

ttime

A MAGAZINE FROM TRELLEBORG GROUP

1-2018

Solutions that seal, damp and protect critical applications.

STAY ACTIVE

The performance of
prosthetics is improving
rapidly to meet people's
requirements to live an
active life.



FABRIC COATINGS FOR SURVIVAL

DIGITALIZATION IN REALITY

CONTENTS

06

HIGH-QUALITY COATED FABRICS

Meet the team that fulfills the need for products that protect us from infection, fire and icy waters.

10

VACATION AT SEA

Trelleborg's solutions make sure a holiday on a cruise ship is an enjoyable experience.



16

GOOD COMBINATION

The new Brawler tire combines a resistant tread compound with excellent damping capabilities.

19

BIG DATA IN PRACTICE

Plamen Kiradjiiev, head of Industrie 4.0 at Smart Data Innovation Lab, is a true digitalization ambassador.



Cover photo:
Getty Images

Next issue of T-Time will be released June 20, 2018.

Responsible under Swedish Press Law:
Patrik Romberg,
patrik.romberg@trelleborg.com
Editor-in-Chief: Karin Larsson,
karin.larsson@trelleborg.com
Co-Editor: Donna Guinivan
Production: Appelberg Publishing
Project Manager: Petra Lodén
Editor: Eriq Agélii
Language Coordinator:
Helena Åkesson
Art Director: Kristin Pæeva
Printings: Trydells Tryckeri
Subscription:
trelleborg.com/subscribe
Address: Trelleborg AB (publ)
Box 153, SE-231 22 Trelleborg,
Sweden
Tel: +46 (0)410-670 00
Fax: +46 (0)410-427 63

T-Time is published three times a year. The opinions expressed in this publication are those of the author or people interviewed and do not necessarily reflect the views of Trelleborg. If you have any questions about Trelleborg or wish to send us your comments about T-Time, please email: karin.larsson@trelleborg.com

facebook.com/trelleborggroup
twitter.com/trelleborggroup
youtube.com/trelleborg
trelleborg.com

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.



TRELLEBORG

EDITORIAL

SMART DATA

Digitalization and mobile technology open up new ways for Trelleborg to integrate with our customers, such as offering support via the Internet or apps. Not least, our products are becoming increasingly intelligent and in turn have higher value for the customer.

In this issue, you can read about Industry 4.0 and big data. For Trelleborg, our ways of working are changing as we use big data to create smart data and refine information about how our customers act and what they need. We do all this with the aim of making it easier for customers to do business with us. Read about the difference between big and

smart data in an interview with Plamen Kiradjiiev on page 19.

Digitalization and other new technologies are still in their infancy in many of our industries. My assessment is that a lot more remains to be seen and discovered, including at Trelleborg.



A handwritten signature of Peter Nilsson.

Peter Nilsson,
President and CEO

The aim of prosthetics manufacturers is to make sure the devices they offer can keep up with the lifestyles of their users, even the most active ones. Trelleborg helps the producers achieve their goal.

NO LIMITS

The incidences of limb loss are increasing and as a consequence also the need for prosthetic devices. Manufacturers of these devices aim to provide the best quality of life for those who unfortunately find themselves in need of a replacement limb and to meet patients' demands for an active and independent lifestyle.

Text Donna Guinivan Photos Matthew Stockman/Getty images, Trelleborg

A **very unfortunate trend** is that the incidences of limb loss are increasing. *Forbes* has stated there are between 10 and 15 million amputees in the world. According to the Amputee Coalition, nearly two million of these are in the United States, with approximately 185,000 amputations occurring each year. The main causes are vascular disease (54%) – including diabetes and peripheral arterial disease – trauma (45%) and cancer (less than 2%).

Prosthetics manufacturers focus on development of devices that provide the best quality of life possible for amputees. The needs of users vary depending on lifestyle. Older people may be satisfied with a simpler device, while others may require a complex prosthetic that allows them to fully participate in even the most extreme sporting activities and that as nearly as possible replicates a natural gait.

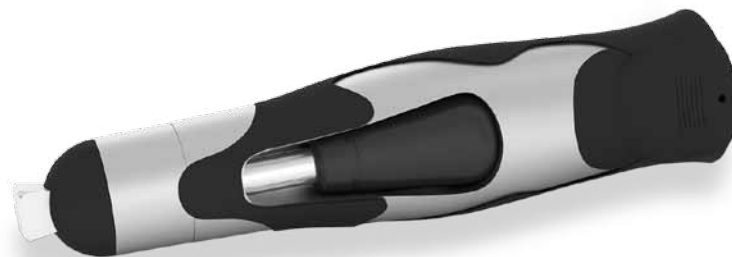
“Prosthetic performance, especially for complex devices, is improving at a rapid rate, and most prosthetics now incorporate a hydraulic system whereby the user can vary the damping force to help cushion shock loads,” says Jerry Zawada, Sales Engineer for healthcare and medical at Trelleborg Sealing Solutions. “More advanced systems use a microprocessor with some element of intelligent ‘learning’ to make adjustments when a prosthetic user is standing, walking, running or climbing stairs.”

One of the main challenges with advanced knee and ankle devices is the development of a robust sealing system for their hydraulic cylinders. “The sealing systems for the piston and rod in ankle devices are generally similar to those used in knees,” Zawada says. “However, performance is more difficult to achieve in the ankle than the knee because ankles are more compact, have a much shorter stroke, and must allow a degree of rotation. This makes side-loading more problematic.”



The cylinder needs a sealing system for both the piston and the rod. The piston must be sealed on the outside diameter to maximize the effectiveness of electronic valves, forcing the fluid through the piston valve in a controlled manner. Seal materials must be compatible with the lubricating fluid to ensure a long life for the prosthetic in a wide range of temperatures.

For most devices, engineers strive for a zero-leakage system, which can be difficult. In addition, bleed-down can occur during prolonged inactivity, such as when the prosthetic is sitting idle overnight. In this case, oil stuck



A custom FKM Bladder separates pressurized air from the hydraulic fluid in a prosthetic device's hydraulic system.



AGAINST THE ODDS

In 1999, at age 19, Amy Purdy came home with what she thought was the flu. Just 24 hours later, she was in the hospital, given a two percent chance of living. Bacterial meningitis was taking its toll on her body and after two and a half months of hospitalization, Purdy had lost her spleen, both kidneys, the hearing in her left ear, and both legs below the knee.

Today, Purdy is working as an actress, model and Olympic snowboarder. She is co-founder of Adaptive Action Sports and a motivational spokeswoman. She works for Freedom Innovations, a manufacturer of prosthetic feet, as its "Amputee Advocate."

on the piston slides down, creating a pool of oil on top of the outer seal. In addition, a balance of seal and lip load must be struck to seal in the hydraulic fluid without creating too much rod friction.

To avoid stick-slip, which can cause an impact shock to the prosthetic user, low-friction materials should be used. Adding a wear ring or two on the piston keeps the piston aligned properly during side loading. The seal and bearing materials must be selected to be compatible with the cylinder-bore material, surface finish and coatings to maximize cycle life.

The rod sealing system serves two distinct functions: it prevents external contamination from entering the system, and it keeps hydraulic fluids inside the cylinder. To achieve this, a complex configuration of multiple seals is required, with each seal performing a separate function to give the optimum performance in combination.

What's the next step for prosthetics? "Every year there seems to be no limit to the technological advancements when it comes to new prosthetic designs and the sealing solutions behind them," Zawada says. Futuristic versions of advanced prosthetics that have been seen in popular movies in recent decades are already a reality. "Electronic



Turcon Slydring



Zurcon Variseal



Zurcon Variseal

A variety of seals in prosthetic devices provide smoother movements for patients.

actuators as part of exoskeletons are helping to rehabilitate patients with limited mobility, due to a stroke, for example, enabling them to move when they cannot," Zawada says. "Progress is also being made with bionic systems where limbs are connected to the body's nervous system, allowing a user to control prosthetic movement just as they would their own limbs." ■

FOR MORE
INFORMATION
jerome.zawada
@trelleborg.com



PUSHING THE ENVELOPE

The coated fabrics team draws on decades of expertise to create products that protect customers from infections, fire and icy waters.

Text Trish Riley Photo Tom Kane



A hospital stay is inherently filled with stresses and concerns, but Trelleborg helps ensure that medical facilities have the latest in technologies available to keep you safe and secure. It's reassuring to know that when you're shown to your room, you can count on a clean, germ-free bed to rest in while you endure the medical procedures you'd rather avoid.

John Mouland, Technical Director, and his development team within Trelleborg Coated Systems work to create mattress covers that remain impermeable to fluids and germs and prevent cross-contamination from the illnesses patients bring to hospital environments.

"Our coated fabrics use polyurethane coatings to exclude unwanted media so that it does not penetrate into the bed," he says. "I've been with Trelleborg since 1998, working with the production and new product development teams, taking our work within the laboratory and helping implement this into production to meet customer demands."

Mouland's team, based in New Haven, Connecticut, in the U.S., applies these technologies to a variety of fabrics for the healthcare & medical and aerospace industries, as well as for consumer and recreational products. "Our fabrics are used within a wide variety of industries, so we're dealing with a lot of different fabrics," Mouland says. "Fortunately, here at Trelleborg, making coated fabrics of the highest quality is of the utmost importance. Customers bring us their ideas and specifications, and we work with them to meet their needs."

- ▶ One recent application was to create coatings for survival gear worn by workers being transported by helicopter to remotely located oil rigs. They need to wear survival suits designed to protect them in case of an accident that might drop them into icy Arctic waters, keeping them warm, dry and safe until they are rescued from the sea.

Camping gear is yet another popular application. In addition, Moulard says his team is working to improve lighter-than-air ships such as blimps.

“The material requirements can push the envelope in production,” he says. “If it were easy, then everybody could do it, but if it’s difficult and we succeed in solving the problem, we help our customers be at the top of their field. It can be challenging to find the weight and strengths needed.

“Sometimes it’s about the feel of the fabric. It might need to feel softer for a customer’s application. Or they might require a soft fabric that also has a lot of adhesion. Occasionally these needs go against each other, and there is always the possibility that the customer’s needs change as we are mid-development on their product. Trelleborg has been in the engineered coated fabric business for more than 40 years, so we’ve earned a good reputation for meeting our customers’ demands.”

As a Global Key Account Manager within Trelleborg Coated Systems, Dan Culhane connects with customers to uncover needs that Trelleborg products and solutions can deliver. Currently Culhane is working with customers to see that tourniquets used in surgeries and emer-



gency situations remain reliably in place to arrest bleeding – combating an issue that occurs when a tourniquet slips out of place. Another customer is seeking a barium-infused fabric for use under X-ray that will shine during laparoscopic surgeries and identify the exact location of the device during surgical procedures.

“Whether at the physician or production level, the biggest challenges in the medical industry are enhancing functionality, making existing products better and improving performance without compromising capability with the product itself – all while ensuring environmental safety,” Culhane says. “With coated fabrics, the

VARIETY OF PRODUCTS

Trelleborg’s operation in New Haven, Connecticut, in the U.S., specializes predominantly in polyurethane coated fabrics. They use a wide substrate of fabrics to create a variety of products from air mattresses to airships with lighter-than-air properties and impermeability to everything from water to germs.



demand in the healthcare & medical industry is to provide more durable and cleanable materials to be both infection- and fire-resistant, while still aesthetically pleasing. You need everything to last and to be chemically resistant. It's a challenge to meet all those needs."

Culhane says it's the talent of the team at Trelleborg that brings success to the company and his own work. "We have a great development team that walks through a five-step process to define the project requirements and to create the most successful products for each application," he says. "We work with our customers to agree on the specific parameters required, and then our development team comes up with the concept and timeline. They analyze the physical properties and chemistry needed, and they prototype a sample material for the customer to run their performance tests on. The final step is commercialization. Sometimes it can take two to three years for product development and FDA approval.

"Development is really where Trelleborg excels," Culhane concludes. ■

Watch
John Mouland
tell us about his
job in a video on
trelleborg.com



FOR MORE
INFORMATION
.....
john.mouland@trelleborg.com
dan.culhane@trelleborg.com

PROBLEM SOLVERS



JOHN MOULAND is Technical Director for Research and Development within Trelleborg Coated Systems in New Haven, Connecticut. He brings to his role a background in chemistry and chemical engineering in polyurethane chemicals, films and resins as well as coated fabric experience. His family includes two grown daughters, one working as a kindergarten teacher and the other studying to be a teacher at the University of Connecticut. He enjoys tinkering with radio-controlled cars, but he says that what drives him is his work.

"I've been in production and development all my life," he says. "It's always satisfying to be able to understand what the customer needs and work with our team to put those ideas into practice with a product they can use and that we can sell. It's like gardening: you plant a little seed, do different things and watch it grow to harvest. That's the best part of the job – there's always something new."



DAN CULHANE works globally, bringing 25 years of experience in finding customers and satisfying customer needs with the best chemical solutions. Based in Minnesota, he works remotely with the team in New Haven. He loves spending time with his wife and daughters, ages 16 and 18. Athletic endeavors keep him healthy; he runs marathons and likes to spend time outdoors. "I enjoy working with customers to solve their problems and find revolutionary solutions. When you have the great team talent I work with, that makes it easy. Our customers are continually satisfied, so they come back to us to help solve their other problems."

EVERYWHERE CRUISE SHIPS

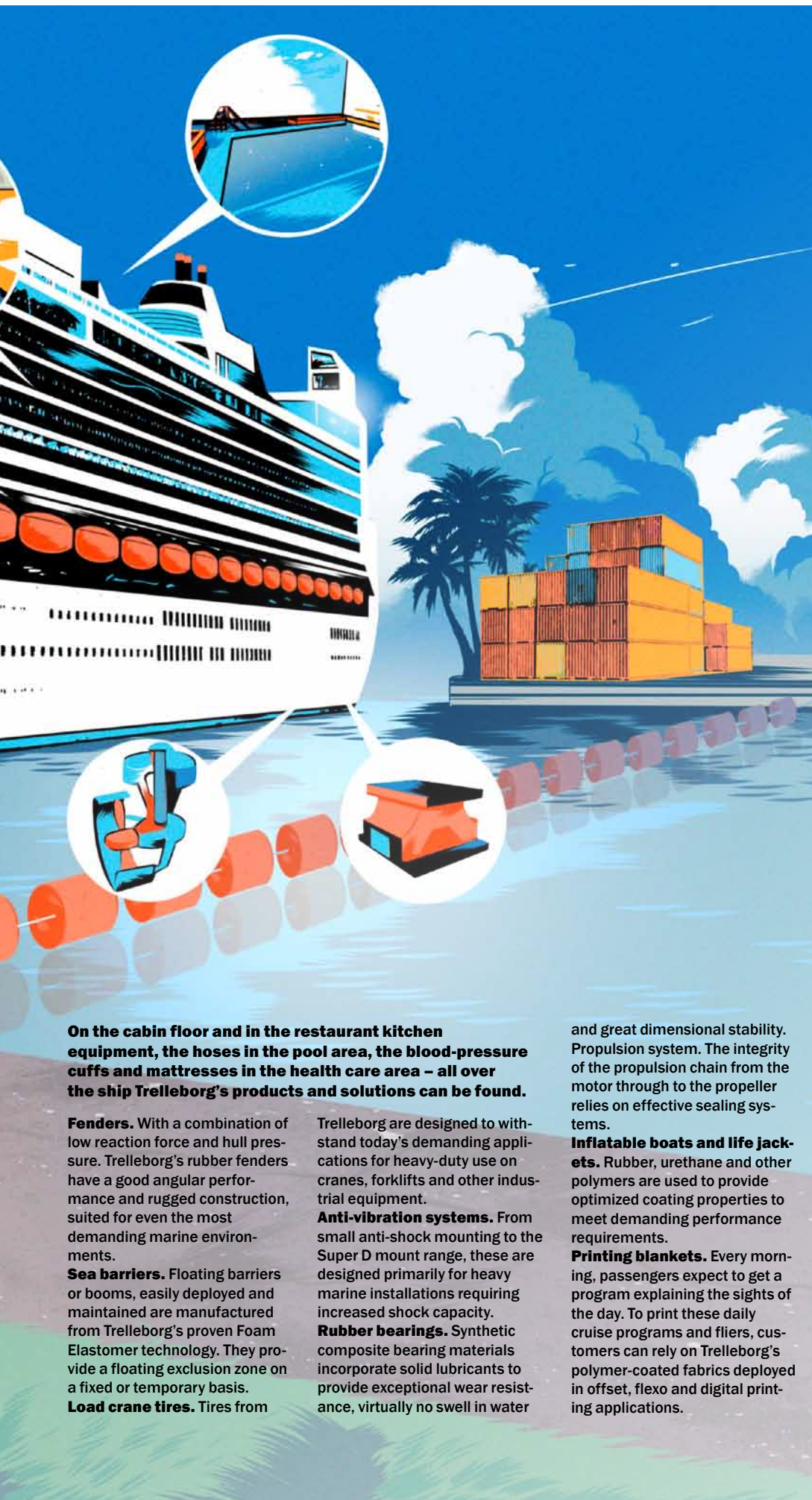
Text Petra Lodén

Illustration Alexander Wells

SAIL ON

The cruise industry keeps on growing. Millions of people choose to spend their vacations on a ship, often in the Caribbean. The sight of turquoise-blue waters and white sandy beaches adds to the allure of fine dining and dancing the night away. Behind the scenes, Trelleborg makes sure that passengers and crew alike are safe and comfortable on board.

Fenders prevent damage by absorbing the energy of a ship berthing at a quay. Custom-made anti-vibration and noise-suspension systems optimize comfort, health and safety. But that's not all. Look around the cruise ship and you'll find Trelleborg's products and solutions in many places, inside and outside the ship and on the quays in the cities and islands you visit. ■



On the cabin floor and in the restaurant kitchen equipment, the hoses in the pool area, the blood-pressure cuffs and mattresses in the health care area – all over the ship Trelleborg's products and solutions can be found.

Fenders. With a combination of low reaction force and hull pressure, Trelleborg's rubber fenders have a good angular performance and rugged construction, suited for even the most demanding marine environments.

Sea barriers. Floating barriers or booms, easily deployed and maintained are manufactured from Trelleborg's proven Foam Elastomer technology. They provide a floating exclusion zone on a fixed or temporary basis.

Load crane tires. Tires from

Trelleborg are designed to withstand today's demanding applications for heavy-duty use on cranes, forklifts and other industrial equipment.

Anti-vibration systems. From small anti-shock mounting to the Super D mount range, these are designed primarily for heavy marine installations requiring increased shock capacity.

Rubber bearings. Synthetic composite bearing materials incorporate solid lubricants to provide exceptional wear resistance, virtually no swell in water

and great dimensional stability. Propulsion system. The integrity of the propulsion chain from the motor through to the propeller relies on effective sealing systems.

Inflatable boats and life jackets. Rubber, urethane and other polymers are used to provide optimized coating properties to meet demanding performance requirements.

Printing blankets. Every morning, passengers expect to get a program explaining the sights of the day. To print these daily cruise programs and fliers, customers can rely on Trelleborg's polymer-coated fabrics deployed in offset, flexo and digital printing applications.

DID YOU KNOW?

USD 39.6 billion

The global cruise industry generated estimated revenue of USD 39.6 billion in 2015.

466,000 passengers

The passenger capacity of the global cruise market reached 466,000 in 2016.

53 million bed days

The number of available bed days in the Caribbean in 2015. Passenger bed days are the number of days that all berths could be occupied at 100% occupancy.

1/3

The Caribbean held the largest share of worldwide deployments at 33.7%, around one-third, followed by the Mediterranean with 18.7%.

5 million passengers

The busiest port by passenger volume is the Port of Miami in the U.S. Nearly 5 million people traveled on a cruise ship from Miami in 2016.

USD 4.87 billion

The leading cruise line company worldwide in 2016 by revenue, was Norwegian Cruise Line, with a turnover of USD 4.87 billion.

1,700 rescued

Cruise companies sent ships to rescue people during the devastating storms of 2017 in the U.S. Royal Caribbean evacuated 1,700 people affected by Hurricane Irma.

Sources: statista.com, cruise-marketwatch.com, Royal Caribbean, Wikipedia



SHIP-TO-SHIP

Pneumatic fenders are large air-filled rubber bladders placed between ships to prevent them from damaging each other during ship-to-ship (STS) transfer. When Teekay Marine Solutions' involvement in STS transfer increased dramatically, they turned to Trelleborg as a new partner.

As Trelleborg redeveloped its fenders to meet Teekay's demanding requirements, the relationship between the two grew closer, so that Trelleborg became the primary supplier of fenders to Teekay in 2015, recalls Richard Hepworth, President within Trelleborg Offshore & Construction. The partnership was working so well that by early 2017 the two decided to jointly market Trelleborg-made fenders under a new HALO brand of premium pneumatic fenders.

"Teekay's operational expertise, experience and worldwide logistical capabilities for storing and handling of fenders in their global network of supply bases, combined with Trelleborg's manufacturing

experience, is a perfect match," says Ozlem Kir, Business Development Manager at Teekay Marine Solutions, a wholly owned subsidiary of Teekay Tankers, one of the world's largest conventional tanker owners.

Working together allows the partners to provide unprecedented levels of service and product availability for the fender market. "A priority for a ship owner is the safety and security of their assets," Kir says. "When two ships come together for an STS operation, you want the best fenders to protect your assets. Remember, these ships can be up to 330 meters long and weigh 320,000 metric tons."

Hepworth explains, "These fenders need to be carefully designed to facilitate the berthing of two ships together. They also need to be extremely durable under the arduous operating conditions they see."

To enhance the level of service offered, HALO Fenders can be either purchased or rented. Rentals

can be long- or short-term, and a buy-back option also is available. These options are designed to offer customers maximum flexibility when it comes to financing.

"Trelleborg and Teekay see its new HALO Fenders partnership driving increased demand, and Trelleborg is currently in the process of expanding its production capacity at the plant in China to cope with the forecast growth," Hepworth says. ■

FOR MORE
INFORMATION

sales
@halo-fenders.com

HALO PNEUMATIC FENDERS

HALO premium pneumatic fenders are fully compliant with the ISO 17357-1:2014 standard. They are made with an abrasion-resistant outer rubber layer that protects the inner rubber and tire-cord layers from external damage.

The fenders are usually supplied in sets of four and are typically 3.3 meters in diameter by 6.5 meters long for oil transfers. For LNG applications, increased levels of safety mean that four "jumbo" fenders, 4.5 meters in diameter by 9 meters long, are used.

BLUE DIMENSION*

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

SEALING THE SOLAR LOOK

Renewable electrical power is pivotal to achieving the global shift away from fossil fuel and fighting climate change. A lot is happening, and one area where Trelleborg is contributing is sealing profiles for solar panel installations.

Text Björn Raunio Photo Peter Cederling

Solar power is booming. As demand has risen, production costs for solar panels have plummeted. A technology that only recently was dependent on government subsidies in many countries is now one of the cheapest electrical energy sources in new installations.

“Solar energy is quickly becoming dominant within production of electrical power for new buildings in many countries,” says Erik Martinson, Partner and Managing Director of Svea Solar, a company specializing in installing turnkey solar energy solutions for



- houses and buildings. “It’s a tremendous development, and no one expected things to go this fast.”

Svea Solar has enjoyed annual growth of 200 percent since starting in 2013, with figures in the black from day one. Today the company has 50 employees and a local market share of about 10 percent.

“We want solar energy to be a simple and safe investment,” explains Björn Lind, Chairman of the Board and the other partner at Svea Solar. “With Swedish labor costs being high, one crucial factor is a system making installation as simple as possible. Aesthetics are also very important. Our installations must look good and not bring down real estate values. We only use black solar cells and want to achieve a look that is both discreet and pleasing.”

This philosophy has led Svea Solar to develop a brand new solution in which the solar panels become an integrated part of the roof. It eliminates the need for tiles underneath the panels when replacing an old roof or building a new one, achieving both a better look and lower costs. A crucial detail is sealing these integrated panel installations with durable and reliable sealing profiles.

“The expected lifespan of our installations is 40 years,” Martinson says. “We take great care in selecting all the various components, looking for trustworthy suppliers. Trelleborg was very helpful in developing a sealing solution that is easy to work with for our installers and contributes to the look of the integrated solar panels.”

Peter Somvall, Market Development Manager within Trelleborg Industrial Solutions, says his team is very strong within construction. “We know what materials and technologies work for various applications, and what challenges the installer faces,” he says. “We put our expertise to work and developed a sealing profile

“

The expected lifespan of our installations is 40 years. We take great care in selecting all the various components, looking for trustworthy suppliers.” *Erik Martinson*



solution that seals well, looks good and is easy to install. It ensures the longevity of both the solar panels and the house or building underneath them.”

The sealing profile is also designed to allow for a certain margin when mounting the panels, thereby simplifying the process.

“It’s never easy to develop an entirely new product,” Lind says. “It has been good for us to have Trelleborg by our side in this process. Now we are taking a really good solution to market.”

Somvall concludes, “For me, it’s a true joy to work with companies within renewable energy. This sector is so dynamic and happening right now. It helps both me evolve as a person and Trelleborg evolve as a company.” ■

FOR MORE
INFORMATION
peter.somvall
@trelleborg.com



The seal can be mounted quickly and easily on the aluminum profile.



The sealing profile is designed to allow for a certain margin.

Svea Solar has developed a solution in which the solar panels become an integrated part of the roof. From left: Björn Lind, Partner and Chairman of the Board at Svea Solar; Peter Somvall, Market Development Manager at Trelleborg Industrial Solutions and Erik Martinson, Partner and Managing Director of Svea Solar.

SOLAR TECHNOLOGY OF THE FUTURE

Apart from delivering solutions to the existing solar panel market, Trelleborg is involved in the development of future chemistry-based solar technologies. Trelleborg has helped a research project at Swerea IVF in Gothenburg, Sweden, with seals for its experimental solar panels. Containing nontoxic chemical material components, they require a tight seal obtained by a special compound used in the battery industry. These aesthetic solar panels are expected to be commercially viable within six or seven years.

An advanced version of the Brawler tire designed for waste management and recycling vehicles combines enhanced driver comfort with significant cost savings for operators.

THE BRAWLER ADVANTAGE

Text John Frank
Photo Trelleborg

The waste management business is tough on tires. Off-the-road (OTR) pneumatic tires are prone to puncture in this extreme environment where big wheel loaders move everything from scrap metal to construction debris to household waste, and often do so around the clock.

Customers in this industry have traditionally been faced with three choices – pneumatic tires prone to puncture and damage from impacts; solid tires, which eliminate punctures but at the cost of driver comfort; or polyurethane, sometimes called foam-filled, pneumatics. These filled tires represent a compromise because they are puncture-proof and more comfortable than a solid tire, but are not damage-resistant and don't have the same tire life as a solid tire.

Over the past 10 years, Trelleborg's Brawler range of solid OTR tires has

become increasingly popular in the waste and recycling world. Puncture-proof and with up to three times the wearable tread compared with a pneumatic tire, Brawlers have delivered significant savings to customers who have chosen them.

But over this period, customer feedback has consistently highlighted one issue – driver comfort. Brawler's solid construction and cut-proof mining compound deliver great longevity but at the same time come with a hard ride due to the increased exposure to vibrations from a solid tire. Many of these customers consequently were still using filled pneumatic tires despite all the drawbacks – financial, operational and environmental – and were asking what Trelleborg could do to help.

Throughout 2014 Trelleborg spoke with several customers in the waste management industry to better understand this issue, says Ditri Zweistra, Segment Manager for

mining and waste management at Trelleborg Wheel Systems.

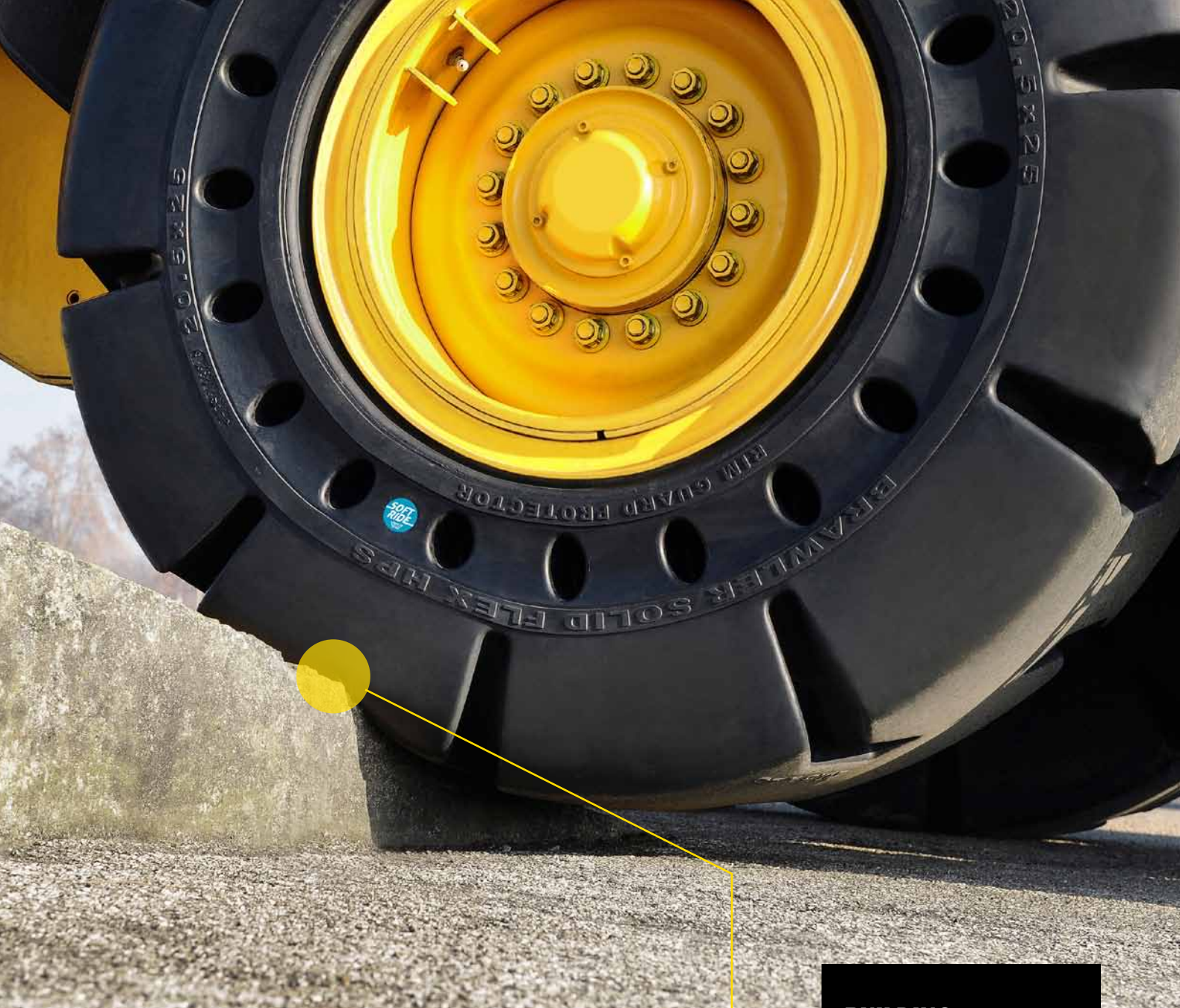
"The challenge for us was to find a solution with all the advantages of a solid tire but without the hard ride and resulting driver discomfort from the standard solid tires," Zweistra explains. "And so we went to work looking at how to develop for the waste management industry a Brawler solid tire that performed to the same comfort level as a filled pneumatic."

The answer, introduced in May 2017 after two years of extensive



Ditri Zweistra





research and testing, is the Brawler HPS Soft Ride Tire. It combines Brawler's ultra-cut-resistant tread compound with a newly developed interior cushion compound that allows much better damping capability and which reduces the exposure to vibration to the same level as a filled pneumatic tire.

Trelleborg ran a two-year beta test for its new tire, working with customers across the waste and recycling industry in both Europe and the United States. The results have exceeded expectations, with

machine operators pleased with their softer-riding tires and customers enjoying operating cost reductions of 25 to 35 percent resulting from enhanced tire life and greater machine uptime.

"Our customer focus and applications expertise have been key to this project," Zweistra says. "We have created the perfect solution for waste management and made some operators very happy." ■

FOR MORE
INFORMATION
ditri.zweistra
@trelleborg.com

Brawler HPS Soft Ride Tire combines ultra-cut-resistant tread compound with a newly developed interior cushion compound that allows good damping capability.

BUILDING PARTNERSHIPS

In addition to the Brawler range of tires, Trelleborg also contributes to a smoother ride with its antivibration products and solutions. Trelleborg is delivering smoother, quieter and more efficient transportation in off-highway vehicles where Trelleborg's solutions are designed to improve safety and operator comfort while prolonging equipment life and optimizing performance. Within antivibration, Trelleborg specializes in isolation, attenuation and suspension solutions of unshakable quality and reliability.



In France the grape harvest is over, and vats of wine are starting to bubble and ferment in wineries across the country. As they do, the winemakers at Les Vignerons de Buzet, a cooperative cellar in the Lot et Garonne department of France, are happy to have new Handle-Tech hose handles for manipulating the heavy hoses used to decant wine from tank to vat and from vat to barrel.

“Winemakers can suffer from repetitive strain injuries and back problems as they have to decant large volumes of grape must during the intensive harvesting and maturation period in the fall,” explains Patrick Hersant, Sales Manager within Trelleborg Industrial Solutions, based in Clermont-Ferrand in the Auvergne region of central France. “In response, the cooperative cellar of Les Vignerons de Buzet last year ordered Handle-Tech hose and pipe safety handles for all their workers, to improve the safety and efficiency of hose handling.”

Les Vignerons de Buzet was already a Trelleborg client, supplied with hoses for its cellar, but the Handle-Tech handles, launched around a year ago, are certainly lightening the load. “They’re very happy with the handles,” Hersant says. “Employees no longer need to hitch the hoses onto their shoulders to help move them around, as this can lead to back problems. The handles also reduce exposure to liquids, are easy to clean, and are lightweight and durable. We’re expecting many more clients in the wine industry to follow suit.” ■

FOR MORE
INFORMATION
patrick.hersant
@trelleborg.com

THE RIGHT WAY TO HANDLE YOUR WINE

Winemaking is hard work. Now an innovative type of handle to maneuver heavy hoses full of wine takes strain off workers in wineries.

Text Anna McQueen Photo Julien Domec



Handle-Tech hose handles.

EASY MOVEMENT

Trelleborg focuses on making its hoses for wine production easily maneuverable. Its Vinitrell and Vendange hoses are specially engineered to move flexibly within the confines of wineries and cellars.

BIG DATA GOES SMART

Text Michael Lawton Photo Thomas Müller

Manufacturers and information technology specialists work closely together at Germany's Smart Data Innovation Lab to find hidden value in Big Data. Plamen Kiradjiev, the joint head of the Industrie 4.0 Data Innovation Community, explains how the lab focuses on digital manufacturing strategies to extract Smart Data.



How many industrial revolutions have there been so far? Everyone knows about the one that began in the 18th century, when hand production methods moved to machines and steam power. But that, according to some, was only the first industrial revolution – since then, we’ve had the assembly-line revolution, the automation revolution and now a revolution driven by data exchange. That makes four in all, so it’s no surprise that the German government called its digital manufacturing strategy ‘Industrie 4.0.’

Plamen Kiradjiev is the joint head of the Industrie 4.0 Data Innovation Community within the German government’s Smart Data Innovation Lab (SDIL). Kiradjiev works for IBM, where his official job title is Industrie 4.0 Chief Architect, and where he describes himself as IBM Ambassador@SDIL.

“The aim of the SDIL is to apply Big Data in practical ways,” he explains. “It’s not abstract research – we take real data and real scenarios.” As well as Industrie 4.0, the SDIL has Data Innovation Communities on medicine and smart infrastructure. The SDIL is effectively sponsored by four large companies – IBM, SAP, Software AG and Huawei. All four provide massive computing

power and specialist consultancy. “We do it for the honor,” Kiradjiev says. “It’s good for our image, but it also provides a test lab for real life.”

And, as he points out, that’s also the reason a number of university research institutes are involved. “I wasn’t really aware of their hunger for real-life data,” he says.

The threshold for companies to participate in an SDIL project is low. “If a company says it can provide the raw data and has a real scenario, their application will be decided within ten days,” he says. “Often they can’t precisely see what to do with the data to get a return on investment, but SDIL will make it clear whether there is an return on investment or not.”

Companies gather a substantial amount of data, and some of it is useless. There’s a difference between Big Data and Smart Data, Kiradjiev says. “Big Data includes a lot of dirty data; Smart Data is a collection that is useful for analysis,” he says. “It’s a matter of getting the data to work together.”

He and his colleagues mine the data to discover correlations that might be of interest. They work in a team with manufacturers, since it’s up to the company to decide whether it’s worth following up the correlations, and whether these can be turned into the foundations

of a business case. The service is particularly designed for small and medium-sized businesses, and Kiradjiev points out that SDIL wants to remove the suspicion in many managers’ minds that their company is too small to deal with huge players like IBM or SAP. “We want to say, by using the cloud, the threshold goes down and the difference disappears,” he says. “One buys a service for a specific business case – you don’t have to buy a swimming pool if you just want to swim.”

Indeed, a test case showed that it cost just EUR 30 to 40 a month to provide server capacity and data analysis to optimize a small factory making individual cases for business cards.

Kiradjiev notes with some surprise that big companies also want to take part. “One man said, ‘Here I meet all my suppliers, IT providers and competitors,’” he says. “That makes it worth being involved.” But even big companies can improve their processes.

Industrial plant manufacturer ABB, for example, used SDIL to look at how to analyze huge amounts of localized log data, so that it could be used to monitor entire production processes. John Deere wanted to analyze its error messages and test protocols to optimize its own tractor manufacturing.

Kiradjiev argues that manufacturing has to emerge from the 20th century and get into the 21st. “From an IT point of view, production is so ‘90s,’” he says. “Factories may have robots, but each one plays like a soloist instead of being part of an orchestra.” With Industrie 4.0, Kiradjiev is helping to provide the conductor’s baton to make the entire manufacturing process play the same tune. ■

“

One buys a service for a specific business case – you don’t have to buy a swimming pool if you just want to swim.

Plamen Kiradjiev





PLAMEN KIRADJIEV

Title: Industrie 4.0 Chief Architect, IBM Ambassador@SDIL

Education: Master of Information Technology and Marketing from Hamburg University

Family: Married, a daughter at the university

Hobbies: Basketball ("not so good"), travel

Observations: "Not all technology makes sense. I find automatic parking control a nuisance. My next car won't have it – if you can still buy a car without it by then."

What I like about my job is that I'm involved with down-to-earth people. If one of them applies my findings, that means a lot to me."

TRELLEBORG AND SDIL

Trelleborg Sealing Solutions is involved in a project with the SDIL to improve the reliability of its seals using sensor data that is already available.

"An airplane, for example, already has some 6,000 sensors," says Dr. Johannes Kunze von Bischoffshausen, Manager Digital Transformation with Trelleborg Sealing Solutions. "We want to build algorithms that translate the sensor signals into a seal health score in a variety of applications." The project is ongoing, but it has already proved possible to identify fitting errors, as well as forecasting wear in hydraulic seals.

BREAKING THE WAVE

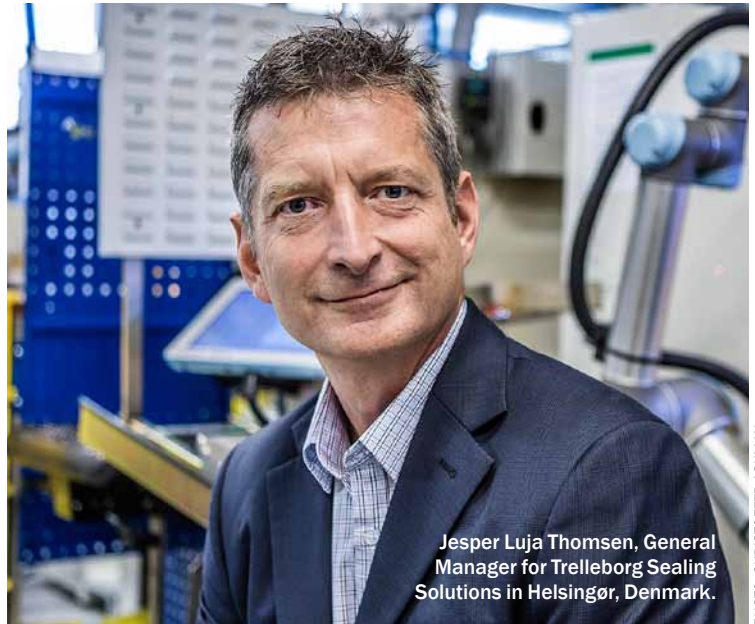
Solar and wind power are well established in the world's energy mix, but wave power is not there yet. The company CorPower's small, efficient wave energy converter buoys might lead to a breakthrough for wave power.

The ocean is the world's largest untouched source of clean energy. Sea waves represent a concentrated form of energy because water has a high density. But power plants have so far meant high costs and advanced infrastructure to cope with the loads borne by equipment during storms.

CorPower is developing a unique technology in which small, durable buoys efficiently utilize the motion of the waves.

"Solar and wind power are good and costs have come down in a satisfying way over the last few years, but this is just the beginning of the transition to 100 percent renewables in our electricity mix," says Patrik Möller, the CEO of CorPower. "Ocean waves, having several times high energy density and being more predictable, offer the physics that could support an even more competitive electricity cost."

Trelleborg supports the project with several applications such as sealing solutions and anti-vibration technology.



Jesper Luja Thomsen, General Manager for Trelleborg Sealing Solutions in Helsingør, Denmark.

PHOTO: CHRISTOFFER ASKMAN

HIGH-END PRODUCTION IN DENMARK

Trelleborg has decided to invest in a new state-of-the-art production facility in Denmark, relocating its current manufacturing facility there. "The Danish operation offers high-end solutions to the most demanding of sealing applications. The new production facility will be dedicated to highly automated and lean production lines for the automotive, aerospace and renewable energy industries, contributing to better business and higher technical customer support," says Jesper Luja Thomsen, General Manager for Trelleborg Sealing Solutions in Helsingør, Denmark.



The Bosch Group award



Trelleborg Sealing Solutions is proud to have received a Bosch Global Supplier Award in the field of mechanics.

Volkmar Denner, the chairman of the Bosch board of management, emphasized the special role of the increasingly inter-linked cooperation between Bosch and its suppliers:

"In the connected world, partnerships are becoming more and more important. Hierarchical value chains are turning into value-added networks. With our open platform technologies, we are in an ideal position to seize the opportunities offered by digitalization in our partner networks."



50 COUNTRIES

The Trelleborg Group has operations in 50 countries and over 100 manufacturing facilities.

41%

The number of employees in the Group at the end of 2017 was 23,152, an increase of 41 percent compared with 2015, mainly due to the acquisition of CGS.

Effective succession

"In 2017 we have appointed no less than three new business area presidents, due to planned retirements and an external job change," says Peter Nilsson, President and CEO Trelleborg. "All new business area presidents are recruited from within the Group, which I see as a proof of our established succession planning. They are all people who know the company well and who will be able to develop their respective business areas in a good way."

Peter Hahn was appointed the new Business Area President of Trelleborg Sealing Solutions as of January 1, 2018. He succeeded Claus Barsøe who became Executive Vice President

within Trelleborg Sealing Solutions, focusing on business development, among other things.

Jean-Paul Mindermann was appointed the new Business Area President of Trelleborg Industrial Solutions as of July 1, 2017. He succeeded Mikael Fryklund, who left Trelleborg and assumed the position of President and CEO of Hexpol.

Paolo Pompei has been appointed the new Business Area President of Trelleborg Wheel Systems as of April 1, 2017. He succeeded Maurizio Vischi, who retired.



Peter Hahn



Jean-Paul Mindermann



Paolo Pompei

WHAT IS THIS?

Take a number. No, this is not something to use to wait your turn in a store but a unique product that damps sound and vibration – but where? Answer at the bottom of this page ...



Answer: Trelleborg's unique rubber-to-metal composite material for noise damping in disc brakes, such as in a car. This product endures enormous strains and tension.

The background of the advertisement is a photograph of a modern cable-stayed bridge with a white arch structure. A train is crossing the bridge. The bridge is situated over a body of water, and the sky is clear blue.

Blue Dimension™ protects infrastructure and assets

At Trelleborg, we believe that the benefits of our solutions stretch beyond functionality and business performance. Whenever possible they should also contribute to better sustainability. In fact, many of our solutions protect the environment and people, as well as infrastructure and assets. This is what we call Blue Dimension™ – Solutions for Better Sustainability.

trelleborg.com/bluedimension

BLUE
DIMENSION™