b on top

THE MAGAZINE OF
OTTO BIHLER
MASCHINENFABRIK
GMBH & CO. KG
2017

AN ACTIVE APPROACH TO SUCCESS

◄ About the cover photo

Today's skis are made from carefully matched components and materials. The pair shown here, designed for the Bomber Ski brand by ski ace Bode Miller (see page 48 ff.), are a fine example. They offer a degree of technical perfection that helps skiers perform their best, both in and out of competition.

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

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solarseven, Wolfgang B. Kleiner

Dear readers,

Raising production output, reducing resource consumption, increasing manufacturing agility, and being faster to market are all key objectives for manufacturers looking to stay competitive in today's global arena. All these objectives can be achieved by taking extensive steps to optimize processes that deliver improvements across the entire value chain. Otto Bihler Maschinenfabrik has a rich support portfolio designed to help. It includes mature manufacturing solutions based on things like Bihler NC technology – solutions that ensure highly efficient, dependable production at the highest quality level. And unlike mechanical systems, they exploit untapped optimization potential effectively, thanks to faster cycle rates, greater component quality, and setup times so significantly shorter that even small batch production is profitable. Starting with or switching to servo-controlled Bihler systems is now more worthwhile than ever thanks to our new Leantool system, which makes the whole tool creation process quicker, easier and, above all, less costly. In combination with our Bihler Planning app, it allows users to respond rapidly to customer inquiries and, at the same time, radically reduce overall time to market.

Besides technology, we also offer a range of knowledge and skills that are key to optimal process design. We provide support that begins with your initial idea for a new or expanding contract and continues all the way through to actual implementation and component manufacture. Beyond that, we can help with ongoing optimization and continued system availability as well. Throughout the process, we will support you in the spirit of an open, authentic and constructive partnership with a range of services and fully practicable solutions.

The examples presented here in this issue of b. on top show in compelling fashion how Bihler's combination of technology and expertise can open up new dimensions in manufacturing and thus enable businesses to achieve bold and ambitious objectives. As a partner or customer, you can take your performance and solutions expertise to a new level of success and, by working with us, bring about a whole new era in stamping and forming technology. We are here to support you.

I hope that you find this an enjoyable and inspiring read!

Mathias Bihler

b. on top 2017

PARTNERSHIP WITH MONTANA STATE UNIVERSITY

COLLABORATIVE PROGRAM ON TRACK

In mid-2016, Otto Bihler Maschinenfabrik laid the foundations for a new collaborative project with Montana State University, in Bozeman, USA. The company had the pleasure of welcoming as its guests Dr. Brett Gunnink, Professor Daniel A. Miller and Professor Durward K. Sobek, the leading members of the Department of Mechanical and Industrial Engineering at the Montana State University, to set out the terms and objectives of the new venture. First and foremost, this cross-border collaboration is about the creation of an exchange program that enables students to extend their otherwise campus-centric education by gaining valuable hands-on experience in industry.

Collaborative agreement signed

The project, which has been met with immense enthusiasm by all involved, is now up to speed. Recently, for instance, Professor Tom Jungst from Montana State University's Mechanical Engineering Technology program spent almost three weeks at Bihler as a guest. Responsible for coordination between the organizations involved, he came on a fact-finding trip to experience Bihler and Kempten University first-hand. He was also one of the signatories to the collaborative agreement between Montana State University and Kempten University that established the framework for the student exchange program. The first student to take part is Kyle Olson, who will be at Bihler as a student trainee from October 2017 until February 2018. ■

DR. JOACHIM SCHUSTER

NEW IMPETUS FOR CUSTOMER SUPPORT

Dr. Joachim Schuster has headed up Bihler Customer Support since the beginning of 2017. The 48-year-old family man studied automation technology at the University of Applied Sciences in Ulm, Germany, before gaining a doctorate in computer science from Leicester, in the United Kingdom. Schuster, who was born in Göppingen, Germany, went on to work in software development and customer service roles at a number of prominent companies. He is now bringing his extensive experience and expertise to bear at the helm of Bihler Customer Support: "Our customers need strong and effective support if they are to maximize the productivity and profitability of their Bihler systems," says Schuster. "To address the growing importance of customer support, we've refocused the division and are expanding its portfolio by adding new, forward-looking services."

A stronger support team

Bihler Customer Support, now a separate division of Otto Bihler Maschinenfabrik, has a portfolio that encompasses customer service, spare parts, training and consulting, system expansion, machine overhauls, pre-owned machines, and CAD. This represents an optimum combination of services when it comes to assisting the company's worldwide customer base quickly and professionally. Bihler has also increased staffing levels in this area and now has 70 highly motivated and expert people in customer support roles. ■

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INTERNATIONAL BIHLER FORUMS

MAJOR INTEREST IN THE LEANTOOL SYSTEM

More than 300 people attended five forum events held by Bihler in Spain, Germany, France and Sweden to find out about current trends at the company. The main focus of these events was the Leantool system for the RM-NC and GRM-NC servo-controlled stamping and forming machines, with Bihler experts demonstrating how bending tools could be made more quickly, more easily and more cost-effectively using this new standardized modular tooling system. They also demonstrated the new Bihler Planning App and bNX software in detail in connection with the Leantool system.

To be continued in 2018

In other presentations, attendees learned which Bihler systems were best suited for particular stamping and forming tasks and how to use the servo-controlled BIMERIC production system to manufacture assemblies more efficiently. Other agenda items included resistance welding and a survey of the latest Bihler support portfolio. Specifically, attendees discovered how to use tailored services to maximize machine availability and productivity in manufacturing operations. Each event also included extensive discussions on the topics covered. The feedback was extremely positive, and similar events are planned for 2018. ■

FORTY YEARS OF BIHLER OF AMERICA

IMPRESSIVE SUCCESS STORY

Bihler of America celebrated its 40th anniversary at the end of 2016. The success story began in 1976, when company founder Otto Bihler managed to encourage Barry Littlewood from England and Vulgens Schön from Germany's Allgäu region to set up a subsidiary in the United States. Littlewood and his UK company J.E.B. had previously made Bihler tools. Schön worked at Bihler as a toolmaker and had self-trained as a machine tool technician. Littlewood recalls: "Otto Bihler trusted two young men to conquer the vast U.S. market with Bihler technology." It began at the Chicago Machine Tool Show in 1976. Times were tough initially, and the young business had to fight hard to prevail against powerful market players. However, the enterprise grew steadily. Today, Bihler of America employs 220 people and is an ISO 9001-certified systems supplier that develops custom automation solutions and engages in contract manufacturing. CEO Maxine Nordmeyer, Barry Littlewood's daughter, is upbeat about the future: "With Bihler technology we're helping U.S. companies to manufacture highly profitably in the states. We see huge potential in the newly developed series of 4Slide-NC machines." ■

GET THERE

Even when means are very limited, as in the 1922 Italian Grand Prix in Monza, speed has always been the crucial ingredient in motor racing. Pierre de Vizcaya (shown here refueling his car) took third place in his Bugatti T30.

FASTER?

OPTIMIZE YOUR

Finely tuned processes and plenty of sophisticated technology are part and parcel of today's motor racing circus and save those precious seconds that can make all the difference. But everything still revolves around people, as illustrated here by the McLaren-Mercedes team in Sepang, Malaysia.

PROCESSES!

Cutting production costs, raising production rates and exploiting cost-saving opportunities – these are the primary objectives of process optimization efforts designed to boost one's own efficiency to good effect. They are key in allowing companies to differentiate themselves commercially and technologically and thus achieve a competitive advantage in the global market. Otto Bihler Maschinenfabrik realizes these increases in value added across the board within the framework of a comprehensive lifecycle management system, supporting their customers with a wide variety of services and solutions, ranging from the initial idea through component production and right up to follow-up support activities.

In Germany, mechanical and plant engineering has a turnover that is among the highest in the manufacturing sector, contributing 3.3 percent to total gross value added. In recent years the focus has been on deploying strategies and methods to raise efficiency and create greater value along the entire production chain. And it pays. Because, after all, vast potential for growth and improvement lies dormant in the industry. A recent study by the Federal Association for Information Technology, Telecommunications and New Media (BITKOM) and the Fraunhofer Institute for Industrial Engineering (IAO) shows that in the mechanical and plant engineering sector alone, productivity could be raised by as much as 30 percent through to 2025.

Methodical improvements

The possibilities for improving efficiency and streamlining processes are many and varied.

Existing processes, for instance, can be altered in such a way that goods can be manufactured at lower cost using existing resources. Likewise effective is the use of new manufacturing technologies that make production more flexible while driving process and product quality at the same time. Changes like higher component densities, too, are helping to tap

►

Components and processes need to be in perfect balance for a chance at success. Hardware, like race tires (left), and the control center (right) both have a crucial role to play.

into substantial savings and optimization potential.

Comprehensive support

At Otto Bihler Maschinenfabrik, huge importance is placed on optimization initiatives designed to boost efficiency, not least because these help customers to maintain their competitive edge in the global marketplace. But for Bihler, optimizing processes and creating greater value is not just about streamlining individual production stages on Bihler machines or speeding up cycle times. On the contrary, Otto Bihler Maschinenfabrik takes an all-encompassing approach that addresses every step in the manufacturing process, from the raw material to the final product.

Turning ideas into production

The Bihler Leantool system exemplifies the company's end-to-end approach. Both universal and modular, the system optimizes the path by which new tools are created and makes the entire process simpler, faster and cheaper. At the same time, the Leantool system optimizes upfront processes that help customers to acquire new business. With the Bihler Planning app they have advanced access to essential information on the technical feasibility of stamped and bended parts made from strip material or wires. Likewise available is information on the type of machine needed, projected cycle rates, estimates of likely setup times, and information on the possible output volumes that can be produced. All this enables users to run exact cost calculations prior to production and to respond more quickly to customers – two factors that increase their chances of winning orders.

Tool costs cut in half

When an order comes in, manufacturers can design and optimize a production task in terms of tools from beginning to end using the Bihler Leantool system Here, too, the Bihler Planning app is exceptionally useful. Users can download designs quickly and efficiently that can be modified easily to create and develop the desired components. The subsequent toolmaking process is likewise optimized as it utilizes standard parts that only require minor modification. Thanks to the ease and simplicity of tool assembly and system setup, component production can begin exceptionally quickly, keeping the time to market short. In addition, conventional tools can be made in the same fashion but for as little as half the cost.

Comprehensive lifecycle management

"The Leantool system exemplifies the end-to-end services and solutions that we offer our customers to help them leverage untapped optimization potential throughout the process chain," says Mathias Bihler. "We are not just with them from initial acquisition all the way through to production, we also offer continuing assistance through our customer support." This lifecycle management even extends to subsequent optimization of manufacturing processes that might be necessitated by mounting cost pressures. Here, Bihler provides a range of additional consulting and support services aimed at promoting real performance gains over the longer term. For instance, Bihler employees can assess which working steps could be automated and run together on the same machine so as to tighten up the value chain. This high level of consulting and support expertise is as unique as it is characteristic of the company. In tandem with other solutions designed to optimize processes, it offers customers of Otto Bihler Maschinenfabrik a substantial long-term competitive advantage.

Profiting from knowledge

Customer focus, authenticity and openness – always at the forefront of Bihler's customer and partner relationships – play an important role in the successful optimization of processes, too. This is particularly true when it comes to sharing

knowledge and expertise. "With the Bihler Planning app, for instance, we give our customers access to a comprehensive pool of knowledge that they can then combine with their own expertise to implement projects successfully," explains Mathias Bihler. This takes the sharing of mutually complementary knowledge to a new level and contributes substantially to both sides' success.

NC-supported optimization

NC technology opens up immense practical potential for optimization. It makes production so hugely efficient and flexible that it delivers immeasurable performance gains compared to mechanical systems. Besides dependable, reliable production at the highest quality level, it also allows much shorter setup times, maximum reproducibility when setting up tools (particularly where smaller batches and frequent changes are involved), and fully usable, cost-effective solutions based on the Leantool system. Mathias Bihler is convinced: "Every customer using this combination is in an excellent competitive position for the future." The training programs Bihler offers are therefore designed to ensure that attendees acquire all the knowledge they need to use servo-controlled production systems effectively and so offer customers an immediate return on their investment.

Expanding production horizons

This comprehensive, end-to-end approach to optimization by Otto Bihler Maschinenfabrik focuses on new projects and tasks as well, not just on existing manufacturing solutions. Here, too, the company can bring its exceptional consulting and service capabilities to bear. "We feel duty bound to deliver a level of performance that helps our customers succeed," says Mathias Bihler. This the company achieves in practice by providing mature manufacturing solutions designed to satisfy customer requirements and do more than merely accomplish new tasks with ease. At the same time, though, customers using Bihler systems often think outside the box and develop specific process expertise that, with time, allows them to come up with new potential applications. Thus, new projects executed on new Bihler systems not only broaden users' horizons, they also encourage innovative ideas for future projects. Here, as always, Bihler is on hand to help with its array of support services and pool of knowledge built on 60 years' experience in stamping and forming technology.

Continuing digital transformation

Bihler is steadily expanding its portfolio by adding new digital solutions and services as well. This began with the introduction of smart control technology in the form of the VC 1 control system, efficient process monitoring tools, and network-based remote maintenance. There are new tools in the pipeline that will provide access to comprehensive system-specific information online. Other upcoming features include live status information on customers' own systems, analysis and suggestions for improvements. Systems will also be easier to integrate into digital environments thanks to the addition of new interfaces and sophisticated communication capabilities. All new and existing services and features offered by Otto Bihler Maschinenfabrik with the aim of optimizing processes have the capacity to drive success. Says Mathias Bihler in conclusion: "Our tailored services help customers to set themselves apart from rivals, both technically and economically, and so command a competitive advantage in the global area." ■

WANT TO RAISE EFFICIENCY?

PHOENIX FEINBAU GMBH & CO. KG IN LÜDENSCHEID, GERMANY

RATIONALIZE YOUR MANU-FACTURING!

Recently, Phoenix Feinbau GmbH & Co. KG, a company based in Lüdenscheid, Germany, transferred the manufacture of components for overvoltage protection modules to the BIMERIC BM 4500 assembly system. The servo-controlled NC units complete all the process steps fully automatically on a single system and make production more efficient and economical. Of crucial importance for the success of this technological leap was the close cooperation with Otto Bihler Maschinenfabrik which provided in-depth consulting in the engineering, welding and programming fields. And with the expertise that it now possesses, Phoenix Feinbau GmbH & Co. KG is able to open up further optimization potential with existing products and successfully handle new projects with its BIMERIC BM 4500.

Ordering components, coordinating suppliers, managing transport and logistics, synchronizing production steps – those are only a few of the many tasks that Lüdenscheid-based company Phoenix Feinbau GmbH & Co. KG used to have to complete before the actual production of the overvoltage protection modules. Even though the company was always able to rise perfectly to these challenges and delivered its important components on time and as required, these work, time and cost-intensive activities are now a thing of the past. This is because this long-standing company, which was founded in 1939, manufactures the components

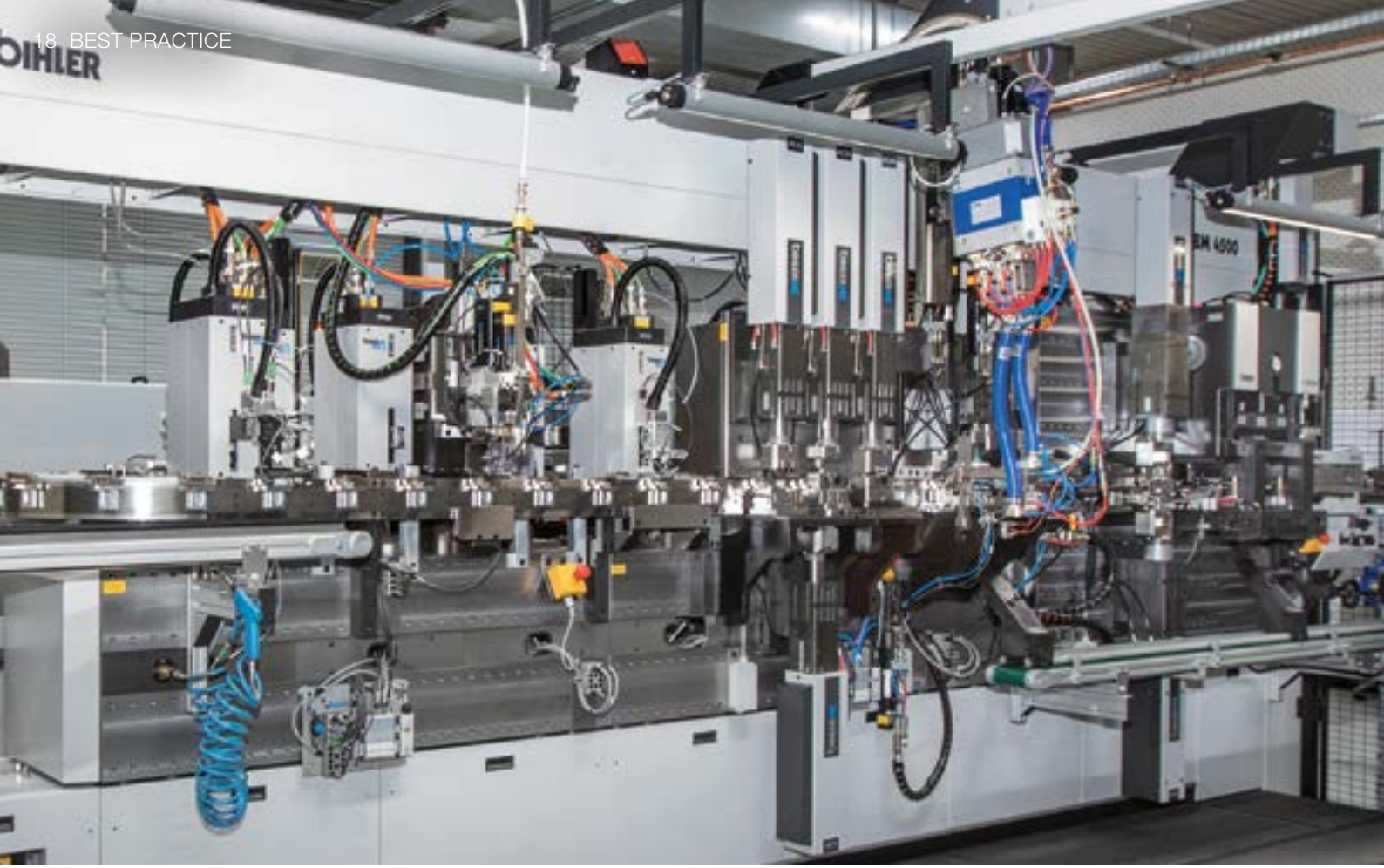
entirely inhouse with no outsourcing – and does so on a new BIMERIC BM 4500 servo-controlled production and assembly system.

Targeted rationalization

The components for overvoltage protection are a fixed part of Phoenix Feinbau's product portfolio. At the same time, the company's workforce of approximately 700 employees also manufactures metal stamped and bended parts and plastic parts for electronic components at its Lüdenscheid plant. "We have been manufacturing the product groups for overvoltage protection for some 15 years and decided to conduct a rationalization project to get away from the previous manual assembly operations and introduce a uniform, automated manufacturing solution," explains Dr. Jens Heidenreich, Managing Director of Phoenix Feinbau GmbH & Co. KG. "We also took the opportunity to rethink the entire value chain, analyze all the individual process steps and redesign the product groups." This approach is also representative of the constant further development and great innovative capabilities of Phoenix Feinbau, which is a member of the Phoenix Contact Group. As a global market leader, the group employs 15,000 employees at ten sites worldwide, where it manufactures more than 60,000 products and solutions for the electronics and automation industries.

Precisely costed investment

The fact that Bihler was chosen for the change of production strategy for the overvoltage protection components was due not only to the large number of Bihler systems that were present on site and had excelled for decades due to their high performance and reliability. "The decisive factor was the BIMERIC principle, which makes it possible to combine multiple process steps on a single



system and consequently to significantly tighten up the entire production process," emphasizes Dr. Sabrina von Hebel, Head of Toolmaking at Phoenix Feinbau. "This was the prerequisite for concentrating the creation of value added here in the company and thus, ultimately, the source of the greatest savings." In late 2014, the end customer's agreement to the change of process was secured while, at the same time, the company entered into its first discussions with Bihler. During these discussions, it was possible to determine the performance offered by the new system, the scale of future tool investments and the cost savings that this type of large-scale project, amounting to more than 1 million euros, would ultimately bring. "The fact that the modules were existing products with robust, foreseeable sales figures helped minimize the risk," explains Heidenreich.

Manufacturing concept redefined

The end of 2015 saw the detailed planning of the process, vigorously supported by all the expertise and consulting know-how of Otto Bihler Maschinenfabrik. And the requirements were great – in particular in the fields of engineering, welding and programming. Ultimately, the task was not simply to integrate the previous production workflow on a single system and define the required stations and units. Instead, the entire manufacturing principle had to be practically turned on its head in order to make considerable materials savings in the form of screws and box terminals. "Further challenges consisted in guaranteeing the desired cycle of 60 processes per minute and ensuring that it is possible to switch from one module to another in under 90 minutes," explains Patrick Hellmich, Project Manager at Phoenix Feinbau. However, thanks to the close cooperation between the companies, it was possible to define a reliable, end-to-end, high-performance manufacturing solution on the BIMERIC BM 4500 that met all requirements in just a few months. "The ideal solutions were identified, even for vital interfaces, for example for stamping the contact bridge and feeding it to the

Patrick Hellmich (left) and Kay Wesendrup did a perfect job of ensuring that all the project's technical requirements were met.

They completed the tech transition successfully: Dr. Sabrina von Hebel (right) and Dr. Jens Heidenreich (far right). The BIMERIC BM 4500 (left) served as the basis.

welding tool," adds Kay Wesendrup, Team Head of the Technology Segment at Phoenix Feinbau.

High-precision production process

At the BIMERIC BM 4500, the production process for the two product families, each consisting of four variants, starts with the infeed of the parts for assembly on the parts carrier. These include screws, box terminals and, depending on the model, a pressure piece or connecting bracket. Equipped in this way, the parts carrier then travels on the conveyor to the other side of the system where the contact bridge, known as a "tulip", is stamped and bended. This is then fed to the welding unit and welded to the pressure piece or connecting bracket. The tulip is then pressed downward within a tolerance range of a tenth of a millimeter and the gap at its base is calibrated in order to ensure that it functions correctly as a contact part. In the next step, the screw is inserted in the box terminal before the component is ejected and lands on a final conveyor belt complete and ready for use. In this way, approximately 1 million of these components are manufactured every year and protect power supply systems, IT systems, as well as wind and solar power installations, against overvoltages.

Value added for the future

"Production started in September 2017 and, to date, the new system has fully proved its worth and has run without problems," is how Wesendrup sums things up. "And if adaptations are ever required then our mechatronic engineer is able to complete them in just a few minutes thanks to the programming training received from Bihler." As a result, the project, which also stayed exactly within the predefined budget and timeframe, is a great success, in particular at the economic level: "The value chain is shorter, reprovisioning and response times are faster and component quality has improved," is Hellmich's assessment. "What is more, the actual manufacturing operation itself is now much easier, the cost and effort involved in storage, logistics and communications have been minimized and, last but not least, it has been possible to make materials saving of approximately a third." Thanks to the BIMERIC BM 4500, it will now be possible to explore the potential for optimization of other existing products. Sabrina von Hebel and Jens Heidenreich both agree: "With the introduction of Bihler servo technology, we have successfully made a technological leap that will allow us to continue developing purposefully in the future. This will ensure our continued competitive advantage and allow us to maintain our production operations in Germany." ■

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PHOENIX FEINBAU

DR. MICHAEL-VIKTOR FISCHER

»THERE'S NO BLUEPRINT – BUT THAT'S THE FUN!«

Tomorrow's e-mobility market will not just transform motoring, it will also give rise to innovative technologies and business processes. Continuously advancing, optimizing and pursuing new strategies, it is a hugely dynamic sector. An interview with Dr. Michael-Viktor Fischer, Managing Director of Austrian e-mobility provider Smatrics.

b. on top: Smatrics operates Austria's only full-coverage charging infrastructure. How is expansion progressing? And how fast are you growing?

Fischer: In 2013, when we started out, we divided Austria into circles with a 30-kilometer radius and set up a 22 kW charging station in each one. Back then, it was state-of-the-art. We built out this initial network by adding 70 50 kW fast-charging stations in 2015. That means we currently have a very good network in Austria – arguably, unequalled in Europe to date. We're now starting to develop next-generation 350 kW charging stations to deploy in Europe. These will allow drivers to charge up enough in ten minutes to travel 400 kilometers. This is a joint initiative with BMW, the VW Group, Renault and Magna. The first car to work with 350 kW stations will be the Porsche Mission E, which is due out in 2019.

b. on top: Smatrics is known as a charging network operator. Could you describe your overall business model?

Fischer: We have two business segments: public charging, where we already have a solid network in place, and managed infrastructure, which offers charging solutions for businesses. With the latter, our focus is on creating and managing a charging infrastructure for third parties like small and medium-sized enterprises, hotels or large vehicle fleets. Going forward, we would also like to help aspiring businesses that want to become players in the e-mobility market but lack the requisite expertise. We would provide the whole setup and the know-how; I'm thinking specifically of the German marketplace in this context.

b. on top: The reality of the market today is that many motorists say there's no point in buying an electric vehicle because there are not enough charging stations. However, the charging infrastructure won't be built as long as there are so few EVs on the roads. It looks like a classic chicken-and-egg situation.

Fischer: That's not really a problem, though. With the chicken and the egg, it's obvious: the egg came first. And it eventually turned into a chicken. It's the same with electric mobility: First come the cars, then the infrastructure. Developing a new car typically takes around five years. There's not much that can be done to change that. We, though, can roll out a charging infrastructure very quickly, and expand the network in Austria to twice or three times its current size. There's no blueprint – but that's the fun! The upshot is, we can always grow to meet demand.

b. on top: What are the key factors that could transform e-mobility into a mass market – other than the fact that we need more exciting EVs?

Fischer: The big issue is range. From 2018, though, we'll start to see new cars that can go 400–500 kilometers on a single charge. For many of us, that's plenty. According to statistics, Austrians, for instance, drive a distance of more than 500 kilometers just five times a year. The next factor is faster charging. Stations rated at 350 kW are not the end of the line. Charging will become up to four times faster. Electric cars will no longer be more costly to buy and they'll be much cheaper to run. They don't have a gearbox or an exhaust system, and they never need an oil change or new spark plugs. They'll be unrivalled in terms of price. And, crucially, they are huge fun to drive. I've also not mentioned the word "subsidy" yet. All of the support currently in place is helping to push e-mobility closer to crossing the critical threshold. And once the range issue is sorted, there'll be no holding it back.

b. on top: To charge your vehicle, you currently need to sign up with various vendors, and the payment process is complicated. Why is that?

Fischer: It's not as simple as filling up at a regular pump, for sure. The charging infrastructure is very IT-driven. And every charging station operator runs its own backend systems. As you can imagine, it's as if they all speak a different language. What we need now is some kind of translation solution that will allow the various cards to work everywhere. Roaming will definitely happen at some point. When

it does, other vendors' customers will be able to use their cards at our charging stations and vice versa. Creating this compatibility is a costly and complex process.

b. on top: Talking standardization, are there any other significant technology challenges facing Smatrics?

Fischer: Greater standardization and cross-compatibility between systems and services will lead to simpler, stress-free processes for customers. One challenge we're taking on right now is Plug & Charge. Customers won't need a card anymore; their vehicle will be identified automatically based on its chassis number. Once an overall solution to support this is in place, it will be possible to tell who owns the vehicle and who gets billed.

b. on top: The advent of vehicle-to-grid technology will introduce bidirectional charging, allowing cars to be used to store electricity and return it to the grid. Surely cars need the electricity themselves in order to drive.

Fischer: Not necessarily. In the future, your average electric car will have a battery capacity of around 100 kilowatt hours. Your home consumes 5–10 kWh and your daily mileage roughly the same. This means you have enough power in your car for two to three weeks. If, say, your solar panels stop working because there's snow on the roof, you can draw power from the car, then charge it up later. Vehicle-to-grid, or V2G, will also let you sell your electricity. You can use an app to tell your power utility that they can have electricity from your car but they should leave you enough charge after 5 pm to finish your evening commute home. They can have the rest – for two euros. When demand peaks and a thermal power plant costing millions would normally be brought online, the power utility can source power from consumers instead. This is a win-win situation: For the power utility it's cheaper than ramping up a power station. And for customers, it's a good deal because they can either use the stored power for free or pay just 18 cents to repurchase the power they sold to the power utility. ■

DR. MICHAEL-VIKTOR FISCHER

Dr. Michael-Viktor Fischer, a former BMW manager, is Managing Director of Smatrics. Smatrics, a joint venture of Austrian power utility Verbund, Siemens, and OMV, is more than just a charging network operator, it is a full-range e-mobility service provider with a portfolio aimed at businesses as well as consumers.

Smatrics operates Austria's only full-coverage high-power network for electric mobility, with more than 400 charging locations, including around 70 50 kW fast-charging stations.

PROF. DR.-ING. BERND KUHLENKÖTTER

»DATA AS THE BASIS FOR OPTIMIZATION«

Process optimization is becoming increasingly important in the modern industrial world. Professor Bernd Kuhlenkötter of the Chair of Production Systems at the Ruhr University in Bochum explains the potential that this opens up, the importance of security in this field and how optimizations can best be implemented in practice.

b on top: What is the importance of process optimization in industry today and what sectors and production workflows offer the greatest potential in this field?

Professor Bernd Kuhlenkötter: Process optimization is of particular importance in modern industry. Such optimization efforts should cover a wide range of processes and comprise both organizational and technical processes, such as production processes. Production-side optimization starts with engineering and product design, which provide the basis for subsequent efficient manual or, of course, automated manufacturing. It then continues with a suitable choice of level of automation and automation tools and extends through planning and commissioning and on to quality optimization and assurance as well as optimized maintenance strategies. Only if every area is optimized is it possible to fulfill the requirements for high-quality, on-schedule and economically efficient production in Germany in the long term.

b on top: What role do Industry 4.0, know-how protection and IT security play here?

Professor Bernd Kuhlenkötter: In many companies, Industry 4.0 has ushered in a fresh, new way of thinking that leads to improvements and optimization of new processes. But in many areas, it has also – and this is the particular significance of Industry 4.0 – led to reflections about long-standing procedures that had previously been thought to be successful and efficient. The new communication and networking capabilities that find widespread support in many of the new devices and protocols permit a previously unheard of level of control and recording of production data, which – and here I return to the first question – is of the very greatest importance for the required continuous optimization of processes.

Only through seamless know-how protection is it possible to guarantee the long-term consolidation of achieved market positions in the production field. And it is most specifically in this field that the new capabilities of Industry 4.0 are placing the issue of IT security firmly on the agenda. This is because the Industry 4.0 paradigm is making product and production data acquisition capabilities, and of course production control capabilities, accessible and

controllable over the network and therefore also, in extreme cases, over the Internet. In the light of these developments, it is essential that the good, old-fashioned factory gate and the staff and visitor entrances are "transposed" to the age of Industry 4.0 by means of high-performance protection mechanisms such as firewalls and gateways, as well as by access controls and secure, encrypted communications – and it is here that IT security plays an essential and ever more important role.

b on top: What is the current research focus concerning production automation and industrial robotics? What challenges are involved?

Professor Bernd Kuhlenkötter: In recent years, human-robot collaboration (HRC) has grown in importance. It permits meaningful, purposeful combinations of human strengths, such as their sensory and motor capabilities, with the qualities of robots, such as reproducibility and endurance. What is more, the appropriate implementation of HRC applications in production can bring about many advantages. By way of example, I need refer only to the support given to humans in terms of workplace ergonomics or, of course, adaptation to the ever increasing requirements associated with product individualization. HRC is also a valuable ally during product start-up and variations in part numbers. But of course, there are many different challenges in this field. Given that there are already a number of different robots suitable for HRC applications on the market, the task now is to plan an efficient product- and worker-specific division of labor between human and robot and implement this in a way that ensures reliable, economical operation. ■

PROF. DR.-ING. BERND KUHLENKÖTTER

Professor Bernd Kuhlenkötter was born in 1971 and graduated in 2001 in the Faculty of Machine Elements, Design and Handling Technology at the Technical University of Dortmund, where he also worked until 2007 as senior engineer and deputy head of faculty. In early 2007, he became Head of Development at ABB Automation GmbH. In 2009, he returned to the Technical University of Dortmund as Professor for Industrial Robotics and Production Automation, and worked there as head of the Institute for Production Systems from 2012 onwards. In 2015, he joined the highly reputed Ruhr University in Bochum as Professor for Production Systems. At the same time, he is President of the Wissenschaftliche Gesellschaft für Montage, Handhabung und Industrierobotik (Scientific Society for Assembly, Handling and Industrial Robotics).

BIHLER STRATEGIC PARTNER GROUP

VIBRANT PARTNERSHIP

The newly formed Bihler Strategic Partner Group is allowing Otto Bihler Maschinenfabrik to expand its global footprint in the fields of tool design, toolmaking and tool assembly. At an initial meeting with strategic partners, relevant areas of interest were identified and appropriate activities defined in order to bring to life a vibrant partnership that delivers a high level of customer benefit.

Otto Bihler Maschinenfabrik is the world's leading supplier of stamping and forming, welding and assembly technology systems. But the company is not resting on its laurels. Instead, it is constantly and proactively responding to its customers' needs, coming up with high-performance solutions that deliver exceptional value added. The best example of this is the recently founded Bihler Strategic Partner Group. This is a network that currently encompasses 16 companies who operate globally in the field of tool design and/or toolmaking and assembly.

Global reinforcement

"The objective of the Strategic Partner Group is to expand our global footprint in the fields of design and toolmaking," explains Mathias Bihler, Managing Director of Otto Bihler Maschinenfabrik. "As a result of this partnership, all customers will have a local strategic Bihler partner who is in a position to provide quick, cost-efficient solutions and who also has a thorough knowledge of specific market requirements."

The 31st of May and 1st of June, 2017, saw the first meeting of the Bihler Strategic Partner Group. It was held in Halblech and chaired by Professor Christian Donhauser from the Faculty of Mechanical Engineering at Kempten University of Applied Sciences. The attendees included 16 strategic partners from Germany, Austria, Italy, Spain, Sweden and the Netherlands, along with many members of staff from the Technology, Plant Engineering, Customer Support, Sales and Marketing departments at Bihler.

Strategic realignment

The meeting focused on how strategic collaboration with Bihler will

be aligned in the future. To start with, Mathias Bihler introduced the concept behind the collaboration between Bihler and its strategic partners. Partner projects that have already been concluded successfully were also presented. The specialists at Bihler then gave the participants a run-down of the current range of expert services and solutions offered by Bihler. This concentrated on the current product portfolio, welding technology, Bihler's support services and, above all, the Leantool system. Users of this system will find that the process of developing and building new tools is even easier, quicker and more cost-efficient, because the system encompasses every step in that process, from planning and design, through manufacture and assembly of the tool right up to setup and live production.

Constructive identification of topics

On the second day, a workshop was held in which the representatives from the partner companies split into five groups and identified their own wishes and expectations in respect of Otto Bihler Maschinenfabrik. The work in the groups was both intense and constructive, and the core topics that emerged as being of special importance included training courses, design, technical support, know-how transfer, communication and vibrant partnership. Professor Christian Donhauser then drew together a detailed summary of these topics and on this basis defined the future objectives and strategies.

Systematic project implementation

Ludwig Mayer, member of the Management Board, draws this conclusion: "The meeting was a great success and met with a favorable response, both from the partners and from the staff at Bihler. Our job now is to take these suggestions and requirements and to put them into practice in order to turn the strategic partnership into a vibrant part of our lives." This includes, for instance, offering tailored training courses, optimizing communication channels or adapting Bihler's technical support to meet the specific needs of the partners. The Bihler Strategic Partner Group will meet on an annual basis going forward. ■

BIHLER STRATEGIC PARTNER GROUP

Art Group, Netherlands
Beutlhauser Stanztec GmbH, Germany
Christoph Liebers GmbH & Co. KG, Germany
Dawedeit GmbH, Germany
Leicht + Müller Stanztechnik GmbH + Co. KG, Germany
LEICHT STANZAUTOMATION GMBH, Germany
MATRIX SA, Spain
Origin Tool AB, Sweden
PAPINI STAMPI s.r.l., Italy
PENTAP s.r.l., Italy
PSU-Technologie GmbH, Germany
schell-connect GmbH, Germany
Steinel Normalien AG, Germany
tba Stanz- u. Biegetechnik GmbH & Co. KG, Germany
vr-konstruktionen GmbH, Germany
Wörgartner Gesellschaft m.b.H., Austria

BIHLER

EXPANDING A SUCCESSFUL SYSTEM

Bihler has expanded the LEANTOOL system to encompass new, high-value modules. This includes the Bihler Planning web app and the new standard component catalog, along with the fact that it will in future be possible to use the LEANTOOL system to manufacture linear tools. Furthermore, four new members of staff have joined the support team to assist with extremely simple, fast and cost-efficient toolmaking.

Recently, Bihler introduced the LEANTOOL radial system. It is a state-of-the-art, future-ready system that has already become the new standard for creating tools for the RM-NC and GRM-NC servo-controlled stamping and forming machines. And this is not without reason: The standardized modular tooling system makes toolmaking even simpler, faster and more cost-efficient, thanks to its utterly consistent approach. It provides extremely short implementation times, cost savings of up to 70 percent compared with bending tools on mechanical machines and an extremely short time to market for new products, even with very small batch sizes.

The Bihler Planning web app

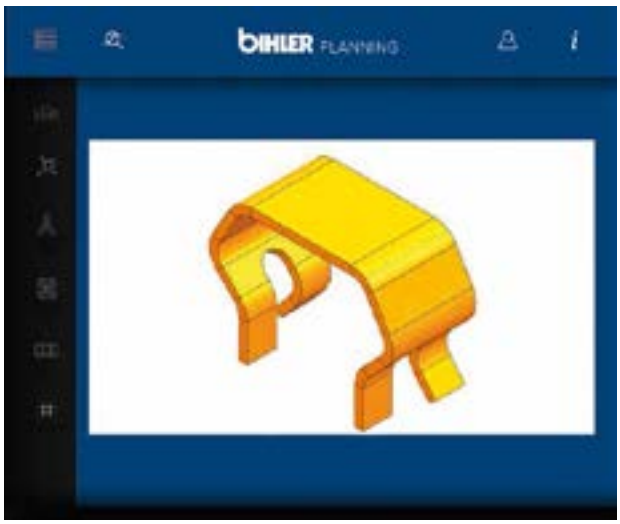
The formula for success is to provide support from planning, through the design and manufacturing phase, right up to production, and Bihler continues to develop this concept still further. Consequently, the new Bihler Planning web app is available with immediate effect. It shows exactly how a given stamped/formed part is bended and provides valuable support when planning components and designing tools for stamped/formed parts made from wire and strip material. Users are given a simple, rapid overview of all the aspects involved in creating stamped and formed parts, including the various stages in bending and the tools used. Supplementary information such as the production speed, setup times and processing time for each batch is also available at a glance. The app additionally contains a sample database packed with knowledge from Bihler and tool designs for parts made from wire and strip material. And the best thing about it is that the Bihler Planning web app can be used free of charge at www.bihlerplanning.de after users have registered. You can find additional information about the web app in the form of a video on the Bihler web site.

New: Linear LEANTOOL

Up until now, the LEANTOOL system was designed for radial tools, but as of EUROBLECH 2018 it will be extended to accommodate linear tool positioning. This means that linear design tools can now be built quickly and easily for the RM-NC and GRM-NC servo-controlled stamping and forming machines using the unique, end-to-end LEANTOOL manufacturing system. The concept behind the modular system remains unchanged, whether dealing with radial or linear tools. Its capabilities are impressive: simple, rapid planning; a clearly structured design process using the bNX software; efficient toolmaking; problem-free assembly and setup; and high-performance production of parts.

New standard component catalog

The new standard component catalog is another valuable extension to the LEANTOOL portfolio. Subdivided into standardized machine and tool parts, it lists in detail all components required for the LEANTOOL system in conjunction with the RM-NC and GRM-NC servo-controlled stamping and forming machines. It includes drawings of



Free application and knowledge tool: the Bihler Planning app is available at www.bihlerplanning.de.

Bihler's LEANTOOL system guarantees efficient, single-source toolmaking.

the components, item numbers, order numbers and additional type and dimension information. It thus gives users a quick, compact overview of all LEANTOOL components – from the tool holder to the retaining plate and the die mounting. All standardized machine components and standardized tool components for the LEANTOOL system are kept in stock at Bihler.

Enhanced LEANTOOL support

Last, but not least, Bihler has also expanded the range of training courses and services provided specifically for the LEANTOOL system. For instance, a five-strong process planning and technical sales team (PP/TV) has been in place since January 2017. They are there to help in finding solutions to new stamping and shaping tasks on (G) RM-NC machines, to assist Customer Support on issues relating to the LEANTOOL system and to help in the development of LEANTOOL machines and software. Headed up by Marc Walter, the team also creates the examples for the technology platform www.bihlerplanning.de, works on methodology planning for stamping and forming concepts and provides draft LEANTOOL designs. Taken together with LEANTOOL information events, the basic training seminars, and consultancy services for design and initial construction, Bihler thus provides a perfect package of comprehensive support for every aspect of the LEANTOOL system, and throws open the door to sustained success in toolmaking and productive stamping and forming. ■

The new process planning and technical sales team: Reinhard Böck, Norbert Immler, Marc Walter, Thomas Zettlmeier, David Walk (from left to right).

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ACCORNERO SPA, DRUENTO, NEAR TURIN (I)

»FOR DOUBLE-DIGIT ANNUAL GROWTH RATES«

Accornero Spa in Druento, Italy, have heralded in a new era in their punching and bending operations with a new RM-NC and the Leantool system. As a result, not only is it possible to manufacture all parts faster and more flexibly, but the tools needed can also be produced efficiently by a single source. Both these components are key elements of the success strategy of a company that is targeting annual growth of at least ten percent.

Alongside injection molded components, contact elements, clamps and formed wire parts, the focus of Accornero Spa's product portfolio is springs of all types, from compression and tension springs, through coil springs and right up to flat spiral springs. Founded in 1958, the Druento-based company's 33-strong workforce produces a total of around 300 million parts a year, which are used in cars, motorbikes, electrical products and white goods. The manufacturing equipment includes seven Bihler machines, the first of which was a DR1, which the company bought back in 1987. Some sixty percent of the parts produced goes to other countries in Europe, to Turkey, the USA and Mexico. Carlo Bazzano, CEO of Accornero Spa: "Our aim is to increase sales by at least ten percent annually, and we are investing heavily to achieve this. Our focus is on developing solutions and manufacturing concepts that allow us to manufacture faster, more flexibly and more economically, and which will also enable us, together with our customers, to bring new products to market successfully."

For Carlo Bazzano, CEO of Accornero Spa, the new RM-NC and Leantool system are the right answer to the market's requirements.

Accornero Spa is the first company in Italy to use Bihler Leantool system.

Market-driven manufacturing under servo control

One key aspect of this strategy for success is systematic modernization of the machine pool, something Accornero is also doing in the field of punching and bending. And the best example of this is a new RM-NC machine, which was delivered to Accornero in mid-2017. It represents the latest generation of servo-controlled punching and bending machines, and allows the company to manufacture to minimal tolerances extremely efficiently, with absolute precision and in top quality. But the new machine also delivers the production flexibility that Accornero needs to handle their huge range of batch sizes, from runs of several million down to just a few dozen units. Bazzano: "The market is demanding ever smaller runs and shorter delivery times. The RM-NC is just the answer to those demands." Accornero first saw the RM-NC on a visit to Otto Bihler Maschinenfabrik in Halblech in July of 2015. And the servo-controlled machine duly impressed the visitors, in particular when it was demonstrated that a tool that they had brought along from an existing mechanical machine was able to be adapted to the NC machine without difficulty.

Making tools competitively

At the same time, Bihler also launched the Leantool system – an innovative modular tool system that revolutionizes the production of new tools – and this solution was also enthusiastically embraced by Accornero. Paolo Destefanis, Technical Director at Accornero Spa: "We have been successfully engaged in toolmaking for many years, and immediately saw the potential offered by the Leantool system. The Leantool system makes us more competitive, because it allows us to make the tools we need, particularly for short runs, extremely quickly, cost-effectively and from a single source." And so it became clear that the company would put their trust not only in the RM-NC, but also in the Leantool system – a combination that would lift both component manufacture and toolmaking to a new, highly efficient and sustainable level.

The success of Leantool in practice

In June, 2017, the new RM-NC machine arrived at Accornero, and the company has been working with ►

the Leantool system since around this time. Even though the two components have only been in use for a short time, the investment is already bearing fruit. For example, Accornero has already successfully made a bushing tool that is used to produce ten different bushing products per month. And in future, all new tools will be built using the Leantool system. The first step is to consult the Bihler database. In eighty percent of cases, this offers tried-and-tested phase plans and step-by-step plans for the punched and bended part that is needed. Then the tool is designed using the bNX technology software before it is sent to be manufactured. Following the Leantool system, the tool is then fitted, the machine is set up and production of the parts can begin. Thus, Accornero has now become the very first Italian company to handle the entire tool-making process on site according to a seamless, precisely defined formula.

Expectations of RM-NC exceeded

And the RM-NC, which was already up and running within a week of delivery, is impressive in day-to-day practice: "Our existing tool from a mechanical system runs on the RM-NC at 250 strokes per minute," says Paolo Destefanis. "This repre-

Provided support for the new investment: Efisio Carutti, Bihler's sales representative for Italy, with his daughter Eleonora.

For Paolo Destefanis, technology manager at Accornero Spa (right), the Bihler Leantool system's potential was obvious from the outset.

sents an increase of 20 percent and is exactly what we set out to achieve." A further increase in speed up to 300 strokes per minute is conceivable, and the company believes that the use of servo technology will allow a general increase of cycle times of up to 50 percent.

Another huge plus is that the set-up time has been slashed from between four and eight hours to an average of around one hour. Paolo Destefanis: "This means that we can now manufacture far shorter runs economically on the RM-NC." Not only that: the stock levels for the input materials can be reduced to meet the requirements of the batch size, which also has a financial benefit. Beyond that, the monitoring options provided by the machine, with their precise analyses and forecasts, have been enthusiastically received. And the ease with which the RM-NC can be operated has proved its worth in practice, as has the user-friendliness of the Leantool system.

With Bihler on the path to success

Paolo Destefanis is certain: "The support given by Bihler, in particular the initial and ongoing training on-site, were crucial for the successful deployment of the RM-NC and the Leantool system. Bihler doesn't simply supply a machine, but also delivers the associated skills." In future, Accornero will migrate all their operations to Bihler's servo technology, and a new GRM-NC machine will arrive at the company at the end of the year. CEO Carlo Bazzano is very positive: "We are extremely satisfied. Bihler is a good, reliable partner with whom we will continue to be able to achieve our objectives in the future." ■

www.accornero.eu

TALENTED ALL-ROUNDER

THE NEW B 20K WELDING CONTROL SYSTEM

The high-performance B 20K, Bihler's latest welding control system, can be used for all kinds of resistance welding tasks. It supports the integration of servo axes, provides effective protection against voltage fluctuations and features an expanded range of measurement and analysis functions.

Alongside stamping and forming technology, welding is a core field of expertise at Otto Bihler Maschinenfabrik. For 50 years now, the company has been incorporating welding capabilities into its automation solutions that offer users exceptional process reliability, maximum productivity and excellent welding quality. Bihler continues to refine its process technology. The most recent advance is the new B 20K welding control system. Based on the current B 5000 welding system, it can be used for resistance welding – especially in the manufacture of electrical contacts.

More welding frequencies

The new B 20K is a universal control system capable of supporting all the sizes of welding contacts that Bihler uses. It converts the supply voltage into a welding transformer voltage with a range of frequency levels. All Bihler welding transformer models from 70 kVA to 250 kVA can be connected to a converter without a refit. The control frequencies for the welding processes can now be adjusted flexibly in the range from 1,000 to 20,000 Hertz. When it comes to making micro contacts in particular, this enables even better contact properties.

Compensating for supply fluctuations

Another important advantage of the B 20K welding control system is its resistance to supply fluctuations and voltage drops. This is accomplished through a built-in, mains-independent power supply delivered by an active upstream PSU. At the same time, its ability to reduce the internal supply voltage in a controlled fashion during the welding process also allows it to lower the system load by 50 percent in short welding operations with durations of less than 20 milliseconds.

Five measurement channels

The new feature set in the B 20K control system also includes enhanced analysis and monitoring capabilities. Measurement channels have been added to record power, voltage, force and travel, as has a separate channel for, say, thermal signals. Each channel can be linked to threshold limit values and/or control and monitoring functions for process control purposes. A quick-access function lets machine setters adjust the welding controller within set limits during production – either in its entirety or in segments – without changing the welding control profile or shutting machinery down. This enables welding parameters to be adjusted during production to allow for electrode wear or changes in the material. The stepper function, like the manual quick-access function, also changes the welding controller. The change takes place automatically after a set number of welds defined by the machine setter. The number of

The B 20K is exceptionally easy to operate and use.

The new B 20K is a universal welding control system that can be used to manufacture contact elements and supports all Bihler welding contact sizes.

welds and extent of the change are prescribed in a stepper profile.

Improved power handling

Another benefit of the B 20K welding control system is that the welding current rise time is up to 50 percent faster. As many as 25 profile segments can be created for a given welding task. Each profile segment can be programmed individually to set the current or power, time and frequency. This means, in effect, that there is infinite scope for fine-tuning welding jobs. The B 20K's new capabilities also include faster control routines that offer 30 percent better control quality when adjusting current profiles.

Integrating servo axes

The B 20K is available in different models. There is a stand-alone version, controlled via a touch screen and keyboard at the control cabinet. It features two welding points as standard, expandable to a maximum of eight using add-on cabinets. The system is fully compatible with the B 1000 and B 5000.

Likewise available is a stand-alone version with servo actuators for welding tools. This is an expanded B 20K with additional axis cabinets, designed to integrate welding tasks into a progressive die stamping system on a single press. The movement sequences during welding occur independently of the press stroke or press speed. The benefits for users are higher processing speeds, simplified peripherals, longer electrode service life, and improved manufacturing quality.

The B 20K is also available in a version designed for integration into existing machines equipped with a VC 1 controller. With this configuration, the B 20K can be visualized and operated quickly and efficiently from the VC 1 touch screen. It allows separate measurement results to be linked with VC 1 measurements and shared easily. In addition, the welding actuators can be adjusted automatically using VC 1 functions. In the future, it will also be possible to evaluate closing travel or closing force measurements by angle. ■

B 20K HIGHLIGHTS

- Process frequencies up to 20,000 Hz for an unlimited range of applications
- Mains-independent power supply for maximum process reliability and lower mains load during the welding process
- Integration of servo axes for independent welding tool operation
- Measurement channels included as standard for optimal control, process monitoring and diagnostics
- Online adjustment of parameters (manual and automatic) to allow quick changes to the welding profile during production

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GRM-NC, LEANTOOL SYSTEM AND B 20K

TAKING PRODUCTION EXPERTISE TO A NEW LEVEL

A new servo-controlled GRM-NC, a Leantool system radial tool, and the new B 20K welding control system – these components are the foundation for the latest generation in smart manufacturing solutions. Together, they allow typical progressive-die components to be made quickly, reliably and economically on a single stamping and forming machine.

At this year's Blechexpo fair, Bihler will again be showing its latest innovations and developments in the field of stamping and bending technology. The highlight on show is the GRM-NC in combination with a Leantool system radial tool and the new B 20K welding control system. This is the most recent generation of smart manufacturing solution – universally deployable, and offering exceptional component quality and process reliability. These are key qualities when it comes to manufacturing the highly complex components that are usually made on a progressive die stamping system and are material-intensive to produce. Bihler will be showing specifically how components of this kind can be made quickly, reliably and cost-effectively on a single stamping and forming machine.

Standard, not extra

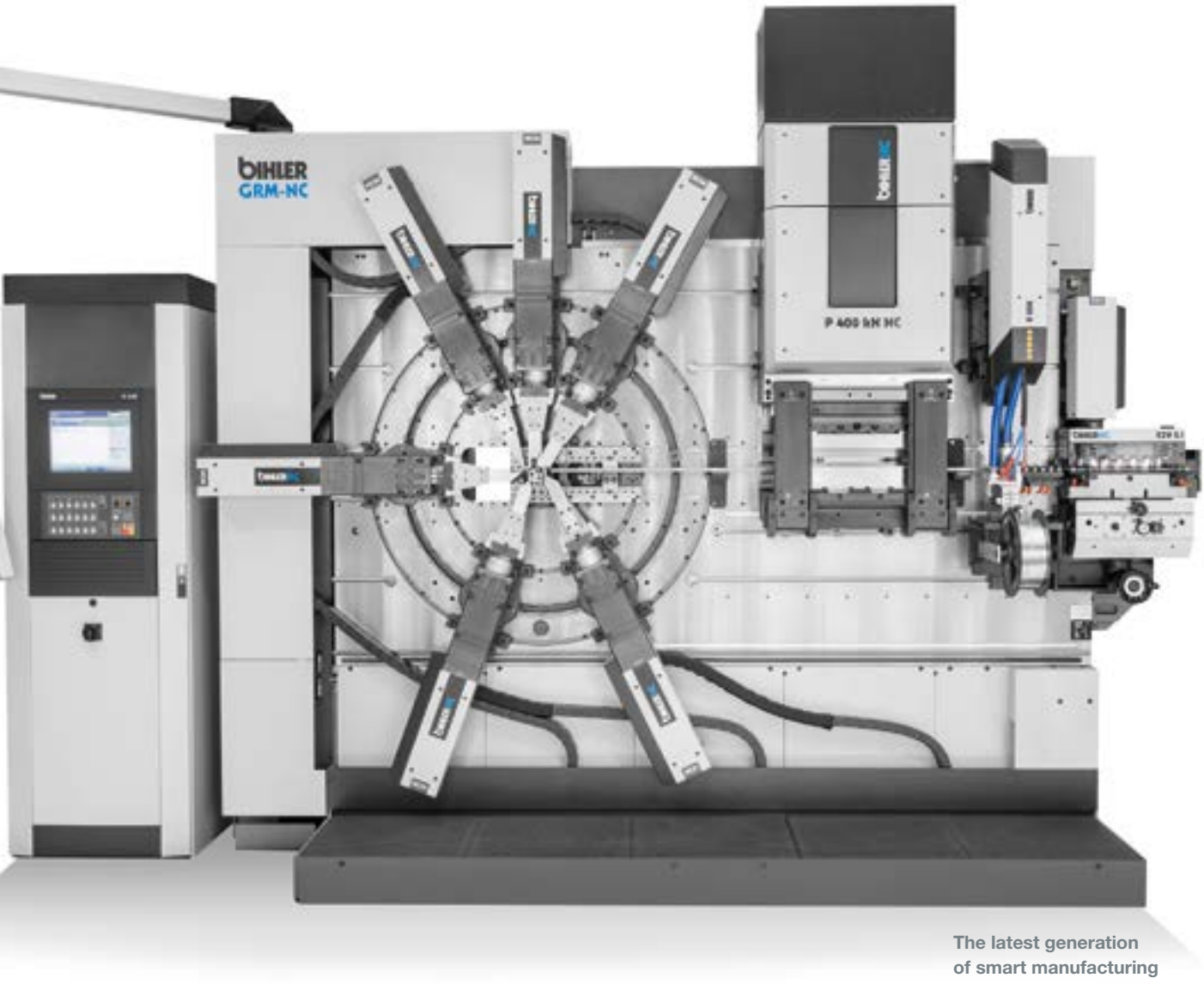
The solution is based on the GRM-NC servo-controlled stamping and forming machine. The NC-controlled slide units ensure the flexibility needed to make sophisticated components on a system with a radial setup. The GRM-NC on show is not a specialized machine but a standard system with six forming slides, a central mandrel, a press, and a material feed that ensures exceptionally efficient production, even with the smallest of batches, high production speeds, and extremely short setup times.

The Leantool advantage

What is new here is the radial bending tool fitted to the GRM-NC, which was developed using the Leantool system. The latter allows exceptionally simple, fast and inexpensive toolmaking using a single, standardized approach. The modular system covers every step in the process, from planning and design, through tool manufacture and assembly, to setup and final production. The radial tool on show is an excellent example of the system's benefits. It consists of just 15 separate elements, more than half of which were created from standard Leantool parts. The radial tool took 70 hours to design, and the overall costs only ran to around 20,000 euros, including programming, construction and optimization.

Welding to perfection with the B 20K

The new B 20K welding controller is the final element in the system. It is universal in that it supports any Bihler welding contact size and can be controlled completely and directly from the VC 1. The latest generation of the control platform also incorporates highly effective protection against voltage fluctuations, and adds extensive new measurement and analysis options.



The latest generation of smart manufacturing solution: The GRM-NC with a LEANTOOL SYSTEM radial tool and the B 20K welding controller.

Conductor rail production, live

At the trade show, the GRM-NC with the radial tool and the B 20K will be making copper conductor rails for electric vehicles. The exceptional efficiency with which it produces these complex components starts with the material feed. The copper strip is the same width as the components so as to make maximum use of the raw material and avoid waste almost entirely. Prior to pressing, a contact is welded on by the new B 20K welding control system. The contact is then embossed in the press to give it its final form before the required part geometries (phases or perforations, for instance) are punched into the strip. In the machining center, the radial tool separates the component and bends it into its final shape. The Bihler system produces around 80 parts per minute in this way. An important side benefit of this approach is that the electronic component sustains just minimal oil contamination because the tool does not require lubrication. This significantly reduces any subsequent cleaning required.

Long-term savings and profitability

The system demonstrates that a costly, specially designed machine is not essential and that Bihler can accomplish even complex and sophisticated manufacturing tasks on a standard version of a conventional GRM-NC stamping and forming machine that users can also utilize for numerous other production tasks. The GRM-NC, combined with the Leantool system and new welding controller, offers an economical manufacturing solution that will save on tool costs and more than pay for itself in the long run. ■

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GERMAN SME TOP 100 AWARD

EXCELLENCE IN INNOVATION

Otto Bihler Maschinenfabrik again ranked as one of the top 100 innovation leaders among Germany's small and medium-sized enterprises. In an independent selection process, the company was chosen for an award in recognition both of its successful innovations and its interactive approach to process, quality and knowledge management through the iPOOL, a system that enables employees to propose and promote new ideas, processes and innovations.

Ranga Yogeshwar (left) with the highly coveted award that he presented to Manfred Grundner, Managing Director of Otto Bihler Maschinenfabrik.

It was a moment of elation when, on June 23, 2017, Ranga Yogeshwar presented a coveted TOP 100 Innovator award to Manfred Grundner, Managing Director of Otto Bihler Maschinenfabrik, at the Deutscher Mittelstand Summit for SMEs, in Düsseldorf. This is the second time that the Halblech-based company has been honored as one of Germany's most innovative small and medium-sized enterprises. The award selection process was conducted independently by a highly respected jury panel made up of expert and well-known members of the business community, the political establishment and society. They picked Bihler in recognition of its successful innovations and the interactive process, quality and knowledge management system that it operates in-house. Both are key factors in the continuing success of a company that for more than 60 years now exemplified the very best of technology made in Germany and, today, ranks as the world-leading systems supplier in the field of stamping and bending technology.

Steady advancements

"We are constantly advancing, and around 80 percent of our automation solutions are genuine innovations," says Manfred Grundner. "As we drive the development of innovative manufacturing solutions, our highest priorities are efficiency and value creation, harnessed to the goal of making machines capable of producing stamped and bended parts and assemblies with a high level of productivity and minimal consumption of materials." The servo-controlled systems developed and launched by Bihler are a case in point. These, in combination with a VariControl VC 1 machine and process control system, ensure that manufacturing

iPOOL

The Bihler iPOOL is an ideal system for putting employees' ideas and suggestions into practice.

can be carried out cost-effectively and with exceptional efficiency. The VC 1 adds considerable intelligence to the machines by uniting advanced software and hardware to create a flexible platform capable of supporting highly complex automation solutions and Industry 4.0 systems.

Interactive knowledge database

Another reason for the TOP 100 Innovator award was the interactive management system Bihler rolled out in 2016 based on the Q.wiki platform. This is a transparent, cross-disciplinary knowledge database designed to support process, quality and knowledge management. It allows the company's 730 employees to contribute information on their own work procedures and processes and to document new developments. "This is a comprehensive repository of knowledge. It serves as a valuable resource for new hires, helping them to get up to speed quickly on the current status of innovation developments," says Manfred Grundner.

Creative idea management

Bihler is also an innovator when it comes to idea management, which it handles through the iPOOL. "Every innovation begins with an idea," explains iPOOL supervisor Roman Niklas. "The purpose of the Bihler iPOOL is to provide a forum to promote creativity and nurture employees' potential ideas. Our goal is to deliver a sustained and ongoing improvement in our products, technologies, procedures and processes." Any company employee can get involved – and it can be very worthwhile. For instance, ideas that are implemented successfully are rewarded through a points-based system or through bonuses, depending on the scale of the potential savings and improvements. The process begins when an employee has a flash of inspiration or comes up with an idea and records it in the iPOOL. The iPOOL supervisor first checks its validity; it is then assessed by the relevant department head and given a preliminary evaluation. The idea or suggestion for improvement is subsequently put before the iPOOL review panel, a body of seven people who assess it again and decide on any bonus to be awarded.

Value creation by employees

"The Bihler iPOOL is an ideal tool as it allows literally any employee to contribute ideas or suggestions for improvements, regardless of the field in which they work or the scope of their proposal," says Niklas. "The system attracts around 100 suggestions and ideas every year. These, taken together, can add up to six-figure savings." One prominent and successful idea submitted through the iPOOL was for a new design of noise suppression hood for the feed systems on Bihler machines. Unlike its predecessor, the new version can be fitted and removed without tools, has a leaner design, and saves the company a five-figure sum each year, plus a significant amount of work. ■

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ROSENBERGER HOCHFREQUENZTECHNIK GMBH & CO. KG, FRIDOLFING, GERMANY

»EXPONENTIAL GROWTH«

The demand for plug-in connectors for automotive communications technology at Rosenberger Hochfrequenztechnik GmbH & Co. KG in Fridolfing, Germany, has rocketed in recent times. The company is responding by using new RM and MC systems. With servo-controlled NC machines and the Bihler Leantool concept, it may well be possible to successfully open up further growth potential in the future.

In manufacturing: Manfred Gropper, production supervisor (center), Michael Schnitter, head of the Punching Technology department (right), and Tobias Schuller, machine setter and setup operator (left).

With some 10,000 employees and 19 sites worldwide, Rosenberger Hochfrequenztechnik GmbH & Co. KG, which is headquartered in the Bavarian town of Fridolfing is one of the world's leading manufacturers of connector solutions for high-frequency and fiber-optic technology. Its has a range of some fourteen thousand products which are used in the fields of mobile communications, telecommunications, industrial measurement technology, vehicle electronics and medical and industrial electronics. "What is special about our products is their outstandingly high, frequently tested quality with zero fault tolerance," explains Rudolf Gropper, Head of Production at Rosenberger. "At the same time, however, we can supply our products quickly and at particularly economic prices because we permanently optimize our process chains and manufacturing structures."

The success story continues

This is particularly true of the coaxial plug-in connectors, which were previously manufactured in a time-consuming multistage cutting and machining process – and whose production was moved over to mechanical Bihler stamping and bending machines some time ago. "It took a lot of development work to be able to manufacture this product as a pure stamped/bended part", says Gropper looking back. "At that time, Bihler was the only supplier of efficient, reliable solutions that could output finished products at an impressive level of throughput." Even though the plug-in connector, which is used for transporting signals in the automotive sector, has naturally since been further developed, its manufacture as a pure stamped/bended part is still a success story – and one that will be continued into the future. The reason for this is the massive leap in demand for coaxial plug-in connectors that are needed in order to meet increasingly complex on-board network demands in terms of installation space, transmission speed and toughness, for example for camera monitoring, infotainment applications or in-vehicle Internet. According to Gropper: "We are currently experiencing exponential growth, in particular in the field of stamped/bended parts." "And further developments, for example in the field of assistance and safety systems for autonomous driving and electromobility, could dramatically boost demand even more in the future."

Prepared for future challenges

"We continue to be enthusiastic about Bihler's stamping and bending technology and the high technical performance delivered by the multicenter systems, in particular. What is more, unlike progressive tool solutions, these are open systems in which we can easily integrate all the different process steps, including all the optical and mechanical test operations," continues Gropper. Cooperation with Bihler and the support it provides in ensuring reliable, highly efficient day-to-day manufacturing operations also plays an important role. Gropper concludes: "The new concepts presented at the Bihler Support Event are extremely interesting, in particular with regard to monitoring and methods of intervening in order to improve the productivity of systems and tools. In this area, we exchange experience and ideas constructively, and openly on a basis of mutual trust and support." To sum up, the company is ideally equipped to face every challenge. With Bihler, we can perform automated manufacturing without outsourcing and consequently keep all our production in-house. We also intend to make use of the latest Bihler developments, for example servo-controlled NC systems and the Leantool concept for tool manufacture." ■

www.rosenberger.de

Rosenberger

JOHANN VITZ GMBH & CO. KG, VELBERT, GERMANY

»ONE BIHLER BNC 4 FOR FOUR MRPS«

Significantly shorter setup times combined with noticeably higher performance – for Johann Vitz GmbH & Co. KG in Velbert, Germany, these were the main arguments in favor of a new Bihler BNC 4 production system. However, the servo-controlled system also impressed due to its full compatibility with the MRP systems which are already installed at the site and which will be replaced by further BNC 4 systems in the future.

Johann Vitz GmbH & Co. KG in Velbert was founded in 1908 and now has a workforce of some 270 employees manufacturing springs, punched and bended parts. The company not only has more than 350 modern production machines but also possesses its own toolmaking shop with engineering and prototyping departments, an in-house tempering station, as well as state-of-the-art testing equipment for its manufacturing and quality assurance operations. The products manufactured by this spring specialist are used in practically every area of industry, such as the automotive, telecommunications, mechanical engineering or consumer electronics sectors.

A key strategic decision

"Our products stand for flexibility, innovation and high standards," explains Managing Director and graduate engineer Michael Vitz. "Our strengths come from our state-of-the-art production equipment which allows us to implement individual, cost-effective production solutions for our customers." And it is precisely in this area that Johann Vitz GmbH & Co. KG will further increase its performance in the future because the company has been able to boast a new Bihler BNC 4 in its portfolio since the start of 2017. This represents a modernization of the machine pool, which includes a number of Meyer, Roth & Pastor (MRP) type UB systems, some of which are already several decades old. "These no longer meet modern safety requirements, setup times are disproportionately long and the performance is too low", is how Michael Vitz assesses things. "At the same time, it is becoming ever more difficult to find qualified personnel for these purely mechanical machine types." This, together with its excellent experience of NC systems, for example for the manufacture of torsion springs, is why the company decided to opt for the Bihler BNC 4 production system. And of course, the outstanding quality of the Bihler systems was another selection criterion – because Vitz also has a number of older systems from Halblech which are still greatly appreciated during everyday manufacturing activities due to their unfailing high precision. And, last but not least, the Managing Director is very well acquainted with Bihler after completing his training as toolmaker there in 1979, emerging as one of the best in his year.

Expectations confirmed

The new BNC 4 started productive operation in early 2017. And the initial expectations in terms of enhanced performance and shorter setup times have been completely confirmed. Vitz: "Thanks to the shorter setup times, we can now manufacture small products runs

Equipped for the future: Michael Vitz, Managing Director of Johann Vitz GmbH & Co. KG.

just as well as large series, which are worthwhile simply due to the time saved as a result of the boost in performance." More specifically, the previous setup time, which averaged between four and six hours, has now been reduced to approximately one hour. All the setup operations can be performed precisely and simply and are one hundred percent reproducible. At the same time, performance – even without any tool optimization – is four times that of the old mechanical machines. "The bottom line is that the new Bihler BNC 4 replaces four old MRP systems," says Vitz.

Building on the competitive advantage

Thanks to full compatibility with the MRP standard and the ease of tool adaptation, which was successfully demonstrated at the Bihler site in Halblech prior to the purchase, the new BNC 4 was able to start productive operation without any difficulty. "The machine ran smoothly right from the very start and our employees enjoy working with it," is how Michael Vitz sums things up. "We will gradually replace all the old MRP machines with further BNC 4 systems and in this way further extend our competitive advantage in the international environment." ■

www.vitz.de

VITZ FEDERN
Stanz- und Biegetechnik

CONSTANT COMPANION

All day, every day, we are surrounded by millions of objects made on Bihler machines – everything from relatively simple stamped and bended parts to complex assemblies. Some we encounter directly, others remain concealed inside enclosures or within machinery or equipment of some kind. One thing that all these Bihler-made parts share in common is a high level of quality and reliability that assures us, as users, functionality we can depend on and peace of mind. This, along with highly efficient, cost-effective manufacturing, is what Otto Bihler Maschinenfabrik stands for.

POWER HYDRAULICS

Agricultural and construction machines commonly use hydraulic systems to drive their work units. Electrically controlled hydraulic valves ensure that the pressures in these systems are regulated safely and reliably. Three- and four-point connectors for hydraulic valves are made on a BIMERIC BM 4500 servo-controlled production and assembly system. The contact part is made first. It is punched, stamped and drawn, then a thread is cut into it. Next, the connectors are assembled. The BIMERIC BM 450 inserts a screw, adds the casing, separates the contact part, and then fits out the assembly in a pick-and-place operation. The process is exceptionally reliable because the stamped and bended part is handled directly on the punch strip. Up to 80 connectors a minute in 16 variants can be made on this end-to-end system. Change-overs from one connector type to another are managed by a central control system and can be completed quickly and easily in under 30 minutes. ■

RELIABLE POWER CONNECTIONS

The electric vehicle may be poised to dominate the future of motoring but the majority of cars on the road today are still powered conventionally by an internal combustion engine. This engine relies on a battery to power the starter motor as well as components like the engine control unit, fuel injection system, ignition coil or glow plugs. It also keeps things like the clock, radio and hazard warning lights powered when the engine is not running. The power passes from the battery's terminals, through battery terminal clamps, to the vehicle's wiring system. Terminal clamps like this are made in a Bihler BZ 2/4 processing center. Its modular, open design places almost no constraints on how processing units needed in a manufacturing process can be integrated, making it ideal for the production of high-quality precision parts – parts like battery terminal clamps, which require a range of steps (specifically, punching, bending, stamping, assembly and feeding) to be performed on a single system. The output rate runs to around 150 parts per minute. The BZ 2/4 processing center combines this kind of high processing speed with exceptional precision while minimizing offcut and scrap. ■

SAFE MAINS SUPPLY

NEMA sockets are a common type of mains power receptacle used in the United States, Canada and parts of Asia. Unlike standard European sockets, they have three pins to connect to the three-wire, single-phase mains supply in these regions. NEMA receptacles are designed for voltages of 125-600 volts and currents of 15-50 amps. It goes without saying that safe and simple use is the number-one priority. A key part in these receptacles is the connecting piece that carries the mains current to an attached electrical appliance or other load. In the USA, this connecting piece is made on a GRM 80 mechanical stamping and forming machine and a BZ/2 processing center. Together, they carry out all the necessary steps, from punching and bending to thread cutting, screw insertion and assembly. These two Bihler systems, working in three lines, produce roughly 300 of these receptacle parts. There are around 80 variants of the final product. The Bihler machines, running 24/7, excel in terms of their reliability. They also operate as smart network, which allows them to buffer production – a valuable capability. And lastly, both of the manufacturing systems incorporate comprehensive process monitoring capabilities to ensure maximum reliability during manufacturing. ■

ELECTRIC MOTOR EFFICIENCY

The advance of the electric-powered vehicle is a key emerging trend today. Germany alone aims to have a million electric cars on its roads by 2020 and to gradually replace the environmentally harmful internal combustion engine. The business potential associated with electric vehicles is therefore huge. Otto Bihler Maschinenfabrik is actively involved in research and development in this new field of technology and is already supplying machines and systems on which important components for electric motors can be made. One of these is the BIMERIC BM servo-controlled production and assembly system. It is on this system – an ideal platform for manufacturing components economically – that a Bihler customer is now making a part known as a hair pin. In automotive electric motors, this part (so called because it looks a little like a hair pin) ensures that power is transmitted safely and efficiently. Twenty-two variants of this pin – made from round and flat wire – are manufactured on the BIMERIC BM. This highly flexible system can produce around 60 finished clips per minute. It performs every step in the process, including stripping, chamfering, bending, forming, adjustment, and final measurement of the part's geometry. ■

ENHANCED SERVICE FOR MAXIMUM COST-EFFECTIVENESS

THE BIHLER SUPPORT EVENT 2017

As part of the strategic realignment of its customer support, Bihler is expanding its service portfolio for partners and customers. The Bihler Support Event 2017, held at Füssen's Festival Theater, explored ways to maximize system lifecycle cost-effectiveness, and previewed new services that Bihler will be offering in the future.

In July 2017, Bihler's customer support activities were assigned to a separate division within Otto Bihler Maschinenfabrik in a restructuring move that underscores their expanding role. "Customer support is becoming increasingly important, because it ensures that our customers benefit from maximum machine availability and productivity," explains Managing Board member Dr. Joachim Schuster. "With this realignment and various new, future-focused services, we are enlarging our service portfolio and broadly stepping up our support activities. This will help to ensure that users everywhere can keep their Bihler systems operating cost-effectively in the long term." As part of the restructuring, the support team headcount was increased from 55 to 70.

Services spanning the entire lifecycle

By expanding its support solutions, Otto Bihler Maschinenfabrik is setting itself apart from marketplace rivals, who often only offer a basic level of service for machine maintenance. "By contrast, Bihler is putting its entire expertise in punching,

The Bihler Support Event 2017 proved extremely interesting for all involved. Following the main program at Füssen's Festival Theater, the event wound down with a boat trip on Forggensee lake.

bending, welding and assembly into its service portfolio and is placing this expertise at its customers' disposal," says Dr. Schuster. In line with this change, Bihler's customer support offering now spans the entire lifecycle of its systems. "We're designing and developing the most cost-effective production approaches on a task-specific basis. Our staff receive practice-driven training and application-centric instruction to acquire the specialist knowledge they need," Dr. Schuster explains. "Our specialists' ability to commission machinery efficiently helps to keep the production start-up phase short." But that is not all: During production, too, Bihler takes steps to keep its machines' availability as high as possible – through preventive maintenance, a ready supply of original spare parts, and the wealth of experience that its customer service technicians bring to the table. "Our professionals even advise customers on ways in which they can increase current production and help them put these into practice. We also plan and carry out machine expansions and overhauls as part of our support offering."

SUPPORT
EVENT 2017

A connected future

The benefits for partners and customers from Bihler's strategic realignment of its customer support were front and center at the Bihler Support Event, held at Füssen's Festival Theater on the 6th of July, 2017, where company experts showcased the full breadth of the new service portfolio. The highlight was a presentation by Dr. Joachim Schuster on the new services to be offered in connection with the new Leantool system and Bihler NC machines. A look ahead to Bihler's plans for future Industry 4.0 service solutions drew particular interest. "We're concentrating on four main action areas," Dr. Schuster explained. "The first is that we will be providing online access to comprehensive system-specific information and our spare parts program. We're also expanding system availability information and evaluations to include live status reports, unlimited evaluation periods, weak-point analysis, and optimization proposals. Third, we'll step up our systems' ability to integrate with existing operating structures through fully programmable status communication and high-performance interfaces. And our fourth action area is system diagnostics: Here, we will be making it possible to display machine-specific diagnostic information on critical modules."

A boat ride to finish

The event concluded with a two-hour boat trip on Forggensee lake. This gave the participants, all of whom were thrilled with the event, an opportunity to mingle and enjoy a relaxed chat with the others on board. Bihler's Support Event 2017 was a huge success, and there are already firm plans to hold another next year. ■

... BODE MILLER, SKI ICON AND ENTREPRENEUR

»DRIVEN BY IMAGINATION«

World Cup ski racer Bode Miller knows what it takes to become a world class champion and a market leader and how to maintain your success at the top, and so does Mathias Bihler. Even though sport and industry would appear to be contrasting disciplines, there are a number of parallels and similar challenges. Mathias Bihler met the ski icon at his home in California to talk about their passion for skiing, self-discipline, their desire to be the best in their fields and his new product line for Bomber Skis.

b on top: Mr. Miller, besides your passion for skiing, you are known as an all-around talent who is very self-disciplined and focused on self-improvement. Can you bring these traits into your new profession as an entrepreneur?

Bode Miller: Yes, I think you bring these into everything that you do - father, husband, athlete, or business owner. You make decisions based on personal experiences and that makes everything so interesting. I have always tried to do things my way – what works best for me, specifically my methods of training and my style of skiing. This requires total self-discipline, concentration and commitment.

In the media, I have often been portrayed as a "know-it-all or cool boy". They misinterpreted my focus and determination for arrogance and they could not have been further from the truth. I was just being myself. I was focused on being the best athlete that I could be, regardless of how that made me look.

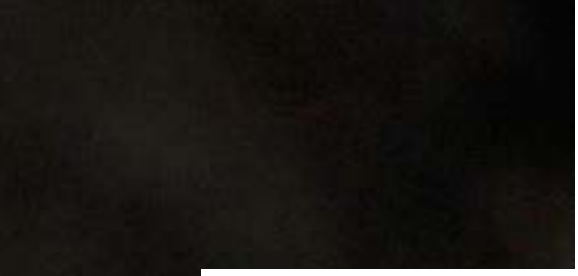
I am not passive about anything I do, everything is well thought-out and then I take action. I place a very high value on being prepared for all different scenarios, and for this you need a very good imagination. Of course unexpected circumstances can occur requiring one to react, some days absolutely everything goes wrong, causing serious injuries and setbacks. In general the need to react is often the result of improper planning. How well you react depends on your experience and proper training and these will influence your outcome. As an athlete, you rely on your self-discipline and motivation to pick yourself back up and try again. Since I was a young athlete, being prepared has been important to me and I think this can easily be applied to being an entrepreneur.

Mathias Bihler: That is very similar to myself and our business. To best support our customers, we must first have a clear understanding of what it takes to make them successful. First, we carefully review all project specifications and then take action. Even then, this does not always mean proceeding with our first ideas. Rather, we take a step-by-step approach analyzing various manufacturing solutions to determine the best path forward that meets all of our customers' needs. After all, this is our goal, for only when the customer is successful, have we done our job correctly.

b on top: What factor does personal motivation play in competition?

Bode Miller: Everything. In my opinion, there are two types of athletes. The first is one who is self-motivated to do their very best every time and improve with each race. They are driven to learn and give 100 % time and time again. They may win or they may only achieve 5th place, but for them that may be a personal best. This type of motivation translates very well in business. You must be willing to judge and criticize yourself and believe me this is not easy to do, however, it allows you to be your best every day. Essentially you push yourself so there are no limits.

The second type of athlete is one who simply tries to do their best and is motivated just to win. They focus on winning one particular race or beating one particular person. This type of motivation can be successful and is also found in business. I believe this type of motivation provides short-term success and



Bode Miller, skiing icon and entrepreneur:

»My personal motivation has always been to do my best and give everything I could every single time. You not only want to achieve the possible but also the impossible.«

lacks the foresight and endurance necessary to continually be an innovator and a market leader.

My personal motivation has always been to do my best – give everything I could every single time and to learn from situations and build on my experiences. You not only want to achieve the possible but also the impossible. This gives you the mental strength to push harder. If you are only doing the bare minimum necessary to beat the next guy then you will never reach your true potential. But when you push even harder than you knew you could, then anything is possible.

Mathias Bihler: I agree. You have to push the envelope every single day, both physically and mentally. Your imagination is limitless, which opens up a world of new technical possibilities. We as a company must continually prove to our customers that we are globally competitive.

It is my responsibility to motivate our team to continuously develop ideas that lead to new and innovative technologies. We are always looking outside of our core markets to explore new manufacturing methods and potentials. Currently, the focus is on e-mobility and green technologies. Our innovations must set us apart from our competition and give our customers a competitive edge. This is what drives me and that is what drives the company forward.

b on top: Mr. Miller, was that also a reason why you decided to join the Bomber Ski company and launch the Bode Miller product line?

Bode Miller: Exactly. In my opinion, R & D in the world of professional skiing concentrates only on keeping up with the competition. Unfortunately financial investments are limited and this restricts the development of new and innovative equipment. The marketing budget is focused on sponsoring the athletes in order to increase market share. There are technicians who are responsible for the quality of the skis and bindings, but not for making adjustments and improvements. The individual athlete and their technical support team must try to optimize their own equipment to gain a competitive edge.

There have been developments over the years but they have been very minimal. Back in the 1990s, ski boots had changes made to the sidecuts but not much since. Over the last 40 years, even skis are still made from the same materials of fiberglass, rubber, and wood.

Mathias Bihler: But you know exactly what it takes to make skis perform. Your experience and knowledge can now influence the entire ski performance – starting with technical design advantages and material composition. I believe your developments will be successful and influence how young athletes perform in the future.

b on top: Now that you are an owner of Bomber Ski and free of any restrictions, how can you push the technical limits of ski design? ►

Mathias Bihler, Partner and Managing Director of Otto Bihler Maschinenfabrik:

»It is only through imagination, envisioning what could be possible, that we can build upon our knowledge and effectively implement solutions. And this takes courage. This is innovation. It is the Bihler culture and it is what drives us.«

► **Bode Miller:** Technical restrictions are not the biggest challenge, it is the financial funding and that is still a factor. Your business model must be as innovative as your products. For it is ultimately your financial strength that dictates the rules of any business.

Bomber skis are high-end skis, engineered to perform aggressively in a wide range of conditions. Our new line of skis will enhance the overall ski experience and safety of the recreational skier. The technical challenge is to design the skis to handle a wide range of skiing abilities. The ski cannot be too stiff or soft and must still be stable enough to grip the snow. The technical advantage is that the skis will not react too aggressively, giving the skier better maneuvering capability, meaning better control and increased safety. We want to achieve a true skiing experience and for that, the skis must perform on the snow.

In our business model, we have to produce a certain number of skis each year and we need a business plan that allows more money to flow into the company in order to further expand our R&D. So I said, "Why don't we create a new business plan for the skier who likes to travel?" Owning your own skis is good when you always ski in the same location, but when you travel the ski conditions and opportunities are different. Also, it is always fun to try out new skis. That is when we came up with our Membership Program, giving our customers the ultimate ski experience with Bomber Ski equipment combined with 5-star service and convenience, wherever they want to ski.

We begin by finding out about our customer, their ski ability and their interests. Then they simply give us their hotel information and the rest is up to us! Three different pairs of Bomber skis will be delivered and waiting for their arrival. The skis will be properly tuned, meaning the correct edging and waxing for their ski location conditions. They can try all three skis and if one or the other are not to their satisfaction, then through the mobile app, they give us feedback and new skis will be sent the next day.

We will have certified ski shops strategically located around the globe, where all our skis will be readily available and perfectly tuned every time. The more someone skis with us, the better they can customize their skiing experience. Everything will be taken care of, which is a new concept for a concierge service. We make sure that their time spent on the skis is safe, enjoyable and that they have fun.

Mathias Bihler: This concept is very similar to how we work with our customers. The more we know about them and their requirements, the better we can customize our products and processes for their specific manufacturing needs. For example, after working with a company on several projects or in our case with customers for over 55 years, we know exactly how to configure the slide, feed, and press units, electronic control units, and machine layout and set-up to best meet their specific needs.

I think your Membership Program is an innovative business model for the ski circuit and is going to be a great success. Especially when you travel around the world, it is very inconvenient to take your own ski equipment with you – not to mention the problem of cramming the entire family and equipment into the car.

b on top: Mr. Bihler, in your business you have a similar customer

Bode Miller, skiing icon and entrepreneur:

»Above all, it is imagination, your own vision that will drive you forward.You have to imagine where you want to go and what you want to achieve. There are no limits.«

product information exchange. To what extent can Bihler machines be optimized while in production?

Mathias Bihler: Yes, we work very closely with our customers through an open dialog to best understand one another; it is a two-way street of information being exchanged.
We have over 55 years of manufacturing experience. The Bihler know-how has not only been handed down over the generations to Bihler employees, but also to our customers, teaching them how best to implement our technology.
In today's world of instant messaging, we are also interfaced with our customers' manufacturing processes. The focus right now is Digital Services - Industry 4.0, which is the ability to remotely access, monitor, and analyze a manufacturing process in real-time data through digital interfacing. The goal is to dramatically reduce the troubleshooting timeframe by quickly implementing solutions that maximize machine productivity.

An example of this is our Remote Diagnostic Assistance offered by our Customer Support Division. At the request of our customer, a Bihler service technician logs in via the internet to their manufacturing process and instantly begins evaluating data. This trouble-shooting can take as little as a few minutes and the customer is soon back up and running.

Often the customers are looking to optimize their entire manufacturing process and in this case our staff must analyze their process for an extended period of time. Based on real-time data we gain a detailed overview on how best improvements should be implemented. This service is available to our customers worldwide.

Bode Miller: That level of information exchange is not found in the traditional world of ski racing. In our business model we very much value such feedback. In fact, it is crucial for our business plan to work successfully. We give our customers a lot of information about skiing and through this dialog we get a lot of information in return. An average customer in our Membership Program will ski at least ten different ski models per year and we learn how each model performed. In comparison to a traditional skier, who might buy one or two pairs of skis every year or two, there is no feedback. The better we educate our customers on the importance of quality skis, proper tuning, and how they both affect their overall skiing experience, the more they will value the advantages of our products – then we are both successful.

b on top: As a professional skier, you know what you are talking about when it comes to ski performance. As a recreational skier, I might not have the right

►

terminology to accurately describe ski performance. For example, I might be describing grip when I might mean something different. How can you interpret this information?

Bode Miller: Our customers might not always have the right terminology, but as someone who has skied their entire life, I can tell exactly what the customer is trying to explain. The information feedback is going to come from a wide range of skiers.

It may be as simple as: "with this model I had a lot of fun, or they did not like the ski, or it did not perform as I would have liked." With time, you begin to have a database of information that speaks for itself. Small nuances that do not fit into this format may occur, but at the moment there is no other business model quite like ours.

b on top: Have you implemented sensors into your skis to collect data, like those found in Bihler machines?

Bode Miller: We have integrated chips into our skis, they are not as sophisticated at the moment, although customer information and tuning specifications are stored. When skis are returned to us, we analyze the data, such as vibration and reaction time in relation to the customers' demographics and ski location conditions. Over time, this helps us to better understand how the skis performed under various parameters. The end result is better, more customized service for all our Membership Program customers.

Mathias Bihler: To get back to ski design and development – have you ever considered different materials, such as carbon fiber? Since the stiffness will be determined on how you insert the mesh, you may gain better flexibility and stability. You see, my father was glider pilot and worked closely with the glider manufacturer to optimize performance.

They were constantly experimenting, making adjustments here and there to improve the stiffness of the wings and reduce the weight of the glider. Always looking for ways to go further and faster. I can imagine that this concept is very similar to engineering skis for optimum performance.

Bode Miller: There is very little motivation to experiment with those types of idea in the ski world. To my knowledge, not even the major ski equipment companies are working on anything like that. They are too concerned with retaining their market share and selling skis. Only when something new and innovative is presented on the market do they react. Then they all scramble to catch up.

I do not want to sound too negative, but as an athlete who has spent my entire career trying to improve my capabilities, it is frustrating when the same degree of commitment is not shared by the ski manufacturers. Of course, there have been some developments, such as rocker skis, which are now wider. However, the technology used to develop them is not innovative. They are not building on previous experience to gain knowledge, and with this philosophy you cannot create innovation products. For me that does not make sense, that is not how I like to work. So I welcome the opportunity to build upon friendships and establish business relationships with companies that have the same commitment and desire to create something better.

As a member of the US ski team, I often had very heated discussions

with equipment manufacturers. For me it was personal. I was the one trying to be the best skier in the world, training day in and day out, risking my life to get the job done. I wanted more, I expected more, and unfortunately, I was disappointed with their lack of commitment to R&D. I was considered a trouble-maker; however, I do not think that is the right description of someone who just wants to move forward and improve something. I believe that as an innovator and that is why I am working with Bomber skis.

Mathias Bihler: Despite this, you went on to become one of the best skiers in the world. You got where you are today thanks to your own commitment, self-discipline and your own vision. What vision would you give the young people of today?

Bode Miller: I would tell them it is all about knowing and learning about yourself. Find your true passion in life. Above all, it is imagination, your own vision that will drive you forward. You yourself are in control and this is your motivation. You have to imagine where you want to go and what you want to achieve. There are no limits.

Mathias Bihler: As Einstein said, "Imagination is more important than knowledge. For knowledge is limited." This is true. When a customer presents us with a new project we need imagination. Even with our 60 years of Bihler manufacturing know-how, our knowledge is limited. It is only through imagination, envisioning what could be possible, that we can build upon our knowledge and effectively implement solutions. And this takes courage. This is innovation. It is the Bihler culture and it is what drives us.

Bode Miller: Imagination doesn't always work the way you think it does. First of all, it is working all the time – I mean, you are probably imagining something right now. Your subconscious is off doing something. You just have to give it the respect and the fuel it needs to develop. This means not pushing it aside like a kid does with his toys and never touching it again. You have to exercise that part of your brain and make sure that you explore it. It may just be a question of everyday household activities but ultimately, it's the same concept. There are always things you can do to improve yourself.

b on top: You have celebrated some very high points in your long and dynamic career, as well as, the agony of defeat and serious injury. How were you able to handle these situations?

Bode Miller: I enjoy my life to the fullest. I am an optimist, so I always try to have a good time and make the most out of even a bad situation. When I am down, say I have an injury, I try to look on it as an opportunity to do something that I typically do not have the time for, such as read a book. All of a sudden, your priorities are turned upside down and suddenly you have time to explore other interests - this allows you to grow as a person and not be just one-sided. That I could keep up this optimism after so many years and injuries, has again to do with self-discipline and determination. I may have said that a lot in this interview, but without them you are lost.

b on top: Will you continue to pursue a career as a professional skier?

Bode Miller: I don't think so, my children are now my top priority. Now I am concentrating on all the work at hand in my company. Currently, we are developing a new binding. I test-skied the prototypes last season but their reaction time was way too slow. The binding and the ski must work as one synchronized movement and this only happens when the tension in the body is instantly transferred through the boot to the binding and on to the ski. When this happens, everything is perfect. I believe the design of the binding can be further optimized, but for this I need a strategic partner.

Mathias Bihler: We would be happy to work with you on these ideas. After all, providing innovative solutions for technical challenges is our daily business. We could review your design, make recommendations, and provide prototypes for testing. I would even volunteer to go on a test run with you. We work on such challenges every day and we would welcome the opportunity to further develop your products with you. We have the resources and it would be my pleasure to work with you.

Bode Miller: That would be great! Thank you for your offer and I happily accept! ■

Bode Miller, born on October 12, 1977 in Easton, New Hampshire, USA, is his country's most successful professional ski racer and one of the few all-rounders to win races in all the World Cup disciplines. During his career, Miller won the gold medal in the Combined event at the 2010 Winter Olympics, as well as four World Championship titles in four different disciplines (Combined, Giant Slalom, Super G and Downhill). To this tally can be added five more Olympic medals, a further World Championship medal and two overall World Cup titles, as well as numerous victories in the Super-G, Combined and Giant Slalom World Cup disciplines. Bode Miller is one of only five skiers to win World Cup events in all five Alpine disciplines and to date the only one to achieve at least five victories in each. In the course of his career, Bode Miller began to develop his own skis and he is now co-owner of the high-end ski manufacturer Bomber. He lives with his family near Los Angeles in California.

SPECIALIST TERMS EXPLAINED

THE BIHLER GLOSSARY

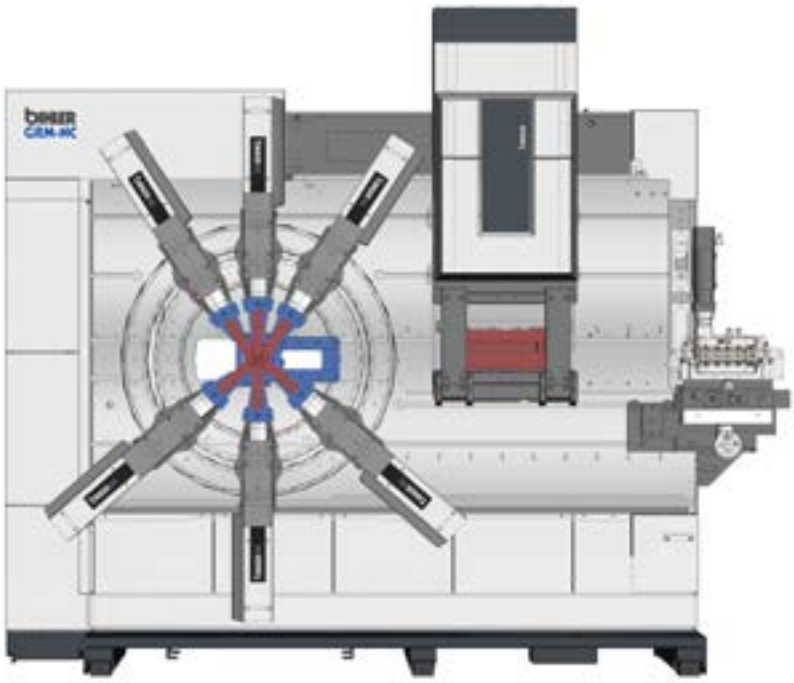
As a world-leading system supplier of forming, welding and assembly technology, Otto Bihler Maschinenfabrik provides its customers with a full range of innovative, high-performance solutions. The Bihler Glossary explains the most important parts and procedures involved in Bihler's machine technology.

RADIAL AND LINEAR

Bihler machines use two fundamental tooling and manufacturing setups: linear and radial. These differ in the way that the individual machine units are arranged. In a radial setup, they are arrayed in a circle around the processing center. In a linear setup, the tool components are positioned parallel to the processing level. The machine configuration chosen for a particular job depends on the steps involved in manufacturing the part.

RADIAL SETUP

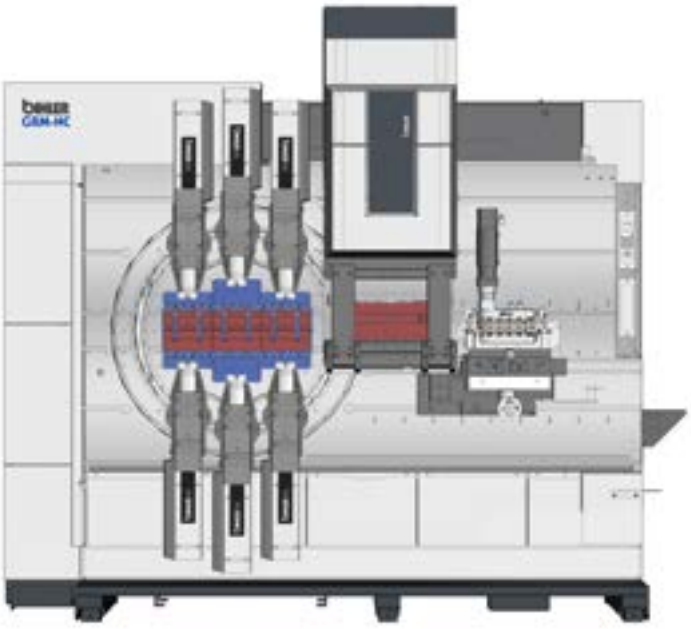
In a radial manufacturing solution, parts are processed in a single, set sequence, in the machining center, where all the bending operations take place. Having the machine units arranged radially and working inward toward the center maximizes the possible number of movements that the units can make. Such systems are equipped with six slide units as standard. In contrast to a linear setup, parts – either pre-punched on a press or cut directly from a punch strip – are bent into their final shape in multiple steps. How the slide units are arranged depends on the part's geometry and dimensions, the thickness of the material, and the manufacturing quality required. A radial manufacturing setup is particularly well suited to making, say, relatively simple parts that require just a small number of bending operations, or parts with an appropriate geometry, such as bushes, rings or flange clips.



In a radial setup, parts are processed by machine units arranged in a circle. Many of the tools required can be made with the Bihler Leantool system.

Radial Leantool

Many tools needed for a radial manufacturing solution can be created using the Leantool system. This uses a base set of standard Bihler components which are extensively pre-engineered to enable fast, inexpensive final tool manufacture. Tools made with this system can be fitted to all RM and GRM series stamping and forming machines.



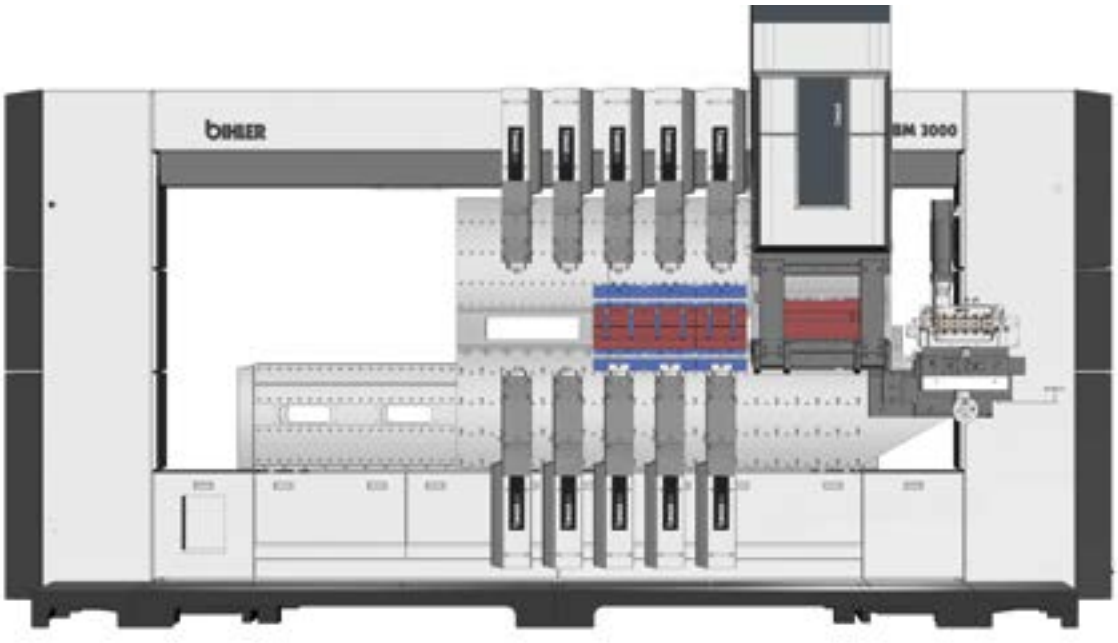
In a linear setup, the processing is performed by vertically arranged machine units. Going forward, it will also be possible to use the Bihler Leantool system to make the tools needed for this kind of setup.

LINEAR SETUP

Linear manufacturing is a well-established approach to stamping and bending which, in terms of procedure, is like progressive die stamping. Stamped and bended parts are not cut as such but remain attached to the carrier strip while they are processed. The strip is fed through a sequence of processing stations along a machine line and is only separated from the finished parts once the final operation has been performed. In Bihler systems of this kind, the slide units are arranged in a linear fashion and positioned vertically, above and below the main processing level (the perforated workplate), with sufficient clearance to accommodate the punch strip. A linear setup is typically the preferred tool arrangement for, say, complex parts that involve a large number of bending operations, or parts or assemblies that require additional working steps such as thread cutting, screw insertion, welding, feeding or assembly.

Leantool for linear systems

In the future, it will also be possible to make linear tools using the Leantool system. These will be able to operate in any RM and GRM mechanical stamping and forming machines and in any BIMERIC servo-controlled production and assembly system. From early 2019, the expanded modular Leantool system will be available for all users of linear production solutions. ■



In the future, it will also be possible to make tools for BIMERIC servo-controlled production and assembly systems using the Leantool system.

B. ON TOP HIKING TIP

THE ALLGÄU'S MATTERHORN

At 2,592 meters, Hochvogel mountain is a prominent, iconic landmark in the Allgäu Alps and the highest of the region's giant peaks. Climbers call it the Allgäu's Matterhorn – and not without good reason. To make the ascent, you need to be physically well-prepared and surefooted, but hikers who reach the summit are rewarded with spectacular views across the German border into neighboring Tyrol.

To make the very most of the nine-hour trip to the mountaintop and back, it is worth planning an overnight stay in the comfort of the Prince Luitpold House. The tour begins in Hinterstein, where a bus service is on hand to take hikers up to the Giebelhaus restaurant. The ascent to the Prince Luitpold House begins there.

The view from Hochvogel is truly stunning, with a vista that takes in mountain peaks like Zugspitze, Grossvenediger, Parseierspitze, Ortler, Hoher Riffler and Säntis. From the Prince Luitpold House, a mountain refuge run by the German Alpine Club, the route ascends to Kalter Winkel via Balkenscharte. Here, even in summer, you still find pockets of snow. The climb continues across scree and along rocky ledges secured with steel ropes, rising steeply to Hochvogel's summit. The descent follows the same route via Kalter Winkel. Hochvogel is currently only accessible from the German side because the way down into Tyrol's Lech valley has been closed for safety reasons. This means we follow the downward route via Kreuzspitze – easily manageable, thanks to the sections secured with ropes. We continue from Kreuzspitze back to the Prince Luitpold House and then on to the Giebelhaus restaurant. From there, we take the shuttle bus back to Hinterstein.

Further information:
www.outdooractive.com/de/bergtour/allgaeu/hochvogel/1371022/ ■

Reaching 2,592 meters above sea level, Hochvogel is a proud and imposing peak.

Highly recommended: an overnight stop at the Prince Luitpold House on the way to the summit.

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