b on top

THE MAGAZINE OF
OTTO BIHLER
MASCHINENFABRIK
GMBH & CO. KG
2022

USING RESOURCES EFFICIENTLY

◄ Making efficient use of resources

Satellites possess photovoltaic panels that use the sun's power to supply them with the required energy. Only by means of up-to-the-minute, high-performance technology is it possible to ensure that the available energy resources are used efficiently.

b. on top The magazine of Otto Bihler Maschinenfabrik GmbH & Co. KG

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"OPTIMIZED RESOURCE USE IS THE KEY TO SUCCESS"

Dear readers,

Given the aftermath of the pandemic, increasing raw material and energy prices, supply chain shortages, and now the conflict in the Ukraine, many companies are taking a cautious approach to the future. However, I am convinced that despite these difficulties, the economy will not stand still. That is why it is my advice that now is the right time to move forward with strategic projects and invest pro-actively for the future. The crucial element is to become more competitive.

How well we manage our resources plays a vital role as to our success. Whether it is in the form of employees, raw materials, energy, or expertise – it is essential that resources be utilized in a strategic, focused way. The challenge is to make optimum use of available resources, while creating greater value added. This has always been part of the Bihler culture and the philosophy we follow in our daily business activities. To best support our customers, we at Otto Bihler Maschinenfabrik are continuously developing new, innovative machine and process technologies, as well as solutions to enhance the performance of existing processes, to ensure effective resource management and energy-efficient production.

Where this success can lead you can be seen in the articles of this edition of *b. on top*. The portrayed companies explain how they have made significant gains in efficiency and simultaneously open up new production capacities for new products. And you too, our valued customers and partners, can take advantage of all the possibilities for improving efficiency that Otto Bihler Maschinenfabrik has to offer you. With every project, we support you from the initial inquiry, machine commissioning, and throughout your entire production lifecycle. In this way, we can work together in a close partnership and continue to build upon our shared success in the future. We hope you find the current edition inspiring,

Mathias Bihler,
Partner and Managing Director

b.on top 2022

CONTENT

EXPERT INFORMATION FROM THE PEOPLE WHO KNOW

Some 140 industry professionals from more than 60 companies in Germany, Austria and Switzerland visited the Neuschwanstein Festival Theater on 21st September 2022 to attend the fourth edition of the Allgäu Stamping and Bending Forum. This established industry get-together for the entire stamping and bending sector dealt with topical issues such as vehicle electrification, material and energy efficiency, standardization and digitalization. Seven presentations by experts in the field explained to the industry professionals attending the event how Otto Bihler Maschinenfabrik, the copper specialist, Wieland, and the manufacturer of standard parts, Meusburger, are rising to these challenges. The representatives from Bihler presented the company's latest machine and tool technology and described successfully implemented automation solutions to show how Bihler's technology is able to achieve material savings of up to 50 percent during the manufacture of e-components. At the same time, attendees discovered the benefits resulting from customer training at the digital twins of Bihler machines. Wieland then informed listeners about the latest trends in the field of copper alloy strips and the bending capabilities of strips. Meusburger talked about standardization in the field of stamping tool manufacture and ways of safeguarding corporate knowledge. The highly successful event was rounded off by a shared evening meal and a visit to the three companies on the following day. ●

NEW PARTNER FOR SPECIAL SOLUTIONS

Markus Schnöll has been the new Bihler Regional Sales Manager for Bavaria-South and Austria since November 2021. Aged 43, his activities focus on supporting existing Bihler customers, acquiring new customers and identifying new potential applications for Otto Bihler Maschinenfabrik's many different developments and innovations in the field of stamping and bending technology. "I enjoy working together with our customers to develop solutions to meet their specific challenges," explains Schnöll. "The production of complex components for a constantly changing market is being influenced by a growing number of factors – and that is why I want us to be a reliable partner in close proximity to our customers."
Born in Halblech, he brings a wealth of experience with him. Thus, while studying electrical engineering, he completed a number of internships for various Bihler departments. Schnöll gained further experience of the metalworking sector at a company specializing in solid forming for a variety of customers in the automotive and other industries, and, most recently, he worked as Key Account Manager for a manufacturer of electrical components and plug connectors. ●

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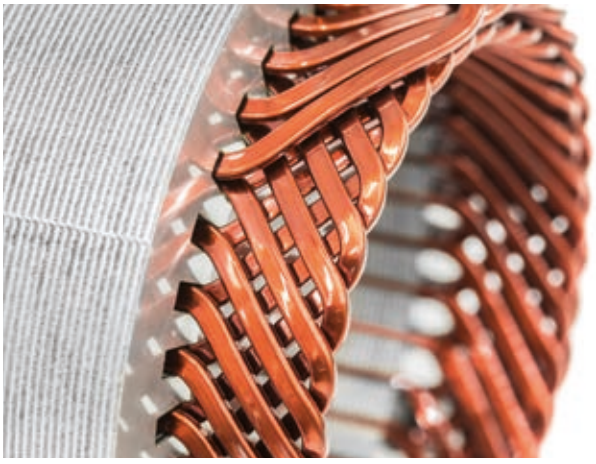
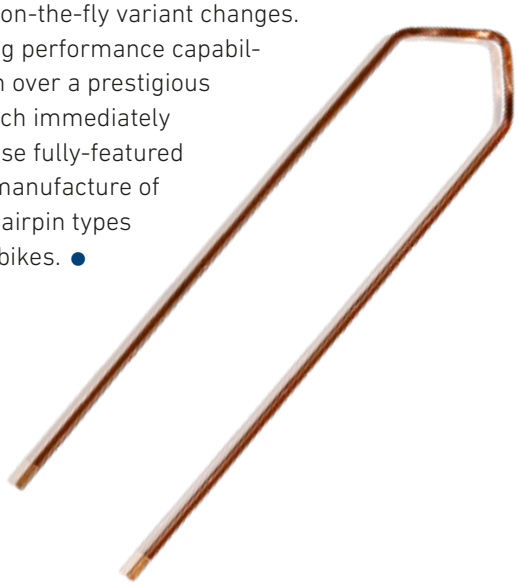
TAKING LEAVE OF A VISIONARY AND FRIEND

A black, broad-brimmed hat – that was Carlo Alberto Carutti's trademark appearance. He wore it when he traveled to Pfronten in 1957. His father had given him the task of tracking down Otto Bihler and having a look at the RM 25. After arriving at the railway station, the young Italian asked his way until he finally reached Otto Bihler and his workshop. That is where he examined the stamping-and-bending machine and was so enthusiastic that he wanted to buy the system there and then. Although the man's sudden appearance and seemingly unprompted interest surprised Otto Bihler, they sealed the deal with a handshake, thus laying the foundations for a partnership that has lasted nearly 70 years. During this time, Carlo Alberto Carutti contributed greatly to the success of Bihler technology in Italy and provided support for the company's sales activities right up until the end. Bihler is now already working with the third generation of Caruttis: Efisio and Eleonora Carutti. Carlo Alberto Carutti passed away in early March at the age of 98 years in his native Milan. In him, we have lost a visionary and friend who has accompanied Bihler for almost 70 years. ●

HAIRPINS IN DEMAND

e-mobility continues to travel in the fast lane and many companies now rely on technology from Otto Bihler Maschinenfabrik for the fully-automated, flexible, energy-efficient manufacturing of components for electric vehicles. This is particularly true of the so-called hairpins that are needed for the stators of electric motors. With its modular platforms and innovative process technologies, Bihler provides solutions that are precisely tailored for these components – as well as for connecting and I-pins, shielding sleeves in HV charging plugs, power rails and busbars for electrical distribution. In the field of hairpin technology, in particular, Bihler is able to call on more than 40 years of experience and has developed the Bihler BM-HP servo system specially for the mass production of hairpins. This compact machine with standardized machining processes stands out for its very high throughputs and on-the-fly variant changes. These outstanding performance capabilities recently won over a prestigious global group, which immediately ordered 22 of these fully-featured systems for the manufacture of a wide range of hairpin types for e-cars and e-bikes. ●

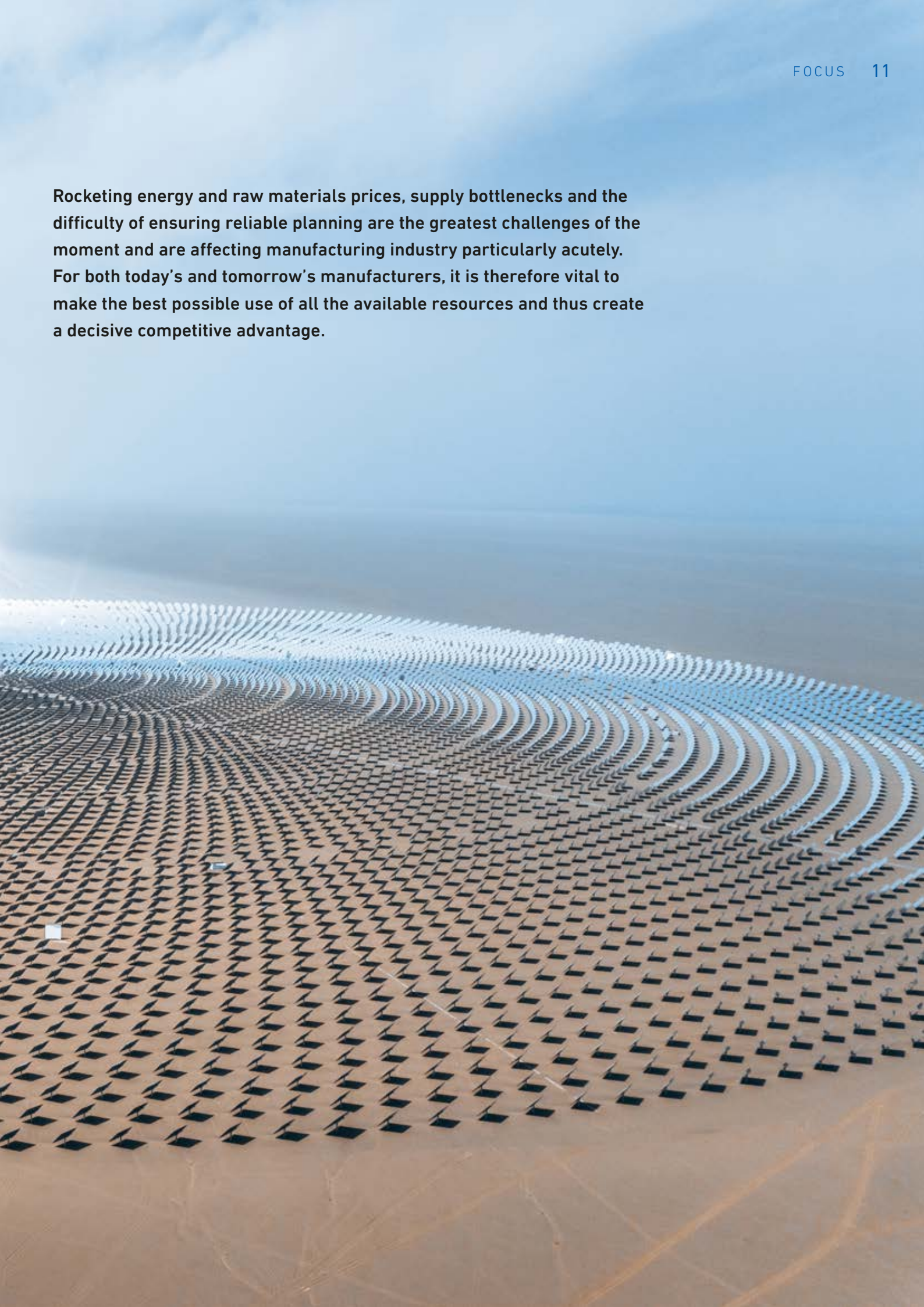




NATURE AS OUR EXAMPLE: USING RESOURCES EFFICIENTLY

TECHNOLOGY HELPS GAIN MAXIMUM BENEFIT FROM RESOURCE USE

Rocketing energy and raw materials prices, supply bottlenecks and the difficulty of ensuring reliable planning are the greatest challenges of the moment and are affecting manufacturing industry particularly acutely. For both today's and tomorrow's manufacturers, it is therefore vital to make the best possible use of all the available resources and thus create a decisive competitive advantage.



Otto Bihler Maschinenfabrik covers approximately 75 percent of the electricity requirements of its Füssen site by means of a photovoltaic installation. The PV installation that will shortly come online at the Halblech factory is on a similar scale.

Manufacturing industry is one of the most important sectors of the German economy and accounts for more than a fifth of the country's gross value added. However, at present, – like practically every sector of industry – manufacturing is facing enormous challenges. The most pressing of these is the great increase in raw materials and energy prices. For example, steel prices are at least 40 percent higher than they were in 2020. The same applies to aluminum, chromium, copper, nickel and silver. Changes in the price of energy have been even more drastic: Crude oil has increased by a good 50 percent compared to 2020 and the price of gas to end customers has already increased by 160 percent since the beginning of the year. During the last ten years, the price of electricity has increased by approximately 30 percent. Many companies are attempting to put an end to their dependence on these trends and generate their own energy, for example by installing photovoltaic systems. The efficiency of these systems has almost doubled in recent

Only companies that press ahead with innovations and make use of state-of-the-art technology can boost their own competitiveness and construct valuable new production capacities.

years and the world's highest-performance solar cell generation solutions, recently developed by the Fraunhofer Institute for Solar Energy Systems (ISE), achieve efficiency of over 47 percent. Otto Bihler Maschinenfabrik also has its own in-house photovoltaic installation in Füssen, which covers approximately 75 percent of the plant's electricity requirements. The installation which will soon come on stream at the factory in Halblech is on a similar scale.

Bottlenecks and uncertainties A survey recently undertaken by the Association of German Chambers of Industry and Commerce (DIHK) shows that the surge in the price of raw materials and energy represents the greatest burden for three quarters of companies. Depending on the total value of the quantities involved, these factors ultimately have a direct impact on company profits.
One aggravating factor is that many businesses also have to struggle with supply bottlenecks and a lack of all types of primary and intermediate products. A recent study by Deloitte suggests that global supply chains will not fully recover until some time during 2024. Companies are also facing a labor shortage. Many businesses are directly impacted by the lack of skilled workers and are urgently – albeit often unsuccessfully – searching for qualified personnel. In addition to all this, there is also the conflict in Ukraine. This constitutes a significant risk and factor of uncertainty for businesses, in particular given that the effects of the measures taken during the Covid-19 pandemic are still very present.

Great potential for efficiency improvements So what can companies, and in particular those in the manufacturing sector, do in order to successfully face up to the current range of challenges? The most promising strategy is to make the best possible use of the available resources and use them in ways that maximize their contribution to value added. And the potentials that exist are considerable. For example, a study conducted for the metalworking industry by the VDI Competence Center for Resource Efficiency shows that it is possible to achieve between two and six percent materials savings per year, while the potential for energy savings rises to as much as 14 percent. A study conducted by the Fraunhofer Institute for System and Innovation Research (ISI) comes to a similar conclusion, pointing to an average energy savings potential of 15 percent.

People play a pivotal role In general terms, it is possible to identify four broad types of resource whose use has to be optimized: raw materials, energy, technology and personnel. The human workforce plays the pivotal role here: It is the firm conviction of Mathias Bihler that "people are and will always be the vital factor for success. They form the basis that allows us and our customers to thrive in competitive global markets." That is why Otto Bihler Maschinenfabrik has, for decades, been committed to the ongoing training and qualification of its workforce. This includes, on the one hand, the dozens of apprentices who come to Bihler every year to take advantage of its well-known training opportunities and who often stay with the company at the end of their apprenticeships. On the other, Bihler has many experienced employees boasting outstanding expertise, some of whom have been working with the company for decades. All of

People are and will always be the vital factor for business success. They form the basis that makes it possible to thrive in competitive global markets.

this taken together reflects a very high level of skill, knowledge and innovative strength. These strengths and skills form the basis for all the company's developments and innovations and they have enabled Otto Bihler Maschinenfabrik to become the world's leading system supplier of stamping and bending, welding and assembly technology.

Benefiting from Bihler's expertise Bihler also makes the outstanding expertise and innovative strengths of its own employees available to its customers in order to work with them to develop solutions for optimized resource utilization. Bihler provides support throughout the entire value-added chain in the form of technical consulting, testing, the production of sample parts and process verifications. These activities are followed by project implementation and industrial production, for which Bihler also acts as a full-range supplier for all the required equipment. The next step is to train the customers' personnel and Customer Support can then subsequently introduce further optimization measures if required. In addition, Bihler also offers its proven 24h telephone hotline service as well as its highly-appreciated virtual system training solutions. And last but not least, customers can also benefit from new tools and features, such as virtual commissioning or the Bihler Analysis Tool, which gives users an overview of all production activities on their Bihler systems whenever they want it and independently of their location. These outstanding, all-round consulting and service skills are unique and make Otto Bihler Maschinenfabrik the ideal partner for optimizations and efficiency enhancements.

Highly efficient new equipment Bihler naturally also uses its exceptional skills and qualifications to develop and implement new, innovative equipment and process technologies. These are designed from the outset to ensure maximum efficiency and guarantee that all users benefit from the greatest possible process quality and cost-effectiveness. One example is the Bihler LEANTOOL system, which cuts tool manufacturing costs by more than 50 percent. The efficiency in material utilization offered by the new fully-featured Bihler equipment solutions is of a similar scale. For example, innovative Bihler Technology has helped Schürholz Stanztechnik (for a portrait, see the following best-practice article) in Plettenberg achieve materials savings of approximately 30 percent during the manufacture of housings, while Freudenberg Stanz- und Umformtechnik in Weinheim has been able to reduce material utilization for the production of sealing rings by up to 85 percent using Bihler technology.
All new Bihler equipment has been designed not only for minimized raw materials consumption but also for energy-efficient workflows. This includes, for example, factors such as low power consumption, low lubricant and oil requirements, a long service life coupled with low maintenance requirements, as well as a small CO_2 footprint.
Another important advantage of the new Bihler systems lies in the fact that they can be fully automated. Many enterprises are now making use of the resulting cost-related and competitive advantages to relocate their production operations back into their own countries, for example by moving out of Asia. For many customers, fully-automated production systems are also a way of responding to the labor shortage. At the same time, such systems help make companies more attractive, in particular for younger employees.

Optimizing existing processes Last but not least, by helping customers optimize their existing structures and processes, Bihler enables them to save resources and enjoy the advantages of greater efficiency. One example of this is the Bihler BC-R upgrade and retrofit package. This is a fast and easy way to modernize older Bihler machines in order to achieve greater productivity and benefit from a guaranteed spare parts supply coupled with relatively low energy and resource consumption levels. Further advantages come from the use of modified, individually adaptable tools. This not only makes it possible to more than double system throughput and save energy but also to reduce material

consumption. The reduction in setup times resulting from the use of Bihler NC technology also brings considerable potential for efficiency enhancements: It takes an average of one hour to completely retool a Bihler GRM 80R NC compared to the eight hours needed for a mechanically-controlled system.

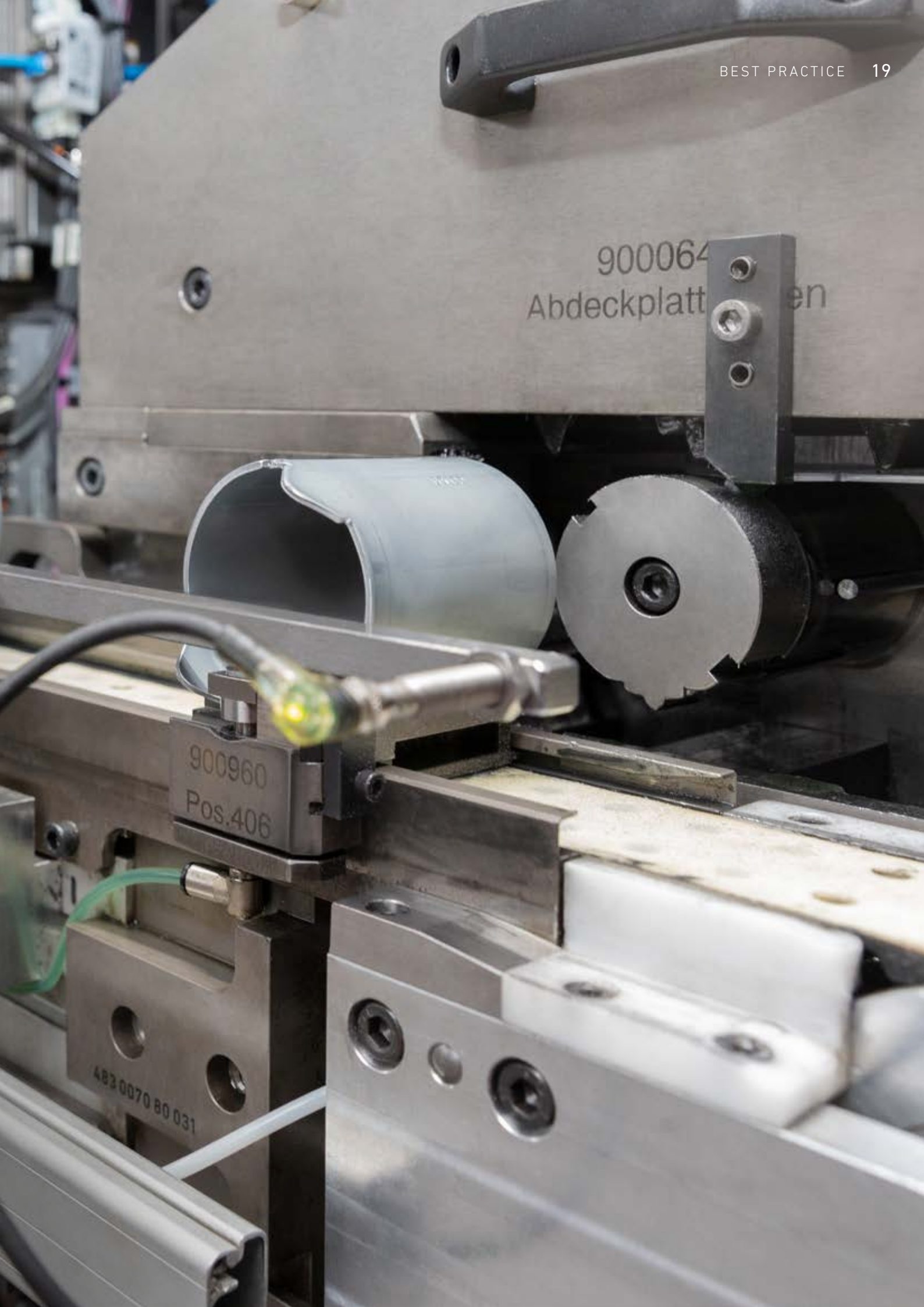
Ideally equipped Whether for a new system or the optimization of existing processes: Whatever the application, Otto Bihler Maschinenfabrik can provide the perfect solution to allow businesses to exploit resource and savings potentials. It not only provides the necessary technology but also supports its customers in achieving their goals. "In this way, our customers are able to make themselves outstandingly competitive and differentiate themselves successfully in the market," says Mathias Bihler. "They are therefore equipped to meet the challenges of today and the future." ●

Raw materials are another important resource alongside energy, technology and personnel. Depending on the quantities involved, they have a direct impact on company profits.

HOW DO YOU MANUFACTURE HIGHLY EFFICIENTLY?

Schürholz Stanztechnik manufactures watertight electric motor housings on a new Bihler BIMERIC BM 6000 servo production and assembly system and uses around 30 percent less material compared with deep drawing.

INLINE MANUFACTURING FOR 30 PERCENT MATERIALS SAVINGS.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Schürholz GmbH & Co. KG in Plettenberg joined forces with Otto Bihler Maschinenfabrik to develop a new process for producing watertight electric motor housings on a Bihler BIMERIC BM 6000 servo production and assembly system. The system, the only one of its kind in the world, performs all work steps inline in a seamless process and offers outstanding precision at high cycle rates. Not only that: It uses around 30 percent less material compared to conventional deep drawing technology.

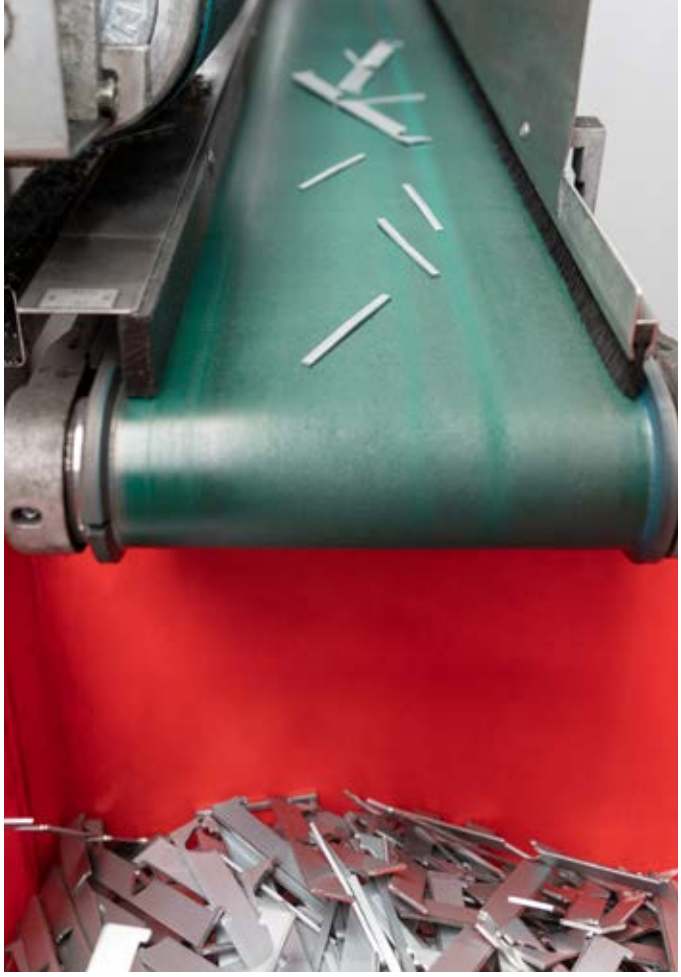
The new Bihler BIMERIC BM 6000 servo production and assembly system is a globally unique system that provides maximum automation and efficiency. On it, all the operating steps are performed inline in an end-to-end process.

The product portfolio of the Plettenberg-based Schürholz Stanztechnik includes embossed parts, stamped parts, stamped and bended parts and drawn parts. The components are used in the electrical industry and in railroad technology, but above all in the automotive and automotive supplier sectors. Metal housings for electric motors used for adjusting seats in vehicles play an important role in these sectors. Up until now, the company produced the housings using the traditional clinching method with bearing covers on a Bihler BM 1500 production system in combination with a Bihler COMBITEC CC 1 forming center. In 2017, the company decided to also use these housings for window regulator motors in vehicles - even though the requirements for these are significantly higher: "The housings for window regulator motors must be watertight and pressure-tight as per IP67 to ensure that windows can be opened even under water in an emergency," explains Managing Director Angelo Castrignano. "A clinched component can never meet this requirement, so we had to find an alternative manufacturing solution."

Maximum automation and efficiency The idea was for all the necessary process steps to be redeveloped and fully mapped to a single system, namely a new Bihler BIMERIC BM 6000 servo production and assembly system. This was no easy task, as production involves a wide variety of process steps such as stamping, bending, laser welding, fitting the cap and pressing it tight. But after two years of development, including a project study, the entire process was integrated into the Bihler BM 6000. Castrignano: "It is a globally unique system that provides maximum automation and efficiency. Its main advantage lies in its high production speed of up to 60 strokes per minute. At the same time, the machine is designed for optimum material utilization

and uses around 30 percent less material compared with deep drawing. With a planned 28 million parts per year, this represents a considerable efficiency boost. And not just in financial terms due to the sharp rise in the cost of raw materials: The reduction in material use can also save thousands of tonnes of CO_2 each year."

Parallel development of the solution Otto Bihler Maschinenfabrik was quickly chosen as the partner for developing the solution, especially since other suppliers had previously failed in the face of the complexity of the task. "Only Bihler has the necessary expertise and manufacturing technologies for a product like this," says Castrignano. "We worked together in parallel to drive the solution forward, with us concentrating on the tooling and Bihler on the system. Our customer, Brose Fahrzeugteile provided us with constant support." The watertight joining of the motor housing to the stamped cover and the integration of laser welding into the process presented particular challenges. The latter issue had already been considered by Brose Fahrzeugteile some 15 years ago and has now been taken up again and implemented. Ultimately, it was possible to master all the technical challenges within budget and on time, and so the Bihler BM 6000 was able to go into operation at Schürholz at the end of 2018. "The up-front machine acceptance in Halblech went absolutely smoothly," recalls Stefan Wortmann, Production Manager. "We switched on the machine and ran through a complete batch of 30,000 units without any malfunctions."



Minimized waste quantities: The reduction in materials consumption is not only worthwhile from an economic perspective but also saves thousands of tonnes of CO_2 every year.

Complete housings every second At Schürholz in Plettenberg, production of the motor housings starts with pulling in the strip and punching out the blank. This is bent to form the body. The component is then calibrated and transported to the laser welding unit. This then welds the housing. The two screw lugs of the housing are then bent through 90° on a computer system and punched. The housing then rotates and the first step is rasped at the upper end of the housing. To do this, the wall of the housing is pressed down precisely from above. The cover is then placed on this protrusion using a pick-and-place unit. After that, the housing is rasped again so that an absolutely tight press-fit joint is formed. Finally, the component is checked using a camera, and a laser sensor also checks the weld seam – and then the completely finished motor housings drop into the box in a matter of seconds. "In contrast to deep drawing, the new technology also allows a wide variety of material thicknesses to be employed easily and flexibly, and with constant precision across the entire housing body. This is another major advantage of the system," explains Stefan Wortmann.

Continuing on the road to success The enormous success of the project prompted Schürholz to commission another Bihler BM 6000 for the production of larger housings. These are also used in cars, but also, for example, in electric garage doors or coffee machines. In addition, the company already has concrete plans for a third Bihler BM 6000. "The Bihler BM 6000 is the new flagship in our company's machine park. It represents an important foundation for us for the future, as it will enable us to continue to grow successfully in the field of housing production irrespective of the type of drive used in the vehicle," says

The portfolio of Schürholz Stanztechnik includes embossed parts as well as stamped parts, stamped and bended parts and drawn parts.

The watertight and pressure-tight design of the motor housings was one of the core challenges overcome by Managing Director Angelo Castrignano (right) and Production Manager Stefan Wortmann during the conduct of the project.

Angelo Castrignano. "At the same time, the system reflects the greatest possible expertise in development and technology. It makes a crucial contribution to maintaining and securing our local production location." The considerable innovativeness of the solution is also evidenced by the fact that Schürholz, together with Brose Fahrzeugteile, has now applied for numerous patents on this method of manufacturing the waterproof electric motor housings. And, to crown it all, Schürholz, together with Otto Bihler Maschinenfabrik, was named the most innovative supplier of 2019 by Brose Fahrzeugteile. ●

schürholz Group

When he founded his pressing shop in Plettenberg back in 1918, Johann Schürholz laid the foundations for a company that now successfully specializes in the manufacture of embossed, punched, punched-bended, and drawn parts and has further sites in Poland and China. In 2021, the 412-strong workforce at the Schürholz Group produced some 160 million parts and achieved sales of approximately 118 million euros.

www.schuerholz-group.com

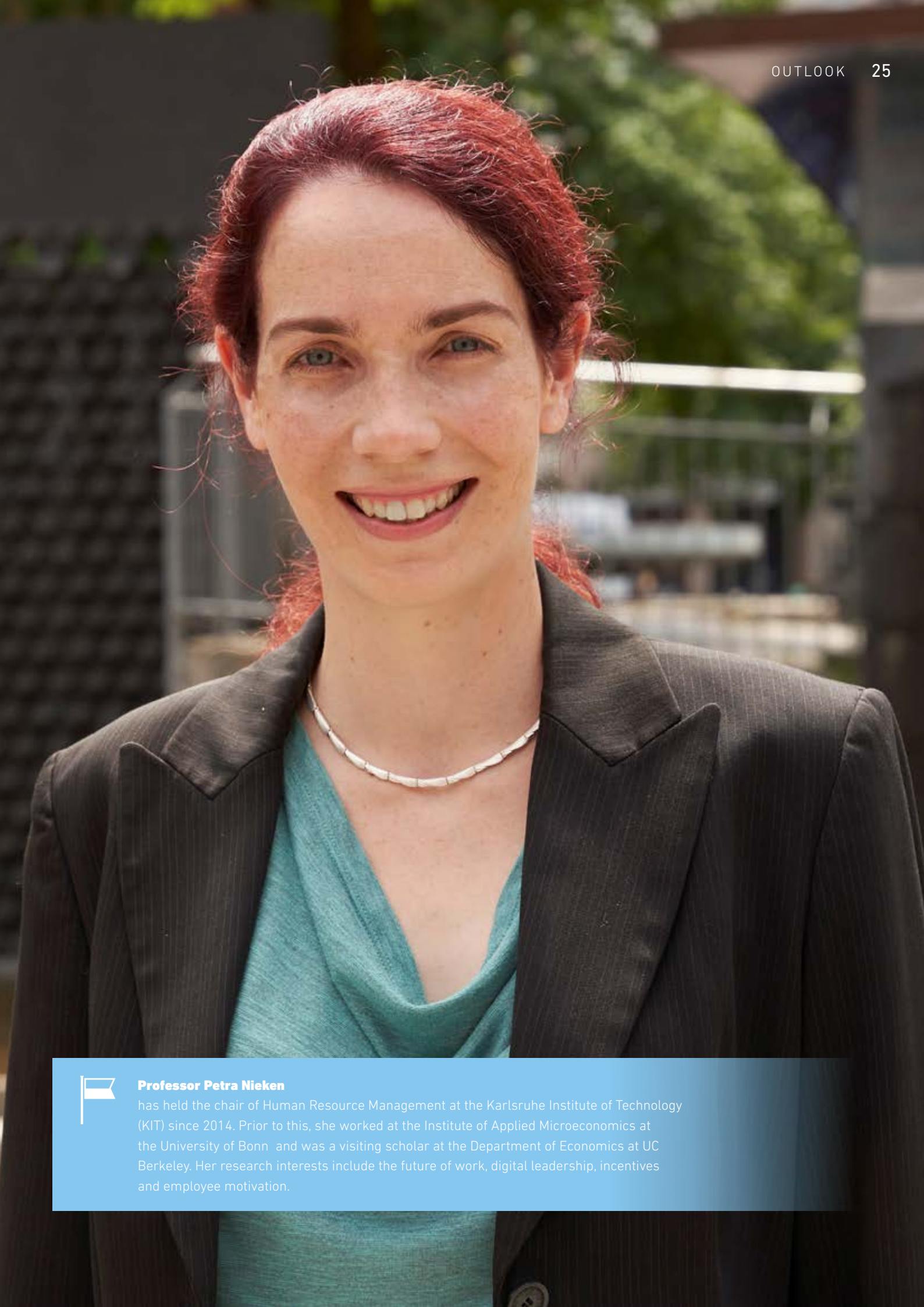
PUTTING PEOPLE AT THE CENTER AGAIN

Professor Petra Nieken, Chair of Human Resource Management at the Karlsruhe Institute of Technology (KIT), explains the role people play in the changing world of work and what is important in HR management.

What is the significance of people in today's world of work and the corporate environment, and to what extent has the role of the workforce changed recently?
People remain the central force in the world of work. People have the creative ideas and drive innovations. Right now, we are seeing a shift in industry away from fully automated, Industry 4.0 production largely devoid of people and towards putting people back at the center of our thinking. This is the Industry 5.0 principle, according to which technology adapts to the needs of people. The goal is efficient interaction between humans and machines working together in an integrated way.
The pandemic, the move to the home office and the shortage of personnel have greatly accelerated this development. At present, we are still finding the right balance as to how and where we do our work in the future: We've seen that remote working functions even better than expected, but we also need those informal interactions in the workplace, i.e., chatting over coffee or meeting in the corridor. We are, after all, social creatures.

What might the future of work look like?
In future, the world of work will be based on a hybrid model, where employees spend a few days a week in their home office and the rest of their working hours in the company. Given the shortage of labor, the workforce will increasingly be able to choose the alternatives that are important to them, and employers are quite willing to adapt to this. At the same time, the workforce will become more diverse and international, and all these people will want to be seen and heard in the workplace. We are already using various forms of digital communication on a daily basis, and we need to think about future collaboration models that integrate the social element. Technology will do a lot, but not everything. At the same time, workplaces will change, as they always have. We should see this as an opportunity. We should see technology as a helper that takes on routine tasks, for example. As a result, the workforce will have more time for their real jobs and can devote themselves much more intensively to the creative and social aspects of work.

Ideally, how should HR management be structured now and in the future, what is important?
We are currently facing the problem that there is too much work for too few employees. HR management must transform itself to take up a people relations role and act as a coach for managers and employees. Many processes of a purely administrative nature, such as payroll administration or job advertisements, can be easily digitalized and automated if this has not happened already. This frees up time for strategic work and allows people to focus on making the company a great and sought-after place to work. The workforce will become more diverse and many different needs will have to be reconciled. Employees need to be helped to feel at home in the future world of work and to tackle the challenges. A good approach is to address employees individually and, for example, offer tailored training options. Digitalization provides the necessary flexibility to do this. And, last but not least, HR should also make use of the potential of AI and digitalization judiciously and integrate it transparently into its processes. ●



Professor Petra Nieken
has held the chair of Human Resource Management at the Karlsruhe Institute of Technology (KIT) since 2014. Prior to this, she worked at the Institute of Applied Microeconomics at the University of Bonn and was a visiting scholar at the Department of Economics at UC Berkeley. Her research interests include the future of work, digital leadership, incentives and employee motivation.

THE ENTHUSIASM MUST NEVER BE LOST

The path to becoming a professional is fraught with obstacles for up-and-coming soccer players. In this interview, Markus Hirte, Sporting Director for Talent Promotion at the German Football Association DFB, explains how to find, nurture and motivate young talent.

According to Markus Hirte, the enjoyment and fun of playing should always be at the forefront and should be encouraged by the trainer and everyone else in the player's environment.

How does youth development work at the DFB, and who is it aimed at?
The DFB's talent promotion program has been around since 2002 and is aimed at the 11-14 age group, i.e. from U12 to U15. The aim is to identify young talent right across the country – outside of the club academies and elite soccer schools – and to develop it further through weekly DFB training alongside club training. There are a total of 366 centers across Germany, each with 3-4 paid coaches. The training itself is specifically tailored and focuses on the individual player. When we are looking at players, we focus on motor skills, i.e. the player's agility and dexterity, but also their perception and decision-making on the pitch.

What are the biggest obstacles on the way to becoming a professional player nowadays?
One of the biggest challenges for young players is finding a balance between the demands of sport and the demands of school. This requires time management and concentration, and it's often not easy. Another difficult aspect, and one that is not easy to influence, is the increasingly early age at which young players are focused on achieving their goals and dreams, for example "I'm going to play in the Bundesliga". Other critical issues include the financial and business activities of agents, early club transfers and the associated monetary aspects. Ultimately, the players have to tread a fine line to pursue a goal while not neglecting other important things. On top of that, players go through their ups and downs, especially as they are growing up – and also have to accept setbacks if they are occasionally benched or are injured. It's crucial to be able to deal with situations like this properly.

How do you best motivate players in the face of these challenges?
In my opinion, everything should revolve around the passion for what they are doing, in other words, the sheer joy and fun of playing. This enthusiasm must never be lost, and must be encouraged by the coach and the people around the player. For me, it is ultimately the basis for improved performance. No matter whether we are dealing with a serious, determined type or a more relaxed, playful character, personal contact with all players is crucial if we are going to be able to motivate them successfully.
I think we have a very large pool of talent in Germany. The DFB helps to discover players with the potential to play professionally and pave the way for them to play in the Bundesliga and the national team. ●

Markus Hirte
Was born in Berlin in 1963 and has been the Sporting Director for Talent Promotion at the German Football Association DFB since 2016. He is responsible for talent development in the academies and the elite soccer schools for the DFB throughout Germany. Prior to this, he was the head of Fortuna Düsseldorf's academy and worked for Hamburger SV and the Berlin Football Association.

THE STANDARD IN T

The new compact LM 2000 machine platform expands the innovative Bihler machine pool by introducing a high-performance system for small to large batch sizes. It is fully compatible with modular linear tools and stands out for its ease of access, simple operation and optimized maintenance.

At EuroBLECH 2022, Otto Bihler Maschinenfabrik will be presenting the new LM 2000 machine platform live for the first time. This platform is used to manufacture stamped and bended parts from strip material using linear tool technology and also supports the integration of further operating processes. It is equipped as standard with a feeder module, press module and central mandrel module that have been designed for all speed ranges. The LM 2000 platform is electrically pre-installed for maximum occupancy and for easy subsequent installation of further bending modules and central mandrels. Two variants of the LM 2000 are available: the LM 2000-KT and LM 2000-NC. These differ in the modules used for bending in the linear area. A bending module equipped with cam technology (LM 2000-KT) is used for the production of medium-sized to large batches. A bending module based on spindle technology (the LM 2000-NC variant) is used to manufacture small to medium-sized runs in order to permit the shortest possible setup times. All the modules (feeder, press, central mandrel, bending) are servo controlled.

Important role The LM 2000 plays a new and important role in Bihler's standardized machine concept because, in the same way as the NC variant, the Bihler LM 2000-KT is fully compatible with uniformly designed bending tool modules – for example, LEANTOOL Linear, parts taken from LEANTOOL Linear or or with compatible tool solutions of the user. It is also possible to use cutting tools from the Meusburger standard modular system. This means that every system can be operated using simplified and highly standardized tools. This in turn ensures shorter times to market,

OP PERFORMANCE

Maximum performance The Bihler LM 2000-KT is ideal for medium and large batch sizes with few variants. It controls the movements of the tools with one cam disk each, achieving cycle rates of up to 500 rpm. At these speeds, smooth running and stability are crucial. This is why the Bihler LM 2000-KT has a solid, robust machine bed. It effectively absorbs vibrations, which also has a positive impact on the service life of the tools and the productivity of the system. The system also has a particularly simple structure. This makes the machine easier to understand and operate. What is more, the developers of the Bihler LM 2000-KT placed particular emphasis on energy efficiency and reducing CO_2 emissions.

Standardized modules
The compact machine body comprises the feeder module, the central mandrel module, the press module and five module positions in the bending area, each with movement from above, below and the third plane. Other standardized modules that can be fitted at the module locations for operating processes such as contact welding, thread cutting and assembly are under development. For technical reasons, the retooling time for the cam-driven Bihler LM 2000-KT is longer than for the servo-driven NC variant, but it is possible to switch out six cams within 90 minutes. A convenient quick-change system for the cams was therefore developed to achieve this. The Bihler LM 2000-KT will be available from the beginning of 2023. ●

increased cost-efficiency and faster production. But above all, the Bihler LM 2000-KT and -NC offer greater flexibility in component production. This is because all the stamping and bending tools are compatible without any adaptations and can be ported between various Bihler systems: Bihler GRM-NC, Bihler LM 2000-NC, Bihler LM 2000-KT and Bihler BIMERIC Modular. The tools can be used throughout the entire product lifecycle, meaning that the most suitable production system can be chosen as the batch sizes increase or decrease and value-added grows.

THE NEW BIHLER LM 2000 PLATFORM

Highly standardized machine platform for the production of stamped and bended parts from strip material using linear tool technology and cycle rates up to 500 rpm.

1 LM 2000 platform

- machining length of 2,000 mm for punching, bending, stamping and other processes
- machine body with integrated electrics and control system
- press, central mandrel and material feed designed for all speed ranges
- pre-installed electrics for subsequent expansion of machining components in the linear area
- can be expanded with additional processing modules for contact welding, thread cutting and screw insertion for further added value
- electrically pre-installed for maximum occupancy, for easy subsequent installation of further bending modules and central mandrels.

2 LM 2000-KT slide unit

- designed for a maximum speed of 500 rpm.
- runs using a positive control cam
- manual quick-lift function for reaching the setup/ maintenance position without changing the cam
- newly designed rapid change system for easy and convenient replacement of the cam
- overload sensor system and recirculating oil lubrication as standard for maximum service life
- sealed, fully encapsulated housing for greater cleanliness in the tool area

2 LM 2000-NC slide unit

- designed for a maximum speed of 250 rpm.
- operated using spindle technology
- continuous stroke and stroke position adjustment
- machine setup at the touch of a button, resulting in very short setup times
- sealed, fully encapsulated housing for greater cleanliness in the tool area

3 Central mandrel

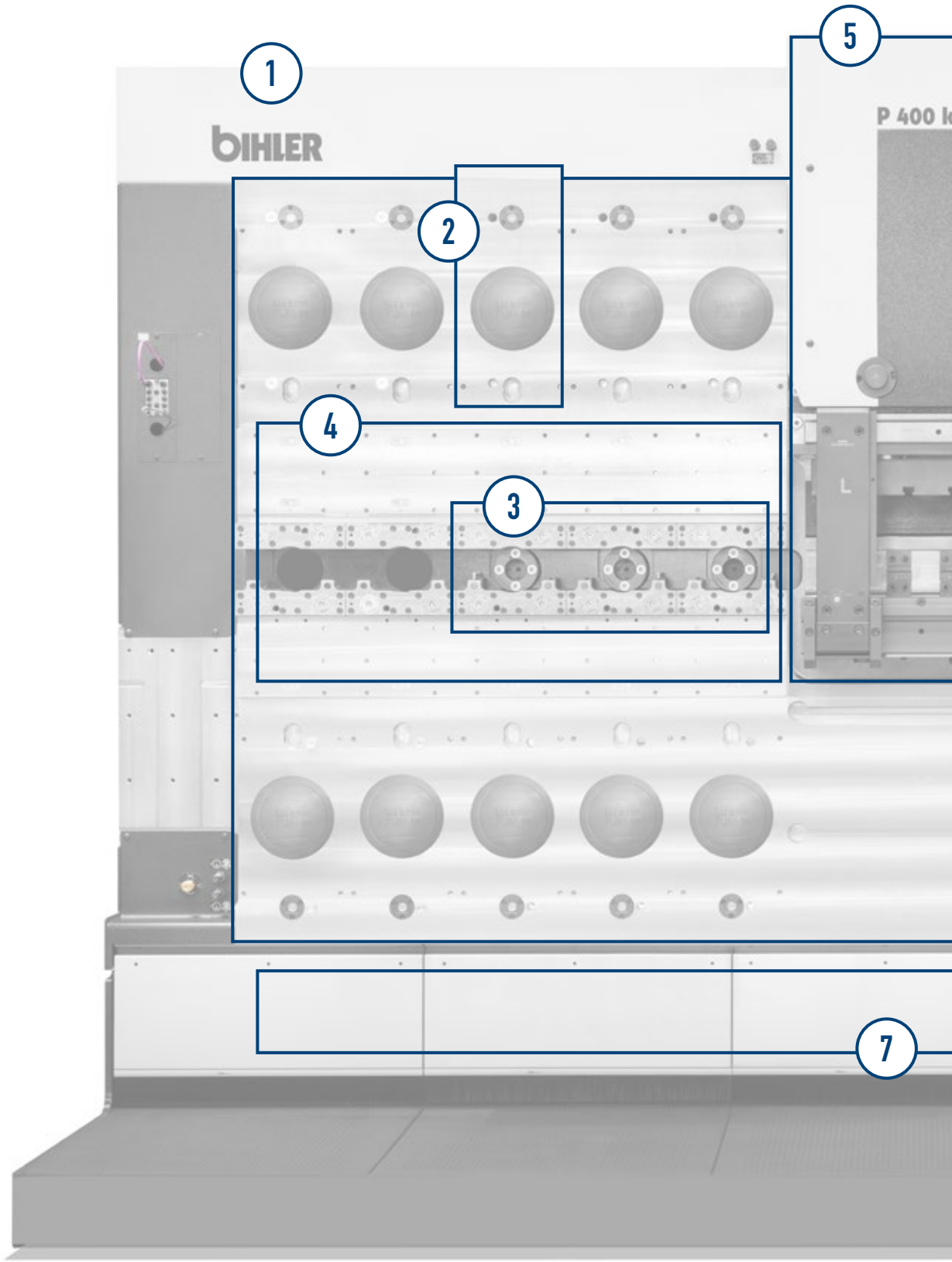
- servo-driven central mandrel, designed for all speed ranges
- integrated manual positioning system to move the central mandrel to any of the five mandrel positions quickly and accurately
- up to five central mandrels can be easily retrofitted

4 Linear area

- five module positions in the linear area, each with up to three independent movements from top, bottom and third plane
- standardized interfaces and zero-point clamping system with hydraulic clamping functions for fast and secure positioning and clamping of the tool modules
- stamping and bending tools fully compatible with machine types from the new, modular product line

5 Press module

- eccentric press with 400 kN nominal press force and 16 mm fixed stroke
- manual stroke position adjustment with digital travel measuring system and controller connection to compensate for tool wear and manufacturing tolerances
- integrated press force monitoring with overload protection, bearing temperature monitoring and connection to recirculating oil lubrication system
- press installation space compatible with Meusburger SBP 400 and SBH 400 die sets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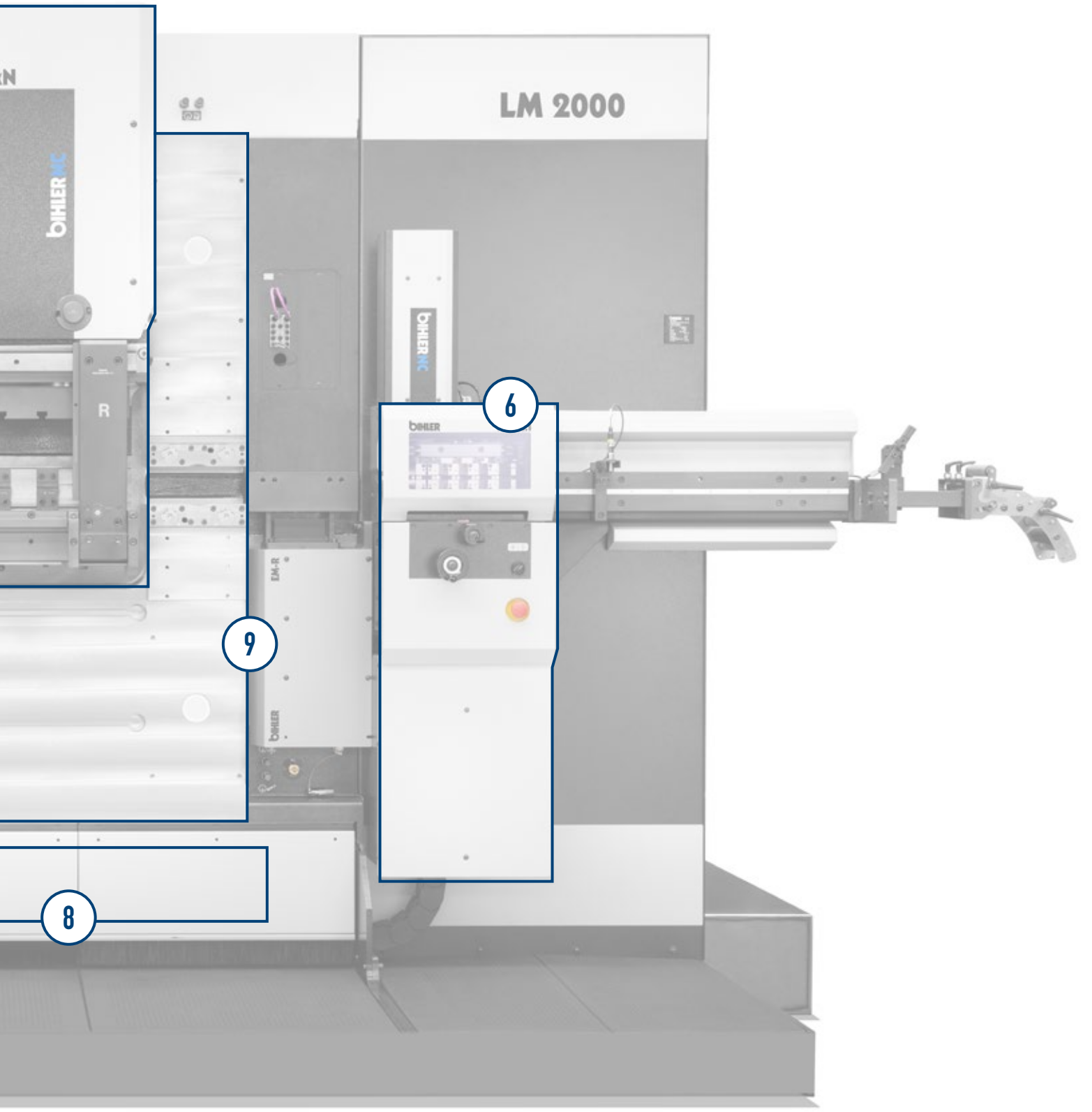
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6 Feeder module

- RZV 2.1 servo radial gripper feed for highly dynamic, slip-free feeding and positioning of the strip material
- designed for all speed ranges
- with adaptable components such as strip guards, strip oiler, straightener, standardized strip guide blanks

7 Recirculating oil lubrication

- freely accessible recirculating oil lubrication to lubricate and cool all processing components
- electronic monitoring of oil temperature, filling level and contamination
- temperature-controlled cooling of the lubricant and flow-dependent monitoring of each individual lubrication point
- considerable oil savings and cost reduction thanks to filtering, cleaning and preparation of the lubricant

8 Central lubrication system

- freely accessible central lubrication system for tool and application fitted as standard
- two differently timed and independently programmable lubrication circuits, e.g. for bending area and press
- with electronic lubrication pressure monitoring

9 Maintenance

- freely accessible machine elements, electrical components and connection elements
- all components clearly structured
- rapid maintenance, reduced machine downtimes and increased machine availability

10 VariControl VC 1

- VC 1 machine controller (version 2.0) for controlling, regulating and monitoring all machine and process functions
- with freely programmable digital and analog I/O bus modules integrated on the machine side
- clearly structured, very easily operated control interface
- tailored menu interfaces for the machine, process and tool areas
- clear display of machine statuses, functional areas (e.g. process module, feed mechanism and tool clamping) and production overview

11 OPC UA interface

- OPC UA interface integrated as standard
- for transferring machine statuses to the Bihler Analysis Tool or to MES or EAP systems
- acts as interface and basis for IoT, M2M and Industry 4.0.

12 Condition monitoring

- all parameters and system statuses are measured, evaluated and monitored in real time
- allows evaluation of the machine status and individual components
- notification via machine controller if thresholds are exceeded

THE BIHLER LM 2000-NC

The Bihler LM 2000-NC sets new standards in the Bihler portfolio for flexible production with frequent tool changes. But it is also ideal for developing tools and processes and opens up new manufacturing benefits for users of traditional linear tool technology.

The Bihler LM 2000-NC is the servo-controlled counterpart to the cam-controlled LM 2000-KT. This machine also fits perfectly into Bihler's standardized machine park strategy and is compatible with all uniformly produced linear tools. This means, for example, that a newly developed tool, initially designed to run on the Bihler GRM-NC to produce samples and smaller batch sizes, can be moved to the Bihler LM 2000-NC without any difficulty. This is ideal for batch sizes that require frequent tool changes, as the Bihler LM 2000-NC allows extremely fast retooling.
Its versatile bending modules with spindle technology and the controller offer a particularly wide range of options for fine-tuning of the travel profiles to generate the perfect sequence of movements. In contrast to the cam-driven machine, this can be done within a few minutes at the push of a button on the Bihler LM 2000-NC. Consequently, the Bihler LM 2000-NC is also ideal for developing tools and processes and/or for producing small to medium batch sizes. The tool can subsequently be mounted on the Bihler LM 2000-KT if larger batch sizes are to be manufactured or on the BIMERIC Modular if additional value-added processes are required. The system combines this high degree of flexibility with a production output of up to 250 strokes per minute. But the future may see even higher performance figures thanks to the ongoing development of the controller and software technology.

Robust and compact Like the KT variant, the Bihler LM 2000-NC has a particularly robust and simple design, reduced to the essential functions. The machine

The new servo-controlled Bihler LM 2000-NC is ideal for developing tools and processes as well as for producing small to medium batch sizes.

body is designed to be compact and space-saving. The side-operated standalone system does not require an additional control cabinet, because the electrical hardware, the drive elements and the VC 1 control system are already integrated in the machine. Unlike the Bihler GRM-NC, the Bihler LM 2000-NC only supports linear operation, and not radial operation. However, although the two systems are the same size, the LM 2000-NC possesses more module positions.

New manufacturing benefits The standardized tools, the linear production principle and the fact that the carrier strip does not have to be lifted out also make the Bihler LM 2000 platform interesting for customers who are already using traditional linear tool technology - and produce a relatively large amount of waste material, for example in the form of stamping strips. The Bihler LM 2000-KT or -NC, on the other hand, only require one stamping strip and can thus achieve material savings of up to 30 percent. Bihler's standardized portfolio of solutions, which are fully compatible with each other and are available from a single source, thus opens up new, unique manufacturing benefits even for users who previously relied on classic linear tool technology. ●

CONTINUED GROWTH

The acquisition of a new Bihler GRM-NC by VIRMA in Sulbiate in northern Italy heralds their first step into Bihler servo technology. With this move, the long-established company has significantly boosted their manufacturing expertise and is achieving enormous efficiency gains in production. They are also ideally equipped to cope with the increasingly complex manufacturing tasks of the future.

Founded in 1972, VIRMA S.p.a.is today one of the leading manufacturers of complex stamped and bended strip and wire parts, welded fasteners and assemblies. The company's product portfolio includes, for example,

Enjoying the benefits: CEO Serena Agostini has been able to achieve enormous efficiency improvements in production thanks to Bihler's servo technology. With this, the company is also ideally placed to take on ever more complex component manufacturing tasks, sometimes involving high levels of automation.

stamped parts made of partially pre-treated copper and electro-welded contacts made from silver or silver alloys, complete terminal connectors with stamping and assembly of the contact and spring inside the plastic shell and cover, and laser marking integrated in the machine. Headquartered in Sulbiate, northern Italy, and with a manufacturing plant in Bulgaria that went into operation in 2013, the company offers a full range of services related to the production and supply of stamped metal parts, from prototyping, design and in-house tool-making to manufacturing and logistics. VIRMA produces around 800 million parts a year and supplies customers around the globe from all industrial sectors, particularly the electronics and electrical engineering industries.

A partnership spanning decades The company is managed by Serena Agostini, the daughter of founder Eraldo Agostini, together with Roberto Portinari, the Supply Chain Manager, and Luca Ferrario, the Technical Manager. "Constant growth is the mark of VIRMA," says Serena Agostini. "To achieve this, we are continuously modernizing our production methods and work together with leading technology partners on a long-term basis." And Otto Bihler Maschinenfabrik has a special role to play here. The companies first worked together back in the late sixties, when VIRMA acquired its first Bihler RM35. The company now has around 90 Bihler machines, ranging from 10 RM25s and 22 RM35s to 15 GRM-50s, two BZ 2s, a CC1 and an MC120.

VIRMA is headquartered in Sulbiate in northern Italy.

Luca Ferrario, Technical Manager at VIRMA, is delighted at the significant increase in productivity resulting from the introduction of Bihler's NC technology.

VIRMA's Supply Chain Manager Roberto Portinari is also extremely happy with the smart parts production based on Bihler NC technology.

"Over the decades, we have been able to successfully realize many key technology projects with Bihler," Serena Agostini tells us. "This is because Bihler supplies us not just with the machines, but also with the associated technology. This always allows us to take the next step on the path of innovation into the future."

More flexible and more efficient In 2021, VIRMA took another important step towards the future with their purchase of a new Bihler GRM-NC servo stamping and bending machine. One reason for the move to Bihler's servo technology lay in the nature of the customer's manufacturing jobs, which were difficult to achieve with existing mechanical equipment. Agostini: "In this respect, the new GRM-NC was also a strategic investment. In particular, we were impressed by the much shorter setup times and the considerably reduced effort needed for machine adjustments. We can also use the machine to produce smaller runs, which are what our customers are increasingly demanding, efficiently and flexibly." The advantage here is that existing tools can be fully adapted to the new Bihler GRM-NC. And VIRMA plans to use the Bihler Leantool system to build new stamping and bending tools, thus benefiting from further time and cost gains. The company is also considering a second Bihler GRM-NC for the VIRMA plant in Bulgaria.

Enhancing the company's appeal VIRMA acquired the necessary knowledge and skills in a one-week Bihler training course held at the company's headquarters in Sulbiate. "This showed that our younger staff in particular are very keen on NC technology," Agostini recounts. "Seen like that, we have also hugely enhanced our appeal to the younger generation with the new Bihler GRM-NC."

The first Bihler GRM-NC servo stamping and bending machine arrived at VIRMA in 2021, and a second Bihler GRM-NC is now being considered for the VIRMA factory in Bulgaria.

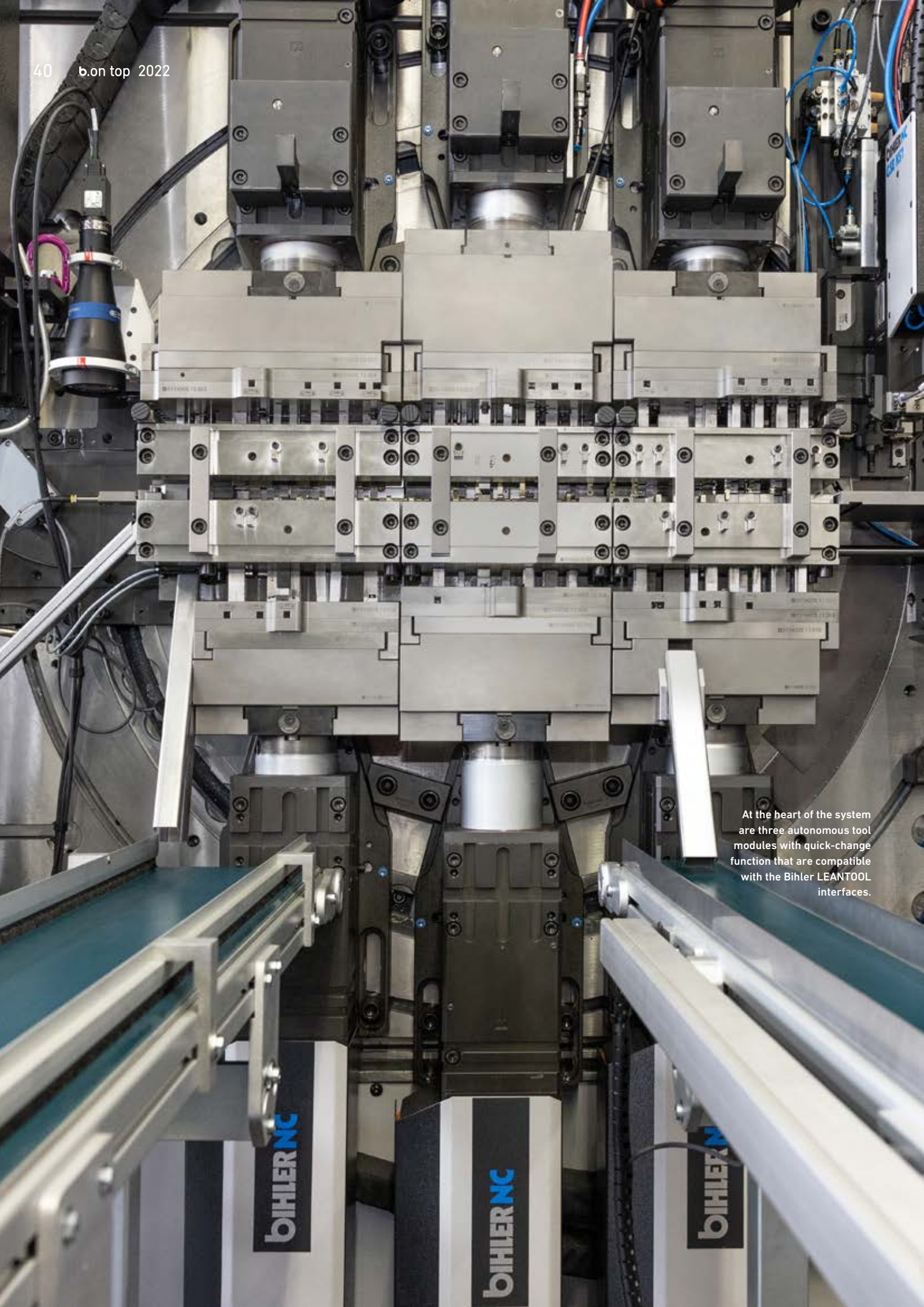
Twice as fast At present, VIRMA has already adapted an existing tool from a Bihler GRM-80 to the new Bihler GRM-NC, and more are in the pipeline. "We expect setup times to be significantly reduced," Roberto Portinari and Luca Ferrario stress. "We have already seen that all tools can run twice as fast. We are very pleased with this productivity boost and smart part manufacturing using Bihler NC technology."

"Going forward, we want to continue improving our manufacturing technologies by further increasing the number of Bihler NC machines we use," says Serena Agostini as she looks to the future. "This will allow us to respond to our customers' requirements in the way we need to. They are entrusting us with increasingly complex component manufacturing tasks, some with a high degree of automation, in order to reduce the number of subcontractors they are using." ●

VIRMA S.p.a.

In 1972, Eraldo Agostini founded the company that is now one of Italy's leading suppliers of stamped and bended parts and assemblies. Alongside its headquarters in Sulbiate, VIRMA has also had a manufacturing plant in Plovdiv, Bulgaria, since 2013. VIRMA produces around 800 million parts a year, primarily for the electronics and electrical engineering industries.

www.virmagroup.com



At the heart of the system are three autonomous tool modules with quick-change function that are compatible with the Bihler LEANTOOL interfaces.

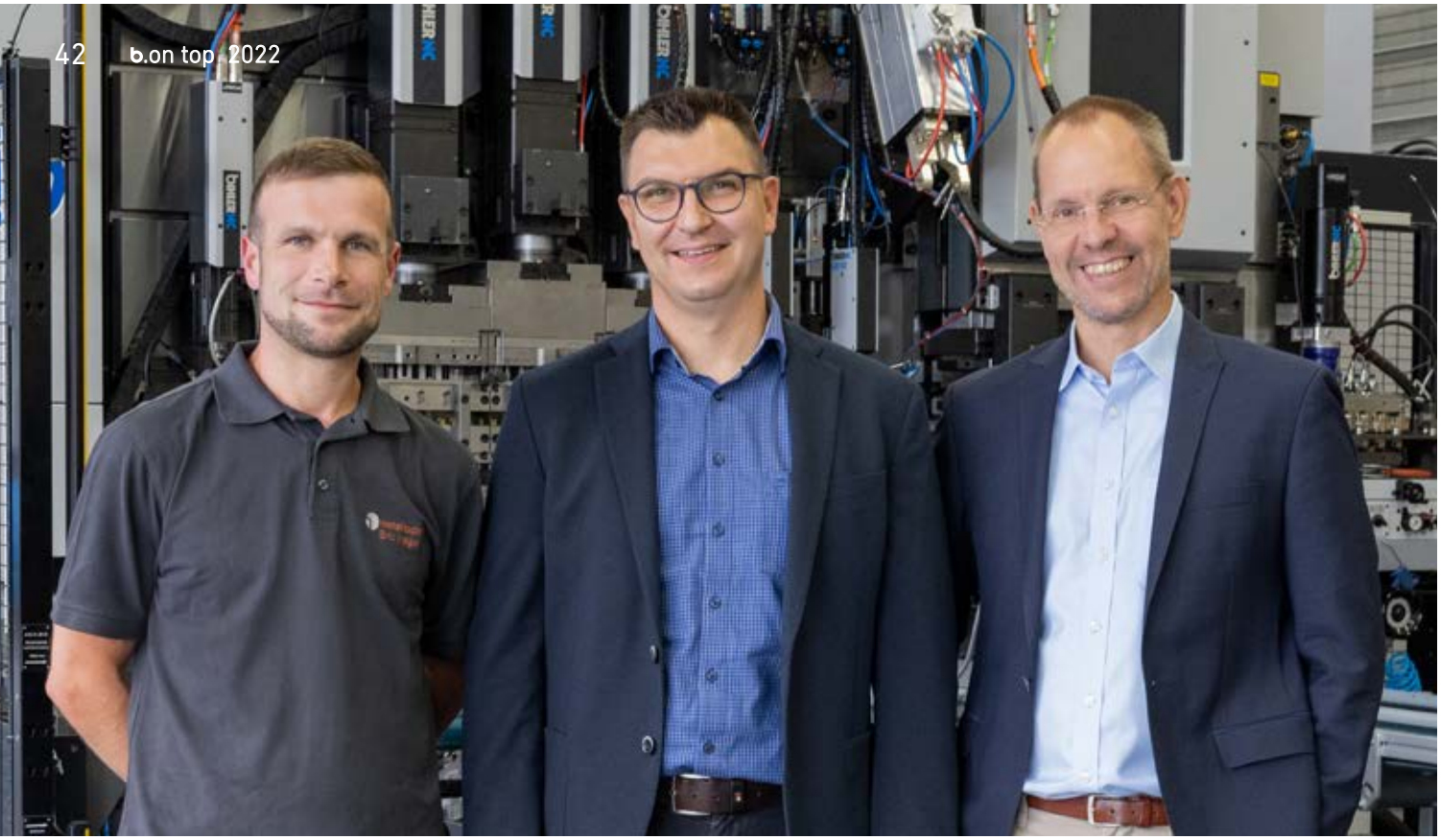
FLAGSHIP PROJECT

Metalltechnik Annaberg GmbH & Co. KG used a Bihler GRM-NC servo stamping and bending machine for the successful completion of a pioneering flagship project for the manufacture of contact parts for electrical connectors. Compared to conventional linear tool technology, Bihler's solution achieves significantly higher production speeds of 160 parts per minute. The tools, which are compatible with the Bihler LEANTOOL interfaces, ensure vastly reduced setup times combined with simple handling.

Everything from a single supplier – that is the motto of Metalltechnik Annaberg GmbH & Co. KG, a company headquartered in Königswalde in the Erzgebirge. The service and product portfolio of this company, which was established in 1998, is correspondingly broad: "As a full-service provider in the metalworking industry, we assume full project-management responsibility, from development through to series maturity," explains Thomas Schaarschmidt, Managing Director of Metalltechnik Annaberg. "We focus on module assembly and surface finishing and, above all, on the production of complex, high-precision stamped-and-bended parts for the electronics industry." To manufacture these parts, the company has been using equipment from Otto Bihler Maschinenfabrik for over 20 years and now possesses a total of eight Bihler machines. "The Bihler systems stand out for their great reliability, stability and durability. They provide the precision and dynamic properties we need," continues Schaarschmidt.

A new challenge Grounding brackets and ground connectors play a central role in Metalltechnik Annaberg's product portfolio. These parts are present in almost all electric plugs and sockets and ensure the reliable flow of electricity, for example in charging points for electric vehicles. The company has been manufacturing these ground connectors and grounding brackets on a Bihler GRM 80E for well over ten years. "Although the system gave us the production quality we needed, the concept and output were not optimal," reports Thomas Schaarschmidt. "The machine only cycled at 30 strokes per minute," adds Eric Nagel, a technology expert at Metalltechnik Annaberg. Against this background, Metalltechnik Annaberg decided to revisit the manufacturing concept for its connector components in early 2021 – in particular given that a former manufacturer was restructuring its operations and looking to outsource the production of precisely these parts. "Originally, we planned to manufacture the components using the conventional progressive tool process our partner had been using for years," explains Schaarschmidt. However, this approach would only have achieved speeds of 60-70 strokes per minute. But our experience of Bihler technology had taught us that we could do better than that!"

Fivefold performance boost It was clear that a project of this type could only be undertaken successfully using a new Bihler system equipped with the corresponding tools. This was the reason for choosing a Bihler GRM-NC servo stamping and bending machine. "The Bihler GRM-NC was ideal for us because it allowed us to increase our production speed more than fivefold from 30 to approximately



Proud of what they have achieved: Thomas Schaarschmidt, Managing Director of Metalltechnik Annaberg (center), Eric Nagel, technology expert at Metalltechnik Annaberg (left) and Liebers Managing Director, Michael Starke (right).

160 strokes per minute," explains Nagel. To implement this forward-looking project at the machine itself, Nagel worked together with the project team, which consisted of representatives from Metalltechnik Annaberg's Design, Toolmaking and Sales departments. Metalltechnik Annaberg entrusted the toolmaking activities to a certified Bihler Leantool partner in the form of Christoph Liebers GmbH & Co. KG in Gaimersheim. The outstanding commitment of Liebers' design and assembly specialists, who took on the challenge and rose to it expertly thanks to their many years of toolmaking experience, cannot be overemphasized. hey converted a total of three tools to create autonomous modules with quick-change function that are compatible with the Bihler LEANTOOL interfaces. "The interface-compatible modules are able to run asynchronously thanks to the NC technology. This makes an enormous contribution to productivity because the slowest bending operation no longer determines the overall speed," explains Liebers' Managing Director, Michael Starke.

Faster, simpler, more versatile The entire Bihler solution has been up and running at Metalltechnik Annaberg since August 2022. The manufacturing process starts with the Bihler RZV strip intake mechanism and the 40-tonne press which cuts out the contour. The strip then moves on to the thread tapping unit and optionally also to the welding unit and possibly also a second thread tapping unit. The three bending modules then perform all the necessary bending operations. An optical inspection unit then performs the final quality checks before the components are output from the line ready-for-use – at an average speed of 160 parts per minute. In addition to the enormous performance increase, the system also brings many other benefits: "On average, retooling now only takes 45 minutes and all the settings can be made at the touch of a button in just a few seconds," says Nagel. "This makes production particularly easy and versatile."

Unique technology Naturally, the Bihler solution implemented by the company also surpasses the originally planned production approach using conventional linear tool technology: "The tools for a conventional progressive manufacturing system would have been extremely complex to produce and we also had doubts about the reliability of the process and the stability and dimensional precision of the components," stresses Schaarschmidt. "The time required to harmonize the tools with the finished components was between one and three weeks," adds Maximilian Mohaupt, Bihler Head of Sales for the North-East Region. "That just wouldn't have been feasible using conventional progressive tooling technology." And there is yet another benefit: "Unlike in the case of progressive tooling, you

The company, which was founded in 1998, is located in Königswalde in the German Erzgebirge.

For Thomas Schaarschmidt, the new Bihler system has opened up completely new prospects for the future.

can actually look into the Bihler LEANTOOL interface-compatible modules. The component is visible throughout the entire production process, meaning that any potential anomalies or malfunctions during manufacturing can be detected and eliminated extremely quickly," explains Starke.

New possibilities "With this solution, we have successfully worked together to complete a genuine flagship project which will have a real impact. I'm looking forward to presenting it to our other customers," says Schaarschmidt summing up. "We now possess a highly-productive system which will enable us to face up to the challenges of the future and open up a completely new range of possibilities." ●

metalltechnik annaberg

Metalltechnik Annaberg GmbH & Co. KG

The company, which was founded in 1998, is part of the Wöhner Group and specializes in the manufacture of stamped and stamped-bended parts, produced primarily from steel, copper and brass. It focuses on terminal and contact parts as well as on connecting elements for switchgear and the construction of equipment for the electronics industry Every year, Metalltechnik Annaberg GmbH & Co. KG machines approximately 2,000 tonnes of raw material and manufactures some 700 different products in a production space of approximately 2,500 m^2.

www.mt-annaberg.de

FIT FOR THE FUTURE

Johann Vitz GmbH & Co. KG brought two Bihler GRM 80 machines up to date using the Bihler BC-R upgrade and retrofit package.

Johann Vitz GmbH & Co. KG in Velbert has already modernized two Bihler GRM 80 stamping and forming machines with the Bihler BC-R upgrade and retrofit package. The new control system with guaranteed availability of spare parts ensures that the system will remain operational over the coming years, and installation of the upgrade, which the company carried out itself, went absolutely smoothly.

Whether it be monitors or control boards, spare parts are no longer available for the control units on older, mechanical Bihler systems. Since 2019, Bihler has been offering the BC-R upgrade and retrofit package for all users who nevertheless wish to continue manufacturing with their existing systems. This allows Bihler RM-30, RM-35, RM-40, GRM-50, GRM-80, GRM-100 as well as Mach-1, Mach-1/7 and Mach-05 machines to be quickly and easily brought completely up to date, providing greater productivity combined with the latest safety features and guaranteed spare parts availability. The package includes a Bihler BC-R control system with touch display and control cabinet, a frequency-controlled, infinitely adjustable drive and freely programmable input and output modules. Also included are improved sensor technology for machine monitoring and the electronic hand-wheel.

Reliability for years to come The Bihler BC-R upgrade and retrofit package also impressed Johann Vitz GmbH & Co. KG in Velbert. "The Bihler mechanical systems are extremely robust and are extremely reliable in operation. We value them for their extreme precision and the fact that the tools are compatible across the machines," says Managing Director Michael Vitz. "On the other hand, they need long set-up times and require qualified employees." The company therefore modernized two Bihler GRM 80s immediately the package was released. Vitz: "The guaranteed availability of spare parts gives us the security to be able to operate the machines for many more years." One important aspect: "The upgrade means that the machine does not need a CE mark, as it is primarily safety that is being enhanced, not performance." Other advantages: Thanks to the new BC-R controller, the machines can now be set up and programmed far more easily and quickly. And last but not least, the new control system has met with considerable acceptance among the workforce because it is clearly structured and quick to operate. In addition, any of the machines modernized in this way can optionally be networked.

Problem-free installation At Johann Vitz GmbH & Co. KG, the workforce installed the Bihler BC-R upgrade and retrofit package on the stamping and bending machines themselves, i.e. without a Bihler engineer present. "All the components arrived perfectly packaged and sorted, and the whole package was installed without any problems within a few days. The upgrade went off without a hitch," reports Viktor Schäfer, head of operations and maintenance. In practice, the modernized systems

Thanks to the guaranteed availability of spare parts, Managing Director Michael Vitz can be certain of being able to continue to operate the machines for years to come.

Viktor Schäfer, Head of Operations and Maintenance at Vitz, worked together with his team to install the Bihler BC-R upgrade and retrofit package themselves.

make a very positive impression not only because they are easier to program, but also because of the greatly reduced setup times and greater ease of operation: "Thanks to the electronic hand-wheel, the machine can now be moved in increments of a tenth of a degree, which is a huge help to the operator. This never used to be possible due to the way the gearing and clutch work."

Further modernizations Vitz sums up: "The modernization of our machines has absolutely paid off, and machine availability has been increased significantly. We are planning to upgrade even more of our existing Bihler machines with the package, and in parallel we are updating our machine park with new, NC-controlled Bihler systems." ●

VITZ FEDERN
Stanz- und Biegetechnik

Johann Vitz GmbH & Co. KG in Velbert was founded in 1908 and now has a workforce of some 260 employees manufacturing springs, punched and bended parts on more than 350 production machines at their 10,000 m² factory. These are used in the automotive industry and telecommunications as well as in the mechanical engineering sector and the manufacture of household appliances.

www.vitz.de

INCREASED OPERATING EFFICIENCY

To meet the increasing demand for shorter runs, Mi Me S.p.a. in northern Italy has chosen to go with the latest technology – two Bihler stamping and bending machines, an RM-NC and a GRM-NC, along with the Bihler Leantool system for toolmaking. Reducing costs and improving operating efficiency were the key factors behind the decision.

For General Manager, Dr. Massimo Carrara, the clear cost-effectiveness increase resulting from the reduced setup times and higher production speeds were decisive factors.

CEO and Mi Me owner Raffaele Meles considers his company to be extremely well-positioned thanks to the adoption of Bihler servo technology and the Bihler Leantool system.

Mi Me manufactures complex precision stamped parts such as arc-welded contacts, assemblies and co-molded parts in its 20,000 square-meter facilities at its headquarters in Bonate Sopra in the province of Bergamo. The company supplies customers in a variety of industries, including the electric power sector, and the electronics, household appliance and automotive industries. Mi Me currently exports around 90 percent of its production to markets around the world. The company was founded back in 1950. Over the decades, Mi Me has constantly expanded its range of services and products to match market developments and customer requirements. The company's success is based on clear goals and targets: "Our outstanding quality and our one hundred percent service to our customers are the driving force behind us," explains General Manager Massimo Carrara. "Of course, our high technological standard and manufacturing expertise are also crucial, and we are constantly expanding these together with leading strategic partners. This means we can always implement the ideal manufacturing process, providing optimum quality and cost-effectiveness."

Thanks to the Bihler VC 1 controller, machine fitter Diego Facheris is now able to manufacture small runs on the RM-NC particularly efficiently and cost-effectively.

Existing machine pool The decades-long cooperation with Otto Bihler Maschinenfabrik and the current Bihler machine pool are impressive evidence of this company strategy. "We received our first Bihler machine, an RM35, in 1979," says CEO and owner Raffaele Meles. "After that, we acquired up to three more Bihler machines each year. These machines and the Bihler technology that goes with them have made a decisive contribution to our growth and success." Today, the company has a total of 55 Bihler systems, ranging from the RM series and GRM models to BZ processing centers and MC Multicenters, as well as two Bihler RM-NC and GRM-NC servo stamping and bending machines. There are also a large number of Bihler welding controllers of the types B1, B4, B 1000, B 5000 and B 20 K for some 30 welding machines in the company. Most of the mechanical Bihler systems are still running today: "They are extremely durable and still deliver the precision we need," says Raffaele Meles. A large part of this is down to the maintenance and servicing department at Mi Me, which goes to great lengths to keep the machines and associated tools in tip-top condition. "The investments in maintenance and upkeep are still worthwhile for us," says Massimo Carrara. The machines are used primarily to produce high volumes of parts that the company constantly manufactures and that do not require frequent tool changes.

Faster setup and production But times are changing: "The demand is increasingly for shorter runs, which require more frequent retooling," says Massimo Carrara. That's why Mi Me opted for a Bihler RM-NC servo stamping and bending machine in 2018 and a GRM-NC in 2021. "This allows us to adapt our production at extremely short notice and to manufacture small batches efficiently and economically," Raffaele Meles explains. The main advantages: "The setup times are only about a third of those of our mechanical machines. At the same time, the NC systems have allowed us to increase production speeds by an average of one third." And Mi Me was able to successfully adapt many existing tools to the new NC systems.

Mi Me is headquartered on a site of approximately 20,000 square meters in Bonate Sopra in the province of Bergamo.

Mi Me's product portfolio includes precision stamped parts such as arc-welded contacts, assemblies and co-molded parts.

More cost-effective tool production Mi Me has recently started using the Bihler Leantool system to build new tools for the Bihler RM-NC and GRM-NC. The company has already produced around six tools with this system. And the benefits are clear: "The smaller number of parts and the use of standard parts make the production of tools with the Bihler Leantool system particularly cost-effective," Raffaele Meles points out. "At the same time, toolmaking has also become far simpler and faster than before."

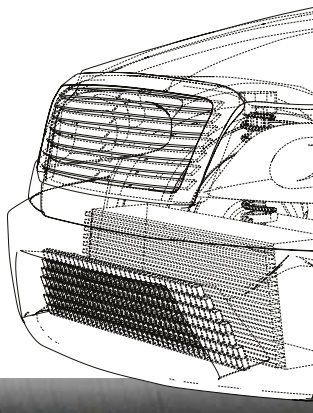
Geared up for the future "Our adoption of Bihler's servo technology and the Bihler Leantool system and our ongoing partnership mean that we are very well positioned, particularly for the production of small runs. At the same time, in order to be able to cope with complex manufacturing tasks in the future, we have already made firm plans to acquire a new Bihler BIMERIC processing and assembly center," says Raffaele Meles in conclusion. ●

Mi Me - Minuterie Metalliche Meles S.p.A

In 1950, Pietro Meles founded a company producing metal wire articles in Lecco. In 1964, the company moved to Presezzo in the province of Bergamo. In 2001, production was moved to Bonate Sopra, where the warehouse and toolmaking shop were also added in 2009. In 2011, the headquarters were also relocated there, and today the company produces precision stamped parts for a wide range of industries and exports to the major industrialized countries across the globe.

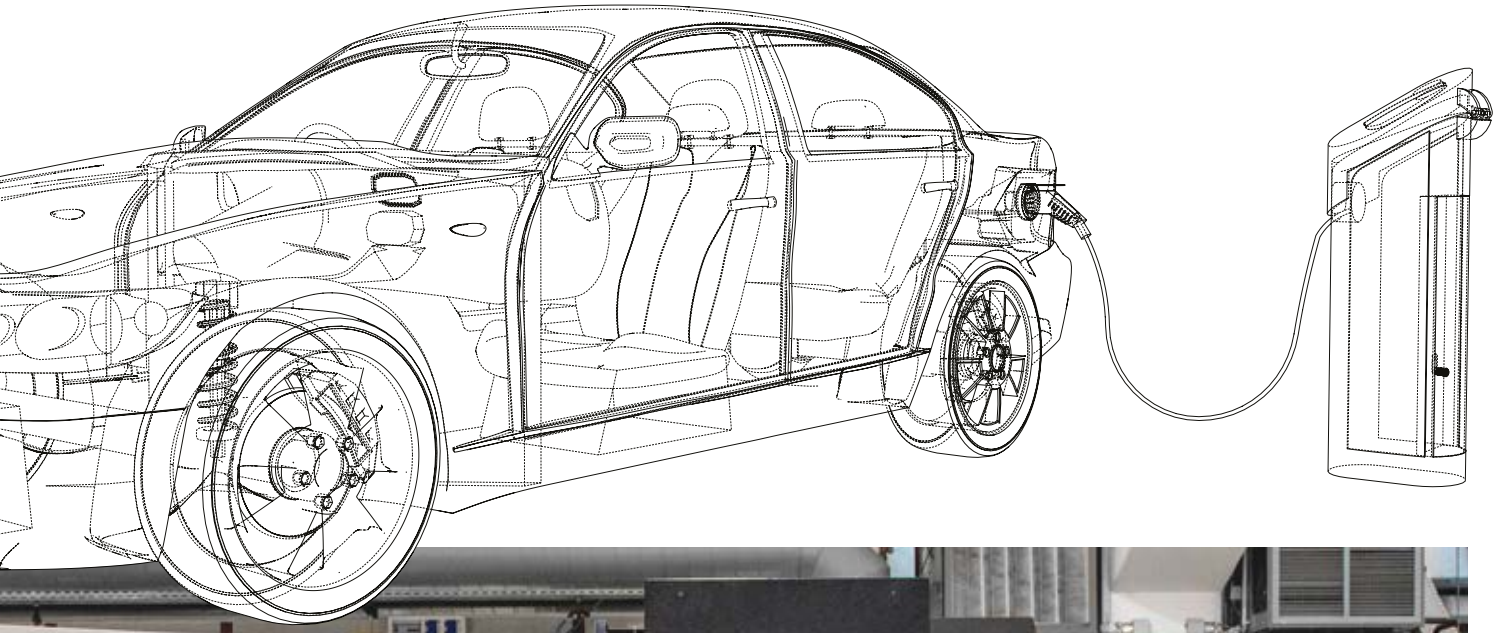
www.mi-me.it

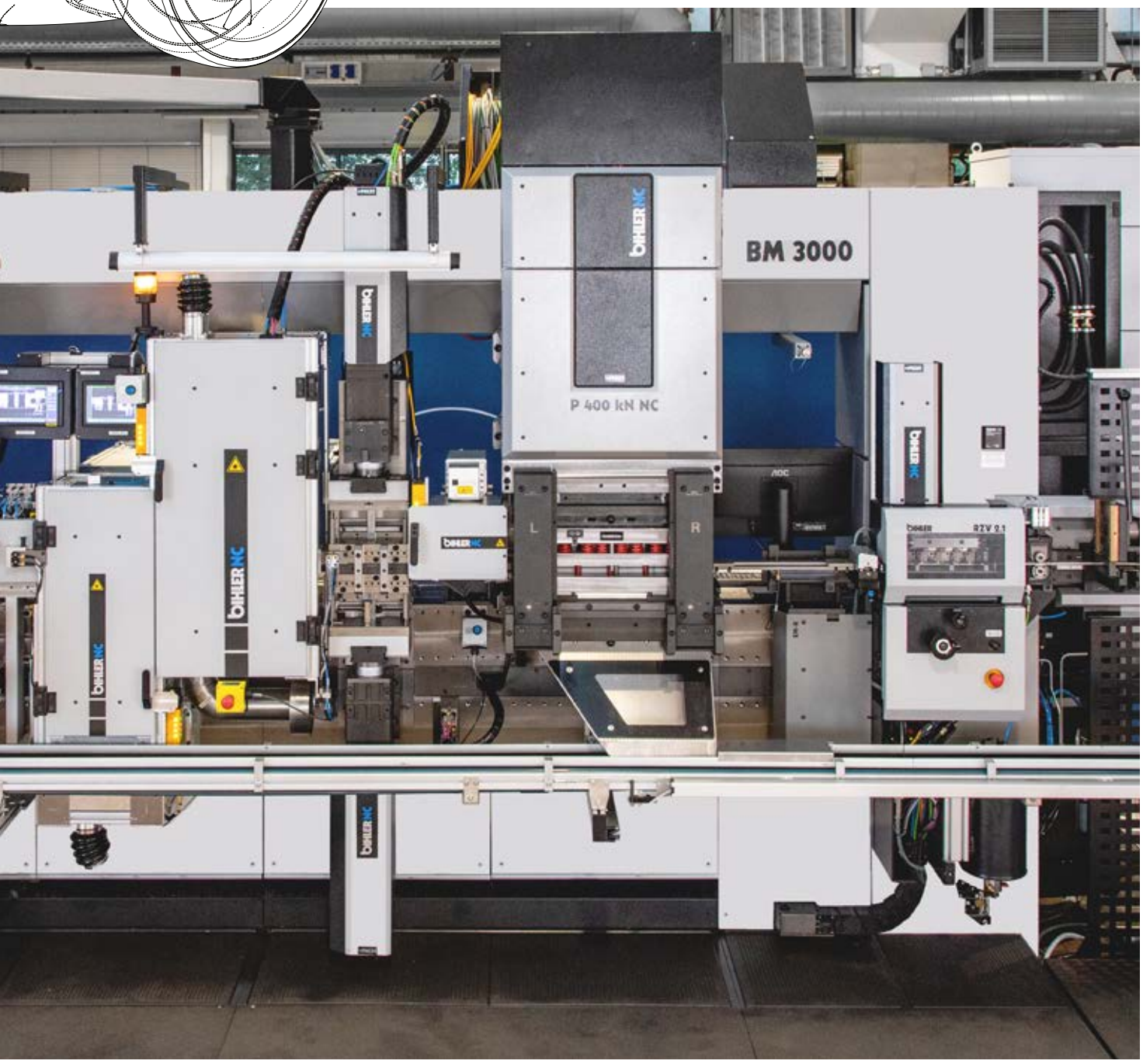
SUCCESSFUL ENTRY INTO THE E-MARKET



Frötek-Kunststofftechnik GmbH recently started using a Bihler BIMERIC Modular equipped with Bihler Leantool modules for the fully-automatic manufacture of busbars. Using this technology, it is possible to produce these power rails for electric vehicles extremely quickly in a single end-to-end process. Thanks to this successfully completed project, the company has been able to enter the (large-scale production) e-mobility market for the first time.

The machine pool of over one hundred injection-molding machines together with extensive stamping and welding equipment makes one thing clear: The core competencies of Frötek-Kunststofftechnik GmbH lie in the combined machining of plastics and metal and, in particular, in the manufacture of plastic-clad metal parts. Of crucial importance to the company are its battery cell connectors made from plastic-coated copper wires, which ensure reliable voltage distribution in the batteries of, for example, electric forklifts and other industrial trucks. Working with four fully-automated systems, Frötek-Kunststofftechnik GmbH manufactures approximately 15 million of these battery cell connectors every year and machines approximately 2,000 tonnes of copper in the process. However, these components are only designed for conventional lead-acid batteries – and not for the lithium-ion batteries that are found in all electric vehicles. This technology naturally represents another considerable market potential for Frötek-Kunststofftechnik GmbH: "To put ourselves in a position to meet market requirements in this high-growth segment, we decided to expand our

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The team that discovered the potential of the BIMERIC Modular during the acceptance period in Halblech: René Wilhelm, Carsten Baumeyer, Bernd Kamprath und Dr. Mathias Anhalt (from left to right).

product portfolio to include new components specifically intended for lithium-ion batteries," explains Tobias Vollrath, CFO of the Frötek Group. "Thanks to our many years of experience of manufacturing cell connectors and our knowledge of copper machining, including even parts qualification, busbars were the most obvious new product for us to adopt, in particular because there is enormous demand for them on the part of customers."

End-to-end automation The busbars are power rails that are needed for the distribution of the electrical energy in practically all electric vehicles. "These are non-standardized components, meaning that our customers' requirements for the initial prototypes were also very different," reports Vollrath. Frötek-Kunstofftechnik GmbH produced these initial parts using a water-jet cutting system, manually operated bending machines and single-die stamping equipment. Although the sample parts and very small runs produced in this way were inefficient to manufacture, they were very much appreciated by customers – and it was not long before the first large-scale series request was received from a prestigious German carmaker. More specifically, Frötek-Kunststofftechnik GmbH received an order for two million busbars per year in early 2020. "Naturally, it was clear to us that there was no way we could take on this order using our previous equipment for manufacturing prototypes and that we therefore had to invest in a new production solution," says Vollrath. From the very outset, the company excluded the option of manufacturing in multiple, separate, personnel-intensive and often error-prone individual steps, as is common with many other manufacturers: "It was vitally important to us that the new busbar manufacturing solution should map the entire production of these power rails in a single end-to-end process and consequently possess a very high degree of automation," stresses Vollrath.

Tobias Vollrath, CFO of the Frötek Group

A completely new partner These process requirements, coupled with the complexity of the components, made Otto Bihler Maschinenfabrik the almost automatic choice as a completely new partner for implementation of the project. Tobias Vollrath does not hesitate to make it clear "that the many glowing references and success stories reported by current Bihler customers, as well as Otto Bihler Maschinenfabrik's 70-year history, were vital factors in the decision." He goes on to say that "the manufacturing solution itself, which ran on the Bihler BIMERIC Modular, entirely convinced us. It was extremely exciting to see the finished components leave the machine every second. Which it is why it was clear that Bihler is the right partner for us."

30-60 busbars per minute "At Frötek-Kunststofftechnik, the process begins with the Bihler RZV material feeding unit which transfers the strip to the BIMERIC Modular. Here, the silhouette is stamped and the strip is transferred to the first Bihler Leantool bending module. Another module is responsible for the laser marking of the component. The next step consists in the fully-automated, high-precision infeed of the solder plates, which are then aligned and placed on the top and bottom of the components and welded in place using the laser unit. The component is then transported to the final bending unit and punched out into its finished form. "Depending on the component, the throughput is between 30 and 60 complete, finished busbars per minute – free from any defects and in perfect quality," explains Vollrath. A total of four different tools were developed. Thanks to the Bihler Leantool system, the average setup time is approximately 45 minutes. Final series production will start at Frötek-Kunststofftechnik in mid-2023.

Winning all round "We were deeply impressed by Bihler's outstanding technical expertise as well as by the extremely smooth and pleasant collaboration throughout the entire project phase," says Vollrath summing up. "With our new busbar component, we have developed an outstanding reference product and have successfully established ourselves in the world of e-mobility. At the same time, we have, in Bihler, gained a valuable partner with whom we can successfully undertake further pioneering projects in the future." ●

Frötek-Kunstofftechnik GmbH
The company, which was founded in1985 by Bernhard and Barbara Fröhlich and has its head office in Osterode, has a global presence with eight production sites worldwide. This OEM supplier to the automotive industry and battery specialist focuses on injection-molding technologies, welding, small system construction and toolmaking, as well as module assembly. In 2021, the company, which has a workforce of more than 700 employees worldwide, achieved sales of approximately 93 million euros.

www.froetek.shop/de

Busbars, as illustrated here, are needed for the distribution of the electrical energy in practically all electric vehicles.

ANALYSIS AND OPTIMIZATION

The Bihler Analysis Tool permits detailed data and fault analyses and identifies valuable potential for optimization. At the same time, offline programming and training ensure greater machine uptimes.

The idea behind this modern, forward-looking software solution? To optimize your production and thus make major cost savings. "Thanks to the Bihler Analysis Tool, all users can analyze their Bihler machine-based manufacturing activities quickly and easily," explains Bastian Hartmann. "The application shows in detail where there is scope for optimization and helps to boost machine availability." One initial highlight: thanks to its plug & play concept, the digital tool is ready for operation immediately. And the two modules of the Bihler Analysis Tool for the corresponding production analyses and VC 1 offline programming and training are designed to be just as simple.

Generating trend statistics The analytical module allows data to be explicitly filtered from the machines and specifically prepared. It also permits the generation of trend statistics with precise chronological error sequences. It indicates the most frequent faults together with the dates and times of occurrence and the lengths of the corresponding production downtimes. The period considered for analysis can be limited as required. In this way, the scope and importance of any faults becomes immediately apparent and targeted optimization measures can be introduced. The precious added extra provided by the initial evaluation of the analysis data: The experts at Bihler's consulting department

To optimize your own production, the Bihler Analysis Tool offers detailed options for in-depth data and error analyses and their processing.

assess the initial results of the fault analysis and provide specific recommendations for actions that can be taken to optimize the production processes. This additional service is included in the analysis module subscription. If required, the Bihler consulting team will then support users during the implementation of optimization measures with an optimization package that is available separately.

Programming offline The offline VC 1 module can be used to program new tools, configure existing tools or perform other preparatory work offline at an office computer without having to interrupt system operation. This increases machine availability and also boosts cost efficiency. The same applies to training at the VC 1. This simply takes place offline at a desktop computer during ongoing production. What is more, using this module it is also possible to test the most recent VC 1 version offline before going live. To use the Bihler Analysis Tool, it is necessary to have version 2 or higher of the VC 1 control software, an OPC UA server and a desktop computer, laptop or tablet running under Windows 8.1 or higher. ●

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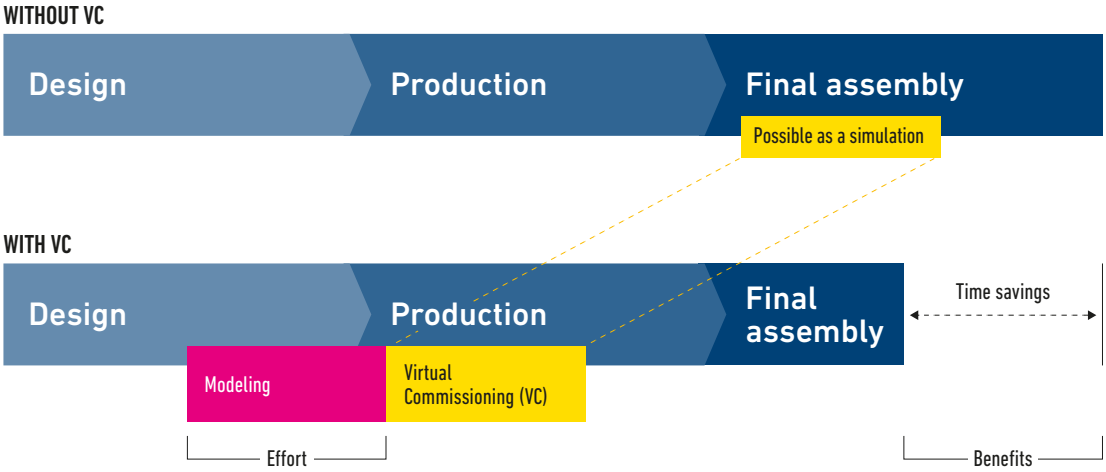
OFF TO A PERFECT START

Virtual commissioning is performed at specially configured simulation workstations at the Bihler site in Halblech. In particular, the VC 1 controller can be used to program the axis movements of the NC units and track these at the virtual model.

Otto Bihler Maschinenfabrik creates digital twins of complex manufacturing solutions and commissions the entire system virtually in advance. This allows the machine to be configured optimally, increases the quality of the software and ensures fast, smooth initial commissioning and optimization of the production system.

Otto Bihler Maschinenfabrik creates a digital twin of all its high-tech manufacturing solutions, such as the Bihler BIMERIC BM servo production and assembly system, creating a virtual image of the entire manufacturing process. This permits the virtual commissioning of the machine long before the start of productive assembly. "Virtual commissioning provides valuable insights throughout the entire life cycle," explains Thomas Niggl from Bihler's tooling design department. "It allows a wide variety of production processes to be run through and tested in their entirety. Malfunctions and sources of error are thus quickly revealed and can be eliminated as early as the design phase. Virtual commissioning thus makes real commissioning during final assembly far easier and ensures problem-free assembly." It also enhances the quality of the Bihler system and the associated software, for example in the form of a tailored user interface for customer-specific solutions. As a result, the customer receives a particularly reliable, high-performance Bihler solution with maximum process reliability.

Detailed presentation At Otto Bihler Maschinenfabrik, the digital twins of the systems are created during the development process on the basis of the design data. The



Although Virtual Commissioning (VC) requires more time and effort up-front, it reduces subsequent setup and commissioning times and improves system quality.

NX Mechatronics Concept Designer software from Siemens is used to do this. This data is then used to perform virtual commissioning at specially configured simulation workstations in Halblech. These workstations include a PC and the Bihler VC 1 control panel and associated electronic handwheel. Niggl: "The VC 1 controller can be used in particular to program the axis movements of the NC units. The VC 1 controls the digital twin and implements the corresponding material flow. The system uses a bidirectional interface, and the associated sensor signals are fed back to the controller." All programmed axis movements can thus be followed 1:1 on the virtual model, as can their impact on the material flow and the component being manufactured. "Virtual commissioning of a Bihler system improves our understanding of the processing sequence in the machine and the control system," explains Niggl. After the optimum process sequence has been configured, the program created on the VC 1 controller is transferred to the real machine. The system can then be started up in real time with all the requisite tools and components.

Valuable time and quality benefits To date, Otto Bihler Maschinenfabrik has already commissioned more than 20 highly complex manufacturing solutions virtually. The feasibility of components with a high degree of variability has also been successfully confirmed, including testing for crashes and the sequencing of the positioning axes. In all projects, it became apparent that "the simulations enabled all subsequent setup and commissioning times to be reduced by up to 15 percent," Niggl reports. "The time savings come from the fact that work can be done on the system in parallel: Our software specialists program virtually, while at the same time our engineers set up the real system." Bihler uses this time saving to reduce lead times and increase quality. "There is a lot of work involved in modeling the digital twin, but it pays off for both parties," says Niggl in conclusion. "In addition, the digital twin of the Bihler system can subsequently be used for training purposes, such as virtual Bihler VC 1 training." This technology is also used in the area of feasibility and project studies. Here, production processes are simulated even before a quotation is prepared. ●

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VIRTUAL KNOW-HOW TRANSFER

Machine training on the virtual customer machine allows all participants to quickly and efficiently expand their skills in all aspects of the VariControl VC 1 machine and process controller. Using the real VC 1 control panel, it is possible to simulate all functions and features throughout the entire production process without intervening in ongoing production in any way.

Digital twins are available for all of the more complex Bihler systems, for example those based on the Bihler BIMERIC 1500 servo production and assembly system or higher. These are virtual images of the system that show the machine and its peripherals in detail. At Otto Bihler Maschinenfabrik, digital twins are used for virtual commissioning of the systems, but also for training purposes. These focus on Bihler's VariControl VC 1 machine and process controller. "Machine training on the virtual customer machine is aimed at the operators and setup engineers of the machines as well as the maintenance and servicing personnel," explains Peter Thieme, Head of Bihler Consulting. "The training is carried out on the 3D model of the customer application, i.e. the digital twin, and directly via the real VC 1 control panel. Operation of the virtual customer machine is identical to operation on the real system. All functions are available and can be simulated."

A detailed overall picture Machine training on virtual customer machines has a modular structure and goes through a number of different learning and training steps. Training starts with a basic introduction to the machine and the VC 1 controller to give all those taking part an initial basic understanding of the subject. Then the exact sequence of operations is explained on the digital twin, i.e. the virtual system. According to Thieme, one clear advantage of this approach is that "all those taking part in the training course can effectively look inside the various

The training is performed at the system's digital twin. All the functions can be simulated via the actual VC 1 control panel.

modules. All the parts and components of the tools and the covers can be displayed or hidden depending on what needs to be explained. This builds up a detailed overall picture of the system, and the entire sequence of operations is clear to see." The virtual machine is then started from the VC 1 control panel – with all the tool components the customer needs for the production job in hand.

Optimum knowledge transfer Once the virtual machine has been started, all changes to the sequence and the functions can then be simulated directly in the running process using the VC 1 control panel. Because this is done exclusively in the virtual world, it is possible to test, simulate and try things out with no stress – by trial and error.
The environment also promotes this special way of passing on knowledge during machine training. This is because all training courses take place in the quiet atmosphere of the Bihler Training Center in Halblech. Here, all the participants can ask their training manager any questions that are on their minds and also exchange ideas with their own team members. Feedback from the training courses held so far, which last between two and five days depending on the size of the machine, has been positive. Thieme: "Machine training on the virtual customer machine has so far always met with great enthusiasm on the part of all the participants." They were able to quickly and efficiently acquire valuable knowledge and in-depth expertise on all aspects of the Bihler control system, from which they will benefit long term in their real-life jobs." If anyone is now interested in also taking advantage of this special skills upgrade for themselves and their team, simply send a short inquiry email to the contact address below! ●

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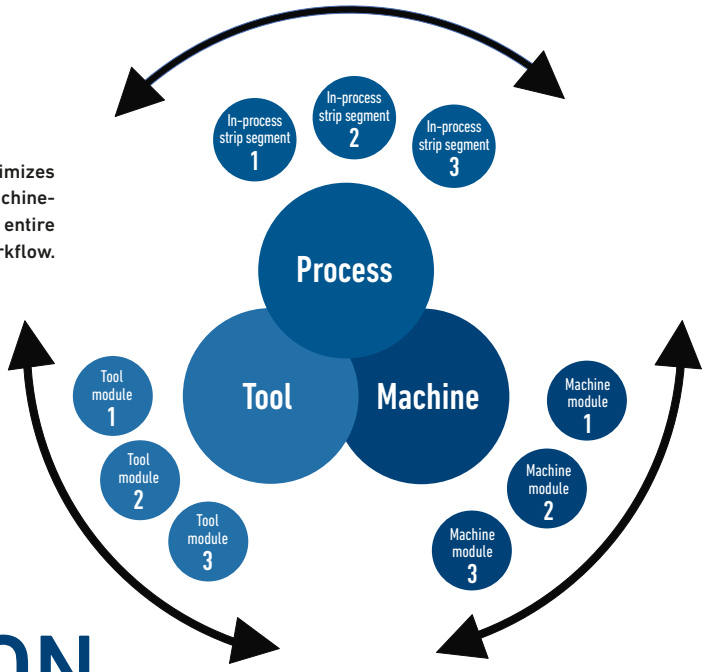


The system configurator optimizes the process-, tool-, and machine-related aspects of the entire manufacturing workflow.

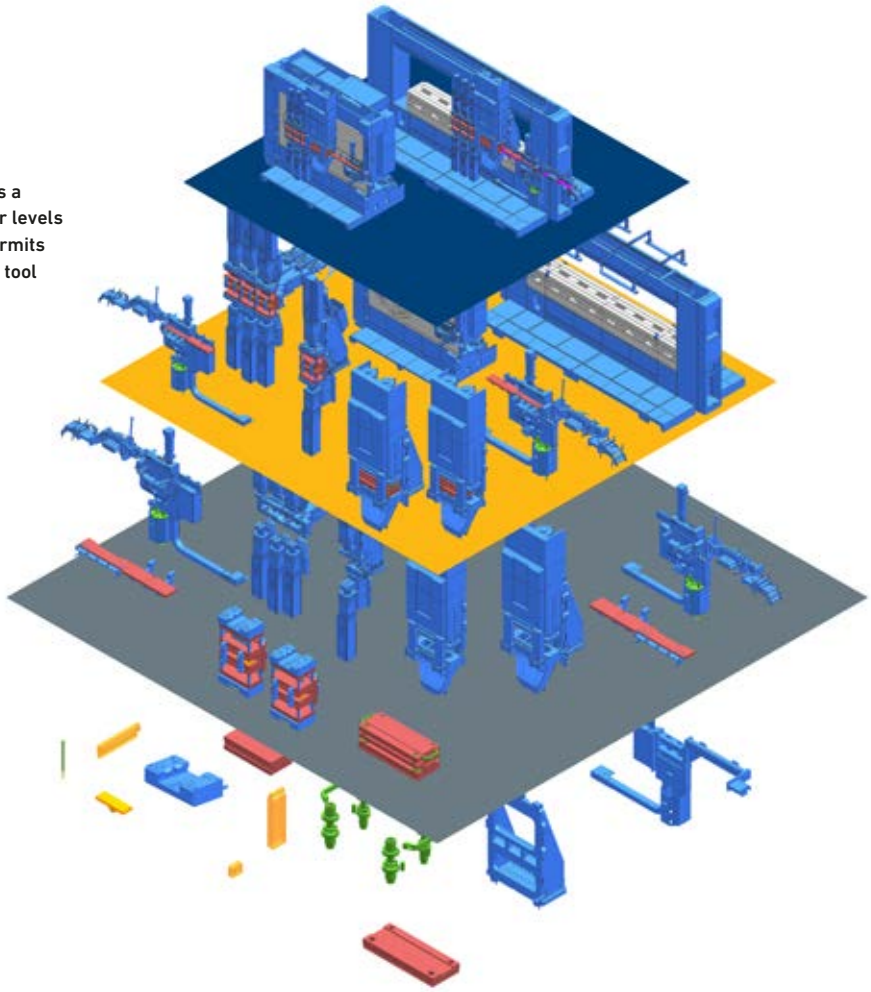
NEW: DIGITAL TRANSFORMATION CREATES PRECIOUS ADDED VALUE

The new system configurator can be used to configure all tool and machine modules for the Bihler systems GRM-NC, LM 2000-KT, LM 2000-NC and BIMERIC Modular. It is an innovative, fully-featured solution which allows all users to arrive at the design they need quickly, easily and reliably.

With its modular series, Otto Bihler Maschinenfabrik is giving all users access to completely new dimensions in manufacturing and enabling them to get to grips with all production requirements extremely efficiently and completely flexibly. With the GRM-NC servo stamping and bending machine, the two linear machines – LM 2000-KT and -NC – and the BIMERIC Modular servo production and assembly system, the modular series currently comprises four of the latest generation of highly-standardized, high-performance Bihler systems. They all possess uniform interfaces for forming operations and are fully compatible with one another in terms of the employed stamping and bending tools. This means that the corresponding forming tools can be moved between systems and used independently of the machine.

Focus on the process window Otto Bihler Maschinenfabrik has now developed the brand-new system configurator for the above-mentioned machines. It represents these machines in the CAD design and permits the individual configuration of all tool and machine modules for linear stamped and bended parts, always in a way that is perfectly adapted for the underlying manufacturing process. At the heart of this approach lies the process window as a geometrically defined working area which is absolutely identical at all machines in the modular series. Using the configurator, the stamping-and-bending process is, so to speak, developed for integration into this working area, i.e. all the required tool and machine modules are geometrically designed to dovetail precisely with the standardized process window, thus ensuring that they can be used on any of these systems. No additional configuration work is required at these systems and customers can immediately start to develop the required tools, which they can then simply use themselves or make available to their partners and suppliers for use on their own systems without any adaptations.

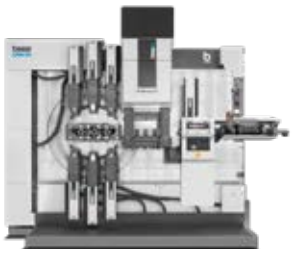
Complete information from a single supplier The system configurator has a simple, logical structure in the form of a toolkit. In this, all the necessary modules and information, consisting of the CAD model, process window, possible extensions and limit values, are made available to the design engineer on four levels. The configurator makes sure that the corresponding components are compatible with one another on all four levels (e.g. tool module with machine module and machine module with machine) and automat-



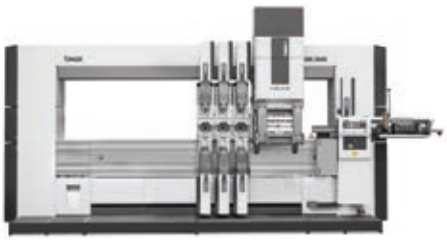
The system configurator provides a detailed representation of all four levels of the production solution and permits the individual configuration of all tool and machine modules for linear stamped and bended parts.

ically combines all the elements to form the subsequent production solution.
"The system configurator is an innovative, fully-featured solution that considers the process window as a whole and itself provides all the necessary information regarding the tool and machine technology," explains Marc Walter, Departmental Manager for Design & Development at Bihler.

Clear value added in practice Overall, the new system configurator makes it considerably easier to develop tool and machine modules than in the past. Ultimately, it is no longer necessary to start by assembling the machine and then developing the corresponding manufacturing process in iterative loops involving an enormous variety of tools. Instead, thanks to the standardized process window, it is possible to develop the stamped strip in advance without having to worry about going beyond the geometrical limits of the machine or tool module. In practice, this would result in reworking operations that it is impossible to plan for. This is possible because all the functions of the modules, as well as the production sequence, can be standardized in advance. This also saves a lot of time and considerably reduces costs. The greatest practical advantage lies in the fact that all modules configured in this way are compatible with the entire modular series, can be ported to these machines without difficulty and function securely and reliably on them. The system configurator will be presented by Bihler for the first time at EuroBLECH 2022 and will become available after this. ●



Whether a Bihler GRM-NC servo stamping and bending machine, LM 2000-KT or -NC linear machine or BIMERIC Modular servo production and assembly system: The system configurator can be used for all the systems in the Bihler L250 product line.



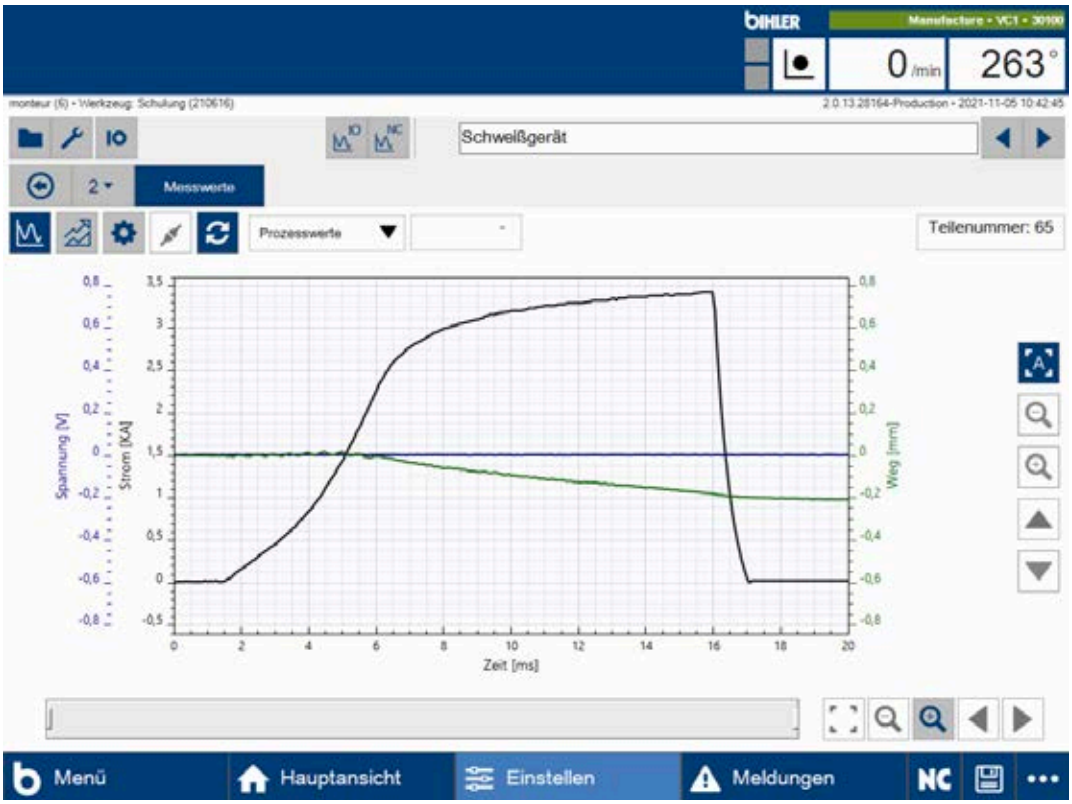
THE BIHLER WELDING LABORATORY

Each year, the Bihler welding laboratory handles an average of 30 customer projects with around ten Bihler welding specialists.

Whether for a new system or an existing machine, the Bihler welding laboratory develops the best joining solution for any component, no matter what the requirements. In doing so, it taps into the company's decades of welding expertise and relies on close, long-term partnerships with its customers in order to achieve optimally welded components.

Alongside stamping and bending and assembly technology, welding technology is one of the core competencies of Otto Bihler Maschinenfabrik, and the company has been successfully integrating welding processes into its automation solutions for decades. And the Bihler welding laboratory in Halblech plays a key role in this. It is attached to the testing department, but also works closely with the materials technology, sample parts production, tool technology and mechanical engineering departments. The laboratory has been constantly expanded over the decades, and today around ten Bihler welding specialists work there. And their objectives are clear: "We establish the right joining solution for each customer's component production," explains Martin Ott, Head of Welding Technology at Bihler. "We use feasibility studies to determine what process is best suited and also provide support in respect of the appropriate material pairing."

Decades of experience The feasibility studies often feed into the development of new, inno-



The Bihler welding laboratory determines all the welding parameters required for each production solution.

vative Bihler welding technology solutions, for which the Bihler welding laboratory is also responsible. Ott: "Our particular strength is that we can draw on six decades of welding experience. It is a unique wealth of experience, and we also make it available to our customers. Another key aspect is the especially close working relationship we have with our customers, which is based on intensive, collaborative development work for the manufacturing solutions involved."

For existing and new machines Bihler's welding laboratory has all the welding control systems and the associated jigs to hand. They cover all areas of resistance welding: upset, mash-seam, projection and contact welding. In the laboratory, experimental setups are used to determine the welding parameters required for each production solution, both for earlier Bihler welding controllers and for the current Bihler B 20 K controller. These parameters enable components to be manufactured on existing Bihler welding systems, in the simplest case using standard welding heads. Another joining process that is being developed is laser applications. Furthermore, the Bihler welding laboratory of course also develops completely new manufacturing solutions, for example for innovative products in the fields of e-mobility, hydrogen technology and white goods. In this case, customers receive all the equipment including all welding parameters for their solution. The Bihler welding laboratory handles around 30 projects each year, with lead times ranging from a few days to several months.

The best joining solutions are established for all components such as this welded nib.

Long-term benefits "Each customer has their own personal contact at Bihler who is there to support them throughout the entire project. The customer has a single source from whom they receive expert advice on all aspects of the process technologies, plant technology and the production of specific components," explains Ott. "And even after the feasibility study and commissioning, we continue to support the customer on an ongoing basis." In the long term, this ensures that all users have welding and production solutions that are tailored to their manufacturing needs, delivering maximum process reliability, the highest possible productivity and excellent welding quality. ●

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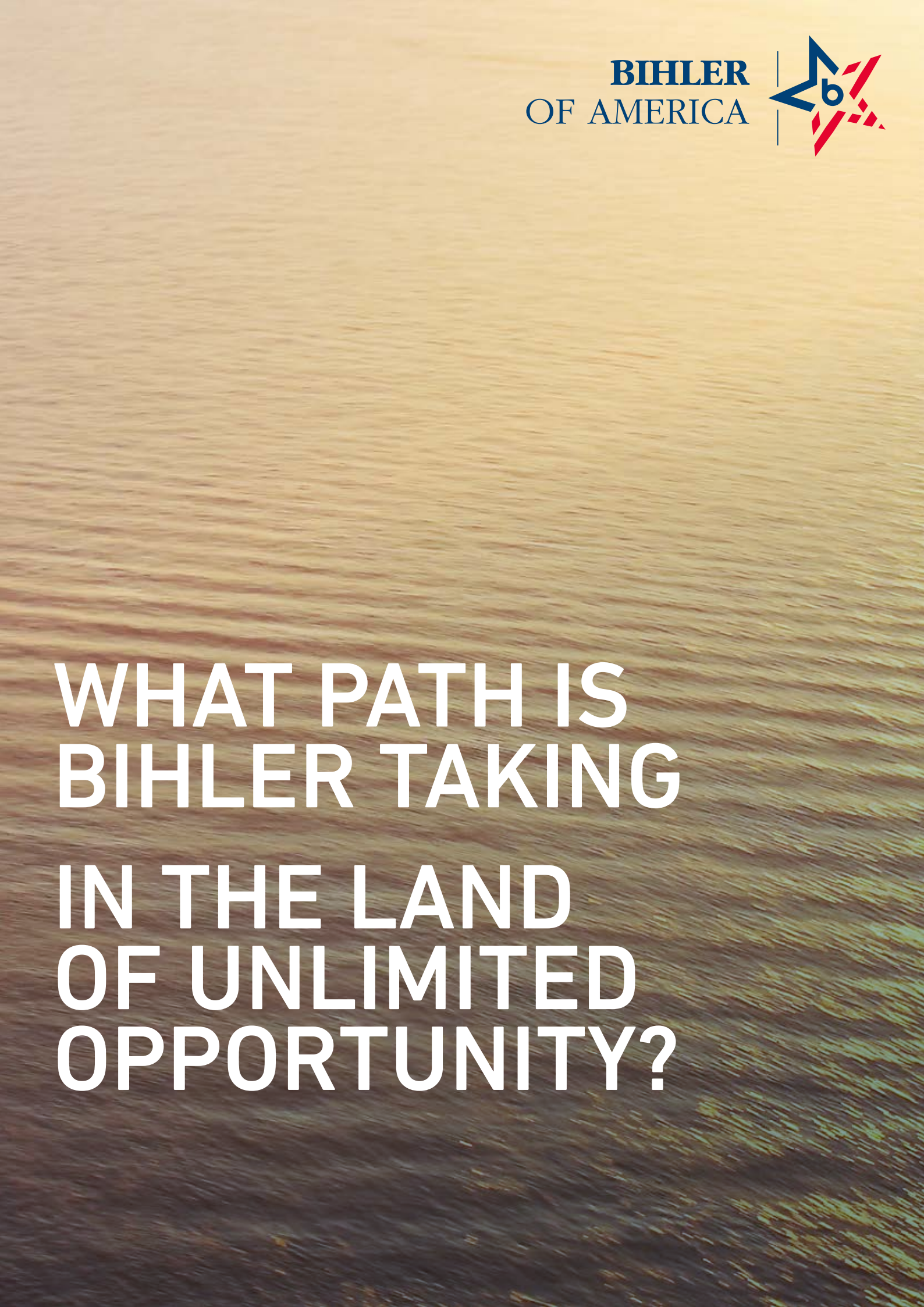

BIHLER
OF AMERICA
WHAT PATH IS BIHLER TAKING
IN THE LAND OF UNLIMITED OPPORTUNITY?

Bihler of America's headquarters are located at the site owned by the company in Phillipsburg, New Jersey.

BIHLER
OF AMERICA

TWO WORLDS – ONE ALLIANCE

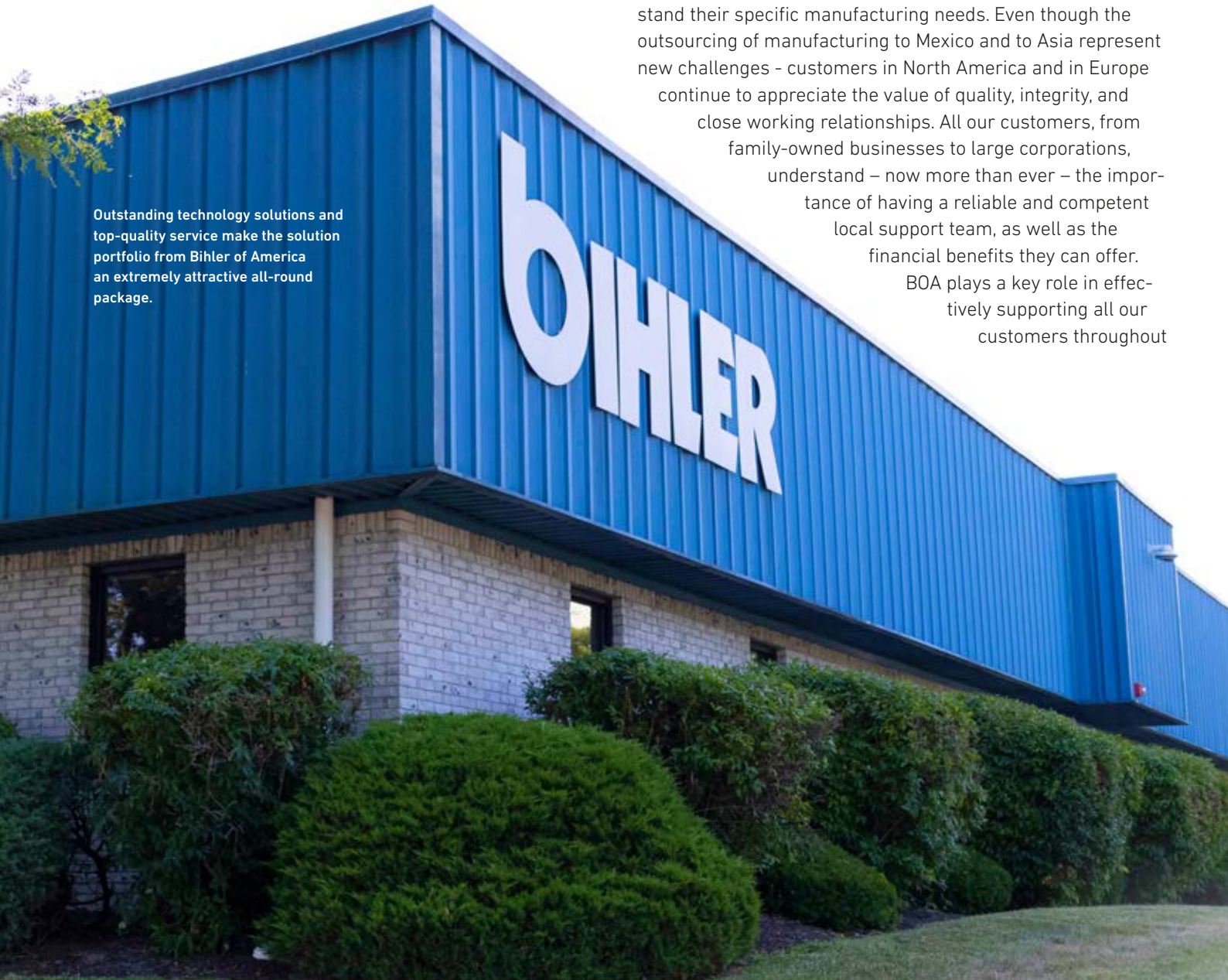
Innovative, precision German engineering meets American ingenuity and experience at Bihler of America to serve the expansive North American market. Founded as a sales company in 1976 by Otto Bihler, Barry Littlewood, and Vulgens Schön, Bihler of America has grown into a leading supplier of state-of-the-art manufacturing solutions. Bihler of America (BOA) is a success story with an exciting future.

Maxine Nordmeyer, CEO of BOA, Mathias Bihler, President of BOA and CEO of Otto Bihler Maschinenfabrik (Bihler), and Andreas Strobl, Director of Operations and Sales North America, take part in an interview to discuss the evolution of BOA, the specialties of the North American market, and their current marketing strategies.

What makes Bihler of America different?

Maxine Nordmeyer: For 46 years, BOA has been a strategic supplier to our customers, ranging from small, family-owned businesses to OEMs, and Tier 1 – Tier 3 suppliers in the Automotive, Construction, Medical, and Electro-technical industries. We view ourselves as a Partner to our customers - working closely with them to develop turnkey solutions that meet their specific needs. Particularly now, with supply chain shortages, we believe it is crucial to our role as a reliable partner to support our customers with the most efficient manufacturing solutions possible. Our experience in partnering with our customers has shown it to be the optimal way for them to achieve success.

Mathias Bihler: Collaborating directly with our customers at their facilities has always been part of the Bihler DNA. It gives us the best opportunity to identify and to fully understand their specific manufacturing needs. Even though the outsourcing of manufacturing to Mexico and to Asia represent new challenges - customers in North America and in Europe continue to appreciate the value of quality, integrity, and close working relationships. All our customers, from family-owned businesses to large corporations, understand – now more than ever – the importance of having a reliable and competent local support team, as well as the financial benefits they can offer. BOA plays a key role in effectively supporting all our customers throughout



Outstanding technology solutions and top-quality service make the solution portfolio from Bihler of America an extremely attractive all-round package.

North America.

Andreas Strobl: The sales area of BOA covers Canada, the United States, and Puerto Rico. One advantage to having our headquarters in Phillipsburg, New Jersey is its proximity to airports and to seaports, which makes it easier to import machines and spare parts from Germany into the United States. We support the majority of our customers from our Phillipsburg location and we have two regional sales offices. One of our Sales Engineers deals primarily with the automotive industry and EV projects in North Carolina, South Carolina, Tennessee, and Georgia. The second Sales Engineer works to extend our range of contacts in and around Chicago and the Great Lakes region.

Describe the relationship between Bihler of America and Bihler. What do they have in common, and how are they different?

Maxine Nordmeyer: While Bihler in Germany invests a great deal of resources to continuously develop and advance the performance of Bihler Technology, here at BOA we concentrate on testing, adapting, and marketing Bihler Technology for the American market. To do so, we work in close partnership with our German colleagues to ensure the solutions meet the specifications of our customers. Many of Bihler's European customers have subsidiaries here in North America. These companies provide us with extremely valuable informational groundwork, in terms of making contacts for potential new US customers. What is more, we have many reference customers who will confirm that Bihler technology delivers the promised benefits. Our aim is to expand our international alliances and offer one seamless global service to Bihler customers.

Mathias Bihler: At the same time, BOA acts as a stimulus for us in Germany. Through their direct customer interaction, they complement our efforts here in Germany and provide us with vital information that we otherwise would not be able to obtain. If new customers want to see Bihler technology in action in a live production environment, the Phillipsburg facility gives them an outstanding opportunity to witness firsthand the benefits of Bihler technology. Moreover, practice has shown that new technology which is introduced in North American facilities very

I think we are on the right path – working together with our customers for a more productive future.

Maxine Nordmeyer

Collaborating directly with our customers at their facilities has always been part of the Bihler DNA. It gives us the best opportunity to identify and to fully understand our customer's specific manufacturing needs.

Mathias Bihler

We want to be a one stop source where our customers can find everything, they need to gain the competitive edge.

Andreas Strobl

The Team of Directors at Bihler of America is headed by CEO Maxine Nordmeyer and consists of Director of New Projects Karl Reed, Director of Production Billy Daniels and Director of Engineering Bob Chrouch (from left to right).

often catalyzes new needs in affiliates or parent companies in Europe. Ultimately, wherever we are located, we all have the same task – to support our customers successfully – and in so doing, build confidence and create long-term relationships.

How has the product range offered by Bihler of America developed over the years?

Andreas Strobl: The focal point has always been and still is Bihler Technology. BOA started as a sales division selling machines with limited customer support services. Nowadays, we offer complete turnkey production solutions with expanded customer support services including product design with prototyping, 3D printing and modeling, tooling development, spare parts, customer training, and manufacturing services. With the shift away from mechanical machines to the latest Bihler NC Technology with our Leantool concept, customers benefit from optimum flexibility, shorter tooling set-ups, faster time-to-market development cycles, and higher productivity. We want to be a one-stop source where customers can find everything, they need to gain the competitive edge.

How important is the Bihler 4 Slide-NC Machine for Bihler of America and the North American market?

Maxine Nordmeyer: Four-slide technology is one of the world's oldest stamping and forming production technologies, yet it is still widely used by many North American manufacturers. The problem today is that these companies maintain large inventories of expensive tooling, but they lack the necessary spare parts and the skilled resources to retrofit and maintain the old four-slide machines. Recog-

nizing this significant gap in the market, BOA developed the Bihler 4 Slide-NC machine, to specifically meet the needs of the North American market. With our "Baby Bihler," as we call it, our customers will realize valuable cost-savings from the ability to utilize their existing tooling, with increased workflow efficiencies.

Andreas Strobl: Thanks to Bihler servo-technology, customers can expect to double their output compared to their old mechanical machines. Although it sounds like magic, it is in fact, purely innovative servo-mechanics, combined with our quick-change modular tooling concept and our high performance VC 1 control system. It is now possible to achieve tooling changeover and set-ups times in as little as one to two hours. On the old machines this would have taken as much as several days – if it was even possible at all. For example, we have customers who were able to replace 50 older four-slide machines with just 14 Bihler 4 Slide-NC machines, which enabled them to optimize their product workflow, and to dramatically increase their productivity. The North American market has enormous potential for the Bihler 4 Slide-NC machine, which also serves as an entrée to other Bihler Technology. Once customers have used the 4 Slide-NC machine and see the benefits of increased productivity and resource efficiencies, they are very much interested in finding out how Bihler Technology can help them in their other manufacturing processes.

INCREASING PRODUCTIVITY

Four-slide technology, which is still widely used worldwide, and especially in North America, is starting to show its age – particularly in the lack of both the knowledge – and the spare parts – that are necessary to maintain them. The Bihler 4 Slide-NC machine, developed by BOA, is an innovative modular tooling concept that allows customers to utilize their tooling and benefit from modular quick change over capabilities. Its standard VC 1 Control System provides versatility and boost production by at least 100%, while reducing changeover time by up to 80%. Available options include thread tapping, screw insertion, welding, inspection, and much more. Making the Bihler 4 Slide-NC machine the most efficient choice for the future.

Mathias Bihler: North American customers – and all customers, for that matter – appreciate proven manufacturing solutions that meet their production specifications – without incurring any development risks. To do this successfully, we first spend a significant amount of time consulting with our customers to fully understand their specific product and process needs for now and in the future. This process works best when it is based on trust and mutual respect, and it does take time. The focus for us, however, is not on short-term sales – the quick sale of a standard machine – but rather, on achieving long-term success for our customers in their day-to-day production activities. We believe that a long-term relationship of this nature is ultimately far more advantageous for both parties and is therefore, an integral part of the support that both Bihler and BOA offer.

What Customer Support Services does Bihler of America provide to its customers?

Maxine Nordmeyer: Our highly trained technical staff at BOA provides a complete portfolio of customer support services. Currently, our consulting services are focusing on cost saving solutions for product materials and automated processes. We maintain an inventory of over $2 million worth of parts in our spare's division, which covers the full range of Bihler machines. Parts are kept on-hand here and are available for immediate shipment – this eliminates long delivery schedules and delays due to customs clearance. The increasing shortage of skilled resources and the need to optimize existing machine performances are making our Retrofit Program one of the

fastest growing services at BOA. The extent of the retrofit depends on the condition of the Bihler machine, the customer's requirements, and on the various control system options – such as the VC 1 system, which allows monitoring functions and network capability for digital remote services. Retrofits can be done in-house at BOA or at the customer's facilities and come with a full Bihler warranty. The Retrofit Program lets you breathe new life into existing machines and in so doing, realize new manufacturing potential.

At a time when many 4 Slide-NC customers are unable to perform any configuration work at their old machines themselves, Bihler of America's experienced experts are able to make a vital contribution.

Bihler of America offers manufacturing services to its customers. As a supplier of Bihler Machine Technology, is this a conflict of interest?

Andreas Strobl: On the contrary, here in North America, this is viewed very positively. In part, this began over 35 years ago when we were developing several complex production lines for household, appliance, and medical products. While we were completing the final machine test runs at BOA, the customer asked – because of their limited capabilities at the time – would we consider running their production for them. We agreed, and in doing so, we created a new manufacturing service, which we continue to offer today. This service has proven to be very beneficial for our customers, particularly in the production start-up phase, as an excellent platform for extensive customer training. It also provides us with an excellent opportunity to demonstrate Bihler technology - in operation – to potential customers, when we are permitted. Based on my experience as Head of Sales in Europe, this service would be perceived there as competition. However, here in North America, the perception is very different. We are very open about our service, and we encourage everyone here at BOA to answer any questions in this regard.

What challenges for the North American market does Bihler of America foresee, and how will you address these issues?

Andreas Strobl: North America is currently struggling with a shortage of qualified skilled workers. The reasons for this

problem are twofold. First, there is a lack of a skilled technical workforce coming out of the school systems. Second, experienced workers have taken early retirement due to the COVID-19 pandemic, leaving companies with a large void in their production capacity. From one perspective, this is a positive for Bihler automation technology. However, our machines require skilled workers to operate them. To address this shortage of workers, BOA offers an apprenticeship program to train the next generation of workers with the necessary skills to effectively operate and maintain Bihler Technology. BOA is one of the few companies here in New Jersey to conduct an apprenticeship program of this nature, and we work closely with local high schools, trade schools, and universities to ensure the success of the program.

Mathias Bihler: Over the past two years, the pandemic and now the war in Ukraine, have affected all of us – through supply chain shortages and rising energy costs. These problems are in addition to the already existing challenges of the EPA CO_2 neutral regulations and the uncertainties they present in the transformation of the automobile and energy industries. Shortages of raw materials, microchips, oil, and skilled resources have demonstrated to us the severe consequences of dependence. As a result, companies are re-evaluating how they do business. We are currently seeing a trend in both Europe and North America, where businesses now recognize the importance of their local supplier base. In Europe, we call it doing business "Local to Local." Companies are bringing back manufacturing and concentrating it in their local markets to safeguard the stability and sustainability of their businesses, while at the same time reducing their CO_2 footprint. Production which, in the past five years, would have been outsourced overseas without much thought or concern, is now being done regionally. We see this as an enormous opportunity for Bihler to support our customers and we are already seeing the benefits through new machine orders.

How do you see Bihler of America in the future?

Maxine Nordmeyer: As Bihler Technology continues to advance and as we at BOA expand our customer support, our

From Canada through the United States and on to Puerto Rico – the team headed by Andreas Strobl, Director of Operation and Sales, and consisting of Area Sales Manager Southeast Josiah Nisbett, National Sales Manager Christopher B. Alexander and Area Sales Manager Midwest Jim Scannell (from left to right) looks after a vast sales region in the Americas.

A LOOK AT THE COMPANY'S GREEN CREDENTIALS

Maxine Nordmeyer explains what BOA has already done in terms of sustainability, and what is planned for the future:

"BOA was one of the first businesses in New Jersey to put into service its own photovoltaic system, enabling us to generate a significant portion of our electricity. Even though the environmental regulations in America are not as stringent as they are in Germany, we want to fulfill what we see as our environmental responsibility in creating a more sustainable economy. The transition to sustainability is an ongoing process that will take time. We have begun the process by implementing high-efficiency LED lighting in our factories and through the use of more efficient machines in our tool production department. We are also helping our customers reduce their CO_2 footprint by integrating the latest Bihler NC Technology and our focus on product material cost efficiencies. The NC technology dramatically reduces their need for hydraulic oil, decreases electricity consumption by 50%, and at the same time, achieves higher productivity. A perfect example of sustainable manufacturing can be seen in our latest process development for Hairpins, IPins, and JPins products for E-mobility. Our innovative mechanical stripping process to remove the insulation from copper wire, eliminates the use of a laser, which not only consumes a great deal of energy, but which also emits hazardous fumes. The Bihler process has proven to outperform the laser technique in quality, repeatability, speed, pollution, and power consumption - which goes to prove that environmentally friendly solutions can also be the most productive solutions."

Commitment and expertise are the key characteristics of Bihler of America's workforce of approximately 350 employees, who work in a 24/7 shift structure to maintain the company's productivity. Sophia Calderon can draw on 25 years of experience in the company.

goal is to be an even stronger partner in the future. We want our customers to confidently think of us first when it comes to their new projects. Currently, we are working with Bihler Germany to enhance our digital remote service capabilities. Through a Service Hotline using AR and VR technology capabilities - services that are already being offered in Germany - our trained technicians can provide immediate customer support, keeping them running 24/7. In addition, we are planning a Customer Training Center here in Phillipsburg. Customers will have access to the latest Bihler Technology for product design testing and extensive customer training. We want our customers to have confidence in Bihler and to see the value that we - Bihler of America – bring as their reliable local partner throughout their entire product lifecycle. This is a step-by-step process, and I think we are on the right path - working together for a more productive future. ●

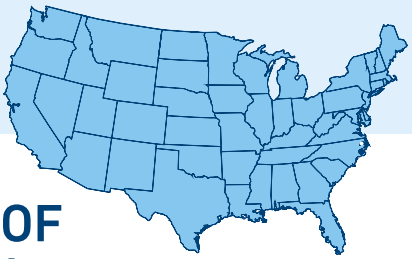
Bihler of America's area of activity also includes manufacturing parts such as switches on behalf of its customers.

WHERE THERE'S A WILL ...

Meeting the customer's specific needs has, since the day it was founded, been a guiding principle for Bihler. Mathias Bihler remembers:

"From the very beginning, my father, Otto Bihler, believed that trade shows were an excellent way to make contact with new customers. He was always eager to learn about their particular manufacturing needs and this often inspired him with new ideas. He particularly enjoyed talking with visitors who, at first glance, might not seem to be potential customers. One instance stands out in my mind. While exhibiting at the IMTS in Chicago, my father began a conversation with a visitor who happened to be Amish. Barry Littlewood pointed out to my father that we probably could not help this visitor, for the simple reason that the Amish do not use electricity, making it rather difficult to run a Bihler machine. Nevertheless, my father continued the conversation explaining how a Bihler machine could bend wire in many different directions. As it turned out, this was not wasted time. One year later, we received an order from the Amish visitor for an RM35 machine – however, without an electric motor. It turned out that the customer ran his machine using a belt attached to his windmill. American ingenuity at its best - although we couldn't help but think that the output must have been highly dependent upon the weather! What I learned from this is that, amidst all the production challenges that our customers must overcome, lies the opportunity for us to develop for them a successful solution."

BIHLER
OF AMERICA

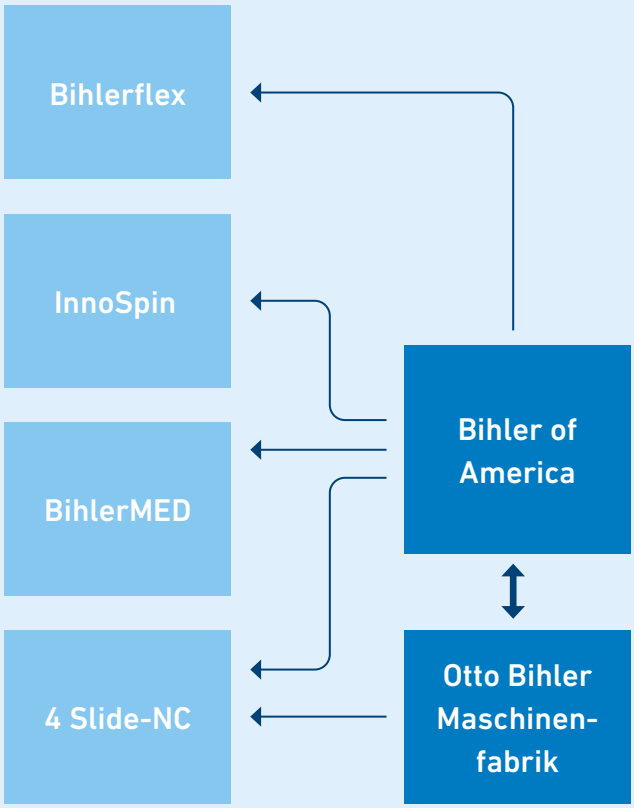


BIHLER OF AMERICA

Founded:	1976
Head office:	Phillipsburg, NJ, USA
Site size:	32,500 square meters
Workforce:	350 with 24/7 operation
Scope of activity:	USA, Canada, and Puerto Rico
Mission:	Developing state-of-the-art manufacturing solutions
Philosophy:	Partner for productivity
Values:	Quality, integrity, teamwork
Markets:	Automotive, Construction, Medical, Electro-technical, Transportation, and Agricultural.

COMPANY HISTORY

1976	Bihler of America founded by Otto Bihler, Barry Littlewood and Vulgens Schön
1983	Construction of a factory in North Branch, New Jersey
1994	Acquisition and extension of a building in Alpha, Phillipsburg, New Jersey
2006	Construction of Building B on the Alpha site
2006	Launch of BihlerMED, specializing in medical solutions
2007	Maxine Nordmeyer takes over the company from her father Barry Littlewood
2008	Maxine Nordmeyer receives WBENC certification (Women's Business Enterprise National Council).
2010	Founding of Bihlerflex, LLC specialization in bungee products with Flexapure ®
2016	Launch of Bihler 4 Slide-NC, specializing in upgrading 4 Slide technology using the Bihler Standard control system VC 1 and servos.
2019	Construction of Building C on the Alpha site. The entire complex including North Branch now covers approximately 32,500 square meters



STRONG COMMITMENTS

It is our philosophy to work closely as a partner with our customers and this is based on mutual respect and trust. Creating a relationship with open dialog in order to develop the most efficient solutions for their specific needs. This is our guiding principle at Bihler and it is essential to the success of our customers' productivity each and every day.

Bihler 4 Slide-NC®, a joint venture between BOA and Bihler that manufactures machines to produce simple steel strip and wire components. The integration of IoT, Quick Tool Changing System, and servo automation represents a considerable leap forward for this forming technology.

BihlerMED develops and manufactures forward-looking medical devices and accessories.

Bihlerflex develops and manufactures bungee products.

InnoSpin produces circular and cylindrical metal components.

CONTACTS THAT INSPIRE CONFIDENCE!

So-called NEMA sockets are the standard connector type used for the mains power supply in the USA, Canada and many parts of Asia. Unlike the European design, they have three plug connections with flat connectors for the phase and neutral conductors and a round grounding contact. NEMA sockets are designed for voltages from 125 V to 600 V and currents of 15 A to 50 A. These sockets are extremely complex components with many individual parts. These include, for example, the base plate, the connecting terminals, the casing, screws and plug contacts.
In the USA, Bihler of America Inc. has been manufacturing NEMA sockets for more than 35 years. It supplies them as finished end products and performs all the necessary manufacturing operations for all the plastic and metal components. While Bihler of America manufactures all the required plastic parts on Arburg injection molding machines, the metal parts are produced on a Bihler GRM 80 stamping and bending machine and a BZ/2 processing center. These are complemented by a number of special machines which have been developed and built inhouse by Bihler of America and are flange-connected to the Bihler equipment. These house all the process modules for welding, thread cutting, screw insertion, feeding, testing and marking. All the systems are connected to one another via a pallet system, meaning that component production can continue even if an individual machine has to be shut down, for example for maintenance work. In this way, a complete line produces 120 finished and packaged sockets per minute and ensures an outstanding level of efficiency and automation – all adding up to a successful product made in the USA with German Technology. ●

A SMALL BUTTON WITH A BIG IMPACT

Whether for ceiling lights, wall-mounted spotlights or corridor lighting – all sorts of buttons and switches are used to control these and other indoor light sources every day. A brief press is enough to ensure that the electricity flows safely through the wiring to the light source. Switches such as the North American NEMA designs depicted here have a plastic body below the switch or button itself which contains numerous stamped and bended metal parts. Bihler of America Inc. has been manufacturing every aspect of these components for more than 35 years in end-to-end, fully automated production lines which perform all the required operations from the raw materials stage through to the packaged finished product. A Bihler GRM 80 stamping and bending machine and a BZ/2 processing center are used to produce the necessary stamped and bended parts. The systems are equipped with all the required process modules for welding, thread cutting, screw insertion, feeding, testing and marking. The process also involves a number of special machines, which have been developed and constructed inhouse by Bihler of America and are connected to the Bihler machines. All the required plastic parts are also manufactured by Bihler of America on Arburg injection molding machines. Each of the lines outputs complete packaging units at the rate of 120 switches per minute. The fully automated manufacturing process ensures optimum efficiency and vertical integration, in particular because all the systems are connected to one another via a sophisticated pallet system. This ensures maximum output even if individual machines sometimes have to be stopped, for example for a change of material or maintenance work. ●


KELVIN RICARDO
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Das Fahrwerk!
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THE BOND OF POWER, PASSION AND PERFORMANCE

Innovativeness, dynamism, commitment and an unshakable will – these are the values represented by the DTM racing team Abt and the company of the same name, Abt Sportsline in Kempten. A family-run company with a proud tradition prepares to face the future. E-mobility now complements the company's portfolio, whether it be in their racing activities or in the manufacture of electric commercial vehicles. Like Bihler, Abt has a will to succeed, a wealth of new ideas and the passion to make it a powerhouse of innovation. Mathias Bihler met a kindred spirit in the shape of company boss Hans-Jürgen Abt at the Abt headquarters in Kempten.

We have always been involved in motor sports to demonstrate our innovativeness. E-mobility will be an important source of income. It will continue to develop. We want to be there with our products and be part of it.

Hans-Jürgen Abt

Mathias Bihler:
Mr. Abt, we have a lot in common. Our team culture, how we work with people to spur them on to achieve the best possible results. And in motor racing in particular. You have to push the limits of what is technically possible to have a chance of winning.

Hans-Jürgen Abt:
Exactly, it's in our DNA to go from the race track to the road. My father already exemplified this mindset. That's been our philosophy for 125 years. We've been actively engaged in motor sports for 70 years. We have always been involved in motor sports to demonstrate our innovativeness. But to lead the teams as well. That's about the need to deliver results in racing! You work hard all week in order to make sure that everything is the best it can be when the grid lines up at 9 o'clock on Sunday morning. The team has to be well organized and the material has to be right. It's a chain, a process that has evolved. And as the boss, you have to set the example. A family business, like you as well, is in a better position to act in this way. It is this structure that gives you the opportunity to make the venture financially successful.

Mathias Bihler:
The strength of Bihler lies in the many highly qualified people who identify with the product, making it possible to emerge victorious in the face of global competition. Our customers are like racing drivers in a race against global players. Which is why we also strive to get the maximum out of our machines and processes. The process is essentially the fine-tuning that we do to allow high-quality components to be manufactured reproducibly with the least amount of material.
But how do you deal with change? After all, you are closely associated with the combustion engine. And the same is true of us. Many of our customers manufacture products used in combustion engines. But we have also developed solutions in the field of e-mobility. For instance busbars or hairpins.

Hans-Jürgen Abt:
We can agree on that. As far as transformation is concerned, for instance e-mobility or fuel cells – that's what the auto-

Abt Sportsline
The success story of the Kempten-based, family-run German company Abt started 125 years ago. Their business covers engineering, motor racing and tuning for vehicles from carmakers Audi, Seat, Škoda, Cupra and Volkswagen. Abt is active in the German Touring Car Championship DTM, Formula E and the Extreme E series. As of 2009, Abt has also been represented in the E-mobility sector with its Abt E-Line. The Managing Partner of the company is Hans-Jürgen Abt (59). The company headquarters houses a museum dedicated to the history of the company. From its roots in a blacksmith's shop for horse-drawn vehicles, the company has evolved into a globally active, innovative force in the mobility industry and flagship of the Allgäu economy.

www.abt-sportsline.de

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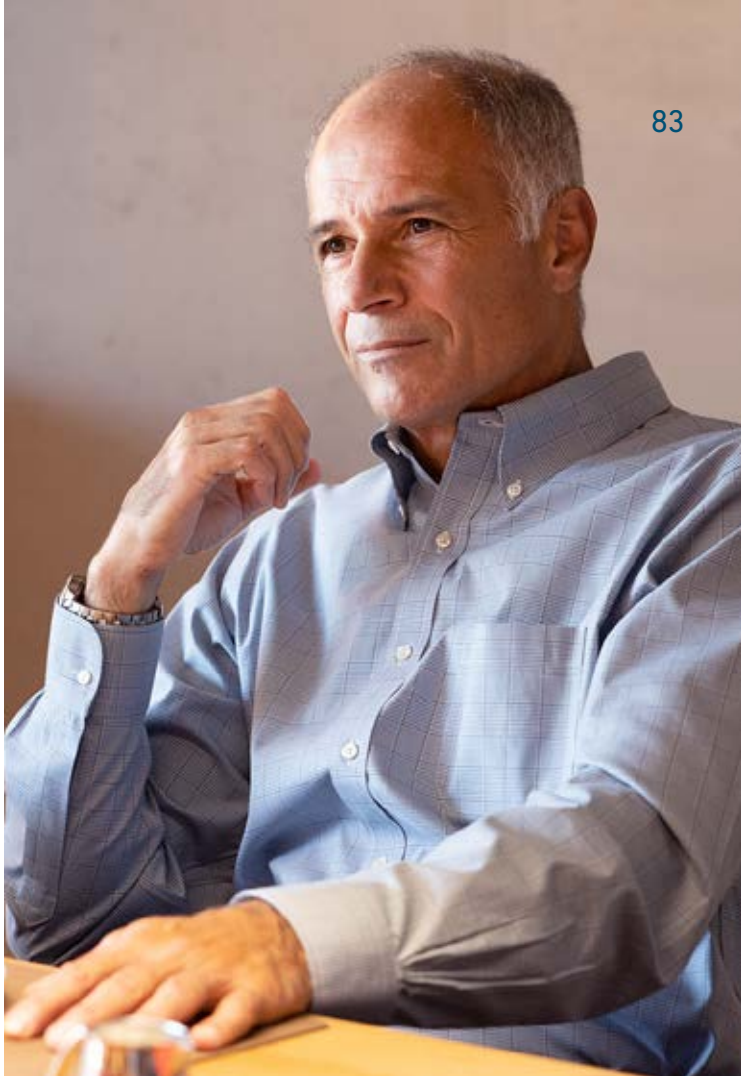
>
> Mathias Bihler



motive industry is calling for. We are currently involved in a development for Bosch in the hydrogen sector, and this will be presented at the IAA Commercial Vehicles show.
In these areas, our approach is to fall back on components. We don't have to make a finished product ourselves. Our job is to do the engineering, and we then have it manufactured. To do this we have 70 engineers, software specialists and managers. We are involved in prototyping and produce pilot series.
This is also the way our business model is structured in our core business. After all, our background is in tuning and refining. For instance, we take a basic package from Audi. We then modify it again. Take it to a new dimension. We then turn it into a limited edition special series. And these are usually sold out. After all, everyone wants a limited edition car. It is a business model with annual sales of around 100 million euros from a workforce of about 250. It is important to us that we are not dependent on anyone. This makes us resilient to crises.
Our strength lies in speed and efficiency, which also make us more cost-efficient. We have also been active in the field of e-mobility since 2009 as Abt E-Line. For example, we developed a complete powertrain for VW. That was VW Commercial Vehicles' first step into e-mobility. The Abt T 6 bus was also exciting for us – to be able to build 4500 cars. Now we are working on developing our own battery.

Mathias Bihler:
In our case, the machine is the platform. Then we develop the actual production process on the machine specifically for the customer. We are constantly looking for other processes to optimize. So that we can ultimately offer the customer a real benefit. Much the same as tuning a vehicle. It's the same precision that we see in your cars: everything has to be perfectly tuned. Let's go back to your involvement in motor sports. What do you take from your experience in Formula E?

Hans-Jürgen Abt:
Our philosophy is that when we develop something for the roads, we advertise it in the world of racing. To give people a real feeing for it. So that people understand it. We were a founding member of the Formula E series. If we go racing, we have a product to go with it. So we launched the E-Line. We were very successful in our E-racing, and won the world championship.
The technological insight we gained is that energy management, temperature and efficiency are the crucial things in e-mobility. Everyone talks about range and performance. What's important is consumption. In the racing series, it is precisely these key criteria on which you are judged. Of course, the objective is to allow the insights of the engineers in the racing environment to flow into series production. We have magnificent synergy effects in-house.
To start with, we were involved in E-racing on our own. Then we became the Audi works team. At present, we're just about to enter Formula E again as a private team. We are well prepared. The series is developing all the time. We are the most successful team after seven years of this series. It's not about the smell of gasoline, but about sporting ambition. You can showcase sport and technology. E-mobility will continue to develop. E-mobility will not replace everything else, but it will be an important source of income. We want to be there with our products and be part of it. We have the combustion engine, we have e-mobility, and we will build up hydrogen technology as another pillar of our innovation company. This is how we refer to ourselves. But that's why motor sports are also part of our life. That's how we live our life! ●

The NCA 6K slide unit

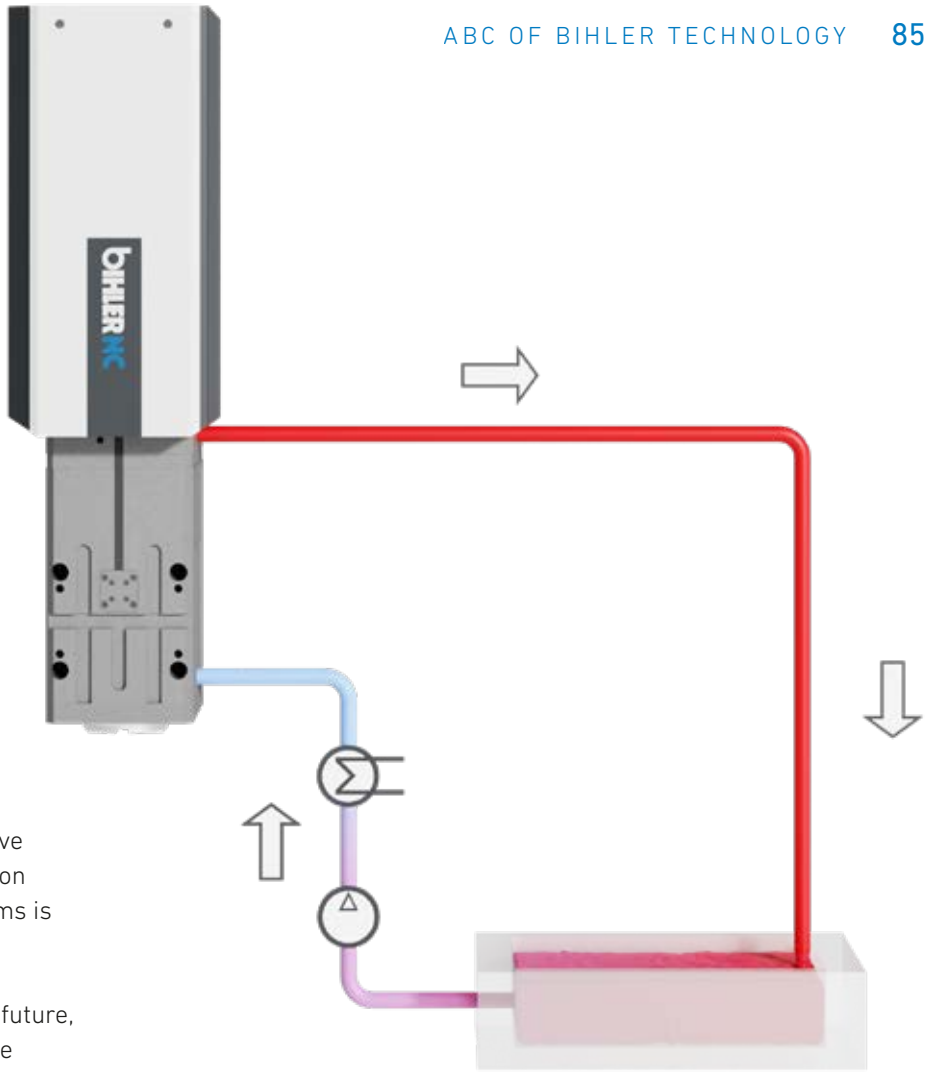
Otto Bihler Maschinenfabrik's most recent slide unit, the NCA 6K, excels through its compact design coupled with the high bending forces it achieves. The unit also possesses a number of other innovative highlights such as circulating oil lubrication, optimized sealing systems and new data storage and network functions.

The NCA 6K, which is available with immediate effect, is the latest servo slide unit from Otto Bihler Maschinenfabrik. At only 876.5 mm in length, the component is particularly compact. As a result, it can be mounted on machines such as the Bihler BIMERIC without difficulty.

The unit's small size was made possible by an adaptation to the drive system. Thus, the rear motor only turns the spindle nut, causing the spindle to start up without rotation. Another new development consisted in moving the radial axle bearing to the motor, where specially reinforced motor bearings absorb all the bearing forces. The NCA 6K achieves its high dynamic performance thanks to the low moment of inertia, which has been reduced to a minimum by means of simulations. Despite its compact design, the NCA 6K makes no concessions when it comes to bending strength, with the two different variants of the unit achieving peak forces of 67 and 89 kN, respectively. With this performance, it is situated between the NCA 5 with 47 kN and the NCA 7 with 200 kN peak force – and therefore possesses the ideal power level for bending, punching and stamping.

Sustainable and robust At the same time, great care was taken during development to keep the NCA 6K's environmental footprint to an absolute minimum. That is why the unit implements a circulating oil lubrication system. This ensures that the oil is pumped in a circuit and that there is no wastage or loss of oil.
The NCA 6K's encoder system has also been redesigned to make it particularly robust. This effectively resists the high vibrations and oscillations that occur during stamping, in particular.

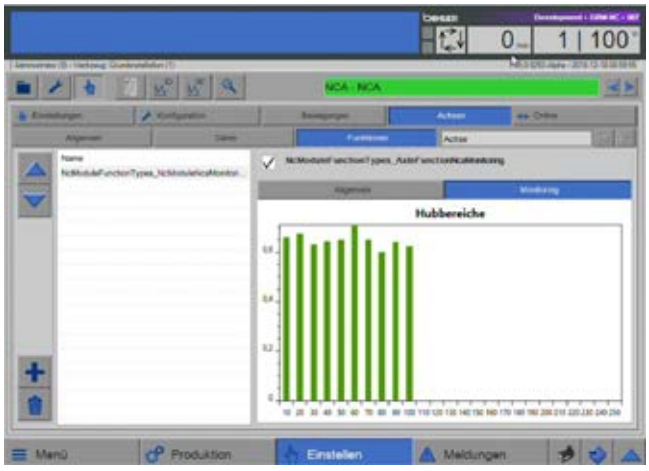
Newly developed seals Another innovative highlight can be found in the NCA 6K's sealing system. This makes use of scraper seals developed inhouse by Otto Bihler Maschinenfabrik. These ensure that the sleeve, i.e. the unit's piston, is reliably and permanently sealed as it travels in and out.



Closed system: New circulating oil lubrication solution with no loss or oil waste.

The NCA 6K's linear position measurement system has also been further optimized. Here, an O-ring has been integrated as a seal in the measuring head. This easy-to-fit component provides the system with effective protection against outside dirt and dust. A silicon seal of the sort generally used in earlier systems is therefore no longer necessary.

With data and network function In the future, the NCA 6K unit will also be extended to include further features such as runtime data storage. This is an integrated memory function which stores a comprehensive set of data, such as distance traveled, number of strokes, machine revolutions and work performed. This data is permanently stored in the axis and therefore continues to be available even after the unit has been removed from the machine In the future, the NCA 6K will also be equipped with a hardware identification function. As a result, the VC 1 controller will be able to automatically identify whether an NCA 6K has been mounted on the machine and set the corresponding control parameters accordingly. In this way, it will be possible to take the NCA 6K into service extremely simply via plug and play for the first time. ●



All the data, such as distance traveled, number of strokes, machine revolutions and work performed, is recorded in the integrated runtime data store.

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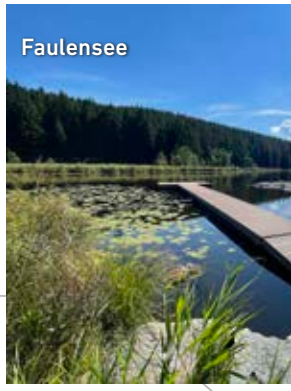
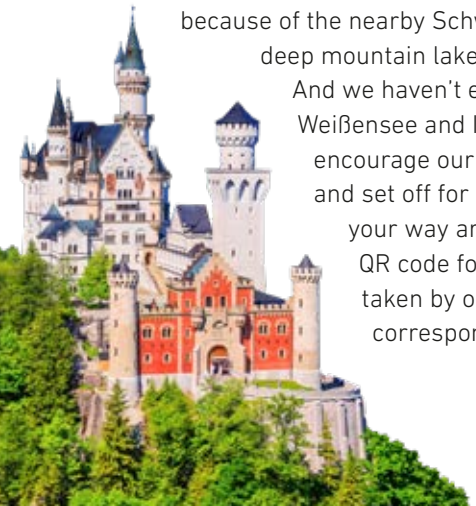
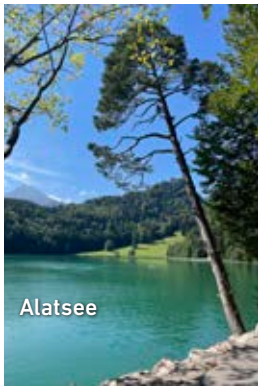
ENCHANTING LAKES IN THE KÖNIGS-WINKEL REGION

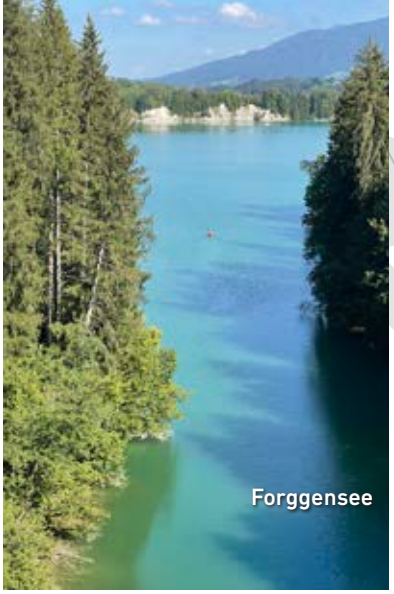


Pleasures fit for a king! What could be finer than a relaxed bike ride from lake to lake, against the backdrop of the Allgäu mountains. Past the fairytale royal castles, pleasant places to stop for a snack and secluded spots for swimming – that's what our cycle tour along the shores of no less than 11 lakes has to offer.

The lakes are strung, one after another, along a stretch of some 60 kilometers. It's not hard to discover the idyllic places along our route, whether by muscle power alone or with a little help from an electric motor. For our suggested excursion in the immediate vicinity of the Bihler plants in Halblech and Füssen, you should certainly come fully equipped with plenty of time, a healthy appetite for the numerous places to stop for refreshment and, of course, swimwear for the opportunities for a dip. It's difficult to pick a favorite, given the picture-book scenery around the lakes we have chosen. But each of the destinations has a different character. Take the picturesque turquoise Alatsee: It became famous as the setting for a Kluftinger detective story and is steeped in myth and legend. Although there are also plenty of legends about the Schwansee, overlooked as it is by Neuschwanstein Castle. The remote and boggy Faulensee offers seclusion, while the Hopfensee is seen as the Riviera of the Allgäu. Sailing enthusiasts will be taken with the Forggensee, which was formed when the River Lech was dammed in 1954. And the Hegratsrieder See and Bannwaldsee on the other hand are something for nature lovers. Many people from Füssen swear by the Alpsee when they need to cool down. Although it is busier because of the nearby Schwangau with its royal castles, it is a deep mountain lake, promising a refreshing swim. And we haven't even talked about the Obersee, Weißensee and Illassee, but we would just encourage our readers to jump onto their bikes and set off for an enjoyable swim. To help you find your way around, here is the QR code for the Komoot route taken by our *b. on top* cycling correspondent. Have fun! ●





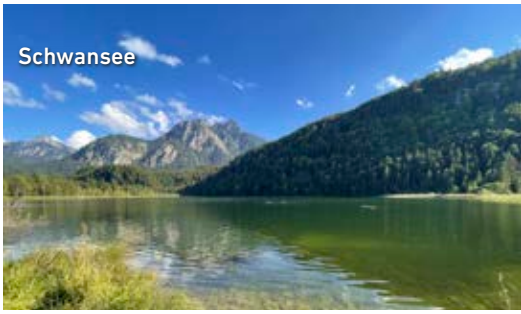

Forggensee


Illasbergsee


Hegratsrieder See


Bannwaldsee

Füssen


Schwansee


Obersee


Alpsee

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