The Magazine from Trelleborg Sealing Solutions

in the groote The world of seals and service



Get in the groot



FOOD & BEVERAGE

Skol to a Sustainable Beer

Helping craft brewers reduce carbon emissions

TECHNOLOGY

Engineered to be **One**

Multicomponent Solutions



eMOBILITY

A Change of Mind

Countering the objections to electric vehicle adoption



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FLUID POWER

Moving Parts

Seals keep off-highway equipment working effectively in harsh conditions.



FACILITY ANNIVERSARY

60 Years Young

The Trelleborg Sealing Solutions facility in Malta celebrates its 60th birthday.

NEWS

NEW SERVICE CENTER

European Service Center Groundbreaking



On June 7, 2021, Trelleborg Sealing Solutions held a groundbreaking ceremony for the construction of its new, highly automated European Service Center in Stuttgart-Gärtringen. Completion of the building, which boasts a sustainable and modern work environment, along with an intralogistics automation system to streamline logistics processes, is scheduled for April 2023.

Expanding Our Service Portfolio

New services for enhancing Trelleborg Sealing Solutions products are at the heart of the new European Service Center. These include industry-specific solutions, such as cleanroom handling for the semiconductor and healthcare & medical industries, sub-assembly for the fluid power and off-highway industries, and nano-strength coatings for the food, beverage & water industry. Various quality assurance processes complete the portfolio, and the space can be expanded as needed to accommodate further growth.

New Cleanroom Capabilities

The existing Logistics Center in Stuttgart-Gärtringen already includes a cleanroom. This offers customers a secure supply and more flexibility in delivery times. It compliments cleanrooms in our manufacturing sites by ensuring that quality and cleanliness requirements are met, not only in production, but through the entire supply chain. Upon building completion, the cleanroom will move into the new European Service Center.

SEALS-SHOP

Seals-Shop Includes Marine Seals and Bearings

Trelleborg Sealing Solutions expands its online store to include Seals-Shop Marine, which makes seals and bearings for the marine industry available to order direct at the click of a mouse or swipe of the finger.

Seals-Shop Marine, a section within the existing Trelleborg Seals-Shop, offers products for a full range of marine applications, including ships, boats and hydroelectric power plants. In addition to dynamic and static seals, the Orkot® portfolio of fabric-reinforced composite bushings and semifinished products, is listed and available for purchase.

SUPPLIER AWARD



Trelleborg Receives Top Supplier Award from Festo

Trelleborg Sealing Solutions received the Festo Supplier Elite Award 2020. Even in challenging times, Trelleborg Sealing Solutions has been a proven partner, Festo says.

Carsten Stehle, Chairman of the Management Board of Trelleborg Sealing Solutions in Germany, commented: "We are proud of this recognition. Festo demands the highest standards of quality, delivery reliability and price - this fits in well with our philosophy. We would like to thank the tireless efforts of our employees and look forward to many more years of partnership with Festo."



Festo, a manufacturer of pneumatic and electric automation technology, honors its top suppliers every year with the Supplier Elite Award. Evaluation focuses on quality of goods, delivery reliability, service in the event of issues. and communication between Festo and the supplier.

CORPORATE RESPONSIBILITY



Doing Good Together

Giving hope in difficult situations has been the aim of the Trelleborg Sealing Solutions SmilingFaces charity donation campaign for seven years now. This year, customers and employees from Germany, Austria and Switzerland selected 15 projects to support, covering a wide range of causes and organizations.



One organization that SmilingFaces supported this year is OneDollarGlasses, which provides children in need with sturdy, affordable eyeglasses. Trained members of the community manage the production, sale and fitting of the glasses. In this way, the OneDollarGlasses Association creates sustainable structures for basic optical care in the project countries. With this year's donation, Trelleborg Sealing Solutions financed 2,400 OneDollarGlasses in Bolivia.



Find out more about the SmilingFaces Campaign at www.tss-smilingfaces.com.

AWARD



Linda Muroski – **Inspiring Woman Leader**

Linda Muroski, President of Trelleborg Sealing Solutions Marketing Americas and Global Healthcare & Medical, has been named one of Industry Era's ten most inspiring women leaders of 2021.

Since joining Trelleborg in 2016, Linda has championed diversity, fostered collaboration, and empowered her team. Under her direction, the business has experienced increased employee accountability and satisfaction and improved business results.

"Linda's attitude and approach to her work at Trelleborg is reflective of our company strategy for growth," says Peter Hahn, Business Area President of Trelleborg Sealing Solutions.

"She understands that collaboration across business units is key and that it's necessary to trust each other to do our best work. I've seen Linda 'walk the talk' and lead real change, which is why the team has been so successful under her leadership."

Congratulations to Linda!



Read the full article.



IMPRINT

Trelleborg Sealing Solutions

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Update

Check out our latest digital resources







Here to help 24/7

Since its launch in 2020, our e-Catalog helper bot has assisted thousands of customers to find the correct seals for their application!

Visit the e-Catalog: www.trelleborg.com/ecatalog/

New Sealing Solutions for Off-Highway Equipment Film

Protecting off-highway vehicles from the dirt that they encounter in operation every day is challenging for seals. Trucks, tractors and diggers not only have to deal with dirt 24/7, but high pressures and fluctuating temperatures. Trelleborg Sealing Solutions has been involved in seal design, specification and development for the off-highway industry for decades and has a wealth of solutions on-hand to keep trucks trucking and diggers digging!

In the new film, get to work with construction, mining and forestry equipment and see where seals improve performance. Products for these types of applications use Zurcon® Scraper DA24, Zurcon® Glyd Ring® D, and Mechanical Face Seals to make sure these machines keep running as planned.

O-Ring Calculator Updated With New Features

The popular Trelleborg Sealing Solutions digital O-Ring Calculator has been updated with new features to make it quicker and easier to specify seals for your application. Enter installation specifications and receive O-Ring sizes, housing layout and part numbers instantly!

Web-version

- ISO 3601-1 Class A (AS568) standard added to calculation base and can be used in ISO Search function
- Cloud-based storage enabled import .tss files from older versions of the calculator
- Offline capabilities If you've used the calculator once online, the tool can be used without an internet connection and a desktop version can be downloaded. All data is synced with our online database when a connection is available.

Mobile-version

- ISO 3601-1 Class A (AS568) standard added as a primary standard to O-Ring Search and Tolerances pages
- French standard, NFT 47-502 added to align with web-version

NEW INDUSTRY WEB SECTIONS

Trelleborg Sealing Solutions is at work updating and improving its industry-specific web sections. Each aims to present you with a concise resource when specifying seals for your industry. Check out the new content in these sections.

Construction and Mining

Forestry, construction and mining vehicles are expected to perform when needed and in extremely harsh conditions. Take a tour around excavators, forestry equipment and mining trucks to see where our solutions improve performance. Get quick and easy access to tools and resources to help choose the correct seals for the job.

Food & Beverage

Trelleborg Sealing Solutions has compiled information about seals and materials for food & beverage processing equipment into an easy to access location for quick refence. Learn about compliance to regional regulations, see materials with peak performance in CIP and SIP cleaning regimes and view technical articles on industry-specific sealing challenges.

LATEST INNOVATIONS!

The new innovations section of the website highlights the latest innovative products, solutions and services, to bring you the highest levels of performance and reliability in your applications.

Isolast® PureFab™ FFKM

A new range of four materials specially engineered for critical semiconductor applications offers the ultimate, high purity sealing performance. They aim to increase product yield and reduce process defects, while reducing downtime, extending maintenance cycles, to give greater process tool uptime and lowering total cost of ownership. In the web section, find a quick summary of all the materials, with detailed webinars and data sheets!

Turcon® VL Seal II

The revolutionary Turcon® VL Seal® II extends the lifetime of hydraulic aircraft systems. The new seal improves reliability and efficiency for actuators, flight controls and landing gear shock absorbers, and is easier to install, which saves time during maintenance. Extensive testing has proven the seal's outstanding 'zero' leakage performance. In addition, by negating the need for drain lines, the seal contributes to manufacturers' goals for weight saving to increase fuel efficiency.

JOIN OUR EXPERTS FOR THE LATEST 'INSIGHTS AND BEYOND' PODCASTS!



A selected panel of experts joins our host each week to discuss and share their passion for technology. Our guests are key figures from business, industry, and research, and discuss current social and technological trends affecting the polymer industry. Each episode is focused on a different aspect of digitalization, electrification, and sustainability.

Episode 7 The Future of eMobility

Episode 8 Artificial Intelligence Needs a **Common Language**

Episode 9 Artificial Intelligence (AI): Opportunity or Threat for Climate-Neutral Companies?



All episodes are available on major podcast and audio streaming platforms. Visit the microsite to find out more: www.tss-podcasts.com



Hotoff Press

Find out about the latest literature from Trelleborg Sealing Solutions.

FoodPro™ E75F1 Flyer Available Now



To meet new requirements for foodcontact materials, Trelleborg Sealing Solutions introduces new Ethylene Propylene Diene Rubber (EPDM) material, FoodPro™ E75F1. Testing has proven it the best material for food & beverage applications requiring high temperature performance, such as liquid dairy processing and infant formula. It also

excels in polar fluids, alkaline cleaning media and other CIP and SIP processes. Approved and compliant to all main geographic standards and regulations, it can benefit your application, wherever you are in the world.



Find out more in the 'Latest Innovations' section of our website.

New Multicomponent Technology Brochure



Changing times call for new innovative solutions. With increasing demands on seals in many industries, multicomponent technology provides the perfect solution when a single component no longer fits the bill.

Trelleborg Sealing Solutions has invested in multicomponent technology that

strongly bonds a range of polymers chosen to meet your specific requirements. Unique seal geometries, combining multiple features or seals, can be customized and shaped to your application. This can improve performance, make assembly easier and reduce the number of parts that you need to handle. The seals produced are leak-free and need less space and assembly effort, making them a cost-effective sealing solution.

Read the brochure to learn more about the benefits, manufacturing technology involved and the host of support services we offer.

> See page 38 for more information on our Multicomponent Solutions.



MORE INFORMATION



To view all Trelleborg Sealing Solutions catalogs, brochures and flyers, go to:

www.trelleborg.com/seals/literature



New Whitepaper - Aerospace Composite Solutions



As manufacturers focus on the development of next-generation helicopters, they are looking to new technology, materials, and designs to meet their aim for a helicopter that is faster with a longer range and better payload. They also want greater reliability, easier maintenance and operation, lower operating costs, and a reduced logistical footprint. The whitepaper discusses advanced composite materials, essential for the light weighting needed to achieve these goals.



Find all Trelleborg Sealing Solutions whitepapers in our technical library.

CATALOG UPDATES

Turcon® Variseal® Catalog



Turcon® Variseal® is a spring-energized, single-acting seal for dynamic and static working conditions. Its special seal profile and choice of proprietary Turcon® or Zurcon® materials offer low-friction performance at high speeds, pressures and temperatures for many different applications. The seals are often chosen when high chemical resistance is required,

extreme temperatures will be encountered or where good extrusion and compression characteristics are required.

The new Turcon® Variseal® catalog helps when deciding on the correct Variseal® design for an application, giving detailed information on the operation and performance, material choices and size ranges available. The latest edition of the catalog has updated material and certification information, reworked ordering examples for Turcon® Variseal® M2, and minor changes and corrections to size ranges.



Hydraulic Seals Linear Metric Catalog



From Rod and Piston Seals, to Scrapers and Wear Rings, the Hydraulic Seals - Linear Metric catalog offers a comprehensive guide for engineers. It guides you through the broad variety of materials and seals, from specification and design to ordering and installation.

The latest update offers a more streamlined product selection, listing the most important and useful products for hydraulic applications. Selected seals have been removed and replaced with improved solutions, and many corrections, clarifications and drawing improvements have been made to present the most complete product guide on the market.







From left to right: Mikkel Moerup, Andreas Gyes, Kim Dalum, Jan Paul.

"We quickly realized there was no existing technology available, so we would have to completely build everything ourselves,"

KIM DALUM.

Founder and CEO of Dalum Beverage Equipment

CRAFT BREWERIES ARE RELATIVELY SMALL,

INDEPENDENTLY OWNED, employ traditional brewing methods, and emphasize flavor and quality. Alongside making great beer, it's about much more: creativity, innovation, passion and stepping outside the box. Brewers are fun to work with, motivated and passionate about what they do.

The craft brewing industry also has a lot of potential. The sector is continuously growing, both in value and in volume, globally at over 14% annually.1 Alongside offering exciting new flavors and tastes, breweries are expanding their distribution networks locally and internationally. Consumers are increasingly preferring craft over mainstream beers because they offer new styles and flavors, and use premium quality ingredients, which are often locally sourced.

Innovation in an exciting segment

"The craft segment is where all the growth is; it's exciting and so much is happening there. That is the main reason why I decided to focus on craft beer when I started my company. I'm now trying to help craft brewers save money and become



more environmentally friendly by reducing emissions," says Kim Dalum, the founder and CEO of Dalum Beverage Equipment.

Upon founding his company, Kim approached several craft breweries with different ideas for new equipment and collaboration, based on his previous experience with large commercial breweries. The craft breweries showed interest in the creation of an affordable, small system to capture and compress CO₂.

In 2019, Dalum started a partnership with Ørbæk Brewery to develop a piece of equipment, which would capture CO₂ emitted during the fermentation process and compress it for storage and reuse at a later stage.

Partnering to make sustainability possible

"We quickly realized there was no existing technology available, so we would have to completely build everything ourselves," says Kim. "This was a true development project with a lot of turbulence and changes based on trial and error.

We knew we would need a seal supplier to help develop a sealing solution for the compressor unit and reached out to a number of companies. We were looking, not only for someone to supply sealing components, but also one with expert knowhow and a partner who could help us evaluate and specify seal designs and materials for our equipment. Trelleborg Sealing Solutions expressed a lot of interest in collaborating with us." \rightarrow



Collaboration with the local Trelleborg Customer Solution Center in Denmark and the Helsingoer manufacturing site was easy. The Trelleborg team provided guidance throughout the entire process, analyzing the seals after testing to understand how they were functioning in the equipment and what adjustments needed to be made, both to the seal and to the hardware.

Kim recalls: "One story from early on in our partnership highlights the important role Trelleborg played. Analysis of a Zurcon® engineered plastic seal, a standard material for applications such as ours, showed that CO_2 was forming carbonic acid somewhere inside the compressor. This caused the stainless steel in the equipment to rust and build a black slurry, which was damaging the seals. The discovery led us to add additional filters to the system to make the equipment run cleaner."

Successful implementation and next steps

In March 2020, after just over one year, Dalum's first ${\rm CO}_2$ Recovery Plant was up and running at the Ørbæk Brewery. This was a big milestone.

"While I was familiar with similar systems in large breweries, it was very challenging on such a small scale," continues Kim. "Many things had to be rethought and redesigned along the way and we were limited with price constraints, which is precisely why something like this had not been possible before in medium and small breweries."

How the CO₂ Recovery Plant works

- CO₂ is captured from the fermenting tanks and flows into the capture plant where it is washed with water and purified using carbon filters.
- To prevent contamination or flavor carryover from particles remaining in the gas, the CO₂ is further purified and dried to food quality standards.
- The CO₂ is compressed in three stages at high pressure, saving energy and enabling compression at a higher temperature.
- Using the brewery's existing cooling system, the CO₂ is condensed at a low temperature and then pumped into storage tanks.

Guaranteed to be 99.98% clean, the organic CO_2 can be used in the bottling process, in the production of soft drinks or given to customers together with beer kegs. The equipment is CE marked and all components approved for use with food and beverages, including the seal materials. The estimated payback period for the plant is two to three years.



After installation of the first system, Kim was ready to sell the equipment. In October 2020, a second CO₂ Recovery Plant was installed at Svaneke Brewery on the Danish island of Bornholm. After implementation of the CO₂ Recovery Plants at two breweries, Kim sees two next steps for Dalum Beverage Equipment.

"First, we want to create a version of the Recovery Plant, designed for smaller microbreweries. And, at the same time, we want to scale up production of the existing Recovery Plant, so we can make it available to a larger number of breweries in a smaller span of time. With this, we need to shift to design for manufacturing and serial production," concludes Kim.

CARBON FOOTPRINT IN REAL TERMS

By using Kim Dallum's equipment, for each kilogram of CO₂ recovered from fermentation, a further kilogram is saved by eliminating production and shipping of CO₂ from an industrial gas company.2

A medium-sized craft brewery, like the ones Kim works with, emits between 50 and 75 metric tons of CO₂ annually during the fermentation process. With the ability to recycle CO₂, these breweries can therefore reduce their total carbon footprint by 100 to 150 metric tons.





OVER smartphone charges 3





- $^{1}\ https://www.marketwatch.com/press-release/global-craft-beer-market-2021-is-defined by the control of th$ expected-to-register-a-cagr-of-141-with-top-countries-data-industry-insights-by-playersregional-segmentation-growth-applications-major-drivers-value-and-foreseen-2021-06-11
- ² Verified by the company ReFlow (https://www.re-flow.io/)
- ³ https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
- ⁴ https://ec.europa.eu/clima/news/average-co2-emissions-new-passengercars-registered-europe-decreased-12-2020-and-share-electric_en
- ⁵ https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator



SEALING THE CO, COMPRESSOR

Dr. Mikkel Moerup, Global Segment Director, Food, Beverage & Potable Water, shares the Trelleborg Sealing Solutions side of the story.

"When we received Kim's inquiry to collaborate with him on a system to capture and compress CO_a, we knew this would be a challenging but rewarding project.

Dalum's CO₂ Recovery Plant is an especially difficult application for seals and sealing materials, as compression of CO₂ is a dry application. Without lubricants, the seal material must ensure smooth performance and prevent friction and wear, to protect the hardware.

During operation, the temperatures in the compressor raise to a high level. Since a Zurcon® FoodPro® engineered plastic cannot withstand this, a Turcon® FoodPro® PTFE was required. In addition, the sealing materials needed to be compliant with relevant food and beverage standards.

Materials and seal designs were tested in parallel to identify the optimum solution. We utilized our full breadth of expertise on sealing technology to test, analyze and create the optimum sealing solution for the equipment. The path was not an easy one, but together with colleagues at the manufacturing site in Helsingoer, was able to meet the challenge."



Take a look at page 30 for more information on our FoodPro® materials for food and beverage equipment.







GAME CHANGER – MARKING A MILESTONE

Since the beginning of 2021, all beer at Svaneke is brewed CO₂ neutral and to mark the milestone there's a new beer called Game Changer. Alongside this new brew, the carbon capture equipment has had a positive impact in other ways.

"Less CO₂ in the brewery improves the working environment. 'CO2 headaches' are not unfamiliar to brewers as the gas normally escapes the process. Capturing CO₂ prevents this problem. Also, Svaneke condensates and captures other fumes from the fermentation, thereby eliminating the smell that often spreads to the brewery's surroundings. This is very positive for our neighbors," concludes Jan.

DENMARK'S FIRST CO, NEUTRAL BREWERY

Svaneke Bryghus is on the Danish island of Bornholm, and for many years it has worked with sustainable initiatives. In 2018, they moved to 100% organic ingredients and introduced canning equipment in 2019. In 2020, after partnering with Dalum Beverage Equipment, they achieved the next goal of CO₂ neutral brewing.

Jan Paul, Brewmaster at Svaneke Bryghus explains: "You add carbon dioxide when the beer is bottled, but at the same time, carbon dioxide is formed when the beer ferments. We brew about 17,000 hectoliters of beer per year, the equivalent of 3.4 million half-liter bottles, and this produces approximately 72 tons of CO₂. This is now recycled during the filling process.

"Kim Dalum loves to innovate and so do I. Working with him to cocreate a piece of equipment made sense. Because of Kim's deep insight into the world of brewing, we formed a unique partnership to optimize Svaneke's brewing process."

BIOGRAPHY



Kim Dalum

Kim Dalum is the founder and CEO of Dalum Beverage Equipment. Prior to founding his company, Kim spent over 20 years managing global engineering firms, developing equipment and technical solutions for the food and beverage industry, in particular for large breweries.

In 2018, he founded his own company and is committed to helping craft brewers improve quality, reduce costs and boost sustainability.



Read Kim's full story and find out more about sustainable craft brewing.

Accelerating Our Sustainability Ambitions

Trelleborg's new sustainability framework, 'Protecting the essential,' highlights climate measures as well as our strong ambition to accelerate the company's sustainability performance across specific focus areas, driven by the business itself.

IN EARLY FEBRUARY, 2021, TRELLEBORG announced its new climate target "50 by 25," which marks an even more ambitious approach to reducing carbon emissions than before. By the end of 2025, the company aims to have reduced at least 50 percent of its emissions from its operations related to sales. And by the end of 2035, the new vision is that carbon emissions should have reached a net-zero level.

Within sustainability, there are new and increasing demands and requirements on companies, both from customers and from society as a whole. As always, Trelleborg wants to be proactive. 'Protecting the essential' is the new framework for how Trelleborg works to accelerate its entire sustainability performance.

"In addition to emissions reduction targets, Trelleborg is working toward circular material flows, which means a higher share of bio-based and recycled materials. We are also improving the wellbeing of our employees in various ways, monitoring our supply chain even more closely, and becoming even more involved in the local communities in the places where we operate. I am proud to say that despite the challenges we see in our markets since the pandemic outbreak, we manage to really focus on strengthening our sustainability efforts," says CEO of Trelleborg Group, Peter Nilsson. →





Driving progress

Already today our business areas drive progress within sustainability and report on a regular basis. Since this spring, business area management groups have worked to further set their business area priorities and activities in the three new sustainability focus areas: Operations, Compliance and Social Engagement (see below to learn more). The business areas will accelerate setting and reaching their respective sustainability priorities, supported by Group tools and task forces such as the new Polymers for Tomorrow Task Force, Global Chemical Task Force, the Compliance Task Force and new tools for internal reporting and communication. To support their work further, internal governance has been strengthened.

Some activities are mandatory for the business areas, such as producing a draft Climate Roadmap to enable reduction of carbon emissions aligned with the Group's target. Other priorities depend on local accelerating requirements in each respective market.

In parallel, Trelleborg Group will continue to communicate around sustainability in Annual Reports and on our website, and going forward, the ambition is to add sustainability cases and KPIs in the quarterly reports.

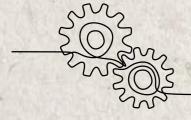
Educating internally

Our new sustainability approach makes us future fit, and will yield even more market opportunities. Internally, it is also important to accelerate the training and education of our employees.

A new sustainability e-learning is one such example, which is available for all employees with computer access. It gives an introduction to the UN Sustainability Development Goals, and to the new sustainability strategy features with special sections about climate as well as circularity - taking even more care about using material resources wisely under the motto "reduce-reuse-recycle," which marks a new phase in Manufacturing Excellence.

Sustainability is really exciting. The whole financial sector focuses more and more on finding sustainable companies to invest in. We want to make sure that Trelleborg is one of their best choices.

Three distinct focus areas, operations, compliance and social engagement, are of importance within Trelleborg's sustainability work:





OPERATIONS

We work to continuously improve our operations, take care of our people and minimize negative impact on society.

COMPLIANCE

We abide by laws and regulations, respect human rights and are characterized by exemplary business ethics summarized in our Code of Conduct.



SOCIAL ENGAGEMENT

We want to be a part of the local community and act as a good corporate citizen.



A bright idea

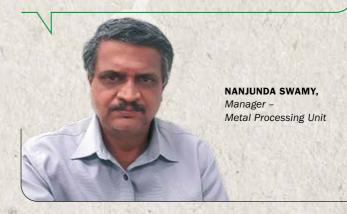
Trelleborg Sealing Solutions in Bengaluru, India, has taken Energy Excellence to heart - and to the roof, with a 60 kilowatt solar power plant.

By Mark Drake

Atop the Bengaluru facility stands a 500 square meter solar panel array. With Bengaluru's 300 days of sun annually, it averages 250 kilowatts of energy production per day, covering the workday needs of the entire 2,000 square meter office floor, with its 76 employees.

"Our pilot study showed a need of around 48 kilowatts of energy to power the lighting, workstation, access control, air conditioning and server redundancy in the office floor," says Nanjunda Swamy, Manager - Metal Processing Unit, who managed plant maintenance at the time of the project. "The solar installation covers all this and more."

"So besides saving energy and money, it's created a green space for employee gatherings"





The 500 square meter solar panel construction in Benagluru.

Saving energy is cool

Solar power loops into the site's internal power distribution and prioritized first. So utility power is only employed when the solar production is insufficient. On weekends and holidays, when only redundant power is needed, surplus can be fed into the regional grid to provide income.

In fact, the solar array decreases energy needs. Because the raised superstructure shades the building's roof, the air conditioning load in summer is 40% less. Since installing the array in 2016, almost 80% of its cost has already been repaid.

"We've even camouflaged the pillars and created a nice garden area underneath the superstructure," says Nanjunda. "So besides saving energy and money, it's created a green space for employee gatherings and birthday celebrations."



Looking for Better Alternatives

Chemicals are central to the solutions Trelleborg delivers, but some of these raise concerns. Balancing the issues regarding chemical use is the role of the Global Chemical Task Force.

In general, Trelleborg strives to avoid harmful substances within its products. However, unavoidably some chemicals used for our specialty compounds and products are classified as posing a risk to human health and the environment.

"The Global Chemical Task Force is a forum of chemistry specialists who work with R&D in our business areas," says Jose Luis Losa, Group Environmental Manager and GCTF coordinator. "We monitor the global legal framework for the chemicals that we use and provide recommendations and guidelines for their safe use or substitution in critical applications."

Continuous advancement

Jose notes that Trelleborg is continuously advancing. "We're always innovating and looking for better alternatives," he points out.

"We created the Global Chemical Task Force to support Trelleborg's business operations by sharing recommendations and expertise on the use, and/or substitution of materials and chemical substances in markets where Trelleborg operates. We document and record the work with Trelleborg's internal Restricted Materials List, and we provide tools and support to the local operations along with information about chemical legislation."

"The biggest impact, however, is with our customers. We want to support their sustainability journey through innovative products that last longer and support energy efficiency,"

> Trelleborg Sealing Solutions has appointed Prof. Dr. Konrad Saur, VP Innovation & Technology as Chief Sustainability Officer coordinating all activities related to Protecting the Essential in alignment with Trelleborg Group management. We asked him a couple of questions.

ITG: How is Trelleborg Sealing Solutions Protecting the Essential?

our people, our customers and our shareholders. We will put additional focus on energy consumption and associated carbon emissions and will aim to exceed targets earlier that the deadline.

The biggest impact, however, is with our customers. We want to support their sustainability journey through innovative products that last longer and support energy

We will also continue our local social programs and further strengthen our role in the communities we operate in. Finally, we will put more emphasis on conditions and environment.

ITG: What do you feel is important?

stakeholders. Besides our strong approach to becoming climate neutral, we will strengthen waste avoidance, focus on safe work places and include sustainability more successful when we can support our customers to

oenence Our Capabilities

VIRTUAL EVENTS, WEBINARS AND TRADESHOWS

Meet with Trelleborg Sealing Solutions wherever you are in the world - even digitally! Take a look at our packed new events listings to find an event for your industry and meet with Trelleborg experts to discuss your requirements and applications.

World of Technology and Science 2021	Utrecht, Netherlands	2 - 3 Oct 2021
Pharmapack 2021	Paris, France	13 - 14 Oct 2021
CAMX	Dallas, TX, USA	19 - 21 Oct 2021
ODT Energy	Stavanger, Norway	19 - 21 Oct 2021
Aeromart	Montreal, Canada	26 – 28 Oct 2021
MD&M Minneapolis	Minneapolis, MN, USA	3 – 4 Nov 2021
Compamed 2021	Düsseldorf, Germany	15 – 18 Nov 2021
Mecspe 2021	Bologna, Italy	23 – 25 Nov 2021
Trelleborg Sealing Solutions Virtual Conference	ONLINE	9 Dec 2021
Medical Technology UK	Coventry, UK	16 – 17 Mar 2022
Achema 2022	Frankfurt, Germany	4 – 8 Apr 2022

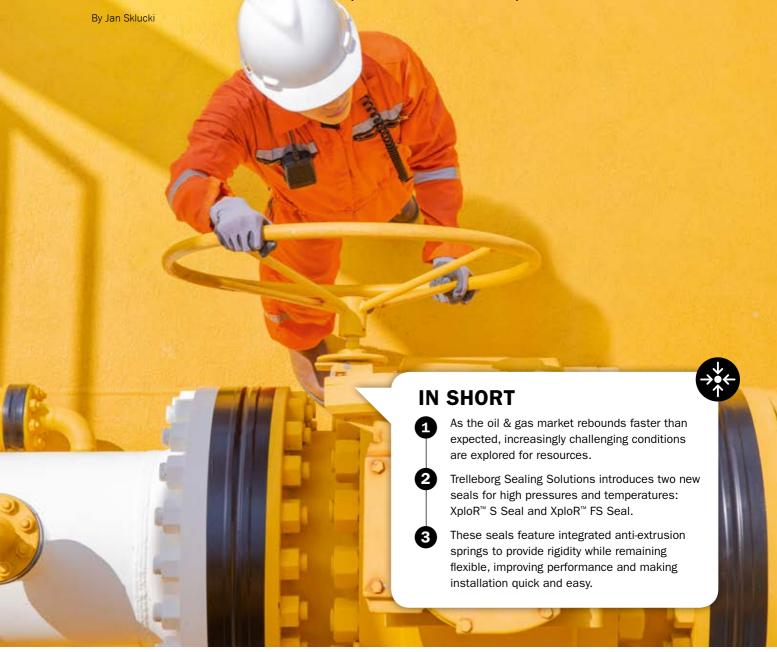
A full listing can be found at:





More to XploR™

Seals used in Oil & Gas applications must survive blistering heat and intense pressures as oilfields move into deeper waters. Eric Bucci, Global Technical Manager, Energy and Oil & Gas for Trelleborg Sealing Solutions explains more about the engineering behind two products designed to withstand these conditions: XploR™ S Seal and XploR™ FS Seal.



DESPITE THE SLOW-DOWN of the global economy in 2020, the oil & gas market is rebounding faster than expected and should continue to grow over the following years as economies further re-open. Growth in the industry is expected to be dominated by demand for natural gas rather than oil. Gas production has recovered quickly despite COVID-19, accelerated by environmental concerns around coal and oil. As reserves in increasingly harsh conditions are tapped, pressure and temperature requirements for seals increase. To extract these resources effectively, reliably, and safely, Trelleborg Sealing Solutions has expanded its portfolio for today's oil & gas applications with two new products.

Secret to strength

The XploR™ S Seal and XploR™ FS Seal are both primary, bidirectional, static seals optimized for stability in the groove under high pressures and temperatures. They each have specially designed profiles and can be custom engineered to adapt them to different applications, from downhole tools to wellheads and tubing hangers.



The secret behind their strength is the two integrated antiextrusion springs, which provide a rigid backbone while maintaining flexibility. Hidden beneath the rubber, they provide strong extrusion resistance to the seal while the elastomer element maintains a gas-tight seal when un-pressurized. During operation, the springs work with the pressure to increase the sealing effect. "As system pressure increases, the anti-extrusion springs are forced into the extrusion gap area providing a robust and reliable seal. Coupled with the rubber sealing interface, leak-free operation is possible and allows for significantly reduced emissions," says Eric.

Consolidating components

One of the key reasons to select the XploR[™] S Seal or XploR[™] FS Seal is to consolidate several seals into one. Applications such as downhole tools can require a complex arrangement of seals, including supporting components like anti-extrusion rings to keep running effectively. As well as requiring more space within the assembly and additional installation grooves. each extra seal costs more time for an engineer to install. "The XploR[™] S Seal and XploR[™] FS Seal are an effective one-piece replacement for arrangements involving O-Rings, Back-up Rings, U-Cups, and T-Seals," says Eric. "And though the springs are strong and rigid enough to provide the necessary anti-extrusion support to the elastomer, they remain flexible enough to allow easy installation into solid grooves, saving more time."

Outside of installation, reducing the number of seals means that ordering can be streamlined, simplifying procurement, and reducing the part numbers to manage. Though a range of parts to standard O-Ring groove sizes is available to select from quickly and easily, Trelleborg Sealing Solutions is also interested in supporting non-standard and novel applications with customized products tailored specifically to that use. "We have worked with customers from an early design stage to provide custom-designed seals for specialized projects and have shipped many already that are working well within the application," says Eric. When applicable, each custom seal is evaluated by engineering teams and simulated using FEA to verify form, fit, and function.

Materials and testing

The operating parameters of the seal are mainly decided by the material choice. The XploR™ range is renowned within the Oil & Gas industry and is specified as standard for both products. Resistant to Rapid Gas Decompression (RGD) and aggressive process media, the materials conform to necessary approvals and standards, such as ISO 23936-2 (NORSOK M-710), API-16C, and ISO 10423.

"Compounds behave differently under different conditions, and often to increase performance in one area, another property, such as media compatibility or temperature range, must be compromised on. It takes knowledge and skill to balance these factors and create a material that perfectly fits an application. That's what we've done with the XploR™ materials; matching the compound with the application," says Eric. \rightarrow

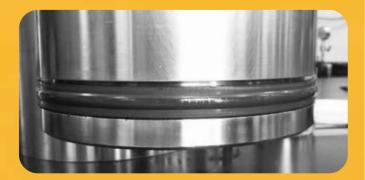
¹ https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energyresourcesus-eri-ogc-report-2021.pdf

XPLOR™S

XPLOR™FS

The XploR® range is drawn from a larger portfolio of materials, including the high-specification Isolast® compounds, which are available for use when required.

To provide confidence in the performance of the design and materials, Trelleborg Sealing Solutions undertook testing regimes relevant to oil & gas regulations. The products are validated in accordance with ISO 10423 Annex F conditions at a range of key temperatures. "The validation testing is very difficult, yet Trelleborg Sealing Solutions has one of the largest compliant material portfolios in the industry," says Eric.



Hardware-friendly

"As with the seal material, what the spring is made of should also be adapted based on the conditions that the seal experiences," continues Eric. Under lower pressure working conditions, a stainless-steel garter spring provides the resilience required without hardware damage. However, in high pressure and temperature applications, such as downhole tools, small movements of the seal or housing in reaction to pressure or temperature can cause wear on mating surfaces.

To minimize any possible damage, a composite spring material can be substituted for the metal. "We might call this the 'hardware-friendly' version, and few other companies offer it as an option," says Eric. "Carbon fiber springs eliminate the risk of damage to the housing without compromising on strength or elevated temperature performance,"

The seals join an already impressive selections of products for the Oil & Gas market. "The XploR™ S Seal and XploR™ FS Seal are another step in enhancing the Trelleborg Sealing Solutions Oil & Gas elastomer portfolio and confirming our reputation as a one-stop-shop," finishes Eric.

XPLOR™ S SEAL AND XPLOR™ FS SEAL

Primary one-piece static seals for Oil & Gas applications. They give bubble-tight sealing at high pressures and temperatures with superior extrusion resistance. Their design manages high hardware tolerances and applications, such as valves and downhole tools where pressure can cause ballooning of hardware.

FEATURES

- High pressures up to 103.4 MPa / 15000 psi
- Temperatures up to -45 °C / +260 °C; -49 °F / +500 °F depending on material choice
- Replace several components with a single seal
- Compliant with multiple industry standards, such as ISO 29001 Oil & Gas design & manufacturing. Compliance to API 6A / ISO, API-16C 10423 Annex F, PSL 3 & 4; Materials compliant to NORSOK M710.
- Material choices to meet any conditions
- Cost-effective
- Robust and flexible with symmetrical cross-section for error-free installation
- · Seals effective even with relatively rough surfaces
- Same quality and standard product anywhere in the world

APPLICATIONS: Oil & Gas industry, including Drilling Tools, Downhole Tools, Trees, Wellheads, Valves, Risers & Connectors, Coil Tubing Equipment, and Fracking Equipment. Chemical Processing and Transport.



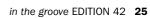
Check out the Oil & Gas website: www.oilandgas-seals.com

Taking passengers safely, efficiently, and comfortably around the globe.

By Meghan Cloud Braunger



The sealing experts at Trelleborg Sealing Solutions Aerospace partner with customers to design and supply polymer sealing components for onboard and ground support systems. Our sealing solutions extend service life and ensure leak-free performance in the air and on the tarmac, keeping systems running, passengers comfortable and expediting aircraft preparation for the next flight. \rightarrow





Interior Systems

The interior of the aircraft is the area on a plane where passengers and crew pass time during the flight. It is equipped to offer passengers a comfortable place to sit and convenient spaces to stow smaller pieces of luggage. Meals and drinks are prepared in the aircraft galley and lavatories offer passengers and crew a place to wash up.

Polymer components optimize the performance of overhead bins, enabling smooth and noiseless movement, and meet interior design guidelines. Because of contact with potable water and food, specially developed sealing materials play a vital role in applications in the lavatory and galley.

PRODUCT HIGHLIGHTS:

FoodPro® safe sealing

Complying with the most relevant food contact regulations globally, the FoodPro® material range is ideal for aircraft galley applications. These materials can be manufactured into a full range of seals, from multi-functional O-Rings to components with more complex geometries.

Injection molded thermoplastics

As a lightweight alternative to metal components, injection molded thermoplastics can be used for structural components throughout the cabin and cockpit, such as storage bin and passenger service unit components.

Extruded profiles fill the gaps

Used to seal unsightly gaps and protect the cabin structure from damage. Trelleborg extruded profiles are approved to all international flame, smoke and toxicity standards.

Cabin Support Systems

Within the aircraft, there are a number of systems, which maintain clean air and water and a consistent climate. The Environmental Control System (ECS) regulates the supply and distribution of air, while keeping temperature and air pressure at comfortable levels. Water and wastewater systems make sure the lavatories and galleys are equipped with clean water and that waste is efficiently removed.

Trelleborg components are specified to meet the unique needs of each application, such as the ability to perform under high temperatures or to provide an ideal strength to weight ratio.

PRODUCT HIGHLIGHTS:

Advanced composite technology

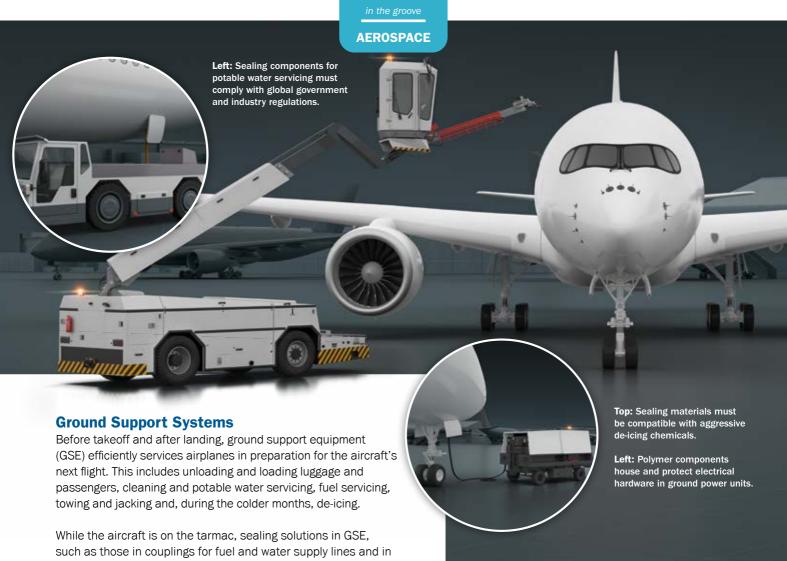
Lightweight composite structures are commonly used in plenums (a box connected to the ECS which that brings in, distributes and removes air), ducts and resonators. These are designed and manufactured to meet customer requirements.

High temperature resistant Turcon® Variseal®

Bleed air systems and hot air ducting operate under constant high temperatures. The Turcon® Variseal®, offers effective, long-term sealing performance and significantly reduces air loss throughout the entire system.

Diaphragms providing precise control

Diaphragms enable precise control of movement and pressure in water and air management systems. They are available in a variety of homogeneous or fabric-reinforced elastomer materials or as multicomponent parts.



PRODUCT HIGHLIGHTS:

Lighter weight bearings and wear rings

ensure leak-free and long-lasting performance.

On heavy-duty equipment, such as aircraft towing vehicles and aircraft jacks, our Orkot® Slydring® and bearing solutions effectively replace metal bearings for a long service life and lower friction.

lifting cylinders for airway bridges and aircraft jacking equipment,

Gaskets meet application requirements

Designed for use in a wide range of applications, elastomer and elastomer-to-metal bonded gaskets specified to meet unique application requirements, such as compatibility with aggressive chemicals or compliance with regulations for potable water applications.

Torlon® components for harsh conditions

Trelleborg Sealing Solutions is a certified manufacturer of highperformance Torlon® components, which are specially engineered to withstand harsh operating environments and aggressive fluids used, for instance, in de-icing equipment.



WATCH OUR WEBINARS

The Technical Library on the Trelleborg Sealing Solutions website contains an ever-expanding range of webinars. Two highlights for aerospace experts are:

- · Aircraft Interior Solutions
- Aircraft Galley Polymer Capabilities



Watch to find out more about how we support customers when specifying sealing solutions for onboard systems.





In Your Own Language

At Trelleborg Sealing Solutions, we offer unmatched levels of engineering, commercial service and technical support. While benefitting from our global expertise and unique services, customers around the world can partner with local engineers to develop customized solutions to meet their individual needs through our Customer Solution Centers worldwide.

By Maria Rifaut

In the groove was happy to chat with Clarissa Maier, Head of Customer Service for the food, water, beverage, chemical processing and automation segments at our Customer Solution Center in Stuttgart, Germany, about how her role at Trelleborg supports a global but local focus.

ITG: What does a typical day at work look like for you?

CM: My role at Trelleborg Sealing Solutions is to take care of my team, and consequently take care of our customers. A typical day usually begins with a team meeting and continues with calls, emails and specific topics needing my attention. When times are less busy, I look to optimize our business processes to provide high quality products and services to our customers, before and after a sale.

ITG: How do you and your team support our customers in their daily business?

CM: Trelleborg is highly customer-focused, so my team goes the extra mile in assisting with our customers' special requests. We serve customers in very demanding segments, so our products need to meet high standards of cleanliness, as well as complying with stringent standards and regulations.

In addition to ensuring our products and services meet such requirements, we make sure the supply chain works smoothly, provide quotations and follow-up on incoming inquiries. I step in whenever a challenging situation arises and my team requires additional support.

ITG: How do you interact with your colleagues globally to provide solutions for customers around the world?

CM: We work together with teams in other Customer Solution Centers on global key accounts. Another example of our collaboration is when it comes to satisfying customer demands or new projects developed in Germany, which are transferred to a different customer location at a later stage. The Customer Solution Center in Germany is specialized in a wide variety of market segments, so we offer our expertise and support to other Customer Solution Centers on a regular basis.

ITG: What is your favorite thing about working in the **Customer Solution Center in Stuttgart?**

CM: We have a state-of-the-art facility, which promotes work-life balance by offering a fitness room, a small library, a family space and a relaxation room, for example. But I'd say my favorite part is having research and development, supply chain management, sales, finance and IT all in one location.

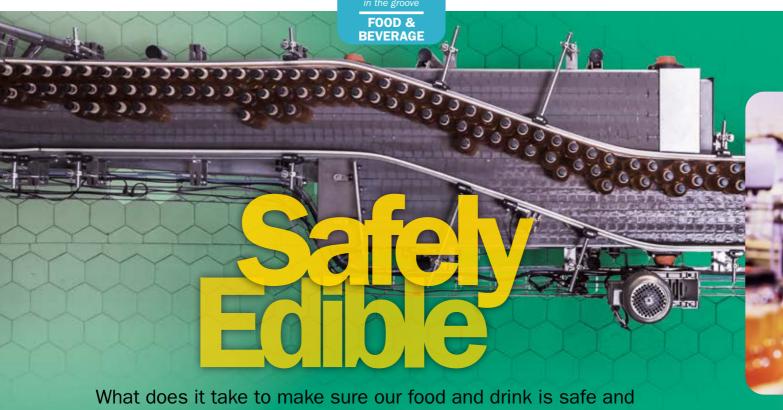
ITG: How would you describe Germany to someone who has never visited the country before?

CM: It's hard to describe somewhere so diverse; there are big differences between North and South, East and West, but I guess what applies to all of Germany is our love of beer and bread, and our appreciation for rules, except on the autobahn, of course. We are a hard-working nation, and even though our cities are pretty crowded, the countryside with its castles and forests is beautiful. By the way, did you know 65% of the autobahns in Germany have no speed limit? WW

MORE INFORMATION



Scan the QR code to learn more about our Customer Solution Centers worldwide, and to meet other local experts like Clarissa.



What does it take to make sure our food and drink is safe and palatable? The answer is effective processing. That includes making sure the right sealing materials are used in the right place.

By Meghan Cloud Braunger

THE SEALING ENVIRONMENT WITHIN food and beverage processing is one of the most demanding. Seal failure can lead to potential contamination or line stoppages. Materials, whether elastomer or plastics, must cope with the processing of a broad variety of food types along with Cleaning in Place (CIP) and Sterilization in Place (SIP) regimes that can quickly destroy incorrectly specified seals. On top of this, compliance with food contact regulations is a must.

A Material Matter

Trelleborg Sealing Solutions makes selecting the right material for every food processing environment simple. Specially engineered to meet all the demands of the food and beverage processing industry, the FoodPro® range of materials includes EPDM, NBR, FKM and Isolast® FFKM elastomers, along with Turcon® PTFE and Zurcon® engineered plastics. The compounds can be used in the production of standard and custom-designed seals, bearings, gaskets and other sealing components.

Trelleborg Sealing Solutions offers one of the widest ranges of materials for food and beverage processing. Here we highlight some of the key choices.

High purity

The new **FoodPro* E75F1** is specifically designed to meet all relevant global food contact regulations, including the strict US Food and Drug Administration (FDA) requirements for use in equipment processing infant formula.

Because FoodPro® E75F1 is compression and injection moldable, it is suitable for both standard and custom-designed seals, including multicomponent parts, which simplify handling and facilitate hygienic design.



Scan the QR code to download the flyer, and learn more about FoodPro® E75F1.

Exceptional resistance

Intended for use in the most challenging food and beverage processing applications, perfluoroelastomer (FFKM) Isolast® FoodPro® J9538 extends seal life, reducing unscheduled downtime. It demonstrates superior performance under extreme low and high temperatures, is compatible with a full range of foods and beverages and can withstand the harshest CIP and SIP regimes.



UP TO STANDARD

FoodPro® materials comply with the most comprehensive number of food contact material regulations and industry standards around the globe, including:

- U.S. Food and Drug Administration (FDA) regulations
- · European Food Contact Regulations including Reg. (EC) 1935/2004

And for most materials:

- Chinese food safety standards
- Japanese Positive List released in 2020
- 3-A Sanitary Standards
- NSF International Standards

Eliminating flavor carryover

One of the biggest challenges in beverage processing is flavor carryover, which can occur when, for example, water is bottled after the same equipment is used with a strongly flavored energy drink.

FoodPro® V8T90 is a high-performance fluoroelastomer (FKM), intended for use in beverage filling lines for soft drinks, energy drinks, liquid food and near water products. Specially formulated, it prevents flavor molecules from migrating into seal materials, which could then be released and absorbed by beverages in subsequent filling processes.

Flat gaskets

Formulated from virgin polytetrafluoroethylene (PTFE) and enhanced with high-quality approved fillers, FoodPro® HMF 48 is a universal solution for flat gaskets. It is available in a wide range of thicknesses and sheet formats, facilitating simple and inexpensive production of almost any seal geometry. Alongside full compliance and compatibility with a wide range of food and cleaning processes, the material is engineered for strong performance in all operating conditions.

Maximum wear resistance

Zurcon® FoodPro® Z81, an ultra-high molecular weight polyethylene (UHMWPE), demonstrates exceptional high extrusion and wear resistance and low friction performance. This material is ideal for reciprocating, very slow rotating and oscillating applications, and can be used with ceramic surfaces, as well as abrasive media and countersurfaces.



Media and temperature resistant

Based on ultra-clean technology, Turcon® FoodPro® MF6 is engineered for unrivalled media and high temperature resistance. Performance in food migration and cleanability tests proves this PTFE material is suitable for the widest range of applications, including those that have repeated contact with liquids, acidic and fatty foods. It also withstands harsh CIP and SIP regimes and many different cleaning solutions, including caustics, acids or disinfectants. WW



Have you read the article 'Skol to a Sustainable Beer'? Check out page 10 to find out what makes this material so impressive.



"Over the years, in the groove has matured to an industryleading magazine featuring topics surrounding innovation and technology."



ROBERT ZAHIRI,

Director of Global Marketing & Communications

THIS YEAR, THE TRELLEBORG SEALING SOLUTIONS **CUSTOMER MAGAZINE** is celebrating a big birthday. *In* the groove has delivered readers a wealth of information on sealing technology and industry trends, including interviews with leading experts, in-depth application case studies and technical information for design engineers, for 15 years.

Robert Zahiri, Director of Global Marketing & Communications, has been involved with in the groove since its original issue. He explains what makes the magazine so special. "In the groove has evolved significantly since the first issue was published. During the first years, without the technology we have today, creating each issue - from content to layout - was a much more hands-on process.

"The magazine has always been a coordinated global effort, involving many colleagues from different locations, which can still be said today. But initially the publication had a strong focus on Trelleborg Sealing Solutions news and achievements.

"Over the years, in the groove has matured to an industryleading magazine featuring topics surrounding innovation and technology. Recent editions showcase our partners and industry experts, covering a full range of markets. It also connects readers to relevant multi-media content, online tools and valuable resources. I'm looking forward to seeing how our magazine continues to grow over the next 15 years."

On this anniversary, the in the groove editorial team would like to say thank you to our readers and everyone who has contributed throughout the years. All the support and input we've received, both big and small, has helped make this magazine the success that it is today. Www

A Blast from the Past: Have you read these? Take a look at some of our all-time favorite articles:



Forensic Seal Investigation, **Edition 2/2010** Trelleborg's forensic examination of seals helps to unravel the history of damaged seals using even the smallest pieces of evidence.



Uniquely Layered, Edition 1/2012 Trelleborg super-heroes showcase our innovative Rubore® manufacturing technology for the automotive industry.



The Drops of Life, Edition 29 Medela, an industry leader in breastfeeding solutions, shares how instrumental breastfeeding research is in the development of their products.



World's Biggest O-Ring, Edition 38 Did you know Trelleborg Sealing Solutions holds a Guinness World Record?



The Fab Four, Edition 40 Trelleborg introduces four new, cutting edge materials that meet the requirements of the semiconductor industry.



In Good Taste, Edition 41

In partnership with Krones, a manufacturer of beverage filling equipment, Trelleborg researches the cause of flavor carryover in the bottling process.



In the last year, the impossible has proven to be possible. At rocket speed, Covid-19 transformed the way we live, work, travel and collaborate. The pandemic shows that change is conceivable and created a new momentum to turn things around and reach the United Nations' Sustainable Development Goals, says Marina Ponti, the leader of the UN SDG Action Campaign.

By Susanna Lindgren

Photo: Hilarius Riese

Marina Ponti has devoted her entire working career to making a difference. Her desire to campaign, inspire and mobilize for change moved her from Milan in Italy via the UN headquarters in New York to Bonn, Germany, where the UN SDGs Action Campaign has its office. Her mission is to inspire people and organizations from all backgrounds and every part of the world to take actions to achieve the UN's Sustainable Development Goals (SDGs).

New understanding

The task received an unexpected tailwind from the threats to society created by the pandemic. It is not that Covid-19 has made people in general more aware of the 17 SDGs, or even more aware of the urgency for change, she explains. Covid-19 has shown how far we are from having resilient, inclusive, sustainable societies that leave no one behind.

"New understanding is emerging around the inextricable links and the need for acting across entire systems," Ponti says. "This offers real hope for unlocking rapid action on daunting challenges such as pandemics, along with deep-seated inequalities and climate change, now and in the future."

Covid-19, she points out, has shown how interconnected we all are, and how threats that touch us all require global action and solidarity. "Also evident is the profound power of individuals," she says.

"People who have done the right things, from wearing masks to staying at home, have collectively constrained the spread of the virus. They demonstrate how actions add up and will take us past the turning point and on to transformation."

Impossible to stop travelling?

Before Covid-19, she says, everybody knew that governments and leaders in the private sector were unlikely to be prepared to make the changes or sacrifices necessary to reach the sustainability development goals by 2030. As an example, she points to the way we travel. Everyone was aware of the negative impact of emissions from air traffic. Everybody agreed that we flew too much. But too many said that it was impossible to stop traveling, and that their mission was so important they just had to go. \rightarrow



WHY MARINA PONTI SAYS CHANGE IS ON THE WAY

Fortunately, we see more and more companies realizing that we are at a turning point for people and the planet, leading to vast changes in their business operations.

The number of leading companies joining the 1.5° Pledge, striving to be net zero carbon by 2040, doubled in the previous year to 1,101 businesses. New joiners include Facebook and Ford.

Another example: large-scale employee volunteer programs introduced by various multinational companies, including Unilever, PricewaterhouseCoopers and Sony Pictures. In addition to long-established companies changing their policies, we see a large entrepreneurial movement that is starting businesses with sustainability at the core of their vision and business model. For instance, the German startup Tomorrow is the first European player linking the two issues of mobile banking and sustainable finance.



"Then all of a sudden we all stopped traveling," she says. "We realized that this was possible, and that it was conceivable to redesign our whole society and rethink how we educate, work, invest and move. We were actually doing something that was considered unthinkable only a few months earlier."

At a turning point

There is, of course, a risk that if we don't grab the opportunity many things will go back to the old normal, she says. The pervasive message is that we are at a turning point for people and the planet, transformative change is possible, and every individual action can unleash tremendous power for good.

"The strategy of the UN SDG campaign leans on three pillars: to mobilize, inspire and connect people to be the change, and to encourage SDG action by everyone everywhere," Ponti says.

For the private sector, that strategy is to invite companies to take part in initiatives that can help them make a shift and to spotlight those companies that really make a difference.

"Not the ones just investing in a corporate social responsibility strategy," she says. "We put the limelight on companies that are ready to question how many women they have in director positions, for instance, or have real transparency in their supply chain. We also want to inspire by showcasing companies that get a return from making truly sustainable choices."

"We were actually doing something that was considered unthinkable only a few months earlier."

> MARINA PONTI, UN SDG Action Campaign

Asked for an example, she mentions the clothing company Patagonia, which encouraged customers in a recent campaign not to buy new, but to reuse what they already have.

Sustainable values

"Companies aware of the fact that sustainable values are changing society are being rewarded," she says. "The younger generation is much more careful and sensitive in their vision of the future and use sustainability as a factor when purchasing clothes, food or means of transport." She points out that other less agile sectors are following.





Left: Marina Ponti sees that change is on the way.

Rome-based ENI, one of the world's largest oil companies. has declared its transformation from oil to renewable energy production. "This changeover cannot be done overnight, but the company is very serious and has given itself 15 years to move from fossil to renewable energy," she says. Assessing the impact of the UN SDG Action Campaign's work is challenging.

The campaign can obviously measure the number of participants at each event, which can involve up to half a million people who watch and comment across the globe.

Individual actions make a difference

"But change is difficult to measure," Ponti says. "We are very humble and say that we contribute to creating an environment where leaders who do the right thing know and feel that they have support."

Returning to her initial thoughts about the impact of the pandemic, she says, "No one can any longer say that individual actions make no difference. As we saw when facing the pandemic, the only strategy to reduce the spread of the virus was to keep a distance, wear a mask and wash hands, which are individual actions. Somehow this demonstrates how individual actions can lead to transformative change." WW



For more information: https://www.sdgactioncampaign.org

MARINA PONTI

LIVES: Bonn, Germany

EDUCATION: Born and raised in Milan, Italy. Master's degree in political science, University of Milan. Additional studies at University of California Santa Barbara in the US and INSEAD, Fontainebleau, France.

WORK AND CAREER: Italian NGO Mani Tese, UN in New York with UN Millennium Development Goals, UN European campaign office in Rome, then back to UN New York to work for UNICEF. From 2018 head of UN SDG Action Campaign.

FAMILY: Two children, 11 and 13. Husband, lawyer working for the UN designing policies. "We take turns. One time we move because of my work, and the next time because of his."

INTERESTS: "I love skiing, traveling for pleasure and reading lots of books not related to my job."

HIDDEN TALENTS: "I am one of the very few people left writing letters by hand, and I like to send them in a stamped envelope."

WHAT DRIVES YOU: "The vision of leadership. I am only able to perform at my best when I believe in what I do and need to be inspired by the potential in achieving things. I am also driven by the commitment and passion of my team."

Engineered to be one

A quality mindset and expert engineering lead to custom solutions that not only do more, but are lighter, stronger and smaller than ever before.







- Multicomponent technology strongly bonds multiple different materials together.
- The parts created can combine functions into one smaller and more efficient component.
- By combining components, the number of parts handled and installation time is reduced.
- When creating new solutions, Trelleborg uses its own dedicated Multicomponent Development Center with a large range of testing and engineering capabilities.

TECHNOLOGY







MULTICOMPONENT TECHNOLOGY IS ONE of the latest trends in the sealing world, where the amalgamation of multiple components allows unique seal geometries. Manufacturers of electronic systems, electric drives, and healthcare devices are often searching for ways to ease assembly and reduce the number of parts needed, whilst maintaining the same functionality and performance.

A multicomponent part may provide the perfect solution, as one product essentially provides the groove and the seal. By strongly bonding multiple materials together, components can take advantage of different material properties and combine functions into a single, integrated part — at any scale.

Size matters

Take for example a microinjection pump in an automated dosing system; a safety-critical device designed to deliver minute quantities of life-saving medication. These replace the need for a patient to administer a drug at the correct timings and quantities, giving peace of mind, both to the patient and their carers. The entire pump is not much larger than a fingernail and the diameters of the seals are the size of a pinhead.

Friction would mean that the pump could stutter, providing too much or too little of the drug, and lubrication is not an option due to potential interactions with the medicine. On top of this, the pumps need to be delivered in large quantities, to a cleanroom specification, and inexpensively, as they are classified as 'singleuse' devices to avoid cross-contamination. \rightarrow

This custom Electronic Control Unit seal contains metal inserts, a plastic carrier and a silicone seal, combining several functions into one part.





Trelleborg Sealing Solutions engineers responded to the challenge with a two-component, medical-grade Liquid Silicone Rubber (LSR) solution. "With a product this small, installing multiple seals is nearly impossible. Only a 2K solution could meet all of these requirements," says Carolin Grandt, Commercial Director Manufacturing at Trelleborg Sealing Solutions.

"In Stein-am-Rhien, we have automated production within ISO-class cleanrooms, providing consistent quality at high quantities, as required by the application." The pump cylinder is fully lined with silicone material, to both seal and prevent stick-slip at the same time. The LSR process injects the two materials simultaneously using Swiss-precision, custom-made tooling that bonds the materials in a single step. "Without this technology, it would not be possible to produce this micro-sized device that is now available and improving peoples' lives," says Carolin.

Combining functionality

But size is not the only benefit to one-piece solutions. Many applications do not require just a single seal, but a series of components to work in tandem to operate effectively, each taking time to install. "Planned and unplanned maintenance are often cited amongst the main causes of inefficiencies when analyzing the cost of downtime," says Carolin. "When manually installed, simple errors such as incorrect seal fitting, will cost time and money in repositioning and rectifying the mistake."

Trelleborg Sealing Solutions encountered such an application with an Electronic Control Unit. Multiple seals were required and each needed to be seated perfectly within the housing.

Several other components, serving different functions, also needed separate installation in the same area. After detailed analysis, including functional testing and Finite Element Analysis (FEA), a new solution was developed.

"We replaced it all with a single integrated component: a combination of plastic and LSR, precision molded into a single part, with four metal inserts in each of the corners," says Carolin. Though challenging to design and produce in the earlier stages, the time savings are apparent. "With high specification LSR on the inner sealing lip, the metal inserts providing the necessary strength on the housing and a custom plastic connector to hold them in place, assembly was reduced to a single, fool-proof step," explains Carolin.

Multicomponent Development Center

When a new multicomponent plastic-to-elastomer solution is being developed, Trelleborg Sealing Solutions calls on its dedicated Multicomponent Development Center. This state-of-the art facility is responsible for developing, testing and validating solutions in quasi-series production conditions. The center is set up for a full suite of operations, including bond strength testing for a range of material combinations, and process parameter optimization, both of which are crucial to validate and optimize multicomponent products. "We have invested in rapid prototyping capabilities to give our customers a fast and effective turnaround time on manufacturing feasibility and testing," says Neal Borg, Product Manager for Multicomponent Solutions at Trelleborg Sealing Solutions.

Trelleborg Sealing Solutions uses its global network of manufacturing, design and logistics centers to support its

customers' businesses, wherever it is in the world. This means speaking their language and understanding their market and requirements. "Being global, the customer can tap into our pool of expertise. Our engineers will use the latest technologies and world-class production facilities to ensure the best solution for your specific application," says Neal.

Choosing the right materials

A huge variety of material combinations are possible, but how do you select which will withstand particular process chemicals, or resist high temperatures and intense pressure at the same time? Even when the ideal materials have been chosen, bonding them together is an exact science and requires a deep understanding of the processes and material interactions to ensure strength and resilience. "It's important to choose the correct materials for the job at hand – our teams will look at the conditions within the application and

determine the optimum material, or combination of materials, for the application," says Neal.

Competencies and capabilities

Multicomponent sealing solutions are suited to various industry requirements and lend themselves to an extensive list of applications. Two of the most common application requirements are reducing the number of components needed and making installation easier and less time consuming. "Product and application complexity require engineering expertise as well as state-of-the-art equipment. Our engineers are at your service to work with you to achieve the best product performance and most cost-effective sealing solution," says Neal.

ADVANCED MATERIALS

We offer one of the most complete material portfolios on the market that is engineered to withstand the most demanding conditions. We have developed a range of techniques and processes to achieve strong bonds between these and with other compounds and metal, ensuring there are no leak paths.

Trelleborg Sealing Solutions is the market-leading provider of plastic to elastomer solutions. The state-of-the-art technology, expertise and toolmaking required is provided by very few companies on the market.

Unique multicomponent material combinations:

- Plastic to Thermosetting Elastomer (Rubber)
- Plastic to Liquid Silicone Rubber
- Plastic to Thermoplastic Elastomer

The type of materials chosen depends greatly on the application. Our engineers work with you to analyze many factors, such as media encountered, temperature range and mating surfaces, to fully understand the sealing issues and develop the best solution.

There is a vast range of polymers available for multicomponent solutions, including thermoplastic elastomers.



Scan the QR code to learn more about this technology.



A Change of Vind

In the debate surrounding eMobility, many objections raised by the media and owners of conventional cars miss the real point. Their arguments are not based on facts and figures, but merely serve as an excuse not to change from the status quo.

By Axel Weimann







- Changes to behavior and mindset, such as with seatbelt use, are needed for full adoption
- Businesses will adapt to electric vehicles, providing charging points and activities to do while you wait



HiSpin®

HiSpin* rotary seals deliver minimum frictional torque while offering a static and dynamic sealing function giving tight sealing regardless of the direction of rotation.

THEY SAY THE EMOBILITY REVOLUTION has only just started. But who exactly are "they"? They are owners of vehicles with internal combustion engines (ICEs), who see only a few electric cars on the street today.

Electric is inevitable

Manufacturers, on the other hand, see the revolution as a foregone conclusion. The electric vehicle is here to stay, and its power source will be a battery. This conclusion is not the result of star gazing or from looking into a crystal ball. If we consider the amount of time needed to develop and prove a new vehicle, as well as its average life span, then the decision to go electric was made a long time ago.

Without a doubt, battery electric vehicles (BEVs) will dominate new car sales over the next 10 to 20 years. A fact confirmed by recent announcements from major manufacturers, such as Ford, Jaguar, GM and Volvo, who are outlining plans to go all-electric by 2035 at the latest.

Lack of speed, range and charging stations

One argument against BEVs is their perceived lack of speed. In fact, the average maximum speed of most electric vehicles is between 150 and 180 kilometers or 93 and 111 miles per hour. An issue for some in Germany, where limitless speeds apply on a few stretches of the autobahn when the traffic allows, it is not a problem elsewhere globally, where top speed limits are way below the maximum level an electric vehicle can reach.

There is still the problem of range, or so say the objectors to electrification. A BEV cannot cover 800 kilometers or 500 miles in one go; at least not yet. Travelling without a break for that distance though, is not safe. There is absolutely nothing wrong with stopping to refresh the batteries of both car and owner after 350 kilometers or 220 miles. Added to this, filling stations in the traditional sense, will probably be unable to cope with a multitude of cars stopping to recharge all at once when summer vacations begin. It will be easier and more relaxing to leave the highway and grab a bite at a proper restaurant while recharging your car, rather than visit a fastfood joint at the side of the road.

HiSpin® PDR RT · Flexible for use in a wide temperature

- range from -200 °C to +260 °C with Turcon® materials
- · Seals at top speeds of over 60m/s
- · Shaft grounding with conductive PTFE
- · Minimum frictional torque



HiSpin® HS 40

- · Flexible for use in a wide temperature range from -45 °C to +200°C with XLT FKM material
- · Seal at top speeds of over 40m/s



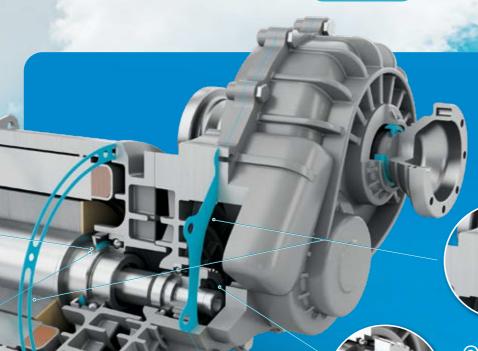
Behavioral change is required

Of course, some behavioral change will always be involved. It was a similar situation when wearing seat belts became mandatory. Arguments at the time ranged from possible internal injuries, through to a risk to pregnant women, right up to the danger of drowning if your car ends up in the river. All these unfounded arguments resulted in a certain antipathy toward seat belts, which only broke down over time, based on wrong beliefs and the unwillingness to change behavior. Today it feels completely unnatural - almost impossible even - to drive without fastening your seat belt.

Behavioral issues also applied to acceptance of mobile phones. If you forget to charge one overnight, you cannot expect to make a phone call with it the next morning. Yet this does not prevent people buying cell phones - the benefits overcame the inconvenience.

A similar thing is true of an electric car. Once again, it simply requires a small change in behavior, until recharging the car becomes as habitual as plugging in a mobile overnight. Many of those who are skeptical of new ideas are wary of making \rightarrow

eMOBILITY



Damping Solutions

With our innovative products, in particular the Rubore* Radial Damper, vibrations can be eliminated where they evolve.

Vehicle acoustics are improved significantly.



Housing seal

- Automated assembly due to form stability
- · Flexible design
- · Large selection of materials



Rubore® Radial Damper

- Damping of vibrations above 300Hz
- Designed to meet application requirements
- · Large selection of materials

ENABLING ELECTRIC VEHICLE DEVELOPMENT

While we cannot predict the needs of the electrification industry, Trelleborg wants to supply its automotive clients with the optimum, tailored sealing solution.

Multicomponent technology

Our customer-specific, multicomponent products allow the integration of the combined features of various materials within a single part, offering easier assembly and the simplified management of parts.

The use of ethylene propylene diene rubber (EPDM) in this multicomponent process provides the greater chemical and physical characteristics required by new applications. A combination with plastic instead of metal means an overall saving in weight, leading to lower energy consumption; both of which are major considerations in the design of BEVs.

Turcon® HiSpin®

Seals that can stand up to the high speeds found in the powertrains on BEVs are vital. Thanks to the use

of specially developed polytetrafluorethylene (PTFE), our Turcon® HiSpin® rotary seals are high-performance products that not only reduce friction but are also conductive. They can take over the role played by grounding rings, requiring less additional axial space, allowing the seals to prevent corrugation damage and craters on the bearing, significantly increasing the service life of the electric motor.

LSR

Liquid silicone rubber (LSR) is the ideal sealing material for many of the new applications in eMobility, such as driver assistant devices and sensors. Recognizing this, Trelleborg has revolutionized the processing of LSR to meet the stringent demands of the automotive industry, producing customized products in a fully automated process for the highest possible degree of quality and reliability.

Using the latest liquid injection molding technology, Trelleborg manufactures parts in closed-loop cells, including in-line quality controls and packaging that excludes any human handling, fulfilling the requirements of Class 7 and 8 cleanrooms; a requirement for the silicone used, for example, in the tiny LEDs universally found in today's electric vehicles.

the behavioral change involved. But as seat belts and cell phones prove, within a few years these fears are no longer a reason to prevent mass adoption.

Quick and pleasurable charging

Technology will also increase the distance electric vehicles can travel. With huge improvements in terms of charging times, new material combinations and better thermal management, there are strong indications that the capacity of today's batteries could increase significantly. This will translate into charging enough energy to travel 300 kilometers or 190 miles within 10 minutes; meaning hooking up to an electric point will take not much longer than visiting a conventional filling station.

"So, why not begin changing your mindset now, as electric vehicles are the inevitable future. Don't look at the negatives, embrace the positives."

AXEL WEIMANN,

Director Global Segment Automotive, Trucks & Transportation at Trelleborg Sealing Solutions



AXEL WEIMANN

Director Global Segment Automotive, Trucks & Transportation at Trelleborg Sealing Solutions

Weimann knows both sides of the eMobility debate: As a self-confessed petrol head, he enjoys driving his Caterham on the deserted country roads of Baden-Württemberg, Germany, early on a Sunday morning, but has been known to swap it for the family car an all-electric Kia Soul.

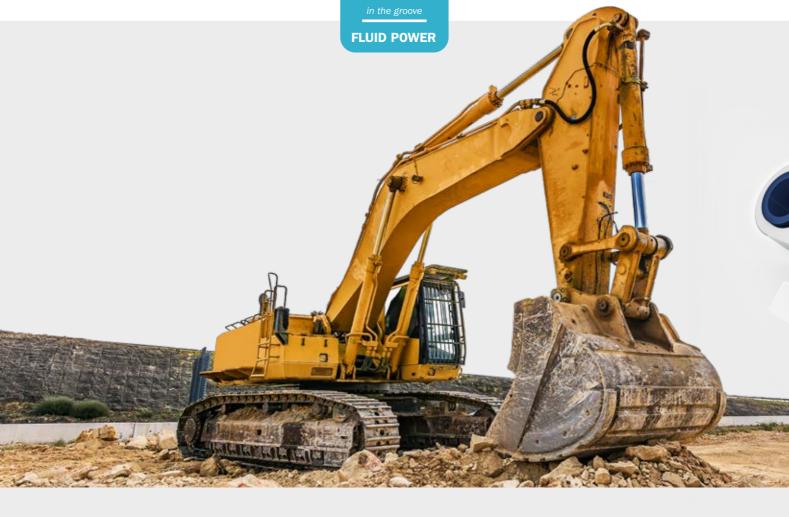
In fact, charging your electric vehicle is likely to be a far more pleasurable experience than filling up an ICE car. Instead of waiting five minutes at the gasoline pump, you could spend 20 minutes at a new type of charging station, which would offer a whole range of novel attractions to help drivers spend their time. Neck and back massages, car cleaning, or children's activities are just three conceivable examples.

We are seeing the first steps in this direction. Some larger stores and service providers are allowing customers to charge their vehicles while they park - rewarding the customer for visiting and making the store's offering more attractive. The result of this can be that the electric car owner does not even need a charging station at home. Any change in behavior here is an agreeable one, as drivers no longer have to make an extra trip to a filling station.

Change your mindset

So, why not begin changing your mindset now? Electric vehicles are the inevitable future. Don't look at the negatives, embrace the positives. We will not only be protecting the environment, but we also have an excuse to treat ourselves to good cuisine and to go shopping! WW





Sealing multiple applications

"The power train or drive system of an excavator transfers power from the engine to the drive, supplying torque to the equipment's tracks or wheels," says Beth. "In this system alone, there can be around 10 to 15 applications that require sealing. Add to that, the seals that are needed for boom and bucket cylinders and actuators, valves and pumps, as well as the implements and attachments, and there are even more fluid power applications on just this one piece of equipment. And in all cases, it is extremely important to specify the optimum seal or sealing configuration to maximize life and performance of each component."

Selecting the best seals for each system is an involved process for construction equipment engineers, especially as they may not be familiar with the intricacies of sealing or fully aware of the options available to them. Trelleborg, however, is there to support.

Continual development

"We work collaboratively with our off-highway customers from the initial design right through to serial production," says Beth. "With so much experience in the off-highway industry, we know what will work. Though specific vehicle designs may require refinements, we can accelerate the design process and time to market through the sharing of our sealing expertise."

As many fluid power sealing solutions are very well established over time, people often think that nothing new can happen in the technology of fluid power sealing.

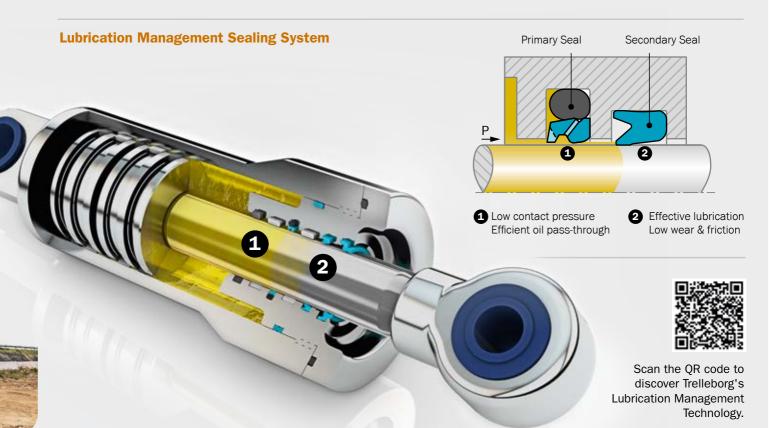
"This is not true," continues Franco. "We're continually pushing boundaries and trying to stay one step ahead in satisfying the current and developing needs of our customers. We know what the pain points are, and continuously evolve existing materials and seal geometries to enhance their performance. In some cases, we create completely new materials solutions."

This was the case with Lubrication Management technology, which transforms hydraulic sealing by adjusting lubrication conditions of all single sealing elements within a sealing system.

Lubrication Management

"It goes without saying that applying lubricants to seals under pressure loads can extend the life of seals and mitigate the effects of friction and wear. This though, is a simplistic view, given the speed and pressure challenges of modern machinery – as well as the mandatory need for redundancy in critical industrial applications," says, Dr. Mandy Wilke from Global Technical Management at Trelleborg Sealing Solutions, who was involved in the development of the Lubrication Management technology.

"In fluid power and hydraulic sealing applications, best practice comes in the form of a primary and secondary seal.



The primary seal does the grunt work, maintaining integrity for as long as possible; the secondary seal is the redundancy measure - ready to step in when it's needed."

Though it may be best practice, there is always a challenge with this configuration.

Mandy, continues: "If the primary seal does its job perfectly for an extended time, no lubricant goes past it. This generates dry running conditions for the second seal and, should it activate, creates wear. Lubrication Management solves this issue by balancing the risk of lubricant leakage to ensure both the performance of the primary seal and extend the life of the secondary seal."

Extending life and more developments

Lubrication Management technology incorporates rounded sealing edges that lower contact pressure and allow just enough fluid to enter the system to sufficiently lubricate the piston rod. This increases the consistency of the tribological system between the sealing configuration and its counter surfaces, reducing friction and wear, and significantly extending application life, while increasing robustness and reliability.

Though Lubrication Management represents a revolutionary step in fluid power sealing, the future holds even more exciting innovations. W

FUN FACTS

Kroll K10000 is the highest freestanding tower crane at 470 feet, with a jib reach of up to 330 feet and an area covered of 7.5 acres.

Liangzhu, China, is home to a series of high and low dams, and levees built 5,000 years ago, making it one of the world's oldest-known hydraulic engineering systems.

Bucyrus RH400 is the largest front-shovel excavator, weighing around 889t with an 8.6-meter-wide under carriage.

MORE INFORMATION



Scan the QR to learn more about Trelleborg's sealing solutions for off-highway equipment.







60. Years Young

By Tanya Borg

In 2021, Trelleborg Sealing Solutions celebrated 60 years of operation in Malta. Located in Hal Far and Marsa, the manufacturing facility produces 25 million O-Rings and engineered seals per week for a global customer base, including many of the world's leading car manufacturers.

OVER THE YEARS THE COMPANY HAS REINVENTED ITSELF

and increased its product portfolio to be at the forefront of new innovative products in the field of elastomers, with the most recent additions being multicomponent and micromolded part manufacturing.

Distinguished guests and big plans for the future

The 60th birthday was marked by a visit of the Hon. Prime Minister, Dr. Robert Abela, to the Hal Far main site on the 20th May. Other distinguished guests included the Minister for Economy and Industry, Hon. Silvio Schembri and the Minister for Energy, Enterprise and Sustainable development, Hon. Miriam Dalli.

The event also saw the announcement of plans to increase the manufacturing footprint of the existing 26,000 square meter facility by an additional 4,000 square meters to host new business and product expansion. W





Martin Hignett, Managing Director of the Malta facility gave a factory tour to Hon. Prime Minister Robert Abela, Hon. Miriam Dalli and Hon, Silvio Schembri,



Malta employee Clayton Debattista, demonstrates the compression molding process to Hon. Robert Abela.



