

b

on top

THE MAGAZINE OF
OTTO BIHLER
MASCHINENFABRIK
GMBH & CO. KG
2019



**OPENING UP
NEW
DIMENSIONS**



◀ Success through innovation

Self-flying, electrically driven passenger-carrying drones such as the Volocopter could open up new dimensions in the world of traffic and transport. It is technical innovations like this that overcome existing capacity limitations and permit new solutions for success – long-term, forward-looking solutions that precisely meet requirements.

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

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THE COURAGE TO INNOVATE IS THE KEY TO THE FUTURE

Dear readers,

The world is gripped by change and the dynamism of the current times is confronting us with new challenges. It demands a measure of flexibility and performance that goes far beyond the current level – and which, ultimately, can no longer be achieved using conventional manufacturing structures. Instead, what is needed are innovative production solutions that open up new dimensions in manufacturing. These solutions are already available today. However, like everything new, it takes courage to embrace them. The courage to innovate is the key to the future. That is why, in this current edition of b on top, I am particularly happy to be able to present many global market leaders who have successfully extended their dominant positions using innovative Bihler technology. They have shown the courage to introduce innovations that are already paying for themselves today and, more importantly, will continue to do so in the future.

At the same time, we are consistently further developing our technological solutions.

These include the EffPro project for the inline measurement of important component and process parameters, as well as the new VR and AR headsets which will make Bihler's service activities even more efficient in the future. Our new processing center, the BZ2-S8, or the new features of our B 20K welding system are pioneering developments. These developments are important. They form the basis for future solutions with which you, our valued partners and customers, can become even more effective in the market and succeed even better in the face of the competition. However, you will also make your company more interesting for young employees. And, ultimately, it is these young people who give a company its life and who are essential for its success. We hope you enjoy reading the current edition,

Mathias Bihler.

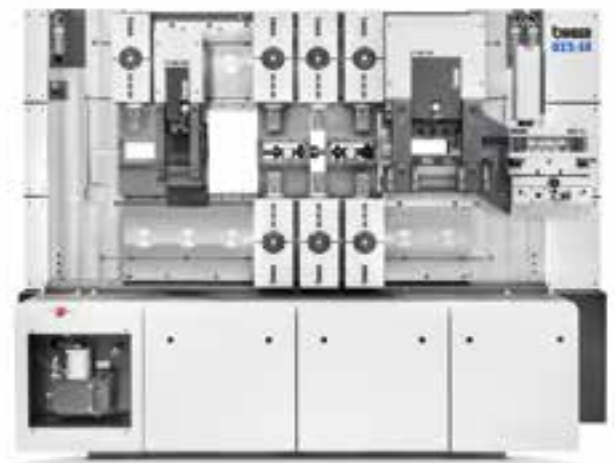


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AWARD FOR INNOVATION

The Brose Supplier Innovation Award is the most important supplier award conferred by the world's fourth-largest supplier to the automotive industry, Brose Fahrzeugteile GmbH & Co. KG in Coburg. This year, the coveted award was presented to Otto Bihler Maschinenfabrik and the Schürholz Group for the pioneering technology developed for the manufacture of watertight window crank motors. The development was based on the use of the BIMERIC modular servo production and assembly system, on which the stamping, bending, laser welding and patented joining of the cover and housing are performed in a way that ensures particularly efficient material use. Thanks to this innovative solution, Brose now saves 32 percent in its material costs and has reduced the weight of each component by 25 percent. This, in turn, makes the vehicle lighter, saves fuel and reduces CO₂ emissions. ●



Receiving the award for the jointly developed innovative manufacturing technology: Bihler and Schürholz have received the Brose Supplier Innovation Award.



TRAINING AT BIHLER

The training of young people has always been of central importance for Otto Bihler Maschinenfabrik. Their training not only helps them to further their own careers but also represents an investment in safeguarding the company's future. The same also applies to the 29 new apprentices and 4 dual curriculum students



who arrived at Bihler in September of this year. They are being trained in eight different professions, including tool engineering, electronic engineering, product design and IT system management, while the students specialize in mechatronics, IT, mechanical engineering and business administration. They are all strengthening the team of 87 apprentices and 12 students who are already active at Bihler. Their three-and-a-half year training, during which they are accompanied by a total of twelve Bihler instructors, starts with an induction week with guided factory visits, a period of getting to know one another, an introduction to the corporate culture – and an evening in a mountain hut with the Managing Directors Mathias Bihler and Manfred Grundner, who provide detailed answers to the many questions asked by the enthusiastic new generation of employees. After completing their training, all career paths remain open to these young people – or like many of the total of almost 1,500 young professionals so far trained at Bihler, they can immediately pursue their careers with the global market leader in Halblech. ●



FORWARD-LOOKING EVENTS

The Allgäu Stamping and Bending Forum has now become an established industry get-together for the entire stamping and bending sector. Thus, this year's third Allgäu Stamping and Bending Forum, which was held on 26th June 2019 in Füssen, was attended by 140 industry visitors from more than 60 companies in Germany, Austria and Switzerland. The focus of the event was placed on the most recent products and services from Otto Bihler Maschinenfabrik and Wieland Werke AG. At the event, Bihler's experts presented their forward-looking servo production systems, modular tool solutions and smart devices. They demonstrated how the perfect end-to-end design of these solutions not only guarantees maximum flexibility and process stability but also permits very short implementation times. For their part, the specialist speakers from the Wieland Group informed visitors about the latest copper materials for plug connectors and press-fit contacts. In addition, they showed how copper strips can be laser-welded and what methods are the most suitable for

performing bending tests. After an intensive discussion session, the enthusiastic participants rounded off the event with a cruise on the Forggensee lake. ●



ON COURSE IN NORTH AMERICA

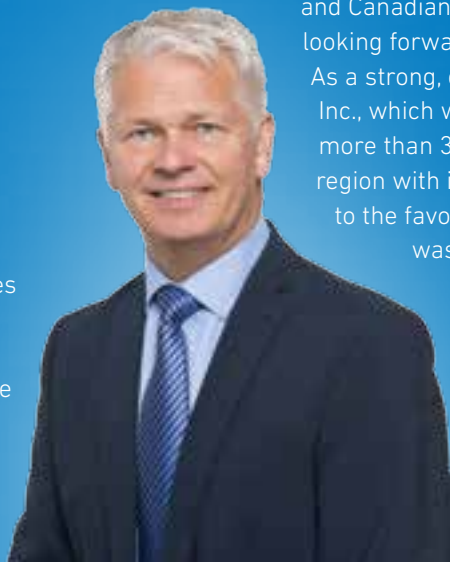
On August 1st, 2019, Andreas Strobl took over as Head of Operations and Customer Support at Bihler of America (BoA). In this newly created position, the 54-year-old executive who, prior to his last position as Managing Director of a mechanical engineering company, had already been Head of Sales for Scandinavia, Germany, Austria and Switzerland for Otto Bihler

Maschinenfabrik, has clear goals in mind: According to Strobl: "The main task is to expand customer support throughout the region and to optimize the communication paths across all areas of the company. "We also need to implement a forward-looking concept to strengthen our presence and must create the corresponding structures and employee responsibilities in order to exploit the great potential of the US-American and Canadian markets even better. I am very much looking forward to this exciting project."

As a strong, established partner, Bihler of America Inc., which was founded in 1976 and currently has more than 300 employees, supports industry in the region with its tailor-made automation solutions. Due to the favorable economic situation, a new building was acquired this year to extend the company's floor space to 32,500 m². As a result, new premises are now available for spare parts sales, service, consulting and customer training events. ●

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WAYS OUT OF THE BOTTLENECK?

A blurred, high-speed photograph of a busy city street, likely in New York City, showing a dense traffic jam of yellow taxis and pedestrians. The image is heavily motion-blurred, conveying a sense of congestion and a 'bottleneck' in traffic. The background shows city buildings and palm trees, suggesting an urban environment.

At the limits of capacity:
To prevent gridlock like we see
here in New York so that
transport users can get
where they want to go
quickly and flexibly using
the existing road network.





OPENING UP NEW DIMENSIONS

A large passenger-carrying drone is shown in flight on the left side of the page, with its rotors blurred. The background is a panoramic view of a city skyline, likely New York City, featuring numerous skyscrapers and a body of water in the distance. The sky is a mix of blue and light orange, suggesting a sunrise or sunset. The text 'OPENING UP NEW DIMENSIONS' is overlaid in large, bold, blue capital letters.

Passenger-carrying drones like the Volocopter model pictured here could open up a new dimension in transport and usher in the individual mobility of the future – efficiently, safely and emission-free.

Act now and actively bring in decisive technological leaps using state-of-the-art engineering – that is how completely new dimensions are opened up in the manufacturing world. When this is done, users benefit not only from greater efficiency and productivity. More importantly, they gain the flexibility and speed that will be vital in the competitive environment of the future. And anyone who takes advantage of technologies and solutions from Otto Bihler Maschinenfabrik is already in a position to make the decisive step forward.

Self-flying, fully electric passenger-carrying drones could revolutionize urban mobility and solve today's traffic problems at a stroke. Even though this type of mobility will only be available in the future, it nevertheless demonstrates the enormous potential offered by digitalization, in combination with artificial intelligence and big data. And at the economic level, it is becoming ever more important to open up these potentials, in particular with regard to networked production in accordance with the Industry 4.0 principle. For example, a current study by the German Federal Ministry of Economic Affairs and Energy (BMWi) expects additional economic growth of approximately 53 billion euros as a result of Industry 4.0 by 2020 and the planned economic investments in Industry 4.0 applications in Germany amount to 40 million euros a year over the next two years. These figures show that digitalization is moving on apace and is of vital importance for industry and technology. Ultimately, digitalization will open up new ways for companies to differentiate themselves even more strongly in the global market in ways no other technology can. Against this background, it is vitally important for company management to get to grips right now with the issues of digitalization, process optimization and transparency in order to be successful and remain competitive in the long term. According to Mathias Bihler: "The important thing is to recognize which benefits of digitalization are of value for your own company, define the corresponding possibilities and then apply these in practice." "And companies will be all the more successful, the more they combine their core competencies with digitalization." This will also bring about an increase in transparency which, for example, will make it possible to recognize wastage and inefficiencies. Improvements and optimizations made with these aims in mind can make a valuable contribution to further enhancing a company's market differentiation.

Act now It is vitally important to act now and actively invest in the potentials of the available technologies in order

to usher in the decisive technological leap. And any company that places its confidence in solutions and technologies from Otto Bihler Maschinenfabrik is making the very best of investments. Because all Bihler users are making the decisive step forward and boosting their long-term performance and competitiveness. In this way, they can achieve considerable improvements to existing products and components and are also ideally equipped for the future. And in the future, ordering behaviors and the rhythms of the large industries will play an ever more important role. The path will increasingly lead away from warehousing and toward requirements-oriented performance provision. As a result, it is becoming increasingly important to deliver quickly and reliably. "Every system and every item of production equipment must be able to manufacture parts at short notice in the required quality and ready for immediate delivery – without time-intensive intermediate steps and warehousing," continues Bihler. Against this backdrop, it is particularly important to act without delay and invest in Bihler's technologies right now in order to actively lay the foundations for future success. The great dynamism of the times and the changes taking place in the markets make this absolutely essential and mean that wait-and-see or reactive attitudes are no longer acceptable.

Custom solutions Bihler supports this approach on the part of its customers in a number of ways. Thus, end-to-end solutions can be supplied, for example in the form of a fully-featured GRM-NC or RM-NC system. These are indi-



It is not enough just to make innovative solutions available. Instead, the necessary peripherals must also be present in order to open up all the new potentials in practical application.

vidually configured to meet the customer's requirements and are therefore designed to provide the best possible productivity and quality. At the same time, Bihler allows its customers to use specific machine units or segments rather than complete systems. This possibility could, for example, involve the machine body of a BIMERIC, which is then complemented and extended jointly by Bihler and the customer through the addition of individual stations and process units that are configured for the specific application in question. Last but not least, users can also benefit from single modules. One of these is, for example, Bihler's "Bihlerplanning" WebApp, which provides valuable support during component planning, as well as the Bihler LeanTool system, which can be used for the extremely simple, fast and economical manufacture of new tools.

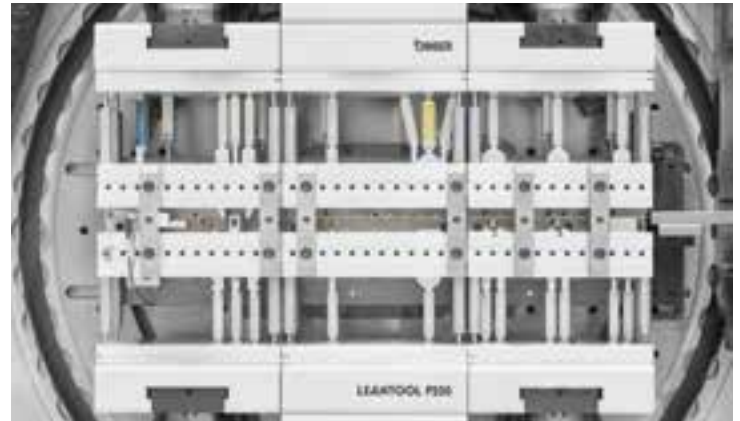
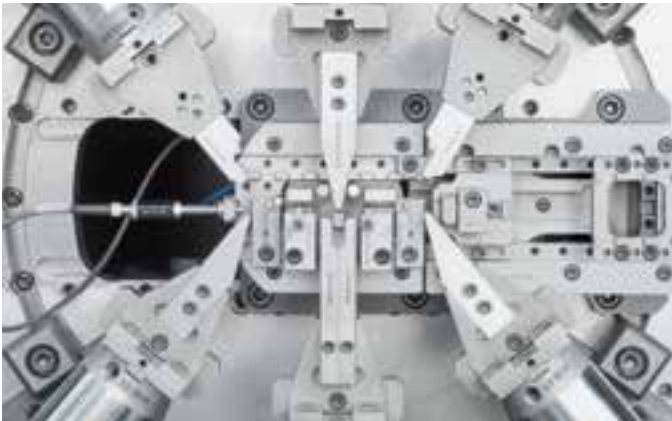
Profitable in many ways For any user, the investment in new Bihler technology pays for itself in many ways and will continue to do so in the long term. This is because this technology not only ensures increased product quality and reduced waste. More than this, a Bihler solution also permits a significant increase in cycle times and therefore the company's own performance capacities. In addition, it provides the precision, flexibility and production reliability that clearly differentiate users from their competitors. And last but not least, the new Bihler systems are fully networkable and provide the ideal basis for digitalized production thanks to their efficiency-boosting analysis and monitoring functions. Another important plus point: The existing, proven

tools can be transferred without problems to the new Bihler technologies and systems, where they can continue to manufacture even more effectively and competitively. What is more, modern, state-of-the-art technologies, such as Bihler's servo-controlled solutions, send out a powerful message, in particular to younger employees. These young people now far prefer to live and work in the digital environment with modern technology than with mechanical systems, which they often consider to be dated and a thing of the past. As a result, investments in Bihler technology pay for themselves not only at the level of manufacturing efficiency but also in ensuring the presence of a qualified workforce for the future.

Expertise included Irrespective of which Bihler technology the customer invests in: Otto Bihler Maschinenfabrik supports its customers from initial planning through to commissioning – and of course also beyond this. And anyone who acquires a Bihler system or Bihler technology also receives all the expertise needed in order to get the very best from their investment. This is provided, in particular, by the training courses and modules provided at Bihler's premises in Halblech and Füssen. Here, all the customer's employees learn all the skills they need to manufacture successfully on a day-to-day basis. Overall, Otto Bihler Maschinenfabrik provides the best possible basis for making a genuine technological leap and raising each company's own performance and competitiveness to a new level of success. ●

FASTER, SIMPLER, CHEAPER

The Bihler LEANTOOL system is one of the most recent innovations from Otto Bihler Maschinenfabrik and allows users to manufacture their new tools faster, more simply and up to 70 percent cheaper. As a result, they themselves are in a position to offer complex parts in small batch sizes faster and more economically and therefore create a clear competitive advantage for themselves.



As a standardized modular toolbox, the LEANTOOL system permits end-to-end tool creation from a single supplier and enables users to save a huge amount of time and money. At the same time, it permits extremely short times-to-market even at very small batch sizes.

The LEANTOOL system is available both for radial and for linear manufacturing solutions in the form of the LEANTOOL Radial and the LEANTOOL Progressive systems. In both cases, the tools manufactured using LEANTOOL consist of up to 70 percent standardized components. In the case of the radial solution, this reduces manufacturing costs by 70 percent. In the case of the linear solution, the costs are up to 40 percent lower and raw material utilization is improved by up to 25 percent. Overall, approximately 40 percent fewer tool parts are required here.

Clear market advantage What is more, the tools manufactured using the LEANTOOL system stand out not just because of their production method. Even more so, they excel through their very short setup times of sometimes under 30 minutes, as well through their optimized accessibility in the system. Other factors of success include the ease of maintenance and a high throughput. The LEANTOOL system now constitutes the standard for new tool produc-

tion at the Bihler RM-NC and GRM-NC servo-controlled stamping and forming machines. The LEANTOOL Radial system, which is efficient in the way it uses materials, is designed for the manufacture of so-called radial stamping and bending tools which can be bended around the core in one position. By contrast, the LEANTOOL Progressive system permits multistage component machining and is therefore perfect for more complex stamped and bended parts. In this case – in contrast to the limited radial concept – it is, in theory, possible to perform an infinite number of operations at the part. Both solutions allow users to bring new products to market faster and much more economically than their competitors. This makes the LEANTOOL system the ideal concept for success in the global competitive environment and for ensuring a clear market advantage, both now and on into the future. ●



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NEW STANDARDS

With new, standardized stamping and bending frames for the Bihler NC presses, Otto Bihler Maschinenfabrik is further extending the LEANTOOL system concept.

The frames, which were developed in cooperation with Meusburger, a leading manufacturer of standard components, ensure additional time and cost savings. At the same time, they further reduce time-to-market and make this easier to calculate.



The new stamping-and-bending frames with sprung guide plate are further contributing to standardization in the field of stamped and bended parts and relieve users of the costly, time-intensive task of manufacturing their own individual frames.

Taking the LEANTOOL system as its basis, Bihler has further extended the concept of standardization as a success factor and has developed it even further in cooperation with Meusburger Georg GmbH & Co KG in Wolfurt in Austria – in the form of standardized cutting frames for Bihler's NC presses with press forces of 200 kN, 300 kN and 400 kN. The frames, which measure up to 596 mm in length are available in the types "SBH tunnel cut" for prototypes and short runs or "SBP sprung guide plate" for high-precision parts and large quantities.

Better calculations The standardized cutting frames are a market innovation and are the most recent result of many years of successful cooperation between Bihler and Meusburger. The idea of a standard for stamping-and-bending frames was the result of clear requirements: "The aim was to free customers from the need for costly, time-intensive one-off production operations by standardizing the frames," explains Thomas Enz, Business Development Manager for Stamping Tool Construction at Meusburger. "With the new frames, we have taken the idea of standardization in the stamping and bending field further, once again cutting time-to-market and making it easier to calculate," adds Marc Walter, Head of Process Planning at Bihler. "The

new frames are much more economical than individually manufactured structures and are available quickly." At the same time, they excel through numerous practical features such as the precise alignment edge, the antitwist protection or the helpful fixing threads. Last but not least, the standardized frames also reduce the risk of errors during the manufacturing process. Ultimately, design engineers no longer have to worry about this peripheral device but are free to focus on other process steps.

Dual availability At Bihler, the new stamping-and-bending frames are already being used as components in complete tool solutions. They can be ordered separately online from Meusburger, where a design wizard is also available for individual configurations. ●

meusburger

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NEW HORIZONS



**Andreas Hofer, Managing Director,
Prometall Fertigungstechnik GmbH:**

“We have been using the LEANTOOL Radial system since the middle of 2019 and have already manufactured two tools for our GRM-NC with it. We chose the LEANTOOL system in order to be able to offer sample parts and small runs economically and cut our throughput times for these components. In concrete terms, we were able to cut our tool costs for our last sample tool by 60 percent. What is more, we were able to cut the construction time for this bending tool by about a third and were able to use standard parts for a third of the active elements in the bending tool.”



Paolo Destefanis, Technical Director, Accornero SpA:

“In 2018, we installed an RM-NC in the Bihler department and since then we have been using the LEANTOOL Radial system. The main advantage for us lies in the lower toolmaking costs. We believe that we can save 20 percent of our planning costs and cut the subsequent toolmaking costs by up to 45 percent. Overall, the LEANTOOL tools are 40 percent more economical than conventionally manufactured tools, in part because, depending on the equipment, the bending units consist of up to 50 percent standard parts. Ultimately, the LEANTOOL philosophy allows us to offer our customers components of unvarying high quality at low costs, even in the case of short runs.”

For many metal construction companies, the LEANTOOL system as a standard for tool manufacturing has now become a fixed part of the solution portfolio. Here, users from throughout Europe speak about the advantages the LEANTOOL system offers them.



**Ola Karlsson, Production Manager,
Spring Systems AB:**

"It is vital to us to be able to manufacture our own tools and we usually make all our tools ourselves. We have been using the Bihler LEANTOOL Radial system for about a year and have already manufactured four tools for our GRM-NC with it. These were between 25 and 30 percent more economical than conventionally manufactured tools. In addition, the toolmaking process was a lot easier and about 20 percent faster than in the past. Another advantage is the short setup time of around two hours. For us, the Bihler LEANTOOL system is a new, smart technology with which we can significantly boost our competitiveness."



**Hans-Georg Reichel,
Managing Director Cefeg GmbH:**

"With the LEANTOOL system, we can engineer and manufacture our tools for our RM-NC and GRM-NC not only faster but also more economically. The system offers a very high level of flexibility combined with manageable, transparent toolmaking effort – which also improves our ability to plan during the offer phase. Since 2018, we have so far manufactured six tools, together with the associated variants and adaptations, using LEANTOOL. These are approximately 30 percent more economical than in the past and reduce both working time and expenses by up to 40 percent. The proportion of standard parts is between 30 and 50 percent depending on the tool. At the same time, the setup times are approximately a third of those required when setting up conventional tools."



Michael Merz, Head of Engineering, Bohnert GmbH:

"Since March 2019, we have been using the LEANTOOL Radial system for our RM-NC. The standardized system saves a lot of time and costs and considerably reduces the time it takes us to respond to our customers. We are now able to manufacture the LEANTOOL tools in approximately 2/3 of the time it used to take us and setup now takes only 2 to 3 hours compared to the previous 8 to 10 hours. What is more, depending on the parts requirements, our LEANTOOL tools are now between 40 and 60 percent more economical than in the past. By using between 50 and 60 percent standardized and standard parts, we avoid the need for many components that we used to have to manufacture individually."

READY FOR THE FUTURE?



Smart home solutions are an important market of the future for Vimar SpA, one of the world's leading manufacturers of lighting, ventilation and air conditioning technology.

SMART HOME





With four Bihler GRM-NC and RM-NC servo stamping and forming machines, Vimar SpA, a company based in the Italian town of Marostica, has completed its shift to the world of NC technology and is ushering in a new era in its manufacturing activities. Using the new systems, Vimar can practically double its productivity, halve its setup times and, in combination with the LEANTOOL system, achieve an even shorter time-to-market. A key factor in the company's success is the extension of the skills of Vimar's employees through training and other development activities at Bihler's premises in Halblech.

ACTIVELY INVEST IN NEW TECHNOLOGIES

With their new GRM-NC and RM-NC machines, Vimar is making a major technological step forward and is thus safeguarding the future success of the company.





Anyone who flicks one of the 20,000 or so switches for air conditioning, lighting and ventilation that are present on a modern cruise liner can be fairly sure that the part itself and the underlying technology come from Vimar SpA, a company headquartered in the Italian town of Marostica, a good 50 km north-west of Venice. The town is home to the head office of the company, which was founded in 1945 and now has a workforce of approximately 1,300 employees who produce 183 million parts every year and which markets some 12,000 products in more than 100 countries. The global market leader's product portfolio includes relatively simple sockets and plugs as well as complex, digital home

wiring systems and modern smart-home solutions. A key component in Vimar's decades of success is the unique combination of the exceptionally high quality of its parts and the outstanding design of the end products. Equally crucial in the company's success is the fact that it has always been able to manufacture extremely efficiently and economically. That is why, even in its early days, Vimar chose to work with Otto Bihler Maschinenfabrik. "When Bihler's technology was launched on the market at the end of the 1960s, our fathers, who were the Managing Directors at the time, immediately recognized its enormous potential for Vimar," recall the current Managing Directors Piero Camillo Gusi and



Deciding on the path to the future at Vimar's headquarters: Bihler representative Efisio Carutti, Mathias Bihler, Vimar Managing Director Piero Camillo Gusi, Industrial Operations Director Sandro Bernardi and Vimar Managing Director Gualtiero Viaro (from left to right).

Gualtiero Viaro. "The innovative mechanical design of the Bihler stamping and bending machines allowed us to make a genuine technological leap and manufacture considerably faster, more economically and in better quality than had previously been possible." The first step on this path took place in 1974 with a Bihler RM-35, which is still operating today. The same applies to the nearly forty other Bihler systems that have subsequently been delivered to Vimar.

The next technological leap And now, exactly 45 years after acquiring its first Bihler system, Vimar is making its next technological leap – this time in the form of

two Bihler RM-NC and two GRM-NC stamping and forming machines. The investment represents a deliberate choice through which the company is actively orienting itself toward changing customer requirements: "The market is demanding ever more products and model variants. This requires not just higher productivity but also shorter time-to-market," explains Sandro Bernardi, Industrial Operations Director at Vimar. "The new systems offer us precisely that extra flexibility, efficiency and speed that we need to achieve this. That is why these systems are even now an important part of our future market strategy." This approach is complemented by the fact that, in future, Vimar will use the Bihler LeanTool system for its toolmaking activities. "This system not only permits particularly economical, simple toolmaking, but also makes the process exceptionally fast," stresses Mathias Bihler.

Industry 4.0 The four NC systems arrived at Vimar in October 2018. After the first tools had been adapted, it was possible to achieve enormous increases in productivity: "We were practically able to double our productivity in



With twice the performance and half the setup times, the new Bihler systems provide Vimar with exactly the boost in efficiency that the world's market leader needs in order to achieve even shorter times-to-market.



terms of throughput per hour. And as far as setup times are concerned, we expect that they will take less than half the time than in the past," says Sandro Bernardi. "Last year, we also started to implement the Industry 4.0 principle in our company," reports Piero Camilio Gusi. "And from this perspective, the Bihler systems are again the best solution for us." Already today, this strategy has found concrete expression in the MES system and the LCD displays next to the machine systems. These displays continuously indicate the number of parts already produced and the actual and target values for the current manufacturing cycle.

Heart and soul

All this means that the new NC systems are a genuine success story for Vimar. However, the story is still missing one more, absolutely vital ingredient: the people who work at the systems. They not only have to be perfectly familiar with the new stamping and bending machines but also with the whole field of NC technology. In Vimar's case, the training provided by Bihler in Halblech made sure that five employees were able to acquire detailed

NC skills in just a very short time. Bernardi makes things clear: "The training in the new NC technology received by our employees was a decisive reason for the investment and their skills and knowledge give us a great advantage." "We have assigned relatively young employees to the new systems and the NC technology. They naturally find it much easier to get to grips with the new digitalized world." Ultimately, the new generation of Bihler NC systems acts like a magnet for the young employees. "They are heart and soul in favor of the new systems. They fiddle around and experiment with them and discover all the possibilities that the technology has to offer."

A unique partnership

"The new systems are precisely configured to get the very most out of the machine through individual settings," confirms Mathias Bihler. "At the same time, we are naturally delighted to contribute our advice and support." This means: If, for example, the company is working on a new design, Bihler will provide an exact forecast of how long the associated development work



will take as well as of the ultimate machine cycle time. The energetic support provided by Bihler is an important factor in ensuring that Vimar is already able to achieve genuine competitive advantages using the new systems. However, it is also an expression and continuation of the close partnership that has united the two companies for nearly 50 years. "The close, partnership-based cooperation, both in past decades and now in connection with the introduction of the NC technology, deserves a special mention," stresses Mathias Bihler. "And we also greatly appreciate this close partnership and take this opportunity to thank Bihler most sincerely for this long and fruitful cooperation," is the unanimous opinion of Piero Camillo Gusi and Gualtiero Viaro. "With the NC systems, we have ushered in a new era and are looking forward to greeting the future together." ●



Vimar was founded on 1 May 1945 by Walter Viaro and Francesco Gusi and manufactures electrical products from sockets to smart home solutions. In electrical supplies for ships and pleasure boats, Vimar is world leader. With a total of 1,300 employees, the company sells around 12,000 products in over 100 countries.

www.vimar.com

DARE MORE INNOVATION!

The digital revolution is opening up enormous potential. However, making it a success will take a new measure of pioneering spirit and daring, as Prof. Dr. Andreas Knie explains in this interview.

What is the significance of digitalization for our future development?

Digitalization and artificial intelligence as a part of the digital scope run through every aspect of our modern world. Digitalization undermines that which already exists and much that we are now familiar with will simply disappear. However, digitalization is also opening up many avenues for innovation and allows us to do things better.

With it, for example, we can decentralize energy distribution and move over to one hundred percent renewables. It also allows us to reorganize demographic change and get to grips with the changeover to green transport, which will significantly reduce pollutant emissions, as well as with changing trends in agriculture that are promoting healthier and more sustainable products and raw materials. All this

means that digitalization can be seen as an industrial revolution such as we have not experienced in the last hundred years. It gives us the keys to the future and it is up to us to be proactive and seize the options and potentials present in these structures – and not to look at them through the prism of the present and anxiously turn our backs on them.

What is important in the development and implementation of new digital solutions?

It takes something that we in Germany no longer know

or have – and that is the trial-and-error culture. We must try things out and experiment much more, with more openness and a different type of cooperation. We need more pioneering spirit that allows us to dare to do new things, and sometimes to fail in them. Instead of that, we are ruled by strict regulations and a consolidated knowledge base. Of course, this system is undoubtedly highly nuanced, but it is not flexible and it tends to hinder us in our search for the new. In this way, we are held captive by our past successes, dependent on established process steps, with extreme security and every possible safeguard. We live in a no-risk society with fully comprehensive insurance cover and no-one dares take risks about anything any more. That is also the case because we have something that we want to keep. When all is said and done, we have reached the highest level of prosperity in human history, and we want to protect that. However, in my opinion, that is only possible if we trust in the new and give it a chance. ●

Prof. Dr. Andreas Knie

Andreas Knie was born in 1960 in Siegen and, since 1996, has been professor of sociology at Berlin Technical University where he specializes in the fields of transport research, technology and science policy and innovation research. Since 2017, he has also headed the Science Policy research group at the Berlin Social Science Center (WZB). Since 2018, he has also been Chief Scientific Officer (CSO) at Choice GmbH. Before that, he was Managing Director at innoZ GmbH and authorized representative and departmental head at Deutsche Bahn AG.





LIKE A SWORD OF



DAMOCLES

The growth of e-mobility and the production of the corresponding vehicles is confronting the entire automotive industry with new challenges. In this interview, Dr. Michael Macht explains the background to this change and how OEMs can best react to it.

What does the growth of e-mobility mean for the industry?

The growth of e-mobility has far-reaching consequences for manufacturers, OEMs and suppliers. Ultimately, legislators have set a CO₂ emissions limit of 95 g/km, which will have to be adhered to as early as 2020. This means that the major manufacturers will have to add a correspondingly large number of electric and hybrid vehicles to their fleets. This is resulting in enormous pressure to bring vehicles of this type into the network right away. Anyone who doesn't respect the CO₂ emissions limit risks being hit by heavy fines. As a result, the CO₂ emissions limit and e-mobility are hanging like a Sword of Damocles over OEMs and suppliers.

What are the challenges for OEMs and suppliers in the field of manufacturing technology?

The drive, the battery and the power supply are the basic components of an e-vehicle. At the technical level, it is already possible to produce these. Despite this, when compared to conventional vehicles, technology in the field of e-mobility is still at the very beginning of its development.

Nevertheless, OEMs and suppliers have to deliver high-precision parts and components that are absolutely reproducible and meet the demands that go with readiness for series production. What is more, the range of variants will increase greatly in the future and the enormous number of required parts will grow even further.

On top: At present, how would you advise a conventional supplier to approach things?

In my opinion, anyone who has used Bihler systems for their production operations in the past is well equipped for the future. This is because Bihler's machines are perfect for manufacturing the stamped and bended parts, components and complete assembly groups that are vital components in electric engines. Bihler supplies the technology and systems necessary for the high-precision manufacture of these parts in enormous quantities and with short throughput times. And looking at the demand side, the number of parts that are no longer needed will be considerably smaller than the new volume that is added. At the same time, it is very important

to recognize the direction in which e-mobility is continuing to develop at the purely technical level. It is therefore vitally important to have the right equipment in order to be ready to manufacture high-precision functional modules for the world of e-mobility. ●



Dr. Michael Macht

Is a qualified mechanical engineer who was born in Stuttgart in 1960. In 1994, he became Managing Director of Porsche Consulting GmbH. In 2009, he was appointed chairman of the management board of Porsche AG and a board member at Holding Porsche SE. From 2010 to 2014, he served as the board member responsible for Group Production at Volkswagen AG. Currently, Michael Macht works for Linde & Wiemann SE, Endurance Capital AG as well as for the Weichai Group and Kion Group AG.

POWER FOR

The huge increase in demand for electric and hybrid vehicles in the future will require new precision parts for drives, batteries and power supplies. Even now, Bihler already offers the platforms and technologies needed for the industrial, automated, economical manufacture of core components such as hairpins, busbars, high-voltage connectors, cell and module connectors and power distributors for stators.

The growth of e-mobility offers enormous business potential. At the same time, however, it is also confronting conventional OEMs and suppliers with new challenges. For Otto Bihler Maschinenfabrik, which has been intensively researching and developing the new technology for many years, this change is of crucial importance. Moreover, since the start of the year, a Bihler Key Account Manager, Martin Lehmann, has been concentrating exclusively on the subject of e-mobility. Because one thing is clear: the advent of e-mobility is inevitable and the demand for the corresponding vehicle parts will very soon skyrocket. That is why it is crucial for OEMs and suppliers to look to the future and invest in suitable manufacturing systems for e-mobility components right now.

Modular and flexible And it is precisely to meet these requirements that Bihler is already offering forward-looking automation solutions in the form of its BIMERIC servo production and assembly system and the GRM-NC servo stamping and forming machine. These have not only proven

to be outstandingly effective in practical applications for several years but are also perfectly suited to the production of the new components needed for e-mobility. "The advantage of the BIMERIC concept lies in the fact that it is designed as a modular system in which all the process steps can be seamlessly integrated," emphasizes Lehmann. "It means that we can respond flexibly to all inquiries relating to the e-mobility field and configure systems designed to meet specific customer requirements."

Above-average throughput speeds Customer inquiries can relate to very different areas of e-mobility. These include components of the drive, the power supply and the battery.

In the drive field, the focus is placed on the manufacture of the so-called hairpins. In a BIMERIC, these can be manufactured in unsurpassed parts numbers of up to 120 units per minute. The BIMERIC also offers unique performance for the manufacture of busbars – fully automated with high throughput rates of up to 60 parts per minute. At the same time, the BIMERIC is also the optimum solution for hybrid components made from metal and plastic. Thus, for example, power distributors for stators, interconnections between assemblies, cell connectors and JV plugs can be manufactured in a single production process. The production of the metal parts, the insertion of the plastic parts, and final assembly are all performed at above-average speed. By contrast, the GRM-NC provides the perfect manufacturing capabilities for individual stamped and bended parts. This is because it can be used for high-precision, fast and economical production, for example, of shielding sleeves and smaller busbars.

Martin Lehmann

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E-MOBILITY

BIHLER
e-mobility



Busbars



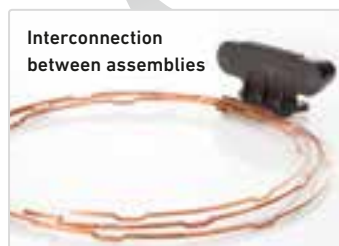
HV connector



The battery, motor and drive are the key components of an electric vehicle. Many of the required components can now be manufactured fully automatically on Bihler systems.



Hairpin



Interconnection
between assemblies



Cell connector

Faster to market “Standardized components and tools with a high percentage of standard parts are used in both the BIMERIC and the GRM-NC. While keeping engineering and tool costs down, these also guarantee very short setup times and correspondingly rapid times-to-market.” This means that OEMs and suppliers are optimally prepared to manufacture the parts that will be needed for the devel-

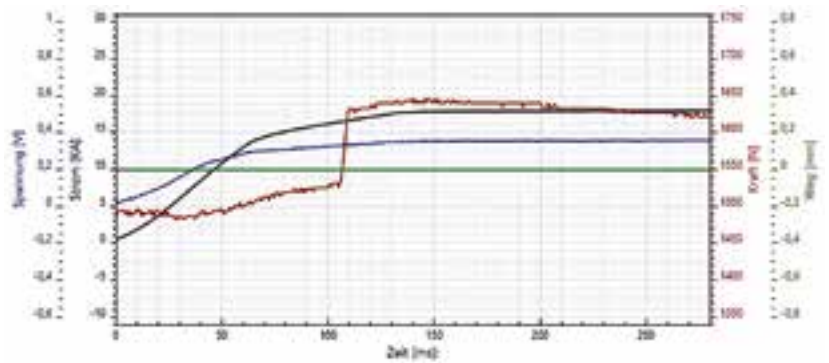
opment of e-mobility in the future. Lehmann makes things perfectly clear: “Those companies that have the right production equipment ready to hand as quickly as possible and can manufacture sample parts swiftly will enjoy a significant advantage. And we naturally provide comprehensive support and service from the first inquiry concerning the system right through to production.” ●

OPTIMUM RELIABILITY, OUTSTANDING PRECISION

As a unique system anywhere in the world, the B 20K welding control system opens up new dimensions, in particular in the field of resistance welding. This is due to the active power supply module, which provides reliable protection against power fluctuations, as well as the new NC linear actuator which now welds the strip and contact material to each other in one precisely controllable linear movement.



The B 20K's active power supply module reliably protects the welding system against power supply fluctuations, for example those caused by the operation of other large energy consumers. To do this, the internal supply voltage is first increased and then reduced again to the precise value required.



The B 20K welding control system has been available since the middle of 2018 and has been warmly welcomed by users thanks to its many unparalleled features and functions. These include, for example, the five measurement channels that are integrated as standard. These capture, analyze and monitor all the relevant parameters and also, as of now, determine the resistance profile during welding. Another impressive feature lies in the fact that in the B 20K, a single inverter provides all the required power values from 70 to 220 kilovolt-amperes. As a result, time-consuming conversion or replacement operations are no longer needed. At the same time, the B 20K excels in practice through its outstanding ergonomics, ease of navigation and compact screen information.

Reliable and economical The B 20K's active power supply module is particularly valuable. This patented mechanism securely and reliably protects the system against power fluctuations. As a result, short-term drops in the mains power supply of just a few milliseconds due to other high energy consumers no longer have any effect on the welding process. This is achieved by raising the internal supply voltage at the start of the welding process and then lowering it again in a linear fashion until it reaches the required level. The increased supply voltage is stored in the buffer capacitor. Like a battery, this buffer then outputs the power needed for welding, which therefore no longer has to be drawn from the electricity from the mains power supply. As a result, this reduces the short-term current load during welding by approximately 50 percent – another benefit of the active power supply module. At the same time, the recharging of the buffer capacity extends the current consumption time to approximately twice the welding time.

Integrated current conduction and extended process control With the patented NC linear actuator, it has also been possible to develop another unique innovation for the B 20K. The actuator is a controllable unit that now welds the strip to the contact material in a linear movement. At the same time, the force it applies can be precisely controlled throughout the entire welding process. In this way, the NC linear actuator complements the B 20K's

conventional welding electrode – and therefore also the previous motion profile of the electrodes, which traveled along an arc trajectory around a center of motion. The current conduction mechanism is integrated in the actuator and is directly connected to the transformer. This combination has a partially flexible design in order to permit repositioning during the welding process. As a result, the force of the welding current, which normally presses the electrode arms away from one another, is applied inside the actuator and therefore no longer has any impact on the welding force. The control of the linear motors is also influenced by the arrangement of the conductors and not by the magnetic force of the welding current. Thanks to the possibility of controlling the linear actuator, the closing movement and force can be set precisely and reproducibly. Another important advantage lies in the fact that the force can be precisely increased and reduced during welding in a way that is synchronized with the welding profile. This permits extended process control. The design of the actuator is rounded off by the presence of additional NC axes for feeding the welding material, cutting it and transporting the contacts. As a result, a fully-featured, NC-based control mechanism is available as of now and makes possible new welding applications by offering unparalleled precision and perfect handling. ●



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The new NC linear actuator now makes it possible to weld the strip and contact material together in a precisely controllable linear movement. In addition, the welding current no longer has any impact on the welding force.

THE NEW

With the new BZ2-S8, Otto Bihler Maschinenfabrik is presenting the latest generation of its proven series of processing centers. Many of the system's innovative features help take conventional disk cam technology to new performance heights – with increased production speeds and reduced maintenance costs.

Conventional disk cam technology continues to offer outstanding advantages in the stamping and bending field and is consistently further developed at Otto Bihler Maschinenfabrik. One current example is the new processing center, the BZ2-S8. This embodies the latest generation of the proven series of manufacturing systems and offers numerous new features and functions. As a result, the BZ2-S8 is now able to achieve production speeds of up to 700 rpm. This is also possible thanks to the machine's completely redesigned drive. Thus, compared to the predecessor model, the processing center no longer has a frequency-regulated three-phase motor but is instead driven exclusively by servomotors. The slide units have also been adapted to the high speeds and are now considerably more robust than before. The BZ2-S8 is again operated and controlled using the VC 1 controller.

No oil leakage Another highlight of the new BZ2-S8 is the innovative circulating lubrication system with oil return mechanism. This is a closed, encapsulated system that replaces the previous loss lubrication system via a central lubrication system at the slide units and presses. Consequently, oil-dripping parts and slides are now



BZ2-S8



a thing of the past because the units connected to the circulating lubrication system are now lubricated as if they were part of a circuit. The oil is then collected again and fed into the tank. Because the circulating oil system does not generally need to be refilled, the previously high level of oil consumption is dramatically reduced. As a result, the new BZ2-S8 is not only cleaner during operation but is also more economical and environmentally friendly. The 30-t and 10-t presses have also been connected to the circulating lubrication system and now operate with no oil leakage. In addition, the braking angles have also been considerably reduced. As a result, the machine does not continue running for so long after a malfunction. This reduces the risk of tool damage.

Open concept Existing BZ 2 tools can also be used at the new BZ2-S8 with only relatively minor modifications. The open machine concept also guarantees easy access for fast simple tool setup and maintenance work. In addition, it is also an easy task to integrate further manufacturing processes such as thread cutting, welding, screw insertion and other stations in the system. In total, eight drive positions are arranged one after the other on both the upper and lower drive level on the two processing faces of the BZ2-S8, and the machine therefore has 32 drive positions. The fact that the two faces are absolutely identical permits the linear arrangement of all the units and process equipment both on the front and at the back plane. The system has a modular structure and can therefore naturally be flexibly equipped and is supplied configured by Bihler to meet individual customer requirements. Overall, all these advantages make the BZ2-S8 a genuine high-performance cam-based machine. For all users, it opens up hitherto unknown dimensions in terms of production performance, flexibility, process reliability and manufacturing quality – and is therefore also able to compete with any progressive processing technology. The new BZ2-S8 will be available in a series-ready version as of the middle of 2020. ●

The BZ2-S8 consists of a basic machine body as well as the two upright processing faces. Up to eight drive positions can be arranged one after the other along the system. The fact that the two faces are absolutely identical permits the linear arrangement of all the units and process equipment both on the front and at the back plane. The system can be flexibly equipped and is supplied configured by Bihler to meet individual customer requirements. The BZ2-S8 is operated and controlled easily and securely using the VariControl VC 1 controller.

1 Encapsulated slide units (connected to the central circulating lubrication system, including cooling)

The slide units have a nominal forming capacity of maximum 50 kN and a maximum stroke of 10 mm. All the units have been adapted to the high speeds and are now **considerably more robust** than in the predecessor model. Like the press, the units are also connected to the new, central circulating lubrication system, which includes cooling.

2 Increased tool space (plus 140 mm)

The open machine concept and the **increased workspace**, which has been enlarged by 140 mm, are further advantages of the new BZ2-S8 processing center. They guarantee fast, simple changeover and maintenance of the tools. In addition, it is also an easy task to integrate further manufacturing processing units in the system. The BZ2-S8 is operated and controlled easily and securely using the VariControl VC 1 controller.

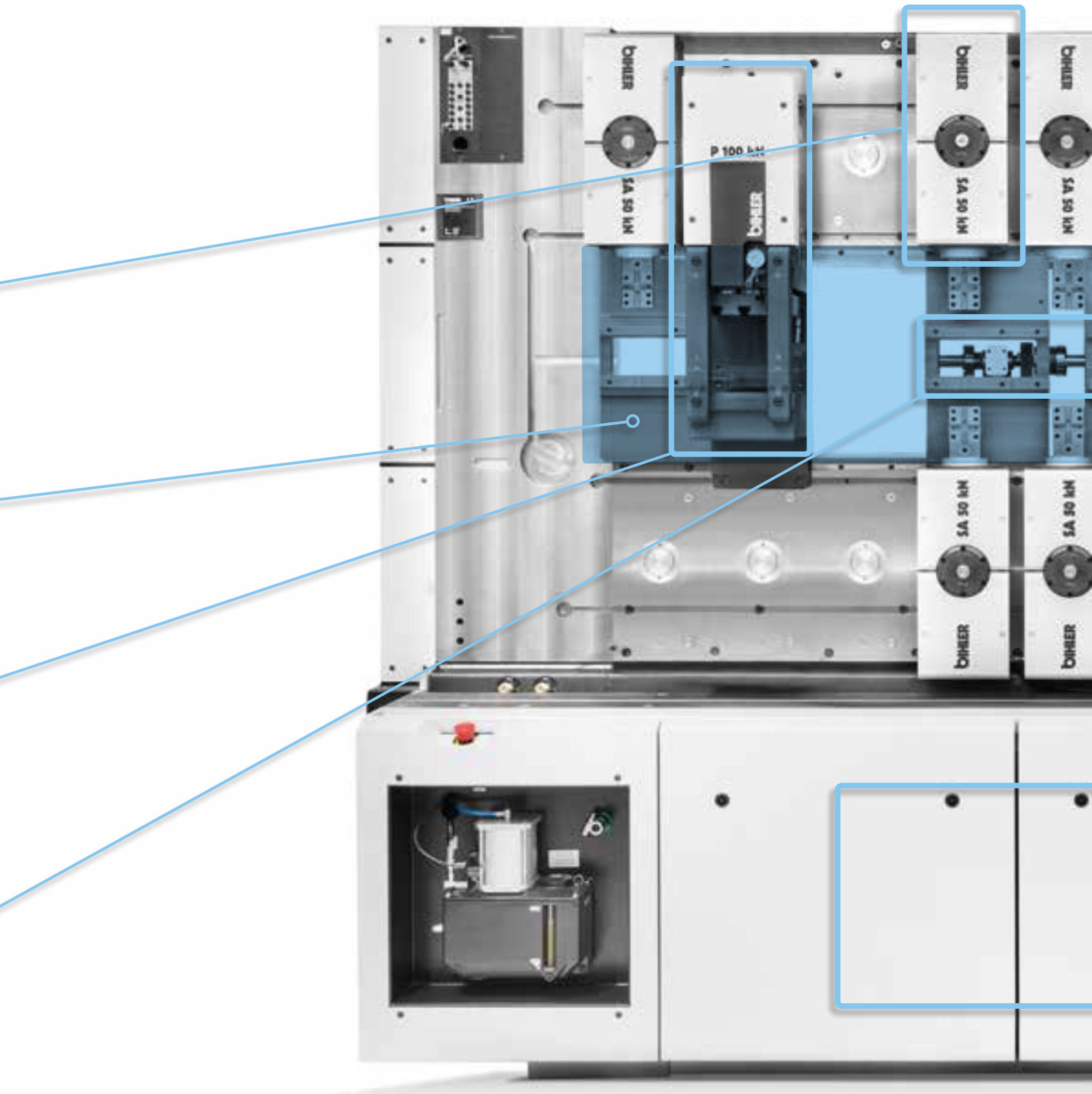
3 Encapsulated 100 kN eccentric press (connected to the central circulating lubrication system, including cooling)

The Bihler eccentric press in the BZ2-S8 provides a **nominal stamping force of 100 kN**. This means that practically all forming and stamping operations can be performed precisely and powerfully. Highlight: The Bihler press is encapsulated and connected to the new, central circulating lubrication system.

4 Central die with direct servo drive

The central die in the BZ2-S8 processing center is equipped **with a direct servo drive** that runs absolutely quietly, even at high speeds. In terms of production performance, flexibility, process reliability and manufacturing quality, the BZ2-S8 can compete with any progressive processing technology.

FASTER, MORE FLEXIBLE



AND MORE EFFICIENT



5 Encapsulated 300 kN eccentric press (connected to the central circulating lubrication system, including cooling)

The Bihler eccentric press in the BZ2-S8 provides a **nominal stamping force of 300 kN**. This means that practically all forming and stamping operations can be performed precisely and powerfully. Highlight: The Bihler press is encapsulated and also connected to the new, central circulating lubrication system.

6 Highly dynamic material feed

The **servo-controlled RZV 2.1 radial gripper feed** boasts high feed speeds and excellent positioning accuracy. The multiple clamping system ensures gentle handling of strip and wire material.

7 Two servo drives

The two servo drives in the BZ2-S8 ensure increased production speeds with continuously variable stroke rates from **5** through **700 rpm**. Thanks to the servo drives, the braking angles have now also been considerably reduced, and the machine only continues to run for a short time in the event of a malfunction. This also reduces the risk of tool damage.

8 Cooling system / circulating lubrication (maintenance-free cooling without oil loss)

One of the highlights of the new BZ2-S8 processing center: The **circulating lubrication system** and the **cooling mechanism**, which are designed as closed, encapsulated systems and replace the previous central lubrication system. As a result, all the units are lubricated as if they were in a circuit and the oil is then collected again and fed into the tank. Because the circulating oil system does not generally need to be refilled, the previously high level of oil consumption is dramatically reduced. As a result, the new BZ2-S8 is not only cleaner during operation but is also extremely economical and environmentally friendly.



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“MECHANICAL ENGINEERING AT ITS BEST”

KOSTAL Kontakt Systeme GmbH is the very first company to use the new BZ2-S8. Working at unparalleled speeds, it not only provides the power and performance that are decisive during the manufacture of automotive plug connectors. More than that, it guarantees the zero-error quality that is the standard in the automotive industry.

If you bear in mind that a modern mid-range vehicle contains more than 2,000 electrical connection points then one thing becomes clear: Contact systems constitute a multi-billion parts market with high quality demands. In a modern car equipped with the latest safety solutions and highly demanding technologies, top-quality plug connections play a decisive role.

It is for precisely this reason that zero-error quality is of central importance to the Lüdenscheid-based KOSTAL Kontakt Systeme GmbH. The company is part of the Kostal Group, which was founded in 1912, and has been manufacturing top-quality contact parts on various Bihler BZ 2 systems for many years.

“To manufacture economically despite year-on-year price erosion, we must focus clearly on identifying and exploiting potentials for improvement,” explains Dipl.-Ing. Wolfgang Becker, Head of Production at Kostal Kontakt Systeme GmbH. “In the company of Bihler, we have been able to do this very well for many years and, with the new BZ2-S8, we will continue on this successful route in the future.” The use of this system will make another noteworthy improvement in performance achievable.



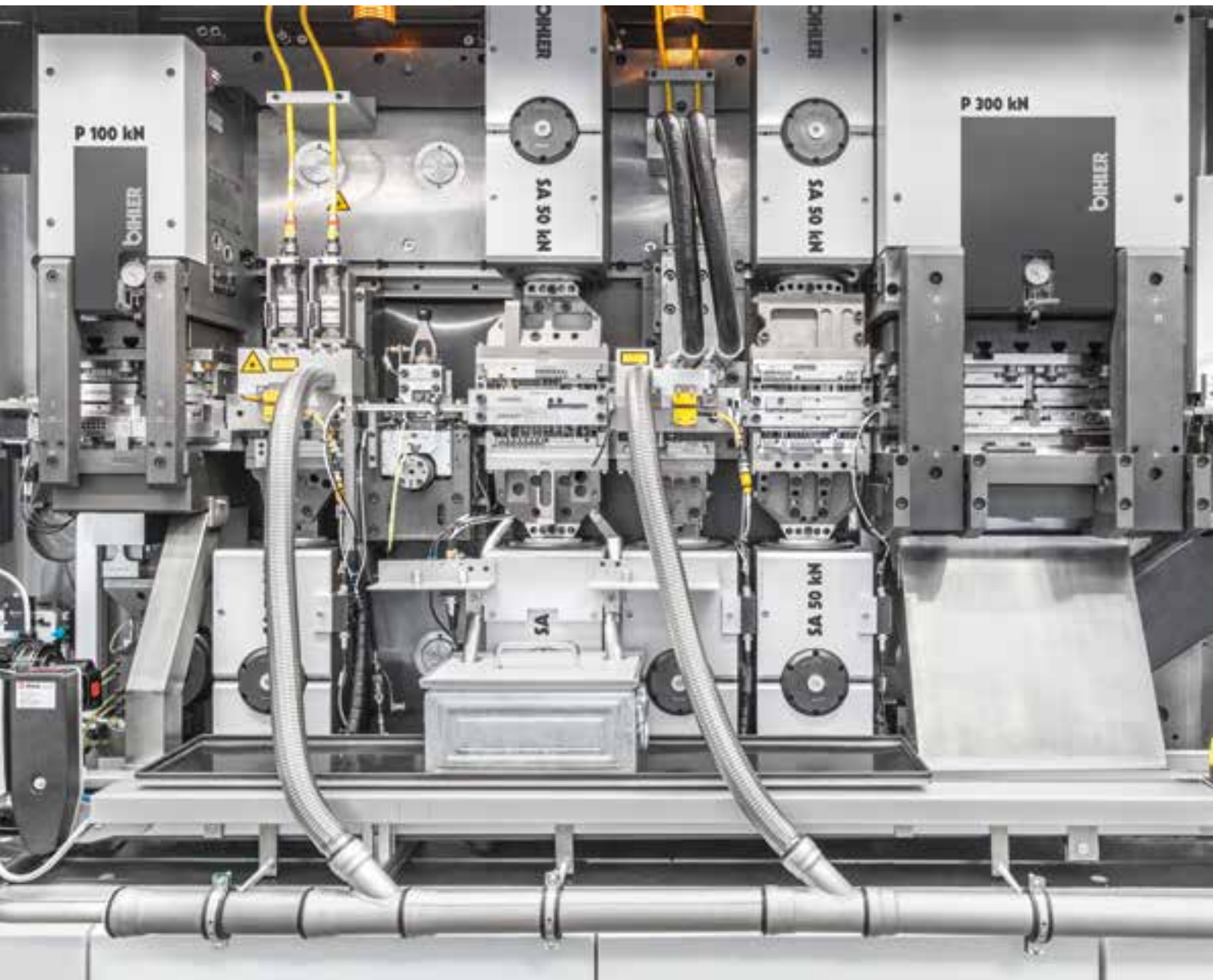
For Wolfgang Becker, Head of Production at KOSTAL Kontaktsysteme GmbH, the BZ2-S8 forms the basis for the high-quality production of contact parts.



Unique dual movement There are very definite reasons why KOSTAL opted for cam technology and Bihler: "Here, we have to manufacture a single part that is subject to very high quality requirements absolutely reproducibly and in quantities of hundreds of millions. In such cases, mechanical solutions still have a very clear advantage because the curve always has the same rising and falling gradient," explains Becker. "Unlike other vendors, only Bihler offers the possibility of manufacturing using a dual movement via the slide units. This makes it possible to implement a stable manufacturing process that requires synchronized machining on two levels. Because the drive units are uncou-

pled from one another, we are independent of speed, quite unlike the case of the central eccentric drive in progressive processing technology."

Open, quiet and clean However, the other new features of the BZ2-S8 were also of decisive importance for KOSTAL. Becker: "The new mass balancing systems are extremely effective and ensure absolutely quiet running even at high speeds." In addition, by using a fully encapsulated system, the processing center completely eliminates the loads that result from an open lubrication system. Even though the further development of the drive system required





With the new BZ2-S8, KOSTAL can not only achieve a significant performance boost but can also continue to maintain its nonconformity rate of 0 ppm.

considerable modifications to the structure of the machine, it was nevertheless possible to ensure tool adaptability. Consequently, the existing tools can still be used.

All-round reliability At the same time, the new BZ2-S8 also meets the demanding requirements in terms of operating reliability that are of such importance for KOSTAL during the manufacture of plug connectors. "The worm shafts in the system are also mechanically coupled via bevel gears," explains Becker.

This means: If a stepping motor, whether at the top or bottom, loses a pulse, the movements continue to be synchronized at all times.

Another new feature takes the form of the camera systems that ensure a 100-percent quality check of every component to an accuracy of a hundredth of a millimeter. Becker is certain: "In this way we can continue to maintain our nonconformity rate of 0 ppm, which we have now achieved uninterrupted for the last ten years, well into the future."

With its central drive units, which are uncoupled from one another, the new BZ2-S8 operates independently of speed. Thanks to the slide units, it is also possible to use a dual movement approach when manufacturing.

A genuine leap in performance At KOSTAL, the new BZ2-S8 is complemented by the company's established traceability system. In this system, an integrated laser labels each part with a code that contains all the production and material data. Overall, with the new BZ2-S8, KOSTAL possesses an individually configured high-performance system that can go head-to-head with any existing progressive processing technology. Summing up, Becker says, "Thanks to its outstanding mechanical design, the BZ2-S8 provides a robust basis for high-quality mass production. We are convinced that with the new system, we can achieve the next genuine leap in performance." ●

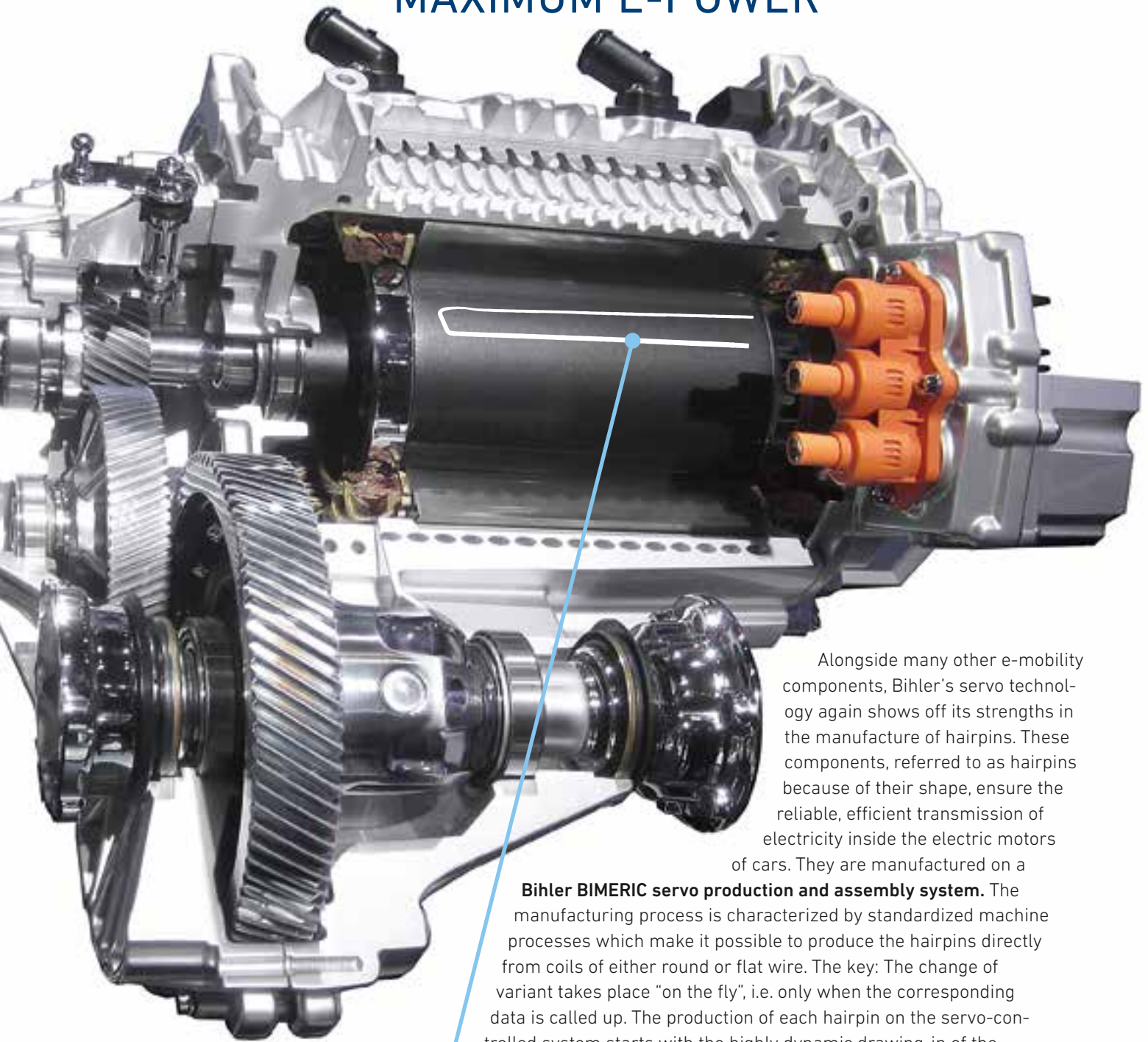
KOSTAL

KOSTAL Kontakt Systeme GmbH's core business lies in the development, production and marketing of plug connector systems for the automotive industry. Lüdenscheid-based KOSTAL Kontakt Systeme GmbH is part of the KOSTAL Group, which was founded in 1912 and, as an internationally active, family-owned company, numbers all the world's leading automotive firms among its customers. It is present at nine locations in eight countries and has a workforce of more than 1,400 employees.

www.kostal-kontakt-systeme.com



MAXIMUM E-POWER



Alongside many other e-mobility components, Bihler's servo technology again shows off its strengths in the manufacture of hairpins. These components, referred to as hairpins because of their shape, ensure the reliable, efficient transmission of electricity inside the electric motors of cars. They are manufactured on a

Bihler BIMERIC servo production and assembly system. The manufacturing process is characterized by standardized machine processes which make it possible to produce the hairpins directly from coils of either round or flat wire. The key: The change of variant takes place "on the fly", i.e. only when the corresponding data is called up. The production of each hairpin on the servo-controlled system starts with the highly dynamic drawing-in of the wire, which is then cut. After this, the isolating lacquer is removed mechanically under NC control while, at the same time, the pin ends are chamfered and the preliminary and 3D die-bending of the component is performed. The manufacturing process concludes with the final measurement of the component geometry and inline adjustment and the output from the process ranges from 60 to 120 high-precision hairpins per minute depending on the variant. ●



RELIABLE LOADING

In charging plugs, shielding sleeves protect conductive or surrounding components against electrical and/or magnetic fields. In this way, they ensure the reliable and trouble-free functioning of the plugs, in particular when high charging currents are used as is necessary, for example, when charging electric vehicles. These safety-related components are manufactured on a **GRM-NC stamping and forming machine using the modular LEANTOOL progressive tool**. In this way, these delicate components can be manufactured to a high level of precision and with a throughput of 170 shielding sleeves per minute. The economical, highly standardized LEANTOOL tool ensures extremely short implementation times and therefore also a very fast time-to-market. The changeover between variants is equally fast and all the required sleeve types can be manufactured extremely efficiently and are one hundred percent reproducible. ●





RELIABLE ENERGY SUPPLIERS

Sockets are becoming ever more important in every field of work and daily life. Ultimately, it is not only necessary to power conventional energy consumers such as lamps, vacuum cleaners or electric shavers, but also to constantly recharge all the more recent devices such as smartphones, notebooks and tablets. The employed sockets are highly complex components consisting of many individual parts. These include, for example, the base plate, the connecting terminals, the casing, screws and plug contacts. All these parts must be manufactured and assembled to a high level of precision, not least in order to be able to reliably guarantee the safety of the electrical circuit.

The socket pictured here, which is designed for concealed installation, is manufactured on a **Bihler BIMERIC servo production and assembly system**. The system is perfectly configured to manufacture

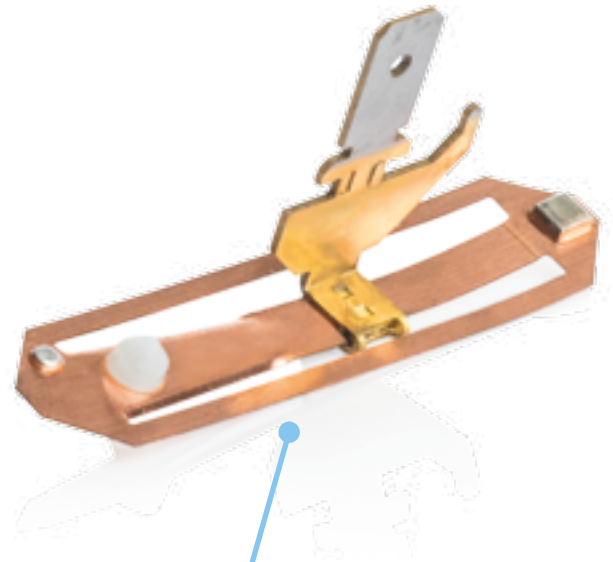
this complex assembly in full in one end-to-end operating process. During this process, all the individual components are not only machined precisely and efficiently but, at the same time, are also assembled to form the finished final product. The Bihler BIMERIC servo production and assembly system ensures maximum process stability and reliability during the operation.

The complete system is intuitively controlled using the VariControl controller. ●



OPTIMUM CONTROL

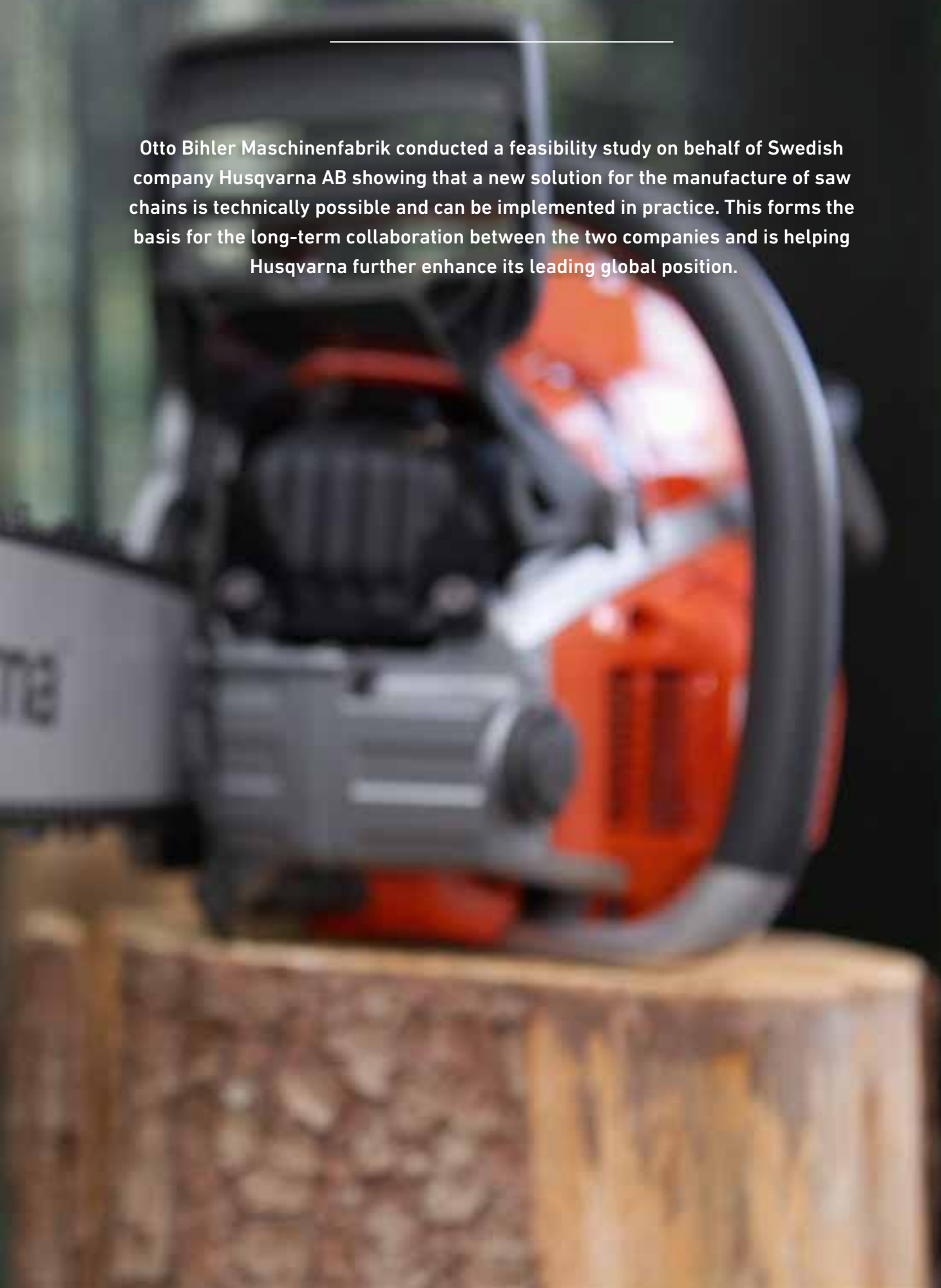
Starting a washing machine sets a complex process in motion that involves a wide variety of components. One of the key components is the pressure switch. Its kickover spring contact controls the water level in the drum and ensures that the water is warm at the right time. To do this, the pressure switch opens and closes circuits that switch a solenoid valve and the heating element on or off. Production of the kickover contacts involves forming, welding, riveting, feeding and assembling. In practice, the entire process is carried out by **Bihler's BIMERIC servo production and assembly system**. It manufactures the complex assembly at 100 to 120 parts per minute at a single station, with the machine and the process being controlled from a central unit. The five welding points are also controlled and monitored by a central welding controller. Additional reliability and 100 percent component quality are ensured by integrated test stations and seamless process monitoring. At the same time, the system boasts optimum accessibility and short changeover and setup times. ●



“WORLD-CLASS”



Otto Bihler Maschinenfabrik conducted a feasibility study on behalf of Swedish company Husqvarna AB showing that a new solution for the manufacture of saw chains is technically possible and can be implemented in practice. This forms the basis for the long-term collaboration between the two companies and is helping Husqvarna further enhance its leading global position.



**The latest generation of chain technology:
The saw chain for chain saws consists of
the most different components, which have
to be merged in a 15-stage process.**



The company, which was founded in 1689, is one of the world's leading manufacturers of tools and equipment for forestry as well as for garden and landscape conservation. Husqvarna AB, together with the Gardena and Construction divisions, is part of the Husqvarna Group which has approximately 13,000 employees in 40 countries and markets its products in more than 100 countries.

www.husqvarna.com

Like very few other companies, Husqvarna in Sweden is able to look back on a history that spans the centuries. This tale started exactly 330 years ago, in the year 1689 in what is now known as Huskvarna, with the manufacture of pistols and rifles, whose iron sights can still be seen in the company's logo today. Over the centuries, Husqvarna continuously extended its product portfolio and, for example, was already manufacturing motorcycles as early as 1905. During the last century, the company increasingly concentrated on garden and forestry tools. As a result of this approach, Husqvarna was able to launch the world's first chainsaw on the market in 1959. Another important innovation took the form of the first robot lawn mower, which was launched in 1995. This was recently joined by another global first: the all-wheel variant. "Always responding to the needs of the market and seizing new opportunities for success is in our blood," says Göran Rudén, Vice President Sourcing in the Husqvarna Division. "This approach is characterized by the stamina and perseverance with which we pursue our goals."

Partnerships that bring market leadership Nowadays, the Husqvarna Group, with its divisions Husqvarna, Gardena and Construction, is one of the world's leading manufacturers of work tools such as chainsaws, trimmers as well as ride-on and robot lawn mowers. At the same time, Husqvarna wants to continue to grow and become the unchallenged market leader for forestry and garden equipment in the coming years. The key components in this strategy are the forward-looking outlook on market developments, the patience and perseverance that characterize Husqvarna, and the consistent, focused development of new processes and technologies. "However, long-term strategic partnerships are also vital if we are to achieve the position of market leader," explains Rudén. "When choosing a partner, it is vital to us that the partner company offers outstanding quality and delivery capabilities, ensures acceptable price levels, and excels not only in terms of sustainability but, above all, innovative force."

The saw chain challenge In Otto Bihler Maschinenfabrik, Husqvarna found exactly the partner it was looking for – in the task of completely rethinking the manufacture of the most recent generation of chains for its chainsaws.

Rudén: "A saw chain is an extremely complex product to manufacture. The chain itself is comprised of many, tightly toleranced components and involves over a 15 step manufacturing process." The goal of the company was to develop a new production process that would reliably produce high quality in tolerance product at very high rate of productivity. "To achieve our goal, we not only had to take into account the high volume of millions of parts per year but also the challenge of handling a large variety of chain sizes and their varying components," explains Rudén. "That is why we turned to Bihler, who is a market leader in precision manufacturing technologies and innovative solutions."

Convincing innovative performance "This was no easy task for Bihler because it was necessary to develop a totally new concept. That is why, in 2016 Bihler was initially commissioned to undertake a feasibility study. The result: The desired manufacturing solution for saw chain production is technically possible and can also be implemented in practice. "It is a world-class process for a world-class product," says Rudén with no little pride. "The expertise of both companies has flowed into this solution and, for us, it represents the perfect balance between requirements and performance capabilities." Crucial to the success of the project was the close, intensive cooperation between the two companies which permitted the step-by-step development of the solution. Ultimately, saw chain manufacture demands an enormous amount of specialist knowledge that goes far beyond normal production expertise and is consequently not available on the market. Instead, it was necessary to step back and completely rethink the approach. Rudén sums things up as follows: "With this study, Bihler showed that it was qualified to undertake the project and that it is the right partner for us. It has the innovative force that we need in order to achieve our goal of securing market leadership." ●

**Positive tuning: Göran Rudén,
Vice President Sourcing
of the Husqvarna Division.
For further business
development, he relies
on partners with great
innovative strength.**



BIHLER



PROGRAMMED FOR HIGH PERFORMANCE

Since the end of 2018, Dreefs Schaltgeräte und -systeme GmbH has been using a BIMERIC to manufacture stamped and bended parts with silver contacts. Working together with his team, Managing Director Harald Müller programmed the NC units via the VC1 controller to enable the system to perform a possibly record-breaking 1,100 welds per minute – and save more than €100,000 worth of silver each year at the same time.



The profiles and start times of all the units are programmed in such a way that they run simultaneously to a certain extent. This allows particularly high manufacturing speeds to be achieved.

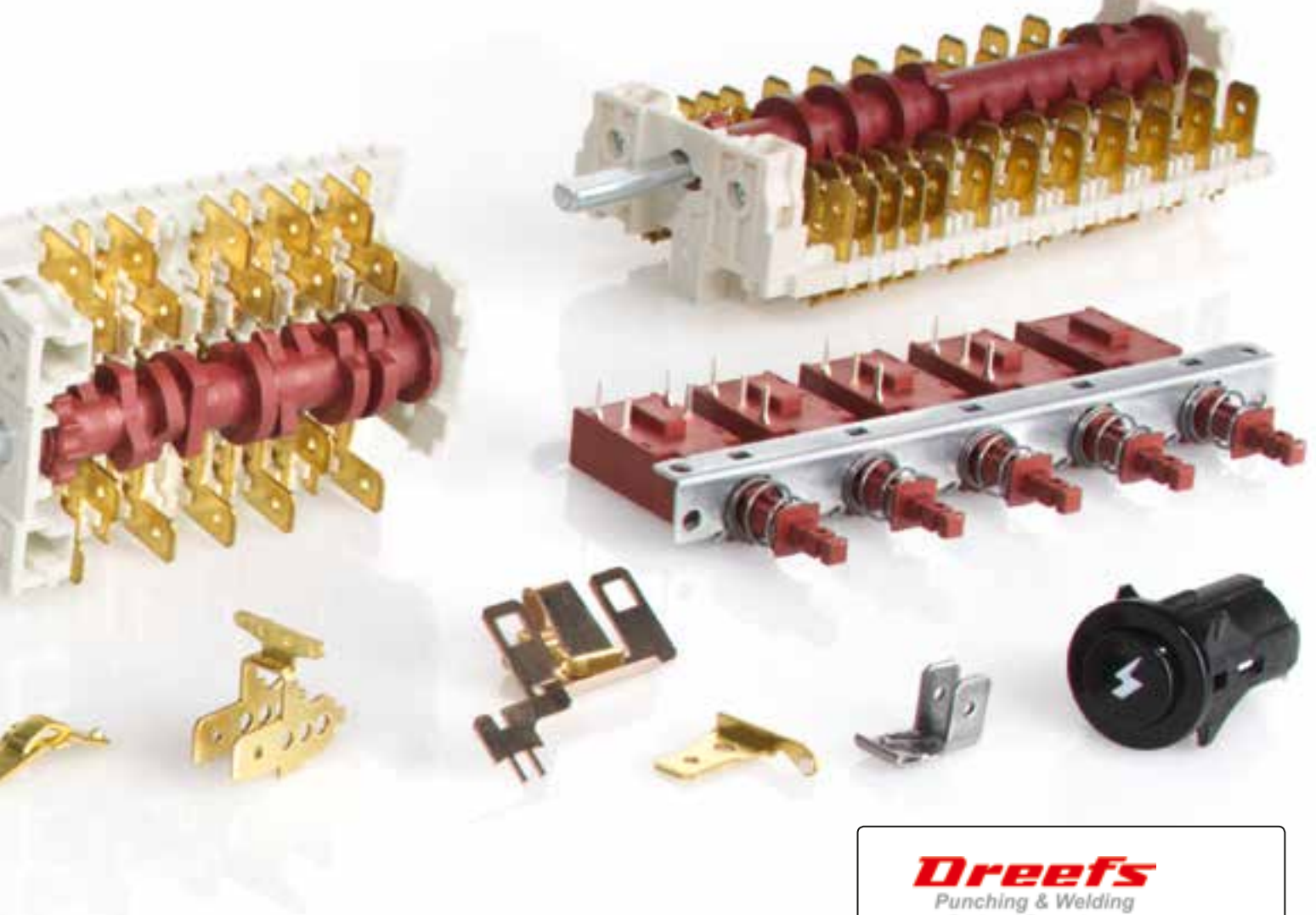


Dreefs Schaltgeräte und -systeme GmbH was founded in 1903 and has been part of the Italian Everel Group since 1998. The Group is one of the world's leading suppliers of electromechanical components for domestic electrical appliances, the automotive industry and the healthcare sector. The portfolio includes oven switches and ceramic cooktop regulators, as well as contacts for car door locks and blower switches. For all these components, for which final assembly is performed in Italy and Romania, Dreefs manufactures the necessary stamped and bended parts – approximately 440 million of them each year! For many years, the stamped and bended parts with welded silver contacts, in particular, were manufactured on five older punches and welding systems, of which four, however, were replaced in late 2018 by a Bihler BIMERIC BM 1500 servo production and assembly system.

In-house development work To manufacture the silver contacts, the new BIMERIC BM 1500 performs approximately 550 rotations and produces approximately 1,100 welds per minute – a potentially record-breaking speed that actually considerably exceeds the machine's normal capacity. However, this immense performance was made possible by the intensive extension and optimization work that Dreefs performed in-house at the system. "We

acquired only the machine body of the BIMERIC, the NC units and the feed mechanism. Everything was only loosely pre-assembled and we also developed the strip guide and positioning system for the electrode holders ourselves," recounts Dreefs' Managing Director, Harald Müller. "We then attended the Bihler training course on the VC 1 controller before programming this to meet our precise requirements."

Simultaneous movement The clear, easily traceable program structure of the VC 1 controller provided practically unlimited possibilities for this task. As a result, it was possible to program all the necessary travel profiles and, in particular, all the NC units in such a way that, compared to the usual horizontal time sequence of separate, successive operating steps, the individual process steps follow one another much more rapidly, and in some cases run in parallel. Thus, the welding electrode starts to close while the strip is still moving, thereby taking full advantage of this onset phase. These tuning measures, accomplished to an accuracy of milliseconds, not only brought about the desired increase in speed but also another advantage: "The optimized travel profiles also help reduce wear at the units," explains Müller with conviction. This is because the feed mechanism no longer has to work at full speed in order to be as fast as possible but is instead able to run more slowly



thanks to the improved timing. "Even at the highest speeds, the BIMERIC runs extremely quietly and stably."

Set up and save However, the enormous productivity achieved by programming the VC 1 controller was not the only reason for procuring the BIMERIC. "Another vital consideration was the fact that we can continue to use our 300 or so existing tools on the new system." At present, 60 tool sets are already in use at the BIMERIC. "We also benefit from the short setup times, which we have reduced from as much as twelve hours to just four hours today," continues Müller. Another vital factor was that the BIMERIC reduces the amount of silver required for the contacts each year by at least 20 percent, saving approximately €100,000, because it produces larger weld connections and thus permits smaller-sized silver contacts with no loss of functionality.

Fully-networked control At Dreefs, all the VC 1 controller data is used for process monitoring and the complete status of each manufacturing job is visible in real time in the EMS system. This capability dovetails perfectly with the Industry 4.0 principle which is consistently and coherently implemented at Dreefs and with which the new BIMERIC with its enhanced capacity utilization, efficiency and quality is fully compatible. ●

Dreefs
Punching & Welding
Center of Competence
member of **Everel**

The company, which was founded in 1903, manufactures electromechanical components for domestic electrical appliances, the automotive industry and the healthcare sector. Since 1996, Dreefs has been part of the Italian Everel Group. As one of the world's leading manufacturers, the Group, which has a workforce of 650 employees worldwide, produces approximately 100 million components at three production sites for the most highly reputed manufacturers of domestic appliances and the most important automotive groups.

www.everelgroup.com



“AN IMPORTANT PILOT PROJECT”

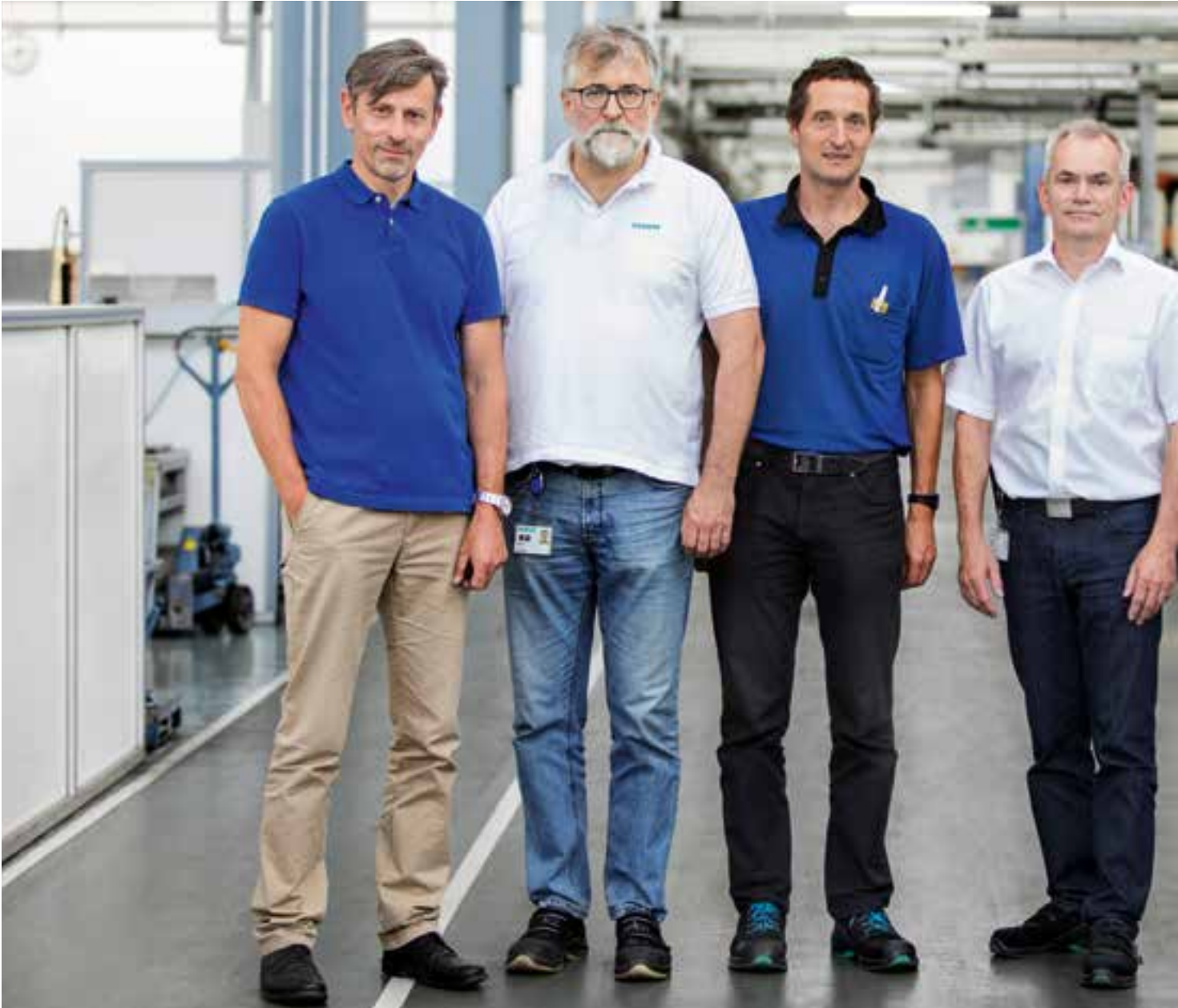
With a new Bihler welding and soldering line, Siemens AG in Amberg is boosting its production efficiency in the manufacture of protective contact pieces. At the heart of the servo-controlled system lies the B 20K welding controller with its new linear actuator.

Siemens Gerätewerk Amberg (GWA) was founded in 1949 and its portfolio includes, for example, circuit breakers and protective connectors for switching electrical current. The fixed and moving contact pieces with their silver contacts are important components of these products. The size S2 is designed for power ratings of up to 37 kW and 80 A. The dimensions of the contact pieces are therefore correspondingly large, with an edge length of 6.8 cm and a thickness of 1.85 mm. In the past, the S2 contact pieces were produced on a Bihler welding machine equipped with conventional electrode holders. “However, in terms of manufacturing technology, we are now at the limit of what we can achieve with this system, in particular with regard to the move-

ment of the electrode and the current intensities of up to 30 kiloamperes,” explains Heinz Speil, who is responsible for connection technology at Siemens. “At up to 300 kilograms, the forces at work in the system due to the magnetic field are enormous. They affect the entire system and can, for example, shift the positions of the axes.”

Equipped with the new linear actuator To get to grips with this issue and, more generally, to extend the existing capacity, Siemens will in future use a new Bihler welding and soldering line to manufacture its contact pieces. At the heart of this solution lies the B 20K welding controller with its new linear actuator. This ensures that the force gener-





ated by the welding current and the magnetic field does not have any impact on the welding process. Another advantage of the linear actuator lies in the fact that the linear movement of the welding head permits particularly fast repositioning, which also reduces the formation of spatter. However, the solution also includes other Siemens-specific features. These include a servo-controlled 50-tonne screw press and a new module for the optical positioning of the welding and wobbling stations at a strip that is now free from stresses. The solution also includes a thermal station developed by Bihler for the production of the surfaces of the silver contacts.

Twice as fast Overall, the new system provides any number of advantages: "The new linear welding module brings our manufacturing process the stability we need, in particular when running at full capacity," stresses design engineer and project manager Alfred Schnellinger. "At the

same time, we can manufacture the fixed contact pieces for the connectors twice as fast as before." Thanks to the active power supply module, the system is secured against mains power supply fluctuations caused by other large consumers. Another important advantage lies in the fact that the previous, time-consuming setup operations have been eliminated and the setup time has been reduced to just a quarter of the time required in the past. "The increase in productivity is of decisive importance for us and was one reason for the investment in the new welding line," explains Erwin Kohl, Group Head for Manufacturing and Engineering at Siemens. However, just as important are the possibilities for intelligent, digitalized process control that the new system offers. "The analysis of the NC data permits better process monitoring, including a more precise definition of the threshold separating conforming and nonconforming parts. In the future, the acquisition will pay for itself many times over and will also justify the investment costs for the system," continues Kohl



For production that matches customer demands Erwin Kohl, Group Head for Manufacturing and Engineering, Heinz Speil, Connection Technology, Heinz Wöllmer, Materials Technology, Alfred Schnellinger, Design Engineer, and Erich Utz, Connection Technology (from left to right).

Best in Class “We are delighted with the development work that Bihler has put into the new system,” says Kohl. “For us, the use of this system is an important pilot project and we also have confidence in the strength and expertise of Otto Bihler Maschinenfabrik.” And Siemens is well aware of Bihler’s skills because the two companies have been working together successfully since the early 1970s. “We are convinced that with this new system, we will be able to manufacture our contact pieces at best-in-class costs,” says Kohl. At the same time, the welding line is a forward-looking solution that is fully networkable and Cloud-capable in line with Industry 4.0 principles. As a result, its performance capabilities can be harmonized with those of other systems. This, in turn, guarantees optimum machine utilization. “At the same time, this allow us to be optimally prepared for the throughput rates demanded by our customers. In the future, this aspect, in combination with production efficiency, will play an ever more important role,” concludes Kohl. ●



SIEMENS

Siemens AG is one of the world’s largest electrical engineering and electronics companies. In Germany, this stock exchange-listed technology group possesses over 120 locations, including one in Amberg. This is the home to the Elektronikwerk Amberg electronics plant and the Gerätewerk Amberg equipment plant, which was founded in 1949. This latter factory manufactures products for low-voltage switching systems, which are primarily used in the mechanical engineering field.

www.siemens.de

VIRTUAL PLANNING AND COMMUNICATION

With new technologies such as virtual reality (VR) and augmented reality (AR), Otto Bihler Maschinenfabrik is ushering in a new era in the field of service and support. These functions, which will be presented for the first time at Blechexpo 2019, permit the complete simulation of processes and components, while also improving the support provided during production.



The new VR and AR headsets from Otto Bihler Maschinenfabrik will undoubtedly be one of the highlights of this year's Blechexpo. This is because with these innovations, Bihler is demonstrating nothing less than the future of service and support, which will become far faster, more transparent and more efficient as a result. Bihler's VR solution opens up completely new dimensions even before production operations start. This is because it permits the detailed virtual representation of entire systems and production lines. "In the future, this VR technology will support everything that involves processes that users need to have explained to them," explains Peter Bertling, Departmental Head for CAx Consulting & Sales. This makes one thing clear: Bihler's VR solution will bring about enormous added value for both sides. Comprehensive virtual information will create even



Bihler's VR technology is already opening up completely new dimensions even before production starts, for example as can be seen here in the virtual observation of a Bihler progressive tool.

greater transparency and reliability for users of Bihler technology.

Bihler's VR solution is based on the 3D engineering data that is available for every system in-house at Bihler. This data is converted into an interactive 3D model via a software platform that is installed at the customer's site and at Bihler. The visual depiction is then presented via the corresponding VR headset. In practical application, the real-time accompaniment by Bihler's experts then ensures that customers find the optimum solution quickly and reliably. In the future, this VR technology will also bring benefits to the field of training.

AR for live service

By contrast, in the future, Otto Bihler Maschinenfabrik will use AR solutions involving AR headsets specifically for its service activities, in order to provide customers with optimum support during the opera-

tion of their systems. This AR functionality will then replace the conventional on-site activities of service personnel. This is because problems can be solved more efficiently using AR headsets by means of video calls. Everything that the customer sees on-site can also be viewed in its entirety by the Bihler service employees and, because we are talking about AR here, can be enriched with additional information. The range of potential applications is a wide one. Alongside the elimination of problems at the systems themselves, the solution also permits the optimum identification of parts. The AR data headset is based on a preconfigured service platform that makes all the functionalities available in the form of an app. The AR headset is currently being tested for the Bihler service department and a range of documents are being prepared for it. AR-assisted service for customers is due to be introduced as of 2020. ●

NEW INLINE MEASUREMENT PROCESS

Within the framework of the “Efficient Production Technology” network (EffPro), the Kempten University of Applied Science and Otto Bihler Maschinenfabrik are developing a new optical measurement system for the inline monitoring of stamping and bending processes. This measures both the cut edges and the tool wear – without contact, online and in real time.

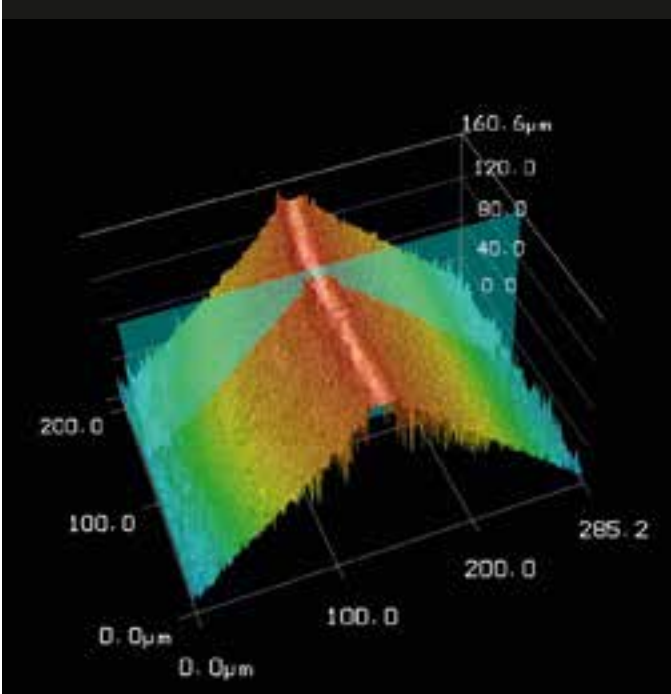
The aim of the “Efficient Production Technology” technology transfer center is to improve manufacturing processes, optimize production technologies and adapt relevant products to the demands of the marketplace. “Particular focus is being placed on competitive advantages, cost reductions, energy efficiency during production and minimizing resource consumption,” explains Project Manager Professor Dr.-Ing. Christian Donhauser from the Faculty of Mechanical Engineering at the Kempten University of Applied Science. One of the partner companies in the EffPro project is Otto Bihler Maschinenfabrik, which last year made a GRM-NC servo-controlled stamping and bending machine available

Prof. Dr.-Ing. Christian Donhauser of the Faculty of Mechanical Engineering at the Kempten University of Applied Science is heading the EffPro project.

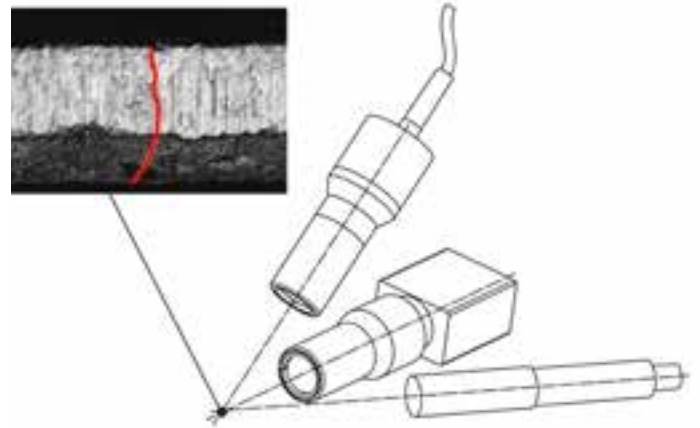
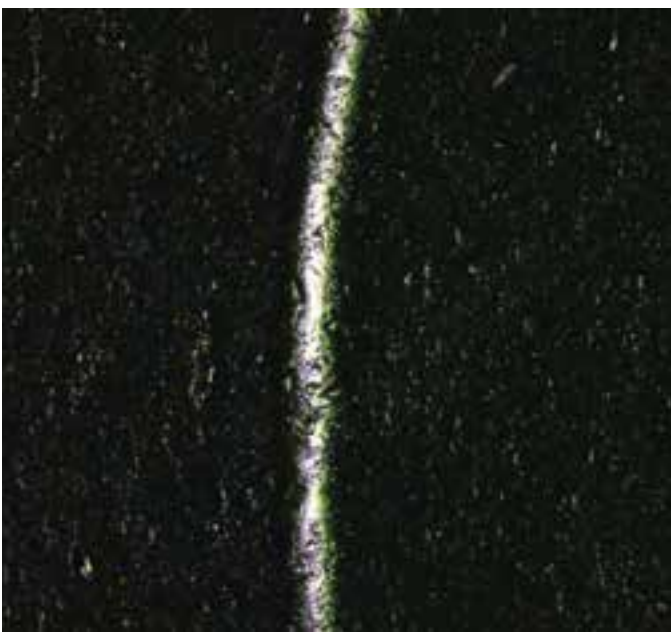
to the University. “We greatly value our cooperation with the Kempten University of Applied Science and, as an experienced technology partner, are happy to support it,” stresses Bernd Haussmann, Member of the Managing Board at Otto Bihler Maschinenfabrik. “The University develops innovative, forward-looking solutions that can be put to practical use by industry.”

20 percent reduction in wear-related costs Currently, as part of the EffPro project, the GRM-NC is being used to develop a new optical procedure for the inline measurement of the cut edges. The new solution permits the continuous online recording of the characteristic values of the cut edges of each part in real time. This is achieved by means of the so-called light-section method and involves a camera system, an illumination unit and a laser unit. The images are subjected to computer-assisted analysis in accordance with defined criteria and warning messages can be issued or the machine halted if, for example, the burr height tolerance is exceeded. This check ensures high parts quality, reduces





It is possible to see with millimeter accuracy that the bended edge of a part appears differently depending on the position and the process parameters



The concept of combined image capture using the light-section technique makes use of an illumination source, a camera and a laser unit. As a result, it is possible to monitor the quality of the cut edges of stamped and bended parts precisely and without contact using a method that is integrated into the process.

the risk of faults and cuts down on unplanned machine stoppages. At the same time, it makes it possible to draw valuable conclusions about wear to the punches and dies. "In this way, the corresponding maintenance activities can be planned much more precisely and can also be postponed for much longer because the precise level of wear is known at all times," says Haussmann. "Overall, a reduction in tool wear-related costs of 20 percent is perfectly realistic."

Adaptation for series use In cooperation with Bihler, the inline measurement procedure is currently being extended to develop a variant that can be used in industry. The development process will conclude with a standardized box that will be marketed as part of the Bihler portfolio. Bihler expects to present the inline measurement system, which is designed for use with punched and bended parts of all dimensions, for the first time at the 2020 sheet metal working trade fair.

At the same time, the inline measurement procedure can also be extended to include other quality criteria. According to Professor Donhauser: "It is perfectly possible to conceive of sensors that continuously measure material properties such as tensile strength, monitor the results of the stamping process and also inspect the bending angle online. In combination with the GRM-NC, at which it is already possible to undertake corrective actions, this would open up a completely new dimension in manufacturing." And this ultimate objective will also form part of the future cooperation between the Kempten University of Applied Science and Otto Bihler Maschinenfabrik. ●



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"SUCCESS NEEDS



CHANGE”

You cannot lead the world unless you are prepared to embrace change and keep your eyes focused on the future. However, commitment, discipline and the right equipment are also crucial for success. A conversation between Wolfgang Maier, Alpine Director of the German Ski Association (DSV) and company head Mathias Bihler when they met in the mountains of the Allgäu shows that this is true of sport just as much as it is of industry.

Mr Maier, your athletes in the DSV are at the very forefront of the sport and are regular medal-winners. How do you get them to this performance level?

Wolfgang Maier: It's a complex process and one that largely depends on three components. On the one hand, the athletes themselves naturally have to have the aptitude to practice sport at the highest level. However, another vital factor is the structure we use to train our athletes in systematic courses. And equally important is the aspect of support – at the sporting, psychological and pedagogical levels. When all these requirements are fulfilled, athletes can progress a long way very quickly. On average it takes approximately 8 to 10 years from the time the association starts to support an athlete through to them becoming one of the world's leading competitors. That is naturally a considerable investment that the ski association makes in its sporting assets.

Mathias Bihler: That is why athletes who constantly keep themselves at the very forefront of their sport deserve so much respect. To achieve that takes an enormous amount of discipline and hard work. As a company, Bihler has now been active for over 60 years

and we constantly have to motivate our employees to adopt a solution-oriented approach to their work. And we also learn from experience. Sometimes it takes a while before you reach your goal, and sometimes you have to learn to live with your failures.

Wolfgang Maier: For me, failure was always the basis for success. The more often you've taken a hammering, the more meticulously and precisely you work to get back to winning ways. We have always had to make our greatest steps forwards in response to our defeats. For example, when you travel to the Olympics and don't pick up a single medal, then you have to take a very close look at what you're doing and change things. If you're not constantly changing in the world of top-level sport then you've already lost. It is extremely important to keep your eyes focused on the future.

Mathias Bihler: That is also the approach that we follow in our company. For example, when we have shipped a machine, the team is already thinking about the next steps and upcoming developments: What can we optimize, where can we make material utilization even more efficient to give our customers even more capacity and performance? This is also the approach



Wolfgang Maier Wolfgang Maier was born on December 19th 1960 in Berchtesgaden in Bavaria. In 1989, he graduated as a qualified trainer and sports instructor. Since 1988, he has been active in the German Ski Association (DSV). There, from 1997 to 2006, Wolfgang Maier was the head trainer of the DSV women's team which, under his guidance, achieved considerable success in World Championships and the Olympic Games. The same applies to the DSV's full team, which Wolfgang Maier has been working with since 2006 in his role as Alpine Director in the German Ski Association.

that we train our young employees to adopt. In this way, our company has grown continuously and successfully over the last 60 years – which is why we are now able to solve many manufacturing problems with our machines and systems.

Wolfgang Maier: In this context, it is always important to have clear structures and defined levels: Who does what and who has what responsibilities and areas of authority? Only in this way is it possible to accumulate knowledge and only in this way is it possible to pass that knowledge on. Ultimately, this structure has led to the DSV becoming Germany's most successful sporting association. At the same time, we also look ahead in our work so that we are not taken by surprise by new trends or changes.

Whether in sport or industry: how do you get to the top and how do you stay there?

Wolfgang Maier: Anyone who wants to be the best in the world must be extremely focused on what they do and be totally committed to achieving their goals. Athletes must have an overview of everything and concentrate on being in peak mental and physical condition. Nowadays, you cannot lead the world unless you live and breath this extremely focused approach. What is crucial is how you get to the next level and how you can continuously improve.

Mathias Bihler: This method is also applicable to industry. Metaphorically speaking, our customers are the athletes. They are measured by their success and we must provide them with the top-class equipment that will help them improve and succeed in a competitive global environment. Of course, some of our customers are world-class athletes. On the other hand, there are also customers that are not yet making full use of the potential of their

Bihler systems. As a result, it is our task to provide training measures to support our customers right up to the point where they, too, are able to achieve outstanding results.

How will Alpine skiing develop in the future and where are the greatest potentials?

Wolfgang Maier: The wonderful thing about competitive sports is that they never stand still. This dynamic and these changes affect every area of the sport. However, what has changed the most is the equipment. It now offers much higher performance than in the past and this, in turn, brings with it the risk of injury. Ultimately, as things stand at present, athleticism, that is to say physical performance capability, has been developed to a point where practically no further improvement is possible. It is in the equipment that the greatest potential for pioneering developments in the future lies. Vast development processes are underway, even though these are incomprehensible and invisible to outsiders.

Mathias Bihler: Skiers and their equipment harmonize to create an extremely high-precision system and it takes weeks for this system to adapt to a new ski boot, for example.

Wolfgang Maier: Exactly. In fact, it goes so far that even models of boots that are basically identical can behave completely differently when you're skiing. The decisive factor here can be the injection molding process that was used or how the dye was added and in what quantities. These are unimaginably fine details that can nevertheless have a huge impact on skiing performance. Ultimately, the aim is to get the very best out of the equipment. In this respect, a company like Otto Bihler Maschinenfabrik can

Keep your eyes focused on the future and be prepared to embrace change - this is the philosophy of both Wolfgang Maier, Alpine Director of the German Ski Association (DSV), and company head Mathias Bihler.



provide excellent support for developments in competitive skiing and help bring forward new approaches. These optimizations can then save the milliseconds that are crucial for success.

Mathias Bihler: Indeed, we are currently developing a new ski binding plate for Bode Miller and his Bomber Ski brand. The key feature is the plate's spring properties with adjustable spring travel and variable spring force. It thus ensures extremely precise transmission of body tension through the ski boots to the skis. As a result, the binding and the ski react as a synchronized, intelligent unit. Implementing the necessary sequences of movements by means of suitable sliding elements and constructing precision guides, that is our everyday business and that is where we can derive full benefit from our experience. Bode Miller is currently testing the latest version of the plate and his experience will feed back into future optimizations.

b on top: How are things looking for the future generation of skiers? What role is played by support centers such as the Ostallgäu-Ausserfern ski support center and sponsorship by Otto Bihler Maschinenfabrik?

Wolfgang Maier: The German Ski Association maintains three national support centers: in the Allgäu, in Garmisch, and in Berchtesgaden. The Ostallgäu-Ausserfern ski support center is one of the regional centers that assist the national support centers. It is particularly important because it supports the new generation of skiers in the local area and we are therefore very happy to be assisted by Otto Bihler Maschinenfabrik. The number of new skiers who join does not depend directly on the top skiers but rather on the type of winter we have. In the last two winters, when we had

very deep snow, the number of participants in the newcomers' competitions rose noticeably very quickly.

b on top: Even though not every young skier makes it to the top – how much do they benefit from the knowledge and abilities they have acquired, for example in professional life?

Wolfgang Maier: The skiers definitely take something with them that will help them in their lives and they learn values that also contribute to professional success, such as discipline, fairness and a goal-oriented approach. Or not giving up when things don't go right for once. And then there is also the ability to persevere and triumph that you learn in competitions. These capabilities make competitive athletes particularly interesting for business and we often receive inquiries from industry and businesses that specifically want to recruit our athletes to their companies.

Mathias Bihler: In our company, we also have numerous top sports persons who are particularly ambitious and disciplined and have enormous mental strength. They are able to motivate others and carry them with them to achieve outstanding results that benefit the entire company. We know that these people provide a foundation for our future growth. That is why we are also investing in the regional ski support center and helping many other young athletes in other associations and disciplines. ●



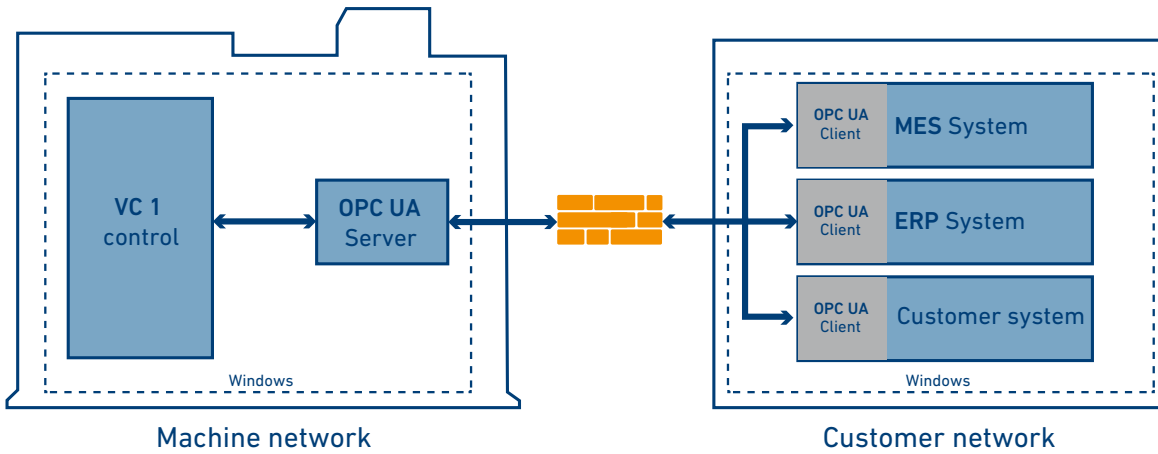
THE OPC UA INTERFACE

Large quantities of highly informative and continuously available data are essential for digital, networked production and manufacturing in accordance with the Industry 4.0 principle. Such data forms the basis for optimizing manufacturing processes, increasing capacity utilization and reducing downtimes. It also makes it possible to detect and eliminate malfunctions quickly and efficiently. At Otto Bihler Maschinenfabrik, machine data is recorded using the VC1 controller and made available via the Bihler OPC UA interface.

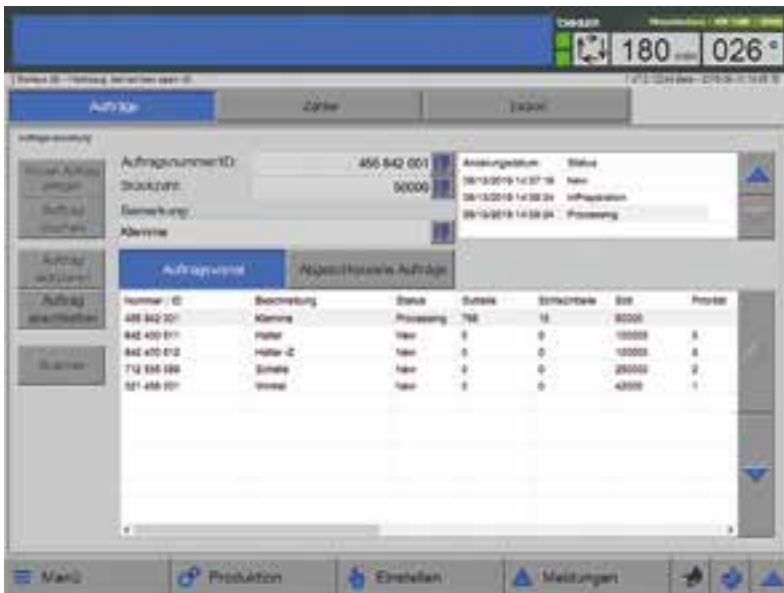
OPC UA stands for “Open Platform Communications Unified Architecture” and is a standardized, secure communication protocol for machine-to-machine communication and industrial automation. The solution was developed by the OPC Foundation, a globally active non-profit organization, and provides a uniform message format in addition to simple interfaces. At Otto Bihler Maschinenfabrik, the OPC UA interface function has been available since the end of 2018. The interface is implemented in all VC 1 controllers and is enabled on a customer-specific basis. On the one hand, the interface can be used to read out machine data which is then transferred to the customer’s analysis and evaluation systems. On the other, it is also possible as part of the job management process to send data from an external system to the machine which – following

activation by the machine operator – then executes the corresponding production job.

Secure exchange The specified VC 1 machine data is kept available on Bihler’s in-house OPC UA server. Here, the VC1 controller acts as an OPC UA client. The data enters the customer’s network via the mGuard, a router with a firewall. The router makes sure that data exchange between the customer and Bihler takes place only over the defined ports and that the rest of the system is protected. Data security is also ensured in the same way with the Bihler Remote Service. An OPC UA client is also necessary in order to read out the machine data. This customer OPC UA client is present in many standard MES or ERP systems. Customers that want to use their own software can also integrate or program the OPC UA



The Bihler-OPC UA interface is implemented in every VC1 controller. Via the M-Guard, which acts as a router with firewall, it makes it possible to read out machine data and also to transfer production job data.



Via the Bihler OPC UA interface, it is possible to provide all the data relating to the job and the machine status as well as fault and warning messages.

client themselves. In all cases, authentication is performed via security certificates or user ID and password. The data is transferred securely using the Basic256Sha256 method.

30-percent increase The amount of data available via the Bihler OPC UA is enormous. In this way, all the information relating to the current job is visible, as is the data relating to the machine status. In addition, all malfunctions and warnings can be displayed online in real time in the same way, of course, as the system's specific measured values. The data permits the detailed monitoring of important process parameters, makes it possible to detect potential problems with particular parts and also reveals possible shortcomings in the organizational structure, for example when switching over from one job to the next. Difficul-

ties with the feed technology can be overcome just as quickly as, for example, faults induced by axis overloads as a result of fluctuating material strip qualities. In practice, Bihler's customers can already successfully improve their production efficiency by up to 30 percent. ●



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A PARADISE FOR MOUNTAIN BIKERS

The Ammergau Alps are a splendid venue for mountain bikers, whether or not they have electrical assistance: Vast forests, panoramic heights, secretive wooded hillocks, romantic mountain streams and flowering meadows – always coupled with the view of towering rock faces. Not just a joy to behold but also excellent terrain for serious cycling. We circled the Trauchberg, making a detour to the Kenzenhütte, and were delighted by what we discovered.



Alongside the Lobentalbach (left). The Hubertuskapelle (center left). A warm welcome at the Kenzenhütte (right).

Our mountain bike tour starts in the Bavarian hamlet of Unternogg just a few kilometers off the B 23 main road which connects Schongau to Garmisch. We ascend a gentle gradient through a shaded wood by the side of the Halbammer as far as the Hubertuskapelle chapel. A quick look at the neat and tidy chapel is well worth it thanks to the charmingly conceived altar in which even a scallop shell can be seen. Our path becomes steeper and we cross a bridge over a mountain stream and then climb to the highest point on the route, the watershed between the Ammer and Lech rivers, before descending again towards Halblech. Again and again, the valley opens up to give us a clear view up to the wooded Hoher Trauchberg in the North and the many peaks surrounding the Grosse Klamm Spitze in the South. The highlight of the tour starts just before we reach Halblech with the path that leads up to the Kenzenhütte. At Siegelsmoos, we enter the Lobental valley, first following a ravine before starting a long, steep climb. The Lobentalbach river is held back in many places and mountain lakes open up to greet us. The trip through the Lobental is a pure delight in so far as the landscape is concerned. However, without an electric bike, its athletic demands should not be underestimated. Anyone who decided to cover the last stretch on the walking path rather than the cycle path had to reckon with a period of bike carrying. However, what is all of that compared to the joy of entering the warm, comfortable and attentively run Kenzenhütte mountain hut? Surrounded by mountain peaks, rock faces and woods, it has everything that anyone could wish for in a romantic mountain destination. We took great pleasure in eating the rich creamy Kaiserschmarrn (a type of thick pancake with raisins) before speeding down the path that led towards Halblech in the valley. Small side roads and country paths then led us back toward Trauchgau. This was the start of the final stage. The track took us back to Unternogg and we twice forded a river before happily arriving back at our starting point after approximately 60 kilometers and climbing nearly 1,300 meters. It was a day out that we shall certainly be repeating. ●



Tour description

<https://www.outdooractive.com/mobile/de/route/mountainbike/zugspitz-region/mountainbiketour-kenzenhuetten/10929382/#dm=1>



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