

NEWS **KOHLER**

COMPETENCE CENTER
LEVELLING

2017 EDITION



An innovative leap in part levelling machines

Levelling gold, silver, and platinum

Strip feeding line for high-strength steels

Levelled parts for laser cutting job shop

Strip levelling machine for digitized production

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BLECHEXPO 2017

Stuttgart, November 07-10

hall 1, booth 1609 / hall 8, booth 8305

KOHLER impresses with innovations

Dear Readers,

The German economy is running like clockwork and growth figures for the entire European economy look promising. This current economic climate is having an extremely positive effect on Kohler. In the first quarters of this financial year, the number of orders received was considerably higher than in the previous year – strip levelling lines and part levelling machines are in demand like never before.

In this edition of KOHLER News, we will be providing you with an overview of all the application areas covered by our system technology and grant you an insight into our recent, innovative customer solutions.

A good example here is the BENTELER Group, which operates on a global scale. KOHLER fought off international competition and equipped the new plants of BENTELER Automotive (one of the top suppliers in the automotive industry) in China and the Czech Republic with two strip feeding lines designed for high-strength metal plates.

The case study of a Swiss supplier to the jewelry and watchmaking industry who uses the Peak Performer 50P.600 part levelling machine provided with new features reveals that levelling technology from KOHLER is also ideal for high-precision levelling of the finest precious metals.

SCHRAG was supplied with a strip feeding line consisting of coil loading car, double sided decoiler, levelling machine, loop pit, hole punch, and cut-to-length line. KOHLER developed a special software that enables the work preparation of SCHRAG to automatically determine the machine parameters from the customer drawings and sends these values directly to the strip feeding line. KOHLER is therefore making a significant contribution to Industry 4.0.

We would also like to welcome you to this year's Blechexpo in Stuttgart/Germany, where you will be able to meet our experts and learn about our products and services first hand. You can find us in Hall 1, Booth 1609 (part levelling machines) and in Hall 8, Booth 8305 (strip levelling machines).

We look forward to seeing you!

Dr. Hans-Peter Laubscher
Chief Sales Officer

Arnd Greding
Chief Operating Officer



— Dr. Hans-Peter Laubscher



— Dipl.-Ing. Arnd Greding

KOHLER REACHES

NEW HEIGHTS WITH PEAK PERFORMER

KOHLER has comprehensively upgraded its proven Peak Performer part levelling machine to provide a significant boost to the levelling capability of the machine family. Assuming the yield strength of the material is unchanged, the machine can now level to the accustomed degree of precision sheets that are up to 50 % thicker than before – a development that places it well ahead of the rest of the market.



— The latest generation of Peak Performer part levelling machine impresses with its precision and efficiency

Scan QR Code



Learn more about our part levelling machines:
pp.kohler-germany.com

As a leading global manufacturer of levelling solutions for the metalworking industry, KOHLER Maschinenbau GmbH, based in the Black Forest area of Germany, frequently stuns the sector with its customer-focused innovations, the latest of which is an enhancement to its batch-produced Peak Performer part levelling machine that can now handle sheets up to 50 % thicker than before. Besides its extended working range, the new generation of machines impresses with its turnable levelling rollers – a pioneering innovation in the marketplace – and a reworked drive concept. With the proven and cost-effective GAP Control for electro-mechanical levelling and the intelligent 4-point overload protection system, the Peak Performer part levelling machine also brings maximum precision and efficiency to your sheet-metal processing operations.



— Setting the required settings quickly using the multifinger touch display and intuitive user interface



— Assessing levelling quality



— The Peak Performer part levelling machine also levels thick sheets with great precision

Turnable levelling rollers with longer service life

The fact that the levelling rollers of the new Peak Performer generation are turnable extends their service life, especially in situations where machines with relatively large processing widths are used to level narrow workpieces, as this places an above-average loading on one side of the rollers. KOHLER engineers have also been able to extend the service life of the rollers by configuring the supporting rollers in a specific arrangement to displace the point load exerted on the levelling rollers once they have been turned.

The reports produced by the system include a tabular overview of the cumulative load distribution across the processing width of the machine. By carrying out a comparison between the left and right sides of the machine, operators can determine the respective loading placed on the levelling rollers. If required, they can then turn the rollers and extend their service life by utilizing each side of them by the same amount.

New group drive reduces wear and significantly extends machinable cross section

KOHLER has optimized the drive concept for part levelling machines in the Peak Performer 80P and higher series. The conventional approach, in which the drive shafts are driven by a single motor, has been superseded by one in which a number of geared motors are

situated on the levelling rollers, which they then drive directly.

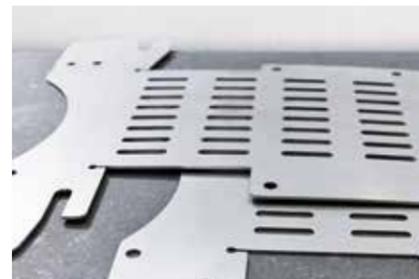
This new drive concept reduces the extent to which the levelling rollers slip on the material as it is being levelled, resulting in a smoother surface finish. The overall tension in the machine is reduced, producing less wear and a demonstrably higher level of energy efficiency in the drive train. Another factor that benefits from the direct input of power into the levelling rollers is that higher material cross sections can be levelled. The working range is significantly increased, particularly in the case of wider sheets. The Peak Performer 80P is able to level S355-grade sheet steel that is up to 14 mm thick and with a width of 1500 mm.

Intuitive operating concept speeds up access to settings

A multifinger touch display is now included as standard with the new Peak Performer generation. Featuring a 10.1-inch or optionally 15.6-inch screen, the display has an anti-reflection coating that significantly improves legibility. KOHLER has also simplified the operating concept by introducing an even more intuitive user interface that offers quick access to the required settings by reducing the number of user inputs required.

The „Expert Calculation System“ simplifies and speeds up the material-specific adjustment of the part levelling machine. The user-friendly

control system enables the operator to save certain settings and call them up again as required. The system automatically saves the most recent settings and in doing so creates a history that can be accessed whenever further optimization is desired.



— Perfect levelling results even with complex geometries

As an optional extra, KOHLER offers a barcode scanner that can be used to identify the parts to be levelled using, for example, the barcode printed on the job documents. The Peak Performer then automatically retrieves the associated levelling parameters and adjusts the axes accordingly.

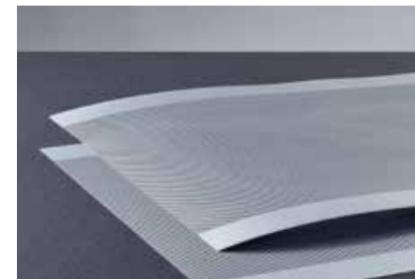
Remote diagnostics interface to obtain status information via Internet

A newly developed interface offers a defined user group, such as the company's task supervisors or production management team, online access at any time to status information relating to the Peak Performer machine.



— Simple cleaning and inspection thanks to electromotive cleaning and quickchange device

This allows them to retrieve operating data or information concerning the utilization of the machine, or to check how often particular load scenarios occurred over a specific period.



— Perfect levelling results even with perforated sheets

Equipment option: Tilting outlet table

The inlet and outlet tables of the Peak Performer are fitted as standard with sliding plates to facilitate the feeding in and output of the material from the machine. An outlet table that can be tilted 35° represents a new equipment option that simplifies part handling, for example when bulk material is being levelled. After processing, the levelled parts slide over the tilted outlet table directly into the containers provided. Conveyor lines, such as roller path, conveyor belts or turning stations, are possible alternatives.

Electro-mechanical, hydraulic-free GAP Control system

GAP Control is an electro-mechanical gap control system developed and patented by KOHLER that eliminates the need for any hydraulic components in the Peak Performer part levelling machine. The direct conversion of electrical energy into mechanical motion – without the losses normally associated with hydraulic systems – increases the cost-effectiveness of the system, not to mention its performance and precision.

Depending on the application, the deactivation option incorporated into GAP Control enables the optimized and load-regulated power consumption to be reduced to zero. The drive motors of the levelling rollers are the only power consumers when idling. In sum, the lower power consumption means that considerable cost savings can be made compared with part levelling machines with servo-hydraulic gap control systems. Less maintenance is required, as no open grease or oil is involved.

The energy-saving and quiet actuators used in the GAP Control system keep the levelling gap constant, regulating it without any vibration through a friction-optimized quadruple wedge system. The high level of stiffness and force-stroke conversion rate of the system

provide incompressible and high-precision control, even under extremely variable and high loading conditions. Quality remains extremely high, even in the case of complex levelling tasks with varying cross sections and high-strength properties. The Peak Performer 80P, for example, has no problem in levelling materials up to 25 mm thickness. Furthermore, the temperature stability of the machine contributes towards its remarkable degree of precision.

Overload protection prevents waste and machine damage

Among the requirements set out in the Peak Performer development specification were greater efficiency and cost-effectiveness with a view to reducing mechanical damage and hence waste. The intelligent 4-point overload protection system integrated in the part levelling machine trips almost instantaneously via a direct load measuring input to ensure that the roller frame, rollers, and motors are adequately protected. If the specified standard loading is exceeded, the system modifies the degree of plastification so that no material is wasted. Should an overload situation threaten, the machine shuts down immediately and the roller frame opens automatically. Monitoring by this continuous and direct acquisition of the loading data is safe and requires no human intervention.

LEVELLING MACHINES

FOR FINE COMPONENTS MADE FROM PRECIOUS METALS

Levelling parts is an absolute must for many areas of the strip and sheet metal working industry. Often levelling parts is associated with large and thick components. However, part levelling machines from KOHLER Maschinenbau GmbH, located in Lahr/Black Forest, Germany, are also tasked with more delicate work such as the work done for Cendres+Métaux SA in Biel/Bienne, Switzerland. For more than 100 years they have continued to work with the noblest and most precious of metals: gold, silver, platinum, and titanium. Levelling technology is essential for the broad selection of small and tiny components, as both semi-finished components and finished products, for dental and medical technology applications, as well as for the jewelry and watchmaking industries.



The precious metals gold, silver, and platinum are all part of the everyday business at Swiss company Cendres+Métaux SA (from the French cendre = ash, métaux = metals) in Biel/Bienne. For more than 100 years, the company has been combining absolute precision with the highest levels of purity in the development and production of semi-finished components and finished products made from precious metals. The company was founded in 1885 by Louis Aufranc as a

precious metal smelting company in Biel/Bienne, right in the heart of the Swiss watchmaking industry. With around 450 employees at present, the name Cendres + Métaux now stands for first-class, high-purity precious metals and precious metal alloys for applications in the fields of dental technology, medical technology, and the jewelry and watchmaking industries, as well as for the recycling and processing of precious metals worldwide.



— Refining – i.e., the processing of materials containing precious metals – is one of the strengths of Cendres+Métaux; with its holistic solutions, the company offers practically everything from a single source: from casting homogeneous and precise precious metal alloys through the manufacture of semi-finished components with specific characteristics to the construction of highly complex, micromechanical precision components.

— Swiss company Cendres+Métaux SA, based in Biel/Bienne, looks and indeed is sophisticated thanks to its century-old mastery of tips and tricks for working with precious metals such as gold, silver, platinum, and titanium.

“We see our core competencies, in particular, in the development and casting of homogeneous precious metal alloys with precise compositions,” says Raphael Volery, head of foundry/forming at C+M. Semi-finished components and precision profiles with exactly specified and proven mechanical properties are produced for both proprietary and custom product ranges.

C+M has an extensive production facility

for the production and processing of its precious metal alloys, with smelting and casting equipment and a state-of-the-art machine fleet for further cutting and forming.

“One of the safeguards guaranteeing the technical production quality requirements is a new part levelling machine from the Peak Performer 50P range from KOHLER Maschinenbau GmbH, which is based in Lahr,” says Raphael Volery. KOHLER has been manufacturing levelling machines and systems for sheet metal working industry for decades, and is in the vanguard of modern levelling technology. At C+M, the new part levelling machine replaced an older unit in May 2017. “The old unit was replaced primarily because 100% replacement part deliveries could no longer be guaranteed. As the need for the investment became clearer, a secondary consideration was that a new unit should also be able to level thicker materials than before,” explains Volery. “That’s why we decided to invest in a KOHLER machine after thorough research. Besides the unit quality, we also now have access to the vast reserves of experience of this Lahr-based company,” adds Volery. One of the criteria for the investment in the KOHLER Peak Performer 50P.600 was also the geographical proximity of Biel/Bienne to Lahr in Baden-Württemberg.

“We rely on outstanding unit availability,” states Volery. “Even though we do not work in shifts and the Peak Performer is only in operation at hourly intervals every day, we have to ensure that it is available at all times. After all, the quality of the downstream processing also depends largely on the accuracy of the levelling results, which can be fulfilled very well using the Peak Performer,” he adds. Mostly the work involves cast bars of rolled and inter-stage-annealed strips of gold, silver, or platinum alloys. The requirements specification for the KOHLER Peak Performer 50P specified sheet thicknesses of between 0.5 and 12 mm, which is clearly within the operating range of the Peak Performer, the maximum of which is 15 mm. The required strip width was specified as 450 mm.

The selected Peak Performer is one of the latest generation of part levelling machines currently offered by KOHLER on the market. The decision makers for the purchase of the KOHLER unit were particularly keen to have a simple, fast, and neat cleaning procedure for the levelling rollers. To achieve this, KOHLER has equipped the Peak Performer with a motorized cleaning and quick-change device. At the push of a button, the user can thus extend the upper and lower levelling roller frames separately out of the unit and

thoroughly clean both levelling rollers and supporting rollers, thereby saving time and money. “This is a decisive criterion for us,” says Volery. “As levelling can create dirt, if we did not eliminate this after every change of material, we would have a mixture of hundreds of alloys. We cannot and do not wish to allow that.”

Furthermore, the Peak Performer 50P.600 is equipped with intermediate rollers. C+M selected this optional extra. Implemented in the form of spirally grooved rollers, they are installed between supporting rollers and levelling rollers and prevent pressure points or marks on the delicate materials to be levelled.

With the emphasis on relatively long and narrow strips, a camber levelling unit is required which has been carried across from the previous unit at C+M and adapted and integrated seamlessly by KOHLER into the Peak Performer, below the inlet table. camber levelling unit prevents the appearance of what are known as camber defects, a uniaxial curvature in the longitudinal running direction of a strip or a profile. “We use the camber leveller as required, but mainly for levelling long profiles, and for that we connect it mechanically,” reveals Raphael Volery.

The Expert Calculation System developed by KOHLER simplifies the setting of the component-specific levelling parameters. The control unit calculates the optimum levelling parameters from material data and component dimensions. KOHLER has already stored the alloy data based on customer specifications for products repeated regularly at C+M. This makes it easier for machine operators to carry out product changes quickly and safely. Machine operators are additionally supported by a control unit with convenient multi-touch interface that was redesigned by KOHLER.

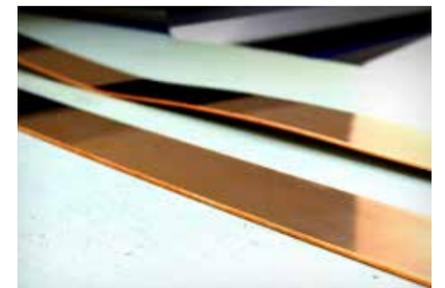
In response to the requirements of leading precious metal specialist Cendres+Métaux SA and with the delivery of a Peak Performer 50P with optional features, KOHLER Maschinenbau GmbH has proven that levelling is not just a task for coarse applications. This is because the processing and levelling of the most precious metals such as gold, silver, platinum, and titanium demand special properties, as well as manufacturing technology solutions of the highest order. These demands are always satisfied by the company’s chosen part levelling machine. Volery and his colleagues are convinced that purchasing the KOHLER machine was an investment in a safe, clean, and cost-effective solution.



— The compact and neatly enclosed Peak Performer 50P.600 part levelling machine, viewed from the outlet side. The levelled precious metal strips are deposited on the table.



— Raphael Volery, head of foundry/forming at Cendres+Métaux, shows examples of the parts to be levelled and explains what is of primary importance to him.



— The levelling result achieved by the Peak Performer 50P.600 is clear; at the top you see the (gold) strip prior to levelling, and below is the levelled, even, absolutely flat strip.



— Two levelling experts: Martin Geppert (left), KOHLER expert and Raphael Volery, head of foundry/forming at Cendres+Métaux in Biel/Bienne, Switzerland.



— Panoramic view of the complete strip feeding line for BENTELER

IN GLOBAL DEMAND

KOHLER SUPPLIES STRIP FEEDING LINES TO BENTELER GROUP

KOHLER Maschinenbau GmbH located in Lahr in the Black Forest has beaten off international competition and will supply strip levelling lines for two new sites owned by the global BENTELER Group.

“ Thanks to the strip levelling machine with cassette change technology from KOHLER, we are fully equipped for the future.”
Christian Sander, Head of Equipment.

Continuous progress is an integral part of the 140-year BENTELER success story. Its development, production and materials technology expertise make the BENTELER Automotive Division one of the top suppliers in the automotive sector. BENTELER Automotive supports its customers throughout the entire value-creation chain, offering components and modules for structural parts, chassis, engine and exhaust systems as well as system solutions for electro-mobility, with over 70 plants worldwide. To equip two new plants for the production of structural parts, BENTELER Automotive has opted for two high-prec-

sion strip feeding lines from KOHLER. These lines are designed to supply steel strips with strengths of up to 1,200 N/mm² (yield point) and strip thicknesses of 0.8 – 7.0 mm at strip widths of 150 – 1,800 mm. They are both used upstream of a high-performance servo press with number of press strokes of up to 60 parts per minute.

KOHLER was able to beat off national and international competitors thanks to its innovative strip levelling technology with cassette changing system and good price-performance ratio.



— Interchangeable levelling roller cassette expands the range of strip thicknesses that can be processed

Both strip levelling machines were fully tested and accepted using customer materials at the KOHLER plant in Lahr. The first machine was delivered in the first half of 2017 to the new BENTELER plant in Chongqing in China, while the second was supplied in July 2017 to another new plant opened by the automotive components supplier in Klášterec nad Ohří (Czech Republic). In this way, KOHLER Maschinenbau GmbH is providing BENTELER with the essential means of supporting its customers in all the world's major markets for the automotive industry.

INGENIOUS DESIGNS

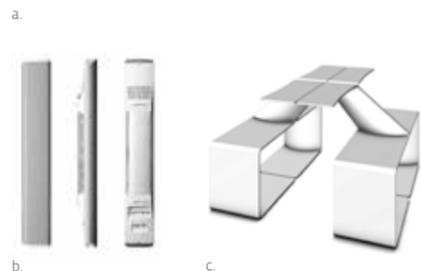
PRECISELY CUT INTO SHEET METAL PARTS

Anyone who hopes to survive on today's market must be able to offer more than their competitors. This also applies to companies who have dedicated themselves to sheet metal working industry. There is very little money to be made in the production of basic sheet metal parts. Margins only become attractive once sufficient added value has been created; something that can be positively influenced through the use of ultra-modern machines and systems. W. Nusser GmbH Metall- und Blechbearbeitung is therefore focusing on the development and production of high-quality components for demanding high-tech applications. A machine fleet equipped with ultra-modern technology – including levelling technology from KOHLER Maschinenbau GmbH – helps to realize this goal.



One look at W. Nusser GmbH's site in Schwabmünchen and you can see that this is no ordinary processor of sheet metal. The Bavarian-Swabian company's premises have a modern, almost futuristic feel. "We were fortunate," says CEO Wilhelm Nusser, "to have been able to acquire an existing commercial site here in 2012, which we then shaped according to our own requirements in order to ensure optimum production and management processes." A second site exists at the company's original home in neighboring Neusäß. Nusser currently employs a total of 115 members of staff. Founded in 1948 and now in the third generation of family ownership, the company has been under the management of Wilhelm and his brother Stephan Nusser since 1998.

— Nusser not only manufactures individual sheet metal parts, but also large numbers of components and complete assemblies for high-tech applications, such as:



- a. High-quality housing for cashless payment systems: welded steel construction, ground surfaces, all components powder-coated and brushed
- b. For mobile communications: antennae for transmitting stations
- c. Mobile seating and work stations for offices and public spaces, for example work station seating element made from aluminum AlMg3, anodized E6 EV1

What the attractive exterior of W. Nusser GmbH promises is confirmed by the generous, open design of the management and production areas inside. "We have high demands of the products developed and manufactured by us, which we expect to see realized down to the finest detail," says W. Nusser.

Challenging sheet metal working requires modern machines

"We can only safeguard our USPs (Unique Selling Proposition) by using first-class equipment. For this reason, we have continually invested in our modern machine fleet over the past few years," underlines Wilhelm Nusser.

Peak Performer for high-quality parts

Due to the requirements of today's customer regarding the components, traditional manufacturing techniques are no longer sufficient. As numerous sheet metal parts are normally visible components that are later fitted in technologically advanced devices and apparatus to form an overall assembly, they must be perfectly clean, straight, and level. This is precisely why Nusser has invested in additional resources to ensure the high quality of the parts in the form of a levelling machine from KOHLER Maschinenbau GmbH in Lahr.



— Wilhelm Nusser manages W. Nusser GmbH Metall- und Blechbearbeitung in Schwabmünchen together with his brother Stephan. They aim to further develop and implement their ideas going forward.

The reason for purchasing the KOHLER Peak Performer GC 50.1250 levelling machine was an order for the production of a dividing or sealing plate, which is subsequently used in automotive compressors and primarily in premium cars. The roughly 200 x 100 mm and 4-mm thick steel plate must be completely level for use in a vacuum field and must also be 100 % leak-proof. "Without levelling technology from KOHLER, we would not have been able to fulfil this order," says Wilhelm Nusser. A total of 60,000 of these parts now run through the Peak Performer on an annual basis. "In addition, we are also levelling other sheet metal parts on this machine that are made from different materials and come in various sizes. To meet the requirements for high-quality sheet metal parts – in particular for special applications – levelling technology is a must," says the entrepreneur.

The decision to invest in this KOHLER levelling machine in particular was the result of levelling trials at the former KOHLER site in Friesenheim. "We had to be sure that the sealing plate at the heart of this challenging major contract was completely level. For this reason, we also contacted other levelling machine manufacturers, but the KOHLER Peak Performer fully met our expectations and has now proven its strengths in practical usage too," explains Wilhelm Nusser.

Electromechanical GAP Control system

Nusser is particularly pleased with the technical features offered by KOHLER's Peak Performer GC range – primarily the electromechanical GAP Control system, which operates without a dirty and maintenance-heavy hydraulics system. Instead, it is equipped with an extremely stable quadruple wedge system and energy-saving actuators. This function is unique to KOHLER and this product range.

Motorized quick-change device – quick and thorough

The motorized quick-change device developed by KOHLER is also receiving considerable praise from all Peak Performer GC users without exception. This device allows the machine operator or maintenance engineer to clean the machine quickly and easily. To do so, the levelling rollers and supporting rollers do not need to be removed from the device one by one; instead they conveniently slide out of the machine almost as one at the push of a button. There is then plenty of room for a quick and thorough cleaning.

Perfect roller settings using the Expert Calculation System

The Expert Calculation System rounds off the outstanding features of the Peak Performer GC. This is a practical calculation model for

— The KOHLER Peak Performer GC 50.1250 levelling machine is a logical addition to Nusser's modern machine fleet. Without levelling, the sheet metal parts would not be suitable for subsequent use in compressors.



— Wilhelm Nusser (left), production manager Frank Laurin (center), and a levelling specialist from Nusser examine the quality of a levelled sheet metal part.

determining a basic setting for the roller frame and the roller settings. The calculation model really comes into its own when there is a new material to be levelled or if the respective operator does not yet have sufficient experience in this field. In cases such as these, the calculation system provides support in the form of its comprehensive database containing information drawn from KOHLER's extensive expertise and decades of experience. It is therefore a useful aid for operators to facilitate a time-saving and reliable setup procedure for the Peak Performer GC.

By investing in the part levelling machine from KOHLER, Wilhelm Nusser is certain that he has made the right decision regarding his future-oriented sheet metal production processes. The levelling machine has already paid for itself, as without it, some parts could not be manufactured at all or would at least fall short of the quality requirements. "In future we would also like to delve deeper into the components and systems business with our own products. This is why our quality standards are always so high. With our modern machine fleet, which includes the KOHLER part levelling machine, we have the best-possible chance of success," summarizes Wilhelm Nusser.

— From the coil to tailor-made, edge-finished blanks: KOHLER Maschinenbau GmbH in Lahr, has recently commissioned a new production line at SCHRAG Kantprofile GmbH in Kirchartd-Berwangen for edge-finished boards, which are subsequently edged to produce edge profiles for hall construction.



ALL IN ONE PRODUCTION LINE

FROM COIL TO LEVELLED, PERFORATED, AND EDGE-FINISHED BOARDS

More than ever before, flexible and economical levelling technology for strip and sheet metal working requires automated manufacturing solutions. This is especially true for the edge profile manufacturer SCHRAG Kantprofile GmbH, with its numerous special solutions. A unit meeting these requirements should be space-saving, mostly automated, and require little maintenance, just like the one at the SCHRAG Heilbronn subsidiary in Kirchartd-Berwangen, Germany. Top marks were awarded here to the unit's manufacturer, KOHLER Maschinenbau GmbH based in Lahr, mostly because of its outstanding skills with regard to plant engineering and an automated strip feeding line with a decoiler, levelling and punching technology, and shear. By acquiring the machine, SCHRAG has taken a clear step towards Industry 4.0.



The name “SCHRAG” has been closely linked with the concept of “sheet metal working” since 1892. Founded by Friedrich Schrag in Hilchenbach, Siegerland in Germany, SCHRAG still focuses on the manufacturing of wall cladding and roof tile sheeting. Friedrich Goswin, one of the grandsons of the company’s founder, directed the company’s focus towards the manufacture of edge profiles and molded components for industrial and commercial building. Now the SCHRAG name is synonymous with steel metal parts essential for steel hall construction, and the company has a turnover of some 100 million euros and 460 employees at six sites in Germany, the Czech Republic, and Poland.

SCHRAG Kantprofile GmbH mostly manufactures structural components for roofs and walls, purlins and rafters, arcade rooflight bases and profiles or special profiles. “Essentially, all our edge profiles are special solutions,” states Jürgen Stötzel, manager of the SCHRAG Kantprofile subsidiary in Heilbronn. “Halls come in numerous shapes and sizes,” he adds. “There is no such thing as ‘standard’, which is why we manufacture tailor-made components from batch size 1 to n that can be assembled quickly and easily later on with the appropriate labeling, as if from a kit.”

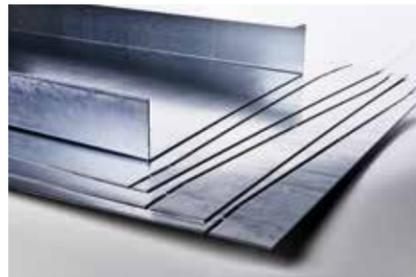
The modern machines and units are used mostly to process galvanized sheet steel in thicknesses from 0.75 to 4.00 mm, aluzinc from 0.75 to 2.00 mm, aluminum from 1.00 to 3.00 mm, and strip coated aluminum from 1.00 to 1.50 mm in lengths of up to 11 m.

“As a result of constantly changing construction component dimensions and batch sizes down to quantities of ‘one’, we decided to invest in a new, considerably more flexible, and easier to use unit from KOHLER,” says SCHRAG subsidiary manager Stötzel. This new strip feeding line replaces the unit from another manufacturer, which no longer met the requirements in terms of flexibility, speed, and accuracy.

Other manufacturing methods such as roll forming were dismissed from the outset, precisely because of the frequently small quantities required. The changing of profile rolls was therefore out of the question from a hardware point of view. “If, for example, a similar profile with a different limb length is needed, production preparation changes the machine parameters and transfers these directly to the unit,” explains Tobias Frank, a KOHLER project manager, who is familiar with the unit down to the tiniest detail and knows exactly how to use it. The unit operators do not need to intervene in any way to achieve this.

An important feature of the unit is the integrated hole punch, which is equipped with 12 tools and can therefore perforate 12 different hole diameters simultaneously. It also allows different contours to be cut. This is made possible by a turning tool that can be rotated through 180°. The hole punch is implemented on both sides of the strip edge like pliers (C frame) and is able to work with tools with diameters from 3.3 to 88 mm, one of the tool mounts being rotatable through 360°. The double-sided or mirrored arrangement of the punching units allows more or less any conceivable hole pattern to be created in seconds.

The material flow starts with a hydraulic and movable coil loading car with integrated weight measurement. The coil weights processed are logged for later evaluations. A new coil is loaded onto the coiler mandrel. A double-sided decoiler is used in order to minimize non-productive times, allowing a coil already on the coiler to be



— The edge-finished blanks produced on the KOHLER machine, which are fully perforated, cut to length and either a) painted or b) galvanized, are given their profile contour in a subsequent bending process, which is dependent on the application.



— Experts together: (from left) Tobias Frank, project manager at KOHLER, and Jürgen Stötzel, subsidiary manager at SCHRAG Kantprofile GmbH in Heilbronn. They have worked together in close co-operation to develop and implement the strip feeding line project.

“Our KOHLER machine allows us to easily level and punch parts of differing dimensions and variable batch sizes.”

Jürgen Stötzel, subsidiary manager at SCHRAG Kantprofile GmbH

unwound as the loading process takes place. “The various edge profile dimensions barely allow a coil to pass through from start to end. This is why we have selected an automatic rewinding system that winds the strip that is not needed back onto the coil,” explains Jürgen Stötzel. The entire loading and unloading process takes place automatically, without any human intervention. SCHRAG selected a coiler with a maximum coil weight of 12 t and strip widths of 200 to 1250 mm from the selection offered by KOHLER. “As far as the user is concerned, avoiding unproductive time due to changing coils is crucial. This allowed us to reduce the strip-to-strip changing times by up to 60 %,” explains Tobias Frank.

With a leading-in device comprising a table below and a holding-down device above, the start of the coil is inserted in the KOHLER 9-roller levelling machine via the strip feed. This is a strip feeding line with an advanced quick-change device. The device allows the levelling rollers and supporting rollers to be cleaned quickly and thoroughly. When doing this, the upper and lower cassettes can be moved separately out of the levelling machine. Users prefer this extremely economical option to solutions in other systems available on the market. The levelling parameters in the KOHLER control system are used for product changes involving recurring materials. For new materials, the Expert Calculation System is used to determine the default values for the roller frame position after entering the sheet thickness and width,

yield point, and type of material, and these can be adapted by the machine operator as necessary. The strip finally reaches the punching units, with the tools that move transversely to the strip running direction, via the loop pit located behind the levelling machine, which is responsible for corresponding compensation when different throughput speeds are used. The preferred hole patterns or contours are made available by work preparation and are called up by the unit according to the production sequence. A roller feeder ensures precise feeding of the strips into the punching unit so that the tools are positioned with up to 0.05mm accuracy.

The strips are cut lengthwise using the following hydraulic cut-to-length shear. The integrated residual strip driver separates strip residues cleanly from the usable parts, shreds these and moves them into a scrap container.

The blanks ready to be edged are pushed onto a downstream side table. Before this, each

sheet metal part is provided automatically with order-specific information. This allows the fitter to identify the parts on the installation site at a later date and establish the corresponding assembly sequence.

The overall system measures about 20 m and is coordinated precisely with the linked production stations. All control and automation programs, including the CAD-based functions in work preparation, were developed and installed by KOHLER. All system-specific parameters interact optimally and make the strip feeding line “round”. This means that not only does the KOHLER strip feeding line represent outstanding flexibility and safety at SCHRAG, it is also the perfect example of what is understood by digitized production and Industry 4.0. As the subsidiary manager for production at SCHRAG Kantprofile, Jürgen Stötzel considers the company is now well-equipped to meet the needs of the future.



— An overview of the entire production line (from left), with coil preparation, coil loading car, double-sided decoiler, levelling machine, loop pit, hole punch, and cut-to-length line.



— The cut-to-length shear cuts the strip to the precise length of the later edge profile.



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