

KOHLER NEWS

Issue 34

STRESS-FREE LEVELING WITH AN ARTISTIC TOUCH

Contract leveling for the future of e-mobility  New 90P product  Easing through the energy transition

Contract leveling for the future of e-mobility

Level, low-stress metal sheets for battery housing covers

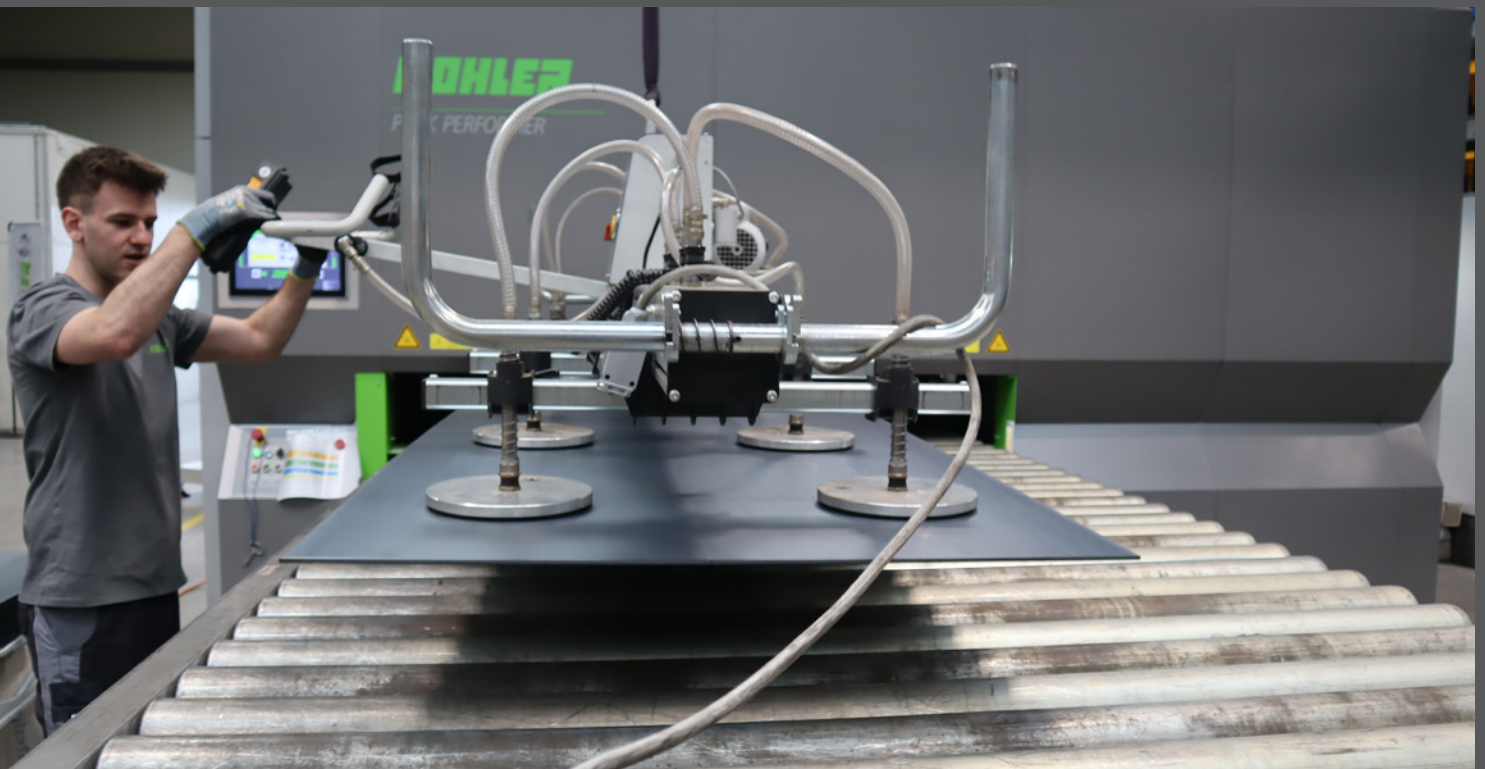
voestalpine Automotive Components Dettingen GmbH & Co. KG is a leading automotive supplier based in Dettingen an der Erms, Germany. Automotive Components is a specialized business unit of the Metal Forming Division at voestalpine AG.

Working as a global partner, the company aims to provide the automotive industry with the best possible support as it pursues new solutions in lightweight automotive construction. voestalpine offers an impressive range of services in terms of materials, production technology, and cost efficiency – from blanks through to

ready-to-install components. With a team of around **5,000 employees** at **14 production** sites worldwide, the voestalpine Automotive Components Cold Stamping & Assemblies Group is a strong partner for innovative lightweight solutions designed with the future of mobility in mind.

The company is tackling a number of special challenges in production, such as complying with tolerance requirements and standards in the automotive industry as well as implementing the zero-defect strategy, which is crucial to its ranking as an A, B, or C supplier.

voestalpine's machinery includes presses with a **capacity of 100 to 3,000 metric tons**, which are used for the production of sheet metal parts. The company's customer base is made up of big-name car and truck manufacturers around the world. Processes in production include punching and forming coils and laser cutting processes for blanks. **Ninety-five percent of production** takes place on the coil line, which is followed by 3D forming. But in order to achieve its zero-defect strategy, voestalpine has certain parts such as battery housing covers leveled by the professionals at KOHLER Maschinenbau GmbH.



The S700 steel sheets for battery case covers with a thickness of 6 mm, a width of 950 mm, and a length of up to 2,560 mm are leveled at KOHLER's contract leveling center to achieve a levelness tolerance of 5 mm/m.

Leveling the playing field for sustainable solutions

Working with KOHLER has proven an efficient way to eliminate leveling issues – even for **uneven material measuring as much as 13 mm**. voestalpine's aim is to meet the highest quality requirements and optimize downstream work processes such as lasering, drilling, and various reworking jobs on the surface and outer contour, so the S700 steel sheets with a **thickness of 6 mm**, a **width of 950 mm**, and a **length of up to 2,560 mm** are leveled at KOHLER's contract leveling center. S700 is a high-strength, hotrolled steel product that was specially developed for cold forming processes and has a **minimum yield strength of 700 MPa**.

The requirements: levelness tolerance of up to 0.5 mm/m

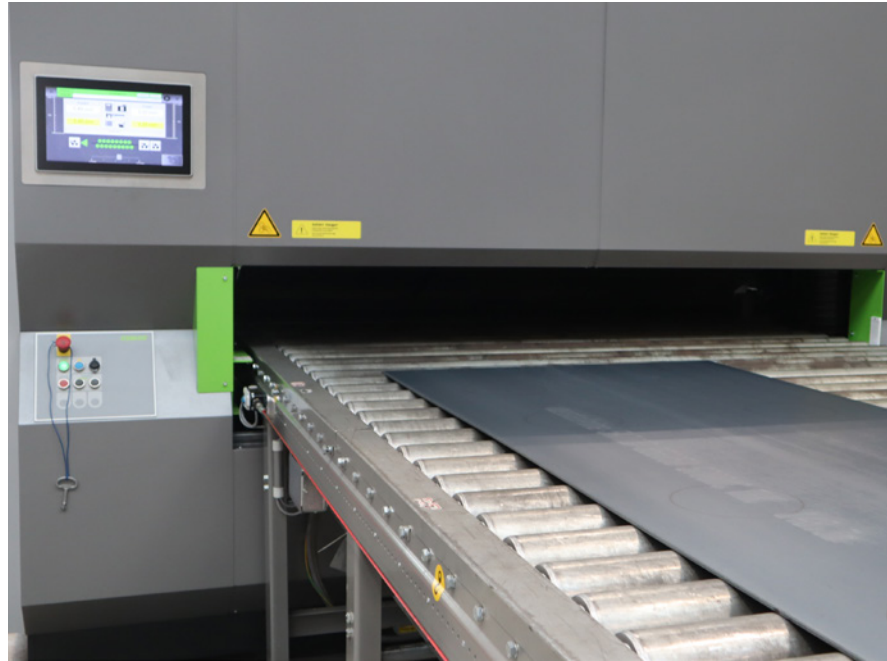
voestalpine requires a leveling precision of **0.5 mm per 1 m**, which means that the S700 steel parts resting on a perfectly ground stone slab should only protrude **0.5 mm** from this slab.

"Without KOHLER, we couldn't achieve the flatness tolerance our customers need. We haven't had any more levelness issues since KOHLER started leveling the steel plates for our battery case covers. We're really happy with the results and have 250 metric tons of steel leveled every month. Saving time isn't our top focus – our main concern is getting our sheet metal level enough to achieve the requirements of our zero-defect strategy," stresses Hans-Martin Reinhardt, who heads up the pilot series prototyping center at voestalpine Automotive Components Dettingen GmbH & Co. KG.

Hassle-free leveling without an in-house part leveling machine

In general, all metals with a distinct yield point and an **ultimate elongation of at least five percent** can be optimally leveled. If these values haven't been determined ahead of time, KOHLER Maschinenbau GmbH offers individual leveling trials at its leveling center in Lahr, which houses all the right equipment. The center of expertise has a variety of Peak Performer part leveling machines on hand to level sheet metal with **widths of up to 2,500 mm** and **thicknesses of between 0.2 and 54 mm** and more.

If, as with voestalpine, investment in in-house leveling technology is out of the question, KOHLER offers high-quality contract manufacturing with a broad range of part leveling machines, innovative features, and tailored service ranges. Customers can count on optimum and, most importantly, consistent leveling results, leaving them free to focus on their core areas of expertise – even when working with perforated sheets, thick sheets, or parts with complex geometries.



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250 metric tons of steel are leveled every month at KOHLER's contract leveling center.

Your contact person at KOHLER:

Klaus Wehrle
Head of Leveling Center
Sales Manager Part Leveling Machines
Phone: +49 7821 6339 – 254
Klaus.Wehrle@kohler-germany.com



Watch the video!

Product innovation for stress-free leveling technology

The new Peak Performer 90P part leveling machine boasts a **streamlined machine concept** and new **functional design components**.

KOHLER Maschinenbau GmbH specializes in leveling technology and regularly launches groundbreaking innovations in the field of leveling technology onto the market. Energy efficiency, optimization of operating costs, ease of maintenance, and functional design were the focus when designing this new part leveling machine.

Stresses exerted on sheet metal play a decisive role in all areas of sheet metal processing, including cutting, punching, edge trimming, bending, welding, and assembly. When combined with the levelness properties of the blanks, this has a critical influence on all upstream and downstream production processes. Professionally leveled sheets are low in stress and have the required degree of levelness to be processed further with ease.

KOHLER's part leveling machines impress with optimum leveling results. The Peak Performer part leveling machines can level sheets between **0.2 and 66 mm** thick, have no hydraulic systems whatsoever, and—thanks to their high energy efficiency—play an active role in saving resources in the industrial sheet metal processing sector. The company is breaking new ground and confirming its position as the market leader with its use of optimized drives and the patented electromechanical dynamic gap control in hydraulic-free part leveling machines, as well as other patented components such as reversible leveling rollers.



The new Peak Performer 90P part leveling machine boasts a streamlined machine concept and new functional design components.

Leading the way in innovation and energy efficiency

The new **Peak Performer 90P** part leveling machine accommodates **sheets up to 2,500 mm wide** and is equipped with an optimized drive that both improves force flow and increases drive torque while maintaining the same level of performance.

Operating costs and downtime for expensive maintenance work have been minimized, as the new machine concept involves fewer spare and wear parts. On the drive side, improved accessibility has been assured to make the already limited maintenance work considerably easier.

The slimmer design not only reduces the space requirement even further, but also offers greater flexibility in terms of transportation, as cost-intensive special transport with an escort vehicle is no longer needed. The new product also offers more flexibility in terms of the material being leveled due to the **40 %** reduction in the minimum part length. What's more, the reversible leveling rollers developed and patented by KOHLER significantly lower one-sided wear on the rollers of the **90P**. This extends the service life of the leveling rollers and increases the machine's efficiency.

Plus, the new **90P** also boasts strong environmental credentials. Thanks to the use of group drives for the **17 leveling rollers** alongside the tried-and-tested electromechanical dynamic gap control, the new part leveling machine outperforms conventional hydraulic machines on the market **with energy consumption slashed by up to 75 %**. Operating the **90P** is now even easier too. The HMI and the Expert Calculation System tool for determining suitable leveling parameters, which is installed as standard, are of such a simple and intuitive design that the operator can quickly locate the appropriate material-specific settings. Presaved settings for known parts can also be accessed quickly, making the whole process much more straightforward.

Visual highlights add functional value

Last but not least, the new **90P** features attractive machine lighting, which visualizes the operating status. For example, an error message is signaled by a red light at the infeed and outfeed, while a smooth leveling process is indicated with a green light. The **90P** truly stands out from its competitors. This compact part leveling machine from KOHLER is the perfect new product for stress-free efficiency, and it looks good to boot!



The fully retractable leveling cassette enables all the rollers to be cleaned quickly and easily. This extra feature not only improves the leveling results by eliminating contamination, but it also considerably extends the service life of the rollers.

Your contact person at KOHLER:

Jens Schendekehl
Sales Director Part Leveling Machines
Phone: +49 7821 6339 – 256
Jens.Schendekehl@kohler-germany.com

Peak Performer 90P product innovation

- Width of the sheets: up to 2,500 mm
- Material thickness of the sheets: from 1.0 mm to 28 mm
- Patented electromechanical dynamic gap control – fast response for consistent leveling results
- Advanced cleaning system (optional)
- Intelligent overload protection
- Intuitive user interface
- Servo-electronic machine concept without hydraulics for added environmental benefits
- Energy-saving and easy to maintain
- Lean machine concept
- Functional design



Watch the video!

Is leveling an art?

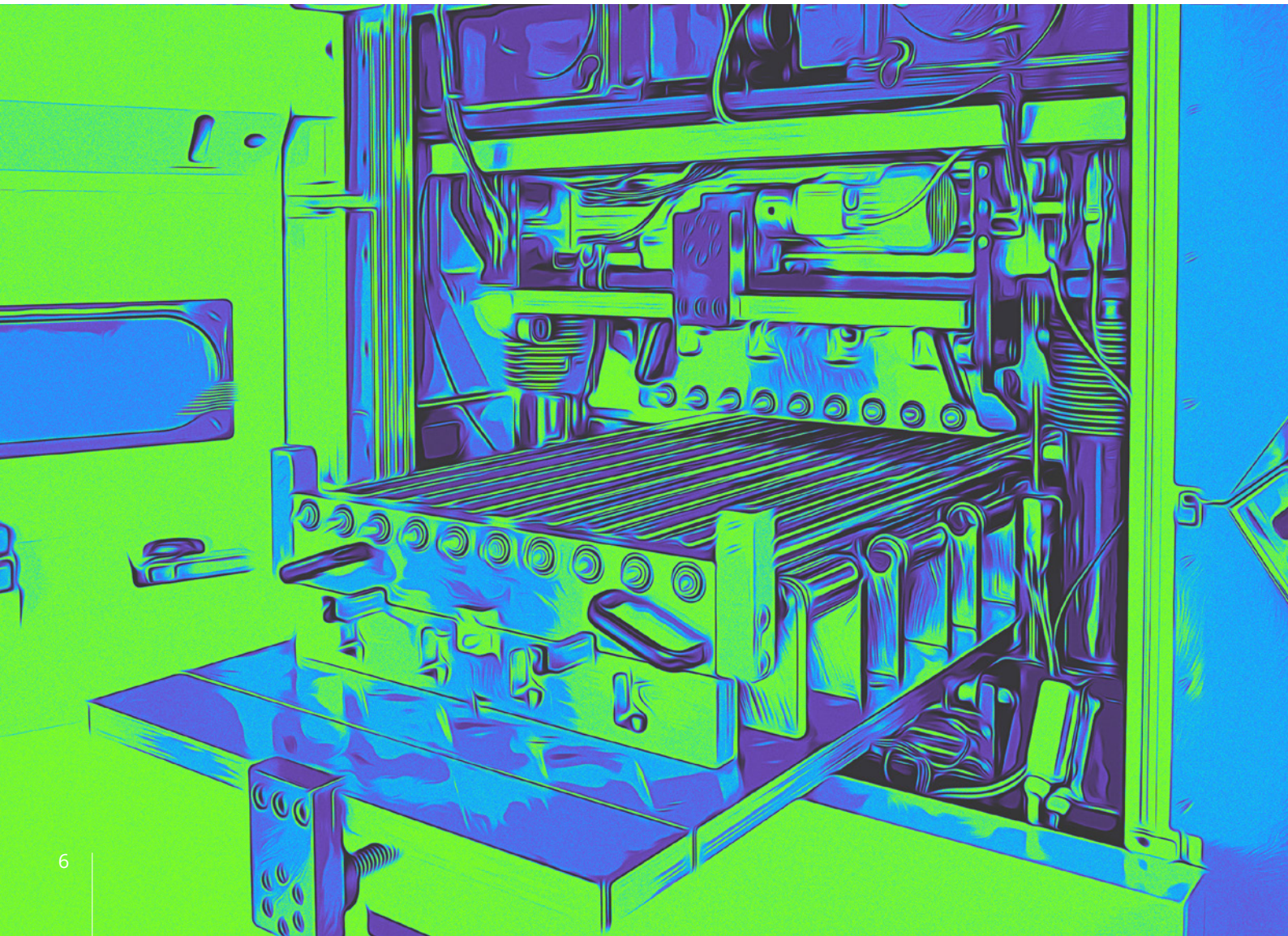
Leveling sheet metal is undoubtedly a process that requires state-of-the-art **technology, precision, and expertise**. But is leveling an art?

Technical precision and expertise point the way forward

Leveling sheet metal requires an in-depth understanding of the correlations between the material properties and physical principles that go into the deformation of metals. Factoring in yield points and degrees of plastification is key when it comes to achieving optimum leveling results, along with using the right techniques.

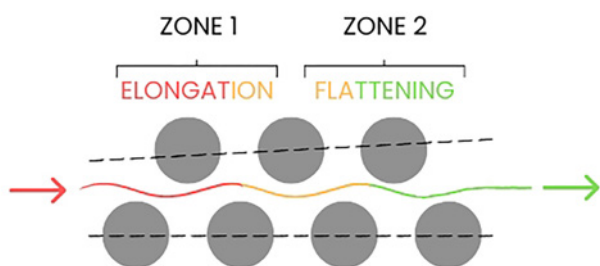
Sheet metal leveling on a roll leveling machine consists of a series of repeated bending operations. During this process, the material is subjected to ever decreasing alternating bending generated by offset leveling rollers.

Imagine the bending process as a decaying sine curve. As the material passes through the first leveling rollers, it is subjected to strong alternating bending, which becomes weaker as leveling progresses. Finally, the curvature and bending are reduced to the extent that the sheet can adopt a flat state without any additional springback.





The alternating bending and continuous decrease in forming mean that after leveling, the material is, for all intents and purposes, stress-free. Areas of the material that were previously under stress are elongated and compressed around the neutral axis beyond the yield point to achieve the desired level of stress reduction.



The machine concept plays a central role in this process. Sophisticated modern machines such as the strip leveling line and part leveling machines made by KOHLER Maschinenbau GmbH are equipped with advanced features that allow for efficient, precision machining. These machines are designed to achieve optimum leveling results in terms of flatness and stress reduction, thereby enhancing quality and productivity in sheet metal processing. Aspects such as trendsetting drive concepts and dispensing entirely with hydraulic systems set new standards and deliver consistent profitability over the long term.

Technology meets craftsmanship

In addition to technical expertise and a state-of-the-art machine concept, the user's manual skill also plays an important role. There's no question that leveling is a process that calls for a sure instinct and good eye for detail. Every geometry and every material involves different challenges and problem-solving capabilities – whether due to the material properties or the customer's specific requirements. KOHLER has responded to these challenges by offering custom leveling trials at its leveling center.

When leveling transforms appearance

A further aspect of leveling is the pursuit of flatness and aesthetics in equal measure. A perfectly level piece of sheet metal that is flat and stress-free not only optimizes downstream processes such as welding and assembly but also enhances the product's look. Flat materials with smooth surfaces and precise edges give the end product a readily visible air of superior quality.

The art lies in the combination

Given all these factors, the art of leveling sheet metal comes down to a brilliant combination of technical knowledge, advanced machine design, experience, and a craftsman's sense of what is feasible. KOHLER is committed to this art and is setting impressive standards throughout the industry.

For an inspiring and stress-free read, check out our latest issue of KOHLER News, where we present our new Peak Performer 90P as well as our success stories. We're sure you'll be impressed!

Indian job shop opts for part leveling machine from KOHLER

For upstream and downstream work processes **optimizing** sheets with **minimum stress**

Whether laser cutting, deburring, edge trimming, welding, or assembling – the levelness and stress of the sheet metal play a decisive role in all areas of sheet metal processing. Professionally leveled sheets are low in stress and have the required degree of levelness to be optimally processed further.

In order to meet the stringent quality and levelness requirements of international customers such as SIEMENS, POWER SYSTEMS, General Electric and Alstom, a Peak Performer 30P.1300 part leveling machine from KOHLER Maschinenbau GmbH is now successfully being used at Gorasia Industries Pvt. Ltd.

The **45 employees** at the Indian job shop now process **70 to over 300 tons of material each month**. Gorasia Industries was founded in 1985 by Gorashiya Murji Harji with the aim of delivering high-precision sheet metal products quickly and at attractive prices. Its **factory covers 2,500 m²** and boasts state-of-the-art machinery: **one laser cutting machine** from Salvagnini; **three press brakes** from Bystronic, Amada, and Accurpress; **one deburring machine** from Time-savers; and **various manual welding systems**. To improve quality and reliably shorten throughput times, the production line has recently been expanded with the addition of a Peak Performer 30P.1300 part leveling machine from KOHLER Maschinenbau GmbH.

Depending on the order volume and



A Peak Performer 30P.1300 part leveling machine rounds out the impressive list of machinery found at Gorasia.

customer requirements, the company, which is headquartered in the state of Gujarat in western India, offers a flexible shift system with **one to three shifts**. Its main products range from cut parts to complete machine housings, with the focus being on **steel (70%), stainless steel (20%), and aluminum (10%)**.

Level sheets optimize processes with minimum stress

The Indian job shop knows only too well that stamped and laser-cut sheets have to be leveled before they can be further processed. The more level the parts are and the less stress they exhibit, the easier it is to edge, bend, weld, and finally assemble them. Before acquiring the part leveling machine, experienced employees had to painstakingly level sheets manually using hammers to meet

the customers' high levelness requirements. This process was time-consuming and not always precise. It was also a big problem if an experienced employee was off work.

*„Manual leveling didn't allow us to achieve the optimal results we needed in the long run. Since our customers are increasingly demanding tight **levelness tolerances** – in some cases of just **0.1 mm/m** on the end product – the decision to invest in a part leveling machine was not a difficult one. We discovered the KOHLER part leveling machine thanks to GVK METALFORMS. GVK is a close sales partner of KOHLER and was able to show us the perfect machine. The KOHLER part leveling machine has proven to offer a huge number of benefits, as it enables faster and more flexible production with less reworking and fewer complaints.*



Perforated components such as speaker grills or perforated and facade components can also be optimally leveled on the 30P.1300.



The part leveling machine was successfully commissioned in India.

The machine's ease of use and maintenance as well as the advanced cleaning system which assists us when changing from structural steel to stainless steel or aluminum play their part in ensuring the machine is efficient and durable. As soon as we had commissioned the machine and produced the first leveled parts, we realized that this machine would save us a huge amount of time and we would be able to meet customer requirements faster and with a greater degree of precision. We were also able to perfectly level perforated components such as speaker grills or perforated and facade components which are intended as high-quality design elements on the KOHLER Peak Performer," explains Rupesh Gorashiya, Managing Director at Gorasia.

Leveling: Quality right from the get-go

Advantages of leveled components include a higher repeatability of the

bending angle during edge trimming and the accuracy of fit of the parts during welding thanks to stress in the sheet metal being reduced to a minimum and the parts exhibiting less distortion.

As a result, downstream work becomes more reliable and more efficient, as time-consuming reworking is eliminated. The ease of use of the machine as well as of the advanced cleaning system impressed Gorasia right away. It is important not to forget to regularly clean the leveling rollers and supporting rollers to remove dirt particles, especially when processing a mix of steel and stainless steel. This prevents abrasive particles from being deposited on the leveling material and dirt or even scratches impairing the material being leveled. Thanks to the fully extendable leveling cassette, the leveling rollers and supporting rollers can be easily

cleaned by only one person between two leveling jobs. This additional feature not only improves leveling results by preventing contamination, but also reduces unwanted scrap.

Looking to the future with minimum stress

This success story shows how investing in state-of-the-art leveling technology from KOHLER optimizes production processes and prepares companies for future challenges. Gorasia Industries Pvt. Ltd. is also planning on expanding and has already purchased a large plot of land. Although no construction work is currently planned, they do have the flexibility to start construction within the next six months. In the new facility, Gorasia intends to produce larger and thicker components and will, therefore, need a larger part leveling machine when that time comes.

Part leveling machine at Gorasia

- **Peak Performer 30P.1300**
- **Levels sheets made of steel, stainless steel, and aluminum**
- **Width of the sheets: up to 1,300 mm**
- **Material thickness of the sheets: up to 6.5 mm**
- **Advanced cleaning system**
- **Intuitive user interface**

Your contact person at KOHLER:

Jens Schendekehl
Sales Director Part Leveling Machines
Phone: +49 7821 6339 – 256
Jens.Schendekehl@kohler-germany.com



f.r.t.l. Dennis Christner, Chief Sales Officer at Leicht Stanzautomation GmbH, Harald Müller, Managing Director of DREEFS GmbH, and Tobias Frank, Project Manager at KOHLER Maschinenbau GmbH in front of the horizontal decoiler with integrated CPL 120 precision leveling machine.

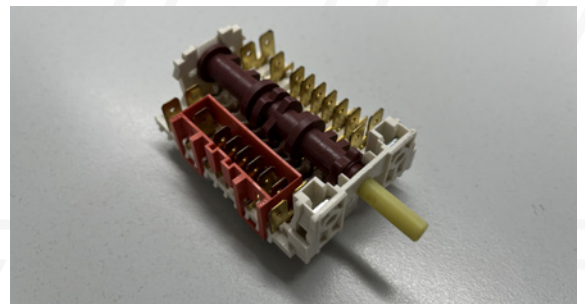
DREEFS GmbH

Precision Leveling Machine + Horizontal Decoiler:

The **perfect combination** for stress-free process optimization

Founded in 1903 and rooted in Marktrodach, Germany, DREEFS GmbH Schaltgeräte und Systeme is a company steeped in tradition and has firmly established itself as a leading manufacturer of electromechanical switches. The company has been part of the Everel Group since 1996 and has specialized in the production of contacts for all types of electromechanical switches since around 2008.

With an annual turnover of **9 million euros** and **23 employees**, DREEFS produces around **500 million contacts annually** at maximum capacity utilization, mainly with welded silver contacts for electromechanical switches used in various sectors such as household appliances, automotive, garden, outdoor, and healthcare.



DREEFS produces around 500 million contacts annually at maximum capacity utilization, mainly with welded silver contacts for electromechanical switches used in various sectors such as household appliances, automotive, garden, outdoor, and healthcare.

The modern machinery employed by DREEFS includes **nine stamping presses** from well-known brands such as BRUDERER, HAULICK ROOS and Mabu, which are exclusively equipped with Bihler welding systems, as well as peripheral equipment from KOHLER and Leicht. The stamping presses have a **pressing force of up to 64 metric tons** and run for around **5000 hours a year at speeds of up to 1500 strokes per minute** in three-shift operation.

DREEFS mainly processes copper alloy strips for the manufacture of switch contacts. **Every year**, some **800 metric tons** plus around **2700 kg of silver** are used to weld the contacts. The **material thickness** varies between **0.12 and 0.8 mm** and the **width** between **5 and 65 mm**. The company predominantly uses horizontal decoilers from Leicht Stanzautomation GmbH to unwind the strips and feed them into the stamping presses.

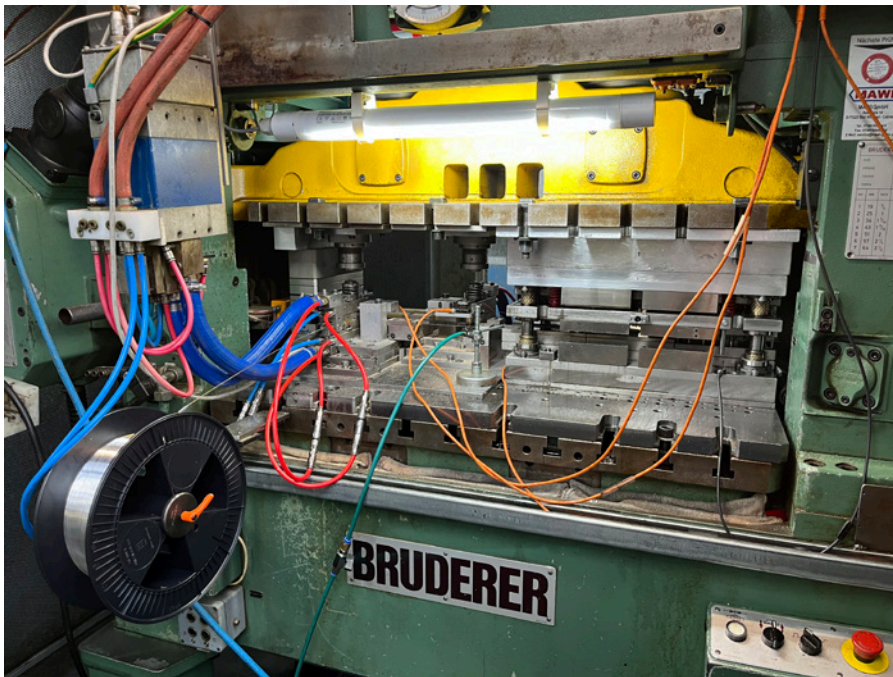
Some of the finished products are wound onto spools as endless strips using Leicht vertical rewinders, but the majority of products are stamped as individual parts in boxes. For machines that produce class A parts, Leicht box changers are used in a patternster system or in a rotary table format.

Welding is carried out almost exclusively using BIHLER welding technology. The biggest challenge in this area is ensuring that the silver contacts are properly welded onto the substrate material. To fully guarantee that the contacts are successfully welded, the raw material must be leveled.

Cutting costs with level, low-tension strips

In order to achieve perfect welding results and further optimize its production processes, DREEFS decided to use a horizontal decoiler from Leicht's PWL-150 series in conjunction with a CPL 120 precision leveling machine from KOHLER Maschinenbau GmbH. There were a number of factors behind this decision, not least the fact that the substrate material for a large number of contact parts has been changed from half-hard brass to unalloyed DC01 steel for cost reasons, meaning that leveling and smoothing the material is essential.

"Integrating the compact precision leveling machine into the control system of the horizontal decoiler has considerably reduced the complexity of the material handling process and saves both time and space when placing and threading new coils. What's more, it has reduced waste and improved the welding results. The compact design of the decoiler and integrated leveler with its extremely small footprint appealed to us immediately. The switch from brass to steel strips, which generated material cost savings of around 90 %, would not have been possible without the CPL 120 from KOHLER. This has made the production process more efficient overall. With many years of excellent experience with a KOHLER leveling machine that has been in use since 1979, we are repeat offenders in the truest sense of the word and have once again opted for the market leader in precision leveling machines for this purchase. We have similarly good experiences with Leicht products in materials management."



DREEFS operates high-performance stamping machines that can run at speeds of up to 1500 strokes per minute.

Each operator looks after **two to three machines per shift**. The machines are equipped with state-of-the-art control technology and are monitored by up to four computers with SPC (statistical process control) systems. DREEFS produces stamped and welded parts with **an output of 150 to 6400 parts per minute** with these machines. This high speed is crucial in order to be able to offer customers prices that are not only competitive but also extremely attractive.

DREEFS mainly produces parts for internal production sites in Italy and Romania, whose customers include renowned companies such as Volkswagen, BSH, Miele, Elektrolux, Gorenje, WOLF, Franke, Hisense, and Amica, and supplies markets in Europe, Turkey, the USA, and Mexico, as well as elsewhere.



DREEFS produces stamped and welded parts at speeds of 150 to 6400 parts per minute. The majority of products are stamped as individual parts in boxes.

The progressive tools used mainly comprise two to eight stations. This delivers a production output of up to **1100 welded parts and 6400 stamped parts per minute**.

The horizontal decoiler with integrated precision leveling machine is the optimal solution for us," says Harald Müller, Managing Director of DREEFS GmbH Schaltgeräte und Systeme.

Precise leveling results thanks to optimum roller diameter

In addition to its compact design, particular attention has been devoted to the number and design of the leveling rollers in the KOHLER CPL 120 precision leveling machine. The **19 leveling rollers** are supported by a large number of supporting rollers, which ensures a high level of 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 also exhibits high rigidity in order to compensate for leveling pressure.

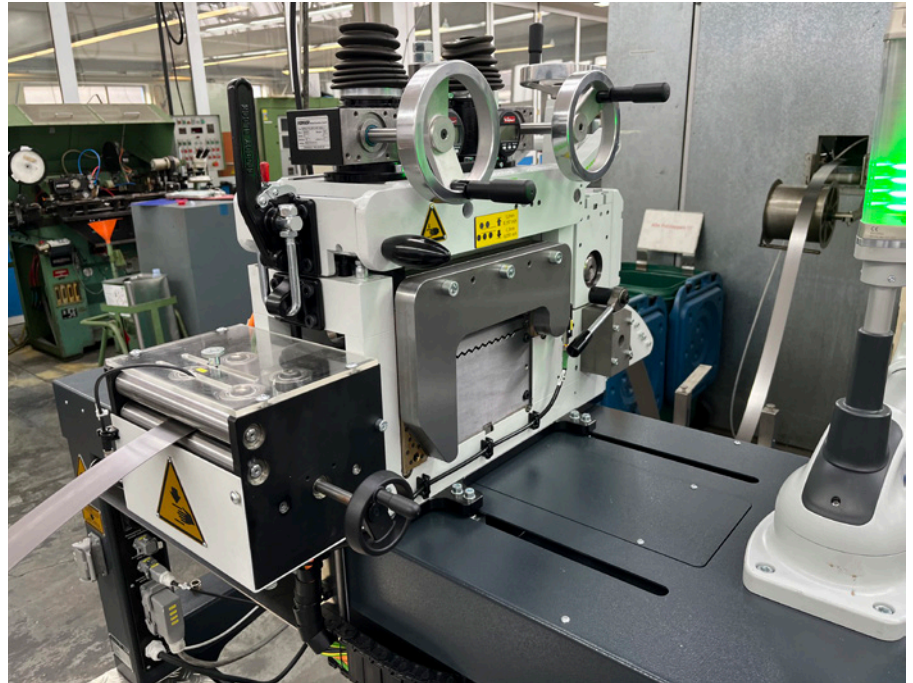
Leveling with a high degree of plastification even for thin strips

The CPL 120 enables degrees of **plastification of more than 70 percent** to be achieved, reliably eliminating tension and unevenness in the strip material. The result is a much more stable production process for components that meet even the most stringent precision requirements. Operating costs can also be reduced, 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 machine is ideal for leveling **strips up to 0.8 millimeters thick** and more. The settings can be configured with sensitivity and precision. The leveling process is always stable and delivers optimum, reproducible results. *"The leveler combined with the horizontal decoiler is simply brilliant,"* says Thomas Weber, Shift Manager at DREEFS.

Optimum quality assurance thanks to industry 4.0

Thanks to the almost seamless integration of all processes in accordance with the Industry 4.0 standard and the networking of all machines via an MES system from MARPOSS, DREEFS can seamlessly track the entire pro-



High-speed production with approx. 800 welded parts per minute requires optimally leveled strips before reaching the welding process. The slightest distortion of 0.05 mm would lead to a poor welding result.

duction process right down to the individual contact parts and their boxes or coils at any time. This means that all stamping and welding parameters can be continuously monitored and recorded. It is also possible to assess the quality of the raw material and any quality fluctuations, and ultimately the leveling results achieved. High-speed production with

800 welded parts per minute requires a gentle material feed and optimally leveled strips before reaching the welding process. The **slightest distortion of 0.05 mm** would lead to a poor welding result, and this in turn could pose a considerable risk in the final application, e.g. in an oven. If there is no silver contact, the oven switch would melt and continue to heat the oven in the on position with no possibility of switching it off, which could ultimately lead to a room fire.

As part of quality assurance measures in accordance with Industry 4.0, defective parts are sorted out at DREEFS or the machine is stopped if there are minimal deviations from the standard process parameters. All parameters are stored and can be used to perform a comprehensive analysis if required.

Stress-Free from start to finish

The collaboration between DREEFS and cooperation partners Leicht and KOHLER has been smooth and stress-free throughout. The perfectly coordinated machines from KOHLER and Leicht play a key role in optimizing production processes and enable DREEFS to maintain its high quality standards while increasing efficiency.

The switch from copper alloys to cold-rolled strip is currently being considered for other products. This has the potential to generate enormous savings thanks to the lower material costs. DREEFS will continue to rely on the products and support of Leicht and KOHLER in the conversion of its processes.

Facts about CPL 120 and the leveling material:

Leveler

Torsion-resistant design	
Number of leveling rollers	19, all leveling rollers supported
Min. and max. strip width	10–120 mm
Min. and max. strip thickness	0,1–2 mm
Max. strip cross section	approx. 190 mm ²
Min. and max. yield point	approx. 200–600 N/mm ²
Min. and max. strip speed	5–30 m/min

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/mm ²

Your contact person at KOHLER:
Volker Ihling
Sales Director Strip Feeding Lines
Phone: +49 7821 6339 – 255
Volker.Ihling@kohler-germany.com

Watch the video!



KOHLER charts the course to the future in the hydrogen industry

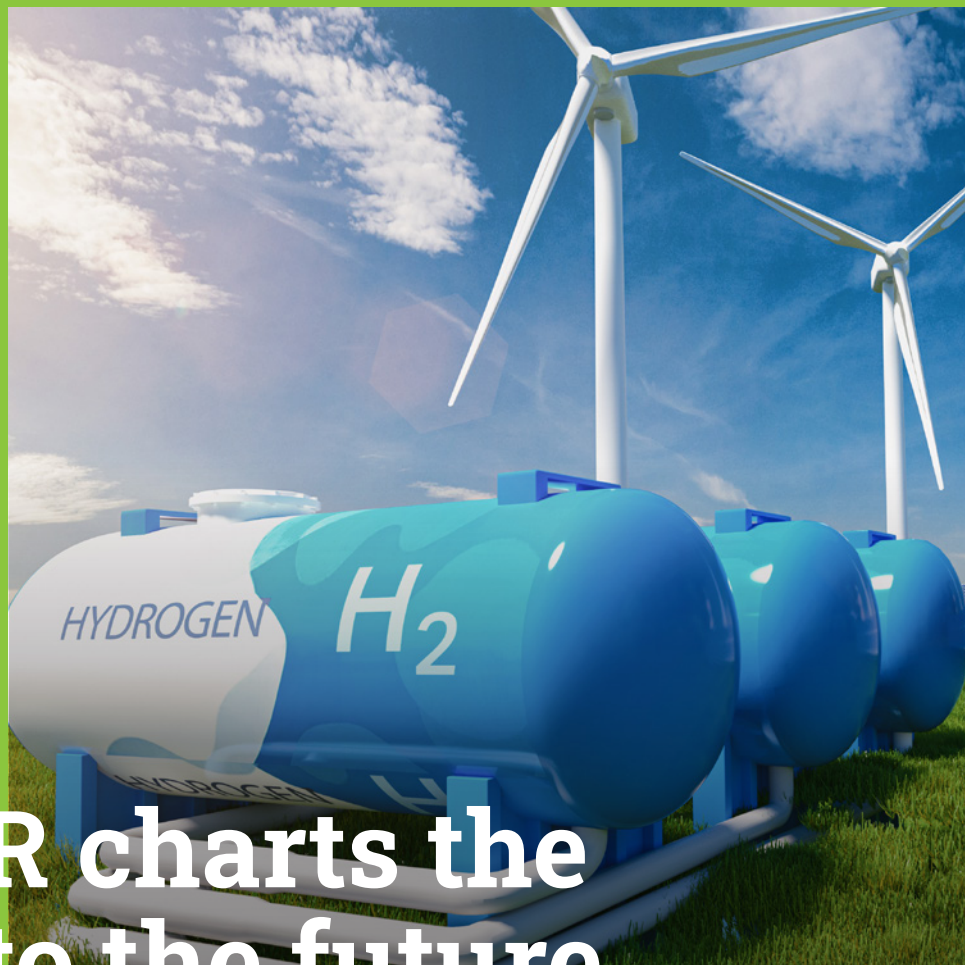


Image: Adobe Stock

The hydrogen industry is at a turning point and is set to play a central role in global energy policy in years to come. Hydrogen, and especially green hydrogen produced via electrolysis of water using renewable energy, offers a promising solution for reducing carbon emissions and promoting a sustainable energy future.

One major advantage of hydrogen is its incredible versatility, which makes it suitable for use in various sectors such as transportation, industry, and power generation. In the transport sector, fuel cell vehicles that are fueled by hydrogen could represent an environmentally friendly alternative to conventional combustion engines.

In industry, hydrogen can be used as a raw material for chemical processes or as a reducing agent in steel production to cut carbon emissions.

Easing through the energy transition with expanded metal mesh

Sheet metal-based bipolar plates and expanded metal structures are used to manufacture components for fuel cells and water electrolyzers.

Expanded metal made of titanium or stainless steel naturally exhibits outstanding properties, with its good flow characteristics, electrical conductivity, and outstanding heat dissipation making it ideal for use in an electrolyzer.

In electrolysis, water is split into hydrogen and oxygen using electricity. Porous transport layers (PTL) with a mesh structure and a microporous layer are used as electrolyzer stacks to produce hydrogen. They conduct electrons, support thermal management, and must ensure good electrical conductivity and optimum stability during operation. Bipolar plates, on the other hand, are key elements in a fuel cell and act as carrier plates for both poles of the cell. They conduct the electrical current between the individual cells and lend stability to the stack. Hydrogen production is an extremely demanding process that requires maximum precision.

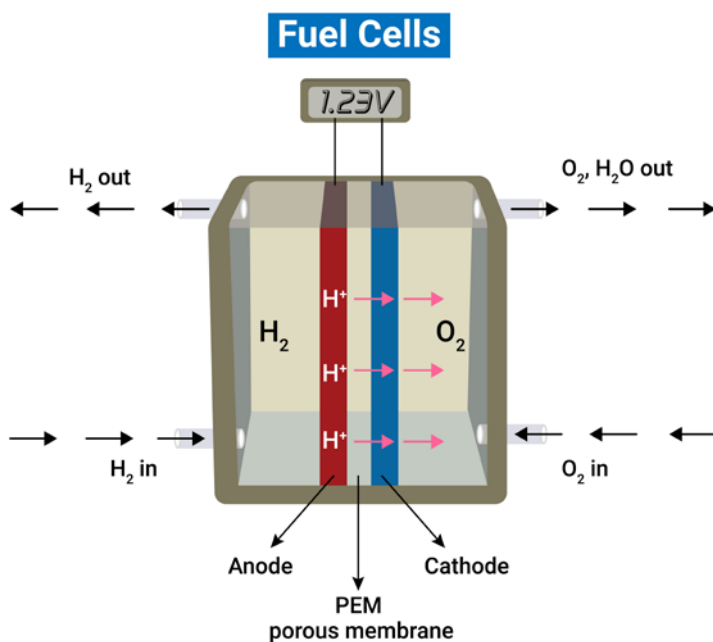


Image: Adobe Stock

Precision starts with leveling

The degree of precision with which porous transport layers or bipolar plates are manufactured will go on to have a major influence on efficiency and hydrogen yield. Therefore, one thing is particularly important: absolute precision. To achieve reproducibly precise results in production, manufacturers rely on process-optimized production lines. This is where KOHLER Maschinenbau GmbH comes in.

Based in Lahr, Baden, the company develops and produces strip feeding lines and part leveling machines for industrial sheet metal processing. Leveling is an essential step in the production of porous transport layers and bipolar plates, whether this involves sheet metal parts and strips or expanded metal mesh. This is because leveled sheets are low in stress and have the required degree of levelness to be optimally processed further.

Special components pave the way for the hydrogen industry

KOHLER offers custom solutions for the hydrogen industry, including everything from leveling sheet metal before/after forming through simple strip feeding without the leveling process. Due to factors involved in the production and use of hydrogen, such as very thin or extremely sensitive materials, standard commercially available components are not able to meet the demanding requirements presented by the processing conditions. This calls for special components, which KOHLER Maschinenbau GmbH supplies custom-tailored to the customer's manufacturing process—covering everything from strip feeding, roller feeding, and special coiler configurations to solutions for precision leveling. The team can even level bipolar plate components that have already been formed.

Is hydrogen an energy source for the future? Studies show that electrification and hydrogen are the key strategies for achieving climate neutrality by 2050. Hydrogen presents great opportunities, but also various challenges that need to be overcome.

Your contact person at KOHLER:

Volker Ihling
Sales Director Strip Feeding Lines
Phone: +49 7821 6339 – 255
Volker.Ihling@kohler-germany.com

Flat + low-tension metal sheets and strips = Process optimization



Better bending results



Efficient welding



Precise assembly



Appealing look



To improve quality, comply with strict standards, and reliably shorten throughput times, the production line has recently been expanded with the addition of a Peak Performer 60P.1600 part leveling machine from KOHLER Maschinenbau GmbH. Image: ALCOLOR

ALCOLOR GmbH

Relieving the stress in modern sheet metal processing

Flat and low-tension metal sheets shorten throughput times and increase **productivity**

Flatness and low tension in sheet metal are crucial factors for further machining in the metalworking sector, including cutting, bending, punching, edge trimming, welding, and assembly. ALCOLOR GmbH is using the Peak Performer 60P.1600 part leveling machine from KOHLER Maschinenbau GmbH to great effect to meet the high demands of international customers and the construction industry in particular.

ALCOLOR GmbH is a leading powder coating and sheet metal processing company based in Nenzing, Austria. The company employs around **35 people** and generates an annual turnover of approximately **€ 6.5 million**. ALCOLOR produces anything and everything made of sheet metal—be it window sills, coverings, facades, electronic housings, or ventilation grilles. Over 50 tons of steel and **around 150 tons of aluminum** are processed by the sheet metal specialist every year.

ALCOLOR's **production site** covers **5,300 m²** and boasts modern machinery: **1 laser cutting machine, 1 plate shear, 1 stamping machine, 2 press brakes** from Amada, and **1 folding machine** from Schröder. To improve quality, comply with strict standards, and reliably shorten throughput times, the production line has recently been expanded with the addition of a Peak Performer 60P.1600 part leveling machine from KOHLER Maschinenbau GmbH.

The sheet metal specialists in Nenzing know only too well that punched and laser-cut sheets have to be leveled before they can be further processed. The lower the stress and the more level the parts are, the easier it is to edge, weld, and assemble them. Advantages include a higher repeatability of the bending angle during edge trimming and the accuracy of fit of the parts during welding thanks to tensions in the sheet metal being reduced to a minimum and the parts exhibiting less distortion. As a result, downstream work becomes more reliable and more efficient.



The sheet metal specialist was impressed at how easy and intuitive the machine is to operate. Image: ALCOLOR

Precisely meeting tight tolerances

The Peak Performer 60P.1600 part leveling machine has been in operation at ALCOLOR since the end of January 2025 and is responsible for the entire leveling process in production. Regardless of whether parts are made of steel or aluminum, a flatness tolerance of up to 0.1 mm/m can be continuously achieved with professional leveling.

"Before we purchased the 60P.1600 part leveling machine, we had to outsource leveling to an external partner, which led to additional costs and delays. We needed a solution that would not only ensure the quality of the sheet metal parts, but also shorten production times and increase flexibility. We opted for the KOHLER 60P.1600 part leveling machine because of its ease of maintenance, energy efficiency, and optimal leveling quality," emphasizes Sandro Vonier, Head of Sheet Metal Technology at ALCOLOR GmbH.

The sheet metal specialist was impressed at how easy and intuitive the machine is to operate as well as the advanced cleaning system. It is important not to forget to regularly clean the leveling rollers and supporting rollers to remove dirt particles, especially when processing a mix of steel and aluminum. This prevents abrasive particles from being deposited on the leveling material and dirt or even scratches impairing the material being leveled. The rollers can be cleaned effortlessly thanks to the fully extendable leveling cassette. This additional feature not only improves leveling results by preventing contamination, but also reduces unwanted scrap.

Leveling the way forward

The KOHLER part leveling machine has proven to be a valuable addition to ALCOLOR's machine fleet. ALCOLOR is now optimally equipped for future requirements and can deliver high-quality results at all times, even with deteriorating sheet qualities and tight tolerances. Using the KOHLER machine has not only allowed the sheet metal professionals to increase production quality and optimize processes, but also successfully open up new business areas such as contract leveling.

Your contact person at KOHLER:

Klaus Wehrle
Head of Leveling Center
Sales Manager Part Leveling Machines
Phone: +49 7821 6339 – 254
Klaus.Wehrle@kohler-germany.com



Regardless of whether parts are made of steel or aluminum, professional leveling makes downstream processes more reliable and efficient. Image: ALCOLOR

Part leveling machine at ALCOLOR in Nenzing

- **Peak Performer 60P.1600**
- **Levels sheets made of steel and aluminum**
- **Width of the sheets: up to 1,600 mm**
- **Material thickness of the sheets: from 0.6 mm to 17 mm**
- **Patented electromechanical dynamic gap control – fast response for consistent leveling results**
- **Advanced cleaning system**
- **Intelligent overload protection**
- **Intuitive user interface**
- **Servo-electronic machine concept without hydraulics for added environmental benefits**



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- Retrofitting



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