

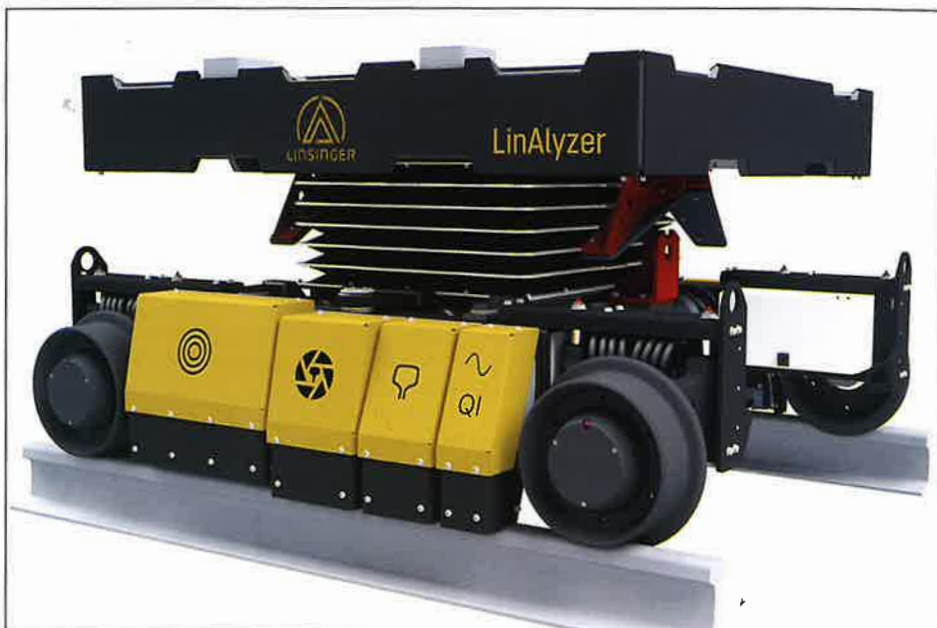
High-performance rail milling technology

Details of the latest generation of machines developed by Linsinger for undertaking rail milling operations.



Above: Diagram of the Linsinger Railmaster rail milling machine.

Below: Illustration of the Linalyzer measuring system fitted to the Railmaster.



Linsinger Maschinenbau is an Austrian engineering company with more than 85 years' experience in milling and sawing technology. Located in Steyrermühl in Upper Austria, the company has evolved from a traditional family business into a globally operating technology leader in highly specialised niche applications. With around 500 employees and an export rate of approximately 98%, Linsinger supplies customers in key industries such as railway infrastructure, the steel industry and heavy industry worldwide.

The company is the inventor of mobile rail milling technology and among the leading manufacturers that have set new standards in rail maintenance by enabling full railhead reprofiling in a single operation. For decades, Linsinger has been regarded as a key technological driver in mechanical rail processing. This is based on a high level of in-house manufacturing depth, continuous research and development and long-term customer partnerships.

Railmaster

More than 30 years ago, the company developed mobile rail milling, setting a milestone in the economic maintenance of railway infrastructure. Building on this expertise, the Railmaster was developed as a new generation of rail milling trains, consistently designed for modularity, energy efficiency and integrated measurement technology. A central development objective was to overcome existing technical and operational limitations of conventional machine concepts. In addition to high performance, particular focus was placed on sustainability, operational safety and maximum process integration.

Rails are subject to continuous wear due

to intensive wheel/rail contact. This results in material loss, increased noise and vibration, and near-surface Rolling Contact Fatigue (RCF) damage such as head checks. If left untreated, these can develop into critical cracks and even lead to rail failure. The key challenge is, therefore, to restore a standard-compliant, crack-free rail with defined geometry and surface quality while minimising material removal and ensuring high productivity in track operations.

The Railmaster addresses these requirements through a consistently modular overall concept. The drive system itself is designed as a redundant energy system.

Depending on the configuration, power can be supplied via either an overhead electrified line, using a pantograph for current collection, or a conventional diesel engine. Looking ahead, a hydrogen-based fuel cell represents a further option for future low-emission drive concepts.

Two of these systems can be combined per machine, providing a high degree of operational flexibility. This enables, for example, emission-free transfer to the worksite via the overhead line at self-propelled speeds of up to 120km/h. During operation, power from the overhead line can also be utilised where infrastructure allows while diesel operation can be used as an alternative in non-electrified sections.

A key design principle is the extensive elimination of hydraulic power systems. Instead, a fully electric system is employed, covering all functions - from traction and auxiliary systems to the milling units. This results in improved overall efficiency and reduced maintenance requirements.

The vehicle is designed as an articulated train, allowing flexible configuration depending on the application. In addition to multiple milling modules, crew cars or integrated workshop modules can be included. This modularity enables optimal adaptation to different infrastructure conditions and operator requirements.

Another focus of development was improving occupational safety and minimising interventions in the track area. Tool changes, which are regularly required during extended operations, are carried out entirely within the machine. During operation, the milling



Left: Austrian construction company PORR Bau own and operate a Railmaster.

The PORR Bau Linsinger Railmaster rail milling machine.



units are swung into the interior of the machine, where replacement can be performed under protected conditions. They are then returned to the working position without interrupting the milling process. This concept not only enhances safety but also increases machine availability and productivity.

Linalyzer

The Railmaster also sets new standards in quality assurance. All relevant measurement and inspection systems are fully integrated into the machine, eliminating the need for personnel to enter the track area for measurement purposes. At the core is the integrated Linalyzer measuring system, which continuously records quality parameters in real time and feeds them directly back into the machining process.

In combination with an AI-supported camera system, damage to the railhead can be detected, evaluated and precisely documented. By linking pre- and post-measurements, the actual material removal can be accurately determined, enabling an adaptive machining strategy. This represents a significant advancement over conventional methods, which often rely on upstream measurement data.

In addition, the Linalyzer to Go mobile measuring system is available, offering

identical measurement functions and particularly suited for flexible condition assessments of individual track sections. The handheld system complies with EN 13977, is ready for operation within minutes, can be operated by a single person, and is designed for maximum flexibility thanks to its lightweight components. A durable battery allows for more than 10 hours of operation.

The Railmaster, therefore, combines high-performance milling technology with intelligent, integrated measurement systems into a holistic approach. The goal is to sustainably extend rail service life, optimise maintenance strategies, and significantly improve both efficiency and occupational safety in railway operations.

As such, the Railmaster makes a substantial contribution to the economic, safe and sustainable maintenance of modern railway networks.

Successful deployment

Leading European infrastructure operators are already relying on the Railmaster. In 2025, DB InfraGO awarded Linsinger a major framework contract for up to six Railmaster rail milling machines with deliveries scheduled to take place between May 2025 and the end of 2029. This contract highlights the system's suitability for one of the largest and most

demanding rail networks in Europe.

The Swiss track maintenance specialist Scheuchzer has also added a hybrid Railmaster to its fleet. The machine is expected to enter operation on the Swiss rail network in 2026. Scheuchzer emphasises the innovative hybrid drive concept, which combines performance and flexibility while meeting future environmental requirements. 'We were convinced by its well thought out concept, which comprehensively addresses the operational requirements,' said Thierry Biselx, Head of Grinding Department, Scheuchzer. The Railmaster enables more efficient handling at the times when large material removal volumes are required.

In addition, RCS Rail Care Solutions has placed an order for two Railmaster machines, further underlining the growing demand for this technology in the rail milling sector. The Railmaster is also in operation with PORR Bau, one of the leading international construction and railway infrastructure companies.

These references demonstrate the growing acceptance of the Railmaster among demanding European market players requiring high productivity, modular adaptability and future-proof drive technologies.

Scheuchzer hybrid Railmaster rail milling machine in operation in Switzerland.



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