Boehringer Ingelheim

Vibration monitoring secures uptime

Ensuring availability of stacker cranes through vibration diagnosis

Pharmaceutical company Boehringer Ingelheim relies on condition monitoring from ifm electronic

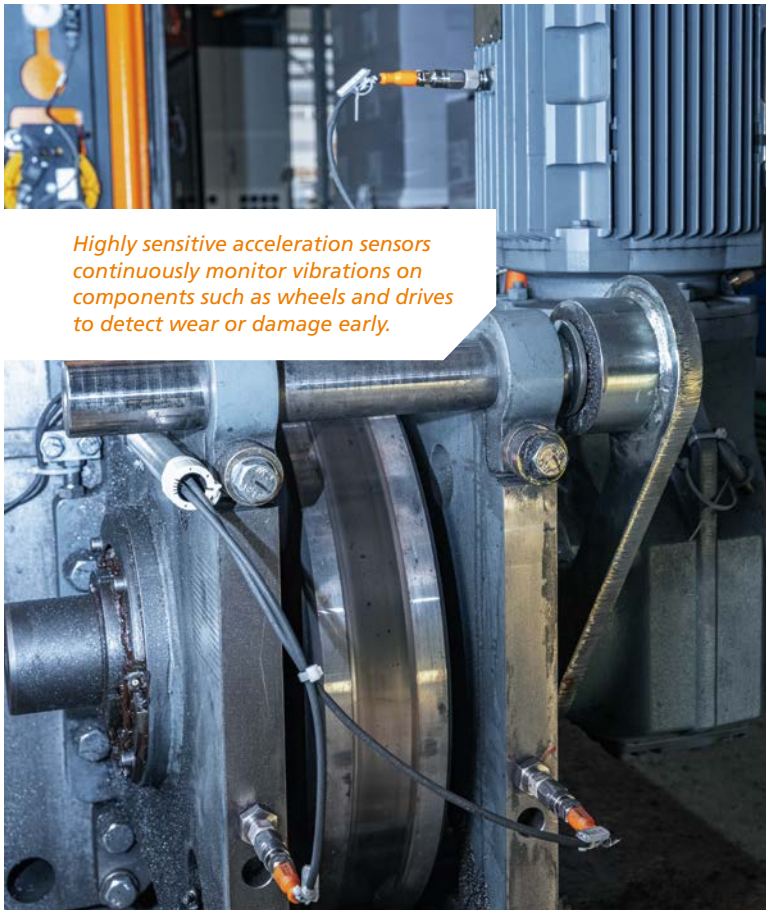
Boehringer Ingelheim is a biopharmaceutical company active in both human and animal health. As one of the industry's top investors in Research and Development, the company focuses on developing innovative therapies in areas of high unmet medical need. Independent since its foundation in 1885, Boehringer takes a long-term perspective, embedding sustainability along the entire value chain. More than 53,500 employees serve over 130 markets to build a healthier, more sustainable, and equitable tomorrow.

Stacker cranes up to 40 metres high and 130 metres long handle loads of up to one tonne.

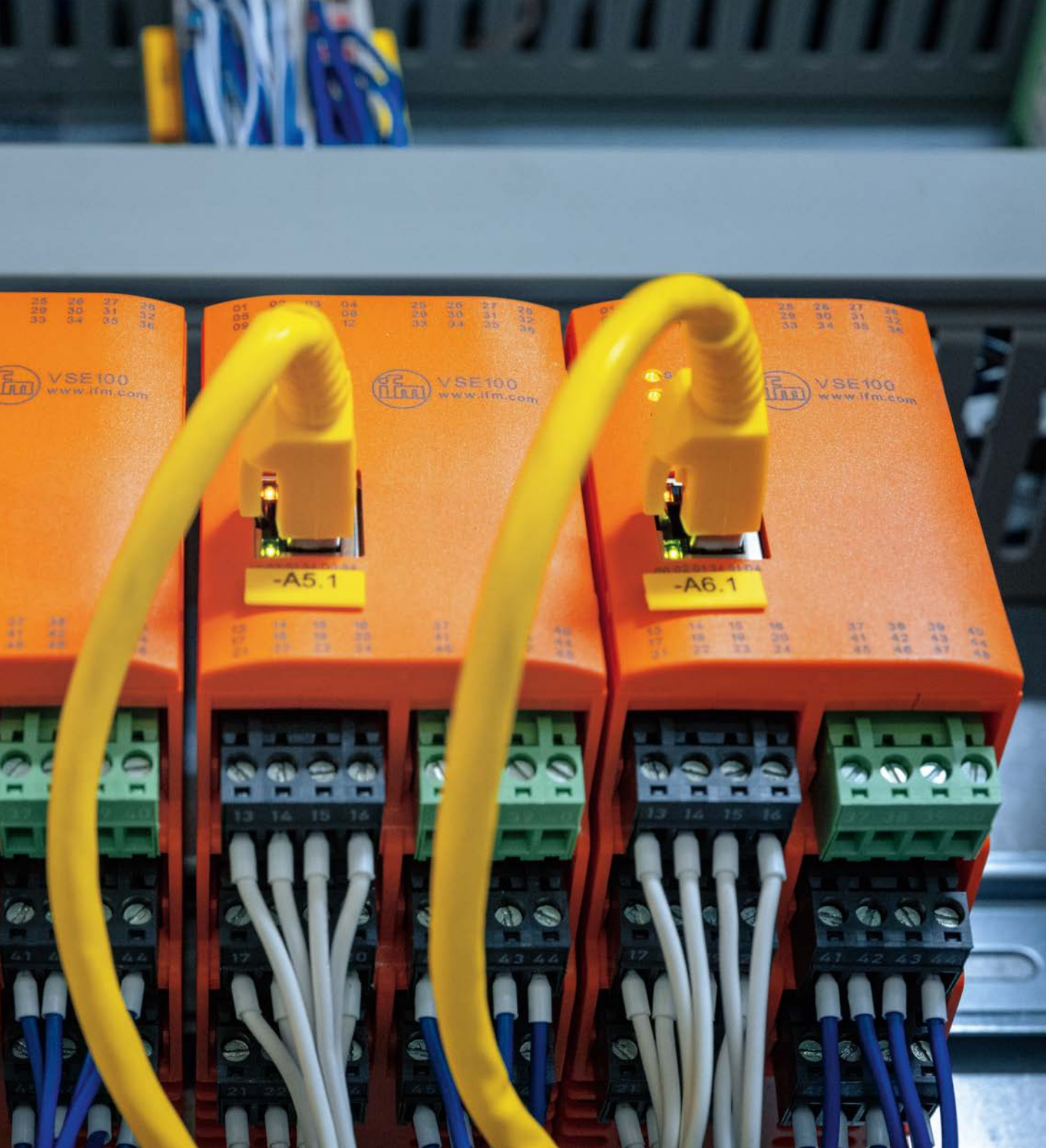
In a state-of-the-art, fully automated high-bay warehouse with a capacity of 16,000 storage locations, valuable raw materials, intermediates, and finished goods are stored securely and efficiently. Continuous availability of these products for production and shipment is essential to maintain an uninterrupted supply chain. The logistics in the warehouse are handled by four high-performance stacker cranes, each 130 metres long and 40 metres high. Capable of moving pallet loads of up to one tonne, they are key components of the internal material flow.

The challenge: preventing unplanned downtime

A key challenge for Boehringer Ingelheim is to prevent unplanned downtime of the stacker cranes. If one of them fails, access to the required products is no longer possible, since storage locations are allocated at random. In the worst case, entire production lines could come to a halt. Such disruptions not only cause financial losses but may also endanger the supply of life-saving medicines to patients.



Highly sensitive acceleration sensors continuously monitor vibrations on components such as wheels and drives to detect wear or damage early.



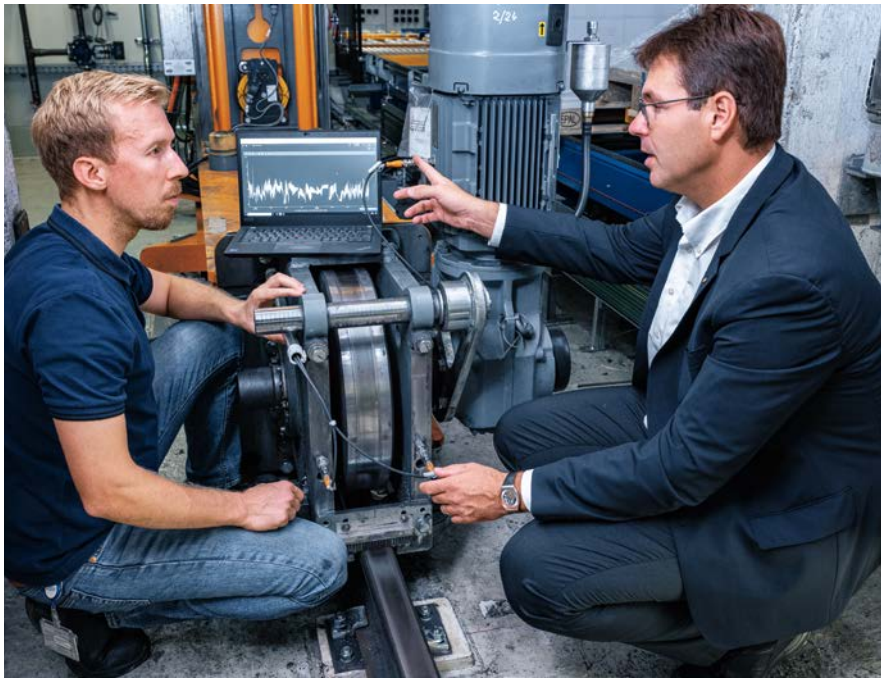
Vibration data is preprocessed by a VSE evaluation unit and analysed by the diagnostic software moneo.

To prevent this, wear-related damage to components such as bearings, drives and mechanical parts must be detected as early as possible. The aim is to enable predictive maintenance and reduce unplanned downtime to an absolute minimum. Regular inspections and maintenance cannot fully account for the cumulative stress the equipment undergoes during continuous operation.

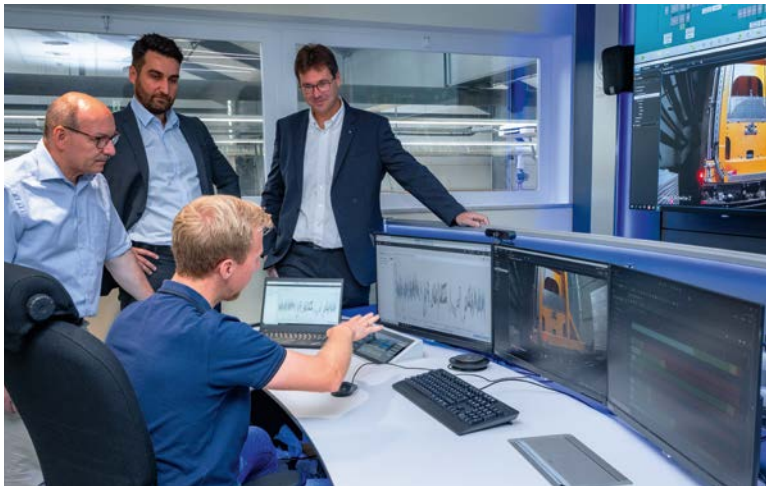
The solution: permanent vibration monitoring

To address this challenge, Boehringer Ingelheim partnered with condition monitoring experts from ifm to implement a cutting-edge system for continuous stacker crane condition monitoring. Highly sensitive acceleration sensors continuously monitor vibrations at critical components such as running and guide rollers, gearboxes and hoist motors. The sensors are designed to detect even the slightest deviations in vibration patterns – allowing potential damage to be identified at an early stage.

The vibration data is pre-processed by diagnostic electronics of the VSE series and sent via optical data link to a dedicated



The diagnostic software moneo interprets vibration data and alerts the team in case of anomalies, supporting on-site adjustment and alignment.



The diagnostic software moneo enables automated analysis and visualisation of all vibration data in the control room, issuing early warnings of emerging damage or wear.

industrial PC, where the intelligent diagnostic software moneo performs detailed analysis and interpretation. To ensure precise detection, the sensors are mounted as close as possible to the components being monitored. In addition, reference runs are carried out in an unloaded state to provide baseline data for detecting anomalies.
Warning and alarm thresholds are predefined in the system. When these thresholds are exceeded, the maintenance team is automatically notified via email. This enables a rapid response to prevent damage before it leads to costly failures.

The benefits: increased machine uptime and targeted maintenance

The aim is to prevent unplanned downtime during ongoing operations. Thanks to early detection of wear, maintenance activities can be scheduled in advance – for instance, during planned downtimes or over the weekend. This proactive maintenance strategy has already proven successful: In one case, increased vibration levels revealed that a guide roller had been set too tightly during maintenance. The issue was quickly identified and corrected – before any further damage occurred. The condition monitoring system thus makes a valuable contribution to improving equipment availability while enabling maintenance without disrupting operations. Encouraged by the positive results, the company now plans to retrofit all their stacker cranes with ifm's monitoring solution. It not only provides a clearer picture of machine health, but also significantly improves operational reliability by helping to avoid unplanned downtime. From the outset, ifm impressed with its in-depth expertise and holistic solution approach.

ifm as integration partner

Throughout the project, ifm went far beyond supplying hardware. The company acted as a full-service integration partner, supporting the Boehringer Ingelheim team through all phases – from the initial idea through detailed planning to successful commissioning. In addition to supplying the vibration diagnostics hardware, ifm assisted with the configuration of the diagnostic electronics and ensured smooth integration into the IIoT platform moneo.

Conclusion

Thanks to predictive vibration monitoring using advanced condition monitoring components from ifm, Boehringer Ingelheim can now identify and address potential issues before they lead to stacker crane failure. This safeguards logistics processes and keeps production lines running. At the same time, wear is reduced and maintenance processes are optimised.

The investment in innovative monitoring technology – backed by a close partnership with ifm – highlights Boehringer Ingelheim's ongoing commitment to optimising its operations and upholding the highest standards in pharmaceutical production and logistics.

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