

NEWS **KOHLER**

COMPETENCE CENTER
LEVELING

EDITION 31



Leveling for the world champion

New: compact precision leveling machine for connector industry

Part leveling machine in steel processing

Contract leveling with high demand



TENSION IN THE ICE CHANNEL – BUT NOT IN THE MATERIAL

KOHLER LEVELS SLED PARTS FOR USE BY THE GERMAN SKELETON TEAM

High-tech equipment for German top-class sport is the specialty of FES, the German institute for research and development of sports equipment. This is where equipment including sleds for the German skeleton team are built. Precision and quality are decisive when competing. KOHLER Maschinenbau GmbH has been responsible for the precise and material-friendly leveling of the high-strength steel parts since 2020. Working together with its technology partner, FES developed the individual sleds that saw the German “Skeletoni” team race to several medals at the 2021 World Championships.

Calm but fully focused, Christopher Grotheer stands at the start of the artificial ice track in Altenberg, Saxony, one of the most challenging bobsleigh and luge tracks in the world. On his head he wears a helmet with face and chin protection, in his hand he holds a flat metal sled. It is Grotheer's last run at the 2021 World Championships, and he is already in the top spot after the first three runs. The starting signal sounds. Grotheer takes a runup of a few meters, throws himself onto his sled, and races head-first down the ice channel at up to 140 kilometers per hour. In less than a minute, the breakneck ride ends at the

finish line. Run done, and in the fastest time. Christopher Grotheer is now the former and the new skeleton world champion.

His teammates are also able to celebrate success at the 2021 World Championships: in both the men's and women's events, the German team takes first, third, and fourth place, and in the mixed team competition even claims both gold and silver. This outstanding overall result is not only down to the impressive skills of the athletes, but also the quality of the material: the skeleton sleds are required to comply with clearly defined regulations and must be individually tailored

to the riders. Every change, no matter how small, can influence the running behavior and spell the difference between victory or defeat.

Sports equipment developed to the highest standards

German winter sports athletes receive support in this regard from FES, the German institute for the research and development of sports equipment. The Berlin-based institute sees itself as the technological center of top-level sports for Germany and develops equipment for sports such as canoeing, rowing, cycling, sailing, speed skating – and for



bobsleigh, luge, and skeleton. “Our aim is to develop sleds that have optimum running and sliding properties under a variety of conditions,” explains Erik Zerbe, skeleton project manager at FES. “This requires that we take into consideration aspects such as the riding ability and habits of the athlete, as well as weather, temperature, ice quality, and the characteristics of the track.” In order to achieve a good result, it is necessary to match the required angles, chamfers, surface structures, and track courses on the sled with extreme precision – a very challenging task.

The skeleton sleds are manufactured from stainless and high-strength steels with a thickness of between three and eight millimeters. They consist of cowling, a frame, and two runners. “We can influence the properties and weight of the sports equipment by means of the material thickness and the type of steel used,” says Zerbe. This is important, for example, because the sled and athlete together must not exceed a certain maximum weight so as not to skew the competition. “In addition, of course, the precision of the workmanship plays a decisive role in whether a sled is ultimately suitable for competition or not,” explains the expert.

Leveling: a flexible alternative to in-house machining

The frame of the skeleton sled consists of several longitudinal and transverse struts, as well as base panels. These parts are leveled before assembly to meet the high requirements for straightness and accuracy, and to eliminate tension in the material. However, this step is not performed in-house at FES: “We construct around eight sleds per season for our athletes. With such quantities, it is not economically viable to purchase a leveler,” explains Zerbe. “Furthermore, we work with many different thicknesses and demanding high-strength materials, which also requires a high degree of flexibility from the leveling technology.”

KOHLER has been the reliable technology partner of FES since 2020. The company, based in southern Germany, is not only a leading manufacturer of part leveling machines and strip feeding lines for industry, but also offers contract leveling as a flexible service at its own leveling center. An extensive range of machinery and competent, experienced employees allow the company to fulfill even highly complex or short-term orders and leave customers fully satisfied.

“The quality of the parts we receive from KOHLER is always high.”

Volker Zerbe, Skeleton project manager at FES

The ideal machine for every requirement

KOHLER’s leveling center has part leveling machines of different sizes. Each of these Peak Performer machines is designed for different dimensions and thicknesses. This means that the necessary flexibility is available for all requirements, including the broad range of parts covered by FES. The machines are state-of-the-art and boast equipment such as hydraulic-free direct drives: this makes them particularly energy-efficient, while also being suitable for leveling larger cross-sections. The patented electromechanical leveling gap control facilitates optimum results by reliably keeping the leveling gap constant, even when it comes to complex parts with changing cross sections made of high-strength materials. Extra-wide supporting rollers also provide particularly rigid support for the leveling rollers, which ensures a reliable and precise process.

In order to protect the material to be leveled from contamination, the machines are thoroughly cleaned at regular intervals in the KOHLER leveling center. A major advantage here is the Peak Performer’s advanced



The longitudinal and transverse struts as well as the base panels of the frame are leveled before assembly, in order to satisfy the high requirements for levelness and precision, and to eliminate tension in the material. Photo: German institute for the research and development of sports equipment (FES)

cleaning system, which allows supporting rollers and leveling rollers to be cleaned quickly and easily. “This is particularly important when machining high-tech components such as our sled parts because any scratch or dirt can have serious repercussions later on,” emphasizes Zerbe.

From manufacturing advantage to competitive advantage

The skeleton project manager is fully satisfied with his new technology partner and the results of the contract leveling. “The struts and base panels of our sleds exhibit a very high degree of precision after leveling, even with long lengths and different material grades,” he sums up. “We can use this to simplify the further assembly process because we are required to perform significantly less manual rework.” Leveling also almost entirely eliminates tension in the material. “Our athletes therefore benefit from very clear advantages in competition because they can use the best possible equipment,” Zerbe is delighted to report, adding: “We are already carrying out leveling tests with KOHLER in the luge area too, so there will be additional collaboration here in the near future.”

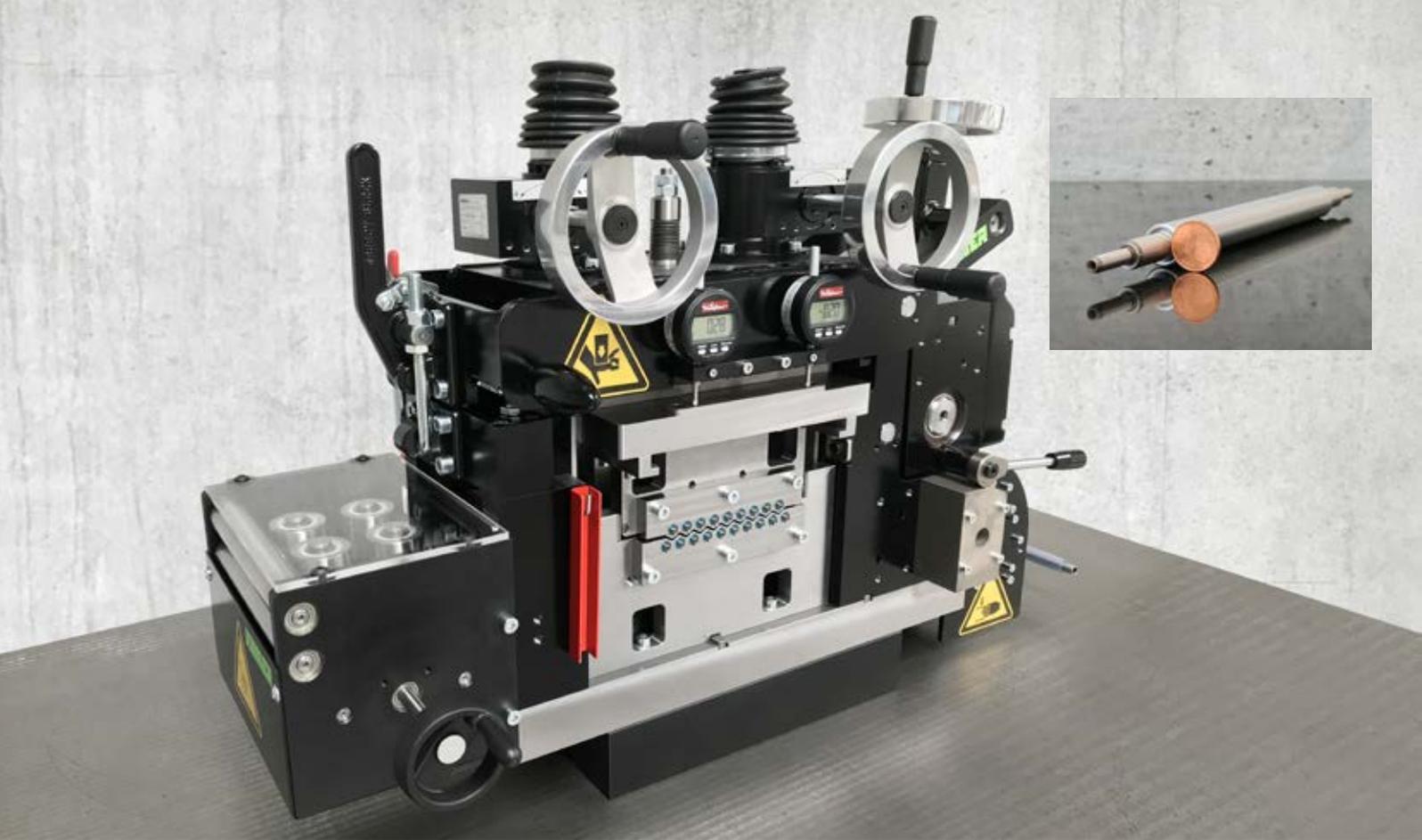


KOHLER’s leveling center includes several different variants of the state-of-the-art Peak Performer part leveling machine.



The skeleton sleds are manufactured from stainless and high-strength steels with a thickness of between three and eight millimeters. They consist of cowling, a frame, and two runners. Photo: German institute for the research and development of sports equipment (FES)

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LOW-TENSION SHEETS FOR STABLE PRODUCTION PROCESSES

KOHLER LAUNCHES NEW COMPACT PRECISION LEVELING MACHINE FOR MANUFACTURING CONNECTORS

KOHLER Maschinenbau GmbH specializes in leveling technology and regularly brings innovations in the field of leveling technology onto the market. KOHLER has now developed a new, compact precision leveling machine that has been specially designed to meet the requirements of manufacturing plugs, connectors, and electronic components. Users benefit from optimum leveling results even in the case of thin coil material or quality deviations. This allows for more stable production processes and the fulfilment of even the most stringent requirements.

Electronic control systems are becoming more advanced, particularly in the automotive industry. On the one hand, the number of vehicles with electric motors is increasing, and on the other, a growing number of electronic assistance, safety, and comfort systems are being built into cars. In order for these control systems to work, connectors

are required. They establish contact between the individual components and transfer data, energy, or signals.

Plugs, connectors, and other electronic components are often made from strips stamped out of copper, steel, aluminum, or stainless steel sheet, which are wound onto

coils. To eliminate existing tension in the material, the strips must be leveled prior to stamping and forming. However, most levelers are not suitable for the high precision requirements of the industry: the leveling rollers are too thick for the low strip thickness, and the machines do not demonstrate a high enough level of rigidity



to provide sufficient plasticization of the material. The consequence is that increasingly complex tools are being used to attempt to overcome inadequacies in the material. This also results in inaccuracies, which can lead to problems in downstream processes such as galvanization or coating with plastic. Thus, the high level of precision required by connector manufacturers often cannot be achieved.

Precise leveling results thanks to optimum roller diameter

With the CPL 120, KOHLER is bringing a compact precision leveling machine onto the market that has been precisely tailored to the requirements of connector manufacturing.

Particular attention was paid to the leveling rollers: the leveler has been equipped with 19 hard chrome coated leveling rollers, which are supported by a large number of supporting rollers to achieve high rigidity. The small roller diameter ensures that even the thin strips normally used in the industry can be leveled with precision.

Easy accessibility allows for quick and straightforward cleaning of supporting rollers and leveling rollers. This protects the strip material from dust, dirt particles, and damage.

The machine exhibits high rigidity in order to compensate for leveling pressure.

High degree of plasticization even for thin strips

The new CPL 120 enables degrees of plasticization of more than 70 percent to be achieved, reliably eliminating tension and unevenness in the coil material. The result is a much more stable production process and components that meet even the most stringent precision requirements. Users can also reduce their operating costs, as there are

fewer rejects and the stamping tools can be designed with a reduced degree of complexity, ultimately resulting in longer service lives.

The first users are already delighted with the CPL. "The machine delivers what KOHLER promised," explains Alexander Frank, Head of Stamping Technology at Schröder & Bauer Werkzeugbau Stanztechnik GmbH + Co. KG.

“A simple leveler and a KOHLER precision leveling machine are worlds apart.”

Alexander Frank, Head of Stamping Technology at Schröder & Bauer Werkzeugbau Stanztechnik GmbH + Co. KG

“The machine is absolutely fantastic for leveling strips up to 0.8 millimeters thick and more. The settings allow for more sensitive and more accurate operations than other models. The leveling process is therefore always stable and delivers optimum, reproducible results.”

Can also be supplied as a complete system

The newly developed compact precision leveling machine from KOHLER can be supplied as a complete system with horizontal coiler or vertical coiler for different coil weights. KOHLER also supplies the appropriate machine control system on request.

Thanks to its space-saving design, the machine can be integrated in existing unwinding and production systems that have been operating without a leveler until now. This means that every user can improve their product quality over the long term, even in retrospect.

Machine and leveling material facts:

Leveler:

- Torsion-resistant design
- Number of leveling rollers: 19
- Min. and max. strip width: 10 – 120 mm
- Min. and max. strip thickness: 0.1 – 2 mm
- Max. strip cross section: approx. 190 mm²
- Min. and max. yield point: approx. 200 – 600 N/mm²
- Min. and max. strip speed: 5 – 30 m/min
- Surface treatment of the leveling rollers: hard chrome coated

Coiler:

- Available with driven horizontal or pull off vertical unwinder
- For unwinding of coils directly from the pallet
- Universal, extremely high-quality pallet unwinder
- Contactless rotation speed control via ultrasonic sensor
- Winding direction can be reversed
- Robust machine body with high load-bearing capacity
- Can be supplied in various sizes due to modular design
- Further options available

Leveling material:

- Copper, steel, aluminum, stainless steel, fully or partially finished strips with precious metals
- Strip thickness: max. 2 mm
- Strip width: max. 120 mm
- Tensile strength: 200 – 600 N/mm²

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Photo above: The unlevelled material has tensions and unevenness. Photo below: With precision leveled strip material the stresses are reduced to a minimum.



Easy accessibility allows for quick and straightforward cleaning of supporting rollers and leveling rollers.

FOR LEVEL, LOW-TENSION BLANKS

SHEET METAL SPECIALIST DEUMU DEPENDS ON THE PRECISE AND EFFICIENT PEAK PERFORMER PART LEVELING MACHINE FROM KOHLER

Sheet metal blanks and welded assemblies made of different steel materials are a specialty of Deutsche Erz- und Metall-Union GmbH (DEUMU) a subsidiary of Salzgitter AG in Salzgitter. Further processing requires that the manufactured parts be as level and low-tension as possible. To ensure this, the company uses a Peak Performer part leveling machine from KOHLER Maschinenbau GmbH.

Steel and metal processing companies across all industries have been facing the same challenges for years: customers are placing tighter demands on quality, speed, and flexibility, while international competition is becoming tougher and more intense as a result of ongoing globalization. Numerous steel distributors are therefore evolving from pure suppliers into flexible service providers and manufacturing partners.

Deutsche Erz- und Metall-Union GmbH (DEUMU for short) is a long-standing expert in this field. The company's areas of expertise include the processing of steel scrap, logistics and purchasing services, as well as steel processing. As a fully owned subsidiary of Salzgitter AG, today the DEUMU steel processing business unit employs around 70 people and generates sales of roughly 18 million euros per year.

Extensive machinery for sheet metal processing

DEUMU uses an extensive portfolio of machinery to manufacture the desired products in the required quality. Two plasma and oxy-acetylene flame cutting systems respectively, a five-axis chamfering robot for weld seam preparation, a continuous blasting system, as well as various press brakes are all in operation at the site. With the Peak Performer 130P.2000 from KOHLER, the company also has a state-of-the-art, high-performance part leveling machine at its disposal.

DEUMU mainly processes sheets made of structural steels such as S355, high-strength fine-grained structural steels such as S700 and S960, and wear-resistant special structural steels. "The parts are cut from sheet metal plates on the plasma or oxy-acetylene torch lines and then cleaned and blasted," says production manager Thomas Kleinwechter. DEUMU also levels entire sheet metal plates on its machinery prior to

delivery to the customer's premises, after which these are cut to size.

Consistently high product quality thanks to part leveling

"Consistently high quality is essential for our customers," emphasizes Kleinwechter. "We therefore work according to the provisions set out in numerous certifications and approvals, such as ISO 9001, ISO 14001, ISO 18800, and railroad approval." Extensive demands are consequently also placed on the levelness of the manufactured parts: The tolerance is usually below one millimeter per meter. Leveling is therefore a pivotal step in the process chain. "Following this process, the parts are not only level, but also exhibit less tension," explains Kleinwechter. "This delivers us decisive advantages when it comes to further processing, for example higher fitting and repeat accuracy during edging as well as significantly reduced distortion during welding."

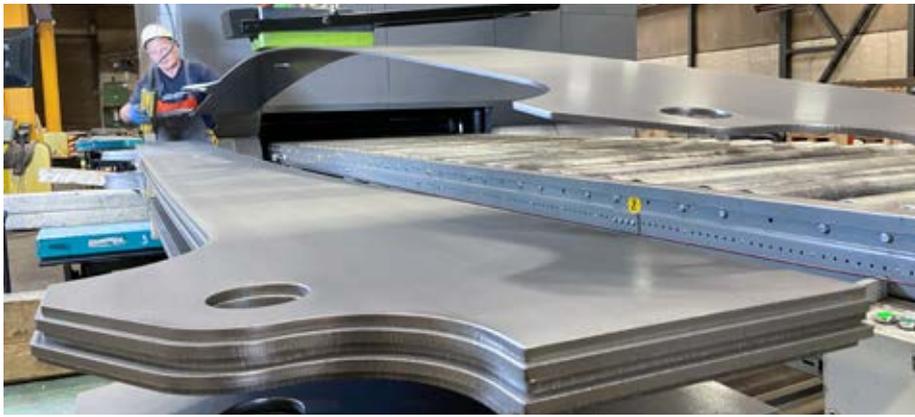
The company used a mechanical part leveling machine for this purpose for decades. However, the machine had become rather outdated and was no longer able to satisfy today's requirements. "It had been apparent for a long time that we needed to make a change," recalls Kleinwechter.

Part leveling machine with numerous advantages

With the Peak Performer range, which has enjoyed many years of success, KOHLER offers high-performance and energy-efficient part leveling machines for numerous applications. These machines are used in particular for leveling parts, blanks, and whole sheet metal plates.



Around 400 tons of material are leveled at DEUMU every month on average.



Depending on customer requirements, DEUMU produces blanks or complete welded assemblies, which the company can also machine and paint.

The machine boasts a range of future-oriented technical features: The leveling rollers, for example, are powered by a direct drive. This increases energy efficiency, reduces wear, and makes it possible to level larger cross sections. This means that leaks are not an issue, the drive is insensitive to temperature fluctuations, and the lower power consumption also makes it extremely environmentally friendly.

” Hydraulics are not required in this system.”

Thomas Kleinwechter,
Production manager at DEUMU

A further advantage of the Peak Performer is its advanced cleaning system for easy cleaning of the leveling rollers and supporting rollers. This allows both the upper and lower leveling units to be extended by electric motor. When extended, all components can be cleaned very easily.

The electromechanical leveling gap control patented by KOHLER ensures consistently good leveling results and therefore also compliance with the quality requirements at DEUMU. “The arguments in favor of the Peak Performer impressed us across the board,” says Kleinwechter. “Furthermore, the exchange of information between us and KOHLER was brisk from the outset. We received answers to all our questions, and KOHLER was able to demonstrate the required leveling quality beyond doubt through various tests in the in-house leveling center. So we knew exactly what to expect from the machine.”

Individually integrated into the existing production setup

The responsible people at DEUMU therefore resolved to replace the existing part leveling machine with a KOHLER Peak Performer 130P.2000.

Production manager Thomas Kleinwechter is more than satisfied with the outcome of the

Machine and material facts

Part leveling machine:

- Peak Performer 130P.2000
- Direct drive for the leveling rollers free of hydraulics
- Advanced cleaning system for leveling rollers and supporting rollers
- Electromechanical leveling gap control
- Intelligent overload protection
- Reversible leveling rollers
- Extra-wide supporting rollers
- Roller path inlet side / outlet side: 6,000 mm respectively

Material to be leveled:

- Sheets of structural steels, high-strength fine-grained structural steels, and wear-resistant special structural steels
- Width: Up to 2,000 mm
- Material thickness up to 40 mm
- Quantity: Up to 400 tons per month
- Levelness requirement: 1 mm per meter

project: “The Peak Performer has brought us even greater quality improvement than we would have expected,” he sums up. “After around two years in multi-shift operation, we are totally convinced that we made the right decision.”

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KOHLER SCORES TOP MARKS FOR LEVELING

In the first half of 2021, KOHLER received highly positive feedback for contract leveling and can be extremely satisfied with a high recommendation rate. It was particularly apparent from the results of the survey that customers were very positive overall when rating the contract leveling service: From advice and order processing to the quality of the leveled parts, KOHLER received very good scores across the board.

High recommendation rate

The results speak for themselves: the customers surveyed were extremely satisfied or very satisfied with the leveling results achieved and with the high quality of the parts after leveling. The (punctual) processing of orders as well as the competence and friendliness of the staff handling

contract leveling orders at KOHLER were also rated very highly. So it is little wonder that the Net Promotor Score stood at 89%, meaning that almost every customer would recommend KOHLER to others. We would like to thank our customers for the trust they expressed in the survey, and for the high rating. Our team is delighted about the positive feedback. It endorses our work and motivates us to continue to provide our customers with the best contract leveling service possible.

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72 TONS CONTRACT LEVELING

There is a lot to do – but that is no problem for our leveling center!

Especially in times of decreasing sheet metal qualities, we „save“ the further processing on laser and punching machines with our leveling machines and thus ensure the perpetuation of the process chains. We also handle large contract leveling orders such as this one with 72 tons of sheet metal with the usual reliable service.

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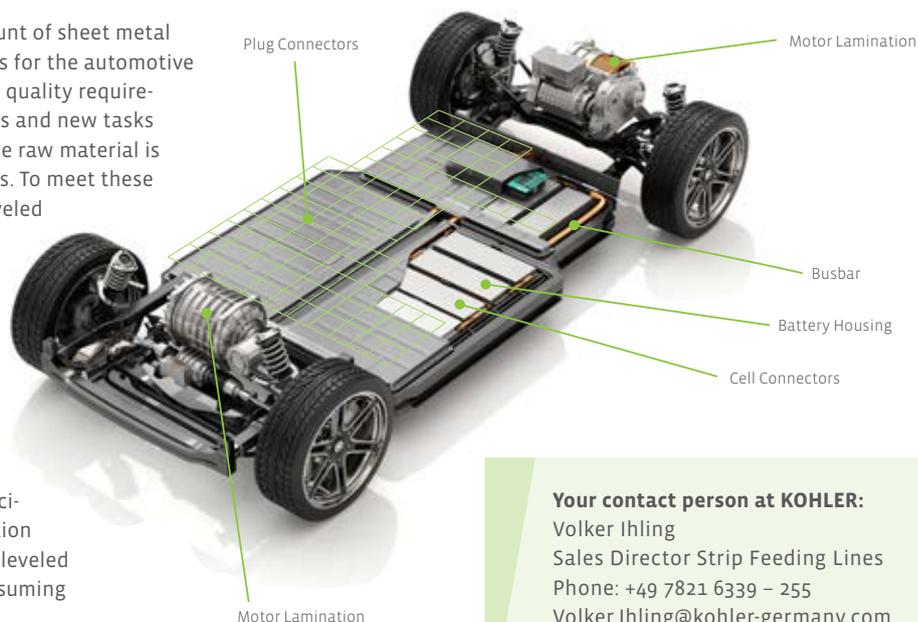
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KOHLER LEVELS FOR E-MOBILITY

The reduction of CO2 emissions from vehicles and the attainment of climate targets are topics that have been with us for years and are becoming increasingly urgent. With its strip feeding lines and part leveling machines, KOHLER contributes to the production of important components for e-mobility and in doing so makes a contribution to environmental and climate protection.

In the sheet metal processing industry, the amount of sheet metal processed to manufacture electrical components for the automotive industry is increasing steadily. While ever higher quality requirements are being placed on electrical components and new tasks are arising constantly, the available quality of the raw material is increasingly posing a challenge - also to suppliers. To meet these new requirements, strips and sheets must be leveled before further processing.

KOHLER strip feeding lines and part leveling machines are used around the world to precisely level coil material and sheets for rotor-stator production, battery housings, battery connectors, cell connectors, and plug connectors for electric motors, for example. This minimizes tension and unevenness in the material and ensures compliance with strict specifications. Furthermore, the downstream production processes benefit from the higher quality of the leveled parts and sheets, because manual and time-consuming rework is superfluous. ■



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THE HEAT IS ON!

Everyone is familiar with the pellet and wood stoves that provide countless households across the globe with cozy warmth during the cold winter season. Did you know that the leveling of parts for these stoves makes the subsequent steps in the manufacturing process, such as welding and assembly, quicker and of higher quality? Leveling produces flat, low-tension sheets that ensure a reproducible and high-quality product without manual rework.

KOHLER is supplying pellet and wood stove manufacturers in Benelux and a riparian state of the Danube with two Peak Performer part

leveling machines 60P.1600. In future, parts made from untreated steel for the housing and storage area of the stoves will be leveled here, with the individual parts then being welded into assemblies by robots in subsequent steps. ■

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You can withdraw your consent to receiving information in future at any time by sending an email to kohler@kohler-germany.com or by writing to KOHLER Maschinenbau GmbH, Data protection department, Einsteinallee 7, 77933 Lahr/Germany.

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