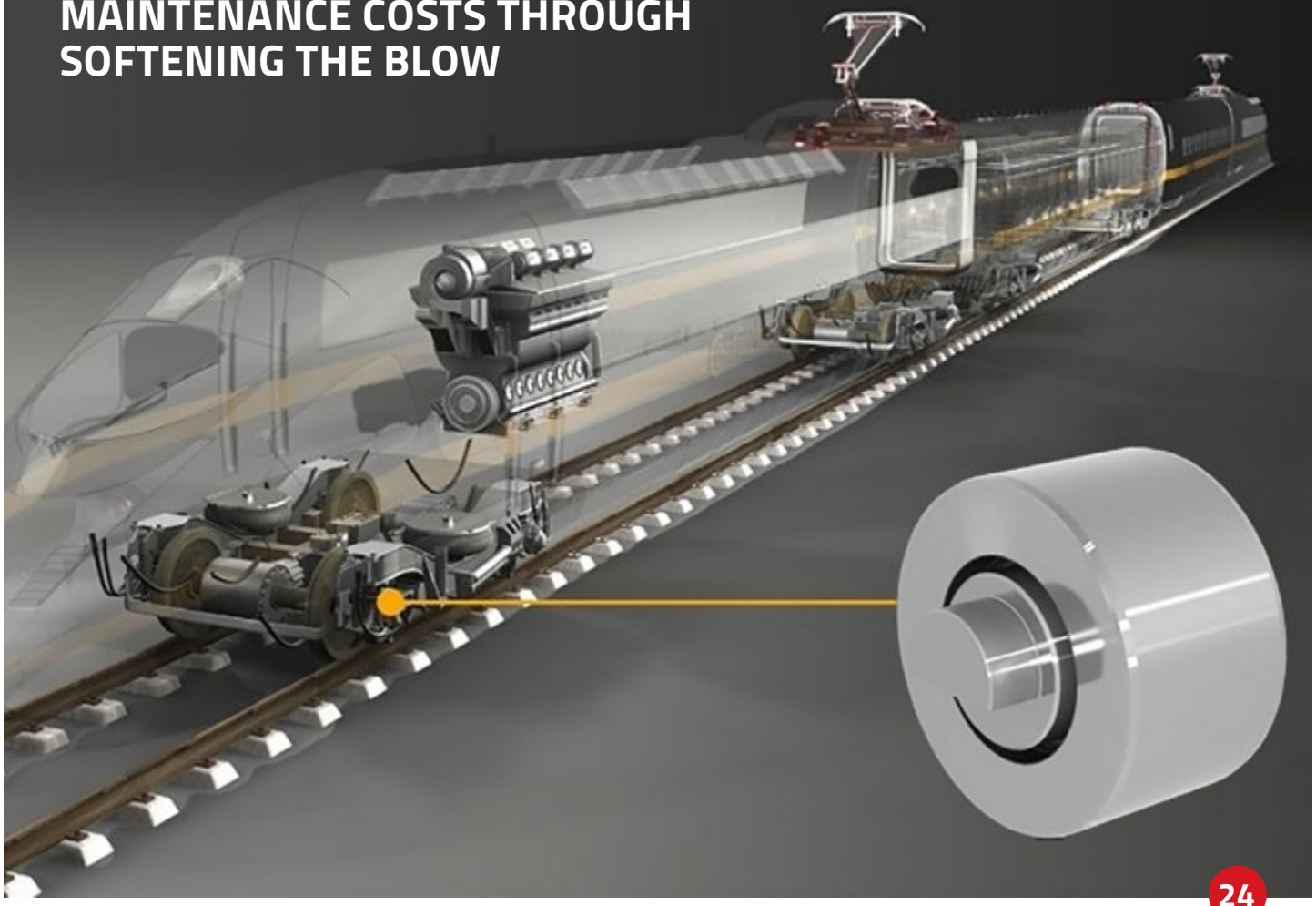
RAILWAY
INTERNATIONAL

OCTOBER 2024

CONTINENTAL HYDRAULIC BUSHINGS REDUCE MAINTENANCE COSTS THROUGH SOFTENING THE BLOW



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RAILWAY INTERNATIONAL

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PLASSER THEURER

REVIEW OF INNOTRANS 2024: A VISIT FROM THE FUTURE

The future of mobility.

This was the motto of InnoTrans 2024, the international trade fair for transport technology. "Future track technology NOW" could be seen at Plasser & Theurer, both in Hall 26 and among the exhibits on the extensive tracks of the exhibition grounds in Berlin. There was a great deal of variety here and there, where the future was also visiting alongside countless trade visitors from all over the world.

Plasser CatenaryCrafter

An impressive exhibit on display outdoors was the Plasser CatenaryCrafter 15.4 E³ for ÖBB. 56 machines of various designs have been ordered as initial call-off orders, and several are already in (trial) operation. Johannes Max-Theurer and ÖBB CEO Andreas Matthä presented the model at InnoTrans 2022, and exactly two years later the two presented the full-size vehicle together. The high-tech hybrid vehicle sets standards, running and working with electrical energy from the overhead contact line or from the traction batteries on board. The combustion engine only starts up in exceptional cases.

In addition to the electric hybrid drive, full equipment, ETCS train protection technology, and modern design, another feature is the modular design of the CatenaryCrafters and upcoming MultiCrafters: the basic structure as well as many components and controls are the same. Changing tasks and design lengths: the generation change modernizes infrastructure maintenance and speeds up installation work on the overhead contact line. All of this is as environmentally acceptable, ergonomic, and economical as possible – it's no coincidence that this is the core message of the E³ brand.

"I would like to emphasize in particular that ÖBB are a very good partner, always very constructive and working in a solution-oriented manner. In turn, ÖBB end up putting a vehicle on track that they can also work with for 30 years. And that's exactly what it's all about." Johannes Max-Theurer

"We are operating one of the busiest networks in the European Union, currently with 166 million train kilometres. We are also an absolute top nation in terms of rail travel because Austrians travel the most by rail in the EU. This means we need highly available infrastructure. But that only works if you have the right tools, in this case a state-of-the-art maintenance vehicle." Andreas Matthä, CEO of ÖBB Holding.

Ten years of E³

The E³ trademark refers to all-electric and hybrid drives. Track maintenance machines with the abbreviation "E³" have been around for ten years, with the first one being presented in Salzburg in September 2015. E³ stands for "Economic, Ecologic, and Ergonomic", i.e. the economic, ecological, and ergonomic benefits of these machines. They make it possible to green track maintenance. Thanks to its high efficiency, E³ technology reduces energy consumption, emissions, and operating costs – even for existing machines as part of retrofits. It is possible to drastically reduce their carbon footprint.

Deutsche Bahn's memorandum of understanding

Following ÖBB's example, Deutsche Bahn AG also intends to procure Plasser CatenaryCrafter 15.4 E³ vehicles. This was confirmed by Infrastructure Director Philipp Nagl at InnoTrans 2024. Increasing line utilization and train numbers necessitate replacement investments by DB InfraGO for its machine fleet. Shortly before InnoTrans, a memorandum of understanding was agreed on for the rental and subsequent purchase of 15 Plasser CatenaryCrafter E³ vehicles. Service partner Plasser ROBEL Services is also party to it.

Plasser CompactFlex with Plasser Datamatic: a debut

The new Plasser CompactFlex 4x4 tamping machine for plain-line track and turnouts made its debut in Berlin. It is part of a contract with the Taiwanese state railway company TRC for a total of 41 track maintenance machines featuring various working technologies. Digital tools are a part of this: the CompactFlex 4x4 on display is equipped with the SmartALC track geometry guiding computer and the DRP (Data Recording Processor) digital measuring recorder. With Plasser Datamatic, the machine is integrated into a cloud-based machine and fleet management system. Current machine statuses can be called up and long-term analyses carried out to increase availability, efficiency, and productivity.

Training on three square metres

3D simulation tools for training courses, also on the machine operating company's premises, make realistic travel and operation exercises possible. The compact solution with a computer and VR glasses only requires one desk and is available for several different machine types.

Plasser InfraSpector

The Plasser InfraSpector is a new solution for infrastructure inspection and surveying, particularly in regional and urban networks. It offers a high degree of flexibility, as seen in the Plasser Italiana service version mounted on a road-rail lorry. Alternatively, versions of the testing equipment in a container or based on the MultiCrafter are possible. Plasser InfraSpector follows the ISO IEC 17025 standard for quality and reliability. Diagnostics examine the track with track geometry, rail and structure gauge, subsoil, turnout, and overhead contact line.

www.plassertheurer.com

ACE STOSSDÄMPFER

LARGE CABLE RAILWAY REQUIRES SPECIAL DAMPING SOLUTION

The dampened drive-in of two exceptionally large cable railway supply cars into the stations required the designing and installation of special damping solutions.

This heavy industrial shock absorber is designed in a way that it can, should breakdown occur, decelerate two and a half times the speed of normal operation. While doing so, it reliably protects the end positions of the construction for an approach velocity of up to 1.0 m/s. Credit: ACE Stoßdämpfer GmbH

With a payload of 40 tons, moving cable cars must be fast and reliable but also be braked gently when driving into the valley station. To manage this task it was necessary to develop novel internal shock absorber sleeves and adapt them to fit heavy industrial shock absorbers. BIBUS AG in Switzerland and German ACE Stoßdämpfer GmbH solved this case for their customer.

90 mm thick support cables with a weight of almost 50 kg per meter, three phase motors with 1,150 kW rated power, a payload of 40 tons and this times two. All this to ensure the supplying of an underground hydroelectric storage power plant during its enlargement, two supply cable cars were made, which may be called the largest in the world. To ensure that these vehicles slow down safely on entering the station it was necessary to develop new industrial shock absorbers in XXXL size.

A Difficult Job with Superlatives

The location idyllic, the Swiss electric utility company AXPO's project formidable, that, in a nutshell is what one may call the Limmernsee dam. It is a reservoir in the Swiss Canton of Glarus that was completed in 1963, and, recently, its underground pump storage power plant had to be expanded. Since the work was completed, the pumps in the power plant are able to achieve an output of 1,000 MW. This value corresponds approximately to the output of a middle-class nuclear power plant, mind you not in terms of energy production but when considering the turbine or pump performance. At the same time, the adjoining Muttsee is the highest reservoir in Europe, a natural lake basin, being about 2,500 meters above sea level, which also has the longest dam in Europe since the works were completed there in 2015/2016.

The goal was to produce convenient base load by pumping water from the Limmernsee into nearby Muttsee. The electricity produced is sold when peak power is required. Many thousands of tons of heavy building materials, machinery and vehicles needed for the construction of the dam had to be transported across the mountain landscape. Both cable cars needed to be built according to the dimensions described because a special drill head for drilling tunnels weighs 30 tons alone. Although the surrounding is idyllic, it is very difficult to access. On this scale, accessories also require special engineering services. As during previous cable car and gondola projects, the Doppelmayr Garaventa Group, manufacturer of the giant cable car, turned to BIBUS AG, a leading Swiss manufacturer of hydraulic and pneumatic drive and control systems and equipment.

The contract was to deliver heavy industrial shock absorbers which make gentle braking of the cable cars possible when they enter the station in the valley. It was clearly evident that only a hydraulic shock absorber solution would be able to meet these requirements. These heavy machine components are not produced by the company itself but procured from its cooperation partner - ACE Stoßdämpfer GmbH in Germany. Therefore, the Swiss BIBUS product manager for shock absorbers turned to the leading supplier of systems for deceleration in Langenfeld, Germany.

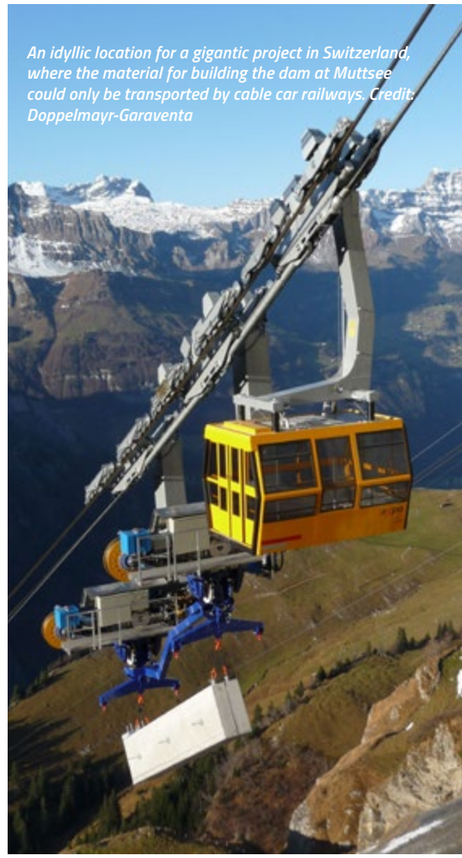
Swiss Man Shouts and Sets off a Test Avalanche

It became clear after a few phone calls and emails to those responsible at BIBUS and ACE that only very heavy industrial shock absorbers would work for the case in question. ACE offers a wide range of adjustable and self-adjusting shock absorbers for this purpose. Types designated CA4x16 are self-adjusting and can brake up to 115,000 kg and when doing so accommodate up to 126,500 Nm per stroke. However, when the first damping characteristic curves were calculated with ACE's software, it turned out that the development of a new inner sleeve would be needed for the heavy industrial shock absorbers due to local requirements concerning supporting force and damping characteristics. This shows two work procedure characteristics used by ACE and BIBUS: Firstly, the end customer is always involved early and intensively in the planning process of new projects so that optimum results are obtained.

The supply cable cars transport payloads of up to 48,355 kg and meet the 1.30 m "small" ACE and Bibus shock absorbers in the valley. Credit: Doppelmayr-Garaventa

Secondly, if requested, the damping specialists can deliver more performance by providing special models as mentioned here. To decelerate the 48,355 kg heavy total mass and the energy absorption of 99,000 Nm per stroke would be a task difficult to accomplish even for the normal CA shock absorber series, but when does a shock absorber normally have to stop a cable car of this size? For comparison: The supply railway in Switzerland is equivalent to a passenger train that could accommodate approximately 500 people. In this case, the incredibly high energy-uptake is derived not only from the weight of the braking mass but also from the fact that the special CA4x16-S-2955 industrial shock absorbers finally used must fulfill two distinct functions: The first is braking during normal operation. Secondly, it is also responsible for a safe stop in case of an emergency. And, if the situation arises, it must also be able to dissipate more kinetic energy than in "normal" circumstances because if failure occurs, the approach velocity is 1.0 m/s, which is two and a half times that of normal operation.

The dimensions of the special design are indeed identical to those of the standard production series but have a different interior and appear tiny in contrast to the huge cable cars. The CA shock absorber measures 1,300 mm in the extended state, 406 mm of which are intended for the working stroke. The previously mentioned performance data show that engineers from BIBUS and ACE are in principle already prepared for designing further record cable cars. Meanwhile, in the Swiss Canton of Glarus the work described has been carried out and the heavy industrial shock absorbers reliably did their job of converting large amounts of kinetic energy.



An idyllic location for a gigantic project in Switzerland, where the material for building the dam at Muttsee could only be transported by cable car railways. Credit: Doppelmayr-Garaventa

www.ace-ace.de

LIEBHERR PRESENTS THE A 922 RAILROAD EXCAVATOR AT INNOTRANS 2024

The A 922 Rail is suitable for use on railway tracks and for road construction and is fast thanks to the mobile undercarriage.

Liebherr presented the A 922 Rail Litronic at Innotrans 2024. Because it is a railroad machine, the A 922 Rail is suitable for use on railway tracks and for road construction and is fast thanks to the mobile undercarriage. A rail travel drive is mounted on both sides of the undercarriage. When entering the rails, the rail travel drive lifts the tyres to rail height. The inside wheels of the dual tyres ensure travel of the excavator on the tracks.

With the A 922 Rail, Liebherr is offering the perfect overall package: the basic machine, the rail travel drive, the quick coupler system, attachments and all of the safety systems are developed by Liebherr and perfectly customised for the machine. Liebherr has been developing and producing railroad excavators for rail construction since 1967 and is global market leader in this segment as an OEM manufacturer.

Flexible use on road and rail: the Liebherr A 922 Rail road-rail excavator

The Liebherr A 922 Rail excavator impresses with its performance: With its 120 kW / 163 hp engine, the A 922 Rail achieves a high working speed with the usual smooth working movements. The innovative hydraulic concept of the A 922 Rail consists of a Liebherr variable displacement double pump with independent control circuits. High-performance, hydraulic attachments can thus be operated independently of the working and travel movements of the Liebherr railroad excavator. The delivery rate of the proven Liebherr variable displacement double pump was increased to 2 x 220 l/min for even better performance. The heavy ballast was also redesigned to yield the best bearing load values with improved weight distribution and a more compact rear dimension of 2,000 mm.

Service-orientated machine design

The service-orientated machine design of the A 922 Rail guarantees short maintenance times and minimises the associated maintenance costs thanks to the time savings. All maintenance points are easily accessible from the ground. The new generation has simplified access to important components even further; for example, air, oil and fuel filters, the main battery switch, the central lubrication point for the undercarriage and the pilot valves for the hydraulic system are much easier to access.

Comfortable double cab

The spacious double cab featuring standard roll over protective structure (ROPS) and a modern interior design offers the best conditions for comfortable, focused and productive work. Entrance lighting is provided to make accessing the cab easier. The usual generous use of glass and standard rear and side cameras provide an exceptional view of the working area and swing range. The touch-screen colour display used for display and operation purposes, as well as the other control elements on the console are all perfectly matched to one another to form the perfect unit.

Security systems direct from the manufacturer

Occupational safety is extremely important in track construction. Liebherr therefore offers their own safety systems which are perfectly tailored to the machine requirements. The safety technologies include load torque, height and sway limitation and the virtual wall.

Liebherr undercarriage for use on tracks worldwide

The A 922 Rail is available with various undercarriage versions with different track widths and rail wheels, which make it possible to use it on tracks worldwide. An independent variable displacement pump for the rail travel drive provides the best traction and safe propulsion at all times. Standard integrated brakes in the rail wheel shorten the braking distance in both the lowered and elevated position and thus enhance safety.

New Liebherr attachments and proven quick coupling system Solidlink 33-9

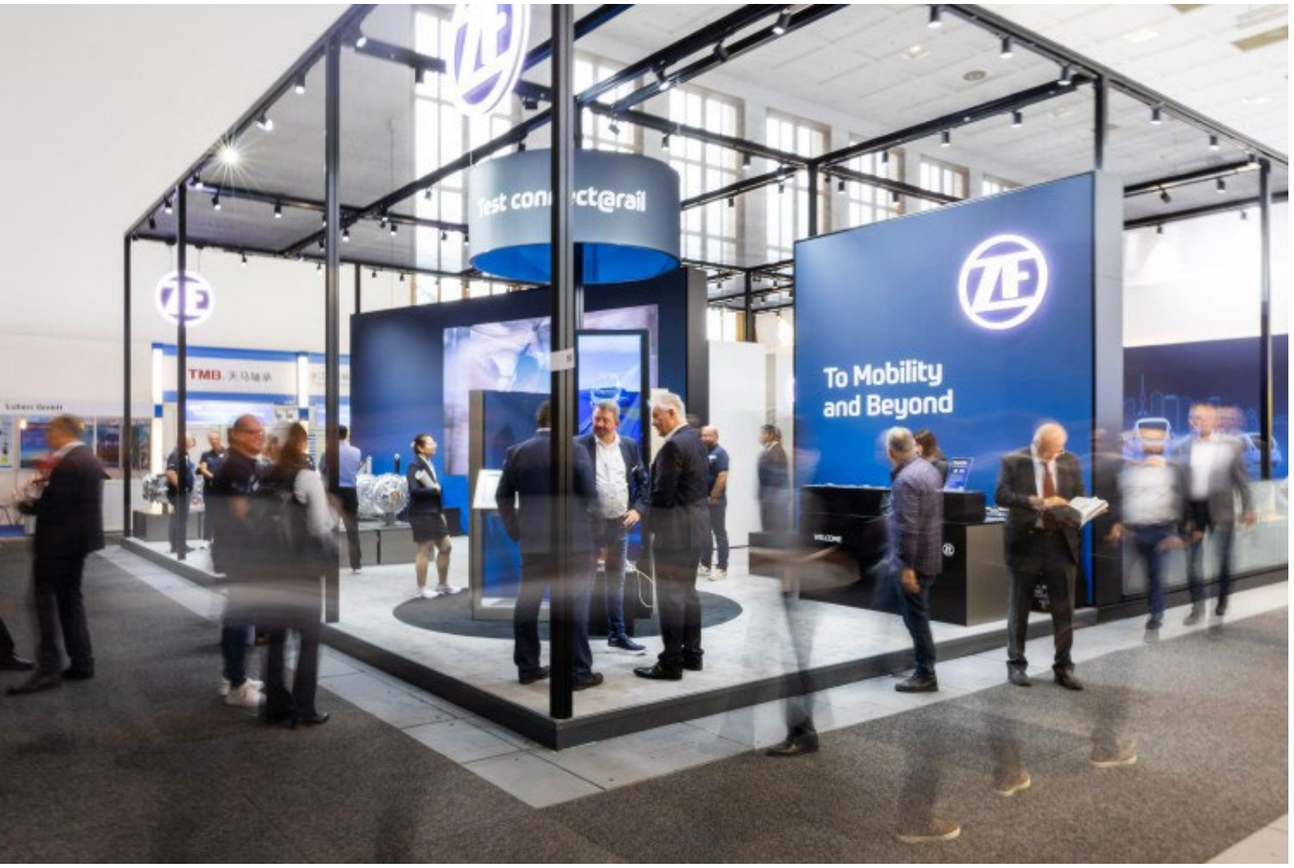
In order to meet the various construction site requirements economically and reliably, Liebherr offers an extensive portfolio of attachments for the A 922 Rail and is presenting a selection of these at Innotrans. The new rail tongs, which have been specially designed for the proven gripper mechanism of the GMZ 22, will be shown for the first time. The attachment, which has been specially developed for Liebherr's Railroad excavators, was designed in close collaboration with machine operators, and enables efficient and speedy work with the track strand.

In addition, Liebherr is also presenting the new GMP 25 parallel grab and the SG 20B sorting grab with universal tongs at the exhibition. The exhibition appearance is rounded off in the attachments area with the Tiltrotator TR 25 and a grading bucket. The A 922 Rail exhibited at the Innotrans is also equipped with a Solidlink 33-9. The new Solidlink 33-9 model adds further couplings to the fully automatic quick coupling system, with all the advantages. The expansion of the couplings to include a second high pressure circuit also allows the use of hydraulic attachments such as tamping equipment in rail construction, mulchers with flaps or Liebherr stick extensions. The Solidlink fully hydraulic quick coupling system allows attachments to be changed quickly and safely from the operator's cab.

www.liebherr.com

INNOTRANS 2024: INNOVATIVE MOBILITY SOLUTIONS FROM ZF

InnoTrans 2024: Innovative Mobility Solutions from ZF for Trains and Buses.



Whether train, bus or shuttle, electric or non-electric drive, mechanical or digital solution: ZF will be presenting its latest mobility solutions for public transport at the InnoTrans 2024 trade fair in Berlin from September 24 to 27. ZF's global aftermarket network offers comprehensive maintenance and repair services, including for products from third-party manufacturers. This year, ZF is celebrating a special anniversary: a century of rail technology.

In its anniversary year, the technology group ZF shows a broad portfolio of conventional and electric drives, chassis technology, digital solutions and aftermarket services at booth 580 in hall 20 of InnoTrans, the leading international trade fair for transport technology.

Prof. Dr. Peter Laier, ZF Board Member for Commercial Vehicle and Industrial Technology, said:

"Public passenger transport by rail and road is an important cornerstone of our daily mobility.

"As an innovative and broad-based technology partner, we support our customers in making this mobility more efficient, safer and more sustainable."

ZF Rail Technology: 100 Years, Countless Successes
Laier continued:

"The sustainable mobility of the future needs a strong rail system.

"That's why our Group has been developing reliable and powerful technologies for the rail industry for 100 years now and will continue to do so in the future."

ZF first developed a drive system for railcars in 1924: The "Soden TS18.5" transmission was the adaptation of a technology that had primarily been developed for passenger cars. Even today, ZF can offer its rail customers proven technology from other application areas: For example, the EcoWorld 2 six-speed powershift transmission with integrated reversing function and hydraulics is based on a proven bus transmission and is now an ideal solution for repowering diesel railcars. Its use can save up to 20 percent fuel compared to hydrodynamic rail transmissions. In addition, maintenance costs can be reduced and travel comfort increased.

With its running gear technology and the digital condition monitoring system connect@rail, the company is also underlining its position as the preferred technology partner for vehicle manufacturers, fleet operators and transport associations. As a comprehensive condition monitoring system, connect@rail combines digital expertise, integrated sensor technology, advanced data analysis and intelligent connectivity for rail transportation. Because it identifies damage to the drivetrain and track infrastructure at an early stage, connect@rail enables efficient maintenance planning. This avoids breakdowns, increases safety and helps to make rail mobility as smooth as possible.

ZF Bus Technology: From Proven Technology to Intelligent Systems
ZF presented the EcoLife CoachLine six-speed automatic transmission for intercity buses and coaches with engine torques of up to 2,800 Nm back in 2022. At InnoTrans, it is clear that the powershift transmission continues to set standards for efficiency and driving comfort, especially on interurban routes and challenging mountain roads. Thanks to its dual cooling system, maintenance requirements are reduced, which has a positive effect on operating costs over the entire service life of the transmission.

With the CeTrax 2 dual, ZF presents an attractive drive concept for all-electric public transportation. The electric central drive with a continuous output of 380 kW integrates modular and in-house developed components in an innovative system solution. Its compact size saves valuable space on board, while the low weight supports high power and torque values with improved efficiency. Thus, CeTrax 2 dual offers amazing performance even with high passenger numbers and/or challenging topographies in the city or in the countryside.

ZF not only offers bus manufacturers and transport authorities outstanding technology, but also supports them in optimizing their processes. The intelligent fleet management system ZF Bus Connect has functions such as Vehicle Health or OptiTire as well as the seamless integration of planning, scheduling, ticketing, passenger information and billing. In this way, ZF ensures the reliability and efficiency of the vehicles – and thus helps to improve customers' profitability.

ZF Mobility Solutions: Customized Mobility Solutions of the Future
Broad portfolio, system expertise, strong global partners: Under the name ZF Mobility Solutions, the company offers services for engineering, consulting and holistic mobility solutions. At the ZF stand, interested parties can find out which concepts our teams of experts can develop for specific applications and tasks, particularly in the rail sector.

ZF Aftermarket: Local Service Thanks to Global Presence
Through the Aftermarket division, ZF ensures smooth passenger transportation with important services such as diagnostics, overhaul and spare parts supply. In this way, the company ensures the reliability of its products over their entire service life – worldwide and around the clock.

And that's not all: ZF offers maintenance and repair for its own products as well as for third-party products, so that fleet operators can obtain solutions from a single source at ZF. A European rail competence center not only covers ZF products, but also market alternatives and retrofit solutions. With its cross-brand and cross-system expertise, ZF provides its customers with a wide range of services, including reverse engineering and lifecycle management. ZF's global support is further strengthened by the local and partnership-based network. This enables ZF Aftermarket to respond flexibly to customer needs and meet the highest performance standards with customized solutions.

www.zf.com

ABB POWERS “THE FUTURE OF MOBILITY” AT INNOTRANS 2024

ABB will be showcasing its wide range of innovative solutions for the rail industry at InnoTrans 2024 (September 24-27, Berlin), the world’s leading trade fair for transport technology.

- ABB showcases a wide range of innovative rail solutions to enable sustainable mobility at InnoTrans 2024
- ABB Traction Division launches the Pro series traction battery for hybrid and full electric rail applications.
- The Pro series further complements ABB’s already extensive Traction Battery offering which are already installed in more than 1000 vehicles around the world

The company has been a pioneering technology leader in the railway sector for more than a century and has continued its journey of decarbonizing the rail industry with innovative and sustainable solutions. ABB is showcasing its range of transportation solutions and energy-efficient technologies for the rail industry at Stand 320, Hall 9.

ABB’s Traction division announces the launch of the Pro series traction battery that are designed specifically for demanding transportation applications. The innovative battery pack, the newest addition to ABB’s already extensive Traction Battery family, is engineered to offer modularity and scalability, as well as best-in-class performance, high level of safety, and superior energy density in a compact design.

The new Traction Battery Pro also provides long lifetime with over 20,000 cycles and has rapid charging capabilities, enabling 80% charge in 10 minutes.

At the event’s popular Speaker’s Corner ABB will hold an expert talk between 3-4pm CEST on Tuesday 24, on the role of Traction Batteries in enabling sustainable mobility and demonstrate how ABB powers energy efficient hybrid and fully electric powered trains all over the world. There will also be a joint case study presentation with TMR on how ABB created a regenerative power solution to improve reliability and lower the environmental impact of the Mont-Blanc Express via annual energy savings of 552 MWh.

This year, ABB Traction was responsible for converting 44 Adelaide Metro train sets to a diesel-hybrid operation, reducing noise and emissions for the nearly 16 million commuters a year. ABB’s traction batteries play a substantial role in driving energy savings in the rail industry and have contributed to conversion projects around the world where up to 35% energy savings have been achieved.

Edgar Keller, Division President, Traction, said "ABB is at the forefront of supporting efforts to decarbonize the global rail industry by developing cutting-edge traction systems and solutions through intense research and development. Our commitment to reducing energy consumption and introducing cleaner, more efficient technologies such as the Traction Battery Pro series to further supports the creation of a more sustainable rail industry, helping to meet ambitious global sustainability targets."

www.abb.com

TALGO

TALGO PRESENTS ITS INNOVATIONS IN SUSTAINABLE MOBILITY TO CONNECT EUROPE AT INNOTRANS 2024

Visitors will board Talgo 230, the intercity train the company manufactures for the Danish operator DSB. This is the first time in the history of the event that a full rail coach will be presented inside the building where the event takes place.

Talgo, the Spanish company leader in the design, manufacture and maintenance of high-speed, lightweight rail vehicles, will present its most innovative trains and railway solutions to decarbonise mobility at InnoTrans 2024. The railway industry's biggest event will bring together the entire sector worldwide from tomorrow 24 September and until Friday 27 September in Berlin. In 2022, more than 2,700 exhibitors from 56 countries and 137,000 visitors from 137 countries attended InnoTrans.

Talgo will showcase in Hall 4.2 of Messe Berlin the latest advances in technology and its value proposition for an accessible, decarbonised and connected mobility throughout Europe. Visitors will be able to get on board the Talgo 230, the intercity train it manufactures for the Danish operator DSB; get to know the DB-Baureihe 105 locomotive, developed for Deutsche Bahn as part of the ICE L project; and explore the modular proposal for high-speed lines in Europe on the Talgo Avril platform.

Talgo 230

Talgo is supplying 16 Talgo 230 Intercity trains for DSB, set to become part of its fleet of vehicles for Intercity services. These trains will connect Copenhagen and the city of Aarhus in Denmark with Hamburg (Germany) and potentially other routes, both international and domestic.

For the first time in the history of InnoTrans, Talgo is presenting one of these coaches inside the building where the event is taking place. This is a milestone as, taking into account the configuration of the building where the event is being held, it is equivalent to raising the vehicle up to a fourth floor: something that only the Spanish manufacturer is able to do due to the greater lightness of its trains.

With a maximum commercial design speed of 230 km/h, and an operating speed of 200 km/h, the trains manufactured in Spain for Denmark will have a greater width than those used as standard in cross-border traffic, allowing for more interior space and greater comfort for passengers, while maintaining full technical interoperability at all times, to provide service on both domestic and international routes.

As part of the Talgo 230 platform, DSB trains also have the capacity to cut energy consumption by up to 30% compared to the industry standard thanks to the Spanish company's unique rolling technology and the reduced weight of its passenger coaches and will also allow for 95% recoverability of the train structure.

DB-Baureihe 105 Locomotive (ICE L)

Talgo is also featuring a new ICE L vehicle, from a contract of 79 Intercity low-floor trains which are also part of the Talgo 230 range, and which are being supplied to the German operator Deutsche Bahn within a framework contract of 100 units.

Named ICE L by Deutsche Bahn (L standing for 'low-floor'), and equipped with interoperable systems that will enable them to cross Germany's borders with several neighbouring countries, these trains are lighter than the industry standard and will also feature a powerful locomotive developed and manufactured entirely by Talgo which will enter Deutsche Bahn's fleet under the series name'Baureihe 105'.

This locomotive is being presented to the public for the first time at the InnoTrans open-air exhibition (track 2): a feature that makes this fair unique, and which allows professionals and future travellers to get to know the characteristics of this Talgo locomotive first hand.

InnoTrans visitors will also be able to learn about the high modularity offered by the Avril very high-speed platform through a virtual reality app, in which all the possibilities it offers to private and public operators across the European rail network are presented.

www.talgo.com

SIEMENS

SIEMENS MOBILITY PRESENTS SIGNALING X AND NEXT-LEVEL RAIL SERVICES AT INNOTRANS 2024

Signaling X opens interfaces and integrates signaling and control systems for mainline and mass transit into one cloud platform.

Signaling X – one cloud for all signaling systems, photo source: Siemens Mobility

Automated Vehicle Inspection, photo source: Siemens Mobility

Mobile Inspection, photo source: Siemens Mobility

Digitalization is a key enabler to reduce emissions and to deliver the capacity to match a doubling of passenger demand by 2050. By providing 100% system availability, maximizing the use of existing infrastructure, and software solutions for seamless door-to-door travel, rail can become the transport of choice in the future. However, one of the biggest barriers to a full adoption of digitalization is vast quantities of data being locked in single systems. Accessing this data via standardized application programming interfaces (APIs) and connecting them with other systems and services in the rail ecosystem with the support of AI-driven analysis and evaluation tools is the key for more efficient rail operations.

Signaling X – one cloud for all signaling systems

Signaling X allows for the seamless control and operation of both mainline and mass transit signaling applications and systems from one centralized Signaling Data Center, powered by standard hardware. This Data Center also enables the management of both safety-critical and non-safety-critical Siemens Mobility applications with standardized APIs, opening interfaces to diagnostic and optimization systems such as Train Planning Systems [TPS] in one cloud environment. This way, rail operators can optimize rail operations and manage them more intelligently through the interplay of our different signaling applications.

Signaling X utilizes the "Distributed Smart Safe System [DS3]", introduced by Siemens Mobility in 2020. The scalable DS3 safety platform serves as the building block as it enables the running of safety-relevant applications in a cybersecure environment in the cloud. The integration ensures the highest level of availability by leveraging georedundancy. It delivers up to 20% of enhanced operational efficiency, up to 30% of energy savings in interplay with ATO over ETCS, and a reduction of possible headways on Mainline and Mass Transit networks. DS3 has been successfully implemented in Austria and Spain and was recently awarded in Finland.

Railigent X makes 100% system availability a reality

Siemens Mobility Customer Services will present innovations for railway operators and maintainers at InnoTrans 2024. With new additions to Railigent X, the company is advancing the end-to-end digitization of train maintenance. The new Railigent X portfolio now gives operators, maintenance personnel, and asset owners the choice to select exactly the applications and services that align with their digital strategy. For example, they can use complete Railigent X applications or rely on their own applications and selectively integrate Railigent X algorithms via APIs. This means Railigent X can handle service tasks even more efficiently and integrate them better into operational processes. Moreover, digitalization and automation enable to completely rethink the process of vehicle inspections of our customers.

Fully Automated Visual Vehicle Inspection

Already today, dedicated measurements of wheel profiles, brakes, and pantographs are done in an automated way. Wear, anomalies, or errors are detected using AI models and displayed in Railigent X. In the future, this process will be further automated towards a fully automated visual vehicle inspection. The vehicles will be scanned by cameras before entering the depot. The images will be analyzed using AI technology. This will enable the automated evaluation of up to 100% of the vehicle surface to detect graffiti or technical damages, for example. Siemens Mobility will present an initial demonstration case from the Rail Service Center Dortmund at InnoTrans, focusing on the inspection of the train roof and roof equipment. This way, depot capacities can be more effectively planned and utilized, allowing for the maintenance of more rail vehicles.

Mobile Inspection

With Mobile Inspection, Siemens Mobility is introducing a new future service offering, which enables the inspection of rail vehicles on sidings outside of depots and serves as an ideal complement to the company's depot network service offerings. Specially designed mobile tools, utilizing robotics and augmented reality, are used to fully inspect the roof and undercarriage of the vehicles with cameras. Pit and roof stands are not required anymore. Consequently, there is no longer a need to transfer a locomotive to a workshop, as a mobile service team can conduct the inspection on a suitable siding outside of the depot. Smaller maintenance tasks can also be carried out on-site. This solution increases vehicle availability and relieves the depot infrastructure. Railway operators will benefit from fewer depot visits, enabling higher availability of vehicles for operation. Mobile Inspection will initially be tested with interested partners in Germany, followed by a planned expansion to other maintenance projects worldwide.

www.siemens.com

MASATS PRESENTS NEW PRODUCTS IN INNOTRANS

Masats will participate in the next edition of InnoTrans 2024, the international technology fair for the railway sector, which will take place in Berlin from 24 to 27 September.

At this edition, Masats will present its latest innovations designed to improve safety, operational efficiency and universal accessibility in rail transport.

Among the most outstanding solutions, Masats will show the Platform Door PSD 2.0 which presents as a novelty a new mechanism composed of two actuators capable of governing a double sliding door, each leaf independently allowing asymmetrical openings of the door. This innovation not only improves the flexibility of use, but also offers faster opening speeds thanks to the significant performance of the actuators, ideal for doors with a free passage of more than 2 meters.

Furthermore, the design of this mechanism optimises the LCC and is condition-based maintenance (CBM) oriented.

PSD 2.0 also includes an acoustic and light signalling system that makes it easier for users to identify the operational status of the gate, significantly improving safety at stations and reducing boarding times, thus optimizing passenger flow. Another novelty is the passenger video information system included in the module, which offers real-time monitoring of the system and is accessible via a tablet or mobile phone. In addition, its customizable structure allows the integration of auxiliary equipment such as fire extinguishers, defibrillators (AED) or intercoms, optimizing space on the platform.

Another product highlight will be the Compact Sliding Door 00Gb, designed for trains reaching speeds of up to 200 km/h. This system ensures fast operation and high availability, ideal for speed trains. Alongside this door, the RF3+ Ramp, a contactless access solution that detects the position of the platform and automatically deploys as a ramp, step or bridge plate according to operational needs, thus facilitating access for all users in a safe and efficient manner, will be on display.

All these innovations will be available at booth 360 in Hall 3.1 in Berlin.

With its participation in InnoTrans 2024, Masats reaffirms its commitment to innovation and the development of technological solutions that prioritize both safety and universal accessibility.

www.masats.com

SCHAEFFLER AND ALSTOM SIGN STRATEGIC PARTNERSHIP AGREEMENT FOR FURTHER DEVELOPMENT IN RAIL TRANSPORT

Rolling bearing technology with reliable, safe, sustainable products, and services become top priorities of this partnership; enables long-term cooperation and expansion of business relationship.

The motion technology company Schaeffler and Alstom, a world leader in the provision of green and intelligent mobility solutions, took the opportunity during the InnoTrans 2024 trade show to sign a partnership agreement. Schaeffler is now a partner for rolling bearing technology in the Alstom AllianceTM programme. Schaeffler has supplied Alstom for many years with axlebox bearings along with housings, drive bearings for rail vehicle gearboxes and motors, and slewing rings for underground trains and trams. Schaeffler is the only partner company in the Alstom AllianceTM in the commodity of rolling bearing technology. Through the partnership, the two companies hope to further expand their business, develop new technologies and spur their growth over the long term.

Long-term partnerships with strategic suppliers

Alstom launched the Alstom AllianceTM programme in 2015 in order to be able to offer customers high-quality, cost-effective products and services in a competitive market. The aim is to build long-term partnerships with strategic suppliers for the development and implementation of innovative, reliable and more sustainable solutions, covering all phases from conceptual design to delivery.

Remanufacturing for economical and ecological railway operations

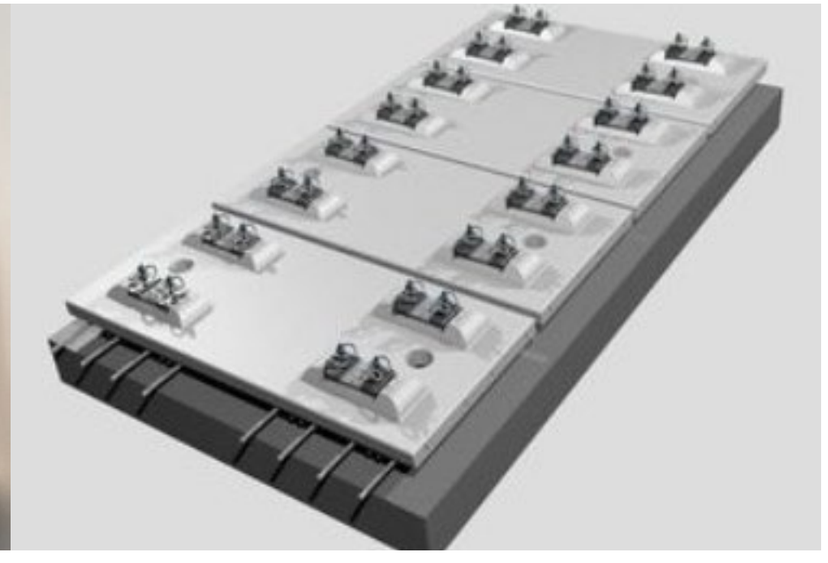
In the area of bearing remanufacturing or reconditioning, Schaeffler is currently expanding its offerings in order to support Alstom regionally with this service and contribute toward achieving the sustainability targets of the train manufacturer. For businesses in rail transport, too, use of the circular economy system is one of the main approaches for achieving greater sustainability. Bearing reconditioning can result in resource savings of up to 95%, depending on the extent of reconditioning. At the same time, Schaeffler offers the same quality and safety standards with its 100% return service and delivers the bearings with the same warranty as for new products.

With a common understanding of sustainability, Schaeffler and Alstom participate in various initiatives and associations to help improve the effectiveness of sustainability management through use of standardised measures and processes. Through their membership in the 'Railsponsible' initiative, Schaeffler and Alstom underscore their commitment to greater sustainability in the railway industry. In addition, Schaeffler's Platinum status, resulting from an EcoVadis sustainability score of 81/100 points, reflects the excellence of its sustainability practices and its unwavering dedication to environmental and social responsibility.

www.schaeffler.com

INNOTRANS 2024 - THE FUTURE OF MOBILITY

In addition to its proven products and globally established solutions, the company will be presenting the new RAILONE slab solution ROCS from the RHEDA 2000® system for the first time.



On September 24, 2024, Messe Berlin open its doors once again to the diverse rail infrastructure industry after two years. With over 2,771 exhibitors from more than 56 countries in 2022, this trade fair offers an incomparable stage for professional exchange.

The PCM RAILONE Group, which is represented in numerous countries around the world, is taking the opportunity of the 70th anniversary of its own concrete technology to present its latest development: The ROCS slab track solution for ballastless track application.

"In some countries and projects, prefabricated slab tracks are preferred. With ROCS, RAILONE offers an alternative based on slab track, while retaining the advantages of the simple and flexible installation known from the RHEDA 2000® system. At the same time, further advantages such as labor savings and additional efficiency are created," said Wojciech Nawrat, Head of Business Segment Long Distance & Technology Support at RAILONE.

With flexibility and intensive research and development activities, RAILONE always responds to individual customer needs as well as to megatrends such as sustainability and safety.

With a two-storey, 214 square meter booth, RAILONE will be presenting solutions from all four business areas: engineering, long-distance and freight transport, local transport and plant construction. For the first time, RAILONE will also be offering interested visitors to InnoTrans 2024 the reliable product solutions of the international group of companies at the additional outdoor stand. With the help of an interactive application, RAILONE demonstrates product diversity, locations and international project references. Experts on site are available throughout to exchange information with interested parties.

Facts and figures on the communication:

- InnoTrans in Berlin, September 24 - 27, 2024
- Booth 790 in Hall 26
- Outdoor stand FGSued O/325
- Presentation of the real exhibit ROCS as an additional development to RHEDA 2000®

www.railone.com

SAR UNVEILS AMBITIOUS RAIL EXPANSION PLANS AT INNOTRANS 2024

Saudi Arabia Railways (SAR) will present its vision for the future of rail in Saudi Arabia, highlighting significant progress on existing projects and unveiling new initiatives that will further enhance the Kingdom's railway infrastructure and capabilities.

SAR and its partners continue to invest in making Saudi Arabia a key hub for global freight

Since InnoTrans 2022, SAR has made significant strides in expanding and modernizing the Saudi Arabian rail network. Passenger traffic has surged by an impressive 84%, demonstrating the growing demand for safe, efficient, and sustainable transportation within the Kingdom. To meet this demand and enhance service quality, SAR has signed a contract with Stadler to supply and maintain 20 Next Generation passenger trains for the East Railway network. Adding to this momentum, SAR will launch a luxury train service, the "Desert Dream," in late 2025. This initiative will attract tourists and offer domestic travelers a unique and opulent way to experience the beauty of Saudi Arabia.

Expanding rail network with international partners and sustainable technology

In the freight sector, SAR has partnered with Bahri Logistics to enhance its freight forwarding capabilities, streamlining import and export processes and solidifying the railway's role in facilitating trade. This commitment to freight expansion is further underscored by the progress on the landmark Landbridge project, which will connect the Kingdom's Red Sea and Arabian Gulf coasts upon its completion in 2030. With the recent selection of a project management consortium, the Landbridge project is well on its way to becoming a reality.

Simultaneously, SAR is pursuing capabilities to seamlessly connect maritime and rail networks by securing key partnerships with global shipping giants, including Maersk and MSC. While SAR and Maersk will collaborate to optimize container transport between Dammam and Riyadh, MSC Saudi signed a contract with SAR to increase container volumes on the same route aiming for greater operational efficiency. These partnerships highlight SAR's dedication to providing efficient freight solutions that capitalize on the strengths of both rail and maritime transport, positioning the company as a key player in global logistics.

SAR continues to be a leader in sustainable rail technology, having commenced trial runs for hydrogen-powered trains in Riyadh. This initiative aligns with Saudi Vision 2030 goals for reducing carbon emissions and promoting clean energy solutions.

SAR has also focused on strategic partnerships to enhance the passenger experience. Agreements with key players like Careem and Uber are seamlessly integrating rail travel with other modes of transportation, providing passengers with a convenient and comprehensive travel experience. This achievement underscores SAR's commitment to leveraging rail technology to serve the needs of the Saudi people and visitors.

Investment opportunities to drive rail innovation in the region

At InnoTrans 2024, SAR will be seeking to further these advancements by engaging with potential partners and investors. The company will present opportunities for international investors to participate in the Kingdom's ambitious rail projects, including the Landbridge project and the expansion of freight and passenger lines.

SAR is also eager to collaborate with leading technology providers to implement cutting-edge solutions in areas such as signaling, telecommunications, and digitalization, further enhancing the safety, efficiency, and sustainability of the Saudi rail network. Finally, SAR is committed to developing local talent and expertise in the railway sector and will be exploring partnerships with international institutions to facilitate knowledge transfer and training programs.

"SAR is committed to playing a pivotal role in achieving the ambitious goals set forth in Vision 2030," said Muhammad M. Hamidaddin - Director Corporate Marketing & Communications. "Our participation at InnoTrans 2024 provides a platform to showcase the incredible progress we have made and to invite the global rail community to join us in shaping the future of rail in Saudi Arabia and beyond."

Visit SAR at InnoTrans 2024 in Hall B, 330 to learn more about the exciting developments in Saudi Arabia's rapidly evolving railway sector.

www.sar.com

CONTINENTAL HYDRAULIC BUSHINGS REDUCE MAINTENANCE COSTS THROUGH SOFTENING THE BLOW

Advanced technical design allows for a differentiation between high and low stiffness that is significantly better than that of conventional hydraulic wheelset guiding bushes.

An advanced technical design allows for a differentiation between high and low stiffness that is significantly better than that of conventional hydraulic wheelset guiding bushes.

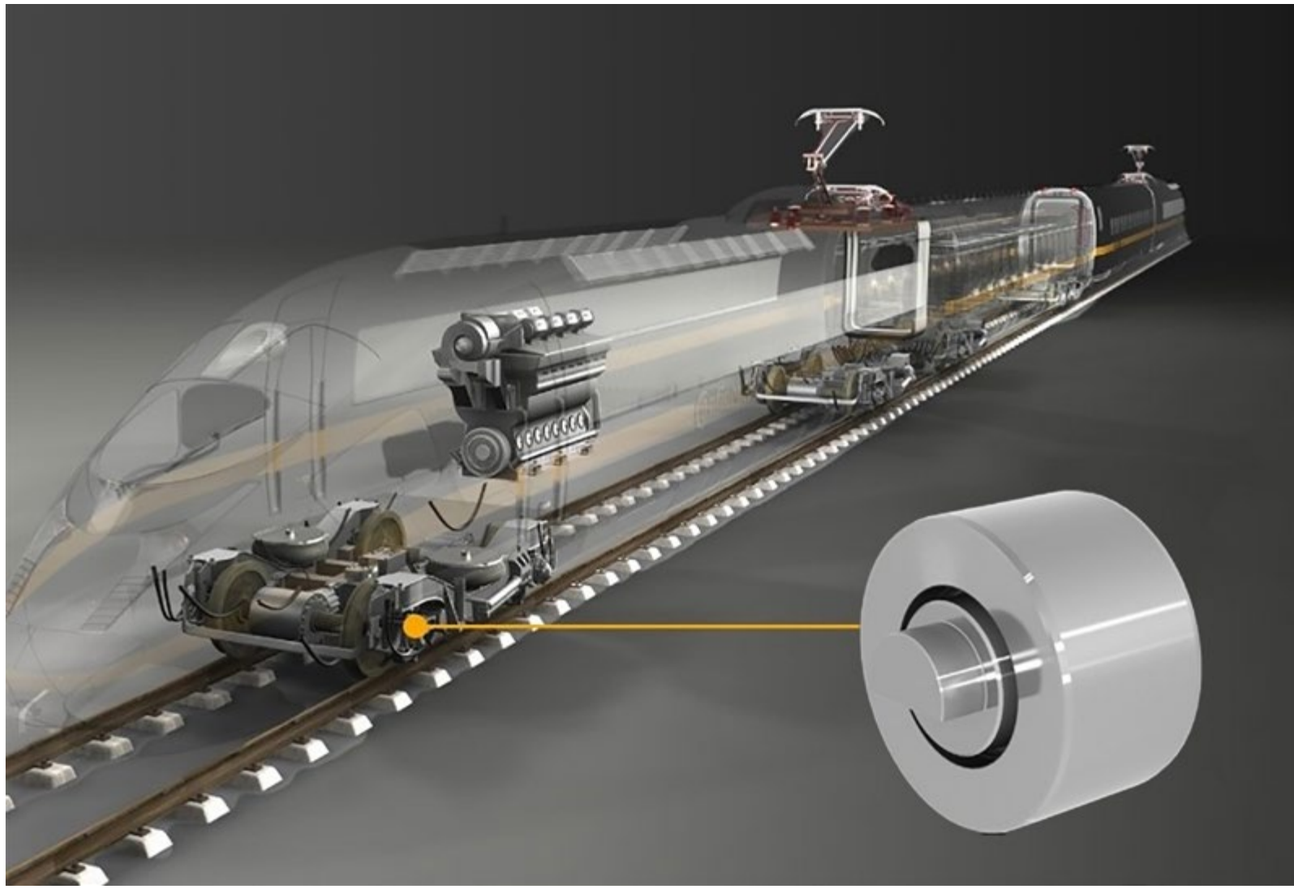
Continental has developed a new generation of hydraulic wheelset guiding bushes for bogies on trains. These bushings can adapt the pressure that tracks assert on the wheelset significantly better than conventional hydraulic bushings. The advanced balancing of the pressure that impacts the wheelset increases the lifespan of critical train components and therefore offers an opportunity to reduce maintenance costs as servicing intervals may be prolonged and unplanned repair work can become less frequent. At the same time, passenger comfort is increased because the impact of track-sleepers on the wheels is noticeably reduced.

Differentiation between static and dynamic longitudinal stiffness is significantly higher

In a train's primary suspension system, hydraulic bushes are used to connect the primary spring swingarm with the bogie. They allow for some movement and flexibility within the primary suspension system for an optimal wheelset guiding. This is crucial for adapting to track irregularities and ensuring smooth operation of the train. Hydraulic bushings are essential for the train suspension system's ability to adapt to the very different riding modes. They can support both: situations where a rigid suspension is required, i.e., high speed on straight rides. Or, in contrast, situations that demand soft suspension, i.e., curves or switches at low speed.

Continental hydraulic bushings enable a differentiation between static and dynamic longitudinal stiffness that is significantly higher than that of conventional hydraulic bushings. This means that very soft wheelset guidance can be achieved in curves and pressure from the tracks is reduced. In contrast, high directional stability is demanded on the straight at high speed. Here, the optimized wheelset guidance of Continental's solution increases the positive impact of hydraulic bushings on passenger comfort, such as less noise and softer rides.

Hydraulic wheelset guiding bushes from Continental allow for higher passenger comfort and prolonged lifespan of critical components.



Positive effect on maintenance cost

The increased adaptability and thus more appropriate wheelset guidance that Continental achieved through the innovative design of its new generation hydraulic bushings has a positive effect on servicing intervals and maintenance cost, too. Continental's hydraulic wheelset guiding bushes can be retrofitted with no modification to the bogie, as they are easily attachable. This makes it easier, e.g., for train operators with challenges in the field of maintenance cost to install them in trains already in operation. "As our wheelset guiding bushes adapt to pressure better than what is standard today, the wear of both rail and wheel can be significantly lower compared to conventional hydraulic bushings, all other factors equal," explains Sara Grotsch, head of Operations Unit Dynamic and Suspension Solutions in the Industrial Solutions EMEA Business Area at Continental's group sector ContiTech, where the hydraulic wheelset guiding bushes have been developed. "That is why we are not only proud of our technology innovation but also of the potential effect on sustainability and efficiency it can have to the benefit of our customers, their customers and everyone riding a train, metro or tram.

www.continental.com

ACTIA INTRODUCES HIGH-BRIGHTNESS MICRO-PROJECTION

ACTIA is transforming the rail passenger experience with a change in technology from backlit TFT to high-brightness direct projection technology.

Making its world debut at the 2024 InnoTrans trade fair in Berlin, this technology, a first in the rail sector, offers more efficient, cost-effective and sustainable passenger information display solutions.

ACTIA and EyeLights: a collaboration driving innovation in rail transport

In collaboration with EyeLights, a specialist in innovative projection technologies, ACTIA is introducing a new generation of onboard micro-projector designed to revolutionise infotainment on trains, trams and subways.

This new technology, already tried and tested in the automotive sector, makes it possible to project high-quality images onto various surfaces, such as metal panels or transparent windows. By replacing conventional TFT display screens, these projectors not only reduce energy consumption, but also the carbon footprint, contributing to more sustainable transport solutions.

"We are delighted to be introducing this technology at the 2024 InnoTrans trade fair. It represents a major qualitative leap in terms of performance and energy efficiency, while providing a significantly improved passenger experience." Damien Redondo, Vice President of ACTIA Rail.

What is micro-projection technology?

The key to this innovation is reflective display technology. In contrast to backlit TFT display screens, reflective display screens use ambient light to make the image visible. This principle is the result of decades of research and development, and has several significant advantages.

Advantages of the technology

- Brightness and compactness: the projectors provide extremely high brightness in a very small space, enabling Full HD images to be projected onto surfaces up to 1.80 metres wide.
- Efficiency and economy: compared to conventional TFT display screens, these micro-projectors are more efficient, consume less energy and are therefore more cost-effective and sustainable.
- Flexible installation: the technology is simple to install and saves a considerable amount of space inside trains. It can be adapted to any type of surface, be it glass, metal or other materials.
- Performance: the systems provide 5 to 10 times the brightness of current technologies, ensuring optimal visibility in all conditions.

In short, micro-projection is a significant step forward in display technology for railway vehicles, offering outstanding performance while simplifying installation and reducing operational costs. This disruptive technology promises to be a game changer for rail transport, making train travel smarter, more scalable and more energy-efficient.

Towards more eco-friendly rail transport

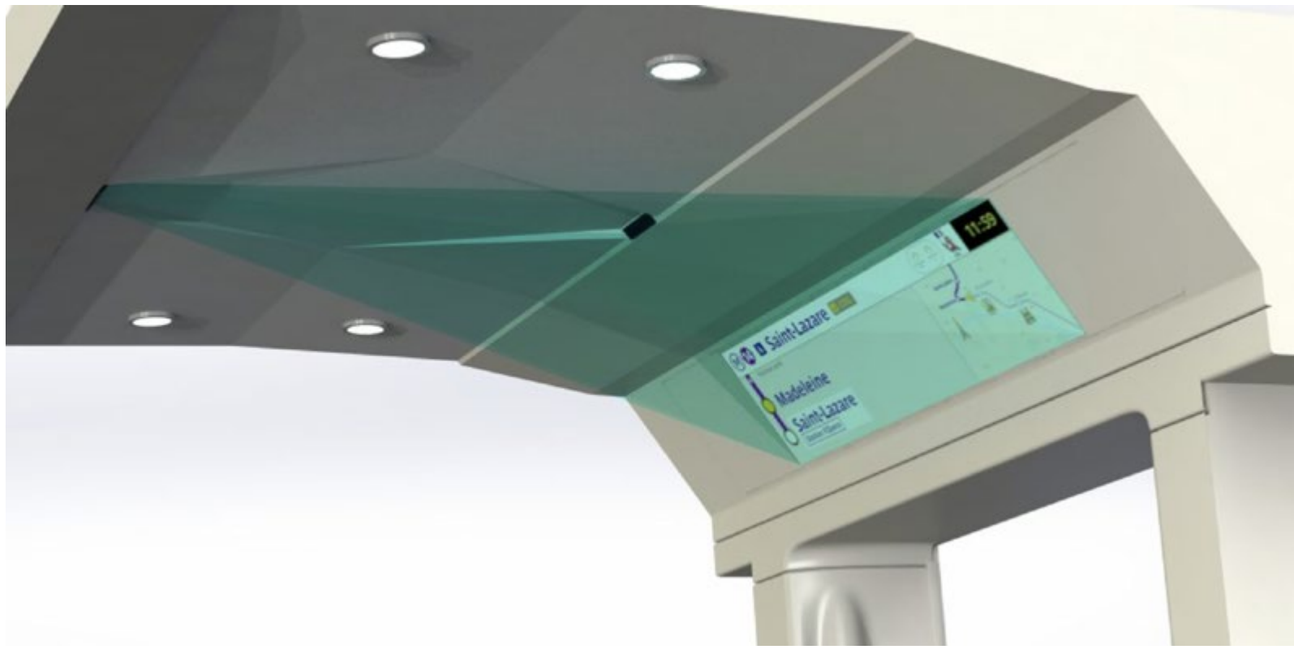
The collaboration between ACTIA and EyeLights is not limited to improving the passenger experience. It is also part of an eco-friendly approach, with technology that significantly reduces energy consumption and therefore the carbon footprint.

Environmental impact:

- Low energy consumption: as there is no backlighting, reflective display screens consume much less energy, which is ideal for battery-operated devices.
- Decarbonisation: The manufacturing of small image generators instead of large TFT display panels helps to significantly reduce CO2 emissions and the carbon footprint.

The new display technology offered by ACTIA is set to become a game changer for rail transport. By combining technological innovation and environmental friendliness, this solution promises to make train travel smarter, more scalable and more energy-efficient. Visit the 2024 InnoTrans trade fair and discover this revolutionary world first.

www.actia.com



RAIL BALTICA

CONSTRUCTION CONTRACT SIGNED FOR THE MOST UNIQUE RAIL BALTICA SECTION IN ESTONIA

Rail Baltica delivery organization in Estonia signed a contract for the construction of one of the most unique sections of the route, where the tracks will partially run through a trench up to 10 meters below ground level.

The construction of this 9.2 km stretch of the main line will cost €70.8 million and will be executed by OÜ Verston and OÜ Järelpinge Inseneribüroo, who won the tender with a joint bid. This section is situated between Soodevahe and Kangru in Rae Parish.

According to Anvar Salomets, Chairman of the Management Board of Rail Baltic Estonia, the Rail Baltica project is not just transport infrastructure – it is Estonia's future connection to Europe. "Our goal is to provide a modern, safe, and environmentally friendly railway that serves both people and nature. Today, we moved 9.2 kilometers closer to achieving that goal," he said.

He added that the aim is to reach agreements and begin construction on at least one-third of Estonia's 213-kilometer Rail Baltica main line this year – approximately 70 kilometers. To date, contracts have been signed or construction is underway for 65 kilometers of the main line in Estonia. This section is one of the most unique in terms of construction – it is the only part of the route where the train will travel in a trench for a total of five kilometers. The trench resembles the Lasnamäe canal, with natural limestone walls rising on both sides of the track. The railway will run through a trench that varies in width from 55 to 75 meters, with the deepest point being 10 meters from ground level to the tracks.

For Verston, this is the fourth contract for a section of the Rail Baltica main line. According to the company's CEO, Veiko Veskimäe, completing Rail Baltica will require very close cooperation between all parties. "As contractors, we are dedicated to finding solutions, as it is clear that in a project of this scale, things do not happen easily by themselves. Achieving our shared goal requires the intelligence, commitment, and genuine effort of all parties to find the best solutions, even in the most challenging situations," emphasized Veskimäe. "It is important that, when the project is completed, both people and nature are satisfied, and that the solutions consider the needs of both."

The Rail Baltica railway will pass under Põrguvälja Road, where Verston is already building technical systems and a viaduct, which will be completed in November. Under the newly signed contract, an embankment for Soodevahe station will be constructed, along with a railway bridge over the Kurna stream, the Uuesalu viaduct, and the Rae wildlife overpass. "Rail Baltica is an important step toward greener transportation, offering fast and environmentally sustainable connections. The Rae wildlife overpass, located above the trench, will provide a safe passage for wildlife, helping preserve the natural environment," Salomets noted.

On the Soodevahe-Kangru section of the main line, the Tallinn-Tartu Highway viaduct has already been completed. In November, in addition to the Põrguvälja viaduct, a viaduct for technical networks located nearby will also be completed. By the end of the year, the railway bridge over the Vaskjala-Ülemiste canal and the Rae highway viaduct will also be finished.

This section of the route will include the important Assaku stop for Rae parish. The parish plans to develop a transport hub in Assaku, where county buses will also stop in addition to the train. As part of the contract, platforms will be built in the trench, with structural supports for crossings, up to the platform level. The remaining part of the station will be constructed later under a separate contract when work on the railway superstructure is carried out.

The duration of the construction contract is 40 months, meaning the Soodevahe-Kangru section of the main route must be completed by January 2028. The construction contract is financed by the Connecting Europe Facility (CEF) and the Estonian state budget.

www.railbaltica.com

OPTIMIZE YOUR ECOLOGICAL FOOTPRINT: EFFICIENT, SUSTAINABLE KNORR-BREMSE TECHNOLOGIES FOR THE RAIL INDUSTRY

At InnoTrans, Knorr-Bremse will showcase comprehensive solutions for helping customers to make their fleets more sustainable by increasing energy efficiency and reducing emissions.

Part of Knorr-Bremse's presence at InnoTrans 2024 will focus on helping customers to optimize their ecological footprint. Hands-on, fascinating exhibits include AirSupply Smart and Sustainable Friction Pairing.

Economical, efficient and sustainable fleet operations are prerequisites for rail transportation to further enhance its position in the mobility mix. Knorr-Bremse enables customers to reduce the ecological footprint of their vehicles: At InnoTrans (Main Hall 1.2, Booth 250), the company will be presenting a wide variety of systems that help to reduce energy and resource consumption, and cut down carbon, noise and particulate emissions.

"Enhancing energy efficiency and sustainability in rail operations is a key factor in making rail mobility even more attractive and successful," affirms Dr. Nicolas Lange, Member of the Executive Board of Knorr-Bremse AG with global responsibility for the Rail division. "To actively influence the trend toward an increasingly eco-efficient, resource-efficient rail sector, we're investing in the development of environmentally friendly solutions that improve the sustainability and cost efficiency of fleet operations, such as high-precision braking systems and smart energy management."

AirSupply Smart – shifting the compressed-air supply paradigm

When supplying compressed air to rail vehicle braking systems, AirSupply Smart enables a new kind of eco-friendly energy and noise emission management. The technology uses permanent condition monitoring to take existing air supply methods to a whole new level by responding directly to real-time conditions and delivering compressed air on demand.

At InnoTrans, Knorr-Bremse will be presenting AirSupply Smart in conjunction with the latest generation of the company's screw-type compressor: ScrewSupply Eco. The entire system is designed to maximize ease of maintenance and reduce lifecycle costs by up to 40%. In addition, the compressor's optimized construction substantially cuts down weight and noise emissions, as well as the installation space required. These product features are all the result of applying EcoDesign principles to the new ScrewSupply Eco generation.

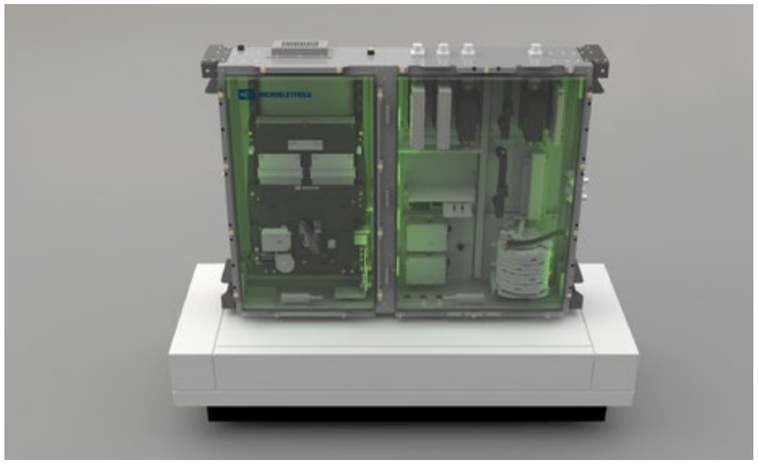
SIFU – a system for improving energy efficiency in vehicles

The highly configurable, service-friendly System Integrated Functional Unit (SIFU) developed by Group brand Microelettrica Scientifica is responsible for smart energy management and measuring current in trains. The unit's sensor system measures and delivers a full range of operating data on the vehicle's energy consumption and voltage distribution – including the amount of braking energy recuperated. Based on smart data analytics, operators can then take steps to improve the vehicle's energy efficiency. SIFU combines the many complex electronic components required to control energy distribution in a single compact, digitized system. Thanks to its adaptable, modular design, SIFU can reduce the amount of wiring in vehicles by over 70%.

Sustainable Friction Pairing – the ideal combination

In braking systems optimized for performance and sustainability, the ideal combination of friction materials – known as the "friction pairing" of brake pad with brake disc – plays a vital role. As a full-range supplier of friction materials, Knorr-Bremse provides application-specific material pairs of brake pads and brake discs for all types of trains, areas of application and global railroad standards.

The interactive Sustainable Friction Pairing exhibit combines a brake disc consisting of three different materials with the optimum brake pad. The exhibit will show visitors how an optimized friction pair helps to reduce carbon, fine dust and particulate emissions, and consequently enables more sustainable braking.



green[air] – climate control solutions that use natural refrigerants

The green[air] concept developed by Knorr-Bremse brand Merak provides a wide range of options for configuring intelligent air-conditioning solutions for trains. As part of a complete, energy-efficient climate control solution for driver and passenger compartments, the system can run on eco-friendly refrigerants such as propane (R290), with a GWP of just 0.02, or CO2, with a GWP of 1. Thanks to their flexible system architectures, Merak's green[air] technologies make it easier for operators to switch to environmentally friendly refrigerants. Operators can also select from a range of technologies to suit their individual preferences, such as optimized output controls, heat-exchanger design or fan aerodynamics. The company's green[air] solutions will be showcased by the custom[air] demonstrator.

Meet up with Knorr-Bremse at #TalentCorner

Break the Limits, RIDE THE FLOW is Knorr-Bremse's dynamic slogan for InnoTrans 2024. Knorr-Bremse's presence in Berlin will feature an impressive 1,000 square meters of exhibition space, showcasing the company's key brands and business units (Hall 1.2, Booth 250). The booth will focus on five areas of innovation: Traffic Flow, Ecological Footprint, Traveling Comfort, Operations & Maintenance and Digital Solutions. In the Talent Corner, the company's HR team will provide details of career options and professional prospects at Knorr-Bremse. InnoTrans is happening on September 24-27, 2024, in Berlin.

www.knorr-bremse.com

PANDROL TO UNVEIL INNOVATION IN TRACK WELDING AT INNOTRANS

Pandrol is set to unveil its revolutionary i+weld product range at InnoTrans later this month, promising to transform the process of track welding with greater levels of precision and efficiency.

The worldwide innovation will be on show for the first time in Berlin as a panel of Pandrol leaders, headed up by CEO Nicolas Groult, launch their new state-of-the-art technology through a series of expert demonstrations.

InnoTrans, regarded as the leading international trade fair for transport technology, takes place at the Berlin Exhibition Grounds between Tuesday, September 24 and Friday, September 27 and is expected to host close to 3,000 exhibitors from more than 50 countries.

The i+weld product range Is a new welding solution which relies on automation and data to improve the overall operational experience and promises to completely transform the aluminothermic welding process, increasing productivity by 40% through improved reliability and ergonomics

Nicolas Demond, Head of Pandrol's Centre of Engineering, said: "We are very excited to launch the i+weld solution at InnoTrans this month. It is a worldwide innovation which will vastly improve the levels of welding precision and efficiency. Pandrol has always been at the forefront of rail infrastructure technology and we pride ourselves in having delivered truly pioneering solutions which are used right across the industry. The new i+weld is the very future of welding and promises to make a significant and hugely positive impact on the way in which engineers around the globe weld our tracks."

Defining the industry standard for rail fastening systems and aluminothermic welding, Pandrol has created rail infrastructure in more than 100 countries. Its capabilities extend to manufacturing castings and plastics, track electrification, and creating equipment for track construction, fastening installation, and welding.

www.pandrol.com

HITACHI RAIL SUPPORTS DUAL-TRACK EXPANSION IN SLOVENIA WITH MODERN RAIL SIGNALLING

Solution will improve rail traffic on Slovenia's primary railway network and strengthen freight traffic towards Hungary.

Hitachi Rail has, with its Slovenian long-term partner GH Holding, d.o.o. Ljubljana, been awarded a contract to enhance capacity on a key line on Slovenia's rail network with its modern, digital signalling solutions. By installing its European Train Control System (ETCS) Level 1 trackside solution on an additional 27 km stretch of line, and updating the existing electronic interlocking system and the Centralized Traffic Control (CTC), a greater number of trains will be able to run safely on the new dual line.

The existing 50 km line between Koper and Divača is a crucial part of Slovenia's primary railway network, linking Koper's port in the west with Hungary in the east as part of the railway Corridor D. As Koper port is a vital hub, particularly for the automotive industry towards Hungary, upgrading the route from a single to a double track will greatly enhance the line's capacity, significantly increasing the share of freight transport by rail. Passengers will also benefit from more reliable and frequent train services, enhancing their overall experience.

Hitachi Rail has already equipped the existing single-track line between Koper and Divača with ETCS Level 1 trackside solutions, electronic interlocking solutions including a CTC and a modern dispatching system, called ARAMIS Module D, with the project completed in 2015. In collaboration with its longstanding local construction partner, GH Holding, d.o.o. Ljubljana, Hitachi Rail will now work on upgrading the line's rail signalling on behalf of project development company 2TDK d.o.o.

Hitachi Rail has a history of pioneering digital signalling in Slovenia, being the first to implement ETCS in the country in 2012. Across a series of projects, the entire Slovenian part of Corridor D, incorporating more than 300 km of track length, has been equipped with ETCS Level 1 trackside solutions by Hitachi Rail. The latest project, which is currently being finalised, also contains a service level agreement securing the high-quality maintenance of the installed system for up to 20 years. After completion of this project, ETCS Level 1 will be implemented on the complete Slovenian part of the European TEN-T rail network by Hitachi Rail in cooperation with GH Holding d.o.o Ljubljana. In addition to ETCS, Hitachi Rail's point machines, axle counters and signals enhance parts of the Slovenian rail infrastructure.

Hannes BOYER, VP Main Line Signalling, Hitachi Rail, said: "We are delighted to continue to contribute to the modernisation of Slovenia's primary rail routes. Our modern, digital signalling on the second track will help to eliminate bottlenecks on this essential rail connection, enhancing seamless and sustainable transportation for both passengers and freight."

On 24-27 September, Hitachi Rail will exhibit a range of its digital signalling solutions at the global rail exhibition, InnoTrans in Berlin.

www.hitachirail.com

TÜV SÜD SUPPORTS THE RAIL INDUSTRY IN DIGITALISATION AND SUSTAINABILITY

At InnoTrans 2024, TÜV SÜD Rail will present itself as a competent and experienced provider of testing, inspection and certification (TIC) services for the rail industry.

The advancement of digitalisation and automation can contribute significantly to making rail operations both safer and more efficient – and thus ultimately more competitive. One example of a technology fulfilling this purpose is the digital automatic coupling (DAC), which can fundamentally improve the efficiency of railway freight transport. At its Rolling Stock Test Center in Goerlitz, TÜV SÜD offers comprehensive testing of digital automatic couplings, covering the entire development process. In addition to this, virtual testing is taking on an increasingly important role for approval procedures. At InnoTrans, TÜV SÜD will present a WSP simulator that can be used to simulate dynamic WSP tests on stationary vehicles. This method facilitates test organisation, allows the WSP system to be adjusted while the vehicle is taken into service and ensures the reproducibility of tests and test results.

Defence Against Cyber-Attacks

However, digitalisation and the use of open interconnected systems also raises the risk of cyber-attacks, which compromise system availability and transport safety. Boasting extensive expertise in this area, TÜV SÜD supports manufacturers, service companies, system providers and operators with the relevant assessments, tests, and certifications. "We are thoroughly familiar with the relevant security standards, including IEC 62443 and TS 50701, and can verify whether they have been adequately implemented", explains Dr Webhofer. Providing their assessment and inspection services, the experts make major contributions to the identification of existing risks and determination of suitable defence mechanisms to ensure protection against cyber-attacks.

Alternative Drive and Traction Systems and Green on Track

In the area of sustainability TÜV SÜD helps manufacturers and operators to comply with increasingly strict regulatory requirements. The experts accompany the design and development of alternative drive and traction systems and have contributed with their experience to various landmark pilot projects for the development of hydrogen and battery-powered trains or hybrid train solutions.

With Green on Track, TÜV SÜD presents a concept for integrated sustainability assessment of rail systems. Providing a comparison of various manufacturers and operators, Green on Track additionally enables objective benchmarking for assessing sustainability performance and improving ESG assessments.

The major trend of digitalisation also extends to the urban-rail sector. Here, the TÜV SÜD experts accompany the development and implementation of communication-based train control systems (CBTC), for new systems as well as for the upgrade of existing systems. In doing so, they draw on more than 20 years of experience in the support of automated metro rail systems, including the introduction of driverless underground trains in Nuremberg, Germany, or Kuala Lumpur, Malaysia.

TÜV SÜD's presence at InnoTrans is rounded off by extensive initial and continued training services for rail employees, including Training Operations Manager (TOM), a new training enabling selected employees from transport companies to get qualified as operations managers for metro rail systems. Information about TOM and other initial and continued trainings from TÜV SÜD for the rail industry can be found at the TÜV SÜD stand at InnoTrans or on the Internet at: tuvsud.com/tom-programme.

www.tuvsud.com

TÜV SÜD

LIEBHERR

NATURALLY COOL: ECO-FRIENDLY HVAC SOLUTIONS FOR RAIL TRANSPORT

Liebherr-Transportation Systems has been working intensively to implement more climate-friendly alternatives to conventional refrigerants and to adapt heating, ventilation, and air-conditioning (HVAC) systems accordingly.

Liebherr-Transportation Systems has been working intensively to implement more climate-friendly alternatives compared to conventional refrigerants and to adapt heating, ventilation, and air-conditioning (HVAC) systems accordingly. © Adobe Stock

In recent years, the rail industry has made significant strides towards making mobility more environmentally friendly. Three technologies stand out in particular: the use of alternative refrigerants such as CO2 or propane, and Liebherr's proven air-cycle technology.

CO2: Energy-Efficient Cooling

What initially sounds contradictory is actually a climate-friendly alternative to conventional refrigerants: CO2, also known as R744. With a Global-Warming-Potential (GWP) of one, it not only has a very low greenhouse effect compared to conventional refrigerants, but it is also particularly energy-efficient in temperate climate zones and can heat very efficiently in heat pump operation. Moreover, the refrigerant is non-toxic and non-flammable. Since carbon dioxide occurs in large quantities in nature, it is cost-effective compared to synthetic refrigerants.

"With the start of serial production of HVAC systems using CO2 as a refrigerant in 2024, we have reached a major milestone on the road to more sustainable mobility," reports Reinhard Aigner, Coordinator of Research and Technology at Liebherr-Transportation Systems in Korneuburg (Austria). He has been intensively involved with air conditioning systems and how they can become more environmentally friendly for many years. "The manufactured HVAC systems will be delivered to Siemens Mobility through 2028. They are one of the first solutions of their kind in long-distance passenger transport to be used in regular operation in Europe."

Maximum Cooling Performance with Minimal Energy Consumption Thanks to Propane

Another major milestone for Liebherr is the start of serial production of propane-based HVAC units. The natural refrigerant, also known as R290, enables more sustainable cooling and, in terms of pressure, is very similar to the previously used refrigerant R134. With a GWP of three, it provides a low greenhouse potential as well as maximum cooling performance with minimal energy consumption. This system also guarantees rail vehicle operators a reliable product solution with low downtime. The corresponding technical concept, which takes all relevant safety requirements, such as the flammability of the refrigerant, into account, was developed in collaboration with TÜV Süd.

Liebherr is delivering the first propane-based HVAC systems to rail vehicle manufacturer Stadler Polska. They will be used in 20 electric FLIRT trains (Fast Light Intercity and Regional Train) and provide a sustainable and efficient solution in regional transport around Helsinki, Tampere, and Lahti (Finland).

Cooling with natural ambient air

A completely climate-friendly solution is Liebherr's air-cycle technology. The trick: it uses only natural ambient air for cooling – no refrigerant is needed.

"With air-cycle technology, ambient air is compressed, cooled, and expanded again to achieve the desired cooling effect," explains Reinhard Aigner. "Since the system consists of only a few components and the cooling circuit does not require pressure testing and evacuation after restoration, the air-based air conditioning system is simple and cost-effective to maintain. Additionally, the system is characterized by low operating costs and, due to efficient partial load control, low energy consumption."

Originally developed by Liebherr for the aviation industry, the air-cycle technology has been used for decades in aircraft air-condition systems. Given the significant advantages over conventional vapor cycle systems, Liebherr was one of the first companies to start using this technology in rail vehicles. The goals in both industries are the same: economy and passenger comfort.

www.liebherr.com

EXPERIENCE EAO'S WORLD OF HMI SOLUTIONS AT INNOTRANS 2024

As Expert Partner for Human Machine Interfaces we look forward to present our latest developments and solutions that go beyond mere HMI components.

EAO positions itself as a specialized HMI Solution supplier for railway applications – as our range includes complex HMI system which we support form project initiation to implementation with comprehensive advice and technical expertise. As an addition to our presentation as expert for HMI Systems and Solutions, we give insights into our inhouse competences in Industrial and UX-Design and our latest innovations.

EAO Exhibition Highlights

- HMI Systems for all railway applications
- New seat reservation system for an optimised passenger flow
- Charging solutions for integration in your train

Another highlight of our booth will be the theme of Swissness. We invite visitors to not only discover our World of HMI but also the fascinating mountain world of Switzerland!

Visit us at our exhibition booth in Hall 27, Stand 760 during this year's InnoTrans from 24th to 27th of September in Berlin.

www.eao.com

INNOTRANS 2024: OPTIMISED AND NEW IVU.SUITE PRODUCTS

IVU Traffic Technologies AG will present the latest developments in its IT systems for buses and trains at the leading international trade fair for transport technology.

From 24 to 27 September highlights presented in Hall 2.1, Booth 615 will include the integrated rail control centre and the web-based control centre for buses and trams, as well as solutions to overcome the shortage of skilled labour.

Digital workflow with the integrated rail control centre

The integrated rail control centre bundles all functions needed for reliable rail transport and enables an end-to-end digital workflow - from timetable planning and train path application to train dispatch and personnel allocation, as well as disruption management and consistent passenger information. As part of the complete IT solution IVU.rail, the integrated rail control centre supports the upcoming European TAF/TAP TSI standards, making it possible not just to order train paths from infrastructure operators at the planning and dispatching stages, but live during operation as well.

Modern and mobile: the new web-based control centre for buses and trams

The new web-based control centre for buses and trams provides an overview of all operating information at a glance and can be used on the move from anywhere. The modern one-screen view is intuitive to use and enables easy control of event-related processes. The integrated dashboard provides a comprehensive overview of the current operation and concentrates on the essential functions in the application.

Software for employee involvement in response to the shortage of skilled labour

The IVU software for personnel planning optimises the allocation of personnel to services, reports possible conflicts and takes requests, preferences, qualifications, and restrictions into account. This IT solution is complemented by the option of mobile working. The web app provides all important information and improves communication between the company and employees.

www.ivu.com

HUBER+SUHNER LAUNCHES RAILWAY ETHERNET SWITCH, OFFERS SECURE TURN-KEY RAIL COMMUNICATION SYSTEMS

The new RES10G switch has been specifically designed to connect all on-board Ethernet based devices for applications such as: passenger Wi-Fi, cellular/satellite uplinks and passenger information systems.

With the "Made in Germany" seal of quality, and compliance with the EN 50155 and EN 45545-2 standards, the solution ensures reliable, safe operations in harsh railway environments. RES10G provides up to six 10 Gigabit Ethernet ports, for connecting the train backbone via copper or fiber optic cabling, or high-end access points and computer resources. 24 Gigabit Ethernet ports are also used to support Power-over-Ethernet with the latest IEEE802.3bt standard, while the solution offers up to 90W per port to provide data and power to connected devices with a total overall power budget of 120W.

"With the launch of RES10G, HUBER+SUHNER can offer the market turn-key system solutions," said Joel Cummings, Head of Solution Engineering Railway at HUBER+SUHNER. "For our customers, this means they can now obtain components for such systems from a single manufacturer. This simplifies both the supply chain, the operation and the troubleshooting process."

RES10G has been created to work seamlessly with the latest products in the HUBER+SUHNER railway portfolio. This includes the SENCITY® Rail ACTIVE rooftop antenna used for train-to-ground communication and GNSS services, and SENCITY® Rail ACTIVE In-carriage antenna as a Wi-Fi access point.

RES10G uses the latest software-defined networking methods based on NETCONF and RESTCONF protocol. Also deploying network security features like RADIUS Authentication and Access Control Lists (ACL), RES10G ensures that customers' networks remain secure, reliable, and effectively managed.

The solution will be exhibited for the first time at InnoTrans in hall 2.2, booth 250, which will be held in Berlin from September 24-27.

www.hubersuhner.com

PARKER TO SHOWCASE INNOVATIVE SOLUTIONS FOR THE RAILWAY SECTOR AT INNOTRANS 2024

On track to a better tomorrow.

Parker Hannifin, the global leader in motion and control technologies, will present its solutions supporting the railway sector's contribution to a low-carbon future at InnoTrans 2024, the leading international trade fair for rail transport technology.

The expansion and modernization of rail systems are crucial to tackling pressing mobility and transportation challenges and keeping operators on track to a better tomorrow.

At the event, Parker will showcase a range of cutting-edge solutions, including hydrogen-compatible products like the O-Lok® H2 Fitting. This fitting offers enhanced pressure resistance up to 700 bar, ensuring superior safety against hydrogen permeation and explosive decompression — key considerations in the advancement of hydrogen-powered rail systems.

The company will also present the Parker Meggitt Sensorex range, featuring static and dynamic tilt sensors, accelerometers, and Inertial Measurement Units (IMUs). These components are critical for precision and safety in rail operations.

Visitors to Parker's booth at Hall 10.2, Stand 230, will have the opportunity to explore an extensive selection of components and solutions tailored specifically for the rail industry. Parker's team of experts will be on hand to discuss the applications and benefits of these innovative technologies.

www.parker.com

MASATS NEWS AT INNOTRANS

Masats will participate in the next edition of InnoTrans 2024, the international technology fair for the railway sector, which will take place in Berlin from 24 to 27 September.

Among the most outstanding solutions, Masats will show the Platform Door PSD 2.0 which presents as a novelty a new mechanism composed of two actuators capable of governing a double sliding door, each leaf independently allowing asymmetrical openings of the door. This innovation not only improves the flexibility of use, but also offers faster opening speeds thanks to the significant performance of the actuators, ideal for doors with a free passage of more than 2 meters.

Furthermore, the design of this mechanism optimises the LCC and is condition-based maintenance (CBM) oriented.

PSD 2.0 also includes an acoustic and light signalling system that makes it easier for users to identify the operational status of the gate, significantly improving safety at stations and reducing boarding times, thus optimizing passenger flow. Another novelty is the passenger video information system included in the module, which offers real-time monitoring of the system and is accessible via a tablet or mobile phone. In addition, its customizable structure allows the integration of auxiliary equipment such as fire extinguishers, defibrillators (AED) or intercoms, optimizing space on the platform.

Another product highlight will be the Compact Sliding Door 00Gb, designed for trains reaching speeds of up to 200 km/h. This system ensures fast operation and high availability, ideal for speed trains. Alongside this door, the RF3+ Ramp, a contactless access solution that detects the position of the platform and automatically deploys as a ramp, step or bridge plate according to operational needs, thus facilitating access for all users in a safe and efficient manner, will be on display.

All these innovations will be available at booth 360 in Hall 3.1 in Berlin.

With its participation in InnoTrans 2024, Masats reaffirms its commitment to innovation and the development of technological solutions that prioritize both safety and universal accessibility. In addition, the company will continue to present its new developments at upcoming international bus trade fairs, such as the FIAA in Madrid, the SITCE in Singapore and the Euro Bus Expo in Birmingham.

www.masats.es

DIRAK AT INNOTRANS 2024

DIRAK will be exhibiting at InnoTrans in Berlin. InnoTrans is the leading trade fair for transportation technology and we look forward to presenting our latest developments and introducing you to a new, innovative locking technology.

In addition to products from our proven standard range, we will be offering you an insight into our products from the field of mechatronic locking solutions. With our mechatronic products, you can manage access control even more effectively by precisely documenting and managing every access. In this way, you can strengthen security in particularly sensitive protection zones.
At InnoTrans, we will also be presenting an exciting and pioneering innovation with which we are setting new standards in the industry.

Meet us at InnoTrans!
If you would like to find out more about the new products and our extensive assortment, we look forward to welcoming you to hall 3.1, booth 740 from September 24 to 27 at InnoTrans in Berlin. Enter the world of latch, hinge and fastening technology and be inspired by our products.

www.dirak.com

HS2

BRITAIN GETS ITS NEW LONGEST RAIL BRIDGE IN MAJOR HS2 MILESTONE

The gently-curved 3.4 kilometre (2.1 mile) long structure on London's north-western edge will carry high speed trains running to and from the capital at speeds of up to 320km/h (200mph).

Contractors building a new viaduct for HS2 today made history as they lowered into place its final deck segment in an operation that crowns it as Britain's new longest rail bridge.

The gently-curved 3.4 kilometre (2.1 mile) long structure on London's north-western edge stretches across the Colne Valley near the M25 motorway and the village of Denham. It will carry high speed trains running to and from the capital at speeds of up to 320km/h (200mph).

The viaduct's completion means that the 3.3km Tay Bridge linking Fife and Dundee has finally ceded the crown of Britain's longest rail bridge to HS2, a record it held for almost 140 years, since 1887.

The Colne Valley viaduct's construction is being managed by the main works contractor Align JV – a team consisting of Bouygues Travaux Publics, Sir Robert McAlpine and VolkerFitzpatrick. It is one of 500 bridging structures on the HS2 project which also include footbridges, drainage culverts and innovative 'green bridges' for wildlife.

Building work on the viaduct's deck began in May 2022. Over the following 28 months a dedicated team of highly-skilled engineers used a massive launching girder to lower into place the bridge's 1,000 uniquely-shaped deck segments.

Edging forward from north to south and supported on the viaduct's 56 piers, the 160 metre long launcher used a balanced-cantilever method to lower deck segments into place to form half an arch either side of a pier before moving to the next pier to complete the arch span by repeating the process.

The 1,000 pre-cast segments are made on-site at a purpose-built factory. Each of the segments is uniquely shaped to enable the structure to curve as it carries the high speed line up to 10 metres above land and water across the Colne Valley.

Once the main civil engineering phase of construction ends, the factory and surrounding buildings will be removed and the whole area between the viaduct and HS2's 10-mile tunnel beneath the Chiltern Hills just to the north will be transformed into an area of chalk grassland and woodland as part of HS2's 'green corridor' project.

The viaduct's construction will next move into the rail systems installation phase as it progresses towards becoming an operational part of the new high speed railway between 2029 and 2033.

Once open HS2 will carry reliable, high-speed trains between London and Birmingham, significantly reducing journey times and freeing up space on the existing mainline for more local and freight services. Major construction work on the project is now at its peak, with more than 30,000 people employed, and the programme will soon start the transition to its next critical stage – the awarding of railway and track contracts as development of the working railway takes shape.

The milestone comes a week after the completion of HS2's first major viaduct, at Highfurlong Brook in Northamptonshire. Work is also progressing on the Delta Junction viaducts in the West Midlands and the elevated approaches to Curzon Street station.

www.hs2.com

PANASONIC ENERGY PRESENTS NEW NICKEL METAL HYDRIDE BATTERY SYSTEM FOR RAILWAY VEHICLES AT INNOTRANS FAIR

The new modular Ni-MH battery system is engineered to provide an auxiliary power supply for railway vehicles, offering a range of features that sets it apart from traditional systems.

Key features of the Ni-MH battery system include its compact and scalable design, allowing for flexible mounting on vehicles. This not only saves space but also contributes to improved efficiency and performance. Additionally, the system boasts a long lifespan, reducing the need for frequent replacements and minimizing downtime.

Maintenance-free and equipped with a remote monitoring function, the Ni-MH battery system enables easy diagnosis and monitoring, enhancing operational reliability and safety. Furthermore, it eliminates the need for electrolyte refilling, offering a hassle-free solution for railway operators. If desired, the system can also replace an existing battery system running on Nickel Cadmium batteries.

Speaking about the new Ni-MH battery system, Panasonic Energy Division Head Mr. Oliver Sonnemann expressed enthusiasm about the potential impact of the modular system. "We are proud to introduce our advanced Ni-MH battery system for railway vehicles at the Innotrans fair. This system highlights our dedication to developing sustainable and efficient solutions for the transportation industry. We believe it will enhance the performance, safety, and environmental footprint of railway operations."

Another advantage is that the new Ni-MH battery system is not classified as class 9 dangerous goods. This means that the transportation requirements are less stringent, which simplifies logistics and operational processes for railroad companies. Notably, the system does not contain environmentally hazardous substances such as lead (Pb) and cadmium (Cd), aligning with Panasonic Energy's commitment to sustainability and environmental responsibility.

www.industry.panasonic.eu

AI IN MOBILITY WITH NEXCOM AT INNOTRANS 2024

Located in Hall 4.1, Booth #310, NEXCOM will showcase its latest and diverse product lines in transportation solutions.

NEXCOM announced its participation at InnoTrans 2024, the world's leading trade fair for transport technology, taking place from September 24 to 27 in Berlin, Germany. Located in Hall 4.1, Booth #310, NEXCOM will showcase its latest and diverse product lines in transportation solutions, including cutting-edge railway computer products and Edge AI solutions designed for various applications.

The four highlights at InnoTrans include:

Railway Edge AI Live Demo Solution:
Experience an advanced AI 3D perception system that monitors environmental changes to predict potential track intrusions. Also featured are Driver's Assistant solutions with blind spot and obstacle detection using integrated IP cameras, developed in collaboration with ecosystem software partners. These technologies enhance public safety by providing early warnings of potential dangers directly through Edge AI devices. Expertise in designing IP67-rated, EN50155, and EN45545-2 rail-certified computers, combined with NVIDIA Jetson AGX Orin™ and Orin™ NX module, ensures high-performance solutions for railway applications.

The X Wall- The Future of Modular Rail Systems:
Unveil the potential of the rugged nROK 7271, featuring a modular design that allow for the easy addition and swapping of expansion modules without incurring extra certification or development costs. Options include a Wireless Network Module, 10GbE Network Module, PoE Port modules for video surveillance, and a Wide Range Power Module with 3-second protection against temporary voltage dips. Designed to meet the high-mix, low-volume, and critical demands of the rail market, this solution is set to revolutionize rail technology.

All on- Train Computing Solution:
NEXCOM has introduced a robust product line for rolling stock applications, featuring solutions for Passenger Infotainment Systems, passenger Wi-Fi, and high-speed data transmission for in-vehicle entertainment. The Driver Consoles integrate computing and touch screen interfaces for easy, intuitive operation. City Safety solutions include PoE ports with isolation for surveillance camera connections. Additionally, Compact Data Gateways support Wi-Fi 6 and 5G, with multiple expansion slots and SIMs to enhance bandwidth. Most demo products are powered by the latest Intel Atom® x7433RE Processors and 12th/13th Gen Intel® Core™ CPUs, ensuring high performance and reliability in demanding rail environments.

Rugged Computing Solution:
NEXCOM showcases a range of IP-rated products specifically designed for the most demanding outdoor environments, including the Intel platform-based VTC and nROK series, NVIDIA Jetson Orin ™-powered ATC series, and all-in-one 7" to 12" vehicle mount computers the VMC series. These rugged solutions are built to withstand harsh conditions such as extreme temperatures rain, and dust. Ideal for rail maintenance and other challenging outdoor scenarios.

www.nexcom.com

OUR TEAM AT ASC SENSORS LOOKS FORWARD TO AN INTENSE, EXCITING INNOTRANS EXPO FROM SEPTEMBER 24-27

As your competent partner to develop, produce and deliver inertial analog, digital and smart sensors of the highest accuracy, robustness and flexibility, we will tailor solutions to fit your exact needs.

Over the years, InnoTrans has become one of the world's largest, most influential trade fairs for railway transport and infrastructure technology. It takes place in Berlin, Germany, every other year.

Book Your Meeting with the ASC Team

At ASC Sensors, we love a good challenge. Give us yours! Come visit us at booth 691, hall 27 to discuss your requirements or any ideas you may have for innovative sensor technologies to propel your business.

Of course, you are welcome to stop by at any time. However, to ensure quality time with one of our experts to discuss your needs and answer any questions you may have, you can book your preferred slot in advance. Just send an email to indicating your preferred day, time and the general topic you wish to discuss, and we will come back to confirm your slot.

ASC RAIL Series to Increase Safety, Capacity and Productivity

ASC offers a flexible portfolio of capacitive accelerometers, gyroscopes, tilt sensors and IMUs for high-end testing and measurement, predictive maintenance and condition monitoring. Our sensor solutions can be customized to your specific requirements. They often form the basis for new, tailormade product and process innovations to strengthen the safety, capacity and productivity of railway systems around the globe.

At InnoTrans 2024, we will introduce our latest sensor innovations for the railway and rail infrastructure sectors, plus those of our partners JAE (Japan Aviation Electronics) and MMF (Metra Mess- und Frequenztechnik). These include the dedicated ASC RAIL series of extremely robust, flexible high-precision accelerometers and gyroscopes specifically configured and qualified according to EN 50155. They meet a broad range of relevant railway norms and industry standards in order to significantly reduce individual documentation requirements on the part of the operator.

See Us At Hall 27 | Booth 691

Renate Bay, CEO of ASC Sensors, said:

"To discuss these and other approaches to increasing your network's productivity and performance, come see us at our booth. Our team can't wait to get started on partnering with yours, to jointly create amazing new solutions that not only advance your business but the future of mobility overall."

www.asc-sensors.de

ACTIA EXPLAINS OPT FOR AUTOMATED SAFETY TRACKSIDE

ACTIA's SAFeasy Portable Radio Warning Device (DAPR) promises to transform rail safety. Approved by SNCF for the French railway network, this innovative system features an automatic release function, improving the safety and efficiency of work sites.

The ACTIA SAFeasy system stands out due to its many advanced functions and major technical features. As a solution authorised by SNCF for the French rail network, it marks a significant step forward in safety management on track work sites. One of its technical achievements is its ability to cover a very long distance, over one kilometre, making it an outstanding solution in this field. The DAPR also incorporates a high level of automation, with a warning system that automatically releases the work area when train traffic leaves it. It also offers a warning solution with alarms onboard the train, optimising mobile work sites by enabling safety warnings to be transmitted as the work site progresses. This means that workers can concentrate on their tasks without having to worry about manually managing safety warnings. It reduces the risk of human error and boosts operational efficiency to ensure maximum safety for everyone on the site.

Improving safety and optimising human resources with an automated solution

Adopting an automated system is a significant step towards greater safety on track work sites. This highly reliable automated system reduces the human resources required to manage the system, which in turn reduces exposure to danger and human error when detecting trains. Additionally, the continuity of uninterrupted operations that automation offers is essential to maintain high safety standards. By reducing the risk of occupational accidents and human error, the DAPR helps create a safer working environment, while freeing up teams to implement more flexible and available safety solutions, thus improving overall productivity.

The advantages of leasing

ACTIA offers a comprehensive installation, leasing and training service for its trackside safety solutions. In particular, ACTIA's leasing offer, which ranges from one week to several months, often turns out to be essential in order to adapt according to the flexibility required for various types of track work sites. When work sites are delayed or overloaded with work, leasing equipment becomes a practical and efficient solution. In this case, ACTIA guarantees the availability of spare parts and an ongoing support service, with radio expertise and high-quality equipment. Preventive maintenance is carried out on the equipment every two years to ensure that the system operates in optimal conditions, enhancing reliability and safety.

www.actia.com

ALSTOM

ALSTOM AT INNOTRANS 2024

Between 24-27 September, Team Alstom will be delighted to welcome you to our stand 450 in Hall 3.2 in Berlin, Germany and on tracks 5/40 and 5/45 in the outdoor display.

We will take you on an immersive journey to discover how we work tirelessly to achieve three things that underpin the mobility of the future: decarbonising rail solutions throughout their entire lifecycle, driving technology forward to extract maximal performance out of rail systems, and ensuring rail passengers love their travel experience, beginning to end.

We will be exemplifying all these themes with a highlight of the most advanced high speed train in existence: the Avelia Horizon.

Decarbonising Rail Lifecycle
Alstom continues to lead the way towards net-zero mobility worldwide. We will bring the market up to date on our unrivalled experience in green traction technologies – a subject familiar to InnoTrans audiences since 2016! But the quest for net-zero mobility does not stop there. This year we will be widening the scope to demonstrate our leadership in the decarbonisation of the entire lifecycle of railway solutions. For Alstom, it is an approach that is fundamental to the preservation of our precious environment, as well as an enabler for our customers to achieve their sustainability targets.

Maximising System Performance
We will offer insight into the impressive array of technologies and solutions that allow our railway systems to consistently push the limits of performance today, while defining the ambitions of transport for tomorrow. Driverless rail, passenger flow modelling, predictive maintenance, data-led operations – to name just a few. And the way it is powered by expertise in the fields of AI, machine learning, big data and cybersecurity. For our customers, all this adds up to future-proofed, resilient, reliable and efficient transport systems. And for passengers, it adds up to an outstanding journey!

Elevating Passenger Experience
Speaking of passengers, Alstom always has their experience front of mind. After all, we are passengers too! At InnoTrans we will cast light on the art of designing complete travel experiences. Visitors in Berlin will quite literally be immersed in a word of experiential innovation – a sensory, tactile, sonic discovery of how passenger experience is more than the sum of its parts. We think about the interplay of lighting, movement, materials, colours, information, connectivity and much, much more so that passengers don't have to. They just enjoy it. We all know rail is the cleanest, greenest form of transport, by far. Our mission is to ensure people choose our sustainable solutions over cars or planes whenever possible.

Defining the future of high-speed: Avelia Horizon
And while we're on the subject of unique experiences… We are also preparing something special that shows how Alstom's ambitions in sustainability, in performance and in passenger experience are now embodied in one extraordinary (and very fast) train. How 40 years of know-how, since Alstom created the first TGV, have led to this moment, to this product, that will change the landscape of very high speed rail travel – way beyond the horizon.

Outdoor display
Come and visit our Coradia Max regional train at Track 5/40 for Landesnahverkehrsgesellschaft Niedersachsen mbH (LNVG), Germany. With its highly modular concept combining single-deck and double-deck architecture, the high-performance regional train addresses the high-capacity double-deck market with cost-efficient operation.

Ranging from 3 to 6 car trains, customers can add or remove cars as required for maximised capacity, with a design optimised for a comfortable passenger experience.

You'll also have the chance to see our Flexity™ tram for Berliner Verkehrsbetriebe (BVG) - the longest tram ever in Berlin - at Track 5/45! This bright and spacious tram is a response to the rising capacity needs in Berlin. Designed for sustainability, featuring reduced energy consumption and noise pollution, its innovative design also ensures great passenger comfort and accessibility.

To ensure safety in the city of Berlin, the trams are equipped with the unique ODAS obstacle detection system, that prevents collisions and accidents.

www.alstom.com

Nicolas Bony
Ipmediaonline

SCHAEFFLER

SCHAEFFLER PRESENTS TECHNOLOGIES AND SERVICES FOR MAXIMUM RELIABILITY, SUSTAINABILITY AND AVAILABILITY IN RAIL TRANSPORTATION

Schaeffler at the InnoTrans 2024 trade fair in Berlin, Germany: From September 24 to 27, 2024, where will be showcasing product solutions for railway industry.

Reliable and robust products – as exemplified by Schaeffler's TAROL axlebox bearings, one of Schaeffler's main exhibits at InnoTrans 2024 – are crucial for ensuring maximum uptime and efficiency in rail transportation. Renowned for their long service life and significantly extended maintenance intervals, these exceptionally low-friction bearings are suitable for passenger trains, high-speed trains, freight and heavy goods transport, as well as locomotives, subway trains and streetcars.

Schaeffler manufactures its TAROL axlebox bearings on an application-oriented basis according to customer-specific design requirements. This includes, for example, adapting bearing dimensions and materials to the required payload and mileage. Special friction-optimized seals are available for freight transport locomotives (Class GG), while variants are also offered for heavy goods traffic (Class K), ensuring energy-efficient as well as safe operation. Schaeffler's TAROL axlebox bearings and their components are qualified according to the AAR (Association of American Railroads) standard as well as the European EN 12080 standard, making them suitable for use in regions including the U.S., Australia, India and Southeast Asia.

Data-based condition monitoring enables predictive maintenance

Schaeffler's Data Matrix Code (DMC) serves as the starting point for the digital supply chain of its products by identifying components with a unique laser marking. This allows for the continuous recording of product and operating data as well as maintenance information, thereby creating a digital twin for condition monitoring and predictive planning of maintenance intervals.

At the same time, the DMC serves as the digital reference for data exchange between Schaeffler, OEM suppliers and railway operators. By alternately linking databases, condition monitoring systems can be set up to access data from existing fixed systems (wayside monitoring devices). At InnoTrans 2024, Schaeffler is presenting an entry-level model based on a feasibility study conducted in Switzerland. Schaeffler will also showcase vehicle-based railway condition monitoring systems (RCMS), which further increase rail traffic safety.

Remanufacturing for more economical and sustainable rail operations

The closed-loop system is a key approach to sustainable management in rail transportation. To that end, Schaeffler has developed an extremely successful remanufacturing service for bearings that can achieve up to 95 percent resource savings, depending on the extent of reconditioning required. At the same time, Schaeffler offers the same quality and safety standards with its 100 percent return service, and the remanufactured bearings include the same warranty as new products. As a full member of the "Railsponsible" initiative, Schaeffler reaffirms its commitment to greater sustainability in the railway industry.

In another first, Schaeffler will also have its Smart Maintenance Tools (formerly known as Bega Special Tools) on display at InnoTrans. This addition completes Schaeffler's portfolio, providing a comprehensive approach that ranges from sustainable products and services to reconditioning and maintenance.

www.schaeffler.com

SINTRONES TO SHOWCASE AI-POWERED MOBILITY SOLUTIONS AT INNOTRANS 2024

SINTRONES announced its participation in InnoTrans 2024, the leading international trade fair for transport technology, in Berlin from September 24th to 27th.

At InnoTrans, SINTRONES will unveil its latest advancements in AI-powered mobility. This groundbreaking collaboration showcases SINTRONES' commitment to shaping the future of intelligent transportation ecosystems.

Key Highlights:

- Station Carriage Information & Smart Signage System: Secure your spot for an exclusive AI Tour at SINTRONES' booth to gain expert insights into the latest AI trends and applications in mobility.
- Intelligent Transportation Computers: Explore SINTRONES' new series of AI-powered computers designed to enhance safety, efficiency, and sustainability in transportation systems.
- Captivating Color ePaper Billboards: Embrace the future of displays with EPD.
- Live Demonstrations: Witness cutting-edge AI solutions in action, including:

– Edge AI Fanless Computer Powered by NVIDIA Jetson Platform

– NVIDIA RTX Embedded GPU Accelerated Edge AI Platform with Intel Processor

– Dangerous Goods & Weapons Intelligent Detection & Warning System

– License Plate Recognition & Traffic Flow Detection System

"We invite all attendees to visit our booth and discover how SINTRONES is leveraging AI to drive the next generation of mobility solutions. Secure your spot for an AI Tour today and witness firsthand the future of intelligent transportation." said Yiying Wu, SINTRONES' Sales Manager.

SINTRONES Event Page

InnoTrans 2024 official page

www.sintrones.com

INTREXIS AT THE INNOTRANS

Cold, hot, moist, varying input voltage, load jumps, vibrations and much more: intreXis power supplies are designed for demanding rail requirements and they fulfil those requirements with reserves for more than 20 years. Guarantee.

1000 Watt DC/DC Converter – ultra-compact, no derating, high efficiency: >96% at 110 Vin are the remarkable key values of the latest DC/DC Converter from the leading intreXis DC/DC Converter Series for Bordnet Voltage Applications.

USB-C Chargers latest generation with Power Delivery (PD) for fast, powerful charging of mobile devices in the driver's cab and passenger compartment.

AC/DC Converters for rail vehicle areas with existing AC voltage or for applications in which battery voltage power is limited and reserve power is available from the auxiliary converter.

We look forward to your visit, during which we'll exchange ideas and concepts and hear about your specific requirements.

Find intreXis in Hall 17, Booth 165

www.intrexis.ch

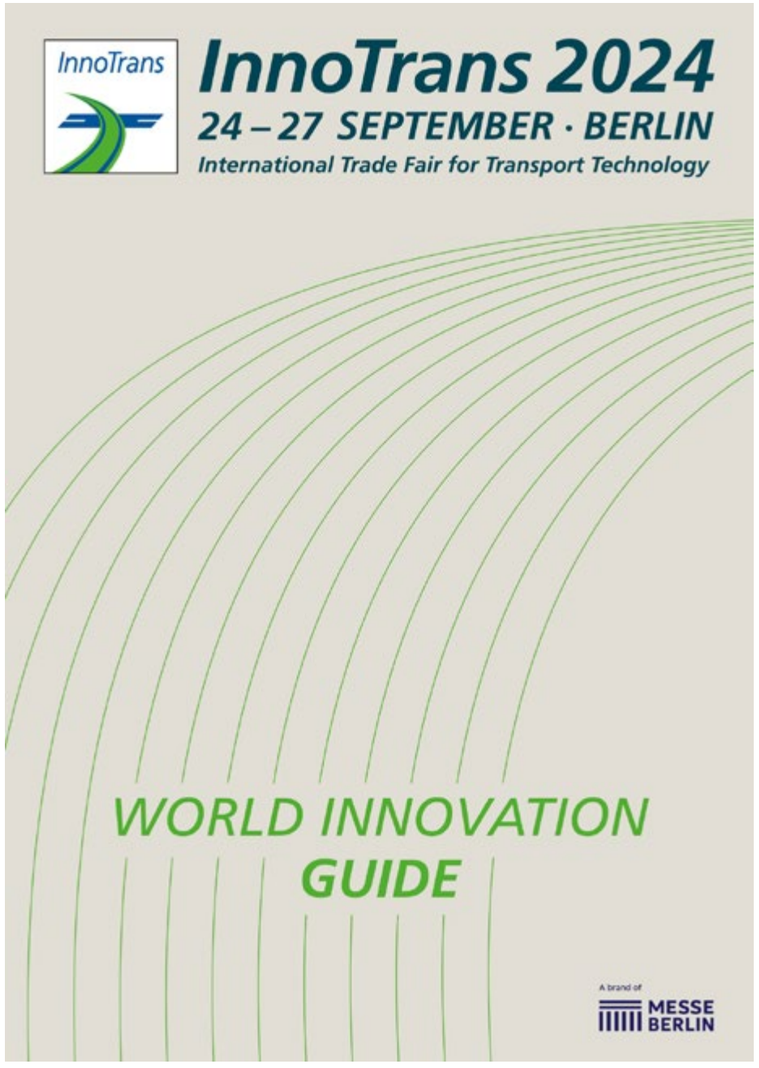
EXPERIENCE THE FUTURE OF MOBILITY LIVE – INNOTRANS 2024 PRESENTS RAIL TRANSPORT INNOVATIONS

From 24 to 27 September at InnoTrans the Berlin Exhibition Grounds will be the global platform for innovations in rail transport and mobility.

This year, occupying an area of 200,000 m² in 42 halls and on the outdoor display and bus display, over 2,900 exhibitors from 59 countries are displaying their latest products and innovations.

Rail track and outdoor display with over 110 vehicles

The heartbeat of InnoTrans is the rail track and outdoor display featuring over 110 passenger and goods vehicles. Exhibits including high-speed trains, regional trains, trams, hybrid locomotives and rail maintenance vehicles will be lined up on the 3,500 metres of rail track, where trade visitors can get a close-up view of the systems directly next to the exhibition halls.



- Over 110 vehicles on the rail track and outdoor display
- Around 220 world innovations in every trade fair segment
- World innovation tours

Among the exhibitors is Siemens Mobility with a total of five vehicles, including its high-speed Velaro train for the Egyptian market (Outdoor Display T7/40). The train was developed for extreme weather conditions and combines relevant design features with premium passenger comfort. Other highlights include the Mireo Smart (T6/40) regional train, designed for a changing transport landscape and growing demand for rail mobility.

Alstom is displaying its Coradia Max™ regional train for Landesnahverkehrsgesellschaft Niedersachsen mbH (LNVG), which combines a single and double-decker design. The company is also presenting its Flexity™ tram for the Berlin public transport company BVG (T5/40). This is the city's longest tram, with standout features including ample passenger room, sustainability and innovative safety systems such as ODAS.

This year, Stadler is presenting eight vehicle concepts. At InnoTrans the company is displaying its RS ZERO to the public for the first time (T9/40). With the RS ZERO, zero-emissions travel using fuel-cell or battery-electric power is possible on branch lines. With its CITYLINK for Saarbahn, the company is exhibiting an urban transport option that simultaneously functions as a train and tram, and can service a city and its surrounding region with no further connecting transport (T9/45).

Other exhibits on the rail track area include Hitachi Rail's high-speed ETR1000 (T1/40), which is compatible with various European electric supply systems. CRRC is displaying CINOVA, a highly energy-efficient regional train (T2/40). Hyundai Rotem is presenting its new fuel cell-powered tram (T2/19), which features low noise, high energy efficiency and rapid refuelling.

Vossloh Rolling Stock is taking part with a demonstrator version of its Modula BFC, a hybrid fuel cell-powered freight locomotive (T2/34). Embodying a flexible, sustainable transport solution, the Modula platform uses a combination of drive systems to efficiently transport freight on different lines.

Among the innovations on display by Tatravagónka a.s. is its six-axle intermodal Sdggmrss featuring two integrated pockets, designed primarily for transporting and loading/unloading non-craneable saddle trailers up to 40 t in weight (T4/60).

DB Bahnbaugruppe and DB Engineering & Consulting are presenting their 360° multi-sensor platform (MSP), which represents a major contribution to digitalising rail infrastructure (T11/40). The MSP combines the use of various sensors and measurement systems on a single rail maintenance vehicle. The Mobile Mapping System, comprising GNSS and a laser scanner, produces a 3D image of the ground. A camera captures a 360° image of the surroundings, while an optional georadar inspects the underside of the rails. The 360° MSP is the result of a joint venture by DB Bahnbau Gruppe and DB Engineering & Consulting (DB E&C).

Around 220 world innovations at InnoTrans

At the 14th leading international trade fair for transport technology, exhibitors are presenting around 220 world innovations in the Railway Technology, Railway Infrastructure, Public Transport, Interiors and Tunnel Construction segments. Products and services include battery-electric and fuel cell-powered locomotives, barrier-free access to mainline trains, MCX-enabled vehicle-to-ground communications, AI-based algorithms for creating timetables, as well as graffiti-resistant film for windows.

World Innovation Guide und World Innovation Tours

The InnoTrans website has an overview of the world innovations submitted by exhibitors here. These brief descriptions of products and services will be updated on a regular basis, and a compilation of all the entries will be available as a PDF on 16 September.

World innovations are identifiable by the World Innovation button, which appears on exhibitors' stands, hall plans, in the InnoTrans app and online on InnoTrans Plus.

At InnoTrans, visitors can take part in World Innovation Tours. These guided tours stop at the stands of exhibitors who are presenting world innovations at InnoTrans. All tours are free of charge, last around 90 minutes, take place several times a day and are held in German and English.

www.innotrans.com

INNOTRANS

PANASONIC PRESENTS A COMPLETE PLATFORM DOOR SYSTEM FOR THE FIRST TIME IN EUROPE AT INNOTRANS 2024

At InnoTrans 2024 in Berlin from 24 to 27 September 2024, Panasonic Industry will present a complete platform door system in full height including control panel for the first time in Europe in Hall 7.1B, Booth 370.

The platform door system offers passenger call buttons with "on-demand" function that improve platform temperature control and enable communication with train signaling systems. This can reduce energy consumption at stations, especially during off-peak hours or at night.

Panasonic Industry will also introduce a new intelligent operation and maintenance system for efficient maintenance and repair of the platform door system. The key components are defined as monitoring objects and the platform screen door components are networked in all stations to form an information service center. This makes it possible to locate and report faults in real time, and to provide recommendations for maintenance and repair.

In addition, the system is connected to the spare parts database and the maintenance personnel management system. Maintenance personnel can also use AR glasses and other smart devices to visualize errors and provide expert solutions for remote troubleshooting.

industry.panasonic.eu

HIGH-TECH HYBRID VEHICLE PRESENTED AT INNOTRANS

The railway of tomorrow needs an efficient infrastructure network. In the case of ÖBB, the goal is to double capacity in Austria by 2040. Maintenance also has to keep pace and needs new concepts to meet that goal.

To that end, ÖBB and Plasser & Theurer presented the Plasser CatenaryCrafter 15.4 E³ – a representative of a new green fleet of 56 maintenance vehicles – at InnoTrans on 24 September 2024.

In times of extreme weather conditions, immediate fault rectification is particularly important. In addition to old lines – such as the Semmering mountain pass, with tight curve radii as well as many bridges and viaducts – it is also necessary to manage new lines and tunnel lengths that were previously unthinkable.

Generational change for more sustainability and efficiency

The new high-tech hybrid vehicles with electric propulsion are replacing diesel-powered predecessors that are being retired after 40 years of reliable service. ÖBB and Plasser & Theurer have had a partnership pertaining to track construction and maintenance vehicles for decades. Once again, however, the Austrian manufacturer was able to score points for its pioneering role in alternative propulsion systems. Track maintenance machines with the abbreviation "E³", which refers to the hybrid drivetrain, have been around for ten years. E³ products have also been exhibited several times at InnoTrans. In 2022, Andreas Matthä and Johannes Max-Theurer presented the new green fleet before videos and a model. Today, the Plasser CatenaryCrafter 15.4 E³ appears on the InnoTrans outdoor track. As a zero-emission, high-performance maintenance vehicle, it runs at 120 km/h to the construction site using electricity from the overhead contact line. Once it's there, it works with electricity from batteries, as the overhead line has to be deactivated during installation or maintenance.

After extensive test drives as part of the authorization process and initial trial work, employees are impressed by the particularly quiet propulsion technology. Those living in surrounding areas will also be grateful.

Modular design lowers training and maintenance costs

ÖBB currently uses 12 different vehicle types. The new fleet will be reduced to three vehicles plus an additional driving trailer. Types 1 and 2 on display are both Plasser CatenaryCrafters, optimized for overhead line installation and maintenance. Another version is the Plasser MultiCrafter for general work on the superstructure. All three types are identical in their basic structure. This can reduce the costs of maintenance and spare parts. It also facilitates training for ÖBB teams. A "train the trainer" programme was initially launched to that end for the ÖBB instructors, who then went on to train the drivers.

In this sense, the new tools on Austria's railway tracks not only offer a green solution, but also a future-proof working environment.

www.plassertheurer.com

PLASSER THEURER

ADDED VALUE IN THE LONG TERM FOR THE WORLD'S RAILWAYS

The 14th edition of InnoTrans, the world's leading trade fair for transport technology, will take place in Berlin from 24 to 27 September 2024.

Plasser & Theurer will once again be among the exhibitors in the railway infrastructure sector. In line with the slogan "future track technology – NOW", the company will present innovations that offer added value in the long term for the world's railways.

How can we react to the challenges posed by climate change as quickly as possible and in a sustainable way? How can the cost-effectiveness of track construction and maintenance continue to increase? And how can the shortage of skilled staff be addressed? These are three key questions of railways. As a technology leader in track construction, Plasser & Theurer feels obligated to answer these questions for the railway sector. There are solutions which mean long-term added value for both railways and railway construction companies.

Plasser & Theurer believes in the railway and sees itself as part of this system. There is no other transport system which is safer, more sustainable, and more economical. Only the railway is able to harmonize increasing mobility needs with the challenges of climate change. This is why the Austrian family-owned company is driven to create added value which continues to enhance the performance of this system.

Yellow machines GO GREEN

The first E3 machines, put into service in 2015, are emblematic of the paradigm shift in the track maintenance industry. These hybrid machines made emission-reduced travel and work possible for the first time. The remaining amount of hydraulic oil required went down drastically. It is only needed now for a few work sequences with high power requirements, such as lifting and lining the track. Furthermore, hybrid drive systems also have an impact on operating costs. When compared to diesel-hydraulic machines, hybrid machines save 40% of operating costs over a period of 20 years of operation.

The experience gained in the past years allows Plasser & Theurer to offer E3 tamping machines as well as E3 machines for overhead contact line installation as a permanent part of its product range. The fact that E3 machines already account for approximately 20% of the current contract volume shows how much the company is catering to the market.

Better availability of permanent way thanks to new offers for infrastructure

In March 2023, a single track inspection vehicle by Plasser & Theurer was able to measure 61 turnouts in St. Pölten, Austria in one night. It only took four minutes per turnout. This demonstrates the amount of expertise the company has acquired after building over 200 track inspection vehicles. Furthermore, it also shows the potential which arises from the digitalization of track maintenance processes.

Another example is the Plasser TampingAssistant, which automatically positions, configures, and controls tamping units with the help of AI. Operators only need to confirm the system suggestions and monitor the process. The system allows even inexperienced operators to deliver high-quality tamping results. In addition, Plasser TampingControl provides data on the quality of the superstructure and tamping process in real time. It optimizes the filling and compaction process in a groundbreaking way. Finally, the Plasser TampingReport provides digital documentation of the entire process, i.e. transparent proof of the work result.

Sustainable strategies for a lack of skilled staff

The lack of skilled staff poses a major challenge to railways. Plasser & Theurer offers several solutions. One of them is to create even more attractive workspaces on the machines. The best example of that is the E3 machines, with their comfortably furnished crew areas and cabs featuring digital controls which make work simpler and more comfortable. Another approach is to automate processes, making it easier to complete tasks with less staff in the first place. The Plasser TampingAssistant shows how this can be achieved on tamping machines. In addition, Plasser & Theurer offers simulators which allow new operators and career changers to practise operating the machines in a secure environment with supervision from experienced instructors. Doing so reduces training time and allows staff to begin working quicker. The simulators available range from tamping-machine simulators to those for ballast distributing and profiling machines and ballast cleaning machines. The company offers track inspection vehicles, such as the EM100VT or the EM120VT, as a third option: nowadays they make it possible to complete measuring tasks for infrastructure much faster and with less staff.

Focus on global needs

As a company with global reach, it is Plasser & Theurer's goal to supply the right track maintenance machine for all of the world's regions. Although the underlying working principles are similar, specific requirements often differ significantly from country to country.

To be able to meet these requirements, the company's Compact portfolio offers compact machines in the Plasser & Theurer quality standard. It covers the entire spectrum of track maintenance, from tamping and stabilization to profile finishing. Thanks to network configurations for everything from narrow to broad track gauge or for tight vehicle gauges and low axle loads, these vehicles can be used in practically any region around the world. Special designs are also available, for example, for local public transport. These machines are high in demand. It was only in 2023 that the track maintenance machine manufacturer was awarded the contract to supply 41 machines for renewing the fleet of the Taiwan Railways Corporation.

A partner you can count on over the entire life cycle of the machines

Around half of all 17,800 machines built are still in operation. This highlights the quality of manufacturing and is also a quality indicator for Plasser & Theurer's global services. The Customer Services division is in charge of these services, which have been winning over customers over the entire life cycle of the machines. Maintenance services for individual machines and entire fleets are highly sought out, as are retrofits: major refurbishments are used to perform technical upgrades at the same time. The latest service is for used machines which includes purchasing used machines and making them fit for new applications before reselling them. This option is ideal for companies that are new to the track maintenance business, allowing them to benefit from time-tested quality.

With innovative ideas such as these services and, of course, with a complete selection of new, future-oriented technologies, Plasser & Theurer is contributing to tackling the challenges of our time. And it helps to make the world's railways even safer, more sustainable, and more cost-effective.

Take time for your visit to InnoTrans and meet us in Hall 26 (Stand 270) and on the outdoor display south (T2/50 + 55, T3/50).

www.plassertheurer.com