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Peak Performer is a hit at Liebherr

KOHLER and Industry 4.0

New generation of strip leveling machines

Photo: Liebherr-Hydraulikbagger GmbH



Liebherr-Hydraulikbagger GmbH relies on the precision and cost-effective operation of the Peak Performer part leveling machine from KOHLER in its Steel Construction department

PEAK PERFORMER IS A HIT AT LIEBHERR

A PART LEVELING MACHINE FROM KOHLER HAS IMPRESSED ONE OF THE WORLD'S LARGEST CONSTRUCTION MACHINERY MANUFACTURERS WITH ITS PERFORMANCE AND EFFICIENCY

A Peak Performer part leveling machine from KOHLER has been in operation at Liebherr-Hydraulikbagger GmbH since 2018, where it delivers level and low-stress steel blanks. The machine completely fulfills the expectations of the Liebherr experts, who are more than happy with their decision to purchase from KOHLER Maschinenbau GmbH.

Everyone has seen the impressive, traditionally yellow, earth-moving machines emblazoned with the name “Liebherr” – wheeled and crawler excavators, duty cycle crawler cranes, deep foundation machines, crawler tractors and crawler loaders, pipe layers, telescopic handlers, wheel loaders, articulated dump trucks, material handlers... In fact, it is impossible to imagine a construction site without them. Hans Liebherr founded the company in 1949 and today, just 70 years later, not only is Liebherr one of the biggest construction machinery manufacturers in the world, but the company is also successful in a number of other industries. The exceptionally wide product range – which now covers 11 business fields – is the result of gradual evolution, which Liebherr has developed on its own.

Around 46,000 people work for the family-run group across more than 130 companies at sites on every continent. At the company’s very first site, in Kirchdorf an der Iller, situated between Lake Constance and Ulm, Liebherr-Hydraulikbagger GmbH manufactures an extensive range of high-quality hydraulic excavators, articulated dump trucks, and material handlers. This is where steel construction takes on a strategically important role.

KOHLER impresses with the Peak Performer

“We also need to make sure that our steel blanks, some of which are large and solid, are exactly level and low stress, to maintain the high quality standards of our products,” explains Stefan Richter, Head of Steel Construction at Liebherr. Working with Project Manager Torben Handeck, who is in charge of programming and welding technology in the Steel Construction department, Stefan Richter set about finding a powerful, reliable, and economical part leveling machine.

As the Liebherr Group’s very first site, they were ideally suited to directly compare the Peak Performer part leveling machine from KOHLER with competitor machines – and were very impressed with the results.

According to Stefan Richter, the decision, in which not just management but also machine operators and technicians from both the Steel Construction department and the Maintenance department were involved, was not taken lightly. Dr. Hans-Peter Laubscher, Managing Director of Sales at KOHLER recalls: “They really grilled us. We discussed every single detail of the machine and gave a demonstration in our leveling center by carrying out different leveling trials.” After intensive discussions with all decision-makers, a unanimous decision was made in favor of a type 120P Peak Performer part leveling machine with an advanced cleaning system.

“ We have now been using the machine for a year and we are very pleased.”

Torben Handeck, Project Manager for programming and welding technology

Plus points for hydraulic-free machine concept with direct drive, reversible leveling rollers, and electromechanical leveling gap control

Three of the Peak Performer’s features tipped the balance toward the KOHLER machine and have proven highly successful since it was commissioned.

Machine and material facts Part leveling machine:

- Peak Performer 120P.2000
- Working range: 2000mm
- Thickness of material for leveling: 1.6 mm – 40 mm
- Hydraulic-free machine concept
- Electromechanical leveling gap control (patented)
- Intelligent overload protection of leveling unit and driveline
- Power consumption during idling 2.5 kW
- Direct drive for the leveling rollers
- Reversible leveling rollers (patented)
- Return feed operation

Material to be leveled

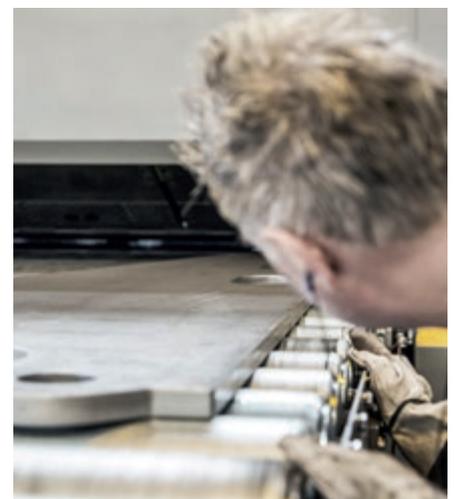
- S355J2+N and S355MC
- Material thickness ranging from 8mm to 40mm
- 300 t / month

Unlike other machine concepts, it operates without any hydraulic systems and so combines ultimate precision with maximum efficiency as well as environmental sustainability. The servo-electronic concept of the leveling gap control is quick and robust, maximizes efficiency through reduced energy consumption and fewer maintenance requirements, and enables the machine to handle temperature fluctuations. At the heart of the leveling gap control lies a reliable quadruple wedge system on roller bearings which keeps the leveling gap constant.

The direct drive for the leveling rollers developed by KOHLER was the second decisive feature. The direct drive replaces conventional drives with distribution gears and cardan



The Peak Performer’s advanced cleaning system enables the leveling rollers and supporting rollers to be fully moved out of the machine, by means of electric motor, for quick, easy cleaning. .



Stefan Richter’s and Torben Handeck’s team level around 300 t of steel per month in the company’s Steel Construction department



Precisely leveled and stress-free steel plays an important role when it comes to ensuring the high quality of Liebherr products.



One of the production processes after leveling is oxy-acetylene robot welding. Leveled parts ensure a constant weld gap and mean that fixtures can be simplified as leveled material only exhibits stresses on a small scale during welding.

shafts. In practice, this means less electricity consumption compared to conventional part leveling machines which have servo-hydraulic leveling gap control and cardan shafts. In addition to being energy efficient, it also increases the direct input of power into the leveling rollers. This in turn increases the material cross section that can be leveled, and considerably enlarges the working range, particularly in the case of wider sheets. What is more, the directly driven rollers reduce slip on the material, ensuring gentler machining of the surface. The steel workers in Stefan Richter and Torben Handeck's team level steel blanks (S355)2+N and S355MC) with thicknesses ranging from 8mm to 40mm with ease.

"The reversible leveling rollers were the third key factor for us," says Torben Handeck. This means the service life of the leveling rollers can be extended by up to 50%, particularly when leveling comparatively narrow parts. Ultimately, the reduced wear of the rollers patented by KOHLER plays a significant role when it comes to the low overall maintenance and repair costs.

300 t of steel blanks per month

The Peak Performer part leveling machine is subjected to permanently high loads in the company's Steel Construction department. Around 300 t of laser, plasma, and flame cut steel is leveled on the machine each month for constructing the upper and undercarriages of hydraulic excavators and material handlers – in two-shift operation.

The advanced cleaning system developed by KOHLER pays off directly for Liebherr-Hydraulikbagger GmbH. To clean the machine's rollers, first the machine operator moves the motor-driven top roller frame upwards. The operator can then slide either the top or the bottom guide plate with the supporting rollers and leveling rollers out of the machine, powered entirely by an electric motor. This means that particles of dirt can be removed quickly and easily.

” The service from KOHLER has been consistently excellent.

Stefan Richter, Head of Steel Construction, and **Torben Handeck**, Project Manager for programming and welding technology.

"The service from KOHLER has been consistently excellent." say both Stefan Richter and Torben Handeck. This can be seen, for example, in their request for a second display for machine operation. A second display was added at the machine inlet on the opposite side of the roller path to the existing display next to the inlet. This allows the machine to be operated from both sides of the roller path, shortening the distances for the machine operator, which in turn speeds up the leveling passes. As the machine can be operated intuitively with

the aid of the Expert Calculation System for setting the leveling parameters, the operators got to grips with the machine right away, report Stefan Richter and Torben Handeck.

The uncluttered interior along with the ease of access and clear arrangement of the machine driveline for the maintenance staff were also rated positively, as was its very small overall footprint.

Precise, economical, reliable: Peak Performer provides optimum support to Liebherr-Hydraulikbagger GmbH

"We set high standards for our machinery and our new Peak Performer part leveling machine from KOHLER fulfills them in our Steel Construction department," summarizes Stefan Richter. The KOHLER machine is the ideal match for the production of construction machinery and material handlers at Liebherr-Hydraulikbagger GmbH with precision leveling results, costeffectiveness thanks to reduced energy consumption and low maintenance costs, and consistently high reliability.

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INDUSTRY 4.0

KOHLER MACHINES SUPPORT PIONEERING CONCEPTS

KOHLER is furthering the integration of cutting-edge technology into the products and processes of its customers in the shape of three new developments: The OPC UA interface provides the basis for the seamless networking of all machines which are involved in the production process; the digital maintenance module for strip leveling lines and part leveling machines optimizes machine maintenance; while the newly developed dashboard makes digital monitoring possible.

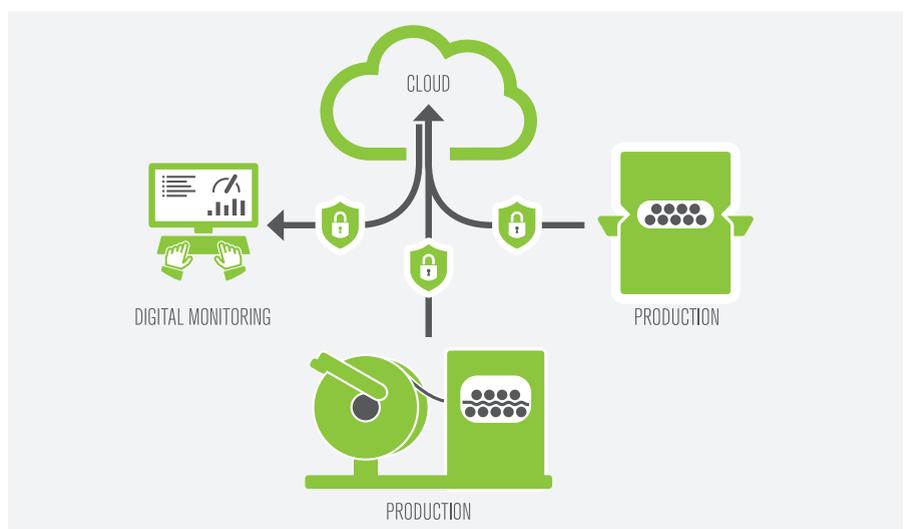
KOHLER is therefore meeting the demands of machine operators for forward-looking Industry 4.0 communication by providing structured machine data for the efficient monitoring and optimization of production processes. The aim is to easily integrate machines into existing lines and to reduce the complexity that leads to significant costs in terms of time and labor during the commissioning and conversion of entire lines and systems. Put simply, efficient production lines are the ultimate goal.

Predictive maintenance: The digital maintenance module

The maintenance module helps to ensure that maintenance work is planned in advance and completed in good time. When developing the maintenance module, easy and intuitive operation was a top priority for Dr. Markus Blust and his team. The necessary maintenance work is shown clearly on the display screen and KOHLER has designed the module to be very flexible, so that it can be adjusted to suit the customer's needs at any time. The entire current product range of strip leveling lines and part leveling machines

“ We have developed the maintenance module in order to help our customers with two tasks. Firstly, the module notifies the customer automatically of any pending maintenance; and secondly, it records whether the maintenance work has been carried out.”

Dr. Markus Blust, Head of Engineering and Design



Machine and line data such as maintenance, setup, and utilization is clearly displayed on the KOHLER dashboard.

has been upgraded with the PLC-supported maintenance module as standard equipment.

Plug & work: OPC UA networking

The foundation and key challenge for an easy and seamless interconnection of machines and other systems (e.g., ERP, cloud) is the platform-independent, interoperable, and manufacturer-independent exchange of data. This digital networking can be achieved with the standard OPC UA. All machines and lines from KOHLER can be easily integrated into existing system environments.

Condition monitoring: Overview

The information provided by machines does not usually have a uniform structure. The KOHLER dashboard allows machine and line data from various systems to be depicted in a clear and well-defined format. OPC UA also forms the basis for monitoring functions (data analytics, condition monitoring).

The user has access to a variety of standardized information on the basis of current data, which not only simplifies machine maintenance, setup and capacity utilization, but also increases the overall effectiveness of the asset.

KOHLER and Industry 4.0

For KOHLER, Industry 4.0 is not an abstract concept for the future. The company has developed solutions with which information and internet technology can be integrated into its products and consequently the processes of its customers. The communication between man and machine already exists at KOHLER in concrete concepts and developments.

New website
www.kohler-germany.com



NEW GENERATION OF STRIP LEVELING MACHINES

THE NEW STRIP LEVELING MACHINE FROM KOHLER COMBINES A MODERN EXTERIOR WITH INNOVATIVE LEVELING TECHNOLOGY.

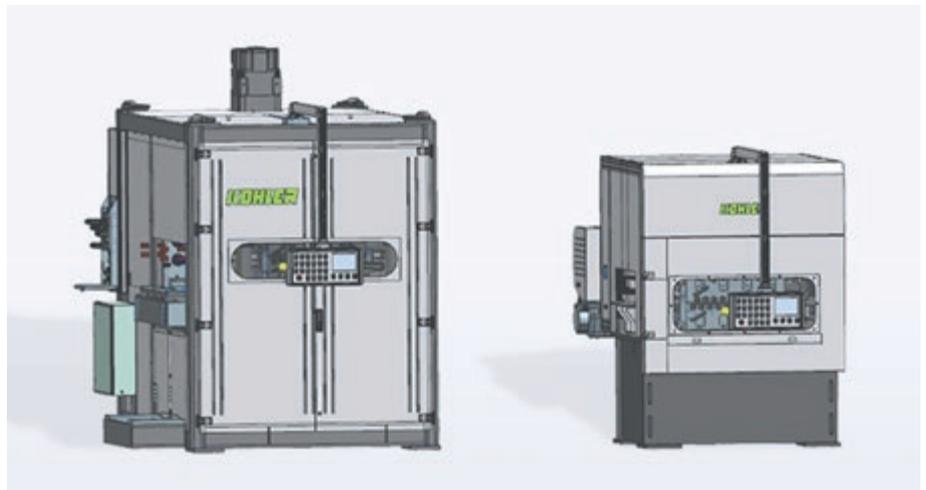
KOHLER is continuously striving to improve and enhance its machines and components while also developing completely new concepts, such as the recently launched strip leveling machine for leveling strips with a thickness of up to 12 mm and a width of up to 2100 mm.

Concepts for maximum cost-effectiveness

Increased efficiency, sustainability, and profitability are the three fundamental demands of the market, which KOHLER and its innovations are able to meet. All this is achieved through taking a new approach to supposedly mature solutions.

Take leveling machines, for example. An electric motor with a distribution gear is usually installed in order to transfer the drive torque to the individual leveling rollers with help of cardan shafts. It is precisely here where KOHLER's innovations come into play. The distribution gear with cardan shafts, which until now were usually driven by a motor, are now being replaced by a completely new drive concept, which functions without these limiting cardan shafts. The results speak for themselves. Maintenance requirements are slashed, as the circulation lubrication needed for the previous drive mechanism is now completely unnecessary.

The machine's appearance has also been redesigned, with this new look being combined with significantly more compact dimensions. As a result, the machine has a roughly 20% smaller footprint than the previous model, which considerably reduces the amount of space needed. The ease of access to the drive motors is equally impressive. An optional hood is also available for the machine. A larger 15" version of the modern machine display can be provided on request.



The image on the left shows the previous leveling machine – on the right is the KOHLER leveling machine with a slimline design and innovative new drive concept.

“ By further developing the leveling machine, we have combined proven KOHLER technology with innovation and design. Our customers are therefore able to achieve optimal leveling results whilst simultaneously reducing their operating and maintenance costs.”

Dr. Markus Blust, Head of Engineering and Design

Proven technology with a new look

KOHLER has also fitted wide and generously sized supporting rollers to ensure the best possible roller support in its new generation of leveling machines. Non-productive time can be significantly reduced using the advanced cleaning and quick-change device for leveling cassettes. If required, intermediate rollers remain available, as well as leveling rollers with different surface coatings for different strip materials.

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