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 **THE BRAZILIAN MANUFACTURER RANDON** HAS BUILT A 500M LONG COMBINED WELDING, PAINTING AND ASSEMBLY LINE FOR TRAILERS AND RAILWAY WAGONS IN THE STATE OF SÃO PAULO. > page 7

 **THE CHINESE BAOYE GROUP** INVESTED IN ANOTHER PRECAST CONCRETE PLANT IN QUZHOU. BAOYE WILL PRODUCE DOUBLE WALLS AND FLOOR SLABS OF UP TO 700,000 SQUARE METERS PER YEAR FOR MEGA-RESIDENTIAL PROJECTS. > page 8

Tacoma



INTRALOGISTICS SYSTEMS

WHAT A FACADE!

James Hardie, a pioneer in fiber cement, is breaking the mold in the US with a new fully automated production line for facade siding. The integrated concept of heavy-duty xpert Vollert includes in-plant transport, an air-conditioned, 100 m long high-bay warehouse, transfer tables, manipulators and automatically clocked autoclave trains.

X Fiber cement is durable. It is a premium high performance building board used in exterior cladding or as interior underlayment. The technology was further developed in the mid-1980s by the Australian building materials manufacturer James Hardie. Today – 8 million homes later – the name is a byword for high quality construction and high-quality design in the field of facade siding. In the United States, these fiber-cement panels in wood design give many houses the typical American country house look.

In 2017 James Hardie arranged the expansion of their production facility in Tacoma near Seattle due to steadily growing demand – with double know-how from Germany. Another mechanical engineer vendor supplied the systems for the fiber composite board production, and together with Vollert, James Hardie took a strategic move towards the automation of the intralogistics processes. “All internal distances from the production line to shipping are fully automated. This is a novelty for the manufacturer, because up to now all workstations were manually connected by forklift,” Lars Strobel, responsible Sales Project Manager at Vollert explains. The advantages of a high degree of automation are obvious. Faster, precisely clocked processes, less floor space requirements and a clear increase in safety when moving the products were factors that convinced the building materials manufacturer to undertake this step. Vollert developed a sophisticated intralogistics concept that also integrates the control of the processes besides the fully automated high-bay warehouse, transfer tables, manipulators and five wire rope systems.

cement and cellulose fibers are mixed with water, pressed into slabs and stacked while damp. The packs of slab are then moved via roller conveyors to the stacker crane for storage in the high-bay warehouse. The air-conditioned environment delivers a constant temperature and humidity which allow to precisely control the pre-drying processes. The double-row warehouse has 160 storage bins. The raw slabs are stored there for several hours to cure before they are further processed. “James Hardie puts great stress on ease of maintenance and easy access to all parts of the plant for their staff,” says Jens Tangel, Technical Project Manager at Vollert. “That’s why, for example, the stacker crane can drive out of the high-bay climate chamber completely for maintenance. Otherwise the job would make the technicians sweat quite a bit.”



TRAINS UNDER PRESSURE AND STEAM

The final strength of the fiber-cement boards is obtained in high-pressure furnaces, so-called autoclaves. The slab packs are moved on trains into these long steel tubes. By means of the ground conveyor system and transfer tables, the packs are first moved from the high-bay warehouse into the autoclave area. A number of high-pressure furnaces are arranged in parallel. Upstream is a track system for loading and unloading the transport trains. The Vollert manipulator is arranged over the tracks so that it can operate all tracks fully automatically at a travel distance of approximately 30 m. One autoclave train can accommodate a number of packs, each 3.5 m long. The manipulator fetches and delivers a stack of slabs within each cycle. After that the Vollert wire rope systems automatically advances the cycle of the trains by one placement, so that the next unloading and loading position is ready for the manipulator. The manipulator needs only 40 minutes to load a train completely. Finally, the transport train runs entirely into the autoclave, which is then closed. The following exposure to heat and pressure accelerates the chemical reactions of the fiber-cement components, so that it cures. The finished boards are then cut according to specifications and painted during the next steps. “Our gripper on the manipulator is specially designed to place the stacks of slabs at an angle if needed, and to pick them up again. The upstream feeder technology can arrange the packs at an inclination, if desired.” explains Jens Tangel.

IN-BETWEEN WET AND DRY IS THE HIGH-BAY WAREHOUSE

The clearly noticeable core of the James Hardie system is a 13 m high and 100 m long high-bay warehouse located at the end of the pre-production line. It serves as a buffer and pre-drying chamber between the wet area (green sheet) and the autoclave plant, where the fiber cement boards are exposed to pressure and heat to attain final strength. During pre-production, sand,



**DEAR
READERS,**



In the current edition we report on interesting intralogistics projects from the USA and Latin America. We also discuss the different heavy-duty tasks our engineers and planners face every day. This includes transportation of shapely fiber cement panels for homes by James Hardie or Randon's assembly and paint line for mega trailers and wagons. We understand our customers' assignments and challenges, speak their language and develop solutions together through consultation. We are also building new concepts in terms of creating living space for the boom cities of the world. New earthquake-proof construction systems and the industrial prefabrication of concrete elements are already changing the face of China and the entire Asia. In this we recently built another precast concrete plant in Quzhou for the Baoye Group.

As leaders in technology, we have been synonymous with innovative shunting solutions, in the chemical industry, steelworks and refineries since the 1970s. They operate in extreme cold conditions in Siberia, in the most exhausting heat in the deserts of the world or defy the most unattractive dirt and dust conditions such as in the coal loading area at the Port of Hamburg. And often only for a limited time. An interesting alternative here is our new rental model, which is now available for the road-rail robot VLEX. More in this issue.

Enjoy reading this edition.

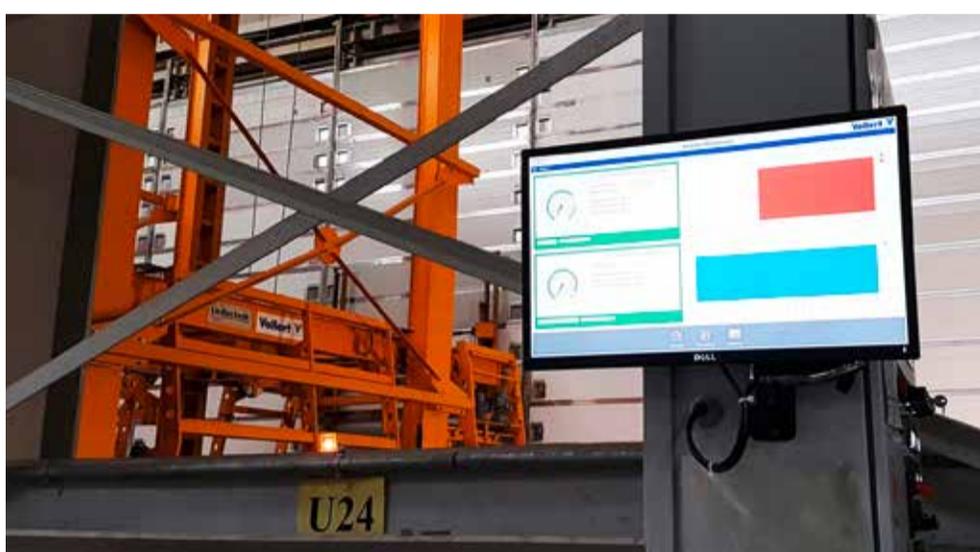
A handwritten signature in blue ink, which reads "Hans-Jörg Vollert". The signature is fluid and cursive.

*Yours
Hans-Jörg Vollert*

CLEAR & BRIEF

PRECAST CONCRETE PLANTS

PREDICTIVE MAINTENANCE FOR STORAGE MACHINES



 To optimize the service life of lifting cables for storage retrieval machines in precast plants, the annual cable change can be replaced by an individual change cycle. This is made possible by a counter, which records the hoisting cycles. A visualization tool indicates the approaching point when the ropes must be replaced from a defined value.

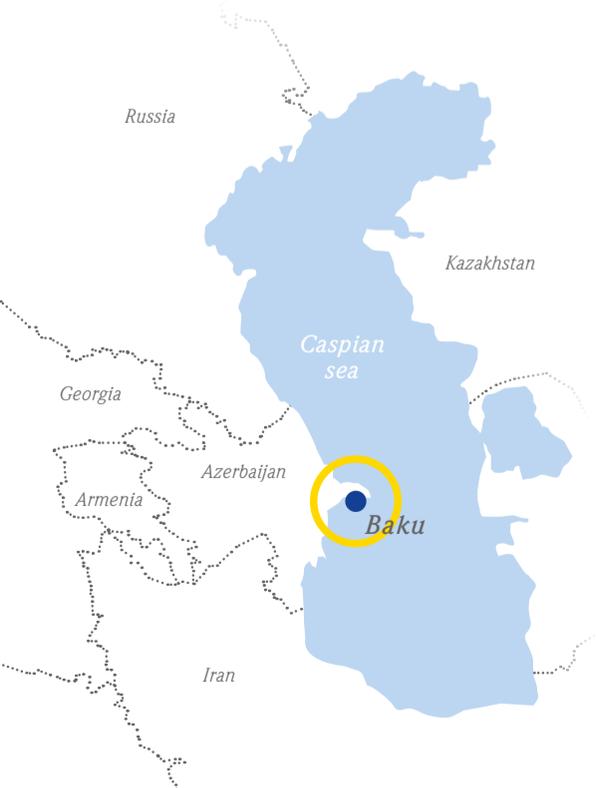
Find out more from our service experts at Vollert.

PRECAST CONCRETE PLANTS

VOLLERT RHEDA SYSTEM IN THE BAKU METRO TUNNEL



 Vollert engineers have relied on the tried-and-tested Rheda system for building solid tracks in the new network sections of the Baku metro line. The plan is to build **55 new underground stations and expand the underground network to 119 km by 2030**. The concrete sleeper production plant was designed in parallel with the planning of the track system. The first sections and tunnels have now been completed. More about this in the next issue.



INTRALOGISTICS SYSTEMS

COATING AROUND THE CORNER



✕ For LEWA as a special pump manufacturer and HAMM as a manufacturer of rollers for road construction and earthworks, Vollert developed and installed new floor-guided and overhead material flow systems for surface coating of **parts weighing up to 12 tons**. While high cycle times are crucial at HAMM, at LEWA for the first-time workpieces weighing tons travel **90° around the corner** and thus enable an extremely compact system layout.



This QR code leads you to the report on our website.

INTRALOGISTICS SYSTEMS

HIGH SPEED PRODUCTION BUFFER FOR 3,000 TONS OF STEEL WIRE COILS

✕ Vollert erected for Saarstahl AG a new fully automatic high-bay warehouse for up to 665 steel wire coils at the Neunkirchen plant. In addition to the high cycle time of just **190 seconds** per double cycle, the heavy-duty engineers also realized the handling of bundles weighing up to **4.5 tons** directly from the stacker crane to the lift truck and on to the truck loading.



This QR code leads you to the report on our website.

INTRALOGISTICS SYSTEMS

NEUMAN ALUMINIUM TRUST ON VOLLERT FOR RETROFIT



✕ Neuman Aluminum modernized their material flows in the extrusion plant in Marktl, Austria, during the Christmas holidays. At the core is a new automatic crane system by Vollert with **21 interchangeable cycles** for loads of up to **3 tons**. It replaces two existing transport cranes and is one of the fastest automatic cranes ever used in the extrusion industry.



This QR code leads you to the report on our website.



PRECAST CONCRETE PLANTS

BETONWERK OSCHATZ RELIES ON ROBOT TECHNOLOGY



 Shapes, colors and surfaces are becoming ever more versatile thanks to modern architecture. At that end, the capacities for construction projects are also increasing while cost pressure is also on the rise. Machine technology in precast concrete production must follow this trend. Modernization is the defining buzzword, and at Betonwerk Oschatz this is no exception. The long-established company has been supplying construction projects with sophisticated precast concrete elements for more than 25 years. The system technology has been modernized several times since 1995 to the latest standards. **“Robotics is increasingly changing our way of working. Manual processes are automated, which allows us to permanently increase our plant productivity,”** says Managing Director Birgit Zocher. As a knowledge partner, you trust the Vollert plant specialist. Most recently, in 2012, a new vacuum turning device was installed in the double-wall production plant.

In 2018, the shuttering area and cleaning processes were modernized. **“Highly efficient robot technology has ensured precision and clean, reliable processes since April,”** explains Markus Schenk, Sales Project Manager at Vollert. The new **SMART SET robot line** handles both the deshuttering process – completely automated – as well as plotting contours for producing floor slabs and double walls. The shuttering profiles of various lengths and installed components, such as magnets for e-cans, are positioned with high precision and high traversing speeds. Modern laser and camera systems monitor this process. The **SMART STORE magazine robot** is another one of our latest installations. It takes over the temporary storage in the storage area or places it back on the supply route to the next shuttering process. **“Thanks to the new robot technology and automated processes, we can pass 5–6 circulation pallets through this work area every hour,”** says Birgit Zocher. **“In addition, the individual robots have separate safety areas so that they can continue working even in the event of disruptions in a robot area.”**

EVENTS IN 2018

ALUMINIUM

Dusseldorf, Germany
09.10. – 11.10.2018
Booth 13105

PHILCONSTRUCT 2018

Manila, Philippines
08.11. – 11.11.2018
German Pavilion

WORLDBUILD BAKU

Baku, Azerbaijan
23.10. – 26.10.2018
German Pavilion

ICCX MIDDLE EAST

Dubai, Saudi Arabia
25.11. – 26.11.2018
Booth 57

THE BIG 5 EAST AFRICA

Nairobi, Kenya
07.11. – 09.11.2018
German Pavilion

BAUMA CHINA 2018

Shanghai, China
27.11. – 30.11.2018
German Pavilion



INTRALOGISTICS SYSTEMS

WELD, PAINT AND FIT WAGONS AND TRAILERS IN ONE LINE

The Brazilian manufacturer Randon has built a 500m long combined welding, painting and assembly line for trailers and railway wagons in the state of São Paulo. For this Vollert has developed a heavy-duty material flow concept.

X In cooperation with the plant manufacturer Eisenmann, Randon, the largest manufacturer of trailers and freight wagons in Latin America, has built a new production line in Araraquara, some 270 km northwest of São Paulo. Since April 2018, trailers and wagons are being welded, painted and assembled in a combined line over a length of 500 m approximately. Different wagon and trailer lengths of 9 to 22 m are feasible. “The interesting thing about this concept is the combination of welding, painting and assembly processes in a continuous line. It is thus possible to achieve a short clock cycle and a calculated capacity of up to 18 wagons per work shift”, explains Jochen Keinath, Sales Project Manager at Vollert. At full capacity wagons and trailers can be completed every half hour.

13 ROPE CONVEYOR DRIVES INTEGRATED IN A SINGLE LINE

Initially, the frame structures set up on dummy buggies are still fed manually into the system. Vollert’s automatic conveying line starts at a weight of 10 tons within the welding range – at the end of the line the total weight of the workpieces can reach up to 25 tons. A total of 13 rope conveyor drives, handle the buggies forward movement after each work step. For this purpose, the drives are arranged one behind the other to allow individual forward feed at the workstations after acknowledgment. At the end of a conveying section, the rope conveyor transfers the workpiece over to the next section. “Rather than using a single rope conveyor for the entire conveyor line, the single



drive concept allows for individual dwell times of the workpieces at the respective workstations,” explains Jochen Keinath. “In addition to that, five buffers are located before painting area that follows.”

The painting area spans over a length of approximately 190 m. It starts with the distribution center equipped with five buffer spaces and a heavy-duty transfer platform from Vollert, which handles the distribution of trailers and wagons on demand. The workpieces enter into the robot blasting cabin, and are moved from there by means of the rope conveyors first to the primer station, then to the painting station and finally through the dryer cabin where at the

end two more buffer positions are placed and a second transfer platform. From here, the conveyor line continues on two parallel assembly lines, each about 90 m long, where the wheelsets are fitted to the trailers and wagons.



PRECAST CONCRETE PLANTS

INDUSTRIAL PRE-PRODUCTION OF TERIVA FLOOR BEAMS IN POLAND

The Polish building materials manufacturer Uciechowski will in future be producing floor beams and slabs on an industrial scale using the TERIVA building system. Whereas manufacturing was previously purely stationary, it is now based on the latest technology.

H In Poland, the TERIVA building system is very popular. Detached houses as well shopping centres or universities are being built with reinforced concrete ribbed slabs. The floor beams are laid directly on the masonry walls, hollow-body bricks are laid in the spaces and the projecting lattice truss reinforcement is fastened on site with in-situ concrete, as with floor slabs. In addition to the large span, the lower slab weight and high load-bearing capacity of the beam are significant advantages. The building materials manufacturer Uciechowski has been successfully producing concrete elements in Raszków for customers in the region of the city of Wielkopolskim for several decades. “However, with manual pre-production and a stationary formwork system, we were no longer able to meet the increasing demand from our customers. An initial contact with Vollert’s concrete plant specialists led to the idea



of a high capacity industrial production of TERIVA floor beams. We also wanted to offer our customers modern floor slabs in the future”, says Robert Uciechowski, owner and Managing Director of the renowned building material manufacturer, describing the situation at the beginning of planning at the end of 2016.

UP TO 60 TERIVA FLOOR BEAMS SIMULTANEOUSLY

“We have transferred the tried-and-tested Vollert circulation system to the production of solid and semi-finished parts to TERIVA beam production,”

explains Daniel Krusche, Vollert’s Project Manager. Decisive advantage: on a circulation pallet (13.5 x 2.70 m), several 120 mm wide beams can be produced simultaneously, the side formwork is firmly mounted. “For this purpose, we specially developed the shuttering system along with a renowned shuttering manufacturer and adapted it to the Vollert circulation system,” explains Robert Uciechowski. The beams can be made up to 8 m long. If we assume a beam length of 3–4 m we can produce up to 60 elements simultaneously.” For this purpose, a CAD-CAM controlled SMART PLOT plotter first records precisely the contours before the TERIVA shuttering profiles are manually positioned and the reinforcement grids inserted. A SMART CAST concrete spreader

is used to apply the fresh concrete, with the separate discharge screws optimally controlling and filling the individual carrier chambers. The concrete is compacted, creating a smooth exposed concrete surface.

The cleaning of the pallet surface was also specially adapted to TERIVA beam production. The VARIO CLEAN pallet cleaner has two brush variants. If the shuttering profiles remain on the pallet for the next circulation cycle, a specially developed round brush cleans – like a toothbrush – the spaces and at the same time frees the scrapers from dirt and residual concrete. If, on the other hand, the shuttering profiles are removed again, a roller brush descends after a rough cleaning by a steel scraper and cleans the entire surface before the release agent is applied.

VCC ENSURES OPTIMAL PRODUCTION PROCESSES

Automated machine technology ensures a consistently high level of TERIVA beam quality. However, the decisive factor for maximum plant productivity is the VCC (Vollert Control Centre) production control system, which creates the order dispatch list, optimizes pallet allocations, determines storage and retrieval sequences, and manages curing times and loading processes.

“Both factors, machine technology and intelligent plant control were the cornerstones of the optimal start-up of the new production process in June 2018” says Robert Uciechowski.

PRECAST CONCRETE PLANTS

CHINESE BAYOE GROUP CONTINUES TO INVEST IN PRECAST CONCRETE PRODUCTION

The Chinese Baoye Group has built yet another precast concrete plant in Quzhou, 800 km southwest of Shanghai. Baoye will produce double walls and floor slabs of up to 700,000 square meters per year for mega-residential projects. The focus is put on China's hot topics, resource efficiency and environmental protection.

Back in 2016, the Baoye Group developed one of China's first and most advanced precast concrete plants in Qingpu, a district west of Shanghai. The Baoye Group is one of China's leading state-owned construction companies. In recent years the architects of Baoye developed the Golden Eagle Tiandi Square in Nanjing, the 330-meter-high Zhuhai Center and the tower of Kuwait Central Bank's headquarter, which are classified as real architectural highlights.

NEW HOUSING PROJECTS FOR CHINA'S BOOMING CITIES

Affordable housing is also in demand on the outskirts of the booming cities of Shanghai and Beijing and in other growing metropolitan areas in China. 83 cities in China feature already a population density of more than one million residents. Residential districts and entirely new neighbor-

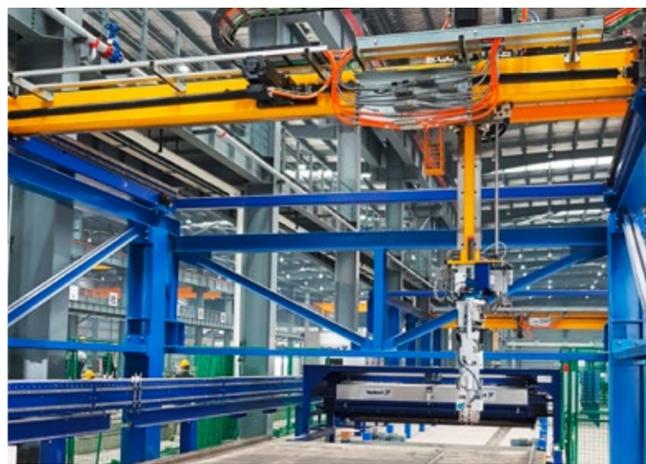
hoods are emerging. Also, in China, prefabricated architecture is the preferred construction method today. Prefabricated architecture features excellent energy efficiency and high weather resistance while constantly complying with high construction standards and, compared to conventional building systems, construction costs are lower and construction times significantly shorter. "Since 2016 we are successfully producing precast concrete parts for Shanghai's metropolitan area in Qingpu. So, a year later we decided to increase our capacities even more. Therefore, we have built another precast concrete plant that will supply the housing projects in the Quzhou region in the fu-



ture," explains Hua Fan, General Manager of the Baoye Group. Just as in 2016, they once again counted on the expertise of Vollert as supplier of technology and systems.

HIGH AUTOMATION

The first walls and slabs in Quzhou were shipped to construction products in the region in May 2018, roughly 10 months after the civil engineers and planners at Vollert had finished pre-design planning. The intelligent MES production control system of the automation specialist RIB SAA Software Engineering optimally synchronizes the walls and slabs in chronological order as per job processing list during production. State-of-the-art engineering technolo-



gy ensures streamlined and highly productive operating procedures. Precise high-performance robots, turning and transport equipment, and fully automated timing of all processes including transport routes deliver the ever-increasing level of automation in the precast concrete plant. "Highly automated SMART SET shuttering and de-shuttering robots are having a key role here. The shuttering profiles are positioned precisely and fixed at high speeds by means of magnets. This is CAD/CAM controlled" explains Björn Brandt, Vice President at Vollert. A 3D laser system scans the surface of the pallet and compares the instant result with the specifications from the plan.

Today innovative concreting and curing processes ensure better construction standards. In the double wall production are hydraulic clamps lock the circulation pallet in the traverse of the ceiling-guided pallet turning device until the upper shell is pneumatically locked by means of a specially developed clamping arm system.

ON TRACK FOR GROWTH

"The precast plant in Quzhou is set to soon supply the next mega construction projects in this region," says Hua Fan. In retrospect, the decision to choose Vollert as a technology and plant supplier was the right step and an important one. "At first glance the costs of investment seem to be higher compared to the Asian suppliers on the market. But ultimately, plant productivity and profitability figures count." says Hua Fan.

SHUNTING SYSTEMS

TEMPORARY SHUNTING WITH THE ROAD-RAIL ROBOT VLEX

At the InnoTrans 2018 Vollert presented the emission-free and battery-operated road-rail robot VLEX also as a rental model, for example on construction sites or for peaks during loading. It has proven itself among others at the Stuttgarter Straßenbahnen AG (SSB).



Vollert presented the new VLEX road-rail robot for the first time live at the InnoTrans 2018 in Berlin. In one-man operation, the radio-controlled, all-round vehicle switches from track to road and back again quickly and easily. Despite its compact dimensions, it is suitable for maneuvering loads of up to 300 tons. Its sophisticated vehicle geometry with articulated steering and four individually controlled wheel hub motors make it extremely agile and economical. These ensure a turning radius of only 7.2 m up to 360° on the spot while protecting tires and is low on wear. "As main applications, the industry and transport companies such as street and subway depots have emerged" explains Jürgen Schiemer, Vice President at Vollert. "For public transport companies we offer suitable variants with many different coupling systems and compressed-air supply for releasing the train brakes."



RENTAL OPTION AS ALTERNATIVE

Another aspect for many customers is using the road-rail vehicle temporarily when required. For example, SSB in Stuttgart installed the compact VLEX for six months to move trams onto newly erected sidings until final installation of overhead lines. With its small dimensions and a dead weight of 4.5 tons, the VLEX is easy to transport and can therefore be quickly employed anywhere. Even in periods of high shipments, VLEX supports a limited time, for example, during the harvest of agricultural products or other goods and materials subject to seasonal fluctuations. In the Czech Republic, Glencore Grain used the rental vehicle to transport raw materials in a rapeseed oil mill for one week to reduce peak loads. "Through the rental option, it is possible to test equipment variants that are appropriate for the given operating conditions, inclines or curves," Jürgen Schiemer adds.