

Press release

## **50 years of excellence: celebrating the Liebherr mobile harbour crane**

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- The LGM 1130 introduced in 1974 was Liebherr’s first mobile harbour crane, and the LHM has evolved significantly with innovative design features and technological advancements
- Over the decades, Liebherr has continuously adapted to market demands, introducing innovative models such as the LHM 250 in 1996 and the LHM 550 in 2010
- The all-electric LPS 420 E from 2019 and the new LHM series introduced in 2022 reflect Liebherr’s commitment to sustainability and forward-looking technologies

Progress evolves with the times and new lessons gained from experience. Liebherr has developed its flagship mobile harbour crane over five decades of changing industry demands, standards, and trends. Upgrades over the years have ultimately served to accommodate larger and heavier cargoes, while maintaining high standards in performance and reliability. This has included updates to the crane’s tower and boom, to modifications in its undercarriage. In recent years, all-electric cranes optimised for energy efficiency and sustainability have come to the forefront. And the newest LHM series focuses on advanced electronics and sensor technology for future automation.

Rostock (Germany), October 2024 – Half a century of innovation. The global market for mobile harbour cranes has seen Liebherr rise to prominence, thanks to the consistent satisfaction of customers who rely on the brand’s dependable equipment and comprehensive service network that extends even to the most remote locations. This trust has been built over years of delivering exceptional performance in the mobile harbour crane segment, making Liebherr a preferred choice across diverse regions and product configurations.

### **A legacy of excellence**

The legacy and evolution of the Liebherr mobile harbour crane couldn’t be more illustrative than with the LGM 1130 introduced in 1974. Mobile harbour cranes in those times were often used as backup for STS container cranes, positioned under the container crane itself. This was made possible through a folding-tower design that allowed the LGM to fold its boom, drive underneath the container crane, and erect itself again to then support the STS. The LGM was introduced during a period when containerisation was becoming increasingly dominant, and global trade routes were expanding.

Mobile harbour cranes are renowned for their flexibility and versatility, and this trait was reinforced over time. Capable of handling various applications such as bulk handling, container handling, and heavy goods transport, these cranes needed to offer more efficiency compared to other port equipment. The

rubber-tired undercarriage provides excellent load distribution, eliminating the need for extensive quay preparation and allowing for easy transition to new projects or ports.

With the introduction of the LHM 250 in 1996, new benchmarks for efficiency and innovation were set. This crane featured an X-shaped undercarriage and individually steerable wheelsets, allowing for improved manoeuvrability in increasingly narrow port environments. The LHM 250 was also the first Liebherr mobile harbour crane to incorporate telemetry, enabling remote monitoring and data transmission. This innovation was crucial as the industry demanded greater efficiency and larger cranes to handle the growing size and capacity of container ships.

“Over the years, Liebherr has continuously adapted to market demands, introducing groundbreaking models that have had an impact on port operations,” says Sebastian Simon, product manager at Liebherr Rostock. “Our commitment to innovation and quality has made us a trusted partner in the maritime industry.”

The LHM 500, launched in 2002, continued this legacy with its robust design and increased focus on environmental sustainability. The crane’s tubular tower and 4-chord boom were designed to enhance steelwork reliability, extending the crane’s lifecycle and reducing its environmental impact. In 2010, innovation saw a shift towards the integration of digital technologies and automation in port operations, with the LHM 550 incorporating advanced telemetry and other features.

Enhancing technical capabilities is just one aspect of improving logistical operations. Maximising limited space is another, and portal crane solutions excel in this area. Liebherr’s LPS cranes have been pivotal in port operations for decades. Their rail-mounted configurations and space-saving portal undercarriage, combined with versatile mobile harbour crane technology, ensure efficient cargo handling in tight locations. The LPS series, including models like the LPS 420 E, epitomises innovation and practicality, handling containers, bulk goods, and heavy lifts up to 308 tonnes with the LPS 800.

## **Assistance systems help optimise logistics – SmartGrip, Sycratronic, Pactronic**

The assistance systems that launched soon after the LHM 550 came to market helped evolve the logistical capabilities of mobile harbour cranes. SmartGrip, launched in 2014, is an intelligent system that optimises grab filling rates through self-learning. It offers higher performance and nearly eliminates overloads. Analyses showed that only 70% of the grab’s capacity was typically used due to factors like suboptimal angles and varying material densities. SmartGrip adjusts automatically, recognising bulk density, compression, granularity, and conditions like depth of impression and grab type. It optimises filling to maximum capacity within seven cycles, ensuring the rate exceeds 70% from the second cycle.

The need to handle larger and heavier cargo led to a modification in mobile harbour crane performance. To accommodate heavy-lift project cargo, particularly from the wind industry, two LHMs must work together. Sycratronic was developed and released in 2004 to maximise performance and turnover by improving the safety and efficiency of tandem operations. It connects two cranes via a Controller Area Network (CAN bus), allowing their Programmable Logic Controller to communicate and synchronise movements. This enables the leading crane to provide input on slewing angle, hoisting height, and load weight to the following crane, which then adjusts automatically. With advanced algorithms and safety systems, Sycratronic allows full utilisation of the cranes’ load capacity, overcoming the typical 75% restriction in tandem lifts. It also enhances safety by monitoring and correcting shifts in the load’s centre of gravity, and eliminates communication errors between crane operators, reducing the risk of accidents.

Hybrid technology is playing a crucial role in modernising port logistics by making operations more efficient and environmentally friendly. Liebherr’s Pactronic system, released in 2010, is a great example of this innovation for mobile harbour cranes. This system uses a special energy storage device that

combines gas and hydraulic fluid to store and release energy when needed. This clever setup boosts hoisting speeds without requiring a bigger diesel engine, which means less pollution and better performance. The Pactronic system is also known for its quick charging, long lifespan, and recyclability, making it a smart and sustainable choice for the future of port logistics. It has a significantly higher energy capacity than conventionally used electrical energy storage devices, such as high-performance capacitors.

## **Going all-electric for more sustainable port logistics**

One of the standout developments in port logistics over the past decade is the increasing demand for a more sustainable infrastructure. In 2019, the LPS 420 E marked a significant milestone as Liebherr's first all-electric portal crane. It features permanently excited synchronous motors, significantly reducing energy consumption, especially during idling times. All crane movements – like luffing, hoisting, slewing, and travelling – were done by electric motors, no hydraulics required. The LPS 420 E was designed for high-efficiency bulk and container operations, reflecting the industry's increasing focus on reducing CO2 footprints. But it was not the first innovation for electric drives. For more than a quarter century now, Liebherr mobile harbour cranes do not emit any CO2 during operation when their electric prime movers are in operation, according to the Scope 1 GHG protocol, and provided that the port has the corresponding infrastructure for it.

The new LHM series, released in 2022, represents the future of crane technology with its advanced automation capabilities. This crane is prepared for supervised work cycle automation, preparing ports for the future of data-driven logistics and renewable infrastructure.

## **Innovations guide the future**

As the maritime industry continues to evolve, Liebherr remains committed to leading the way in innovation and sustainability. The company's focus on data-driven logistics and helping to build out a more renewable port logistics infrastructure through its product innovations ensures that its cranes are prepared for the future.

Liebherr's vision for the future includes more data-driven logistics, which will improve the operations of maritime crane fleets through mastery over data access and optimization. The company also anticipates a significant growth in renewable infrastructure at ports, aiming to reduce local emissions and source more renewable energy. Liebherr's mobile harbour cranes are already prepared for these trends, characterized by low noise, high precision, high speed, and reduced operational expenses.

The extensive sales and service network of Liebherr guarantees that customers receive the support they need, wherever they are in the world. This commitment to innovation and customer satisfaction drives everything Liebherr does, ensuring that its mobile harbour cranes continue to set the standard for the industry.

“The goals for the next half-century are clear: continuous technical enhancements of the cranes, swift adaptation to new developments, and maintaining the agility of a family-owned business with short decision-making pathways,” remarks Andreas Ritschel, General Manager Sales for mobile harbour cranes at Liebherr-MCCtec Rostock GmbH. With a legacy of excellence and a vision for the future, Liebherr's mobile harbour cranes will continue to set the standard for the industry. That's why Ritschel adds: “Reliability remains a cornerstone, both in the products and the service expansion. With a steadfast presence for 75 years and 50 years of experience and innovation in mobile harbour cranes, Liebherr is poised to remain an industry leader for the next 50 years.”

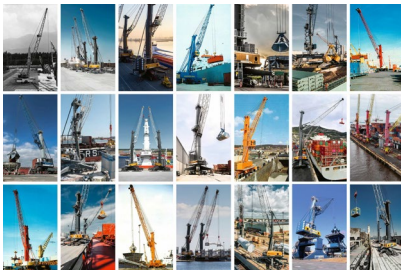
## About Liebherr-MCCtec Rostock GmbH

Liebherr-MCCtec Rostock GmbH is one of the leading European manufacturers of maritime handling solutions. The product range includes ship, mobile harbour and offshore cranes. Reach stackers and components for container cranes are also included in the product portfolio.

## About the Liebherr Group – 75 years of moving forward

The Liebherr Group is a family-run technology company with a highly diversified product programme. The company is one of the largest construction equipment manufacturers in the world. It also provides high-quality, user-oriented products and services in a wide range of other areas. The Liebherr Group includes over 150 companies across all continents. In 2023, it employed more than 50,000 staff and achieved combined revenues of over 14 billion euros. Liebherr was founded by Hans Liebherr in 1949 in the southern German town of Kirchdorf an der Iller. Since then, the employees have been pursuing the goal of achieving continuous technological innovation, and bringing industry-leading solutions to its customers. Under the slogan '75 years of moving forward', the Group celebrates its 75th anniversary in 2024.

## Images



liebherr-50-years-lhm-1.jpg

A kaleidoscope of innovation over 50 years. Covering a variety of the most critical port logistics – from bulk, dry bulk, project and general cargo, and heavy-lift operations – the mobile harbour crane continues to be in high demand. It stands out for its modular applications in ports all over the world.



liebherr-50-years-lhm-2.jpg

Form follows function. Since its inception in the 1970s, the mobile harbour crane has evolved to handle the shifting demands of global port operators. The cranes originally featured a relatively slender frame and folding tower to be backups for ship-to-shore container cranes, with a lifting capacity of around 35 tonnes. They've since become true heavy-duty machines that can handle the increasing weight, size, and turnover capacities that growing infrastructure has required, capable of lifting over 300 tonnes. Based on technical innovations and research from insights around global port operations, the product development for mobile harbour cranes has kept with the times. But it also introduced novel new features, such as assistance systems like SmartGrip and Sycratronic.



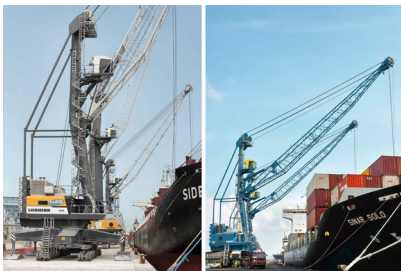
liebherr-50-years-lhm-3.jpg

Staying at the digital and ergonomic forefront. The cabin of the mobile harbour crane has undergone a series of innovations that support a more comfortable work environment for the crane operator while meeting the demands of more efficient operations. Data-driven information about the crane's performance, easy access to assistance systems, and a more comfortable interior environment thanks to a new air-condition system are just some of the updates that have led to improvements.



liebherr-50-years-lhm-4.jpg

Modularity helps achieve success. The "LHM" is just one of numerous iterations that make the mobile harbour crane a standout performer in a variety of port settings. The LFS, LPS, LBS, and LPM round off the portfolio. Whether installed on a portal, a pier, or on wheels, the crane operates where it needs to. Pictured here are the LBS 600, installed on a barge, and the LPS 420 E, the first all-electric portal crane in Liebherr's portfolio.



liebherr-50-years-lhm-5.jpg

An evolution marks the latest generation of the mobile harbour crane. The new "Master V" crane control system, coupled with advanced sensor integration and digital information transmission, sets the stage for future automation systems. The new design features an ergonomically improved operator's cab and a sleek, modern colour scheme, elevating both functionality and aesthetics compared to the older versions.

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