



Liebherr's slewing bearing consists of 68 segments with a total diameter as large as six small cars in row. All photos courtesy of Liebherr.

Modernizing Component Technology

Liebherr offers innovative solutions for heavy-duty applications

Matthew Jaster, Senior Editor

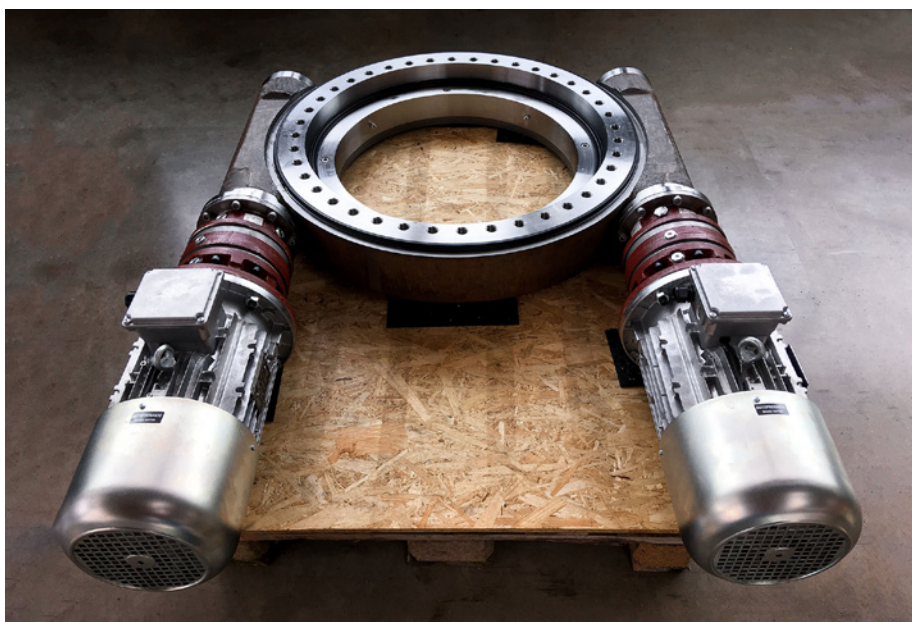
Between trade shows including MIN-Expo and CES 2025, we've been treated to a great deal of new technology in areas like mining, agriculture, construction and heavy industrial components. Liebherr has modified its component portfolio to include digital measurement, electrification and maintenance-free technologies. Liebherr's component product segment offers advanced solutions for slewing bearings and slew drives that meet the rising demands across a variety of applications and industries. These components are future-ready and play a vital role in making operations much more efficient.

Slewing Bearings of the Future

Industries worldwide are under pressure to reduce their environmental footprint, while becoming more efficient, sustainable and safer. But how can these goals be achieved? Often, the answer lies in the hidden champions of heavy industry: slewing bearings and slew drives. These compo-

nents are at the heart of machines in a wide range of applications, including excavators, cranes, tunnel boring machines, antennas, offshore cranes, bridges and wind turbines. To meet the growing demands, Liebherr

focuses on continuous innovation. These advanced slewing bearings and slew drives are designed to seamlessly adapt to modern standards, making operations more efficient, safer and environmentally friendly.



This Liebherr slew drive is equipped with an electric motor.

Bearing clearance monitoring (BCM), for example, provides a digital solution for measuring wear in slewing bearings. Built-in sensors allow precise measurements of axial and radial wear without requiring technicians to perform manual checks in hard-to-reach areas. This does not only improve safety but also speeds up the monitoring process. Permanently installed sensors enable quick wear measurement via a web app, which can reduce downtime by up to 75 percent.

An upgrade to the BCM can be seamlessly integrated into the customers' system without the need for additional measuring devices or gateways, reducing system complexity and allowing users to analyze measurement data within your own systems.

These slew drives can be powered electrically, offering clear advantages: They reduce noise emissions and do not require hydraulic oil, which prevents the risk of oil leaks. Electrically driven slew drives are ideal for applications where no hydraulic systems are used. They offer a clean solution, especially in sensitive environments. The electric motors are also highly adaptable and can be combined with various gears. Thanks to intermediate flanges, motors can be easily integrated and installed in a space-saving manner. Electrically powered slew drives excel in precise positioning tasks, as their power control allows for accurate movements.

Liebherr's innovative solid lubrication, Lifinity, eliminates the need for regular relubrication. In this process, a heated polymer-oil mixture is introduced into the heated bearing. As it cools, it forms a stable layer that provides long-term lubrication for the bearing. A major advantage is the significant reduction in maintenance, as regular relubrication is no longer necessary, leading to considerable savings in operating costs and time. This increases productivity, as equipment requires less downtime for maintenance, thus extending the lifespan of machines and boosting overall operational efficiency. Lifinity also reduces the risk of corrosion,

enhancing the longevity of the bearing. Conventional greases and oils can leak and pollute the environment, but with Lifinity, there's no such risk. This technology also meets strict NSF/H1 standards, making it suitable for food-related environments.

Expanded Slewing Bearing Portfolio

GustoMSC BV is a designer and engineer of mobile offshore units and equipment that focus on safe and efficient operations at sea for a more sustainable future. The company recently developed a heavy-duty crane for a new type of installation vessel. For the positioning of wind turbines on the high seas, transport ships can deliver individual parts directly to such a vessel. This allows for continuous work at sea without having to fetch new parts from the harbor. And it is in this heavy-duty crane that Liebherr's segmented slewing bearing takes over a vital task. Once in place, the bearing is the core element that turns a ship crane with a lifting capacity of 2,000 tons, responsible for the installation of offshore wind turbines. The slewing bearing, developed and manufactured by Liebherr Components in Biberach, Germany, consists of 68 segments, the total diameter of which is almost as large as six small cars placed in a row. During its service life of about

25 years, the 23 m bearing will help to erect offshore wind farms and contribute to sustainable power generation. The segmented slewing bearing was designed as light as possible to increase the load capacity of the ship.

"The crucial features thereby are the induction-hardened raceways of the segments, which offer a more efficient bearing cross-section than inlaid raceway plates, and thus add to weight reduction," explains Benjamin Schmid, head of sales maritime applications at Liebherr Components. "In this way, Liebherr supports the further development of offshore mechanical engineering, which is advancing into ever larger dimensions."

Liebherr Mining Innovation

Liebherr's mining production facility in Colmar, France, is responsible for making sure products can withstand the intense mining conditions. As group manager of the testing department, Lionel Oberhauser oversees the validation tasks that come across his desk, coordinating each task with the members of his highly skilled team.

"We can have very fast-paced days because of emergencies, or calmer days when we can carry out our planned tasks. Every day is different!" said Oberhauser.



Liebherr's mining equipment continues to deliver the latest component technology.



Testing and validation of Liebherr's mining equipment is key to quality control.

The testing department is made up of four test engineers, a workshop manager, three measurement and adjustment specialists and, of course, Oberhauser. The team uses its extensive product knowledge to define and fine-tune the parameters of an excavator prototype to ensure that the machine functions as the designers expect and is as productive and efficient as possible. They are also responsible for checking components within sub-systems, such as the cooling system, have been installed correctly. To do this fine-tuning and checking, the team conducts the relevant tests for each system and subsystem and then relays the collected information to the product development teams.

"We regularly go out to our customers' sites and to Liebherr branches around the world to monitor machines in field tests, take part in troubleshooting or acquire data from the field," Oberhauser said. "Our role puts us in contact with different players both in and out of Liebherr."

Oberhauser has been part of Liebherr Mining for nearly 14 years. He worked as a test engineer in the testing department for eight years before becoming group manager for the same team in 2019.

The nature of the role was a perfect fit for Oberhauser; it allowed him to mix the theory he'd learned throughout his mechanical engineering studies with the practical skills he gained working as a structural design engineer for a company that manufactured car-carrying trucks. Plus, the work itself—overseeing the testing, validation and fine-tuning of Liebherr's huge mining excavators—was a multidisciplinary and complex challenge that he thoroughly enjoyed when he first started and still enjoys to this day.

"Although my title has changed, my job still involves handling test engineering tasks about 40 percent of the time—which I love as this kind of job opportunity is rare," Oberhauser added. "When you work for the testing department, you must be able to talk to everyone as testing our excavators requires expertise in hydraulics, electricity, electronics, software and mechanics. Such collaboration is an important and fascinating part of my job."

Accepting the role as group manager was a big challenge for Oberhauser, but one that he continues to enjoy to this day.

"What's great about my job is the feeling of having an active role in product development and customer

satisfaction. Our machines are gigantic and technological monsters and we're the ones who validate them."

Having a team that he can rely on is a huge part of why Oberhauser enjoys his work. Even during times of stress, he knows that his team will always give their best. During one particularly challenging period, Oberhauser had to work out how his four testing engineers could manage the validation of seven different machines all at the same time. This was all while members of his team needed to make multiple trips around the world, some of which took them as far away as Australia and Indonesia. This not only represented technical, strategic and test equipment management challenges but also challenges in diplomacy.

"In our work, we're facing the customer. We represent the image and quality of Liebherr Mining products both inside and outside the factory and it can be a lot of pressure," said Oberhauser. "But because the members of our group are motivated, trained and committed, we were able to navigate our way through this intense period. We know we can count on each other. It's priceless."

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