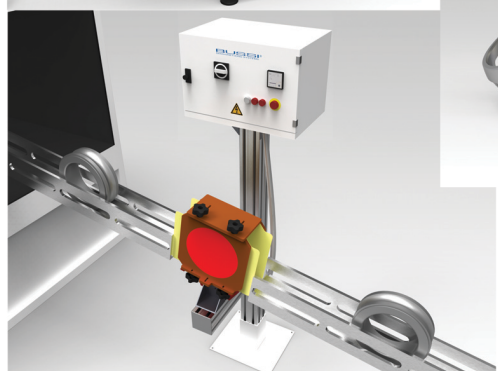
Bussi Demagnetizers prevent from friction, limited fluency, early wear and reduced life of the bearings.



DISCOVER OUR SOLUTIONS DEDICATED TO THE BEARING INDUSTRY

DISCOVER BUSSI DEMAGNETIZERS KEY TECHNICAL ADVANTAGES:

- MINIMUM RESIDUAL MAGNETISM
- MINIMUM ENERGY CONSUMPTION
- HIGH DEMAGNETIZING VALUES REPEATABILITY
- EASY PARTS TRANSFER WITH NO MAGNETIC RETENTION
- EASY IN PROCESS INTEGRATION WITH I/O INTERFACE
- STANDARD A DEDICATED SOLUTION DESIGN
- HIGHLY DURABLE INVESTMENT



– Ready to lift off to the world of maintenance with **simalube**

– *the next level of automatic lubrication*



The simalube IMPULSE connect is the latest generation of the pressure booster from the simalube family. The proven functions of the IMPULSE have been supplemented with the option of connecting the device to a smartphone via Bluetooth®. In connection with the newly developed "simatec world of maintenance" app, the devices can be easily configured and then monitored without having to be directly at the lubrication point. Information such as general status, fill level, lubricant, size, start and change date etc. is displayed to the user and easy to read in the app. It also enables the customer to manage the lubrication points digitally.



Every industry has lubrication points with requirements that can be optimally solved by using the new simalube IMPULSE connect. The initial installation as well as the subsequent monitoring can be carried out quickly and easily thanks to the support provided by the «simatec world of maintenance» app.

Together with the proven functions of the simalube automatic lubricant dispenser and the pressure booster IMPULSE connect, lubrication points are supplied with the required amount of lubricant with the greatest reliability, while at the same time reducing costs.

Compelling customer benefits

Faster, easier and safer inspection rounds can save costs in the long run. The dispenser's status and error displays can be read directly in the app, and the lubrication points can also be managed in Lubechart via the app. Animated installation and operating instructions assist with a correct installation. Continuous lubrication ensures less wear on the components, which also leads to cost savings. Production downtimes for maintenance and monitoring purposes are eliminated, resulting in higher availability of the production equipment.

Together with the simalube lubricant dispensers in sizes 60, 125 or 250 ml, the simalube IMPULSE connect ensures reliable lubrication at high counter-pressures and in lubrication lines up to four meters long. Regular lubrication triggers supply the lubrication point with 0.5 ml of oil or grease up to

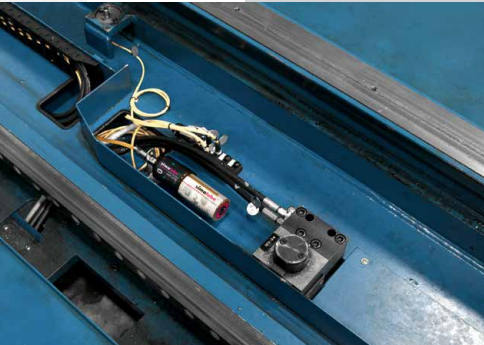
NLGI 2 at a pressure of up to 10 bar. This is gentle on the lubricant, as only the dosing quantity is under pressure. The operating status can be easily monitored with the «simatec world of maintenance» app. The intelligent pressure booster also provides continuous information about the current operating status.

Simple installation and operation

As soon as the battery pack is inserted and the lubricant dispenser screwed in, the simalube IMPULSE connect is operational. The IMPULSE connect is connected to the «simatec world of maintenance» app via Bluetooth. The runtime, the size of the lubricant dispenser and the lubricant can then be selected and saved in the app. The system then works with the settings selected by the customer. When the lubricant dispenser is changed, the simalube IMPULSE connect remains permanently installed on the lubrication point. Only a new battery pack needs to be inserted before a new simalube lubricant dispenser is screwed on. This way, the connection point remains sealed even when the dispenser is changed and no lubricant runs back. The settings saved in the app remain the same, but can be changed if necessary. The new start date is set automatically after the new battery pack is inserted.

Versatile and – thanks to reusability – very cost-efficient

The compact design of the simalube IMPULSE connect allows installations in confined spaces and in all positions; even under water. As an IP68 protection



class device, the pressure booster is dustproof, waterproof and suitable for use in a wide range of industries. Equipped with a new battery pack at each refilling, the simalube IMPULSE connect can be used for ten dispensing cycles of simalube 125 ml or for up to three years.

«simatec world of maintenance» app

With the «simatec world of maintenance» app, simatec ag has created a platform for easier and more efficient management of lubrication work. The app offers the user the possibility to record lubrication points, to set the necessary parameters for the lubrication and to control or monitor all activities around the lubrication. The simalube IMPULSE connect equipped with Bluetooth® can be configured directly via the app, the current operating status can be viewed from a distance of up to 20 m via the app.

Short profile of simatec ag

simatec is an independent, globally operating family business in Switzerland and has been managed in the second generation by Mischa N. Wyssmann since 2005. Since its foundation in 1983, a motivated team has been developing and producing innovative products for the maintenance of roller bearings under the brand names simatherm, simatool and simalube. At the end of 2007, the simatec inc. subsidiary in Charlotte, NC, USA, and in 2017 simatec gmbh in Pforzheim, Germany, successfully started operations.

The simatherm induction heating devices enable rapid heating and the simatool tools facilitate the simple mounting and dismounting of roller bearings and other ring-shaped metal parts. And simalube lubricant dispensers automatically and reliably lubricate machinery and equipment around the globe.

With the launch of the simalube grease and oil lubricator, simatec opened up an extremely successful business segment and became one of the leading suppliers on the world market. The foundation for this success was the development of a special drive system: The patented gas producing dry cell enables a clean, safe, maintenance-free and long-term lubrication of bearings. This new technology simplifies complex processes and reduces the maintenance requirements on thousands of machines and systems.

Manufacturer and Distributor

*simatec ag, Stadthof 2,
CH-3380 Wangen a. Aare, Switzerland
Tel. +41 32 636 50 00, Fax +41 32 636 50 19
Website: www.simatec.com
Email: welcome@simatec.com*

If you have any questions about this article, please contact: Angela Kalousek, Marketing & Communications, simatec ag, Tel: +41 32 636 50 00, angela.kalousek@simatec.com

— Power Your Conveyor with Optibelt!

Transportation and motion over the last two years is becoming more and more important in various sectors and industries. Logistic systems and logistic centres are growing and the number of packages to be delivered have been increasing tremendously. Consequently, the need for more powerful transportation lines as matter of fact are being reported from our customers and market representatives.

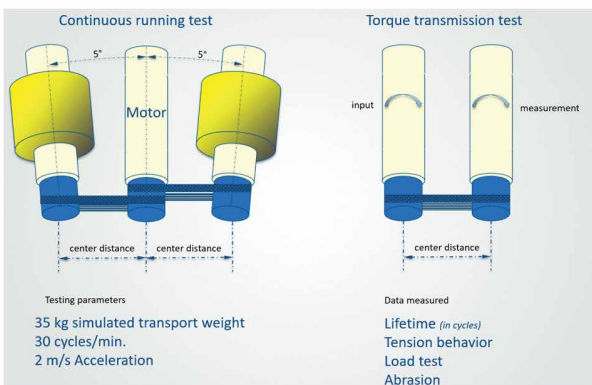
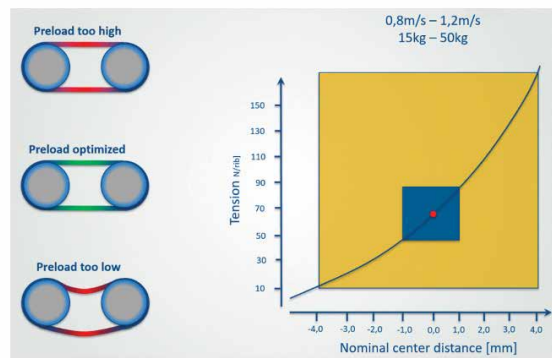


For these specific needs Optibelt have developed the product range Conveyor Power, mainly for roller conveyor systems. Beside V-belts the elastic rib belt is the major drive element.

Optibelt Conveyor Power range is dedicated and especially developed for those roller conveyor systems and has advanced features as follows.

- + Highest power transmission vs. competitor products
- + More than 10 belts in a line suitable
- + Cold-resistant up to -40°C
- + High Temperature-resistance up to 80°C
- + Shock load absorbing
- + Suitable for start / stop cycles
- + High efficiency vs. round belts almost on timing belt level
- + Maintenance-free
- + Suitable for curves
- + Quiet operation
- + Maximum of reliability

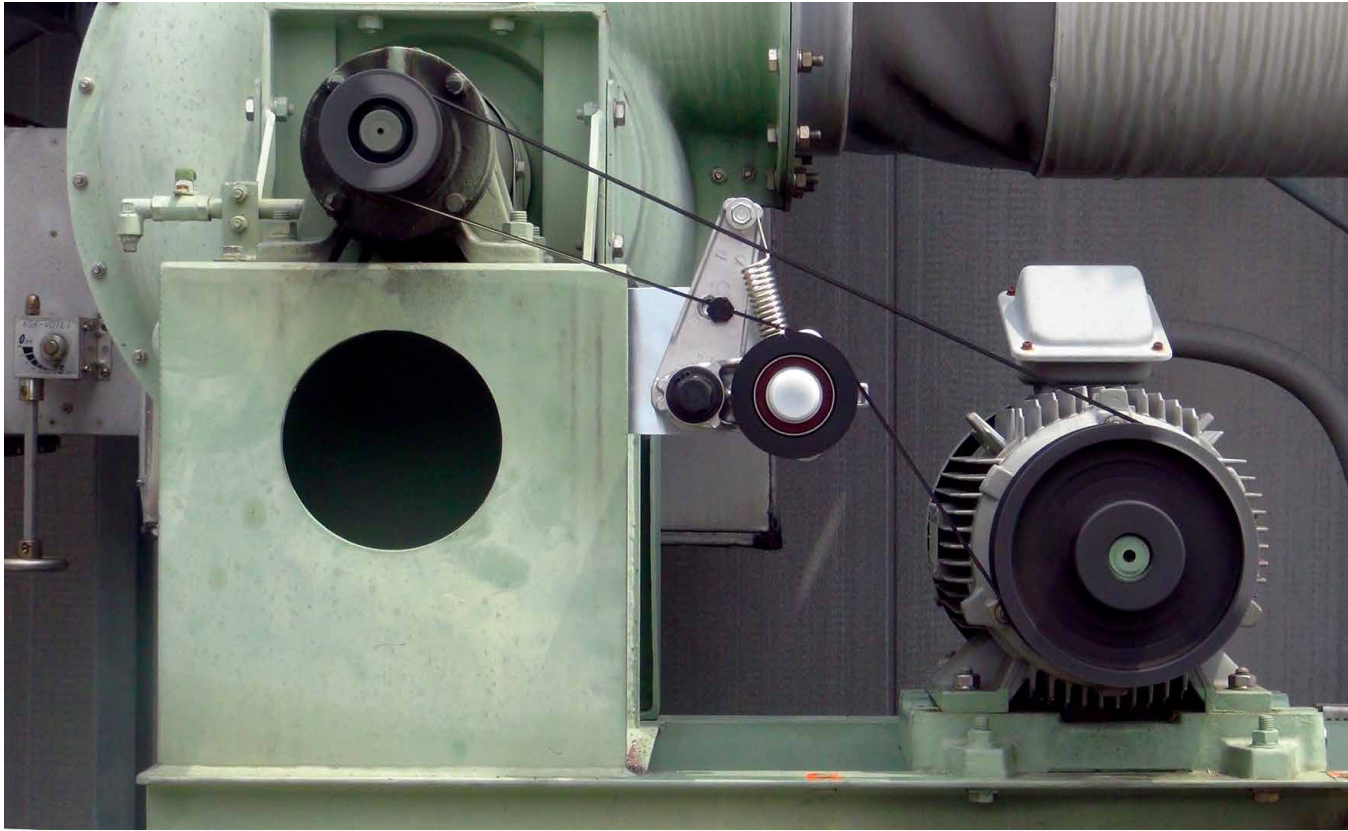
Our Conveyor Power rib belts are produced in tight length tolerances, for optimized operation tension in use (graph below).



Preload force & Usability of the belts added value with Optibelt Conveyor power



For more information about Optibelt solutions check out the home page on www.optibelt.com or use the App Conveyor Power selector at www.optibelt.com/en/products/ribbed-belts/optibelt-conveyor-power



- **BANDO's Energy Saving Transmission Belt System**

+ + + + +

BANDO is a 115-year-old multinational enterprise based in KOBE, Japan. The company's main products are transmission belts for various kind of industries, automotive, motorcycle engine parts and industrial machines, HVAC, factory related parts/elevators, bank machines, security cameras in the town and printers or photo copiers in your office or in your house.



*BANDO could achieve
ENERGY SAVING,
LONG LIFE and
MAINTENANCE-FREE
operations.*



BANDO EUROPE has been established in 1978 - since then the company supplied transmission belts to Europe's competitive manufacturers mainly in automotive industries and precision machinery industries. The new challenge is to contribute to solving Europe's advanced and world's most required issues which is to reduce carbon emission and save energy.

BANDO introduced the energy saving transmission belt system called "HFD" which stands for Hyper Flat belt Drive, since the BANDO's engineering team believes that the combination of "FLAT BELT" + "AUTO TENSIONER" is the most efficient transmission belt system for HVAC industry. More than 100,000 units of blowers and 130,000 units

of cooling towers with conventional V-belts are running in Japan. It is estimated that - a possible change of those 230,000 units V-belts into HFD systems - could reduce approximately 60 GWh, which is almost equivalent to the electricity generated by one small size coal fired power plant.

BANDO has released around 7,000 units of HFDs in Japan, China, Korea and Taiwan. On the other hand, in Europe with the world's most advanced area for environmental protection, the company did not promote this advanced technology yet and aims to be the evangelist who will preach around the method how specific applications can reduce 5~7% of energy consumption with transmission belt systems.



HFD has two other features: One of them is the longer lifetime, HFD can achieve 24,000 hours lifetime, while a conventional v-belt's lifetime is around 8000 hours. The second feature is the maintenance-free solution. These days workforce for facility and asset maintenance has been reduced because of declining working population. For a conventional v-belt, three to four times maintenance is required during its 8000 hours lifetime. But HFD doesn't require any maintenance for its 24,000 hours lifetime and contributes to solve several related socio-economic problems.

How can BANDO achieve these major strong features? This is thanks to the patented tensioner pulley and the development process of the belt materials. For cars with an engine, the company offers a transmission belt maintenance solution for over 50,000 km. This thanks to the accessory drive produced for automotive engines; a ribbed belt and auto tensioner which enables the long life and long-term maintenance-free operation. BANDO introduced this advanced technology from the automotive industry into industrial applications. A good example is the comparison of a conventional v-belt and a flat belt. A flat belt is easy to bend, which means an easy installation capability on pulleys. A conventional v-belt needs more energy to be installed on pulleys, which causes the major loss for belt transmission.

BANDO also introduced a flat surface belt and the meander correction pulley. For the high-power motor application, it was not possible to use ribbed belts that have tiny V shape ribs on the surface, because they got destroyed with higher engine power. The company decided therefore to use flat surface belts instead. However, flat belts cannot run straight without any guide or flange. So, the introduction of the "meander correction pulley" which enables belts to run straight was the solution. With these technologies and innovations, BANDO could achieve "Energy Saving", "Long Life" and "Maintenance-Free" operations.

BANDO is looking for the right business partners from the following areas to build a long-terms cooperation.

1. OEM supply for HVAC (blowers, compressors)
2. Maintenance operation professional companies with wide network, especially for HVAC system. (Public facilities, Hospitals, Shopping Malls, and Factory)
3. Major manufacturing companies who have a target or goals for environmental protection or carbon offset.

Feel free to contact info@bando.de in case you are interested in a partnership with BANDO:



Build an Intelligent World with Innodisk's AIoT Data-centric Ecosystem

– Well-prepared to Build an Intelligent World

Innodisk AIoT Solutions Target EV and Smart City Innodisk



Innodisk, a leading global provider of industrial flash and memory solutions, reflects on its AIoT wins of last year and outlook for 2022. Even now, in 2022, AIoT is still a buzz that's impossible for business leaders to ignore however many are still not exactly sure how the pieces of the AIoT puzzle fit together or where to start. But the business proposition is clear, with 39.1% annual growth expected over the next five years. To seize the opportunities in the AIoT market, in 2021, Innodisk joined up with its subsidiaries to form an AIoT data-centric ecosystem called the "AIoT All-Round Service" that combines their expertise to provide a fullservice industrial AIoT package.

After a year, Innodisk's recent experience confirms this market trend, with AIoT-related projects doubling each year. A deeper look reveals the primary focus lies in 5G, networking, infrastructure, and automation fields.

Especially with the high-performance industrial-grade storage, memory, and embedded peripherals, as well

as software, Innodisk is now going one step further, integrating these into AIoT technology solutions that withstand heavy vibrations and harsh outdoor environments, such as AI robots and electric vehicles.

AI robots have secured their place as the hands-free delivery method of choice in hotels, hospitals, and airports during the pandemic. These electronic helpers meet contact and social distancing prerogatives while reducing personnel workloads. Innodisk worked together with a hi-technology venture in the smart services sectors to integrate its customized SSDs into their AI robots, ensuring reliable operation.

Electric vehicles place a large strain on electronics, with vibrations and heat exceeding the thresholds of standard equipment. A multinational technology company used Innodisk's wide temperature DRAM modules, industrial-grade flash storage, and its subsidiary Antzer's GPS Tracker for their EV truck. As a result, their retail delivery system benefited from the AI technology while reducing pollutant and noise emissions. Eric Chang, Special Assistant of Innodisk, said, "We're confident that the increase in AIoT applications will continue thriving through 2022, especially for electric vehicles and smart city applications." He further added, "Electric vehicles like buses, trucks, logistics, and fleet management will all see growth. Smart cities are also in focus as more countries invest in technology construction to harness AIoT and smart cities, including intelligent street lamps and surveillance systems." Innodisk is well-prepared for these technological advancements and has set a goal to "Build an Intelligent World".



- M.E.C.[®] ProfilBelt: A Zeta Gomma excellence in “customised” belts

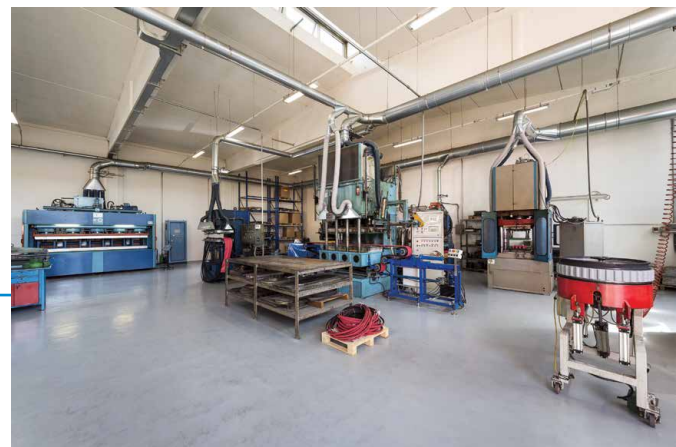


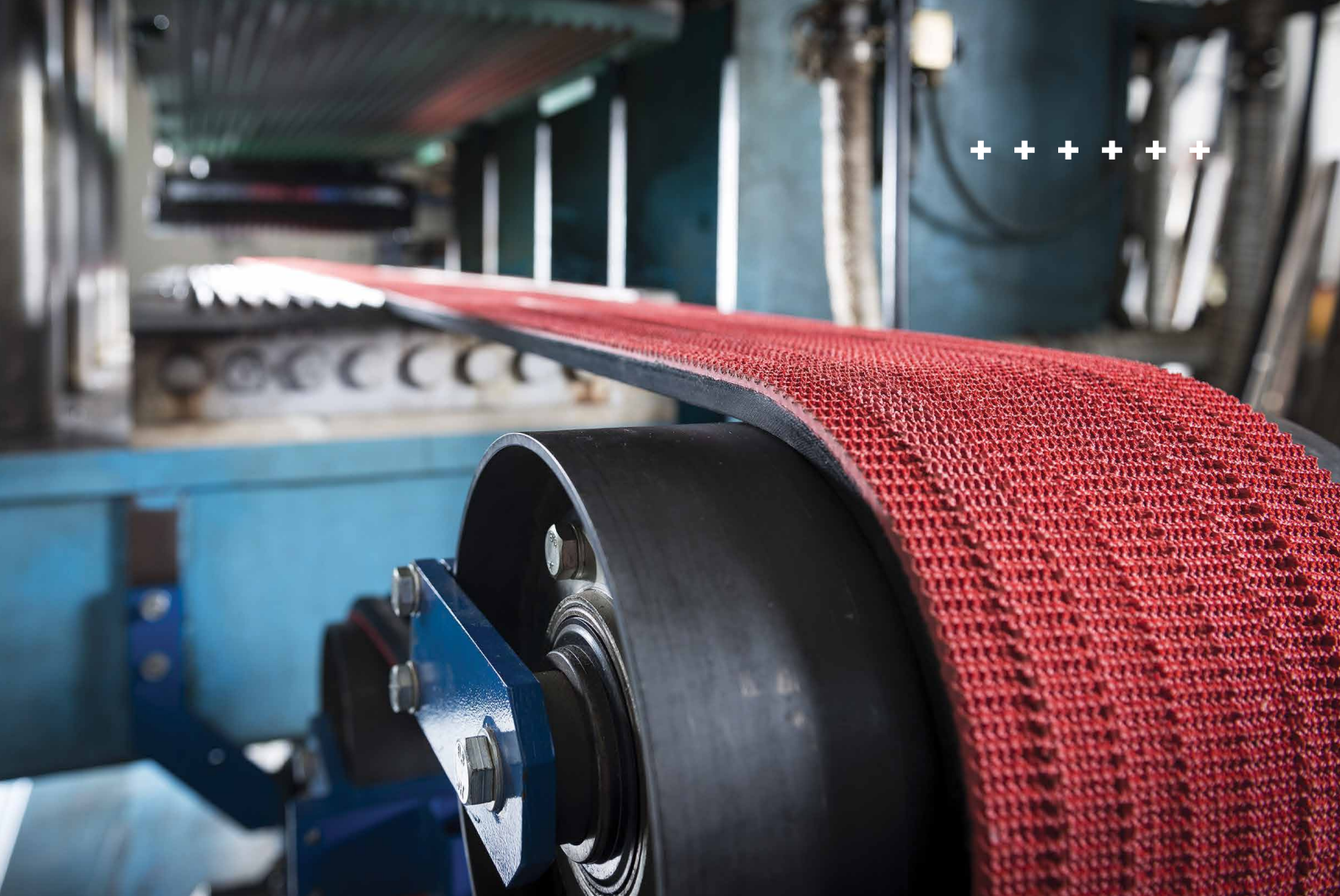
A Zeta Gomma is an international company, established almost 50 years ago in Sassuolo (MO), in the heart of one of Italy's most important industrial areas (for ceramics in particular).

It has a wide range product such as power transmission belts, v-belts, and conveyor belts (in rubber, PVC and PU), as well as thermo-weldable belts, hoses for roller coatings, rubber sheets, moulded products, technical items and equipment for pressing, welding and joining belts. The main features of A Zeta Gomma are the top quality production and the versatility to meet every specific customer need and durability under all conditions of use, even the most severe.

A distinguishing point of A Zeta Gomma's excellence is the M.E.C.® ProfilBelt range, completely customised belts with special rubber coatings.

Thanks to its experience in moulding and a fully equipped internal vulcanising department, A Zeta Gomma is able to create a wide range of coatings in order to adapt the belts to many applications. The coatings differ in terms of the type of rubber, colour and shape, and are perfectly tailored to each customer's requirements.



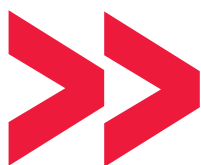


M.E.C.® ProfilBelt optimise the conveyance of materials on horizontal, sloped, or vertical, and their versatility is due to their production features: endless coatings can be vulcanised with different types of rubber, in different colours and shapes, and with smooth, honeycombed or rhomboidal surfaces which can also be made according to the customer's own specifications. In all conditions of use, M.E.C.® ProfilBelt guarantee maximum strength and reliability, in true A Zeta Gomma style. Particularly for this type of belts the great value to be considered is the free set length, which the M.E.C.® ProfilBelt range ensures at the highest levels, providing a leading service, up with the technological developments of machines in the various applications fields.

The great tensile strength of these high-performance belts is combined with optimal flexibility, to minimise the wear and tear of the machines on which they are used. The belts are customisable in every aspect: from the preliminary consultation to the creation of the design, preparation of the sample and final production, thanks to the know-how of the company's internal technical department. This is possible as a result of the A Zeta Gomma's extensive and comprehensive experience in the vulcanising sector: the company is able to rubber or silicone coatings through truly "endless" vulcanisation, to ensure the highest levels of quality. The hot vulcanised

coating on the belt grants a friction for the maximum grip on the conveyed material. The selection of the raw materials is based on the experience acquired by A Zeta Gomma in its numerous years of belt manufacturing, together with constant input from customers, with whom it has almost daily consultations, leading to continuous improvement of the product.

A Zeta Gomma ensures a large availability of its products thanks to the 20,000 m² of floor space, including commercial headquarters, three production units and one warehouse, with 80,000 items immediately available, in order to ensure high standards of product customisation, industrialisation and distribution. A distinctive feature of A Zeta Gomma is the services it offers to its customers: thanks to the direct in-house production of its own item range, A Zeta Gomma is able to meet all customers' needs, no matter how particular or complex. The services begin with customised design support and are always in line with the customer's requirements and expectations. Thanks to its own specialised staff, A Zeta Gomma is also able to make specific products from drawings supplied by the customer or design them in collaboration with the customer. This ensures that each A Zeta Gomma product offers the highest level of quality, with no margins of error. More information about A Zeta Gomma can be found at www.azetagomma.com.

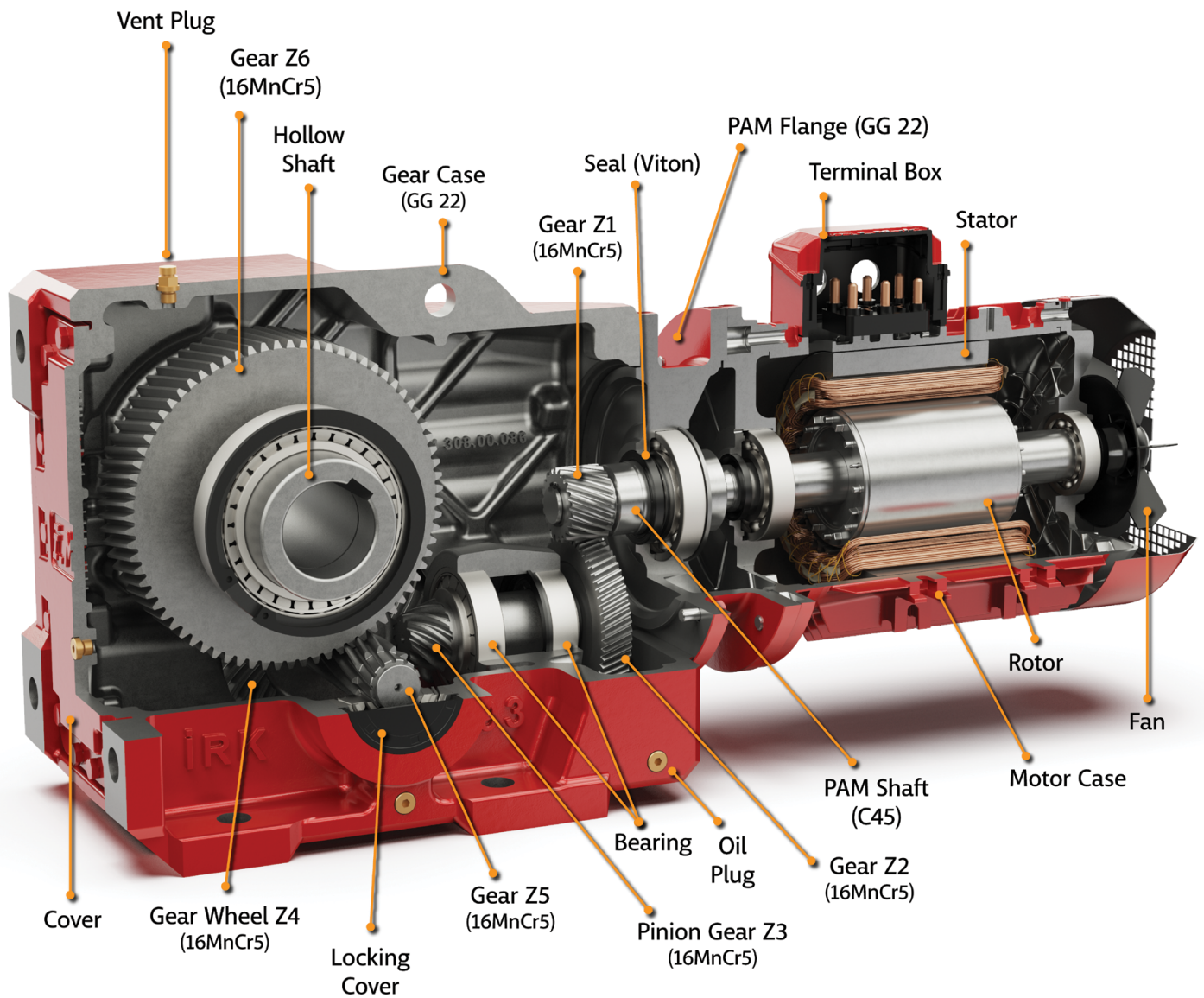


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