

ttime

A MAGAZINE FROM TRELLEBORG GROUP

3•2018

Solutions that seal, damp and protect critical applications.

BUSINESS BACKBONE

Digital technologies transform
the supply chain world.

SAFETY IN DEMANDING ENVIRONMENTS



THE WORLD IS LEANING ON LATVIA

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Cover photo:
Getty Images

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Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way. The Trelleborg Group has annual sales of about SEK 32 billion (EUR 3.28 billion, USD 3.69 billion) and operations in about 50 countries.

The Group comprises five business areas:
Trelleborg Coated Systems,
Trelleborg Industrial Solutions,
Trelleborg Offshore & Construction, Trelleborg Sealing Solutions and Trelleborg Wheel Systems.

The Trelleborg share has been listed on the Stock Exchange since 1964 and is listed on Nasdaq Stockholm, Large Cap.

EDITORIAL


KEEPING THE WORLD MOVING

In this issue you can read about a talented employee – one of many in our organization – who broadened her expertise in Trelleborg and now leads our manufacturing of wheels and rims. It's an important part of Trelleborg's business as wheels and rims along with our premium tires transport the world's goods on a variety of material handling vehicles.

Distribution and logistics are something we look at – internally to ensure that the right product is delivered to the customer on time, but also externally to offer our customers smart products that facilitate their logistics. Here, for example, Trelleborg offers the smart

port of the future with a full-scale pilot and port management system. On the same theme, Wolfgang Lehmacher from the World Economic Forum gives his insights into the digital technology part of distribution and logistics on pages 19-21.




Peter Nilsson,
President and CEO


TRELLEBORG



Reach for **THE SKY**

Oberstdorf in the Bavarian Alps is best known for the FIS Ski Flying World Championships, held here most recently in January 2018. The Heini Klopfer takeoff tower, one of the highest in the world, had to be restored and enlarged in time for the event, and Trelleborg played an important part in the solution.

Text Birgitte van den Muyzenberg Photo Trelleborg, Getty Images





The windows of the platform are all set in wood-and-aluminum frames with Trelleborg's D3630 seals. The giant glazed nest-like box hangs beneath the tip of the tower, high above the trees.

► **T**here are just five ski flying towers in the world, and this is one of the tallest, rising to 72 meters (236 feet). Originally built using wood, it was restored as a concrete structure in 1973 and has been modernized several times since then. But its latest incarnation, the work of Renn Architekten in Fischen im Allgäu, is doubtless the most impressive to date, and Trelleborg played an important part in bringing it to its present state of glory. Trelleborg's D3630 window seals help the glazed facade of the viewing platform defy the harsh mountain climate for many years to come.

Any construction in the mountains has to withstand extreme weather, from rain, hail and snow to blistering winds and temperatures well below freezing. Oberstdorf, a two-hour drive southwest of Munich in the Bavarian Alps, has some of the highest levels of precipitation in Germany, and temperatures sometimes drop below -30 degrees Celsius (-22 Fahrenheit). So when plans were drawn up for

the latest renovation of the Heini Klopfer ski jumping tower, carried out in 2016-2017, cutting corners was not an option.

"The request came in for casement seals that could withstand temperatures ranging from -40 °C to +80 °C (-40 °F to +176 °F), and there was no question that Trelleborg was the supplier with the right solution," says Ralph Blome, Country Manager for sealing profiles within Trelleborg Industrial Solutions in Germany. "For me it's always fascinating to see Trelleborg get involved with many kinds of extraordinary projects. A sealing profile really is a hidden marvel of technology."

Not only would the tower need to endure the power of the elements, it would also have to meet today's stringent security regulations



Heini Klopfer in Germany is one of the tallest ski flying towers, rising to 72 meters.

set by the International Ski Federation. In addition, the viewing platform needed to be built for the ultimate spectator experience.

Affectionately known as the “leaning tower of Oberstdorf,” the ski flying tower has a 118-meter (387-foot) inrun that rises at a 38.7 degree angle. Perched at the far end of the tower, the platform for the coaches and judges offers a premium vantage point, with magnificent bird’s eye panoramic views of Lake Freibergsee and the mountains beyond. The giant glazed nest-like box hangs beneath the tip of the tower, high above the trees.

First-class building materials in the cantilevered prestressed concrete construction are complemented with sturdy fittings and fixtures including the windows of the platform, which are all set in wood-and-aluminum frames with Trelleborg’s D3630 seals – just the high-performance, high-protection hardware required. The facade of the viewing platform was manufactured and installed by woodworking firm Holzverarbeitung Bietsch from Ofterschwang, the prefabricated

elements fitted with profiles running this way and that, like the interlinking twigs of a giant eagle’s nest. It took just three days to install the facade and glazing of the tower head.

Originally opened in 1950 and designed by the ski jumper turned architect Heini Kopfler, the ski flying hill on which the tower stands still dominates the landscape. Here, up to 40,000 spectators gather to see some of the world’s most daring athletes compete for both the Ski Jumping World Cup and the Ski Flying World Championships, which were held here most recently in January 2018.

The sport is extreme and the athletes are hardcore, the hills being much bigger than those used for ski jumping, and the jump distances longer. Daredevil ski fliers will lean into a forward dive, shoot down the ramp at 100 kilometers per hour (60 miles per hour) and launch themselves skywards. Gliding like a giant flying squirrel in a great leap of faith, they manage – somehow – to land on two feet. Apparently with no fear of flying – or accident. ■

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The D3630 casement seal, engineered for sash rebates and overlaps, was used in the Heini Klopfer ski jumping tower in Germany.

SEALING PROFILE FOR WINDOWS

Designed to seal the gap between the window casement and its frame, the D3630 profile, otherwise known as a window seal or gasket, is specially designed for use with wooden and wood/aluminum windows. Compatible with both water- and solvent-based paints, it is made from highly flexible foam, a quality sealing material based on a specially modified thermoplastic elastomer (TPE).

Extremely reliable in terms of its abrasion, UV radiation, ozone, thermal aging and water resistance, the seal also provides protection from the cold, wind, rain and snow. This means that even in critical environments, high performance and a long life cycle are guaranteed.

In Germany demand is growing for both wooden and wood/aluminum windows, which together have around a 15 percent share of the market today.



SHAPING THE WHEELS OF THE WORLD

Training and teamwork are the keys to success at Trelleborg's manufacturing facility in Latvia.

Text Juris Kaža Photo Edijs Pālenš



The Trelleborg Wheel Systems manufacturing facility in Liepāja, Latvia, is about to be responsible for all global production of rims as Trelleborg concentrates all its rims production in one facility.

Site manager Liene Giertmane-Done's team will make rims from three inches to 54 inches in diameter, used for everything from forklifts and farm equipment to huge harvesting machines for forestry. The Liepāja facility will expand its floor space by 73 percent and will fill its new building with equipment and a painting facility to become a Center of Excellence for wheels and rims production.

For four years, Giertmane-Done has managed the production of rims in sizes from three inches to 20 inches, and mounting of tires made by Trelleborg in Sri Lanka onto most of them as needed by customers. The wheels, often custom-made, go to international brands of agricultural and industrial original equipment manufacturers (OEMs).

With her education at the Banking Institution of Higher Education, a master's degree in financial management and prior experience at Trelleborg in finance, she didn't come to Liepāja with academic engineering and manufacturing knowledge, but she gained a lot of on-the-job know-how.

"I spent three years as a finance manager and I wanted to see where the numbers come from," she says. "I saw how they can be impacted by teamwork with operators. I tried operating machines, mounting tires and welding wheels. I love production because at the end of the day you can see what you have made and going home you may pass an agricultural vehicle with our wheels."

Trelleborg put Giertmane-Done through the Manufacturing Excellence School that took her to



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The shop floor is where the expertise is formed.

Liene Giertmane-Done, Site Manager

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► several other Trelleborg operations and taught her a number of skills, such as the SMED (single-minute exchange of die) method to reduce the set-up time between production runs. As Giertmane-Done says, the SMED training she passed on to team leaders and employees helped the Liepāja plant reduce set-up time in 2018 to one hour for a production run for a different product on a line. In 2013 it was eight hours. This saved the facility some EUR 85,000 per year and also boosted workplace satisfaction, getting the product to customers faster.

Learning about other tools such as 5S – the Japanese system of sort, set in order, shine, standardize and sustain – along with Hoshin planning and other training, helped her team rethink the location of machines and free up some 1,000 square meters of space for additional new machines and operators, while improving efficiency.

“We replanned the process flow inside the existing work area and improved flow by 20 percent,” Giertmane-Done says. “Operators feel more responsibility. They helped redesign the workspace and they now work the way they want to. The shop floor is where the expertise is formed. My wish is not to work harder but make the work easier, to work smarter.” Many employees of the Liepāja facility have also been sent for training and experience at other Trelleborg facilities, learning manufacturing processes but also building up communication skills in other languages.

Giertmane-Done plans to staff the Liepāja facility with two or even three shifts when needed. “We are not just looking for employees, we are looking for the best, those who want to work in a changing environment and be flexible,” she says. “We go to universities and technical schools and invite students to visit here to see our working environment.”

WHEELS AND RIMS

The Trelleborg range of wheels and rims, is available from three inches to 54 inches in size and can be supplied in many different configurations depending on application, requirements for load capacity and several other values influencing the design. The wheels and rims are designed with different specifications, such as sizes, integral hubs, bearings, bores, offsets, plate thickness, paint finish etc. that match the performance requirements defined.



Aldis Dima, Machine Operator



Gatis Gucs is one of the Machine Operators at the manufacturing facility in Liepāja.

In a country that has seen considerable labor emigration to other European countries, Giertmane-Done says she now sees people coming back to work at the Trelleborg facility in Liepāja, including two roll-forming machine operators who returned from the U.K. and Ireland after working there for 10 years.

Asked why people are drawn to Trelleborg in Latvia, Giertmane-Done points to the facility's training system and compensation and benefits program. Teamwork in a constant effort to make the work smarter and easier is also a factor. Giertmane-Done describes her goal this way: "I want people to come to work with a smile and would like to have them go home with a smile for their families as well. We are not just hard working. We look every day to raise the bar and make the workplace a place where it is easier to work." ■

A FINANCE MANAGER GOES HANDS-ON

Liene Giertmane-Done was born in the Latvian industrial and port city of Liepāja. She has bachelor's and master's degrees in finance from the Banking Institute of Higher Education, one of Latvia's oldest business schools, now known as the BA School of Business and Finance.

At Trelleborg Wheel Systems, she has gone through the Trelleborg Group's Manufacturing Excellence School program at several locations in Europe, learning state-of-the-art production system methods and practices.

Her career has taken her from working as a financial analyst for government, as an auditor at Deloitte, to private business and as finance manager at Trelleborg Wheel Systems in Liepāja from 2011 to 2014. Since 2014, she has been the site manager in Liepāja.

Giertmane-Done is married and lists her hobbies as raising and training dogs, as well as gardening and traveling.

Watch
Liene Giertmane-
Done in a video on
trelleborg.com



Comfortable CITY LIFE

More than half the world's people live in cities, and the proportion is rising. Often unseen but critical elements from Trelleborg help make urban living comfortable.

Text Petra Lodén

Illustration Alexander Wells

Together with engineers, architects, developers and others, Trelleborg helps to make cities sustainable and pleasant places to live. Growing awareness of the environmental aspects of our lives is making noise management increasingly important. Seals in ventilation systems reduce disturbing noise and keep emissions of particles low. Antivibration systems make transit vehicles comfortable, while bearings damp noise and vibrations in buildings.

In a building's facade, seals block heat, water, ozone, salt spray and UV rays. And no-dig solutions when replacing sewer pipe save lots of time and energy, not to mention annoying traffic disruptions. ■



1. Facade system: Profile seals are used to glaze glass panels in curtain walls and facades, to provide air- and water-tight seals within the facade system and to provide seals around the perimeter of unitized wall panels.

2. Ventilation: Seals keep emissions of particles low and reduce the disturbance of noise and vibration in ventilation systems.

3. Telecom: Molded solutions include products used for sealing radio units and antennas and protecting them from moisture, pollution and dust.

4. Train: HALL Axle Guide Bearing and Active HALL is an innovative axle guide linkage that reduces wear and noise.



DID YOU KNOW?

54%

54 percent of the world's population lives in urban areas.

5 cities

Of the world's ten largest cities, five are in China.

3.9 billion

The urban population of the world grew from 746 million in 1950 to 3.9 billion in 2014. In two decades' time, five billion people will live in cities.

28 mega-cities

The world has 28 mega-cities with more than 10 million people.

857 million

India has the largest rural population with 857 million, followed by China with 635 million.

9 countries

From 2017 to 2050, it is expected that half of the world's population growth will be concentrated in just nine countries: India, Nigeria, Congo, Pakistan, Ethiopia, Tanzania, the United States, Uganda and Indonesia.

Sources: Wikipedia, UN, The Guardian

5. Buildings: Noise and vibration isolation bearings are used to damp noise and vibration from buildings. The isolation is achieved by using composite bearings placed between the building and the ground.

6. Pipe rehabilitation: Trenchless pipe seal technology incorporates a liner along with an epoxy resin into the sewer pipe.

No-dig solutions make pipe rehabilitation easier, less expensive and more environmentally friendly.

7. Pipe and manholes: Easily installed pipe seals, with built-in long-term protection against failure.

8. Tunnels: Elastomeric gaskets for immersed, cut-and-cover and bored tunnels.

Blue Dimension™ refers to Trelleborg solutions for better sustainability. They protect people, the environment, infrastructure and assets.

BEAT THE HEAT

When it comes to fire protection systems, companies cannot afford to cut corners. Passive fire protection solutions based on polymers can be the vital element to ensuring the protection of people, structures and equipment.

Text Birgitte van den Muyzenberg

Photo Monty Rakusen/Getty Images

Fire, as the saying goes, is a good servant but a bad master. Energy companies, for example, are constantly aware of the danger of fire as they process vast amounts of hydrocarbons. As the companies focus on safety, value and carbon efficiency, the high importance they place on fire prevention leads them to invest in Trelleborg's solutions. As Patrick Waal, Business Group Director for Applied Technologies within Trelleborg Offshore & Construction says, "Passive fire protection solutions are available in a series of materials and products to protect personnel, equipment, critical components and structures, and to assist emergency response activity by buying time to gain control of the fire, and evacuate the area."

With proven engineering and manufacturing techniques for protection of all kinds of fires, from simple cellulose to hydrocarbon and jet fire, rubber materials, which are built-up with layers that meet corrosion, thermal, fire, and mechanical protection requirements, protect structures from exceeding temperature limits. Rubber has the unique capability of withstanding weather conditions, movements, providing

ease of inspection and fire protection over the life of a project.

The offshore environment is just one example of an extreme environment with a high fire risk. Exposed to the corrosive effects of the sea, platforms also have to withstand the vibration of oil pumps and the motion of waves. Often split into various units, with living quarters separated from the production area, rigs need overall protection so that a fire can be effectively isolated and its impact minimized.

In an offshore facility, the risk of rapid, uncontrolled spread of fire is greater than in many other environments. So it is essential to ensure the complete protection of all areas to prevent the spread of fumes and flames. The solutions that Trelleborg offers not only do this but also damp and give noise protection. The flexible nature of Trelleborg's rubber-based materials provides protection from vibrations, collisions and explosions.

Take Trelleborg's latest Firestop material, for example, which was developed at its in-house laboratory in Krokstadelva, Norway. Launched in February 2018, the material is thinner and lighter than any other

Fire is a dangerous element wherever it may occur, but it is especially so in enclosed spaces where many people may be located.



Patrick Waal,
Business Group
Director



fire protection material on the market. It is made from a rubber-based compound that can be molded to fit structures of any shape, "like a waffle iron," says Waal, providing protection for personnel and equipment while also preventing structures from exceeding critical temperature limits.

Trelleborg applies Firestop protection to each section of offshore risers, or vertical pipeline, in the "splash zone" – the area between the water's surface and the platform. Covering this vulnerable area with this durable, polymer-based, corrosion-free fire-protective coating ensures full protection.



FIGHTING FIRES

Fire is a dangerous element wherever it may occur, but it is especially so in enclosed spaces where many people may be located. Saving lives and preventing harm in these situations are paramount. Dragoncoat, for instance, is a revolutionary coating used on rubber components. Like Firestop it has many potential industrial applications, and is currently primarily used in the rail industry.

Reducing the flammability of suspension products, Dragoncoat delays smoke and toxic emissions, as well as the onset of flames. In the context of a fire occurring on a train, these factors reduce the risk of passenger exposure by increasing evacuation time by up to three minutes. It may not seem such a long time, but it can literally be the difference between life and death.

On planes fire needs to be avoided at all cost. One of the most at risk areas is the engine, which runs at very high temperatures. In the unlikely event of a fire occurring, specially engineered seals are there to prevent the spread of flame. To ensure they are up to the job, testing so they meet strict standards is critical.

Trelleborg deliver comprehensive in-house qualification testing. Its fire test facility addresses the growing need of aerospace manufacturers to meet varying fire test requirements to comply with industry and customer standards for vibration and air flow. Trelleborg conduct customer specific tests to meet a variety of qualification requirements, such as ISO/TR 2685, which calls for vibration and flame exposure of 1,100 degrees Celsius for fifteen minutes without allowing flame penetration or other defined failure modes.

When it comes to protecting the platforms' helipads and other surfaces from fire, Vikodeck is used. This tiled rubber surfacing is highly suited to harsh offshore oil and gas environments. Energy companies that perform offshore drilling can have these one-square-meter fire-resistant tiles laid on the aluminum decks of their oil platforms. Easy to install, they are also maintenance-free. Besides offering fire protection, they can withstand corrosion and wear, and are highly resistant to abrasion, impact, blasting and jet fire.

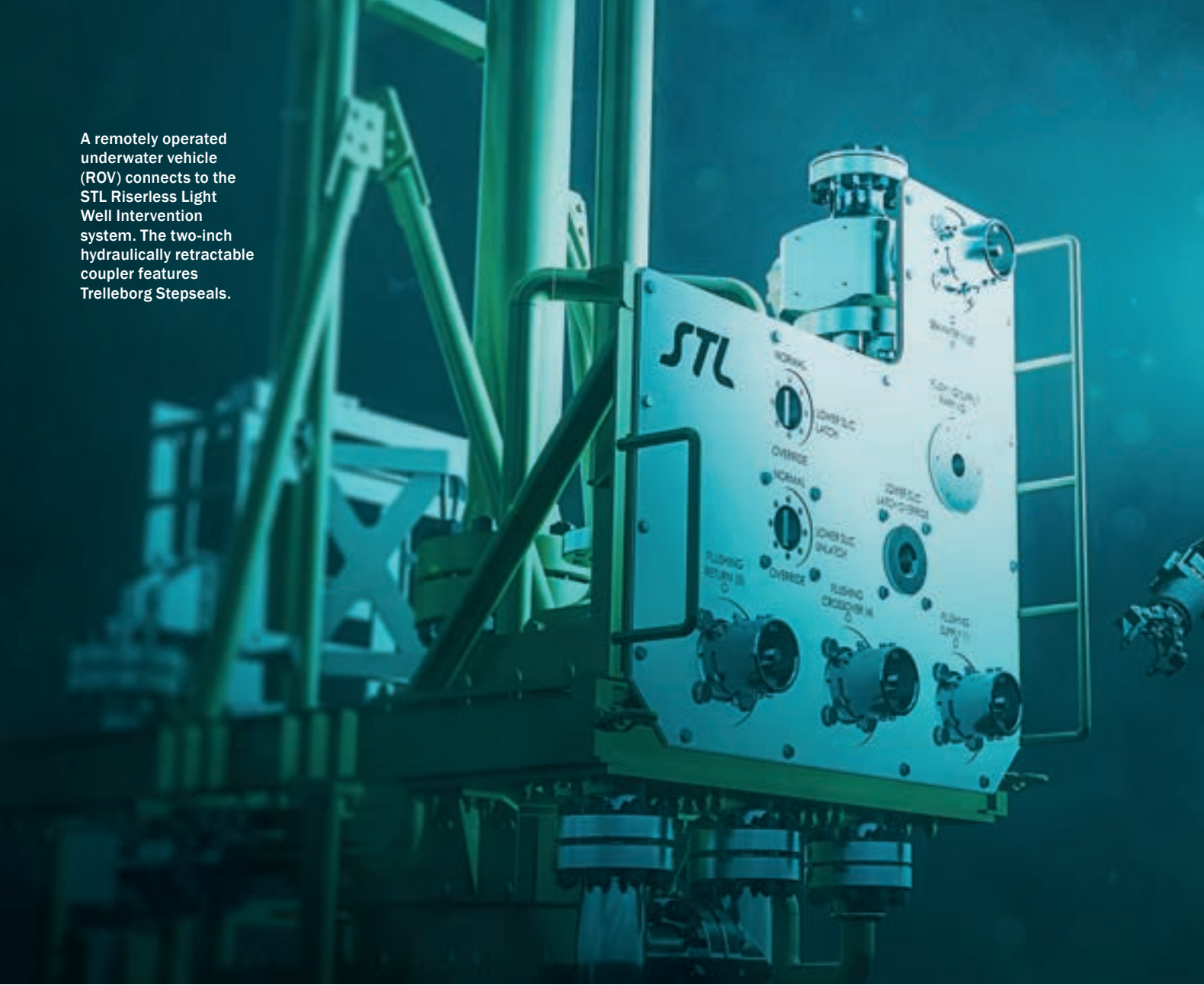
"The life cycle of a typical platform today is 30 years, and Vikodeck

will last at least that long," Waal says.

In fact, that goes for all of Trelleborg's Firestop solutions. "Certain Trelleborg products now in use out in the North Sea were installed in the 1980s, and they're still going strong," says Waal. "Our track record is immaculate."

Trelleborg focuses on a wide variety of industries and applications for its fire protection products. "In the next five years, we want to become just as big outside the oil and gas industry as we are within it," Waal says. "We're busy exploring the possibilities, and there's plenty of scope for development." ■

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A remotely operated underwater vehicle (ROV) connects to the STL Riserless Light Well Intervention system. The two-inch hydraulically retractable coupler features Trelleborg Stepseals.

Ready for the storm

Subsea Technologies teamed up with Trelleborg to design the world's first hydraulically retractable subsea coupler – with the ambition of revolutionizing the energy sector.

Text Amy Brown Photo STL

Subsea Technologies Ltd (STL) faced a challenge. To make a larger version of a hydraulically retractable subsea coupler – the world's first coupler of its size with a hydraulically retractable element – it required engineered seals that could withstand harsh subsea conditions. The company turned to Trelleborg Sealing Solutions to find a solution.

STL, based in Aberdeen, Scotland, manufactures connectors, primarily subsea hydraulic and mechanical ones, and is a leader in solving complex subsea challenges. Creating a larger coupler – a mechanical component that is vital for connecting large-bore, high-pressure

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THE STEPSEAL 2A CR

The Stepseal 2A CR, designed to meet STL's demanding subsea requirements, is Trelleborg Sealing Solutions' new standard corner-reinforced rod and piston seal for single-acting use. Advantages include its anti-tilt design and the dimensions of the seal body.

The coupler is fully Lloyds design-verified and qualified to water depths of 3,000 meters (10,000 feet), rated to 10,000-psi fluid pressure and up to 5,000-psi hydraulic function pressure. It can be used on subsea wellhead connectors, riser connectors, emergency disconnect packages, quick release stab plates and emergency disconnect points.

ancillary lines alongside a structural connector – demanded more than just a scaling up of seal assemblies. Instead, a new sealing system was specified.

“We wanted to create a product that would boost safety and efficiency for offshore engagement,” says Drummond Lawson, CEO and Managing Director of STL.

STL had been exploring the possibility of creating a large-bore (two-inch), high-pressure hydraulically retractable coupler for connecting flow lines with fluid pressures to 10,000 pounds per square inch (psi). The company's experts knew that scaling up to a two-inch bore to allow for choke and kill lines passing through the XR Connector would prove challenging. To capture the full potential and

functionality of the two-inch coupler, they needed a seal that would work in harmony with the larger coupler.

STL had previously developed small-bore (½- and ¾-inch) retractable couplers, used as sub-components in its proprietary XR Connector, a high-angle emergency disconnect package that allows a floating vessel to move away from a wellhead, especially in stormy conditions, without risk of the riser failing. Risers are a type of pipeline developed to transfer materials from the seafloor to production and drilling facilities at the water's surface as well as from the facility to the seafloor.

A formidable challenge to high-pressure seals is preventing extrusion, where high pressures tend to push the material through clearances of an assembly. Trelleborg designed seals for the larger subsea coupler to prevent extrusion. The result was the Stepseal 2A, Trelleborg's new standard corner-reinforced rod and piston seals for single-acting use.

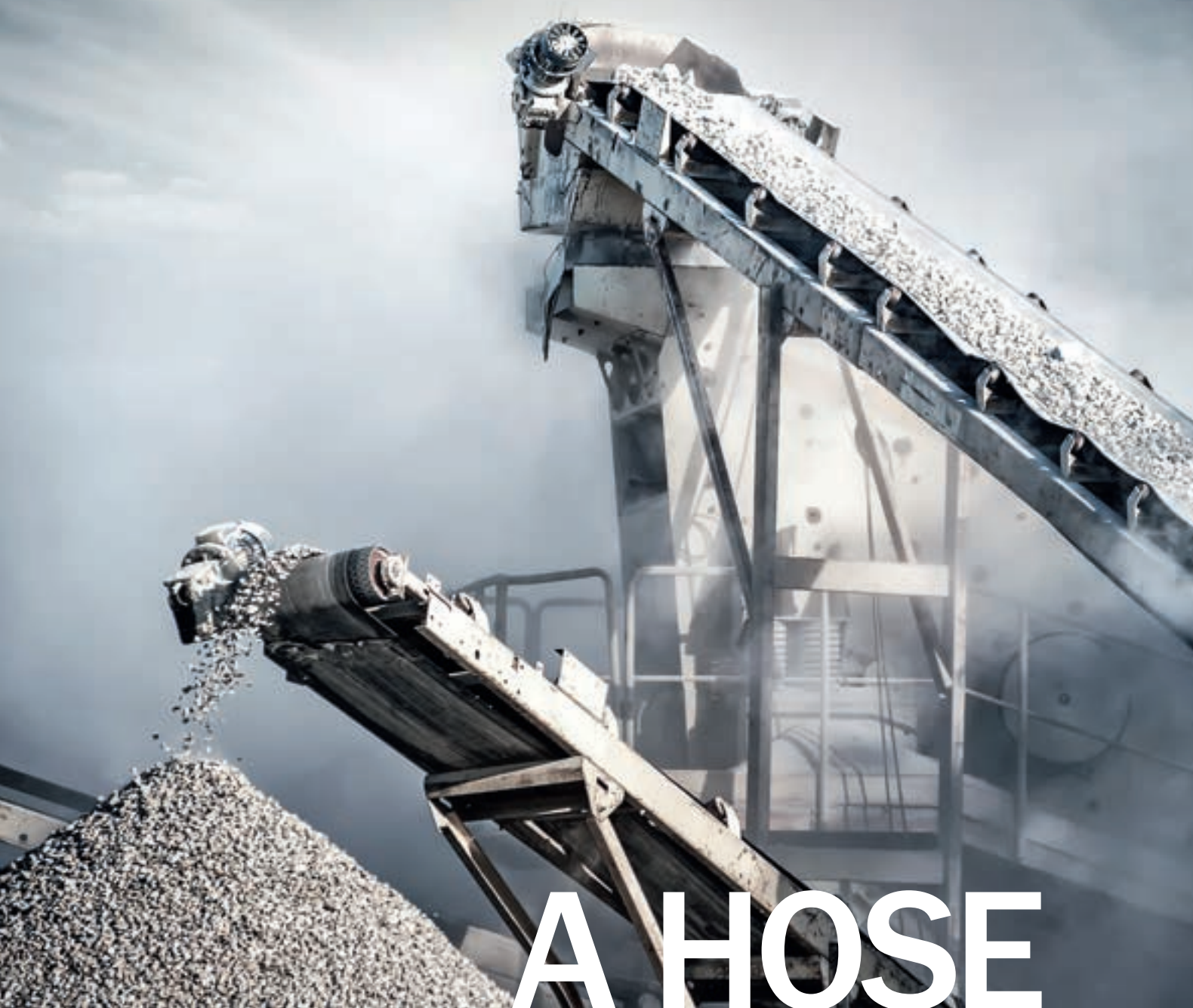
The coupler provides new opportunities for remote emergency release system designs for subsea applications, Lawson says. “As the first coupler of this size ever to be made with a hydraulically retractable element, we are certain this will create opportunities for offshore beyond just its use in the XR Connector,” he says.

STL recently completed the final round of testing and delivered the first coupler, and it has already received further orders.

“The benefits are clear,” Lawson says. “This cutting-edge product will enhance operations and service offerings, enabling our customers to deliver the latest safety and operability enhancements to their clients.” ■



**Drummond
Lawson, STL**



A HOSE LIKE NO OTHER

Abrasive materials are hard on industrial hoses. Trelleborg's innovative Performer Ceramic range represents a breakthrough on numerous fronts: the hoses are lighter, more flexible and longer-lasting than any others.

Text Anna McQueen Photo Trelleborg, Adobe Stock

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For cement producers, steel mills and the mining industry, hoses for conveying materials can be costly, cumbersome and short-lived. But thanks to Trelleborg's new Performer Ceramic range, users can now use hoses that last up to ten times longer than other rubber hoses for highly abrasive industrial applications. In addition, they are up to 60 percent lighter and five times more flexible than other ceramic hoses on the market.

"It's all about the innovative design, which took us around four years to perfect and test in the field before we were certain that this truly was the innovative product we were looking for," says Ludovic Dumoulin, Market Segment Manager for industrial hoses within Trelleborg Industrial Solutions, based in Clermont-Ferrand, France. "Ceramic-lined rubber hoses are not new – they have been around for a long time – but what makes the Performer Ceramic range so unique is the shape and composition of the ceramic tiles with which the hose is lined. There is nothing else like it on the market."

The patented design of the Performance Ceramic range involves using diamond-shaped ceramic tiles that give the hose much greater flexibility. "This pattern means that not only are the hoses much more flexible, they are much easier to maneuver and can be cut with a simple knife, whereas other ceramic hoses require a diamond-tipped disc cutting tool in order to get through the material," Dumoulin explains.

The Performer Ceramic range is specifically for very abrasive applications, such as for conveying solid recovered fuels (mechanically fragmented non-hazardous waste that is not eligible for recycling) into a kiln for making cement. Typically, the lifespan of a rubber hose in such applications can be as little as three to six weeks, given the abrasive nature of the material conveyed. However, Performer Ceramic hoses have been shown to last for more than a year, which offers considerable savings.



Ludovic Dumoulin

- 1 Temperature range
-30°C to +70°C
- 2 Inner tube
92% ceramic tiles
- 3 Delivered in custom lengths



"Moreover, when the Performer Ceramic hose does eventually wear out, it can be replaced much faster than a regular hose, thanks to its unique design," says Dumoulin. "Despite being 92 percent ceramic with an embedded steel helix, it is easy to cut. And because it uses Trelleborg Bloc-End coupling, it's quick to attach."

Dumoulin says a French cement producer previously used Trelleborg rubber hoses that had a lifespan of between three and six weeks. "They had tried ceramic hoses from one of our competitors but found them too stiff to manipulate," he says. "They installed a Performer Ceramic hose, and after 61 weeks it showed no significant wear and they're delighted."

So far, Trelleborg has delivered and installed a number of Performer Ceramic hoses, mainly in France, Sweden, Norway, Germany and Poland. "This project involved a great many teams, from development and technical teams to manufacturing, purchasing and sales," Dumoulin says. "We all worked together to develop the right product to meet everybody's needs. It's the perfect example of teamwork to serve the customer." ■

TECHNICAL SPECS

Inner tube: Al₂O₃, 92% ceramic tiles embedded into a black, natural rubber tube.

Reinforcement: Synthetic textile with embedded steel helix.

Cover: Weather-resistant, black, corrugated EPDM rubber with fabric impression.

Temperature range: -30 °C to +70 °C.

Hoses are manufactured and delivered in custom lengths.

Xingda Precision Machinery in China's Hunan province had a problem finding the right sealing solution for its nitrogen gas springs. After turning to Trelleborg, the quality of Xingda's products has increased substantially.

Text Hou Liqiang Photo Wang Jing

Seals that make a difference

China's national standard for nitrogen gas springs, now widely used in dies for automotive manufacturing, was established around 2010. Shaoyang Xingda Precision Machinery Manufacturing Co. Ltd. is one of China's prominent companies in the automotive manufacturing industry. It began to do research into springs around 2003 after starting up almost from scratch from a state-owned automotive parts manufacturer that was on the verge of bankruptcy. And it put its springs into production around 2008.

"The development of Xingda was not always smooth," Xingda's general manager Zuo Mingliang recalls.

Xingda came across several challenges, including gaining trust from customers and air leakages because of inadequate seals, and it tried various sealing solutions suppliers.

Trelleborg first came to Zuo's attention when he looked into an imported nitrogen gas spring and found Trelleborg's logo. He soon turned to Trelleborg for sealing solutions. "Trelleborg's solutions, such as the U-Cup, polyurethane O-Ring and Guide Ring, have greatly improved our product's quality," says Zuo.

Xingda has upgraded its product line to become a supplier for the world's robot industry, and Trelleborg and Xingda have increased their cooperation recently in an effort to win a contract for robots.

"Instead of only supplying tailor-made solutions to fix our products, Trelleborg this time was involved with us at a very early stage in our design. This helped Trelleborg know our products better and offer more suitable solutions," he says. ■



“
Sealing is key in nitrogen gas spring manufacturing to ensure quality and performance.

Zuo Mingliang, Xingda Precision Machinery

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Navigating the new world of **SUPPLY CHAINS**



The fourth industrial revolution is already affecting the way we do business and transfer goods across the globe. At the World Economic Forum, Wolfgang Lehmacher focuses on how digital technologies are shaping the logistics of supply chains.

Text Susanna Lindgren Photo Lorenz Richard, Robert Hagström, Getty Images



Gone are the days when a company's sales pitch focused just on price, product and market communication. Today an efficient supply chain is just as crucial, and the spread of e-commerce is increasing its importance.

"Supply chain is the backbone and epicenter of every business," says Wolfgang Lehmacher, Head of Supply Chain and Transport Industries at the World Economic Forum. "That's why it is so fascinating. In a way it's like the chip inside a computer. You don't necessarily have to understand how it works, but it has to be working and deliver on its promise."

Simply put, supply chain refers to the system of organizations, people, information and resources that go into moving a product or service from supplier to customer. Lehmacher takes a wider view, however.

"I would like to involve the whole life cycle, which brings in the need for maintenance, service, upgrades, repairs, returns, recycle and reuse," he says.

Digital technologies are opening up new possibilities that provide advantages for businesses and the environment.

"We can see a lot of benefits with a platform economy – for example, digital platforms that facilitate collaboration between supply chain operators for truck capacity and combined volumes," he says. "All optimization of networks has environmental as well as financial benefits."

Document trade and supply chain finance are other fields where he predicts that the interplay between technologies, such as distributed networks and artificial intelligence, will create significant changes.

"The current use of the letter of credit as a secure instrument to finance international trade is a very labor-intensive, paper-heavy, manual process," Lehmacher says.

With a distributed network of technologies, such as blockchain, a letter of credit could be converted into a smart digital contract, a piece of software.

"It is online, it is instant and it is secure, as only authorized people can change the data," he says. "Add IoT, the Internet of Things, and the location of goods can be traced, which in turn can trigger payment. By digitalizing trade finance we could reduce a process that currently takes ten days down to one hour."

A positive spinoff is the creation of data sets. After



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some time there will be enough data to rate how trustworthy participants are.

“It’s what bankers call KYC – Know Your Customer,” Lehmacher says. “Currently 52 percent of the requests for finance from SMEs (Small and Medium-sized Enterprises) are rejected, which according to the World Bank is equivalent to USD 1.6 trillion in unmet financing needs. With digitalization we have a potential to capture a significant part of that.”

These technologies are in the stage of proof of concept. Some technologies, such as blockchain, have limitations in scalability and involve high use of energy. But Lehmacher points out that other solutions will make it possible to overcome these technical barriers.

Most important, though, is to consolidate the solutions and find standards that make it possible for technologies to communicate across the globe.

Cyber safety is also at the top of his agenda. Cyberattacks are already a reality. Two well-known examples are the attacks on the terminal business of shipping company Maersk, which closed terminals for several days, and on TNT, a subsidiary of FedEx, which lost tracking of shipments because of hackers.

“To prevent this, we probably have to move from total integration to deliberate fraction, to prevent a virus that enters through one door from freely moving thorough the whole system,” Lehmacher says. ■

Wolfgang Lehmacher

Lives: “I am constantly on the move but currently reside in Geneva.”

Education: Bachelor’s in business administration from DAV, Deutsche Außenhandels- und Verkehrs-Akademie Bremen.

Work and career: “My work has been an ongoing journey of continuous learning in various fields.” Previous positions: CVA, GeoPost Group and TNT. Present: Head of Supply Chain and Transport Industries at the World Economic Forum, a Swiss nonprofit foundation committed to improving the state of the world by engaging business, political, academic and other leaders of society to shape global, regional and industry agendas.

Family: “My wife, who like myself has become a global citizen.”

Interests: “All things new, but I am more interested in the impact than the technology itself. Also interested in geopolitics and how things connect and why. To understand this you have to know the history and culture of different countries.”

Hidden talent: “I like to sing and dance, especially ballroom dancing. Took up karaoke when we lived in Asia.”

What drives you: “I have a passion to explore, explain, write and do things that have a positive impact on business, environment, government and the populace at large.”

SMART PORTS BY TRELLEBORG

Trelleborg are grasping the opportunities opening up with big data. This includes, among other things, SmartPort for marine environments.

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At Trelleborg, we are focusing a lot of effort on making use of the data we can collect, not just from our own traditional suite of products, but also from other third party assets, be that ships or other port equipment. To do this we have to develop standards and protocols for collecting data and storing data.

We have a robust and versatile technology platform that can be tailored to overcome pain points such as berth congestion and weather limitations, to name a few, that a facility is facing. SmartPort by Trelleborg realizes the critical interface between ship and port, on land and at sea. This gives

Trelleborg a unique overview of the vessel turnaround process and data extraction points throughout it – both on board the vessel and in the port, and in the interface between the two. Trelleborg is seeking to educate the marine industry about the importance and potential of this interface.

SmartPort by Trelleborg connects port operations, allowing users to analyze asset performance and apply data insights, to improve day-to-day decision making for optimized operations: improved safety, reduced costs, greater sustainability and increased revenue return.

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Scott Smith, Vice President of Marine Technology within Trelleborg Offshore & Construction

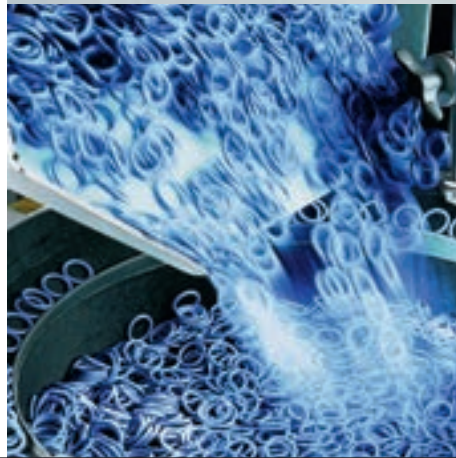
Just a THIN COAT

Big results can be obtained with the thinnest of coatings. Seal-Glide®, an innovative surface treatment from Trelleborg Sealing Solutions, allows seals to be coated thinly to just a few hundred nanometers. Typically Seal-Glide® coatings are less than 450 nanometers, that's ten to 50 times less than standard coating thicknesses. Despite the thinness of the coating, it significantly reduces the friction coefficient of elastomer seals and improves their stick-slip properties considerably.

Elastomers without a surface treatment tend to stick, either to each other during automatic assembly or to counter surfaces in dynamic use. A particular issue is after periods of rest, when there can be a stick-slip-effect. In this, the elastomer seal sticks to its counterpart and when it is moved, elastomer is pulled off the seal, reducing seal life.

The Seal-Glide® coating imparts the benefits of a surface coating without affecting the bulk properties of the seals. As a result, the original elastic properties of the elastomers are virtually unaltered but the seals have a higher service life due to reduced wear when in motion or on startup.

PHOTO: TRELLEBORG



Ski professionals use ultrathin coatings that provide exceptional glide properties. Surface coatings at the nano-scale are not just for winter sports anymore. Seal-Glide®, an innovative surface treatment from Trelleborg Sealing Solutions, significantly improves friction and stick-slip properties of elastomer seals while having little or no effect on the performance of the compounds the seals are made from.

RESPECT THE SOIL

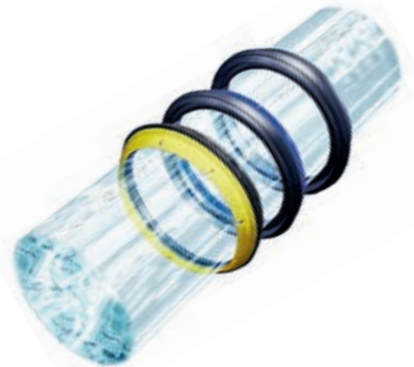
Trelleborg's flagship product range TM1060 generates an extra wide footprint area, improving farm productivity and crop yield while respecting the soil. On the road, the Progressive Traction tread pattern design significantly lowers rolling resistance, fuel consumption and emissions, while increasing comfort and safety for the operator.

HANDY DESIGN

Trelleborg has launched two new trenchless technology sealing solutions for high-pressure potable water applications. Specifically developed for pipe rehabilitation, the two new seals provide a watertight seal for most types of pipe including steel, cast iron, concrete and plastic.

Pipeline system owners are under increasing pressure to repair aging and failing pipelines, while minimizing the impact on the community, traffic and environment. "Previously reserved for sewerage and wastewater systems, pipe relining is steadily on the rise in potable water applications. Due to the high

PHOTO: TRELLEBORG



pressure of the water traveling through the pipes, a more resilient solution is required as there is a risk of water getting between the liner and the pipe," says Tim Sparrow, Director of Sales for pipe seals in Americas, within Trelleborg Industrial Solutions.

Personal data – GDPR



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2 billion

The Group's financial guidelines for 2018 include total capital expenditures of 1.8–2.0 billion SEK.

FOOTBALL PRO

FC Barcelona needed to change the grass in its football stadium. And they needed the job done in record time – just one day.

The club assigned Eduard Viñolas from Viñolas, S.L., an agricultural service provider from Catalonia, Spain. He used three Fendt Tractors, fitted with Trelleborg tires.

"I can rely on Trelleborg tires to have a top performance in the toughest of jobs," says Viñolas. "I am also extremely satisfied with the technical service provided by the Trelleborg specialist in my area. He comes regularly to check tire pressures and advises me on how to take the biggest benefits from my tires. Together with Pneumàtics Perelló, our tire supplier, they make a great team, giving all the local assistance that I and my company need."



PHOTO: TRELLEBORG

"Trelleborg tires have excellent traction and cause a lot less compaction compared with other competitors," says Eduard Viñolas.

WHAT IS THIS?

Is it a submarine periscope or a poisonous snake?
Answer at the bottom of the page.



Answer: This Zurcon Variseal is for a prosthetic device that provides smoother movements for users. Find out more in *T-Time* magazine issue 1, 2018.

The background of the advertisement is a large-scale photograph of a suspension bridge, likely the Tacoma Narrows Bridge, spanning a body of water. An airplane is seen flying in the sky above the bridge. In the distance, wind turbines and industrial structures are visible on the horizon. In the bottom right foreground, a small tractor is working in a field.

Seal, damp and protect

Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Our innovative engineered solutions accelerate performance for customers in a sustainable way.

Read more at www.trelleborg.com

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