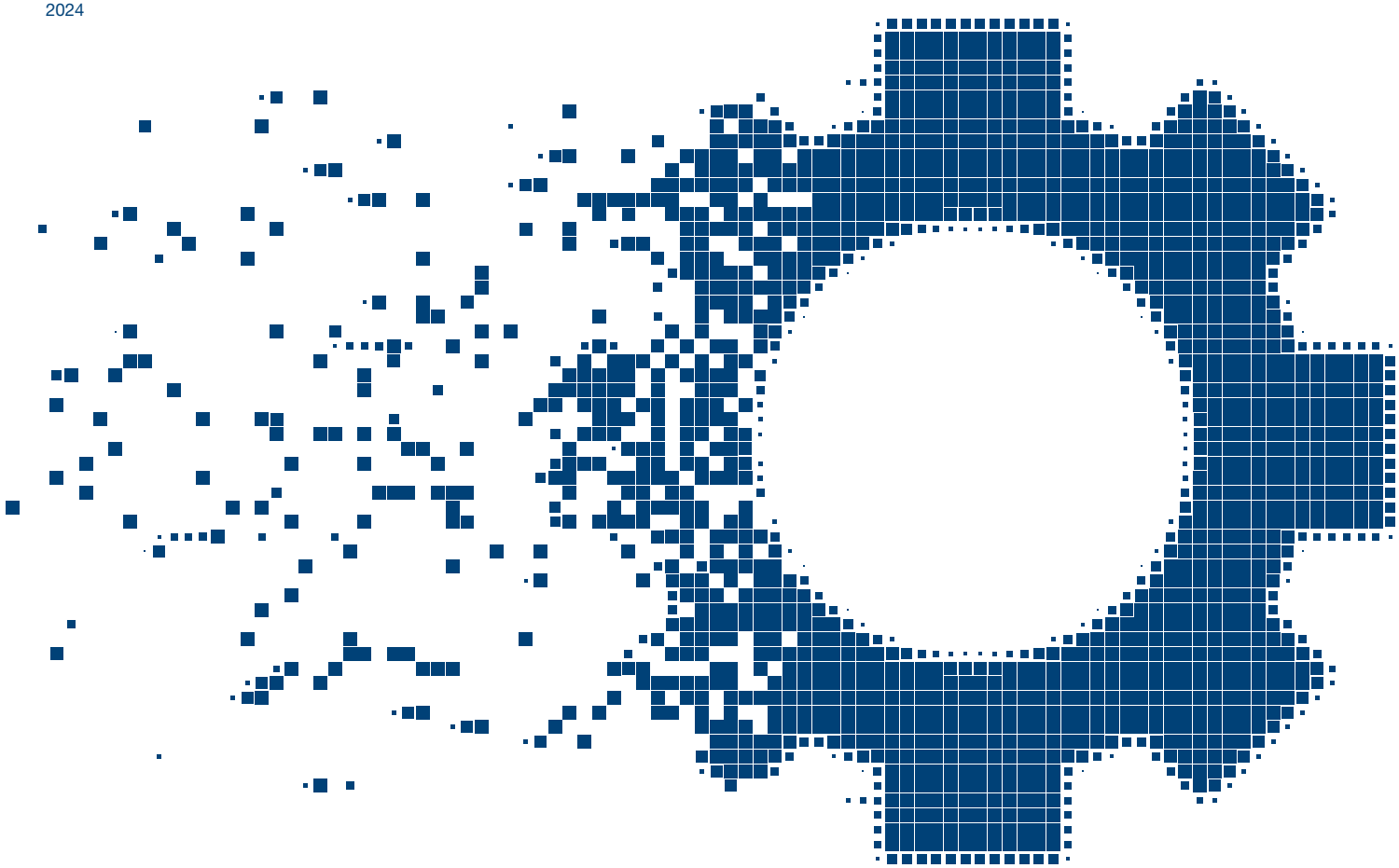
b on top

THE MAGAZINE OF
OTTO BIHLER
MASCHINENFABRIK
GMBH & CO. KG
2024



THE FUTURE IS DIGITAL

◄ The future is digital

The cog wheel composed of individual pixels symbolizes how digitalization combines the real and virtual worlds and creates new value-added. In the metalworking industry, this approach can deliver productivity gains as high as 20 percent.

b. on top 2013 – The magazine of Otto Bihler Maschinenfabrik GmbH & Co. KG

Responsible editor: Pedro Gato López, Otto Bihler Maschinenfabrik GmbH & Co. KG, Lechbrucker Straße 15, D-87642 Halblech, Tel. +49(0)8368/18-0, Fax -105, info@bihler.de, www.bihler.de
Technical Editor for Bihler: Vinzenz Hörmann

Published by (editorial, design, production services): mk Medienmanufaktur GmbH, Döllgaststraße 5, D-86199 Augsburg, Tel. +49(0)821/34457-0, Fax -19, info@mk-medienmanufaktur.de, www.mk-medienmanufaktur.de

All information published as at September 2024. Subject to errors and alterations.

Cover photo: AdobeStock.com/Aha-Soft. Photos: Bihler/Pedro Gato López/Thomas Loderer. photodesign armin buhl (p. 8–11, p. 4), Füssen aktuell (p. 11), istockphoto.com/Thossaphol (p. 12/13), istockphoto.com/gorodenkoff (p. 14/15, p. 4), istockphoto.com/traffic_analyzer (p. 28), Elias Hassos (p. 29), picture alliance/dpa/Arne Dedert (p. 30), Sportograf Digital Solutions (p. 31), istockphoto.com/Drypsiak (p. 30/31), privat (p. 31), HARTING Group (p. 32–37), AdobeStock.com/MKozloff (p. 44/45), istockphoto.com/Iryna Melnyk (p. 56), Patterer GmbH/Sebastian Westphal (p. 61), picture alliance/ASSOCIATED PRESS/Marco Trovati (p. 74/75), Schaeffler AG (p. 79), Muhr und Bender KG (p. 86), Hager Electro SAS (p. 89), Metalltechnik Annaberg GmbH & Co. KG (p. 89), AdobeStock.com/xy (p. 90/91), Simon p.A.U. (p. 94), istockphoto.com/sefa ozel (p. 95), Michael Kießling (p. 96), Gira/Giersiepen GmbH & Co. KG (p. 96), istockphotop.com/Skyimages (p. 97), AdobeStock.com/Anlomaja (p. 98/99), Hoch Zwei/Gruppe C (p. 102–105, p. 107, p. 5), Michael Kießling (p. 108–111).

"DIGITALIZATION WILL PLAY A DECISIVE ROLE IN ENABLING US TO SEIZE THE OPPORTUNITIES OF THE FUTURE."

Innovation is essential in order to remain competitive in the market and digitalization will play a decisive role in enabling us to seize the opportunities of the future. These two factors are therefore the key to long-term success in an increasingly networked world.

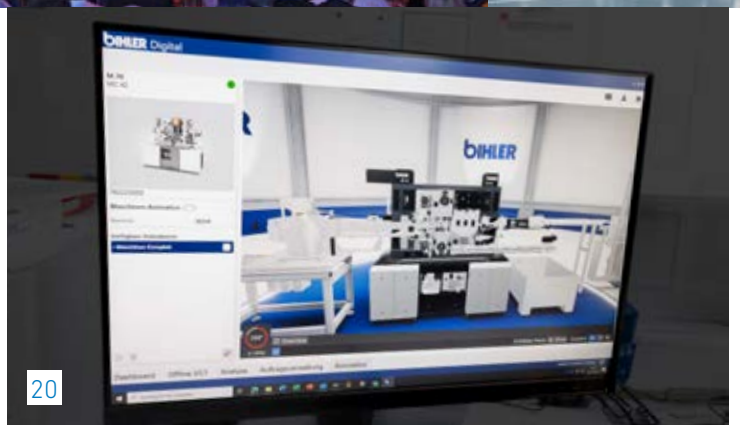
Enterprises that have recently secured a robust technological and financial market position and have been able to differentiate themselves from their competitors will continue to attract high levels of demand and help to shape the future. This is because, despite all the challenges facing businesses worldwide, the demand for high-quality components remains as great as ever.

Companies will therefore be rewarded for focusing on their strengths and using digital technology to benefit fully from all their manufacturing potentials. And we will support you in this with all our expertise and our highly-automated technology solutions. These also make it possible to rise to current challenges such as demographic change and the shortage of skilled labor.

The many projects that are presented in this edition of b on top impressively illustrate how our partners and customers have successfully got to grips with the current challenges and decisively improved their productivity and competitiveness. Let yourself be inspired by them! We hope you enjoy reading the current edition,

Mathias Bihler,
President

b.on top 2024



CONTENTS

TRAINING EVENT FOR THE NEXT GENERATION OF TALENTS

"Do whatever you want but make something of yourself!" – this was the inspiring motto that set the tone for the Training Day at the Bihler plant in Füssen in June 2024. Some 150 visitors attended, interested in finding out out at first hand from the Bihler trainers and current apprentices staffing the ten event stations about the wide range of technical and commercial occupations in which Bihler offers apprenticeships. And the young visitors were able to have a go themselves and get their first practical experience in a wide range of participatory hands-on projects, such as assembling a Rubik's cube or a soldering practice session. "The visitors, and the younger ones among them in particular, were very enthusiastic about the event, which has led to a number of new applications for apprenticeships," reports Bihler Apprenticeship Manager, Gloria Schiel.

So far, more than 1,500 young people have completed an apprenticeship at Bihler – consistently achieving above-average levels of success. One of these is Laura Mayrhans, who completed her training as Technical Product Designer with a score of 1.0, making her one of the top four out of the 279 graduates in her subject. At the same time, Adrian Reichart was singled out as one of the 77 best apprentice toolmakers by the Swabian Chamber of Trade and Industry. Both of these graduates are now firmly established in the Bihler team, just like all of the company's other apprentices from the same year. ●

VIBRANT PARTNERSHIP

This year sees the 75th anniversary of the globally-active M.S.Ambrogio Group, which has its headquarters in the Italian town of Cisano Bergamasco. To mark this very special occasion, representatives of the family-run company paid a visit to Otto Bihler Maschinenfabrik in September 2024 – celebrating the fact that the two businesses have been working together without interruption for the last sixty years. In Halblech, the twelve-strong visitor group, which included CEO Mario Sangalli as well as management personnel from Italy, Germany, Hungary, Brazil and the USA, were treated to a factory tour, a number of exciting presentations and intensive and informative discussions regarding Bihler's latest developments and service offerings. One thing was clear: The M.S.Ambrogio Group will continue to rely on Bihler's technology and expertise in the future and make sure that the partnership-oriented collaboration between the two companies continues well into the future. The visit culminated in a shared dinner featuring regional delicacies and a visit to Neuschwanstein Castle. ●

Mathias Bihler welcomed the group of visitors from M.S.Ambrogio, which was led by CEO Mario Sangalli (second from right).

THE NEW VICE PRESIDENT SALES & MARKETING KNOWS THE VALUE OF TALKING TO CUSTOMERS

As of January 1, 2024, Markus Schnöll has been Vice President Sales & Marketing at Otto Bihler Maschinenfabrik. The 46-year-old holder of this newly created position is responsible for Sales, Marketing and Customer Support and heads a four-strong team of Sales Managers who, in turn, support customers and partners worldwide in their acquisition of new machines as well as with services for their existing systems. "It is particularly important to me to listen to the needs and wishes of our customers worldwide, to provide them with optimum solutions and to establish long-term partnerships with firm roots," explains the Halblech-born Schnöll. "I am very much looking forward to working together with my colleagues to help new and existing customers use our technology in ways that open up completely new dimensions in manufacturing." There can be no doubt that Markus Schnöll possesses the necessary skills and experience. After all, he has spent the last two years at Bihler working as Regional Sales Manager for Bavaria-South and Austria and before that, he worked for many years in various sales positions in internationally active businesses in the connector and solid forming industry. In his leisure time, this father of three likes to go mountain biking and fishing in the region in which he lives and works. ●

Markus Schnöll
Vice President Sales & Marketing
+49(0)8368/18-144
markus.schnoell@bihler.de

STATE-OF-THE-ART COATING SYSTEM

Otto Bihler Maschinenfabrik recently extended its coating capacity with the acquisition of a new "Oerlikon INNOVENTA kila". This latest-generation PVD coating system makes sure that the surfaces of metal mold tools are durable, tough and of irreproachable quality. It ensures that the functional surfaces last longer, support higher throughputs and benefit from optimum wear resistance, leading to higher-quality manufactured part surfaces. The new system can currently be used to apply the four hard material coatings: Bihler Bihler A, Bihler D, Bihler Futura Nano and Bihler ALCRONA PRO. These coating systems are perfectly designed for an extremely wide range of applications and materials. ALCRONA PRO, in particular, is a very good alternative to the Bihler B coating, which is no longer available. Moreover, the two new coatings Balinit Mayura and Balinit Alcrona Evo will be available as of the second quarter of 2025. These hard-material coatings further extend the service lives of the active tool components, improving their productivity and ensuring constant high precision and process reliability by optimizing their friction properties. A coating calendar with precisely defined coating times ensures particularly short and, most importantly, plannable delivery times. ●

“EVERYONE IN STEP“

In fall of last year, Otto Bihler Maschinenfabrik celebrated the company's 70th anniversary at an enchanting birthday event. Approximately 350 guests from every part of the world enjoyed an evening full of spectacular acts, foot-tapping music and moving moments that placed the emphasis firmly on togetherness. A look back at the event

Against the fairy-tale backdrop of Lake Forggensee and Neuschwanstein Castle, the spectacular gala event which Otto Bihler Maschinenfabrik held in fall 2023 to celebrate the company's 70th anniversary got underway with a welcome drink and greetings from company head, Mathias Bihler. The terrace of the Füssen Festival Theater saw some 350 guests from home and abroad relax and get into the swing of the event, which then started in spectacular fashion in the venue's large auditorium – with a unique blend of music, lights and dance which brought the typical sound of Bihler's machines to life in an infectious rhythm that soon had everyone tapping along in time. And it was this feeling of everyone being in step that Mathias Bihler returned to in his opening address, in which he thanked all the company's partners and customers for their long-standing collaboration and the very special spirit of togetherness that is so characteristic of Otto Bihler Maschinenfabrik.

With Event Coach, Jo Wiemers, presenting the acts, the virtual retrospective of the 70-year success story got underway and the event's final show sequence started up right on time to coincide with the serving of the main course. First, the oversized "b" of the Bihler logo was coaxed into life by messages and greetings sent by employees worldwide. Then, once again underpinned by the infectious rhythm of Bihler machinery, the dancers and acrobats struck up the Bihler song, which had been specially composed for the event and celebrated the unique spirit of teamwork that reigns at Bihler. To underline this, the song was accompanied by the entrance of Bihler employees into the hall, where they took part as a large choir in the musical finale of this extremely successful festival event, which continued merrily into the early morning hours. >>>

You can experience more of the anniversary celebration in a YouTube video:

Company head, Mathias Bihler, personally greeted all the guests as they got into party mood on the terrace of the Festival Theater.

The Bihler Managing Board: Mathias Bihler, Martin Niklas, Bernd Haußmann and Manfred Grundner (from left to right).

A splendid prelude: The celebrations at the Füssen Festival Theater got underway to the inviting sound of music against a fairy-tale backdrop.

The acts performed by the musicians, dancers and acrobats made sure that everyone was in just the right mood.

One of the evening's highlights: Bihler employees struck up the Bihler song which had been composed especially for the event (left).

Numerous partners and customers from Germany and abroad were among the guests at the anniversary celebration.

HOW TO INCREASE PRODUCTIVITY?

THE FUTURE IS DIGITAL!

Acting as a virtual map of a production system, the digital twin bridges the gap between the digital world and the real manufacturing environment. It links together humans, machines and processes in real time and ensures greater efficiency and higher quality in the engineering and planning phase, during subsequent parts production as well as during training and instruction activities. In this way, users can harness digital technology in order to benefit fully from the existing potentials and generate the additional productivity that is of decisive importance for their businesses.

Otto Bihler Maschinenfabrik was quick to recognize the potentials of digitalization, and the world's leading system supplier of stamping-and-forming, welding and assembly technology has been consistently further developing its portfolio of digital solutions over recent years. Nowadays, all users are able to benefit from an extensive set of digital tools and services that they can use precisely as required throughout the entire value-added chain: from the initial engineering and planning phase, through parts production itself and on to the accompanying training and support. The aim is clear: "With our smart product and automation solutions, we link the real world of stamping-and-forming technology to the digital world. These solutions work in real time to network products, machines and human beings and permit the cross-system use of all the data that is relevant for production," explains Mathias Bihler. "In this way, the wastage and inefficiencies that are present in every company can be clearly revealed and targeted measures can be taken to eliminate them. As a result, all users are able to perform the development work faster, produce more efficiently and save valuable resources – and therefore also generate the additional productivity that is vitally important for keeping their businesses competitive." And this extra productivity is easy to quantify: Practice has shown that users that take full advantage of Bihler's digital technology are able to increase their productivity by an average of 20 percent.

Comprehensive database The best way to go about unleashing these productivity potentials is the digital twin, which acts as a virtual map of the system and the entire manufacturing process. At Otto Bihler Maschinenfabrik, the digital twin is created on the basis of the engineering design data during the system development process. It forms the basis for the entire manufacturing process and supplies all the process data corresponding to each individual product. This data is stored so that it is available whenever needed. For every part, it is therefore possible to

The virtual depiction of the manufacturing environment can be used for analyses, optimizations and training modules. It helps all users perform their development work faster, produce more efficiently and save valuable resources.

look back and identify areas which might harbor potential problems, for example in terms of the machined material. Even today, the digital twin is already available as standard for all high-tech manufacturing solutions, such as the Bihler BIMERIC servo production and assembly system – and in the future, Otto Bihler Maschinenfabrik will also supply digital twins for all new Bihler systems.

Virtual configuration The digital twin of a Bihler system opens up a range of new possibilities because it can be used repeatedly for a range of specific purposes throughout the entire process chain. This starts during the engineering and planning stage, long before the actual production operations begin. During this phase, the entire system can be optimally configured down to the tiniest detail. Possible malfunctions and sources of error are therefore immediately revealed and can be eliminated as early as the design phase. And, of course, the digital twin can also be used to play through and optimize a wide range of different production processes, designs and prototypes before they go live. This further increases the quality of Bihler systems, meaning that customers take possession of outstandingly reliable, high-performance Bihler solutions that offer them the greatest possible process reliability and product quality. However, they also save an enormous amount of time because the digital twin ensures not only trouble-free but also particularly rapid real-life commissioning of the system.

Optimization during live operation Once the Bihler system is running and producing parts, the digital twin can significantly increase production efficiency and help operators take full advantage of optimization potentials at the machine and in the manufacturing process. To assist in this, Bihler can provide various digital tools, which are also available in the "Bihler Digital App", for example in the form of a dashboard and an Analysis module. This displays the current machine status in real time so that the machine

data can be filtered and processed, for example in order to produce trend statistics. The "Job management" module is equally useful. This allows users to create, edit and plan jobs conveniently at their desks and then feed them digitally into the production environment. Changes and adaptations to the system can also be simulated and implemented quickly and efficiently in the digital twin directly at the desktop computer in the user's office, without there being any need to work at the actual machine. This is possible thanks to the "Offline VC 1-programming" module which, for example, is ideal for programming new tools or configuring existing ones. "All the functions, analyses and programming activities can run during live operation without it being necessary to shut down the machine and halt operation," emphasizes Mathias Bihler.
By optimizing the production processes using the digital twin, it is also possible to reduce material usage and energy consumption. And last but not least, the real-time data also permits predictive maintenance and more efficient planning and these, in turn, help reduce maintenance costs.

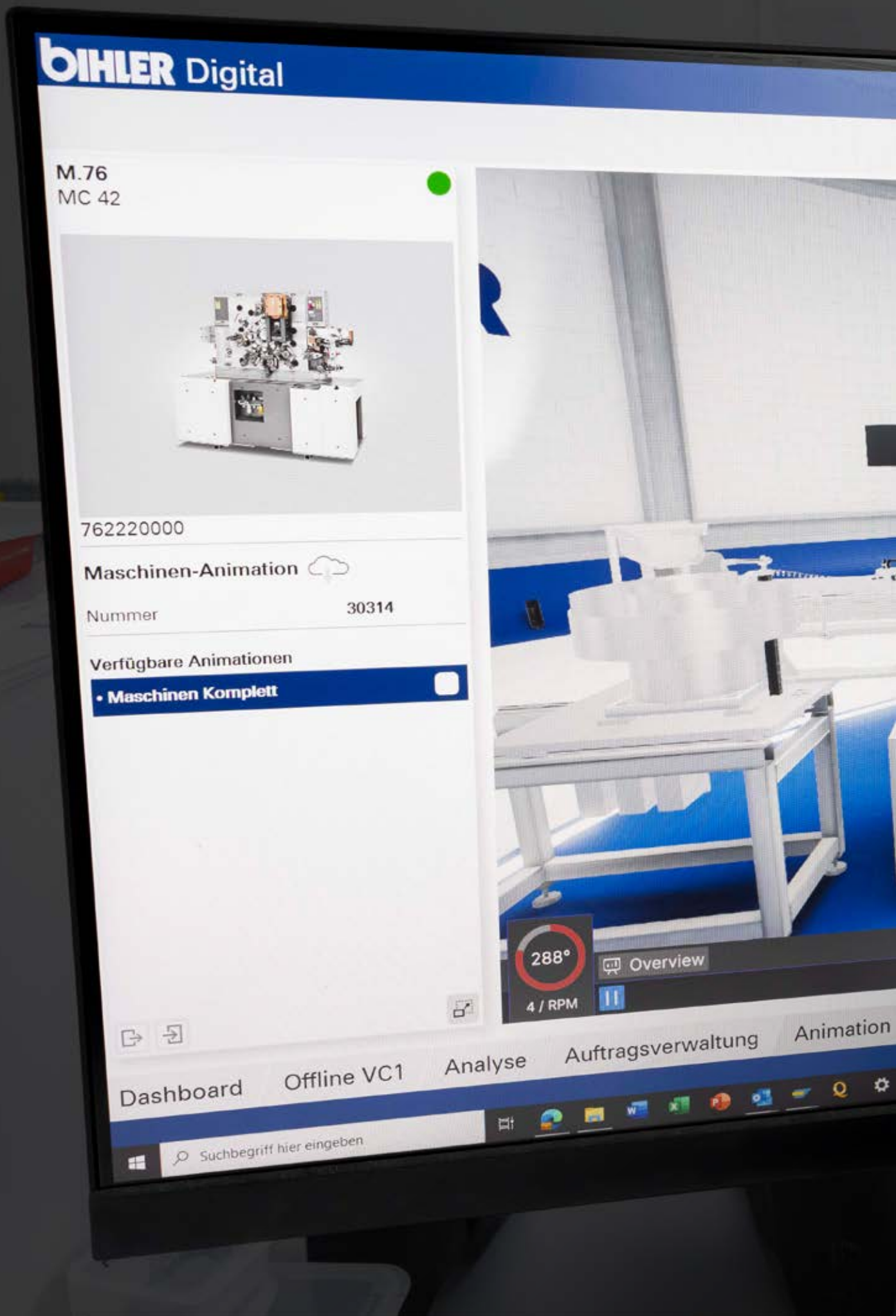
For training and instruction activities And even after live production has started at the Bihler system, the digital twin continues to show its value, in particular when performing feasibility and project studies as well as for training and instruction activities. All of this is possible reusing the animations and simulations of the manufacturing process that have already been created. These permit a purely virtual, almost playful exploration of the Bihler system in real time, free from all the limitations that constrain training at the actual machine. In this way, all users can try out the various scenarios and machine parameters in a secure virtual environment. One very important feature is the capability to play through the complete programming of the axis movements of the NC units at the touch of a button in the "Offline VC 1-programming" module. The Bihler "Animation" module is also

The entire process and the accompanying tools can be fully depicted, tested and optimized at the virtual twin of the Bihler system – without it being necessary to shut down the machine and halt operation.

perfectly suited for training and familiarization purposes. It permits the visualization of complete production systems as well as individual assemblies or tools, which can then be animated based on game engineering principles. In this way, the complete production process can be observed from strip feed through to the end product and additional information, such as settings sheets or instructions, can also be stored in the application.

Profitable for all parties "The purpose of our digital solutions and the digital twin is to simplify production and increase production efficiency for all users. They make a major contribution to the manufacture of reproducible, uniformly high-quality parts. They are intelligent solutions that enable even less highly-qualified personnel to maintain outstanding production quality," continues Mathias Bihler. "And if a customer does ever experience a problem, we can use the digital twin of the system to perform a fault analysis and eliminate the malfunction without any loss of time, because there is no longer any need for a service employee to travel to the customer's premises." The ordering of spare parts is equally simple and efficient. Bihler itself also benefits from the digital twin because the data for every component and every part is transparently available and provides the basis for subsequent optimizations or adaptations. "The digital world and the digital twin therefore help us and our customers to go on improving and effectively differentiate ourselves from the other actors in the market," is how Mathias Bihler sums up. And all of this will be even more effective in the future because the next development stage will be to use algorithms to link the digital twin to Artificial Intelligence. One example of this might be a self-teaching control loop, for example to compensate for differences in the material in a batch, with integrated sensors recording the current values in real time and automatically adapting the production process via the corresponding actuators. ●

HOW TO MAKE THE MOST OF THE AVAILABLE POTENTIAL?


BIHLER Digital
M.76
MC 42
762220000
Maschinen-Animation
Nummer
30314
Verfügbare Animationen
• Maschinen Komplett
288°
4 / RPM
Overview
Dashboard
Offline VC1
Analyse
Auftragsverwaltung
Animation
Suchbegriff hier eingeben

USE BIHLER'S DIGITAL TECHNOLOGY!

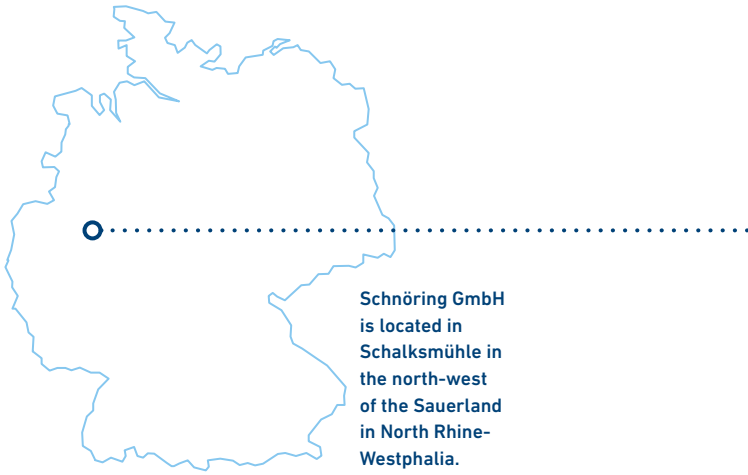
The company uses the Bihler Multicenters to manufacture the ground connectors and protective contacts for GIRA sockets. The solution provides capacity for more than 35 million parts per year.

Since it was founded in 1926, Schnöring GmbH, which is based in Schalksmühle, has grown continuously and now possesses approximately 110 spring winding machines as well as some 50 Bihler stamping-and-forming systems. The family-run company, which has been part of the KERN-LIEBERS Group since 2018, uses this equipment to manufacture springs, wireform parts, stamped-and-formed parts and assemblies on a production area of approximately 16,000 m^2. Since 2008, the company's assemblies business has also included the manufacture of components for GIRA sockets. More specifically, it produces ground connectors together with the right and left-hand variants of the associated Schuko contacts. And the company now possesses a new manufacturing solution for precisely these components that not only brings practical advantages but also creates significant virtual value-added. This is because the entire Schuko contact production process has been digitalized and is available as an animation – in a similar way to the digital animation module in the Bihler Digital App, which makes it possible to visualize and animate complete production systems, as well as individual assemblies or tools, without the need for any additional software. "We mainly use the animation for training purposes. It enables us to show even inexperienced employees without any CAD knowledge exactly what happens where and when in the tool. The information and notes on specific tool setting capabilities that are stored in the animation are also useful," explains Axel Schnöring, who is responsible for the KERN-LIEBERS Lead Center Stamped Bent Parts in Schalksmühle. "The animation helps us give our employees the know-how they need to handle what is, after all, a complex process chain and give

Jürgen Brielmaier, COO of the KERN-LIEBERS Group.

Virtual process animation Doubled throughputs

Schnöring GmbH has recently started using three type-MC 42 and MC 82 Bihler Multicenters to manufacture assemblies for GIRA sockets. This long-standing company uses a virtual animation of the new production solution for targeted demonstrations and training activities. The animation illustrates every detail of the entire, highly-complex process chain, which not only achieves the desired 50 percent increase in throughput but also ensures that Schnöring is able to deliver particularly high-quality ground connectors and Schuko contacts. Close, constructive cooperation with Otto Bihler Maschinenfabrik played a key role in ensuring the overall success of the project.



Schnöring GmbH is located in Schalksmühle in the north-west of the Sauerland in North Rhine-Westphalia.

them exactly the skills they need to operate it," adds Jürgen Brielmaier, COO of the KERN-LIEBERS Group. "However, we can also use this type of animation to provide our customers with valuable support, for example when they make a change to a product and need the corresponding solution. Animations therefore perfectly complement conventional sample parts."

Clear requirements "In the past, we also manufactured the components for the old GIRA socket on Bihler machines. Starting with a throughput of 80 strokes per minute, we were able to increase output up to approximately 100 per minute over the years, but that was definitively the limit to our capacity," recounts Schnöring. "However, a few years ago, our customer further developed the sockets. In addition to adapting our production approach, we also had to find a way of increasing throughput in order to be able to manufacture more than 700,000 components per week. And the dimensional precision of the components, which was already very good, had to be improved even further.

Axel Schnöring, responsible for the KERN-LIEBERS Lead Center Stamped Bent Parts in Schalksmühle.

Manufacturing at the strip It was clear that these requirements could not be met using the existing equipment – with the result that Schnöring GmbH worked together with Otto Bihler Maschinenfabrik to develop a completely new production concept. This is designed around two new Bihler Multicenter MC 42 machines together with a new Bihler Multicenter MC 82. The latter of these is used to manufacture the ground connector, which consists of six individual parts. Of these six parts, the clip and the casing are stamped and bended on the MC 82 and are then assembled with the other four parts (two fingers, a retaining spring

Using the Bihler Multicenters, practically all the process steps are performed at the strip and no longer at the individual component. This proved to be the perfect way to achieve the required increase in throughput, while still maintaining outstanding component quality.

and the plastic release toggle), which are fed to the system via a conveyor mechanism. During the production process, the ground connector is transported via conveyor belt from machine face A to machine face B. The components are then separated and enter an automatic measuring cell that uses a cycle-synchronized camera to check that the products are completely free from any defects.
By contrast, the two Bihler Multicenter MC 42 machines are used to manufacture the right and left-hand variants of the Schuko contacts. The first step in the process is to stamp the housing, followed by the infeed and preassembly of the already manufactured retaining spring. The preassembled contact is then transported on the strip to the machine's B face where it, too, is equipped with a plastic release toggle. The part is bended to the required shape on the strip and is transported – still on the strip – to the measuring cell before then being separated. "The crucial difference compared to our earlier production process is that practically all the process steps are performed at the strip and not at the individual component. This was the key factor allowing us to achieve the necessary throughput, while also guaranteeing the extremely high component quality that was required," explains Schnöring. All aspects of tooling and assembly were developed and constructed in the company's in-house Design

Reiner Schnöring (middle), his son Axel Schnöring (right) and Mathias Bihler.

The new manufacturing process also includes the assembly of the plastic release toggle.

and Toolmaking Department, where Schnöring GmbH uses the Bihler bNX software for its CAD activities. The solution has been operational since April 2022 and provides the capacity necessary for more than 35 million components per year.

A partnership crucial for success "The very close cooperation with Otto Bihler Maschinenfabrik right from the start was crucial for the success of the entire project. This enabled us to meet the customer's requirements for a 50 percent increase in throughput coupled with particularly high component quality, and we are able to do so reliably and consistently. And in the years to come, we will continue to nurture this partnership, which started with our first Bihler system back in the 1950s and has grown even more intense over the last 20 years," says Schnöring. And, in its role as partner, Otto Bihler Maschinenfabrik provides particularly wide-ranging support: "We assist our partners and customers in all their developments, irrespective of whether they require a completely new system or need to adapt and optimize existing equipment or tools," stresses Mathias Bihler. "Together, we can develop outstandingly efficient, forward-looking solutions that open up new prospective avenues of success for all of us." And this is particularly true of the solution described here, which is now being used by Schnöring GmbH to manufacture socket components which GIRA then assembles itself to produce finished sockets: "The new solution has vastly extended our range of competencies and clearly differentiates us from our competitors," is how both Axel Schnöring and Jürgen Brielmaier sum up their experience. "For us, it clears the path towards new, pioneering, forward-looking projects. One of these, for example, will be a laser-welded, multi-part assembly that we will produce on a Bihler BM 4500." ●

KERN-LIEBERS
GROUP OF COMPANIES

schnöring
WIRE & BENDING SYSTEMS
Dynamik die bewegt

Schnöring GmbH, which is based in Schalksmühle, has a workforce of approximately 200 employees and manufactures compression, tension and torsion springs as well as wireform parts, stamped-and-formed parts and assemblies for the electronics, furniture, domestic appliances and automotive industries. Since 2018, it has been part of the KERN-LIEBERS Group, which is headquartered in Schramberg and employs more than 6,000 people worldwide. Globally, KERN-LIEBERS possesses approximately 260 Bihler machines, which it uses to manufacture wireform and stamped-and-formed parts as well as assemblies for all automotive and non-automotive applications. In addition to Schnöring, the KERN-LIEBERS Division Stamped Bent Parts in Europe also includes the EBERLE sites in Schwabmünchen and Rieden. It also has production sites in China and North America/Mexico.

www.kern-liebers.com
www.schnoering.de
www.eberle-federn.de

"LET'S DARE TO EXCHANGE MORE DATA"

If we are to take full advantage of the potentials offered by digitalization in industry, then the transfer and shared use of data must become much more commonplace. That is the opinion of Dr. Olaf Sauer of the Fraunhofer Institute in Karlsruhe. He therefore believes that greater openness, communication and transparency are essential.

How can companies effectively advance in their drive toward digitalization and use it profitably?

I believe that multilateral data exchange will become even more important in the future, that is to say the transfer and shared use of data that the actors present in certain sectors or process chains actually already possess. The task is to make this data available and to use it. For example, a metalworking company that uses presses might find its material manufacturer's coil data important because this information would help it run its systems better. Of course, it is perfectly normal to perform the conventional fine-tuning of individual process steps; however, in my opinion, higher-level data exchange in so-called data ecosystems has much greater potential to bring about improvements and boost efficiency. At the technical level, this potential can be exploited without difficulty today. Instead, the limiting factor here often tends to be the presence of a corporate culture in which interdisciplinary data exchange is just not part of a company's business philosophy. As a result, if digitalization is to progress, what we need is more openness, communication and transparency and, of course, the development of the corresponding data ecosystems.

What are the benefits of digitalization projects for your customers, how are such projects handled?

Digitalization projects make it possible to quantify and take advantage of genuine opportunities to make savings – as we have seen at a current customer that manufactures wooden boards. This customer was able to use digital tools to optimize their material consumption, increase machine availability and implement directly integrated inline quality control. These are significant improvements that genuinely cut costs. We start by working together with the customer to create a roadmap, clarify the areas of the customer's business where digitalization makes sense and specify what the aims are. We then define a schedule of measures extending over, perhaps, five years. It is vitally important for companies to start by tidying up and slimming down their existing processes before embarking on digitalization. This is because a badly organized process will not be made any better by digitalization. The first step in the digitalization processes is to work with basic systems that use production data, for example, and make the manufacturing operations transparent: What is the machine status? What jobs have already been completed and to what extent? What is the quality of the parts? This is followed by data analysis, for example in order to identify any deviations from normal behavior. This in turn acts as the basis for processes such as machine learning, AI and predictive maintenance.

For what industries and applications are the IOSB's automation and digitali-

Dr. Olaf Sauer
has been deputy head of the Fraunhofer Institute of Optronics, System Technology and Image Exploitation (IOSB) in Karlsruhe since the start of 2012. He is responsible for the Automation and Digitalization business sector. He is a member of the International Academy for Production Engineering (CIRP) and is active in the VDI's Modeling and Simulation and Digital Factory expert committees. He is also a lecturer at the University of Kassel.

zation solutions particularly relevant, what are their characteristics?

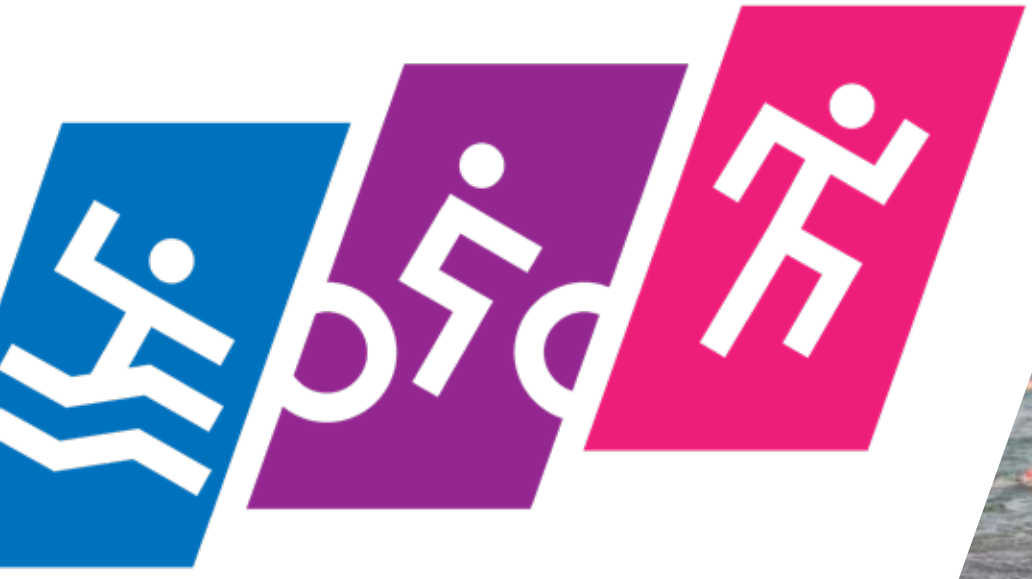
Our target group consists primarily of manufacturing companies, such as mechanical engineering firms, component manufacturers or software vendors, that is to say equipment suppliers to factories and manufacturers producing a very wide range of goods. A recent study has shown that these equipment suppliers are already very well-positioned in terms of digitalization and automation. However, the factory operators, for example mid-sized companies with 20 to 50 employees, still have ground to make up when it comes to digital technology. Nevertheless, it has been shown that proprietary solutions, that is to say solutions developed by companies themselves and designed specifically for their own products, are not the route to success. That is why the digitalization solutions that we propose are broad-based and extremely scalable. We are committed to open standards that are available on the market, ensure the necessary interoperability between the different applications and lead to genuine improvements. ●

SUCCESS DEPENDS ON DIGITAL TRAINING

In the opinion of Lukas Stahl, one of Germany's most promising triathletes, digital training methods hold the key to success in elite sport. In particular, he uses digital training tools to improve the quality of his training and improve his power management.

What digital tools and aids do you use as a high-performance athlete? How much benefit do you get from them?

I can access the training plans developed for me by my two coaches via an online platform whenever I want. The plans are all harmonized with one another and all completed units are also automatically uploaded to the platform together with all the relevant training data. In addition, for cycling, for example, I train indoors on virtual training platforms. These allow me to cycle real courses in a virtual environment and key data such as wattage and generated power are collected automatically. We analyze this data immediately after the end of training. This allows us to see very precisely whether it was sensible to generate so much power on any given section of the route or whether, instead, it was a waste of energy. Over time, I have used all this data to construct a sort of database which shows me very precisely the areas in which I have developed and the progress I have made but also, for example, where there is a significant need for further training. In this way, these digital training tools, which also include pulse and lactate measurements for example, defi-



Happy with the finish: Lukas Stahl won the 2023 Mainova Ironman Frankfurt European Championship in 8:35:22.

nitely help improve the quality of the training. They help me improve my power management and, ultimately, will be decisive for my success as a professional in upcoming competitions. My current aim is to qualify for the Ironman World Championship, which will be held in Hawaii in October.

How did you get into triathlon and how did you become one of the world's top triathletes?

I practiced canoe slalom for over ten years, during seven of which I rowed successfully for the national team. Unfortunately, I never realized my dream of taking part in the Olympic Games. Just for fun, I decided run in a half-marathon in Augsburg five years ago. Although it was an enormous physical challenge for me, I also found that I enjoyed it immensely. Then when the Covid pandemic arrived and we weren't able to go canoing any more, we turned to cycling as a way of training instead. At that time, I also started swimming and that's how I arrived at triathlon. In 2021, I completed my first Ironman. To my surprise, I immediately became European Champion in my age group and also qualified for the Ironman Championship in Hawaii. Given the enormous distances involved in Ironman, one important factor of success is a high level of discipline and staying power. This applies both to the competition itself and to the training, which takes me 35-40 hours per week. It is important to have clearly defined aims and to keep on pursuing these even on days when you're not feeling particularly motivated. ●

Lukas Stahl,
was born in 1999 in Hanau, Germany. In October 2020, he was part of the German under-23 national team which won the European canoe slalom championship. After this, the mechatronics student changed sports and became a successful triathlete: Now aged 25, he won the European Championship in his age group for the first time in August 2021 and triumphed in the Ironman World Championship in Nice in 2023. In January 2024, he decided to become a professional triathlete.

CONCENTRATED INNOVATIVE STRENGTH

★ High process quality Q Real-time monitoring

Dietmar Harting, the son of company founder Wilhelm Harting, with Mathias Bihler.

In acquiring two new BIMERIC BM 1500 servo production and assembly systems, the HARTING Group is continuing its close partnership with Otto Bihler Maschinenfabrik, a partnership which now goes back several decades. HARTING is the global market leader for industrial plug connectors and these fully-networked Bihler systems guarantee the all-important product quality, are absolutely reliable in operation and ensure high reproduction accuracy – all coupled with continuous real-time monitoring.

The HARTING Group, which has its headquarters in Espelkamp, is the global market leader for industrial plug connectors (left). The success story started back in 1945 in a small hall in Minden (top).

The very first products manufactured by the company "Wilhelm Harting Mechanische Werkstätten", which was founded in 1945 by Wilhelm und Marie Harting, included hotplates, electric fencing equipment and flat irons. However, the youthful company soon developed the Han® plug connector, which was later to become the acknowledged global standard. Nowadays, the family-run HARTING Technology Group is the global market leader for industrial plug connections – and it continues to pursue clearly-defined aims just as in the past. The top priority is placed on product quality. And so, today, Dietmar and Philip Harting, the son and grandson of the company's founder, still live by the oft-quoted motto "Quality is when the customer comes back, not the product". "Our products also stand out for their speed and ease of use, their robust design and their versatility and long service life", adds Dr. Andreas Imhoff, Managing Director Operations at HARTING.

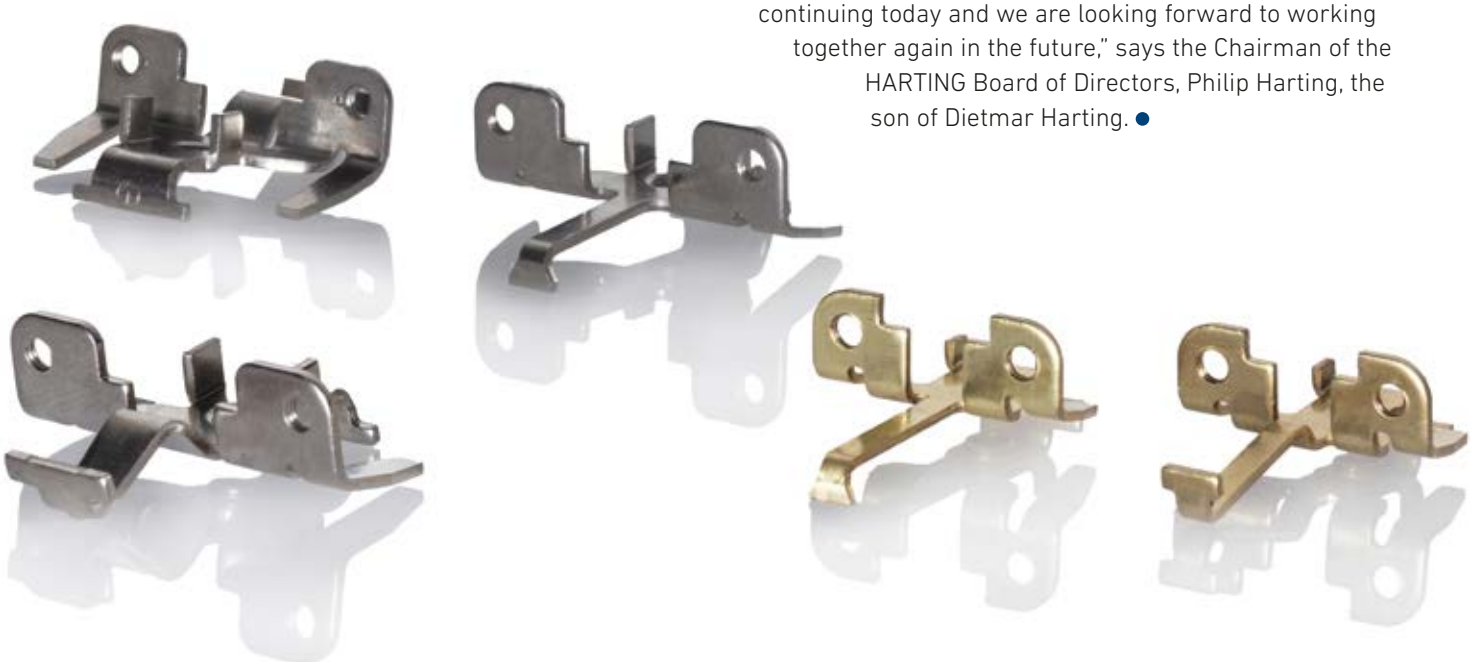
Continuous improvement "To make sure it always meets its demanding quality requirements, HARTING chose at an early stage to work with high-performance partners such as Otto Bihler Maschinenfabrik. Consequently, the first Bihler systems arrived in the company in the 1970s, and the oldest machines still running today are two mechanical Bihler Mach-1 systems dating from the 80s. They are currently producing plug contacts at the rate of 120 parts per minute, and Bihler will shortly be improving this throughput to 350 strokes per minute. Mathias Bihler knows every detail of these two systems: "As a young toolmaker, I used to mount tools on these machines," he recalls. "Even back then, HARTING demonstrated its enormous innovative strength on these machines and this is still characteristic of the company today."

Low-level integration The two new Bihler BIMERIC BM 1500 servo production and assembly systems are a further sign of HARTING's outstanding desire to innovate. "The systems are perfectly integrated in our produc-

They know all about the advantages of long-term partnerships: Philip Harting, Mathias Bihler and Dietmar Harting (from left).

tion environment and we use practically all the available machine data for real-time process monitoring," explains Imhoff. "For example, we are able to measure the production-related energy consumption of every component and use this information to optimize our resource management." The two Bihler systems are used to manufacture the locking pawls for the HARTING Han D® contacts. These make sure that the contact elements engage securely in the contact chamber. More specifically, the contacts and pawls manufactured on the systems are later crimped by the customer and pressed into the chamber. The challenges lie in the high precision of the pawls as well as in the various coating variants.

Stability is crucial "The BIMERIC completely meets the high requirements in terms of quality and reproduction accuracy and the entire process is extremely stable," explains Imhoff. "That is crucial for us and it also guarantees that our Han D® contacts always work." The success of the two new Bihler systems has already persuaded HARTING to definitively plan the acquisition of another Bihler BIMERIC. "It's good to see that our long-standing partnership is continuing today and we are looking forward to working together again in the future," says the Chairman of the HARTING Board of Directors, Philip Harting, the son of Dietmar Harting. ●



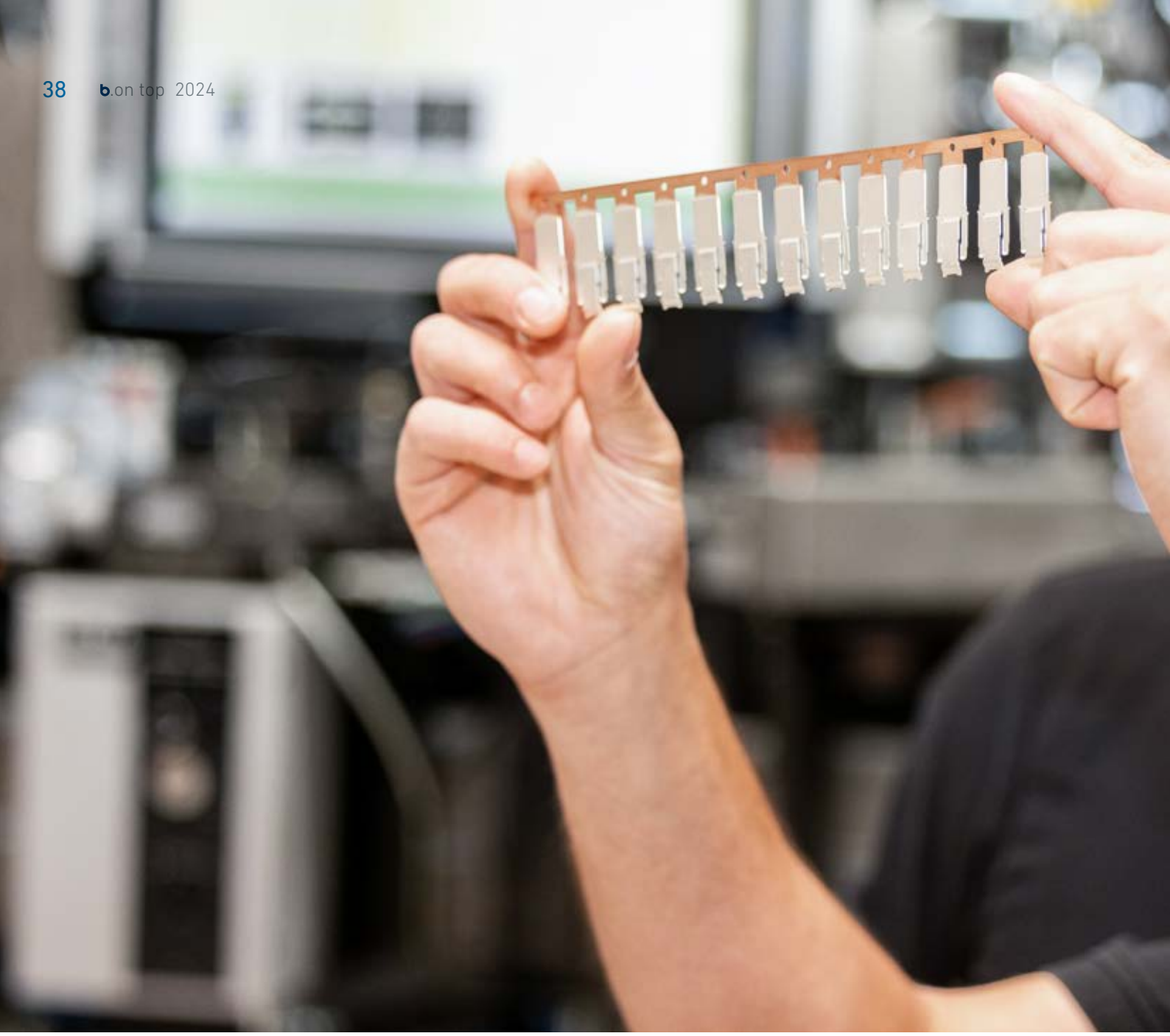
Aylin Schnabel, Group Manager of the HARTING Stamping Center, together with her team.

HARTING

Pushing Performance
Since 1945

The **HARTING Technology Group** is one of the world's leading suppliers of industrial connector technology. HARTING's connectivity solutions are used in many different areas of industry, including transportation, e-mobility, renewable energy recovery, automation and mechanical engineering. Approximately 6,200 employees contribute to the Group's success in 43 sales companies, 14 production sites and six development locations. The family-run company achieved sales of €1,036 million in 2022/23.

www.harting.com



WORK TOGETHER AND LOOK TO THE LONG TERM

- Strategic extension of the product portfolio
- More than 100 million parts manufactured per year

The desire to foster innovation while remaining independent is anchored in the DRÄXLMAIER Group's philosophy. And it is also clearly expressed by the way this globally active automotive supplier goes about producing stamped-and-formed parts internally within the Group. Whether for the development of tools, the flexible manufacture of variant-rich products, the production of large runs or the assembly of complex components – the Technology Center for Stamped-and-Formed Parts in Bischofswiesen reflects the expertise and machine technology contributed by Otto Bihler Maschinenfabrik.

The DRÄXLMAIER Group's Technology Center for Stamped-and-Formed Parts in Bischofswiesen, Upper Bavaria.

New high-performance machine: The DRÄXLMAIER Group uses the Bihler LM 2000-KT to manufacture box terminals for boards at a rate of approximately 400 strokes per minute.

It was when production got underway for a highly-complex plug contact that the decision was made to use Bihler technology. "Production using progressive manufacturing techniques would have been too complicated and other methods would have required welding operations, which would have been problematic for the end customer. So we finally came up with a solution using a folded, crimped locking mechanism. Bihler found an efficient production solution to put our basic idea into practice in the form of a BIMERIC 3000," reports Andreas Keilwerth, responsible for Application Engineering at DRÄXLMAIER. Martin Lehmann, Key Account Manager at Bihler, adds: "The fact that we were intensively involved during product development contributed greatly to the project. It meant that product know-how and manufacturing expertise were able to join forces and this allowed us to take the sting out of many of the challenges up-front." In addition, the system was first set up and optimized by Bihler. At the same time, training courses were held in Halblech to familiarize design engineers, toolmakers and production staff with the system under the best possible conditions. The result is something to be proud of. Stamping, bending, spring infeed, camera-based parts verification and a laser to mark every part with an item and order number – with 27 NC-controlled axes, the BIMERIC 3000 now works to combine three strips into a finished assembly. "Because the surface of one element has to be silver-coated by an external galvanization service provider prior to assembly, one of the strips is fed in pre-stamped. Otherwise, it would theoretically be possible to run the entire process on the BIMERIC 3000," explains Keilwerth. DRÄXLMAIER has secured itself an excellent market position with this innovative assembly. It is installed in the Group's own products and is also sold externally. "Our product is unique on the market in terms of its properties and characteristics. This has led to the product being specified as a requirement by one German carmaker, meaning that all its tier-one suppliers have to use it," says Rupert Feischl, Facility Manager at the site in Bischofswiesen in Upper Bavaria. "At present, we are producing approximately one million parts per year. We are working on the continued market positioning of the assembly and we could increase our manufacturing capacity to 500,000 parts per week, just working two shifts a day. We are therefore optimally equipped to meet future demand."

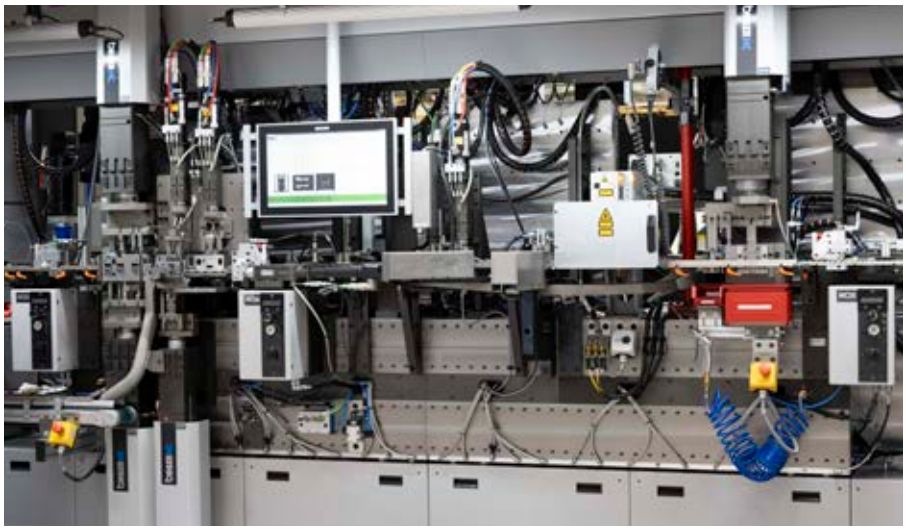
A Technology Center for Stamped-and-Formed Parts

For decades, the DRÄXLMAIER Group has been successfully developing and manufacturing complex vehicle electrical systems, central electrical and electronic components, exclusive interiors and battery systems for e-mobility and supplying these to premium vehicle manufacturers worldwide. "As an owner-run company, the DRÄXLMAIER Group considers its success to be founded on responsible, long-term thinking and the sustainable development of business and production processes. Innovation, proximity to the market and excellence in everything we do underpin all our actions," explains Feischl. The Group has operated a Technology Center for Stamped-and-Formed Parts here since

2012 and has ensured that it is largely self-sufficient in this field. In the plant, which covers approximately 3,500 square meters, more than 70 employees manufacture some 80 percent of the stamped-and-formed parts installed by the Group worldwide. All of the tools and accessory equipment required for the Group's stamping-and-forming activities are manufactured in Bischofswiesen. This is where the pre-series activities and optimization iterations are performed. Since 2016, DRÄXLMAIER has also been using Bihler technology here. With three systems dedicated to different applications, the company possesses the broad-based, flexible capabilities required to rise to market challenges. "The high quality of Bihler technology as well as the way we always communicate as equal partners perfectly match our philosophy. We always want to be at the cutting edge of technology and we need the service that goes with that. That is why we see our collaboration with Bihler as a harmonious full-range package," explains Feischl.

Flexibility and speed DRÄXLMAIER also uses Bihler technology for the manufacture of distance modules that are injected into plastic parts in order to provide stability during screw-insertion operations. These exist in 24 variants and are manufactured in small and medium runs on a GRM-NC, a machine that is ideally suited to this task thanks to its short setup times. "We only need about two hours to switch between variants. That's hard to beat," says Production Manager Wolfgang Heil. In addition to the resource-efficient and material-saving production method, one reason for choosing the GRM-NC was the ability to use existing tools. "We design the geometries of the bushings together with the tools needed to make them here in-house. In this way, the GRM-NC helps us ensure a short time-to-market," confirms Markus Wanka, Head of Toolmaking and Sample Construction. DRÄXLMAIER also takes advantage of this extra speed in its other tool developments.

The path to mass production "For example, we have used the GRM-NC to develop tools for two box terminals for boards, manufactured samples and completed our initial orders. We could now transfer these to our latest Bihler system without difficulty in order to manufacture larger batch sizes," explains Wanka. Since July 2024, DRÄXLMAIER has been working with the state-of-the-art LM 2000-KT



The DRÄXLMAIER experts also use Bihler systems to ensure the outstanding quality of the parts and make it possible to respect the tiniest tolerances (left).

In addition to its headquarters in Vilsbiburg, the company also has a Technology Center in Bischofswiesen (below).

By performing its manufacturing operations on the Bihler BIMERIC, Bihler GRM-NC and Bihler LM 2000-KT, the DRÄXLMAIER Group enjoys a broad-based, flexible market position.

linear machine that uses disk cams to control tool movements and is able to reach speeds of up to 500 rpm. "Our current aim was 400 strokes per minute. We have achieved that. What is more, the high repeat accuracy of the mechanical movement ensures outstanding parts quality with exceptionally low tolerance values," explains Keilwerth. "Thanks to the optimization work we performed in cooperation with Bihler's experts, we have been able to ensure that only one disk cam has to be changed when we switch over to the second variant of the part. That saves us a lot of time and effort." The earlier partnership-based collaboration between DRÄXLMAIER and Bihler was one of the factors pointing the way ahead: "We are in constant contact. During the development of the LM 2000-KT, it was clear that DRÄXLMAIER could see the potential benefits of using the system," says Martin Lehmann looking back. "That makes it all the more pleasing that one of the first systems that we shipped has now started production here in Bischofswiesen." The two box terminals are used on boards in the fuse boxes that are currently installed by one German carmaker. Here again, DRÄXLMAIER has extended its range and now manufactures a part that will be available as a catalog product for a very wide range of possible applications both inside and outside the Group. "The first project is just getting underway and we will produce approximately 560 million parts in two variants up until 2029," says Heil. At the same time, the LM 2000-KT's low energy consumption, as well as its sustainable recirculating oil system, could be a powerful future argument to help attract OEMs, which are attaching increasing value to the low environmental footprint of the components they install.

Staying dynamic "At DRÄXLMAIER, we see change as an opportunity. We are proactive and equip ourselves to meet future challenges," says Feischl. "Whether it's for highly-complex assemblies or large batch sizes – with the various Bihler technologies at our disposal, we are well positioned to ensure that our Group remains dynamic and independent in the way it supports its customers." And so, thoughts in Bischofswiesen are already turning to the future. Among the ideas being discussed are conductive parts such as connectors and contacts, as well as molded parts such as spacers, not to mention the possibility of extending the portfolio to include springs and clips. Feischl: "We have examined various scenarios and are ready to develop new products through to market maturity and then to manufacture them in large quantities." ●

Well positioned: Rupert Feischl, Andreas Keilwerth, Markus Wanka and Wolfgang Heil from the DRÄXLMAIER Group's team of experts (from left) with Martin Lehmann, Key Account Manager at Bihler (middle).

DRÄXLMAIER

As an internationally active automotive supplier, the **DRÄXLMAIER Group** supplies complex vehicle electrical systems, central electrical and electronic components, exclusive interiors and battery systems for e-mobility to premium vehicle manufacturers worldwide. The company, which was founded in Lower Bavaria in 1958 and has its headquarters in Vilsbiburg, has more than 60 sites in over 20 countries worldwide. The workforce of approximately 70,000 employees generates annual turnover (2023) of €5.6 billion. With its Bischofswiesen site, the Group has an innovative Technology Center for Stamped-and-Formed Parts. Here, in an area of approximately 3,500 square meters, a workforce of over 70 employees produces approximately 80 percent of the stamped-and-formed parts that are used within the Group or sold externally.

www.draexlmaier.com

SPECIALITIES FROM FLORENCE

Setup times halved Simplified tool production

The great strength of Florence-based Cecchi s.r.l. lies in its outstanding versatility, which allows this family-owned company to handle very short-run customer projects with extremely tight turnaround times for its customers in the fashion sector. And as of very recently, the specialist for spring production has been able to react much more quickly to new component requests – thanks to a new Bihler RM-NC servo stamping and forming machine that cuts setup times from four down to an average of just two hours.

Cecchi s.r.l.
is located in
Florence, Italy

Open and committed: Senior Management at Cecchi s.r.l. with Paolo Cecchi, CEO (middle), daughter Valeria Cecchi (left), Vice President, and daughter Bianca Cecchi (right) who is jointly responsible for company administration.

The area around Milan, Lecco and Bergamo in Lombardy in the north of Italy is actually the main center of the country's metalworking industry. However, manufacturing companies can naturally also be found further south – for example in Florence, the home of Cecchi s.r.l. The company, which was founded in 1967 by Renato Cecchi, produces a wide range of springs and other small metal components that allow it to service the particular requirements of the regional market: "Florence is an important center for the fashion industry and many of our customers come from the fashion accessories sector," explain CEO Paolo Cecchi and CTO Piero Cecchi, the sons of the company's founder. "It is a very fast-moving sector that only ever calls for relatively small batch sizes of between a few hundred up to 100,000 parts. However, our other thousand or so customers from the medical, oil and gas, electronics and lighting sectors, also place orders of much the same size," adds CFO, Valeria Cecchi. She is the founder's granddaughter and works together with her sister Bianca and cousin Elisa to ensure the general and everyday administration of the company.

Excellently positioned Over the recent decades, Cecchi has adapted perfectly to the needs of its large customer base and the many different product requirements this brings with it: "One of our greatest strengths lies in our outstanding versatility that allows us to complete customer projects with short turnaround times," stresses Valeria Cecchi. "We also have particularly close ties to our customers and, on top of all this, we offer full-service component manufacture from the initial idea, on to prototyping and toolmaking, and through to top-quality industrial parts manufacture."

Cecchi s.r.l. manufactures all the tools for the new Bihler-RM-NC itself.

Restrictive setup times

The seven mechanical Bihler type RM 35 and RM 40 systems that Cecchi has acquired over the years make a vital contribution to the company's high parts quality. The company has produced approximately 700 tools in-house for these machines. However, in the light of increasing product diversification, ever smaller batch sizes and growing component complexity, the existing Bihler solutions were starting to be pushed to the limit: "They are very reliable machines that always deliver perfect quality and we always found the throughputs to be perfectly satisfactory," explains Valeria Cecchi. "Nevertheless, the long setup times were a drawback.


P 200 kN NC
BIHLER NC
BIHLER NC

Cecchi s.r.l. supplies small components such as these clips to customers in the fashion accessories and other industries (below left).

Thanks to the shortened setup times, in particular, the new system ensures enormous time and cost savings (below right).

Production Manager Stefano Biagi installing a tool at the new Bihler RM-NC (right).

For example, it could easily take us between four and eight hours to set up a single Bihler RM40."

Improvements in many areas In order to achieve significant reductions in setup times and the associated costs, Cecchi invested in a new Bihler RM-NC servo stamping and forming machine, which arrived in the company at the end of 2022. And it did not take long for the company to reap the rewards of this investment. Paolo and Valeria Cecchi make the benefits clear: "Thanks to Bihler's servo technology, our setup times have been reduced to just a few hours That alone represents an enormous saving in terms of time and costs. This means that we can react to customer requests much faster than before and that we are much more versatile in our production activities."
Cecchi also produces the tools for the new Bihler RM-NC itself – and here, again, it benefits from significant time and cost savings because the laborious task of manufacturing disk cams has been completely eliminated. "Tool production has become a lot easier. That has also come as a relief

to our employees, who were initially very skeptical about the new Bihler servo technology after decades spent manufacturing on mechanically-operated machines. However, the entire workforce is now extremely enthusiastic about the new system and is already asking about getting another machine. As a result, the new Bihler RM-NC has also had a very positive, motivating impact on our entire team," points out Valeria Cecchi. Fifteen or more new tools have now been manufactured for the Bihler RM-NC. In parallel, the company is also working on adapting its existing tools.

Unhesitating recommendation And, of course, the new Bihler servo stamping and forming machine also delivers the required parts quality, especially since, at an average of 5,000 parts per hour, the system is deliberately not being run at maximum production speed. After nearly two-and-a-half years working with the new Bihler RM-NC, Cecchi's impression of the experience is therefore very positive. Paolo Cecchi has no doubts: "We are very happy with this investment, which has really moved our manufacturing technology forwards and has put us in a great position for the future". "With the new Bihler RM-NC, we can now manufacture even shorter runs of complex components extremely quickly and highly efficiently. It will also give us access to many new customer projects and, if I'm honest, we should have gone about acquiring it a lot earlier," reflects a laughing Valeria Cecchi. "All in all, we can only recommend that all metalworking businesses that are still producing on mechanical Bihler stamping and forming machines switch over to Bihler servo technology as soon as they possibly can." ●

CECCHI s.r.l.

Cecchi S.r.l. was founded in Florence in 1967 by Renato Cecchi and manufactures compression, tensile and torsional springs, together with belt springs and other small metal components. The company's main customers are active in the fashion accessories industry as well as in the energy, medical, electronics and lighting sectors. At its headquarters, which covers approximately 5,000 square meters, the company employs a workforce of some 35 personnel and its overall portfolio comprises in the order of 47,000 different articles.

www.cecchi.com

DAWN OF A NEW ERA

Setup times more than halved **Throughput tripled**

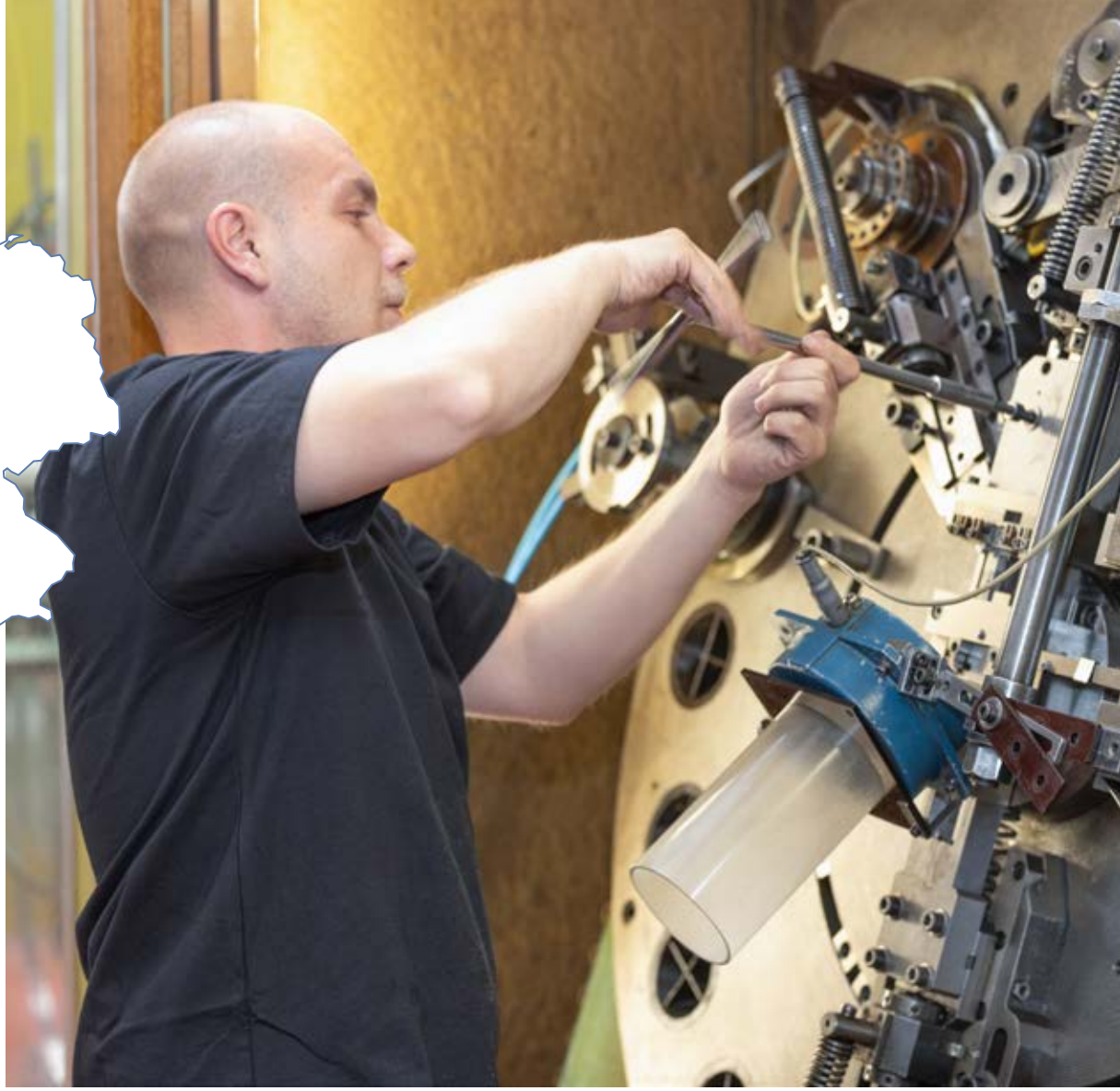
Erwin Müller GmbH & Co. KG has entered the world of servo technology with a new Bihler GRM-NC stamping and forming machine – and has been able to triple throughput while simultaneously more than halving setup times. This will make the small spring specialist significantly more competitive, enable it to handle new customer projects successfully and, in this way, help it safeguard its own future.

Erwin Müller GmbH & Co. KG in Mössingen-Belsen is a very typical and relatively small mid-sized company that specializes in the manufacture of springs and bended products. And the challenges which have recently confronted the business are equally typical: "Our machine pool and, in particular, our 14 cam-controlled Bihler systems, on which we had been manufacturing successfully for decades, was simply no longer keeping pace with the times," explains Managing Director Rolf Kümmerle. "Although we modernized the controller using the Bihler retrofit package, the setup times were very long at up to eight hours and the throughput was limited to the 4,000 to 6,000 range. This meant that we couldn't respond to the demand for larger batch sizes and more complex components."

Looking forward to servo-controlled production: The team from Erwin Müller GmbH; in this photo, at Bihler in Füssen together with Michael Staudenmaier (far right), Florian Hoff (far left) and Thomas Zettlmeier (second from left).


BIHLER
GRM-NC
BIHLER NC
P 400 kN NC
er.de
NIGHT
ADDICT99

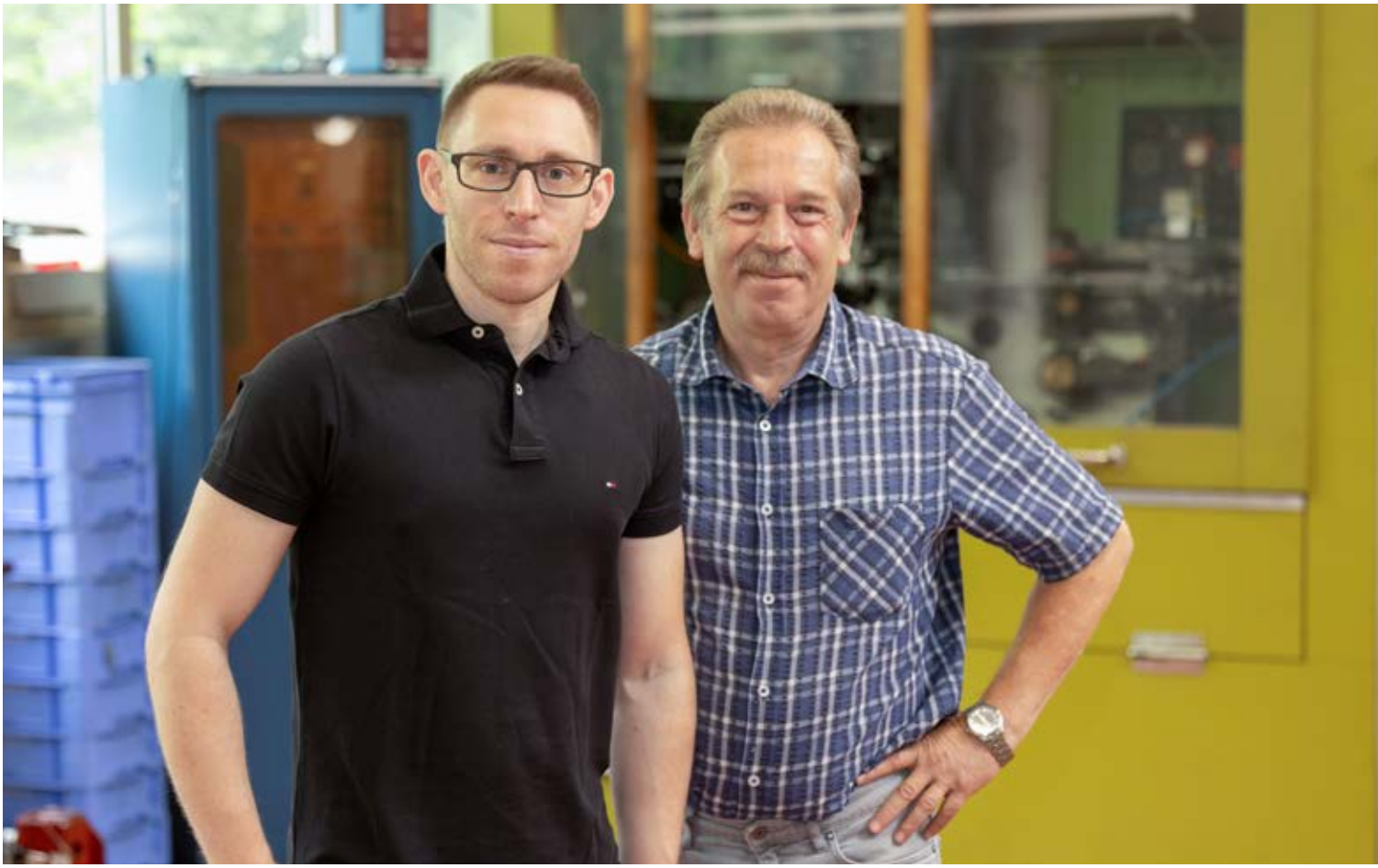
Erwin Müller GmbH & Co. KG in Mössingen-Belsen in Baden-Württemberg, Germany.



No longer at the cutting edge: The old Bihler systems with their laborious setup processes and limited throughputs.

A new era That is why the company decided to acquire a new Bihler GRM-NC stamping and forming machine in the fall of 2023 and switch over from mechanical to servo-controlled machining technology. Kümmerle has no doubts: "The new Bihler GRM-NC is ushering in a completely new era for us and will significantly increase our competitiveness and performance. In this way, we will gain the flexibility that we need to handle larger order volumes and produce more complex parts. More specifically, we expect to be able to cut our setup times by more than half to an average of 2 to 4 hours and to triple throughput to 10,000 to 14,000 strokes."

Looking to the future with confidence: Managing director Rolf Kümmerle (left) with son Simon Kümmerle, who works as a mechanical engineer in the company.



Trust that goes back decades At July 2024, these improvements had not yet made themselves felt in practice because delivery of the system to Erwin Müller GmbH & Co. KG is not planned until September 2024. However, the spring manufacturer has no doubts: "We are confident that the new Bihler GRM-NC will meet all our expectations," says the Managing Director. "After all, we have been working together with Otto Bihler Maschinenfabrik for decades and know that we can always rely on them. The company does exactly what it says it will do and, for us, that was another reason for choosing the system."

The right decision And, here as always, Bihler is not just a machine supplier but also assists with a huge amount of know-how and support. One outstanding example of this is the current training sessions being held in Halblech for Müller's employees, including mechanical engineer Simon Kümmerle, the son of Rolf Kümmerle. The team on-site is being got ready for the Bihler NC technology and is also preparing to adapt the total of approximately 50 existing tools. "The entire workforce is totally enthusiastic about the new Bihler GRM-NC and is looking forward to experiencing servo-controlled production on it," reports Kümmerle. "We are all convinced that we have made an important and decisive step into the future with Bihler – even though the new system represents a massive investment for us. However, ultimately, it will make us significantly more competitive, help us win over new customers and allow us to safeguard our future." ●

ERWIN MÜLLER

Erwin Müller – Federn & Biegeartikel GmbH & Co. KG was founded in Mössingen in 1966. Its core products include tension and compression springs, torsion springs, special springs, leaf springs and stamped parts. The company also produces the tools it requires for these activities itself and its eight employees manufacture approximately 20 million parts per year.

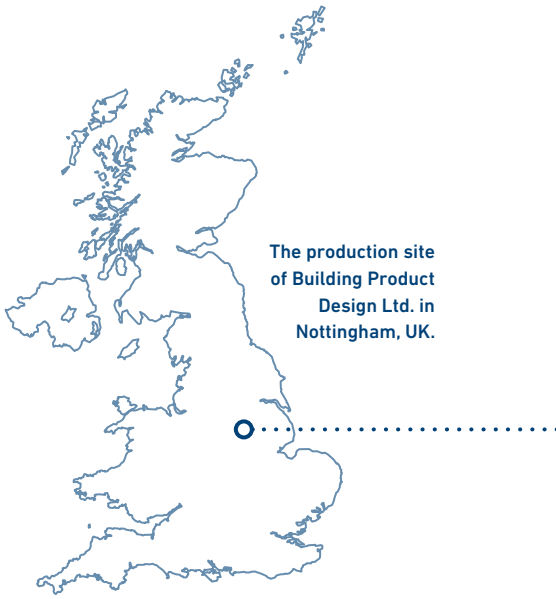
www.federmueller.de

New flagship product: BPD Plant Manager Daniel King with one of the roof tile holders that are being manufactured on the new Bihler GRM-NC stamping and forming machine.

"AN ACE UP OUR SLEEVE"

Setup times cut from 24 to 2 hours **Manufacturing capacities extended**

BPD Wienerberger, the UK's acknowledged market leader in the field of roof ventilation, construction membranes and other specialist construction products possesses a new trump card in the form of a recently acquired Bihler GRM-NC stamping and forming machine. The system dramatically reduces setup times and opens up a range of entirely new manufacturing opportunities for the company, which is being expanded to act as a roofing center of excellence for innovative, system-based roofing solutions within the Wienerberger Group.



The product portfolio of the UK-based Building Product Design Ltd (BPD) features roof underlay membranes, vapor barriers for roofs and walls, building ventilation systems as well as a wide range of other building products. The company, which was founded in the 1980s, is the leader in its field in the UK and has two production sites, namely in Merthyr Tydfil, South Wales, and Nottingham, England. An important new chapter in the company's history got underway in 2019 when it was taken over by the Austrian Wienerberger Group, which is the world's leading manufacturer of roof tiles and market leader in the field of clay roof tiles, paving stones and piping systems. "In this way, the Group is further extending its current portfolio of roofing products and continuing to grow successfully. "BPD is being extended to act as a roofing center of excellence within the Wienerberger Group. Among other things, this means that we will grow our accessories portfolio and diversify to service a wider market than in the past. To do this, we are naturally also investing in our machine pool," explains Ben Gerry, Managing Director at BPD. "Our aim in this new role is to manufacture in-house a lot of the parts we previously had to purchase and consequently better utilize our internal capabilities," explains Daniel King, BPD Plant Manager in Nottingham.

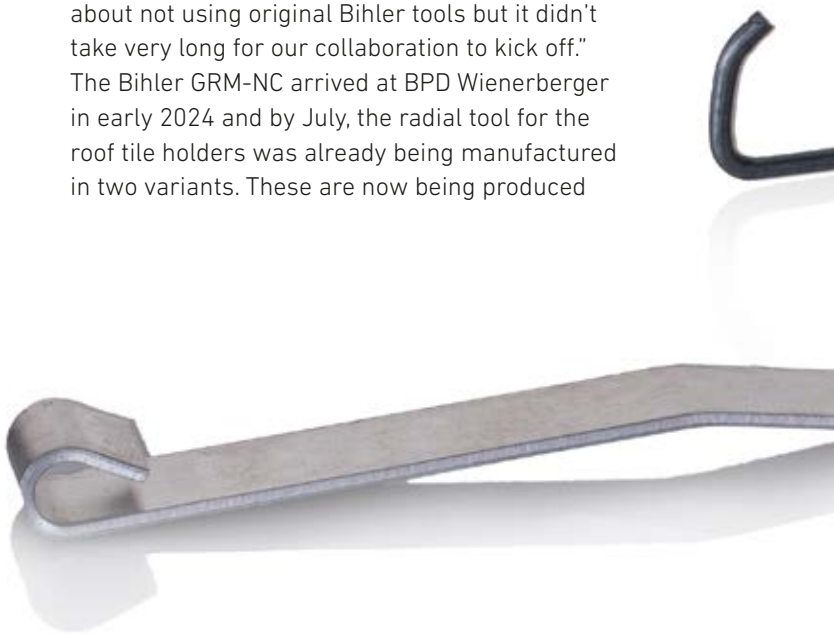
New partnership One of the products that perfectly illustrates BPD's transition into a Wienerberger Group competence center takes the form of the clips used to hold flat roof tiles in place. It was decided to replace the two mechanical machines previously used to manufacture these with a new, high-performance system in order to ensure an optimum environment for the planned product extension. "Naturally, we looked at a large number of potential suppliers before making our decision. However, we finally opted for Otto Bihler Maschinenfabrik and a servo-controlled Bihler GRM-NC stamping and forming machine," explains King. "The extremely professional approach to plant construction that characterizes Bihler in Füssen impressed us from the very outset and we were also able to witness parts production live at a Bihler GRM-NC. It was a fascinat-

The new roof holders are used to secure flat roof tiles on house roofs.

Happy with their new investment: BPD Managing Director Ben Gerry, Plant Manager Daniel King, Bihler representative Chris Sharratt and Nathan Lewis from Complete Tooling Systems Ltd. (from left to right).

ing experience," recalls King. "However, the comprehensive support that Bihler offers was an equally important factor in our decision. All of this means that Bihler is simply the right partner for us."

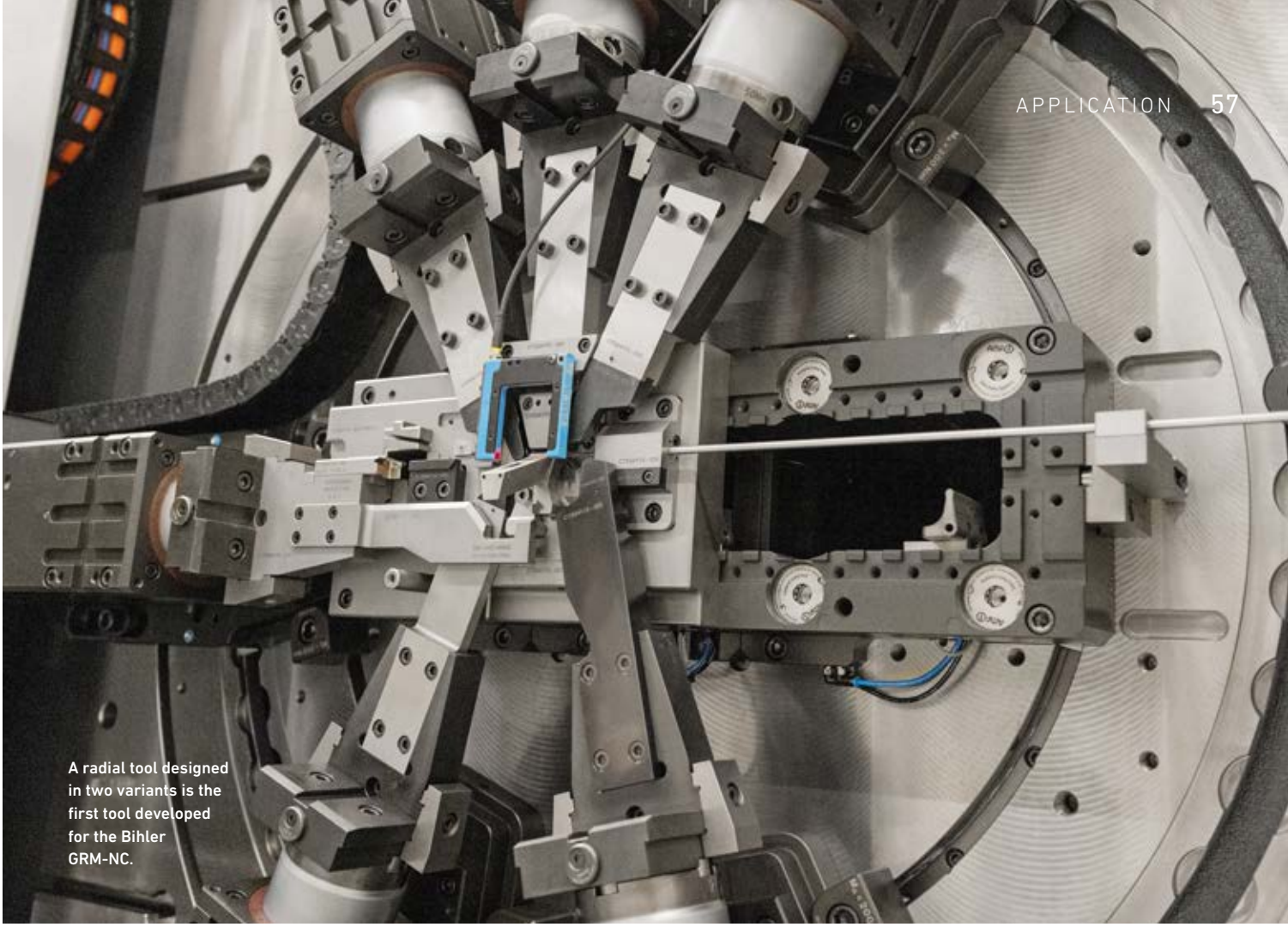
Outsourced toolmaking BPD Wienerberger is every bit as satisfied with Complete Tooling Systems Ltd. (CTS). This British tool specialist works together closely with Bihler to develop and manufacture the new tools for the Bihler GRM-NC, in some cases using the Bihler LEANTOOL system. "At the start, there were certain reservations about not using original Bihler tools but it didn't take very long for our collaboration to kick off." The Bihler GRM-NC arrived at BPD Wienerberger in early 2024 and by July, the radial tool for the roof tile holders was already being manufactured in two variants. These are now being produced



building product design

Building Product Design Ltd.
BPD, which has production sites in both Nottingham and South Wales, is a UK leading supplier of roof construction products. Since 2019, the company has been a part of the Wienerberger Group, which now has 14 factories in the UK and employs a workforce of approximately 1,200 staff.

www.buildingproductdesign.com



A radial tool designed in two variants is the first tool developed for the Bihler GRM-NC.

on the Bihler GRM-NC at a significantly quicker rate. "We change the tool once a week. We have found that it is possible to reduce the setup times from approximately a day to an average of two hours," says King.

A powerful statement BPD Wienerberger soon expects to exploit the full potential of the Bihler GRM-NC: "In the future, we will be able to produce far more, and increasingly complex, parts with this solution than in the past. In addition, the solution will allow the company to move closer to its goal of in-house production. All of this means that BPD Wienerberger has a real ace up its sleeve with the Bihler GRM-NC," says King happily. "The new system is also a statement of how we will develop our growth strategy," adds Gerry. "It allows us to demonstrate our strengths and manufacturing skills here in our local market and will enable us to ensure even greater market success in the long term." ●

SUCCESSFUL INTRODUCTION TO NC TECHNOLOGY

Setup times cut from 12 hours to 1 | Tools adapted

Patterer GmbH recently entered the world of Bihler servo technology with a new Bihler LM 2000-NC. The system greatly reduces the time and effort involved in production compared to mechanical Bihler systems, is able to run with adapted linear tools and is extremely efficient during operation even when manufacturing short runs thanks to the dramatically shortened setup times.

The headquarters of Patterer GmbH in Rieden am Forggensee.

With the introduction of the Bihler LM 2000-NC, setup times have been cut from an average of 6 to 12 hours to approximately 60 minutes.

Continuous further development combined with constant improvement – that is the key to the success of Patterer GmbH, which was founded in Rieden am Forggensee in 1991. The recently concluded two-year modernization project perfectly embodies this desire for improvement. It comprised the construction of new office and production spaces, extended use of digital production and the expansion and modernization of the machine pool. This naturally also applies to the existing Bihler stamping and forming machines, which include a Bihler GRM 80, a number of Bihler MC 42, RM 35 and RM 40 machines and a Bihler B-1000 welding system. "Even though we have regularly upgraded and modernized our existing Bihler systems, production was nevertheless still labor- and time-intensive. That is why we decided to invest wholeheartedly in Bihler servo technology and acquired a Bihler LM 2000-NC," explains Managing Director Markus Egger.

The simplicity of digital setups "For us, the deciding factor was the ability to adjust the cam sequences digitally without constantly having to produce new disk cams," continues Egger. "The shorter sampling times and, in particular, the ability to set up small and medium-sized series quickly also encouraged us in our decision." And, indeed, the setup time at the new Bihler LM 2000-NC is just about one hour, whereas in the past it used to take between half and one day.

Patterer Managing Director Markus Egger is convinced by Bihler servo technology.

In addition to its headquarters at Rieden am Forggensee (bottom), Patterer GmbH also has a production site in Thailand.

Flexible extensions to production Another important consideration was the possibility of extending production to other Bihler systems. "If the production volumes were to increase, we could move over from our Bihler LM 2000-NC to a cam-controlled Bihler LM 2000 KT without the slightest difficulty," explains the Managing Director. "And if additional value-added processes are required, for example if a customer wants us to manufacture complete assemblies, then we can simply switch production to a Bihler BIMERIC – without having to make any major changes to the tools."

Adapted linear tool Production is currently only just starting up on the new Bihler LM 2000-NC and an adapted version of an existing tool is being used. The machine is being used to manufacture stainless steel cable brackets for switchgear cabinets and other electrical installations. As Egger points out: "These are complex parts with a large number of bends that are ideal for linear machining on the Bihler LM 2000-NC." The strip is stamped and bended in the machine prior to the thread-tapping and cutting operations. Throughput is running at approximately 80 finished parts per minute.

Many positive repercussions "We are very happy with our decision to fully embrace Bihler servo technology. Egger sums things up: "We can manufacture on the new Bihler LM 2000-NC much more efficiently using our existing tools without any long, drawn-out setup times. The system significantly extends our capacities and allows us to manufacture new tools quickly, a task for which we will also be using the Bihler LEANTOOL system in the future." The investment is also having positive repercussions on the corporate culture: "The motivating effect of Bihler's state-of-the-art technology on our workforce should not be underestimated," explains the Managing Director. "Our younger employees, in particular, are very enthusiastic about the system and are looking forward to working with it." ●

patterer GmbH Fertigungstechnik

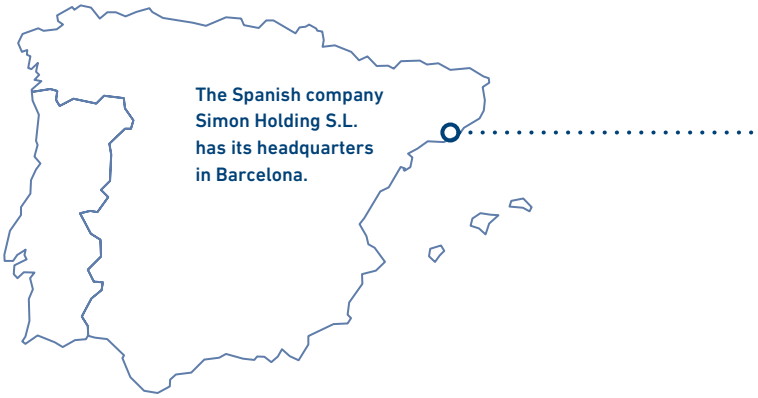
Ever since 1991, **Patterer GmbH**, which was founded by Hans Patterer, has been manufacturing parts and assemblies for the automotive, electronics and telecommunications industries as well as for the medical engineering sector. All the accessories and tools required for production are designed and assembled inhouse. In addition to its headquarters in Rieden am Forggensee, where it has a workforce of some 45 employees, the company also has a production site in Thailand that is similar to the headquarters in Germany in terms of size and the available products and services and which specializes in servicing the Asian market.

www.patterer.de


BIHLER BM3000
simon
2112_12
COSTAT
A

SMART INLINE MANUFAC-TURING

Reduced product costs Shorter lead times



At the Spanish company Simon Holding S.L., a new Bihler BIMERIC BM 3000 is telescoping the various separate work steps previously involved in module manufacture into a single end-to-end, fully-automated production process. In this way, this long-standing company has made a real leap in terms of technology that is reducing product costs, increasing production speed and also contributing to quality assurance.


Laura Prieto Flores from Simon Holding S.L.

"Our company has been a successful actor in the lighting and electronic engineering market since 1916 – that is to say for over 100 years – and has always been a source of pioneering innovations," says Francesc Llamas Asensi, Industrialization Director at the Spanish Simon Holding S.L., speaking with justifiable pride. "For example, we were one of the first companies in Spain to offer solutions for domestic electrical installations and outdoor lighting and we also pioneered smart control technology for underfloor heating." Today, the Group, which has nine production sites worldwide, has a product portfolio that includes not only conventional switches and sockets but also, for example, components for indoor lighting, lighting management systems, plug connections and charging systems for electric cars.


Francesc Llamas Asensi is Industrialization Director at Simon Holding S.L

Extensive inhouse production The Group has always boasted a high level of inhouse production, in particular at the level of the assemblies it uses: "We manufacture all the plastic components and metal parts we require ourselves and also perform final assembly to create the finished modules," explains Laura Prieto Flores from Simon Holding S.L.'s commercial department. "This means that we cover the entire process chain and produce everything we need ourselves." And for decades, the company has been using Bihler technology to manufacture the required standard-and-bended parts. For example, it purchased its first Bihler stamping and forming machine, an RM 25, back in 1968 and the company's Bihler machine pool now comprises some 30 mechanical Bihler systems. "Our Bihler systems may be getting on a bit and procuring spare parts can be difficult, in particular when it comes to control components, but we are deliberately keeping them going," explains Asensi. "With their mechanical design, they function reliably and extremely precisely and give us exactly the parts quality that is so important for us."

Fundamental restructuring When Simon Holding S.L. recently specifically restructured its process chain for complex parts, it was therefore not in order to improve parts quality: "In the past, we performed plastic parts production, metalworking activities and assembly at three distinct sites. This involved us in a lot of complex and expensive logistics and a high level of material rotation, and also meant that we always had to manufacture in extremely process-oriented batches," reports Asensi. "Our aim was therefore to standardize our materials flow, optimize the entire production chain and, ultimately, to manufacture our assemblies in a single, end-to-end, fully-automated production process That is why we decided to acquire a new Bihler BIMERIC BM 3000."

Successful technological leap The Bihler BIMERIC BM 3000 is currently being used to manufacture electrical circuit elements, for which the required metal components are first stamped and bended. The system then performs the inline feed of the spring unit and plastic parts, runs an electrical function test and outputs the finished, fully-assembled module at the rate of one a second. This process is just one example of the many advantages that the Bihler servo production and assembly system has brought to

With the new Bihler BIMERIC BM 3000, it is now possible to manufacture assemblies in a single, end-to-end, fully-automated production process.

this long-established company. As Asensi makes clear: "The system has enabled us to greatly reduce our product costs because many of the previous non-value-added work steps are now simply no longer required, our material logistics have become a lot less demanding and we no longer need any intermediate warehousing." "It also means that we can manufacture faster than before and don't need such long lead times," adds Flores.

And, last but not least, the new system also helps improve quality assurance because potential parts defects are immediately detected during the process – unlike in the past, when problems were not always identified at the separate stations. Both Flores and Asensi therefore have no doubts: "With the Bihler BIMERIC BM 3000 and end-to-end inline manufacture, we have made a real leap at the technological level. The system has completely changed our approach to production and is also the ideal platform for future Simon product launches." ●

Simon Holding S.L.

The Spanish Group of Companies, which is headquartered in Barcelona, specializes in the production of small electrical parts, control systems, connectivity components, lighting systems and charging systems for e-vehicles. Overall, the family-run company has a workforce of approximately 4000 employees and possesses 15 sites around the world, including nine production centers.

www.simonelectric.com

A PARTNERSHIP BETWEEN EQUALS

★ Approximately 40 years' experience of Bihler technology and toolmaking

800 million parts per year

Listening to one another, learning from one another, cooperating in joint projects – together we are stronger. This is the principle that Otto Bihler Maschinenfabrik brings to a range of strategic partnerships. Including with Wörgartner, a company that has its headquarters in Oberndorf in Tirol. It is an approach that has advantages for both sides, as founder and Managing Director, Peter Wörgartner, knows.

Peter Wörgartner has always relied on Bihler as a dependable partner. Here, he is seen standing in front of a mechanical Bihler system from the early days of the company's history.

"We can make high-performance tools for Bihler machines and also manufacture high-precision stamped-and-formed parts in volumes running into the millions on our 27 Bihler machines," explains Peter Wörgartner. "This makes us a valuable partner when it comes to setting up and preparing machines for use at customers' premises. However, we are also ideally positioned as a contract manufacturer of complex parts in large batch sizes." Wörgartner, which consists of the two companies WP-Wörgartner Produktions-GmbH and Werkzeugbau Wörgartner GmbH, operates an end-to-end process chain. In providing its products and services, which range from tool design and construction right through to production, the company can call on almost 40 years of experience with Bihler technologies. Its wide-ranging expertise coupled with its committed corporate culture, which combines a spirit of innovation, entrepreneurship and reliability, have, for the last ten years or so, made Wörgartner the right partner for a special type of collaboration. Mathias Bihler describes it as follows: "We work on joint projects together with our strategic partners. What is important is dealing fairly with one another, being reliable and discussing things as equals. In this way, we can work together to generate capacities and keep to delivery times that would be difficult on our own. Wörgartner is a prime example of

At Wörgartner, a total of 27 Bihler systems manufacture complex stamped-and-formed parts in a material-efficient and finished manner.

WÖRGARTNER

Ever since 1985, Peter Wörgartner has been committed to outstanding quality and perfection in all areas in the manufacture of tools and stamped-and-formed parts for the international market. A total of 115 employees work in the company's two divisions, **Werkzeugbau Wörgartner GmbH** and **WP-Wörgartner Produktions-GmbH**, which together occupy three sites in Oberndorf in Tirol and Fieberbrunn. On an area of approximately 9,000 square meters, the company produces not only highly-complex tools but also some 800 million parts per year for well-known customers in the European fittings, electronics, domestic appliances, consumer goods, construction, automotive and sports equipment industries. In 2022, Wörgartner was ranked first in the Tyrolean section of the category "Nationally active companies with annual sales of over €10 million" in Austria's most important industry competition – Austria's Leading Companies (ALC).

www.woergartner.com

what we mean by a strategic partner." Markus Schnöll, Vice President Sales at Bihler explains: "We are committed to the same culture and have similar approaches. Transparency and ongoing communication create the shared basis for constructive cooperation."

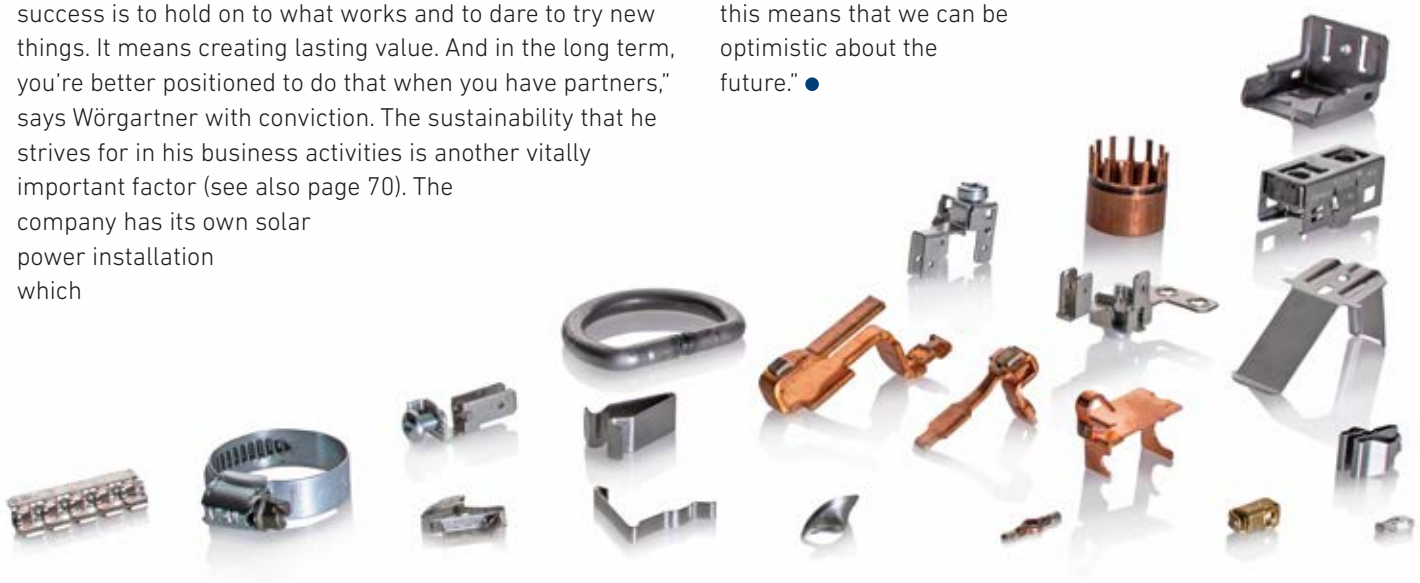
Technology as a tool for differentiation "Precision is the source of reliability" is the watchword at Wörgartner. The company considers itself under an obligation to ensure that its processes function efficiently, free from malfunctions and on-schedule in accordance with both economic and environmental criteria. For his part, Peter Wörgartner and his team at the company's headquarters in Oberndorf in Tirol primarily concentrate on toolmaking. The majority of the production operations are performed at the plant in Fieberbrunn. To perform his tasks, he uses a machine pool that includes 27 Bihler machines such as, for example, the GRM 80E and GRM 80P, as well as Multicenters with two processing faces, for example in the form of the MC 82. The team also uses FMS assembly machines. "Compared to progressive manufacturing techniques, Bihler's technology allows us to produce finished complex stamped-and-formed parts in a material-efficient process. What is more, we are able to machine multiple materials simultaneously, involving welding, thread-tapping and even packaging. This means we enjoy a very high level of automation that ensures we are well-positioned compared to our competitors," explains Wörgartner.

Bihler right from the start Bihler technology has been part of this experienced toolmaker's life right from the very outset. When Peter Wörgartner took his first step toward independence as a one-man operation in 1985, his

Contributing to one another's success: Markus Schnöll, Sarah Wörgartner, Peter Wörgartner, Johannes Wörgartner and Mathias Bihler (from left to right).

first machine was a GRM 50 automatic stamping-and-forming system, which he used – as is only fitting given the winter sports region in which his company is located – to manufacture locking clips for ski bindings. Other parts soon joined the portfolio and the company grew. However, the business has always been characterized by this combination of production and toolmaking. "The knowledge that you gather in one area can always be beneficial for new projects in the other," confirms Wörgartner. Factory 1 in Oberndorf was followed by an on-site warehouse and then, in 2013, by a new site in nearby Fieberbrunn, where the production area was extended to 6,000 square meters in 2019. "Because space in Fieberbrunn is limited, we have built upwards. One prerequisite was that it must be possible to install all types of Bihler machine on all three floors."

Sustainable business activities "The key to long-term success is to hold on to what works and to dare to try new things. It means creating lasting value. And in the long term, you're better positioned to do that when you have partners," says Wörgartner with conviction. The sustainability that he strives for in his business activities is another vitally important factor (see also page 70). The company has its own solar power installation which covers up to 25 percent of its annual energy requirements. The rest is generated hydroelectrically and is therefore also "green". Wörgartner uses groundwater wells to cool his machines and warms the premises by means of district heating. He explains: "On the one hand, it is important for us to protect the environment and, on the other, a small ecological footprint is becoming an increasingly important criterion influencing customers' choice of suppliers." However, at Wörgartner, sustainability goes beyond environmental protection. To create lasting value, it is essential to involve the up-and-coming generation. That is why the company is full of youthful faces and Wörgartner himself is passing on his experience to his son, Johannes, a mechatronics engineer and works supervisor who assists his father as future Managing Director. His sister, Sarah, studied economics and languages and is responsible for customer support and sales. Wörgartner: "As a family-run company, this means that we can be optimistic about the future." ●



High up in the Kitzbühler Alps: Peter Wörgartner has been tending the Steinalm mountain farm, located at an altitude of almost 1,600 meters, for almost 20 years.

"A PART OF OUR CULTURE"

When manufacturing tools and producing parts in his company, Peter Wörgartner is committed to preserving existing values and creating new ones. But what is it that drives him to run an Alpine mountain farm in addition to his full-time job? Soon to turn 65, he let us into the secret of why, for him, this is a dream come true.

There is a sweeping view from the Hochhörndler Spitze past the Henne and on to Bischof, Pfaff and Ministranten. The mountains on the other side of the Hörndlinger Graben stand out strikingly in the West against the evening sky. Behind, there is the Kitzbühler Horn, with the vibrant celebrity ski resort at its foot. However, that is hidden from Peter Wörgartner's view as he visits his Alm, or summer mountain farm, at the end of the valley. Down below, he can hear the gurgling of the Schwarzache, while the sounds of the bells worn by the cows and goats waft down from the steep slope behind the Steinalm, a mountain farm located at an altitude of 1598 meters. The land on which the animals graze the succulent grass from June through to the end of September stretches up as far as the ridge.

While Wörgartner checks up on the number of animals he can see through his telescope, he explains: "My family had a summer farm, so I've known about living and working with animals up in the mountains since I was small." His sister took over his parents' summer farm and he has always dreamed of having his own. When he brought this up in a conversation during a mountain hike with an acquaintance almost 20 years ago, he found out about the planned sale of the Steinalm farm. He didn't hesitate to seize the opportunity, which meant that he had to purchase a small farmstead and undergo agricultural training. "Naturally, it was a challenge to train to be a farmer at evening courses in addition to my normal job." But as he explains, "Life up in the mountain pastures is a part of our culture that I want to preserve and perpetuate." He got to work, brought the shingle-roofed Alpine hut up-to-date with running water and electric lighting and built new stables for the animals.

Profession and calling "Anyone who has animals also has a responsibility. It's more than a hobby that you just do when you feel like it," says Wörgartner. It seems to be a calling that leads him to look after the well-being of the farm's 30

Keeping up with the times: After purchasing the Steinalm, Peter Wörgartner renovated the Alpine hut and added new stabling.

Peter Wörgartner with daughter Sarah and son Johannes.

or so cattle (ten of them his own) and 12 goats come rain or shine, on clear days or foggy ones. "We believe it is our task to preserve and maintain this open space for future generations and to give the animals the sort of healthy life they deserve to lead. However, it is, of course, also a business that must be run sustainably and create value." He spends approximately 700 hours a year on his farming activities, assisted by his youngest daughter Patricia, who will follow in his footsteps – on her own farm in the winter and in the Alpine mountain farm in the summer. He now has set days that he spends up here in the mountains. And when asked if this is a big extra burden on top of his normal job as the owner of a tool and manufacturing company? "It is extra work that is worthwhile for me. Animal husbandry has taught me to make decisions without hesitating. That has also helped me a lot in my work. What's more, here I can clear my head, recharge my batteries and then get to grips with other things full of energy. I'm living my dream," he says, while patting one of the goats that has since come down the slope and is inquisitively sniffing the visitors. ●

Productive: Peter Wörgartner making his own cheese.


uvex
FTI
A1
GlasfA1ser
6
Audi
BOGNER
O/W
ONE/WAY

“IT’S THE FINE-TUNING THAT BRINGS VICTORY”

On the ski slopes, the tiny details can make the difference between winning and losing. With the Bihler torsion and bending machine, Otto Bihler Maschinenfabrik has developed a system that measures each ski in high precision and identifies its material properties. One of the athletes who uses the measured data is Linus Straßer, currently Germany's most successful slalom racer and one of the world's top-ranking skiers.

In the world of professional skiing, it is usually the small details that determine the result out on the slope. And, of course, that also applies to the skis themselves. For example, the two skis in a pair may have been constructed in exactly the same way and yet still differ from one another. Important parameters affecting performance include, for example, the ski's bending tensile strength and torsional stability, that is to say the way the material reacts when subject to load from above or below and how it twists in the direction of travel. And this is the point where Otto Bihler Maschinenfabrik steps in. Because with its "torsion and bending machine" (TBM), it has developed and constructed a unique measuring system that records precisely these parameters. To do this, the system, which is installed in the German Ski Association's (DSV) Technology Center in Berchtesgaden, uses various components, including NC-controlled Bihler units and the Bihler VC1 controller. "The DSV can use the recorded data to build a kind of database of the individual material and behavioral profiles of each individual skier. The data makes it possible to identify perfectly harmonized skis that are absolutely equivalent in technical terms and possess exactly the material characteristics that are decisive out on the slope – and all of this without any test runs on the actual snow," explain Project Managers Tobias Ostheimer, Head of the Machine Design department at Bihler, and Heinrich Etschmann, Plant Manager at Bihler in Halblech, both of them enthusiastic skiers themselves.

Continuous improvements Linus Straßer is also well aware of the vital importance of the skis' properties when competing at the elite level. "Ultimately, the quality of my skis determines what I am able to achieve. It is important that they run smoothly but also that they respond immediately to what I want them to do," continues the successful slalom racer. He was only just over two years old when he stood on skis for the first time. At that time, he used to travel regularly with his family to the Alps near Kitzbühl, where he took part in his first ski race at the age of six. By that time, Linus Straßer was already passionate about skiing as a sport and, as he took part in ever more competitions, his career as an exceptional talent in the fields of slalom, parallel slalom and giant slalom continued to blossom. His most recent major successes include podium finishes at the World Cup in Garmisch-Partenkirchen and slalom victories in Kitzbühel and Schladming. The 31-year-old sums up these triumphs in his own characteristic way: "Of course, I'm always happy when I'm able to win a race. However, the victories are only ever a snapshot that represent what it is that is truly important to me, that is say my own development. And that's something I'm very proud of and from which I can draw the confidence and strength I need for my upcoming races and my future career." And that is also something that the Munich-born skier, who lives in Kirchberg in the Kitzbühel Alps with his wife and daughter, pursues in his own very individual way: "Of course, I have my own grand vision – just like any other racer – for example winning Gold at the Olympics. However, it's much more important to set yourself small goals that you can work towards step-by-step and that help you to improve all the time. It's mostly about little details, the fine-tuning. With strength training, for example, you can gain that crucial bit of extra fitness, or with optimally adjusted equipment, you can knock vital fractions of a second off your times. This fine-tuning is crucial in elite sport and can make the difference between winning and losing."

Heinrich Etschmann, Linus Straßer and Tobias Ostheimer (v.l.) assess an aluminum plate for ski bindings.

For optimum handling
The Bihler ski measurement system in Berchtesgaden is just one of a total of three Bihler solutions that the DSV uses for its athletes. There is also the so-called profile structure machine. "This system uses an appropriately profiled drum to impart a fine structure to the bottom of the ski. This forms the finish over the applied wax and improves the sliding properties at the contact surface between the snow and the ski," explains Ostheimer. Otto Bihler

One of three Bihler solutions that the DSV uses to optimize its athletes' equipment: the torsion and bending machine in Berchtesgaden.

Maschinenfabrik also manufactures aluminum plates that the DSV's athletes use as a linkage between boot and ski. "The plates are structured to possess a certain amount of elasticity coupled with springback properties. They are used, in particular, in the ski cross discipline where, for example, they allow the skier to travel particularly dynamically up out of troughs, making it possible to pick up more speed," says Etschmann.

The World Championships – a real highlight "I am very grateful for the many different ways in which Otto Bihler Maschinenfabrik supports the DSV and therefore also us skiers," says Straßer. "This helps us continuously hone our skills and means that we can look forward optimistically to the coming season, which starts at the end of October. One highlight will undoubtedly be the Alpine World Ski Championships in Saalbach Hinterglemm, an event that I'm particularly looking forward to." ●

Linus Straßer
was born in Munich in 1992. He is a ski racer and member of the German Ski Association (DSV) who competes in the disciplines slalom, parallel slalom and giant slalom. During the 2023/24 season, he won the prestigious slalom classics in Kitzbühel and Schladming. He ended in third place in the slalom at the World Cup in Garmisch-Partenkirchen in 2022. In 2022, Linus Straßer took third place in the slalom at Adelboden, allowing him to qualify for the Winter Olympics in Beijing, where he finished the slalom in seventh position.

“WE BELIEVE IN BEING OPEN TO TECHNOLOGIES”

Headquarters of Schaeffler AG’s Automotive Technologies division in Bühl. Cranes can be seen everywhere. A new Competence Center for E-Mobility is being built here on the company’s Development and Production Campus. This makes it the perfect place for a conversation between CEO of Schaeffler AG’s Automotive Technologies division, Matthias Zink, and Mathias Bihler about the future of mobility, innovations and the challenges facing industry. They start by looking at the technology group’s characteristic new construction.

The Competence Center for E-Mobility of Schaeffler AG’s Automotive Technologies division in Bühl

"MODERN COMPANIES MUST BE MUCH MORE OPEN WHEN IT COMES TO PARTNERING. AND ALSO MORE GENERALLY ABOUT TECHNOLOGICAL DIVERSITY."

Matthias Zink
CEO Automotive Technologies
Schaeffler AG

Matthias Zink was born in 1969 and studied mechanical engineering, specializing in automotive engineering. As CEO Automotive, he is responsible for the Transmission Systems business unit, Research and Development in the Automotive Technologies division, the E-Mobility and Engine Systems and Chassis divisions, as well as Global Key Account Management. The Automotive Technologies division has its headquarters at the Schaeffler site in Bühl.

Matthias Zink is President of the CLEPA European Association of Automotive Suppliers.

Matthias Zink: What you can see here in Bühl illustrates and emphasizes the way our company is shifting in the direction of e-mobility. That is why we are investing in a project building in which we will implement cutting-edge working methods. On the one hand, we want to install a "New Work". We are engaged in complex projects in which we are developing e-motors, e-axles and e-drives. These are very large-scale projects involving up to 250 people each. We want to bring people together, and that includes face-to-face contact. Complex projects encourage a team spirit in which the participants engage with one another. And in addition to using modern methods, we want to do justice to this approach in the various project spaces.

Mathias Bihler: I believe that if you use the synergies that emerge from talking and working together then you can be unstoppable. Technology is fundamental to Germany. We have vast engineering expertise and good universities. This constantly helps us show our worth on the global stage.

Matthias Zink: We once had a well-known saying: "If Schaeffler knew what Schaeffler knows!" The task is to diffuse knowledge in development centers in a way that makes it accessible and ensure that it is available for industrialization and manufacturing. If you also want individuality, that is to say entrepreneurship and a spirit of innovation – then that is an art. Following the merger with Vitesco, we will have over 100 locations worldwide. How to manage things on this scale is another important question. That is why we are building centers like the E-Mobility Center in Bühl. It is a competence center that is also responsible for other sites and for this technology worldwide.

Mathias Bihler: You have mobilized a great team around you, a team with real hunger, or so it appears to me. Intense, sometimes also fiercely-de-

bated discussions breed productivity and ever greater proximity. We recently shared a Technology Day with you on the subject of hairpins. This once again brought completely new ideas to light that neither we nor Schaeffler had previously even thought of. I believe that this gives rise to a driving force that brings a competitive advantage with it. Our clear focus is on relationships and collaboration, not on selling machines.

Matthias Zink: I think we share this way of looking at things. We have a very high level of vertical integration and, at the same time, our proximity to our customers is our greatest asset. We do a great deal ourselves, for example we have a very productive toolmaking department. We want to be technology innovators not only in our products but also in the way we produce them. This then leads to exactly the type of discussion that you have with our people, where we also try to introduce innovative ideas into the production process. Things like this are only possible when there is an open dialog. To do this, we need good processes and machines. A readiness to innovate in the manufacturing field is undoubtedly a part of this.

We have probably never partnered as much as we are doing now. For example, we have entered into a joint-venture with the French company Symbio in order to help greatly expand hydrogen-based mobility in Europe. Our partners are Michelin and Forvia. We do this so that we can act together to minimize the risk, but also in order to maximize the chances for hydrogen. It's not possible to cover all the very many technical solutions on your own. We work in various consortia and also together with start-ups. Modern companies must be much more open when it comes to partnering. And also more generally about technological diversity.

Mathias Bihler: It's possible to see many parallels. Strategic partners, for example Trumpf in the laser welding field in our case, are vitally important. We integrate Trumpf technology in our processes because we know that there are resources we can call on.

Together, we are in a better position to address a wide range of topics such as emissions, energy efficiency or material use. For us, that is always a motivation in our own area, stamping and bending. And I think that the two sides go very well together. During our conversations over the last few months, we have revealed many synergies which have led us to take a close look at ourselves, further develop our own personnel and, most importantly, optimize our in-house processes. All of this shows that production in the mechanical engineering field isn't old-fashioned; it's forward-looking. And that drives us to extend our knowledge through training and further training, through collaborations with colleges and universities. And I think that that is what has made Germany great: Knowledge. And that brings me to the subject of digitalization.

Matthias Zink: When I look at our target markets, digitalization is playing a major role. I've just come out of a discussion where we were talking about Catena-X (open data ecosystem for the automotive industry). Dataspaces and data systems are being defined in which you have to find your own place, because there is no other way of controlling a digital supply chain. This means that beyond the products themselves, we also have to look at the question of processes, which is becoming ever more pressing. Standards, specifications, those are areas that will see very extensive digitalization in the future. We are very intent on digitalizing wherever this makes sense for us. This starts with the development departments and reaches right through into the factories. We have some lovely examples of smart, networked factories that we control digitally, for example in China, Spain and Germany. These are flagship projects. However, there is one thing we mustn't forget. We generate a lot of data and relations between data; however, we still have to read and understand this information – as human beings. Working with all this with state-of-the-art tools, that is something I envy the current and next generation.

Mathias Bihler: Yes, we mustn't forget the next generation. Digitalization makes companies more attractive to applicants looking for an apprenticeship, further training or an engineering position. It helps create efficiency in processes and makes information available to production departments with minimum delay. Of course, it will still be people who make the decisions. However, these people will be better placed to use information to make more reliable decisions. One of the more important things we have developed is therefore the digital twin to permit the virtual commissioning

CLEPA
European Association of Automotive Suppliers

CLEPA
represents more than 3,000 businesses in the automotive supply industry which invest more than 30 billion euros in research and development each year. Automotive suppliers directly employ some 1.7 million people in Europe.

of our machines, something that really excites the younger generation.

These are not "nice-to-have" offerings but solutions that boost our performance. And we are all racing against time. You receive an order from a customer. From that moment on, the clock is ticking. And the faster you are, the more likely it is that you will be successful. Digitalization makes an enormous contribution here. Always supposing that people see digitalization not as an enemy but as a tool helping them become more efficient.

Matthias Zink: And in all this, the question of sustainability is playing an ever more important role. The current generation is more aware of this than the generations before them were. And we must also take account of that. And that is just what we are doing, when I think of the amount that we invest in sustainable projects. For example, we have invested in a hydrogen-driven steelworks in Sweden. We have introduced programs to reduce our freshwater consumption, we plant green areas. That is something you have to do up-front if you want to attract sought-after, talented individuals or motivated employees.

Mathias Bihler: Here we are in the Competence Center for E-Mobility. What do you think the future holds?

Matthias Zink: I wouldn't think of e-mobility solely in terms of battery-powered vehicles. We continue to believe in a transition towards e-mobility. However, we have also always said that we don't think a ban on combustion engines is a good idea. You can have regulations and you can have goals. However, I, and here we return to the strengths of German industry, wouldn't lay down the path to the goal. I would allow the technologies to compete with one another. We support all solutions. At Schaeffler, we have further optimized the combustion engine and worked on combustion solutions and solutions that make combustion engines more efficient. Hybrids, electric drives and combustion engines will all play an important role on the path to e-mobility.
With the acquisition of Vitesco, we have again reinforced our commitment to e-mobility. In our factory here at the site, we have been investing in automatic transmissions for years. We manufacture large volumes here. And it is precisely in this factory that the transition to electric motors is now taking place. We believe in being open to technologies. We believe that electrification is coming. However, ultimately, the best technical and economic solution, the solution that end users will actually buy, should win.

Mathias Bihler: It's important to offer a range, starting with a modified combustion engine that runs with e-fuels, and possibly also a fuel cell. The next stage in development is e-mobility. And e-mobility should ideally be powered using alternative energies. 17 percent of Germany's electricity requirements are supplied by alternative energies, with 9 percent of this being generated by wind power and solar technology and the rest coming from biomass. You can see how much still needs to be done in order to switch over completely to alternative energies.

Matthias Zink: That shows just what a challenge transitioning to CO_2 neutrality is. And I believe that it is important to be aware of this when it comes to working together to define an appropriate, phased path to decarbonization.
One positive thing is that many companies are already acting on their own initiative. Consequently, we are continuously covering more of our energy requirements in Germany with in-house installations. In Kammerstein, for example, we have our own solar park with a total peak output of 9.9 MW. But it will take a few years yet before we have enough renewable energy to truly power all the world's vehicles.

What we need first and foremost is a European charging infrastructure. The Green Deal was decided in Brussels and not in Berlin. These laws that we are currently seeing and will see in the future are European regulations. And that is right because constructing a charging infrastructure and defining

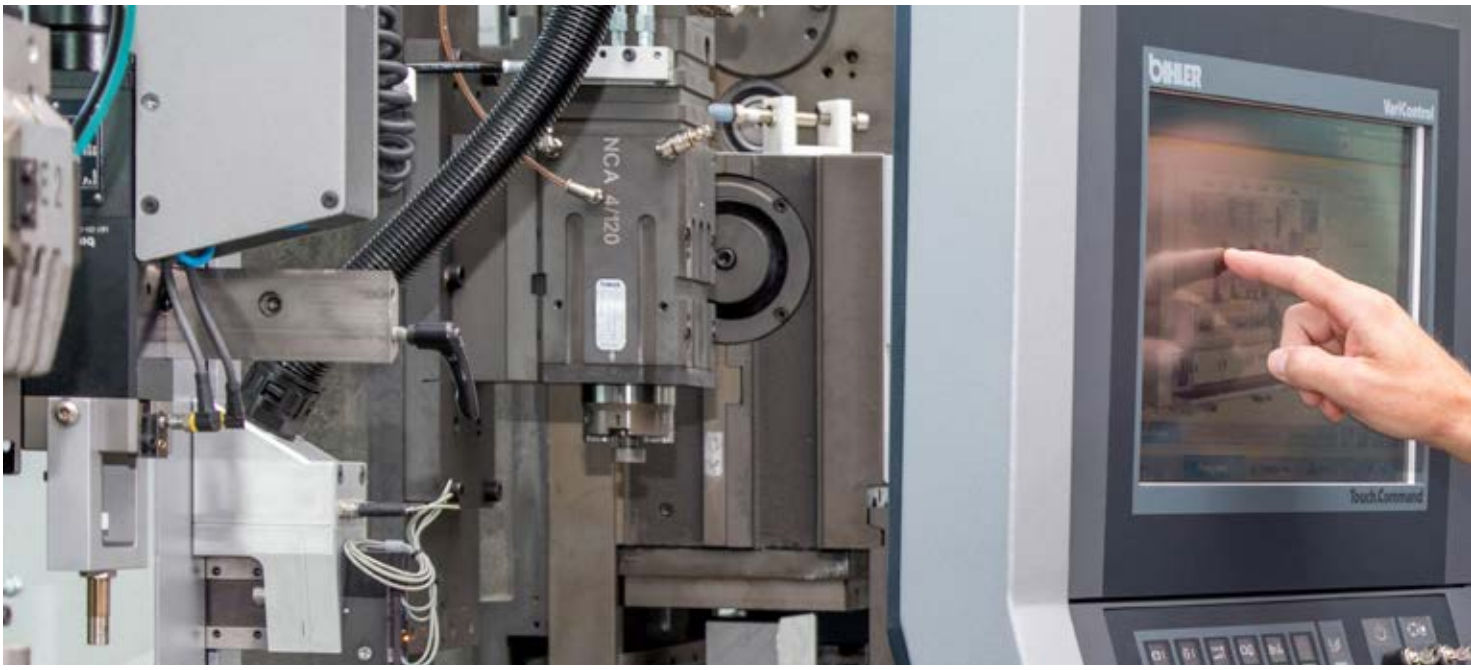
regulations are European-level tasks. How much do we want to reduce CO_2 by and by when? That's not possible at the individual national level, only at the European level. But it also means that any joint solution has to be feasible right across Europe. If you consider that 80 percent of charging stations are currently located in just four countries rather than being evenly distributed throughout Europe, then you can see that there is still a lot to do. I am committed to working together with our association, the European Association of Automotive Suppliers (CLEPA), for the good of the supply industry in Europe. We are currently in an extremely exciting phase.

Mathias Bihler: However, I also think that Brussels must unite Europe again, because some countries are working to destroy all of this. Europe doesn't just mean having the same currency or that it's easier to trade; instead it's about maintaining the power of Europe against North America and Asia.

Matthias Zink: That is what Europe has to do, be strong. Europe has not managed to show the same strength as the other two major regions: America and Asia. Sometimes we have over-regulated and done so in too fragmentary a way. But Europe's actual aim is to be strong, just as the common currency is strong. The aim is to become CO_2-neutral in a sensible, feasible way. The answer is not to over-regulate or to stop parts of the economy from functioning correctly, but instead to innovate our way towards CO_2 neutrality. ●

SCHAEFFLER

Schaeffler Group
The Schaeffler Gruppe has been active in the field of motion technology for over 75 years. Its areas of activity include e-mobility, CO_2-efficient drives, chassis solutions, Industry 4.0, digitalization and renewable energies. The motion technology company produces precision components and systems for drivetrains and chassis as well as rolling and plain bearing solutions for industrial applications. In 2023, the Group achieved sales of 16.3 billion euros. With some 84,000 employees, Schaeffler is one of the world's largest family-run companies and one of Germany's most innovative enterprises.



BIHLER'S TRAINING ACTIVITIES:

With basic seminars, training courses and consulting services, Bihler communicates exactly the skills and knowledge that are important for manufacturing cost-effectively on Bihler systems. The focus is always placed on the acquisition of practical, hands-on knowledge that is specifically tailored to meet each customer's individual needs.

New knowledge and up-to-date production skills are avidly sought after in the metalworking industry. More and more experienced employees are entering retirement and taking their knowledge, acquired over many years or decades, with them. At the same time, many companies are ushering in a completely new approach to their production strategies in the form of modern, servo-controlled Bihler technology – but often without the necessary background knowledge and experience. This is exactly where Otto Bihler Maschinenfabrik comes to their aid by offering a comprehensive package of basic and further training activities and measures. The focus is always placed on communicating practical, hands-on knowledge that is tailored to the customer's specific requirements. "Our bespoke consulting services show how Bihler's technologies can be optimally used to bring about the greatest possible economic benefit," explains Peter Thieme, Head of Bihler Consulting. "This begins with the configuration of the manufacturing process and the design of the tools and goes on to the optimization of the cutting tools, the programming of the system and the settings for the welding process." All the contents are communicated in a practical, interesting and easily comprehensible way, either using the modern equipment at the training center in Halblech or directly at the customer's premises. Three categories are available: Basic seminars, consulting and training courses.

Peter Thieme
Head of Consulting
Tel.: +49(0)8368/18-348
peter.thieme@bihler.de

The perfect introduction There is a wide range of basic seminars intended for new users and modern training machines are used to introduce participants to the necessary theoretical knowledge. This makes them more confident when using the machines and encourages autonomous, goal-directed work. The seminar "Mechanical Stamping and forming machines and Machining Centers" is particularly highly recommended. This gives participants the basic knowledge needed to handle the mechanical machines and provides an introduction to tool technologies and innovative working practices. "Armed with this basic knowledge, participants can operate and maintain the Bihler systems and make tool-specific settings," explains Thieme.

EVERYTHING YOU NEED TO KNOW!

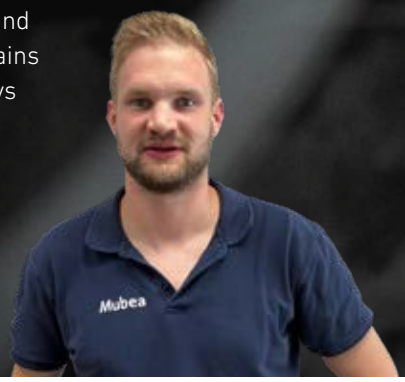
Tailored performance enhancement Bihler's tailored consulting activities build on the knowledge acquired during the basic seminars. They demonstrate how to improve the productivity of Bihler systems, increase tool service lives and perform programming and welding tasks efficiently. This makes it possible to react to market requirements much more quickly and cost-effectively. The "Cutting Tool Optimization" consulting option is of particular interest. This aims to help users extend the service lives of their cutting tools and achieve higher productivity and better results when performing stamping operations. This is done by analyzing the tools, identifying existing potentials for optimization and working together to implement the corresponding solutions. "Practice has shown that optimizing the cutting tools greatly improves the effectiveness and cost-efficiency of Bihler systems," reports Thieme.

Individual know-how transfer The individual training courses go even further. "These focus on the specific part the customer wants to manufacture, the precise requirements and the Bihler system the customer is using," explains Thieme. The best example of this is the training course "Bending Tool Installation and Adjustment". This gives participants a detailed understanding of the best way to go about installing and fine-tuning bending tools on a machine. A standardized procedure for achieving the optimum tool settings is also taught as part of the course. After completing the course, all participants can install bending tools efficiently and reproducibly. Bihler's wide range of training opportunities therefore offers customers the ideal way to equip their employees with valuable specialist knowledge. Employees trained in this way not only boost the company's success but are also more motivated in their everyday work and are more confident when working with the machines. ●

Bihler's training courses equip all participants with the know-how they need, for example in order to mount a bending tool effectively and reproducibly.

“RISKS SIGNIFICANTLY REDUCED”

Since 2011, the company Muhr und Bender KG has been taking advantage of Bihler’s inspection service for the nine Bihler systems that the lightweight design expert uses at its Attendorn headquarters to manufacture its automotive components. More specifically, two GRM-80E, three GRM-80P, one GRM-NC and three MC 120 systems are inspected every six months. “These are highly complex systems and the most important thing about Bihler’s inspections for us is that they help us avoid unscheduled downtimes,” explains Stefan Gödde, Head of Stamping and Forming at Muhr und Bender KG. “It is an excellent service and one of the great advantages is that quotes are issued rapidly for spare parts, which can then be immediately ordered and installed in good time.” The importance of these inspections was recently demonstrated at one of the company’s GRM-80P systems: “Thanks to the inspection, we found out in good time that the main gear wheel had to be replaced. As a result, we were able to plan the replacement well in advance and continue production on schedule,” explains Gödde. “Naturally, something can always happen during production, but Bihler’s inspections greatly reduce the risk.”



Stefan Gödde, Head of Stamping and Forming at Muhr und Bender KG.

Otto Bihler Maschinenfabrik provides an inspection service for all Bihler systems, irrespective of whether they are mechanical or servo-controlled, older models or more recent designs. These are complete machine check-ups that offer many practical benefits to the customer: “Bihler’s inspections identify all the weaknesses and problems before the system fails and make sure they are eliminated in good time. Any spare parts that are needed can be purchased well in advance and the corresponding maintenance and service activities can be scheduled and conducted with minimum delay,” explains Martin Schön, Head of Technical Support. “All in all, this allows all our customers to manufacture much more efficiently.”

Comprehensive examination Every inspection starts with the recording, analysis and assessment of the system’s key parts and components. “Experienced Bihler service engineers scrutinize every detail of the customer’s system and check all the parts for obvious anomalies or wear: From the drive and slide units, then on to the feed components, the press and the straightener, as well as the central lubrication system and the pneumatic and hydraulic components,” explains Peter Schmölz, Group Head of Mechanical Engineering Service Technicians. “Particular attention is paid to the drive, which is a unit that is often underestimated by customers. It is particularly important to replace it in good time if the need arises because it is fundamental for machine operation and production.”

Valuable basis for decision-making In the next step, the results of all the checks are recorded in a standardized inspection report. This also makes it possible to swap information with other Bihler service engineers, for example those responsible for performing the annual maintenance check-up. And the report naturally also gives the customer a detailed insight into their machine – and

INSPECTIONS FOR PERFORMANCE INSTEAD OF STOPPAGES

Inspections are essential and a quick and easy way to ensure the performance of a company's in-house Bihler systems and avoid unscheduled downtimes. All the mechanical machine components are subjected to a thorough analysis and assessment, making it possible for users to act exactly as and when required, for example by ordering spare parts in good time.

its future performance potential. "We recommend actions based on the inspection report, for example a follow-up repair or maintenance activity, a regular check-up in the form of a service agreement or a scheduled modernization," says Schmölz. The particular benefit is that "the customer receives a separate inspection report and a separate spare parts offer for each individual machine. The corresponding spare parts delivery is then also clearly specified for each machine and delivered parts are unambiguously assigned to a specific system." It is reassuring for customers to know that Bihler has adapted its parts stocks on the basis of the previously performed inspections and has a large number of typically needed spare parts on hand. When the corresponding repair or maintenance activities have been performed, the machine is again ready for its future tasks.

Worthwhile investment The inspections, which take around three hours in the case of a mechanical machine, for example, are therefore an absolutely worthwhile investment: "The inspections always pay for themselves and are immensely important, in particular when we are dealing with critical machines that supply an entire line," stresses Schön. "They can be performed with relatively little effort and, most importantly, are free from any time pressures and therefore bear no resemblance to an unscheduled machine stoppage which, as experience has shown, usually has a knock-on effect right through to the highest level." If you would like to be on the safe side and have your own Bihler system inspected by Bihler's experts – all it takes is a short email or a telephone call to Bihler Customer Support! ●

Bihler Customer Support
Tel.: +49(0)8368/18-200
service@bihler.de

With the Bihler Digital App, all users can view the state of their Bihler systems in real time whenever they want and can take advantage of the potentials for optimization that present themselves.

VALUE-ADDED WITH THE BIHLER DIGITAL APP

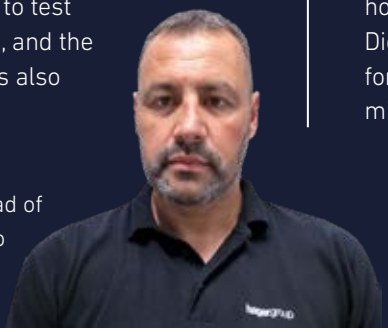
Real-time monitoring, analysis, optimization and testing of production systems – the Bihler Digital App allows users to get the very best out of their manufacturing capabilities. This is just as true of the basic package as it is of the application's versatile add-on modules, which have shown their value in practical use.

More and more Bihler customers are now using the Bihler Digital App. This is a plug & play solution that is ready for use without any programming and which currently consists of the "basic package" with machine overview and dashboard as well as the four modules: "Analysis", "Offline VC1", "Job management" and "Animation". With the basic package, customers get a clearly laid-out, real-time presentation of their own Bihler machines, even if they do not possess their own machine management system, and can see immediately whether a system is currently producing or whether a malfunction might have occurred," explains Bastian Hartmann from Customer Sales Support. "They can access the relevant system via the integrated dashboard and query its detailed status." The basic package is now also available for machines with a VC1 E controller.

Analysis and testing The modules of the Bihler Digital App can be used as and when required and build on the basic package. They include the Analysis module, which displays the production stoppages and messages recorded by the controller. "This often shows that the most frequent malfunctions don't necessarily correspond to the most serious anomalies," says Hartmann. "In this way, the analysis can make an important contribution to improving the system's performance or, more generally, to taking advantage of the potentials for optimization."

“10 PERCENT PRODUCTIVITY BOOST”

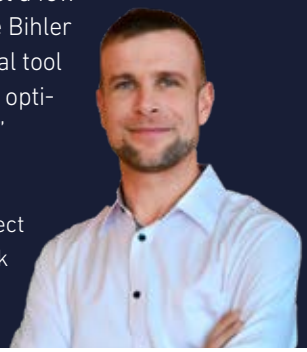
The French company Hager Electro SAS is the leading manufacturer of electronic installations and has been working intensively with the Bihler Digital App for about six months. The app is used with a total of ten Bihler systems, from the company’s GRM-E and RM 30 machines, through the FMS and BZ and on to a GRM-NC. The controllers of the older systems have been modernized to make the machines compatible with the app. The company uses the machine overview as well as the Offline VC1 and Analysis modules. “The Analysis module, in particular, has been immensely useful to us. It has allowed us to identify assembly deficits that we were previously unaware of and introduce specifically targeted measures to eliminate these. All in all, we have been able to increase our productivity by ten percent in this way,” reports Head of Maintenance, Thomas Spehner. “What is more, the Offline VC1 module greatly simplifies the maintenance of our systems for us. We use it to test and adapt production programs, and the ability to guarantee IT security is also important to us.



Thomas Spehner, Head of Maintenance, Hager Electro SAS, Obermai, France

“THE IDEAL TOOL”

Metalltechnik Annaberg GmbH & Co. KG uses Bihler GRM-NC, GRM 80P, GRM80 E and RM 40K systems to manufacture stamped-and-formed parts for switchgear and equipment construction and employs the Bihler Digital App for all these systems. “We find that the dashboard showing the live status of the system is particularly valuable and saves us a lot of to-ing and fro-ing. We can see immediately from our desks whether or not the system is currently producing, how long the current item still has to run and when the next change of variant is due,” says Eric Nagel from the Bihler Project Implementation unit. “We were also able to integrate our Bihler systems with VC1e controller into the dashboard without difficulty.” At the same time, the company also uses the Offline VC1 module for its training activities. “Using this, one of our employees was able to operate a Bihler system all by himself in a matter of just a few hours,” says Nagel. “For us, the Bihler Digital App is therefore the ideal tool for increasing productivity and optimizing machine management.”



Eric Nagel, Bihler Project Implementation, Metalltechnik Annaberg GmbH & Co. KG.

The Offline VC1 module has also been particularly well received in the day-to-day working environment. With this, all users are able to prepare new programs or tools offline – without having to go to the actual system or interrupt production. “It is often used to make production-related adaptations in response to changing customer requirements and also to store and update multimedia contents as user aids,” reports Hartmann. At the same time, many companies also use the module for training purposes in order to familiarize their employees with the VC 1 controller.”

Management and demonstration The Job Management module also delivers considerable added value, in particular for users without MRP-machine integration. It allows these users to set up jobs together with all the relevant key figures, manage them and then feed them into the production environment without the need for any paperwork. All the jobs are stored and can be reproduced at any time.

Last but not least, the Animation module is particularly valuable. It permits a virtual depiction of the machine and manufacturing process in the form of an animation. Hartmann explains: “It is possible, for example, to store the wear limit for a die in the animation and couple this with an associated video explaining the steps necessary in order to replace the part.” Overall, therefore, the Bihler Digital App provides significant value-added in everyday use. The app is continuously updated and extended to include new features and functions. ●

Bastian Hartmann
Sales and Customer Support
+49(0)8368/18-296
bastian.hartmann@bihler.de

WELDING EXPERTISE THAT SAVES LIVES

The latest Bihler B 20K welding controller used in combination with a Bihler stamping and forming machine is the ideal solution for joining ignition wires The greatest advantage is the ability to precisely dose and fine-tune the energy input during resistance welding. This ensures that the wire fuses perfectly, thereby guaranteeing that the component will function correctly.

They are practically invisible in the passenger compartment, trigger in a fraction of a second and save lives: Airbags are one of the most important safety features in the car. It is therefore equally important that all the components are manufactured to the highest quality. This applies just as much to the crash sensors as it does to the plastic bags, which are deployed in just 20 to 50 milliseconds. However, the most important element of all is the airbag's ignition mechanism. "The igniter is the heart of every airbag system," explains Martin Ott from the Bihler Welding Technology Department. "If a crash occurs, it receives an electric pulse from the sensors and then immediately triggers airbag inflation."

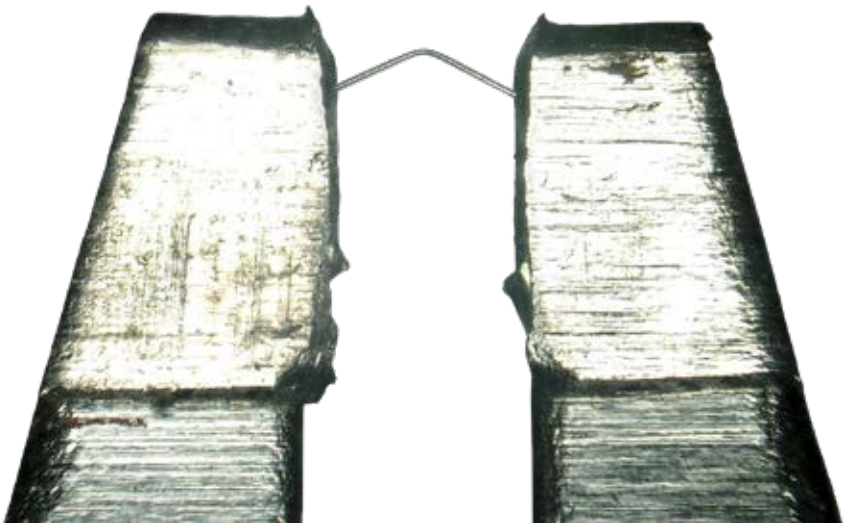
Constant resistance The central component of the ignition unit is the ignition wire, which is only a few micrometers thick and has to remain securely and permanently attached to two connecting pins. Otto Bihler Maschinenfabrik has more than 40 years' experience of applications just like this and has already successfully implemented numerous automation solutions that meet the high requirements, in particular with regard to joining the wires: Ott makes things clear: "The most important quality criterion for igniters is keeping the resistance constant in order to ensure that exactly the right amount of electricity is applied at the transitions of the connecting pins. Precisely dosed, targeted energy input is therefore essential."

Martin Ott
Welding Technology Department
Tel.: +49(0)8368/18-340
martin.ott@bihler.de

In the high-frequency range The Bihler B 20K welding controller represents the perfect response to these requirements. This is because it works at particularly high frequencies of between 1 and 20 kHz and consequently permits particularly precise adjustment of the energy input. At the same time, the Bihler B 20K allows users to make a large number of settings for high-frequency operation and intervene to monitor the welding process online, adapt it to the specific circumstances and consequently achieve optimum parts quality. The process is monitored by five integrated, freely programmable measurement channels. These capture all the relevant data, for example concerning current, voltage and distance, and are used to assess the final weld. In addition, users can choose between various current or power control modes that make it possible to implement individual welding profiles and ensure optimum process reliability. There is also an active power supply module for the network supply that ensures that the system is protected against network fluctuations.

At the heart of every airbag system is the igniter. This triggers the inflation of the airbags in the event of a crash (left).

Machined with micrometer precision: The ignition wire between the two plates.



Clamping and fusing A Bihler RM 40P stamping and forming machine in combination with Bihler's B 20K welding controller is one example of a cutting-edge manufacturing solution for airbag igniters. Equipped with two welding heads, the system handles wire diameters of 11 to 23 µm and outputs 100 finished parts per minute. The two pins are prepared at the stamping and forming machine and the wire is then inserted in the two lugs provided and mechanically fixed in place. At the downstream welding station, the lugs are then securely and permanently resistance-welded to the wire.

Integrating relevant variables This solution once again underscores Bihler's outstanding competence in the manufacture of airbag igniters – an area of expertise that goes all the way back to 1984, when a Bihler MACH-1/7 was used in combination with the Bihler B 10 three-phase welding controller operating at 50 Hz. And in the future, Bihler will use NC technology and OPC-UA-based data transfer to incorporate information about parts preparation in the welding process. This solution will also include further-optimized stamping force management and it will be possible to use information about a number of relevant variables, for example from resistance measurement systems, in a variety of control circuits in order to make the manufacture of airbag igniters and other demanding precision parts even more efficient and reliable. ●

Used in combination with the Bihler B 20 K welding controller, the Bihler RM 40P stamping-and-welding machine handles wire diameters from 11 to 23 µm.

NEW CONCEPT FOR LASER WELDING MODULES

The new solution has been designed for the manufacture of complex industrial connectors.

The new Bihler LSM 250 laser welding module minimizes the effort involved in developing laser applications for the manufacture of plug connector contacts. It is a standard concept used by Bihler to implement corresponding laser welding modules in new systems.

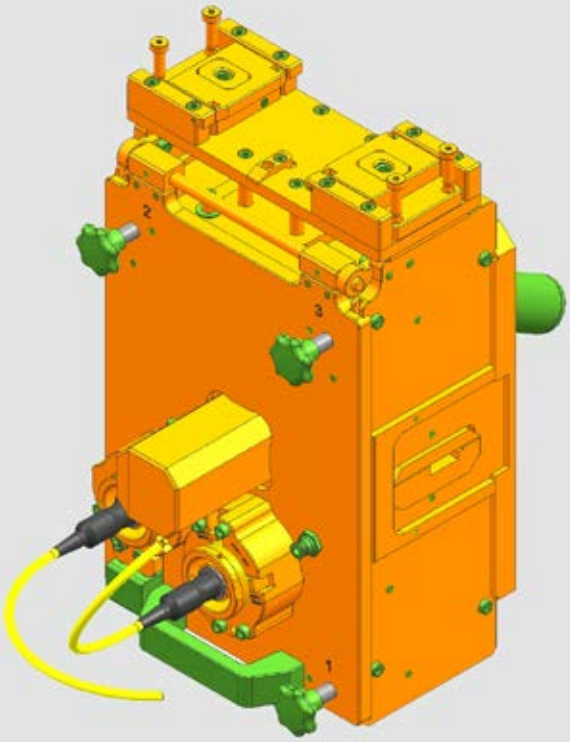
In the past, laser welding processes intended specifically for the manufacture of plug connector contacts were designed to meet specific customer requirements and implemented individually on the corresponding Bihler systems. On the one hand, the effort involved in developing these manufacturing solutions was correspondingly high and, on the other, a new solution had to be developed for each individual application. It is to overcome these drawbacks that Otto Bihler Maschinenfabrik has now developed the new Bihler LSM 250 laser welding module. "The Bihler LSM 250 module is a standard concept for welding plug connector contacts that users can call on whenever they need to and save themselves a lot of work," explains Marc Walter, Departmental Manager for Design & Development at Bihler. "It provides all the functionalities needed for the spot or seam welding of plug connector contacts. These include the strip feed as well as the centering, guidance and clamping of the component. At the same time, the module ensures that the welding fumes are extracted and that the laser welding area is securely enclosed."

Up to 500 strokes per minute Designed in the typical Bihler grid dimension of 250 millimeters, laser welding modules implemented with the Bihler LSM 250 can be used without difficulty on a Bihler LM 2000 KT / NC or a Bihler BIMERIC, for example. Used on these machines, the solution is able to show off all its strengths in the field of plug connector production: "The Bihler LSM 250 laser welding module allows the machines to run at particularly high speeds and at throughputs of up to 500 cycles per minute," continues Walter. "It also ensures stable process conditions, delivers reproducible results and excels through its generally high availability." And if a malfunction does occur from time to time, this can be quickly identified and eliminated thanks to the easy-to-open design. The module also contains all the geometrical interfaces to the machine bed, and the integrated quick-clamping systems ensure particularly short setup and teardown times.

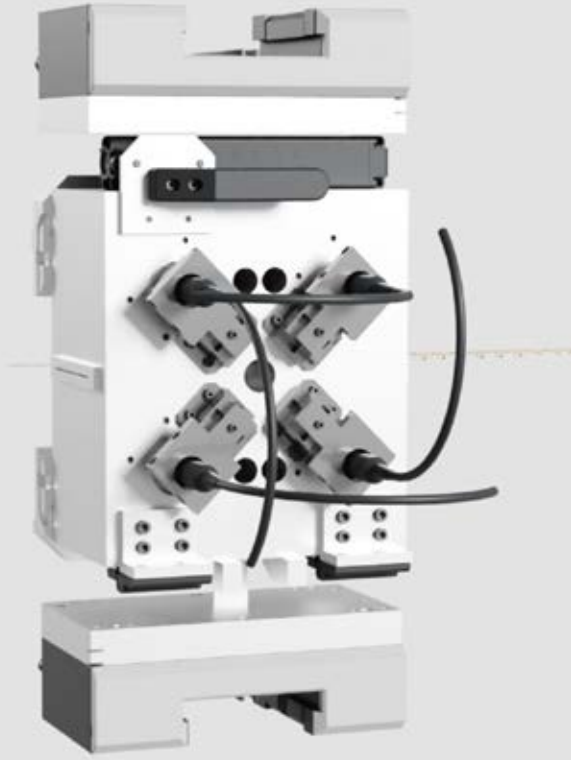
Individual variants With the new laser welding module, Otto Bihler Maschinenfabrik is able to supply finished modules that can be integrated in new, fully-equipped Bihler systems, where they are then immediately ready to start production. However, the solution is also available as a design template for individual variants. The customer must then adapt the template to its own particular plug connector application, complete the design, manufacture it and take it into live operation. In such cases, Otto Bihler Maschinenfabrik naturally provides all users with comprehensive support based on its wide-ranging process expertise in the laser welding of plug connector contacts. The new Bihler LSM 250 laser welding module will be available as of mid-2025. ●

Marc Walter
Departmental Manager for Design & Development
Tel.: +49(0)8368/18-139
marc.walter@bihler.de

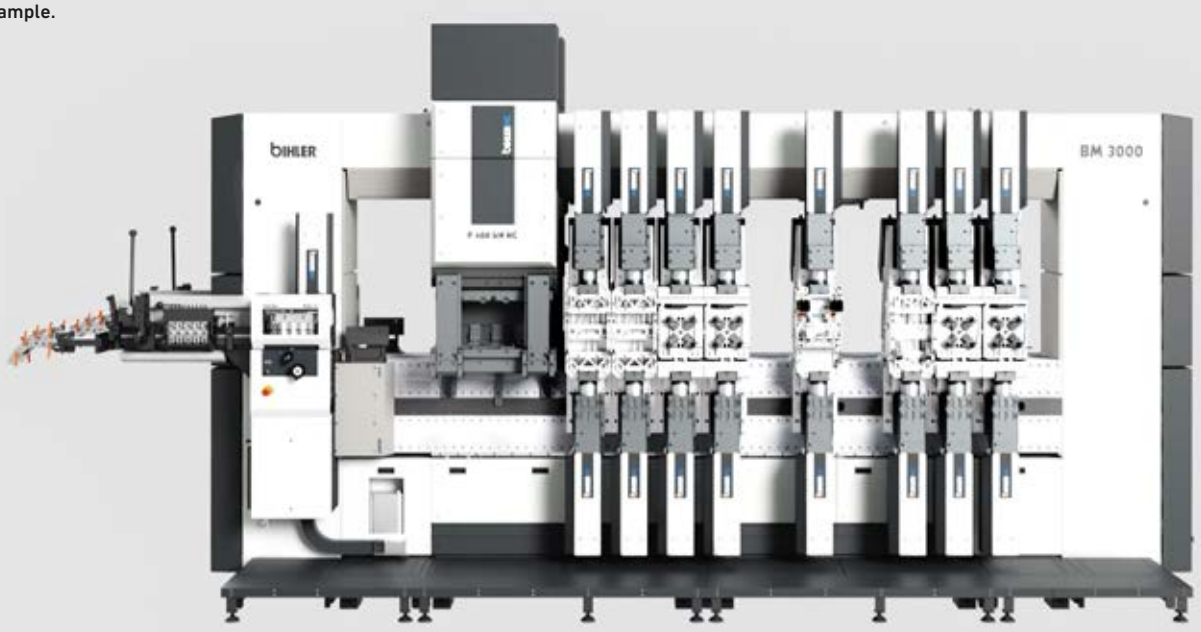
The standard concept provides all the functionalities needed for spot or seam welding.



The Bihler LSM 250 laser welding module has been designed for particularly high speeds and throughputs of up to 500 cycles per minute.

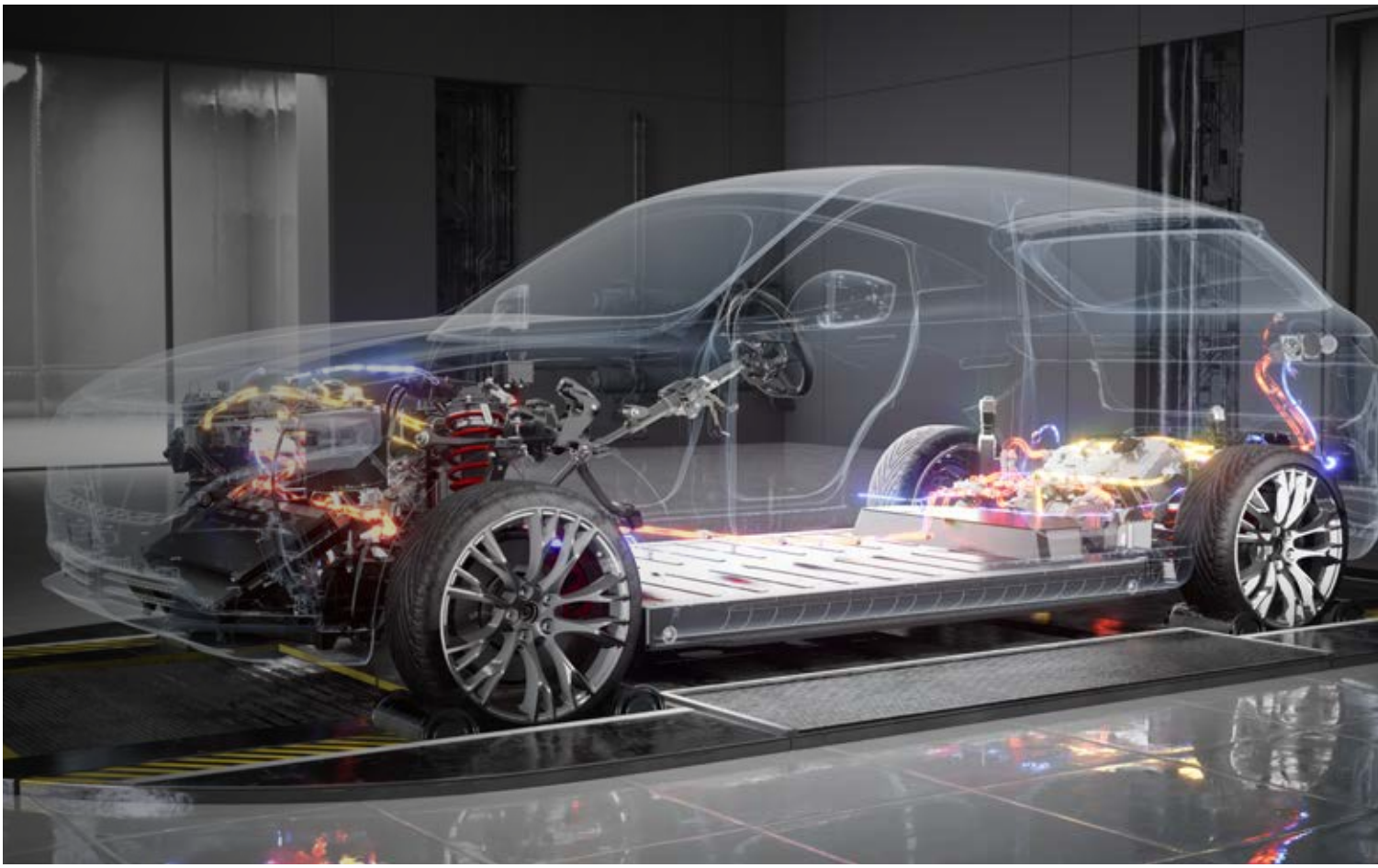


Welding modules implemented with the Bihler LSM 250 can be used without difficulty on a Bihler BIMERIC, for example.



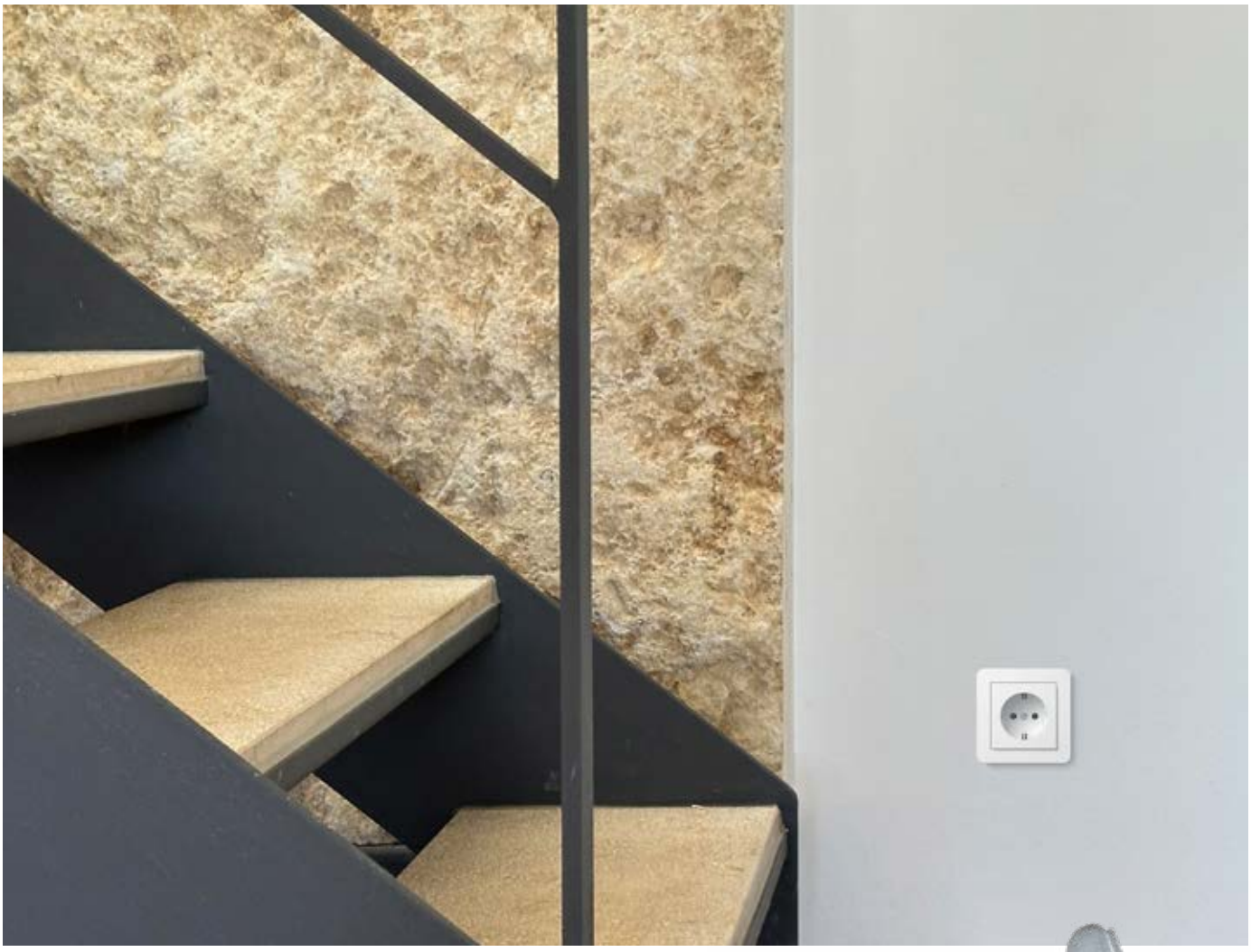
SWITCHED ON!

Light switches are not only used to switch indoor lighting on and off but are now fully-fledged designer products whose switch and frame elements are crafted to blend perfectly into the user's particular habitat concept. Nevertheless, the true strength of any switch is to be found in its complex inner workings. These comprise a number of contact parts, a retaining spring, a box terminal, fixing screws and the housing. If the switch element is to function reliably then it is essential that all the components are manufactured in high quality and assembled without error.
These high production requirements can be optimally fulfilled by a **Bihler BIMERIC BM 3000** used in combination with a **Bihler RM 40** – in an end-to-end, fully automated manufacturing process. The Bihler BM 3000 starts by manufacturing three of the contact parts, including the stamping, bending and resistance welding of the silver contact wire. At the same time, the Bihler RM 40 produces the stainless steel retaining springs. These parts are fed on the strip to the Bihler BM 3000 and are simply mounted in the corresponding contact parts at the machine. The injection-molded switch housings are then fed to the Bihler BM 3000, which separates the fully assembled metal parts and mounts the individual assemblies in the switch housing. This solution operates at a process speed of 65 finished switch elements per minute.



SECURELY GROUNDED

The lithium-ion battery is the beating heart of any electric vehicle. It delivers nominal voltages of several hundred volts and the need for safe, reliable voltage management is therefore correspondingly high. One vitally important component is the **ground connector, also known as the busbar**: These elements connect an e-vehicle's battery to its chassis and ensure that the electrical potentials are equalized. In this way, they prevent sparking due to static charges, reliably dissipate overvoltages and also protect against electromagnetic interference from the battery that might disrupt the vehicle electronics. The **Bihler BIMERIC is a high-performance solution for the manufacture of busbars**. Used for this application, the system is able to show off its strengths for the flexible, efficient manufacture of components and it integrates all the required process steps in a single cycle. These start with stamping, bending and the infeed of the bolt. The bolt is then mounted or press-fitted and the corresponding travel/force ratio is monitored. The washer is then fed in and press-fitted, again with the system monitoring the travel and force values. In addition to this ability to combine the various process steps, the system can also be set up quickly for variants. In practice, this means that three variants of the module can be manufactured without difficulty at a throughput of 60 parts per minute.

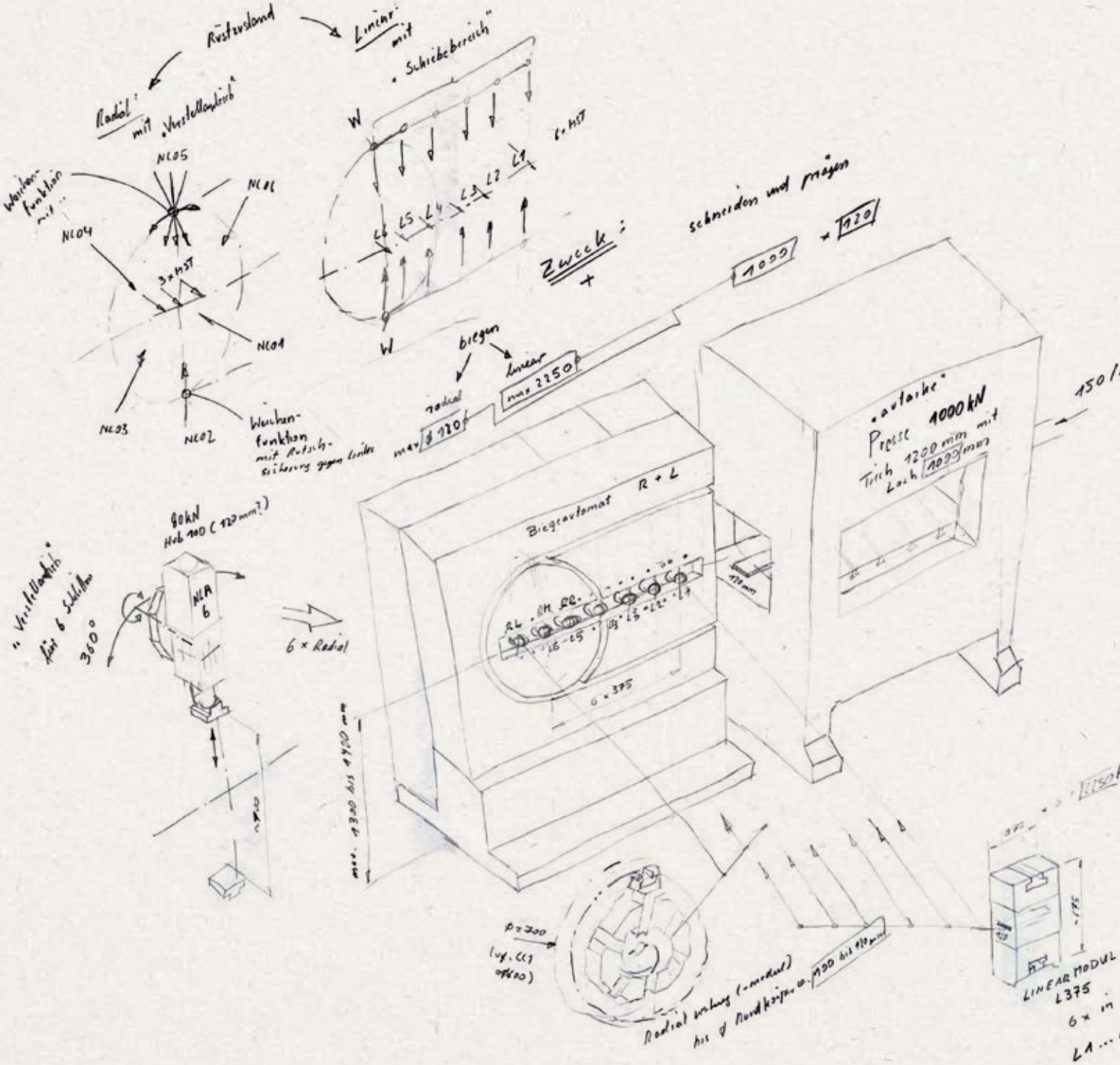


SECURELY PROTECTED

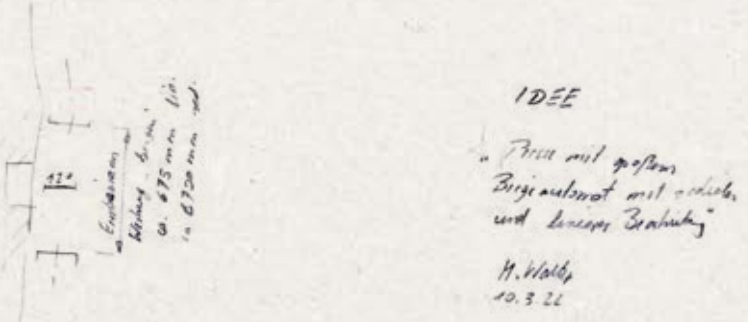
The protective contact (Schuko) in sockets plays a vital role in ensuring the safety of electrical equipment. It does this by grounding the equipment, that is to say connecting it to Earth. This grounding is essential in order to drain off dangerous voltages in the event of a fault or short-circuit and prevent users from being exposed to electric shocks. The two top ends of the **ground connector** can be seen as shiny metal lugs positioned ahead of the actual electrical contacts in the socket. When a plug is inserted, these protective contacts first come up against the corresponding grounding points in the plug. This early connection ensures that the housing of a faulty device is grounded before any electricity is able to flow. A **Bihler Multicenter MC 82** is the ideal choice for the manufacture of the six-part ground connector. First of all, the connector and the box are stamped and bended on the machine. The two metal lugs, which are also known as fingers, and the retaining spring and plastic release toggle are then fed in and assembled. During the manufacturing process, a conveyor belt transports the ground connector over both machine faces. The component is then separated and passed on to a measuring cell that uses a cycle-synchronized camera to check that the products are completely free from any defects.

SECURELY ANCHORED

Anchor bolts are the go-to solution whenever it is necessary to fix particularly heavy loads to concrete or stone surfaces. To fit them in place, it is simply necessary to drive the high-strength steel bolts into a suitable hole and make sure they are flush on the component that is to be secured. The anchor is then tensioned using the nut. The vital element is the integrated expansion sleeve at the bottom end of the bolt: As the tensioning screw or cone is screwed in, the sleeve expands until it is tight against the wall of the hole, thereby ensuring that the component is securely anchored. One ideal solution for manufacturing these complex, multi-part anchor bolts is a **Bihler BIMERIC BM 4500 servo production and assembly system, for example**. The system feeds the bolt in, aligns it and mounts the fed-in sleeve on it. The sleeve is then inspected, the red ring that stops it from turning together with the bolt is mounted and the washer and nut are also fed in and mounted. Finally, the correct number of finished anchor bolts are placed in packaging units and removed from the process. This solution is particularly advantageous due to the high quality and speed of the joining and assembly technology. Throughput of between 80 and 120 parts per minute is possible depending on the size of the bolt.



The start of a big idea: An early functional sketch of the new Bihler LRM 3000-NC. With its extended working area, range of operating capabilities and the possibility of machining both strip and wire material, the system is designed for the production of particularly large components.



A NEW CONCEPT: BIHLER TECHNOLOGY GOES BIG

With the Bihler LRM 3000-NC, Otto Bihler Maschinenfabrik is currently developing a completely new concept machine specially intended for the production of large-volume stamped-and-formed parts. This innovative NC system, which has a working area extended to 3,000 millimeters and offers the possibility of machining wide strips, is versatile enough to handle both large batch sizes and short runs – using either linear or radial tool modules.

With the new Bihler LRM 3000-NC, Otto Bihler Maschinenfabrik is currently developing a completely new servo machine designed to handle both strip and wire material. The system boasts a particularly simple, robust design and differs from the Bihler LM 2000, for example, in one vital area: "The Bihler LR 3000-NC has been designed for the production of larger parts and therefore has a total machining length of 3000 millimeters. This clearly differentiates it from our existing machine types with a working area of 2000 millimeters," explains Marc Walter, Departmental Manager for Design & Development at Bihler. "The Bihler LRM 3000-NC is able to work with strips that are 25 percent wider than is possible with the Bihler GRM 100 stamping and forming machine or the Bihler COMBITEC CC 1 production system." The system will therefore also permit the machining of wide strips measuring up to 150 by 5 millimeters as well as wire diameters of up to 10 millimeters. Typically, it will be possible to manufacture round components of up to 150 mm in diameter from the strip material. In the past, the upper limit for such components was 100 mm to 110 mm in diameter.

For long-running products and short series

However, the Bihler LRM 3000-NC will not only make it possible to manufacture particularly large stamped-and-formed parts. It will also excel through its outstanding versatility in terms of the batch sizes it handles, because it will be possible to equip it for two main types of application. "On the one hand, the Bihler LRM 3000-NC machine platform can be configured for single-purpose applications, that is to say for long-running products with only a few variants and large batch sizes," explains Walter. "On the other, it can also be set up for variable applications involving frequent retooling and different components manufactured in smaller batch sizes. To this end, the system can be optionally equipped with a positioning unit,

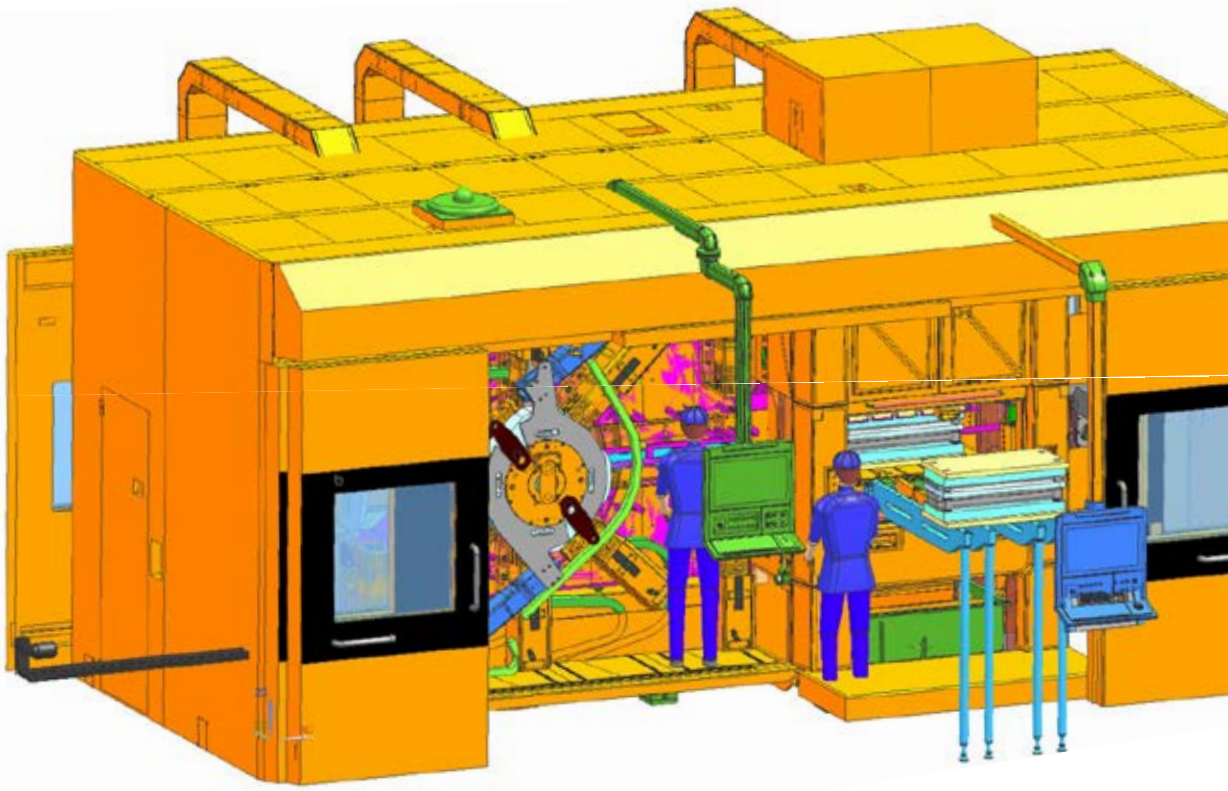
which makes it very much easier to change the machine modules, such as the slide units." But irrespective of the configured variant, the Bihler LRM 3000-NC is designed to perform the conventional forming processes such as bending, stamping, pressure calibration and many more besides. The board can be cut by a 1200-kN NC screw press that is integrated in the machine controller but nevertheless functions as a stand-alone unit. When the machine is used to handle wire material, processing is also possible without the press option. In the future, it will be possible to use the system itself with both radial and linear tools, which will be mounted as modules. All the required tools and machining components can be replaced quickly and easily using the LEANTOOL principle.

High level of integration In terms of design, the Bihler LRM 3000-NC will broadly adhere to the Bihler LM 2000 platform concept. The Bihler LRM 3000-NC has a correspondingly modular structure. However, the machine body has been designed to be particularly rigid in order to compensate for the high forming forces that arise during operation. All mechanical, electrical and hydraulic interfaces to the corresponding processing modules (e.g. NCAs) are integrated in the machine body. The hardware is also pre-installed as standard and comprises connectors, cables and ports for all available machining module stations. As a result, if it is subsequently necessary to extend the system with additional units such as further NCAs or central mandrels, then users will easily be able to install these components themselves. The associated switchgear cabinets are also present at or in the machine body. This minimizes the work involved in separating and re-establishing the electrical connections when moving the machine. And, of course, the tool interfaces are present and arranged in a way that permits the positioning of the tool modules, a task that is performed using high-speed tool clamping systems here. And, last but not least, the Bihler LRM 3000-NC is also equipped as standard with an interface for the optional integration of a positioning unit for a new ring press. In contrast to earlier designs, the ring press will not be a standalone application solution but, instead, a process module fully developed right through to the active components with clearly defined user interfaces. The system will be controlled via the Bihler VC 1 controller.

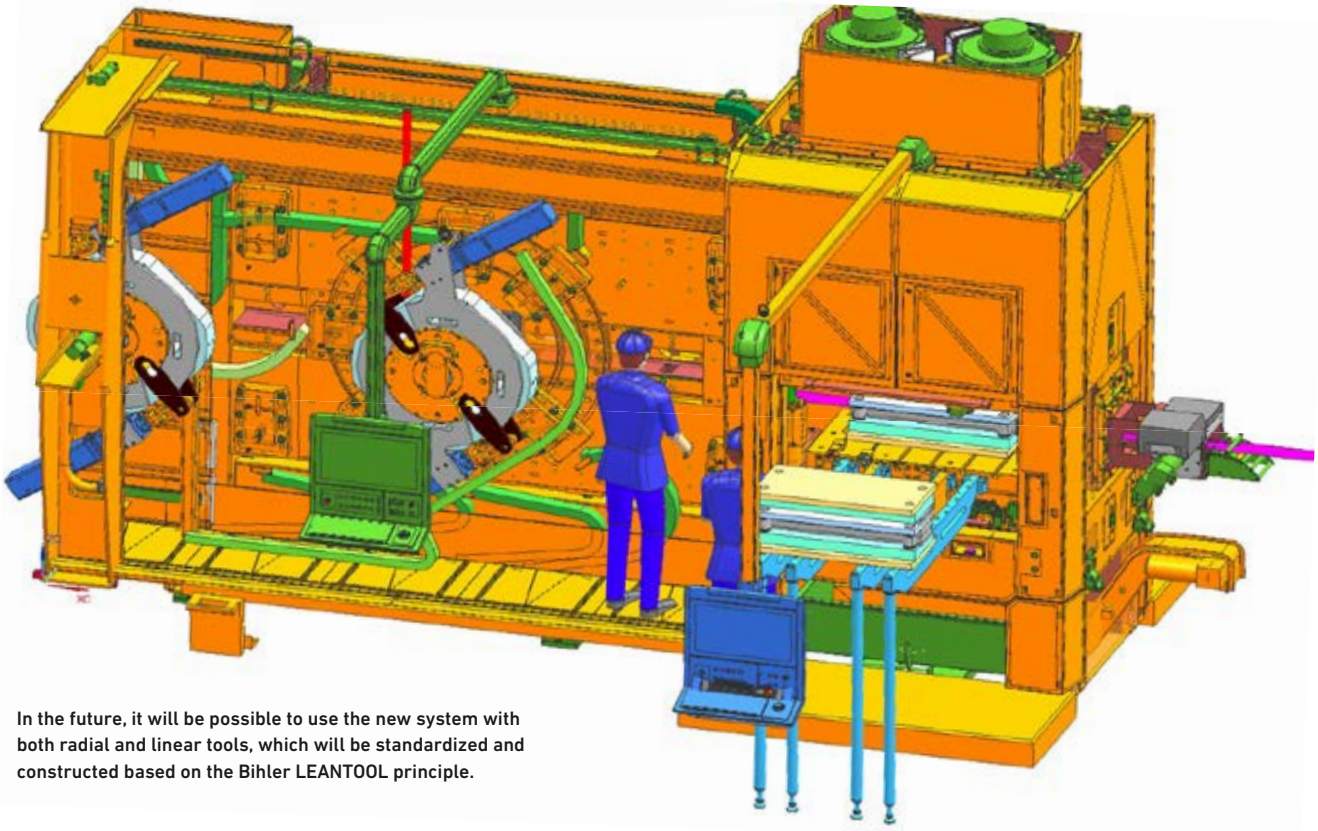
Extended parts spectrum Even though the new Bihler LRM 3000-NC is still in the development phase and no prototype will be produced until 2025 – the future benefits are already becoming clear: "With the Bihler LRM 3000-NC, users will have a new, standardized system, equipped with standardized tool technology, that is ideally suited to the manufacture of larger components both in high-volume series with a limited number of variants and in small runs with frequent tool changes," concludes Walter. "It is a clear, simply-structured machine with a defined area of application which will allow users to significantly extend their existing parts spectrum." ●

The new machine will be controlled via the Bihler VC1 controller.

The Bihler LM 2000 platform provides the basis for the new Bihler LRM 3000-NC.



With its modular structure, the Bihler LRM 3000-NC is designed to perform conventional forming processes such as bending, stamping and cylindrical calibration. Stamping can be integrated in the manufacturing process or can be performed separately using stand-alone presses.



In the future, it will be possible to use the new system with both radial and linear tools, which will be standardized and constructed based on the Bihler LEANTOOL principle.

Marc Walter
Departmental Manager
for Design & Development
+49(0)8368/18-139
marc.walter@bihler.de

“TOGETHER IS THE ONLY WAY”

Learn from the best: The ABT Sportsline team never fails to turn in outstanding performances in the DTM*, Germany's most popular racing series. Harry Unflath, Head of Sports Marketing at ABT, and Head Engineer, Leon Wippersteg, talk about the importance of team-oriented thinking, the need for innovation and the idea of sustainability as factors of success.

* Deutsche Tourenwagen Masters, the successor to the earlier Deutsche Tourenwagen Meisterschaft, in which GT3 racing cars derived from series vehicles competed.

> **We want to be successful and we do everything we can to achieve this!**
>
> Harry Unflath

ABT Sportsline is the most successful active DTM team and, in 2024, is participating in its 25th season. What are your aims in competing against other factory and private teams?

Harry Unflath: The Olympic idea that "taking part is everything" isn't the way we work. We want to be successful and we do everything we can to achieve this. Our motto is: "From motorsport to the street." As a result, what we achieve on the racetrack has a direct impact on our subsequent business. This is the recipe for success that we have adhered to for the last quarter of a century. During that time, we have competed in more than 300 races and finished with a podium position in approximately 90 percent of them, winning just about every fifth race. That is a show of strength to which many people have contributed.

While it is the drivers who get the limelight, a lot of work goes on behind the scenes. How important for success is cooperation between every member of the team?

Harry Unflath: There are four things that make the difference: Good partners that provide financial support, a great car at the cutting-edge of technology, an outstanding driver and, last but not least, an excellent team. Drivers who sign with us know that after winning a race, they will have to hand over the trophy. Because they are only one part of the whole. Together is the only way. And the reward for success belongs to the entire team.

From putting the finishing touches to horse-drawn carriages to sophisticated vehicle tuning – **ABT** is a company that can look back on more than 125 years of history. ABT Sportsline is now the largest tuning provider for vehicles from the VW and Audi Group (Audi, Seat, Škoda, Cupra, Volkswagen and Lamborghini). The family-run company, which has its headquarters in Kempten, Germany, is also active in a number of motorsport disciplines: In addition to the DTM, ABT's vehicles take part in Formula E and the 24-hour race at the Nürburgring.

For more information, visit
www.abt-sportsline.de

Leon Wippersteg: A victory on the racetrack is the result of a lot of hard work. There are the engineers, mechanics, the logistics people... – if we are to get a competitive car to the starting line, then everything has to mesh with everything else. We live our passion and commit 110 percent, even during everyday training with 25 pitstops. Because everyone knows: If it takes 9 seconds instead of 6.5 to change a tire, then even the best driver has no chance of winning. We all know exactly what we have to do. That starts with me when I have to send the team out for the pitstop at exactly the right moment without putting anyone in danger. And it continues right up to the man with the wheel gun, who must be in exactly the right place to dismount and remount the tire as quickly as possible. This means that everyone has to give everything they've got if we are to end up being successful together.

What can the partners of a racing team like ABT Sportsline learn from you?

Harry Unflath: The idea of acting as a team, the trust and confidence that we can all rely completely on one another. Every little thing has to be right. It's often the tiny details that make the difference. That's true of a racing team just as much as it is of a company. And all the peripheral things have to work as well. Our colleague who makes the hotel reservations plays her part, as does management, which motivates the team through its leadership. Another point is the good cooperation between us and our partners, without whom we wouldn't be able to take part at all.

Everyone has to give everything they've got if we are to end up being successful together.

Leon Wippersteg

How important are innovative strength, performance and flexibility?

Harry Unflath: In 1896, the blacksmith, Johann Abt, started to develop horse-drawn carriages with wheels for the summer and skids for snowy days – that is to say, genuine hybrids. During the last few years, ABT Sportsline has brought electric cars onto the street. This just shows that if you want to be successful across the generations, you have to innovate and try out new things.

Leon Wippersteg: But to achieve the necessary performance, you naturally also need to show a certain amount of flexibility. So although we are involved with e-mobility, we are also already using up to 50 percent e-fuels in our combustion engines. Motorsport sees itself as the spearhead of innovation. Every day, we work to bring about improvements. Our cars are equipped with several hundred sensors. There are lasers at six points in the vehicle that measure the clearance between the base of the car and the track to an accuracy of a hundredth of a millimeter and we then use this information to create aeromaps. In extreme cases, half a millimeter can mean the difference between drivable and uncontrollable.

How important is sustainability to ABT Sportsline?

Leon Wippersteg: With our commitment to Formula E or the use of e-fuels, we are already really well positioned in this area. However, sustainability characterizes every aspect of our work. We have all the skills we need in house, even including carbon production to enable us to renovate damaged parts rather than having to buy new ones.

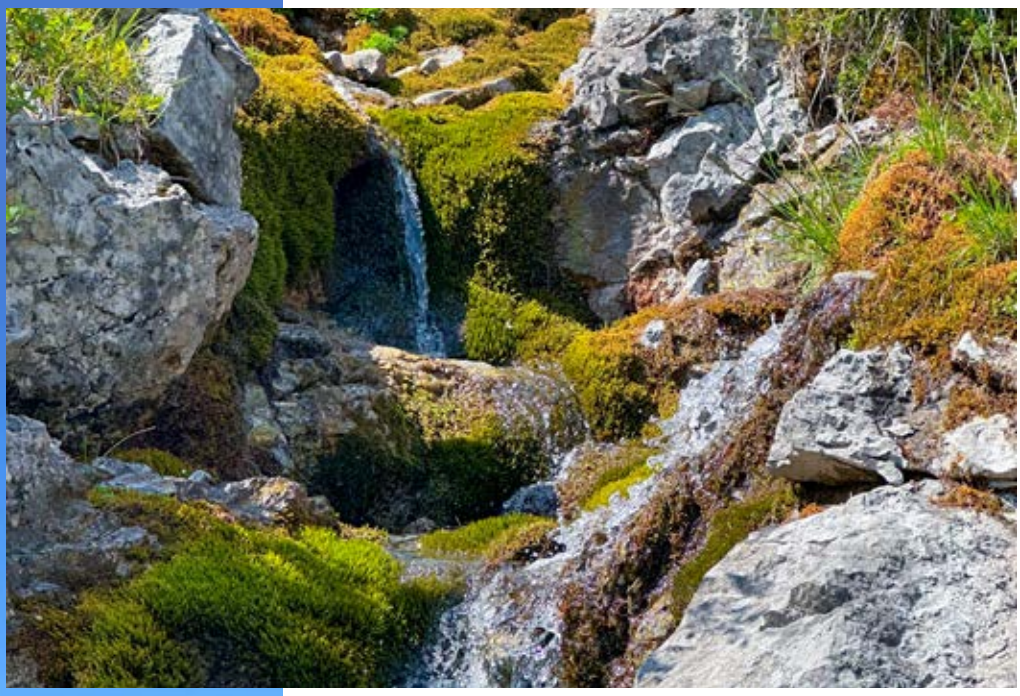
Harry Unflath: At ABT Sportsline, sustainability embraces everything, from our sporting ambitions through our cost-effective working approach and on to the way we live and work with one another. We value consistency and have many employees who have been with us in the team for more than 20 years. A lot of things have come together in that time. And the same is true when it comes to our business partners. Here, too, we have many long-standing relations and are working to ensure that these continue between our various partners in the long term. ●

A STRONG TEAM: BIHLER AS ABT SPORTSLINE PARTNER

As of 2024, Otto Bihler Machinenfabrik has been official partner to ABT Sportsline in the DTM. The event officially got underway with the ABT Racing Party kicking off this year's DTM on March 18th, 2024 at an altitude of approximately 1,900 meters in Obergurgl in Austria. "We are delighted to be able to welcome Bihler into our circle of partners. At ABT, being a partner means more than just having your logo on a racing car. We want to bring people together so that they can work and share with one another in the long term," says Harry Unflath, Head of Sports Marketing at ABT Sportsline. "ABT and Bihler have a lot in common," explained Mathias Bihler at the press conference in the Gurgl Carat Convention Center. "Both companies stand out for their striking innovative strength. Just as for Bihler, what counts in motorsport is the team performance – facing up to the competition and relying on one another, with everyone fulfilling their role in the team with the utmost precision." The partnership was then immediately taken a step further with a DTM Partner Workshop at Bihler in Halblech. Here, the companies partnering the DTM – CUPRA, act3, SONAX, Schaeffler, KEUK, Red Bull, Speedpool, RUKU and Ötztal Tourismus – discussed questions relating to the start of the DTM season, ABT Sportsline, Formula E and commitment to the DTM, and were enthused not only by the Bihler event but also by the high-performance Bihler technology that they were able to observe during their shared factory tour. ●

TO THE SOURCE OF THE LECH

From the Freiburger Hütte, you look out onto an imposing panorama with the Formarinsee Lake in the foreground. Here, on the "Rote Wand", is where the Lech rises.



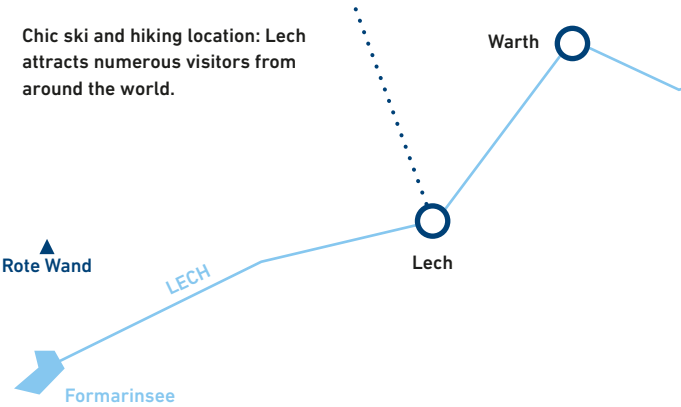
"The rocky one", "the land's water-bringer" and originally " wild, raging" – the various meanings of the name 'Lech' are the perfect description of this Alpine river. It rises from a number of different sources at the foot of the mountain known as the 'Rote Wand' (*Red Wall*) before flowing through the Vorarlberg and Tyrol and then through Swabia and Upper Bavaria in order to join the Danube after a journey of 256 kilometers. We follow the Lech from the Formarinsee Lake as far as Reutte. A pure delight – whether you are on a mountain bike tour or hiking by foot.

A perfect picture for an illustrated book of the Alps: The Rote Wand rises majestically above the picturesque Formarinsee. The water of the mountain lake glows a radiant blue, the rocky outcrops bathe in warm stony hues, cattle graze on the grassy slopes and, between them, the Walserweg Trail leads down through the communal lands of Dalaas. Originally consisting of two streams, the Formarinbach and the Spullerbach, the

The crystal clear waters of the upper Lech at Dalaas.

Lech flows down towards the town of the same name from the meadows of the Unteres Älpele. Anyone who takes this route as a hiker on a gentle path or a cyclist on a gravel track, and shortly afterwards on a paved toll road, passes alongside the stony river bed through an impressive high mountain landscape down as far as the tourist hotspot of Lech. The town provides a striking contrast between imposing Alpine scenery and exclusive tourist infrastructure with quality hotels, gastronomy and mountain railways. The towns of Lech and Warth are linked by a wild, Romantic ravine. Warth is a haven for climbers and skiers that shares the same ski transport infrastructure as the chic town of Lech during the winter and is the last habitation before the boundary between the Federal States of Vorarlberg and Tyrol. The Lech then flows on through the picturesque Lechtal Valley, with the mountains of the Allgäu in the North and those of the Lechtal in the South. The landscape is dominated by the rich green of the valley, the surrounding mountain forests and the rock faces beyond them. Once you have passed Steeg, you reach Holzgau, which is well worth a visit on its own. This is also where the European E5 long-distance hiking path, which connects Oberstdorf with Bolzano/Merano, crosses the Lechweg Trail. In addition to the Baroque parish church of "Our Lady of the Assumption", the commune of Ausserfern also possesses a spectacular suspension bridge which, with a span of 200 meters, is one of the longest and highest suspension bridges in Austria. It connects the Simms waterfall to the via ferrata of the same name as well as to the Lechweg Trail. The many façade paintings which give the village its charming character are also well worth seeing. The river gradually becomes wider, branching far out to the sides and the landscape fills with numerous gravel banks. It is a refuge for nature lovers and sun worshippers and, during the hot summer days, the cool waters of the Lech also

Chic ski and hiking location: Lech attracts numerous visitors from around the world.



The river can also be visited by canoe, for example here at Forchach,

At Steeg, the Lech is still a slender stream nestling between woods and mountains; at Weißenbach, it forms an imposing river bed with branches and gravel banks – the Lech has many faces.

At the junction of the Lechweg Trail and the E5 long-distance hiking path is the 200-meter long suspension bridge at Holzgau.

Holzgau is a romantic village with numerous façade paintings and a splendid parish church.

make it a wonderful place to seek cool and refreshment. It is easy to follow the river, whether on foot or by bike, and Reutte, the district's administrative center, is soon reached.

The route then continues via the Lechfall waterfall towards Füssen and Halblech. Anyone who wants to follow the Lechweg Trail by foot should allow approximately seven days from the source down as far as Füssen. By bike, the route can be completed in 2 to 3 days. Good bus connections in the Lechtal valley mean that you can join the route at any point. ●

For more information:
www.lechweg.com
www.lechtal.at

Otto Bihler Maschinenfabrik GmbH & Co. KG
Lechbrucker Straße 15
87642 Halblech
Germany
Tel. +49(0)8368/18-0
Fax +49(0)8368/18-105
info@bihler.de
www.bihler.de

BIHLER