Motion

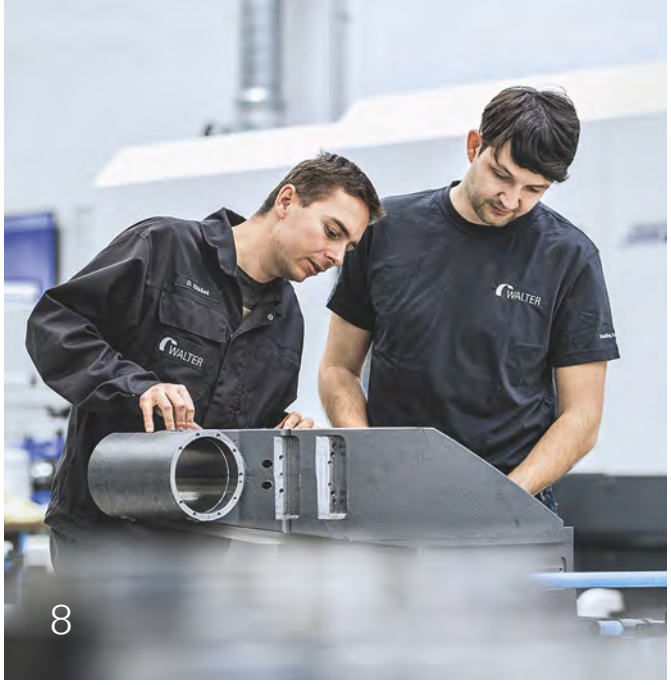
01.2020
The customer magazine of the
UNITED GRINDING Group

UNITED GRINDING

WITH PASSION AND EXPERTISE

If you always want to deliver the highest quality, you have to be dedicated to your work. About the sense of purpose and enthusiasm in the UNITED GRINDING Group

Passion for precision: Petr Konečny, Head of Mechanical Manufacturing in Kuřim



IN THIS MOTION, YOU WILL FIND:

IMPRINT

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Cover: Dominik Gigler; Photos: Dominik Gigler, David Schweizer, iStockphoto, Natalie Bothur

"WHAT DRIVES US IS THE CONVICTION THAT OUR CUSTOMERS ALWAYS DESERVE THE BEST SOLUTION."

Stephan Nell,
CEO, United Grinding Group AG

DEAR READERS,

2020 is an extraordinary year – the coronavirus pandemic has overturned any previous economic forecast and poses major challenges for companies around the world. We are not exempt from this either.

Especially in times of crisis, the fundamentals of a company – the values with which we work and live – are decisive. We ourselves define the core values of what we do with **precision and passion**. The precision of our machines, the passion with which we develop, manufacture and continue to improve them, and the **enthusiasm** for further optimizing of what has been tried and tested – to achieve greater success.

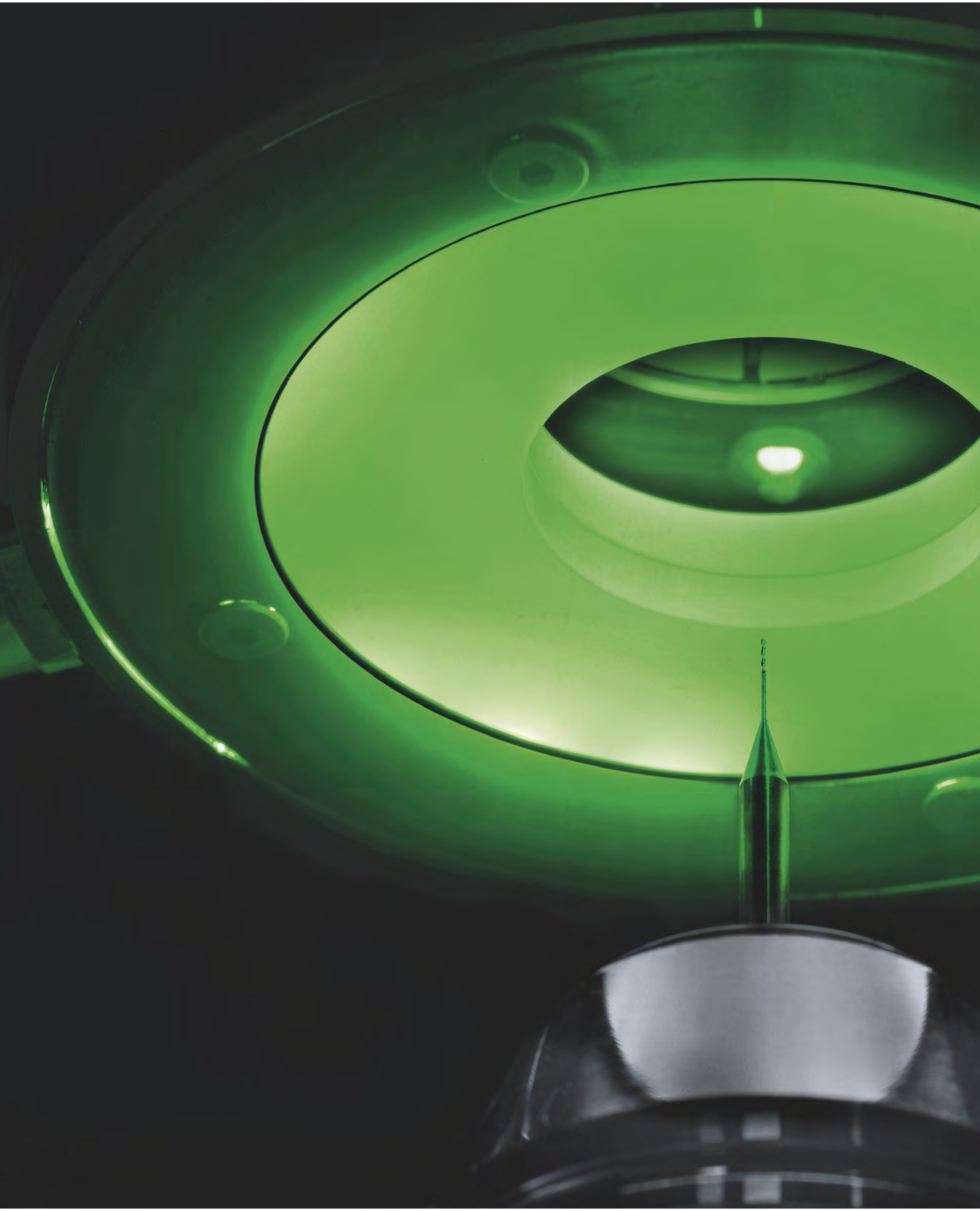
This conviction continues to drive us, despite the adverse circumstances, to pursue our strategic investment projects in our three global manufacturing and assembly sites in the long term. You can find out more in our cover story: "With passion and expertise".

Personal contact is the basis of good customer service – yet it is increasingly difficult to maintain this under the given restrictions. That's why we've been working on solutions that we use to serve our **customers and provide** them with service when you can't be on site quickly. We present these solutions in the article "Magic word: remote". They enable short-term support and a quick restart of production, even without personal contact. One thing that the crisis has taught us: Agility and responsiveness are more important than ever.

With this in mind, I hope you enjoy reading the latest issue of "Motion"!

Stephan Nell
CEO, UNITED GRINDING Group

CORONAVIRUS PANDEMIC:
The UNITED GRINDING Group consistently adheres to the hygiene and social distancing rules. The photo productions for this "Motion" edition took place before the pandemic.



EXACTLY TO THE MICROMETER

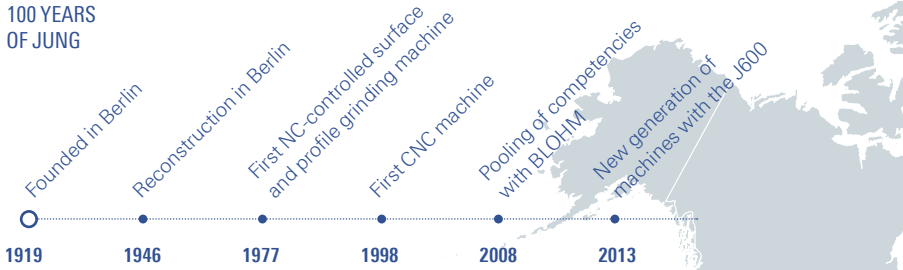
THE DRILL HAS A DIAMETER of half a millimeter, its precision is in the range of a micrometer, that is: a thousandth of a millimeter. Such minimal size ranges pose not only a challenge to production, but also to measuring. The optical measurement of the lengths, widths and angles of workpieces is technically nothing more than the determination of gray-scale value transitions using optics and cameras. For this, however, the optical measuring system must read out the various gray-scales and the workpieces must be optimally illuminated beforehand.

In order to prevent disturbing reflections on high-reflective metals, a diffuser is used at WALTER. This feeds the light from high-power LEDs into a plexiglass ring, avoiding reflections and creating detailed images. The team at the Metrology Development Center at WALTER in Garbsen (Germany) developed the diffuser themselves. "We work with green light, because this makes the display particularly high-contrast", explains Oliver Wenke, Head of Metrology. The technology shown here is used as standard for the WALTER HELICHECK PLUS and is optionally available on HELICHECK PRO.

GÖPPINGEN/GERMANY

FOCUS: REBUILD

100 YEARS IN SURFACE AND PROFILE GRINDING: JUNG takes a look back on this. At an open house in Göppingen on the occasion of the anniversary, customers, representatives and partners were able to find out about the company's history and the current product portfolio. Special focus was placed on the possibilities for machine overhaul and rebuilding of JUNG machines.



THUN/SWITZERLAND

INNOVATIVE CONCEPTS WANTED

FOR THE SIXTH TIME STUDER awards the "Fritz Studer Award". Among other things, we are looking for innovative machine concepts, alternative materials for machine tool manufacturing or digital solutions for production support. Students from European universities and technical colleges were invited to submit their concepts. A jury headed by Prof. Dr.-Ing. Konrad Wegener, Head of the Institute for Machine Tools and Manufacturing at ETH Zurich, evaluates the works submitted. The presentation of the award, endowed with 10,000 Swiss francs, will take place in February 2021.

THUN/SWITZERLAND

NEW FROM STUDER

THE LATEST from external and internal cylindrical grinding was available at the Motion Meeting. STUDER informed about current developments in hardware and software. Numerous sales partners and press representatives found their way to Thun. The annual press conference was also held on the sidelines of the Motion Meeting. STUDER reported a successful year, with a new customer share of 40 percent.

BERN/SWITZERLAND

GRINDING TIPS

HOW TO ACHIEVE GEOMETRICALLY particularly precise results during cylindrical grinding or how to extend the life of grinding machines: Anyone interested in this can read about such topics in the Motion Blog. Started on the grinding.com website, the blog can now also be accessed on the international company website grinding.ch and is available to readers from all over the world with practical tips on everyday grinding and the latest from the brands of the UNITED GRINDING Group.

Motion BLOG

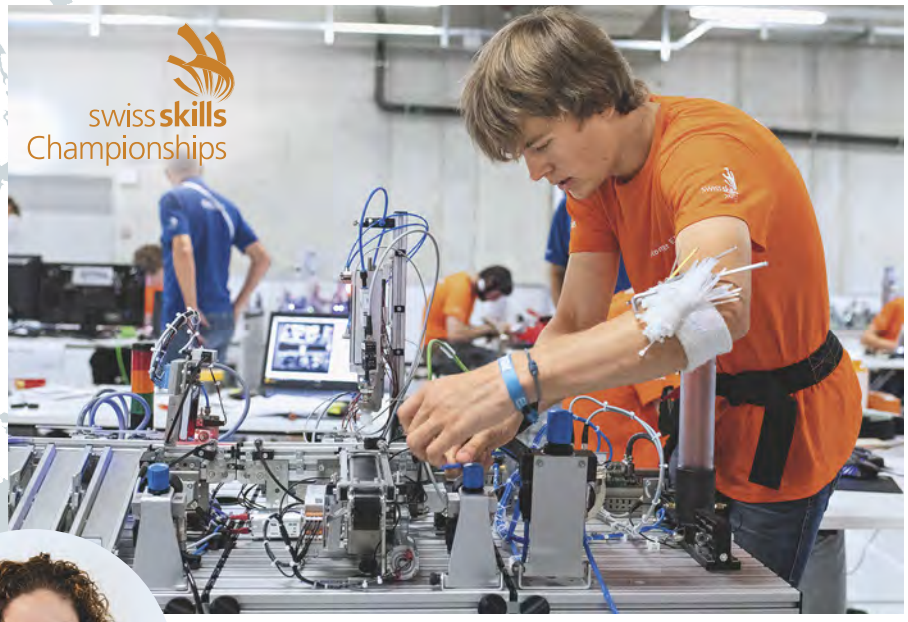
Numerous customers and interested parties were reached by the roadshows in China and the USA

MIAMISBURG/USA, SHANGHAI/CHINA

MORE THAN 500 CUSTOMERS AT 10 STATIONS

UNITED GRINDING NORTH AMERICA and UNITED GRINDING China have traveled to their customers in comprehensive roadshows. With their latest technology, loaded on large trucks, both companies have visited their customers and other interested parties. Seven stations between Memphis, Tennessee and Charlotte, South Carolina were covered by the roadshow in the USA, among other things, the WALTER HELITRONIC POWER 400 and WALTER HELICHECK 3D were presented. The Chinese roadshow covered the cities of Shenzhen, Chongqing and Qingdao. One of the "stars" was the new STUDER S31.

Apprentices from more than 70 professions compete in Swiss Skills



BERN/SWITZERLAND

"RESPONSIBILITY TOWARDS THE NEXT GENERATION"

THE IMPORTANCE OF GOOD EMPLOYEES is also demonstrated by the UNITED GRINDING Group by the sponsoring of the Swiss Professional Championships Swiss Skills. HR expert Maryame Sommer explains what expectations the Group has in it.

What is the importance of Swiss Skills for the group of companies?
It's very important, because it emphasizes the potential of vocational training and the dual education system. It is an ideal opportunity for those who want to orientate themselves practically about the diversity of the professional world and supports young people in recognizing their potential in professional life.

What do you expect from the involvement?
As employers of our size, we have a responsibility towards young talent. With our involvement, we want to make our commitment to vocational training visible as well as the promotion of future professionals. Our average training rate is six percent, and this year we will be hiring apprentices again. Professions such as grinding machine operators or process technicians are rarely found on the market, meaning that we need to train people ourselves.

Is Swiss Skills only one form of promotion of young talent?
It is a suitable platform for us to present ourselves as an attractive employer for apprentices. In the future, however, we would also like to increase our presence at training and further education events and thus strengthen our employer brand UNITED GRINDING Group in the field of vocational training.

The Swiss Skills Championships in the individual sectors will also take place in 2020. Three apprentices from the UNITED GRINDING Group qualified for the polymechanic and two for the automation sector.

Photos: David Schweizer, Shotshop.com, Michael Zanghellini

WITH PASSION AND EXPERTISE

Mechanical manufacture in Kuřim with engineer David Eliàšek, manager Petr Konečny and machine operators Jiří Zeman and Martin Kuchař (from left to right)

Precision and passion: These are the values that shape the UNITED GRINDING Group. On the basis of this understanding, our group of companies is a reliable partner for its customers, even in times of crisis. And on this basis too, the Group invests in its facilities and systems regardless of economic fluctuations

Text: Heinz-Jürgen Köhler Photographs: Dominik Gigler

David Eliàšek and Jiří Zeman (from left to right) check the machining process of a new part

A LARGE, VERY BRIGHT, very clean production hall. There is a distinct lack of the smell of warm metal that is so common in mechanical engineering. Two men stand at a large machining center in the front left wearing the obligatory WALTER shirts while looking into the inside of the machine and discussing matters. At the rear right a slightly older staff member starts up the test cycle on a measuring machine.

Mechanical manufacture lies at the heart of operations at the Czech site in Kuřim. High-precision parts for grinding, eroding and measuring machines are produced here. The machine, on which machine operator Jiří Zeman and technician David Eliàšek are intensively discussing the machining of a new part, is one of two new universal 5-axis machining centers.

Over 200 tools – from drills to cutters to the self-developed finishing tool – are located in the automatic tool changer of each of the machines. "It takes a few hours to produce a Y-slide, and almost 50 of the tools are used," explains Petr Koneny, Head of Mechanical Manufacturing. From here, the slide goes over to the measuring station, where it is tested for precision in the range of thousandths of a millimeter. It is then installed in a WALTER HELITRONIC POWER 400 in the flow assembly.

KEY TERM: PASSION

The industrial estate in Kuřim is situated on a country road coming from Brno, the Czech Republic's second largest city, first mentioned 1000 years ago. The estate is

The tool changer of the machining center holds about 200 tools, and another contains an external magazine (Image r.)

INVESTMENT I

New machining centers in Kuřim/Czech Republic will increase flexibility and make it possible to add previously outsourced parts to in-house production

PROJECT

An automated manufacturing cell with three new, high-end machining centers is used in mechanical manufacturing

DESCRIPTION

Two new machining centers have already been installed in Kuřim, and a third will follow. This was preceded by a comprehensive analysis of the requirements and a training process for employees

CUSTOMER BENEFITS

The new machines boost the capacity and therefore also offer flexibility in production. This makes additional capacity restructuring within the Group a reality. The increasing in-house production of previously purchased parts makes it possible to further boost quality requirements. Optimized processing times mean shorter terms of delivery

Production in Kuřim: This area is where the electronics of the machines are installed

home to plant after plant. The facilities of Walter s.r.o. Kuřim are one of three UNITED GRINDING Group manufacture and assembly sites, situated just to the right of the town's limits. The other two are in Thun, Switzerland, and in Shanghai, China. "We are currently investing in two of these locations," explains Erich Schmid, Director of Strategic Projects at the Group. Practiced corporate values, such as precision and passion ensure that the Group continuously invests in new technologies and solutions. Or as Schmid puts it: "We work with a wealth of expertise – and with a passion."

CEO Stephan Nell also believes in passion as the key value for all corporate actions within the Group: "Developing machines that already operate successfully or optimizing applications that are already widely used would not have been possible without this kind of passion." Expert Niels Alzen also confirms the importance of de-

INVESTMENT II

The inauguration of a new highly flexible spindle shaft production in Thun/Switzerland makes it possible to further boost quality requirements for a machine part that is decisive for precision

PROJECT
Procurement of a total of five CNC machines and one automation cell for the high-precision production of spindle shafts

DESCRIPTION
These new systems to manufacture spindle shafts are installed in addition to their "sister machines" in the production facilities in Kuřim. These are one of the key parts for the precision of grinding machines. In the long term the spindle shafts for all of the Group's grinding machines will be manufactured using highly flexible turning/milling centers

CUSTOMER BENEFITS
Until now, outsourced production steps will be converted to in-house processes. This additionally makes it possible to boost quality requirements. It also eliminates one pre-production step which cuts processing times and thus significantly boosts flexibility

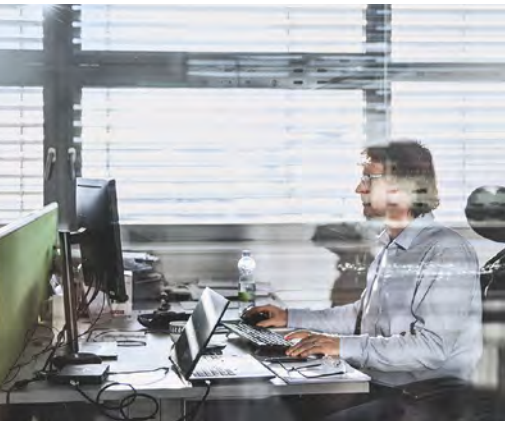
Working at the new machining center: Machine operator Jiří Zeman

fining a company through values. The Executive Director at BrightHouse consulting, a subsidiary agency of Boston Consulting Group, explains: "Motivation and a sense of purpose are what companies really need to shape their future and maintain a competitive edge." Purpose, he calls this necessary superstructure.

ADDITIONAL CAPACITIES

The newly acquired machining centers are primarily used to increase flexibility in Kuřim. "When one machining center is converted or serviced, the other continues to run," explains Milan Urban. As the Head of Supply Chain Management, he is responsible for the internal supply of parts for the assembly. Manufacturing currently merely supplies parts for the in-house production of WALTER and EWAG grinding, eroding and measuring machines. In the long term, the intention is to also manufacture parts for machines of the other UNITED GRINDING Group brands.

Milan Urban coordinates production in mechanical manufacture



The new machines in Kuřim are also intended to machine new parts and prototypes. "In this context, new machines make it possible to significantly cut reaction times", Urban adds. There are plans to add a host of components, such as workpiece carriers, to the range of products manufactured in house. "Consequently, we are in full control of parts' quality", mechanical engineering graduate Konečny explains.

GLOBAL STANDARD

The Group's entire investment program is intended to boost the manufacture at all three, worldwide sites to a global standard. "The idea is to be able to balance capacity on a global level of demand," explains Erich Schmid. In order to make this compensation possible, identical processing centers were

"ANYONE AIMING TO OFFER CUTTING-EDGE HIGH-PRECISION MACHINES NEEDS TO INVEST, EVEN IF THE CURRENT SITUATION IS DOMINATED BY STAGNATION."

Erich Schmid, Director Strategic Projects

INVESTMENT III

An air-conditioning system in assembly at MÄGERLE, Fehraltorf/Switzerland, increases thermal stability and process safety in manufacturing

PROJECT

Installing an air-conditioning system to restrict temperature fluctuations in the hall to one degree Celsius

DESCRIPTION

The installation of an air conditioning and shading system was preceded by a continuous temperature analysis at different points. In addition, the lighting was previously switched to a system that emits little heat. The air-conditioning system had also become necessary as a result of climatic effects, such as hot summers and only minor drops in temperature during mild winters

CUSTOMER BENEFITS

Stable thermal conditions in production avoid fluctuations in precision and guarantee process reliability. These cut lead times and ultimately also increases the adherence to delivery dates

purchased in production at STUDER in Thun, Switzerland, to those in Kuřim.

Across UNITED GRINDING Group's global manufacturing site concept all manufacturing sites are linked by a shared programming system and universal databases. The so-called central CAX support of the Group directs the CAD and CAM programming of the production facilities from Thun. "This way we know what the others are doing," explains Alexander Heiter, Konečny's colleague in Switzerland and Head of Mechanical Manufacturing at STUDER. This enables both the shifting of production as well as the ability to learn from each other across borders.

COMPREHENSIVE NETWORK

Production in Kuřim has been fully integrated into a network. Technician David Elizek

Martin Kuchař measures the guide of an A-axis with a 3-point stylus

THREE QUESTIONS TO ERICH SCHMID

The Director Strategic Projects coordinates long-term alignment within operations

"EVENING OUT WAVES…"

What is UNITED GRINDING Group's strategic alignment?
The economy in general and the demand for precision machining systems in particular follow cycles. We consider it our objective to even out these cycles. This means we want to make our production as flexible as possible with processing times that are as short as possible, from receiving orders to delivering a machine. Customers also benefit from this.

How do you aim to achieve such a level of flexible production?
With our investments in high-tech machining centers featuring automatic equipment systems that permit agile manufacturing at up to three levels, some of which do not require human intervention.

What does that specifically mean for the company's investments?
Our investment volumes roughly remain constant over time. We once again base our actions on economic cycles in this context. Anyone aiming to offer high-precision machines at a cutting-edge technical standard needs to invest, regardless of whether we are affected by economic stagnation today or tomorrow.

Photo: David Schweizer

All small parts are in stock in the high bay warehouse for production and spare parts in Kuřim

David Eliàšek and Petr Konečny (from left to right) are checking a recently produced Y slide

FURTHER INVESTMENTS

GRINDING SYMPOSIUM IN THUN/CH, 2019
Over 1,500 visitors from around the world were able to not only witness the Group's most recent technologies and solutions at the symposium. Specialist presentations by international research and practical experts also analyzed current trends in mechanical engineering and the manufacturing industry as a whole

NEW DEVELOPMENT IN THE USA, 2018
The new building on the outskirts of Miamisburg/Ohio optimizes the space in the plant. Ever since, all staff members have been able to work under one roof. An enlarged Solutions Center enables better training of both customers and employees. This was the largest investment in the entire corporate history of UNITED GRINDING Group altogether

FLOW ASSEMBLY IN KUŘIM/CZ AND THUN/CH, 2016
As one of the first manufacturers in the world, the UNITED GRINDING Group has introduced continuous flow assembly at two of its production sites. In contrast to the conventional tact assembly, the machines of different configurations "flow" in a continuous movement through the 18 assembly stations. In addition to the re-organization of the actual production this also required restructuring of peripheral sections, such as the production and warehousing logistics. The entire bundle of measures enabled a significant reduction of processing times

EXPANSION OF THE DEMO CENTER IN SHANGHAI/CHINA, 2016
On the occasion of an open house, the Demo Center was enhanced and restructured. In addition, the number of demonstration machines has been increased to enable the advantages of the machines to be explained to customers in practical demonstrations

In 16 years at WALTER, Petra Kupová has witnessed the comprehensive automation of logistics processes

"CHINA IS TRANSFORMING FROM LOW-TECH TO HIGH-TECH PRODUCTION AT A BREATHTAKING PACE."

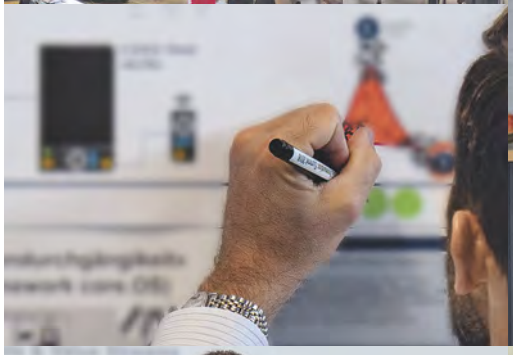
David Wen, Production Manager UNITED GRINDING China

and his team develop programming for processing new parts in the CAD/CAM system. Although he is only 38 years old, the team leader has been working in manufacturing for 20 years, four of them at Walter s.r.o. "As part of the machining of new parts we regularly come here to the shop floor to analyze ways of further optimizing programming together with machine operators", he explains.

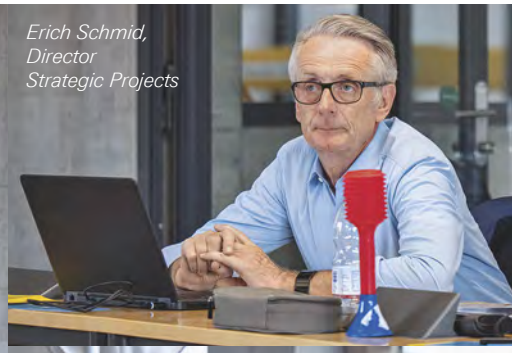
The industrial location of Kuřim and the nearby university town of Brno with its technical faculties are the ideal environment for a demanding machine manufacturer such as the UNITED GRINDING Group. "We can rely on excellently trained staff members here", Milan Urban explains, "and that is just as important as high-precision, high-end machines."

From mechanical production in Kuřim, the parts either go directly into assembly or, until they are needed, into a storage system with automated warehouse management. Small parts required for assembly are stocked in an equally automated high bay warehouse located in an adjacent hall. Logistics team member Petra Kupová and her colleagues prepare them for internal supply as required. Throughout her 16 years at Walter s.r.o. Petra Kupová has witnessed all steps of the ongoing warehouse automation. Now, all logistics systems in Kuřim – procurement, production, warehousing and distribution – are optimized and merged into a comprehensive project.

"Our next investment will be an extended warehouse management system", supply chain specialist Urban explains. It will comprehensively illustrate the overall goods flow and help to further cut processing times as well as additionally boost delivery reliability for our customers. ◦



Daniel Huber, CTO Cylindrical



Erich Schmid, Director Strategic Projects

Stephan Nell, CEO UNITED GRINDING Group

Christoph Plüss, CTO UNITED GRINDING Group

Paul Kössl, Head of Business Development & Marketing UNITED GRINDING Group

FROM THE PITCH

At its Innovation Summits, the UNITED GRINDING Group examines current trends and developments and examines what they mean for the companies

INTO THE

This means that the Group is always pushing for the cutting edge for its customers

TEXT: HEINZ-JÜRGEN KÖHLER
PHOTOGRAPHY: URS DIERGARDT

PRODUCTION

A MODERN BUILDING COMPLEX in a commercial area in St. Gallen, Switzerland. The visitor is welcomed by the lively atmosphere of the start-up culture. Young people in hoodies, coffee mugs in hand, boards filled with post-its, unplastered concrete walls, chic meeting rooms. Here at IRPD, the specialist of the UNITED GRINDING Group for additive manufacturing, the 2nd Innovation Summit was held by the corporate group. “There is a very inspiring atmosphere here,” emphasizes Christian Dilger, CSO Tool. “Especially for established companies like us, it is very stimulating to see the opportunities that young companies have with structures that have not yet been so fixed.”

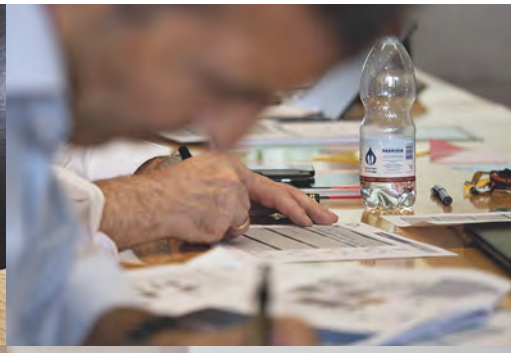
At the Innovation Summit in St. Gallen, the technology and sales managers of the company brands met with CEO Stephan Nell, CTO Christoph Plüss, Director Strategic Projects, Erich Schmid and Head of Business Development & Marketing, Paul Kössl. "The two days of the Summit are all about out of the box thinking," explains Daniel Huber, CTO Cylindrical, the basic principle of the event. What can a grinding machine look like in five or ten years? "It is absolutely necessary for a long-term planning group such as UNITED GRINDING to think about this," says Huber.

EARLY DISCOVERY OF THE INNOVATION SUMMIT

From the automotive manufacturer to the software developer to the city of Hamburg: Many are hosting Innovation Summits today. However, the UNITED GRINDING Group discovered the format of the “Innovation Summit” very early on: As early as 2013, Plüss, then Chief Technology Officer of EWAG, initiated a Summit with the group’s tool grinder manufacturers. The structure of the two-day event proved so successful that it was maintained when the Summits were installed at the group level in 2018.

“On the first day, the heads of sales report on trends and developments from the markets as well as the requirements of customers. On the second day, workshops will deepen the focus topics of the companies,” explains Christoph Plüss. In five-minute pitches, so-called idea previews, the speakers can present a project. Can


Harri Rein, CTO Tool




Sandro Bottazzo, CSO STUDER


Daniel Mavro, CTO Surface & Profile


Fred Gaegauf, VR President (l.)

complex projects be explained in that time? "Yes", laughs Daniel Huber, "if you prepared and explained them accordingly." There were more than 30 of these short lectures in the start-up year in 2018. "There are so many ideas in our companies, the ingenuity is really impressive," says Dilger.

IN THE SPIRIT OF DIGITAL SOLUTIONS

The first Innovation Summit 2018 was dedicated to the UNITED GRINDING Digital Solutions™. "Together, we have designed a digital ecosystem and a corresponding product roadmap for the entire group of companies," says Plüss. "The two days were exciting and highly informative and showed that all brands had similar experiences during the launch phase of the current Digital Solutions," says Daniel Mavro, CTO Surface & Profile.

The idea of group-wide interaction has been an important element of the Innovation Summits ever since. Those responsible for the company step out of everyday operational business - and into dialogue with each other. A lot of information and suggestions are exchanged in this way, and in many cases one company benefits from the experience of another – and when the insights are implemented, the customers benefit above all.

"AN INNOVATION IS ONLY AN INNOVATION IF IT CAN BE PUT ON THE MARKET."

Christoph Plüss, Chief Technology Officer, UNITED GRINDING Group

In addition, the interaction and exchange of ideas also works vertically. "Of course, the Shopfloor employees are also represented at the Summits at the level of our company," explains Christian Dilger. "I then take their suggestions to a higher level for the Group Summit."

As a continuation of the first Innovation Summit, the 2019 event focused more on the fulfilment and implementation of the collected ideas, rather than the generation of new ones. "In this process, it became so precise that even the dates of the market launch of various digitization packages were discussed," says Plüss.

SUCCESSFULLY PUT ON THE MARKET

And, of course, the meetings aren't just about digital matters. "The idea of a synchronous tailstock was also presented," explains Huber. This runs synchronously to the workhead spindle and ensures optimum drive of the workpieces without a workpiece driver. This increases process reliability and efficiency in equal measure. Pitched at the first Summit, the synchronous tailstock is already in production. A good idea became an efficiency-enhancing feature. Or as Christoph Plüss puts it: "An innovation is only an innovation if it can be successfully launched on the market, otherwise it will remain an invention." ◦

WHAT ARE YOU CURRENTLY WORKING ON?

Employees of the UNITED GRINDING Group are active worldwide in customer service, in each Motion Magazine we present four of them. How a purchasing specialist, a customer care employee, an optimization expert, and a software developer help customers become even more successful

"COMMUNICATION IS CENTRAL TO MY PROFESSION"

ROSIE UNDERWOOD

POSITION: Trade Compliance Manager,
United Grinding North America, Inc., Miamisburg, USA

CONTACT: rosa.underwood@grinding.com

IT ENSURES THAT EVERYONE PLAYS BY THE RULES. Trade Compliance Manager, Rosie Underwood, is responsible for ensuring that machines arrive on time at the customer's site and that the corporate regulations are adhered to during import and export. "No working day is the same as another, and my profession challenges me in a positive manner. I'm trying to improve processes and strengthen compliance," she enthuses.

Her tasks include planning all transport between customs, port, companies and customers, regular audits at the freight forwarder and updating certifications. "Communication is central to my profession," says Underwood, "I am in constant contact with our carriers, freight forwarders and brokers, as well as all the departments of UNITED GRINDING North America and my colleagues in Europe.

"WORKING WITH PASSIONATE SOLUTIONS"

DAVID WANG

POSITION: Cylinder Team Consultant, Customer Care,
United Grinding (Shanghai) Ltd., Shanghai, China

CONTACT: david.wang@grinding.cn

PASSION, STABILITY AND PRECISION – that's what I appreciate about my work," says David Wang, Cylinder Team Consultant in Customer Service. Wang began his career at UNITED GRINDING China in 2007 as an engineer for STUDER machines, then after ten years he moved to Customer Care. Now he regularly visits customers to maintain and repair the machines. In addition, his team regularly turns to him when retrofitting machines and in particularly demanding cases.

David Wang's many years of experience and his expertise of machines, technologies and new tools are also regularly passed on to his colleagues in the course of in-house training courses. And even if it gets complicated, Wang finds a way: "I love machine tools and work with great passion every day on solutions for our customers."

"QUICKLY ADJUSTING TO NEW SITUATIONS"

THOMAS WÜTHRICH

POSITION: Technical Specialist PuLs, Fritz Studer AG, Thun, Switzerland

CONTACT: thomas.wuethrich@studer.com

DOES IT GET BETTER THAN THAT? YES, IT DOES! At least when it comes to Thomas Wüthrich. The trained polymechanic and mechanical engineer works as part of the PuLs team on optimization projects across all areas of the company. Most recently, Wüthrich, who started his work at STUDER in 2005 and in the PuLs team in 2008, oversaw the conversion of the Paint Shop, where the machines are painted. He is currently in the process of introducing and setting up an assembly line for the internal grinding machines.

In addition, the technical specialist supervises their own projects and supports other teams, for example in BlackBelt and 5S projects. Wüthrich's tasks are constantly changing, which offers his daily work an element of variety: "I don't have a typical working day. I am constantly coming across new topics and challenges. But one of my biggest strengths is being able to adapt quickly to different situations."

"INTERACTION REALLY ADVANCES YOU"

ALEXEJ BERGER

POSITION: Software developer, Blohm Jung GmbH, Hamburg/Germany

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AGILE WORKING IN A GROUP – this is the principle of Alexej Berger's daily work. The software developer at BLOHM JUNG is working with colleagues from all brands of the UNITED GRINDING Group on a comprehensive project, among other things on the connectivity of machines. In small iteration steps, also called sprints, individual work packages are processed according to the "scrum" lean management principle. Interaction with colleagues plays a major role. "And it's what really drives you forward," says Berger, who has studied electrical engineering specializing in automation technology.

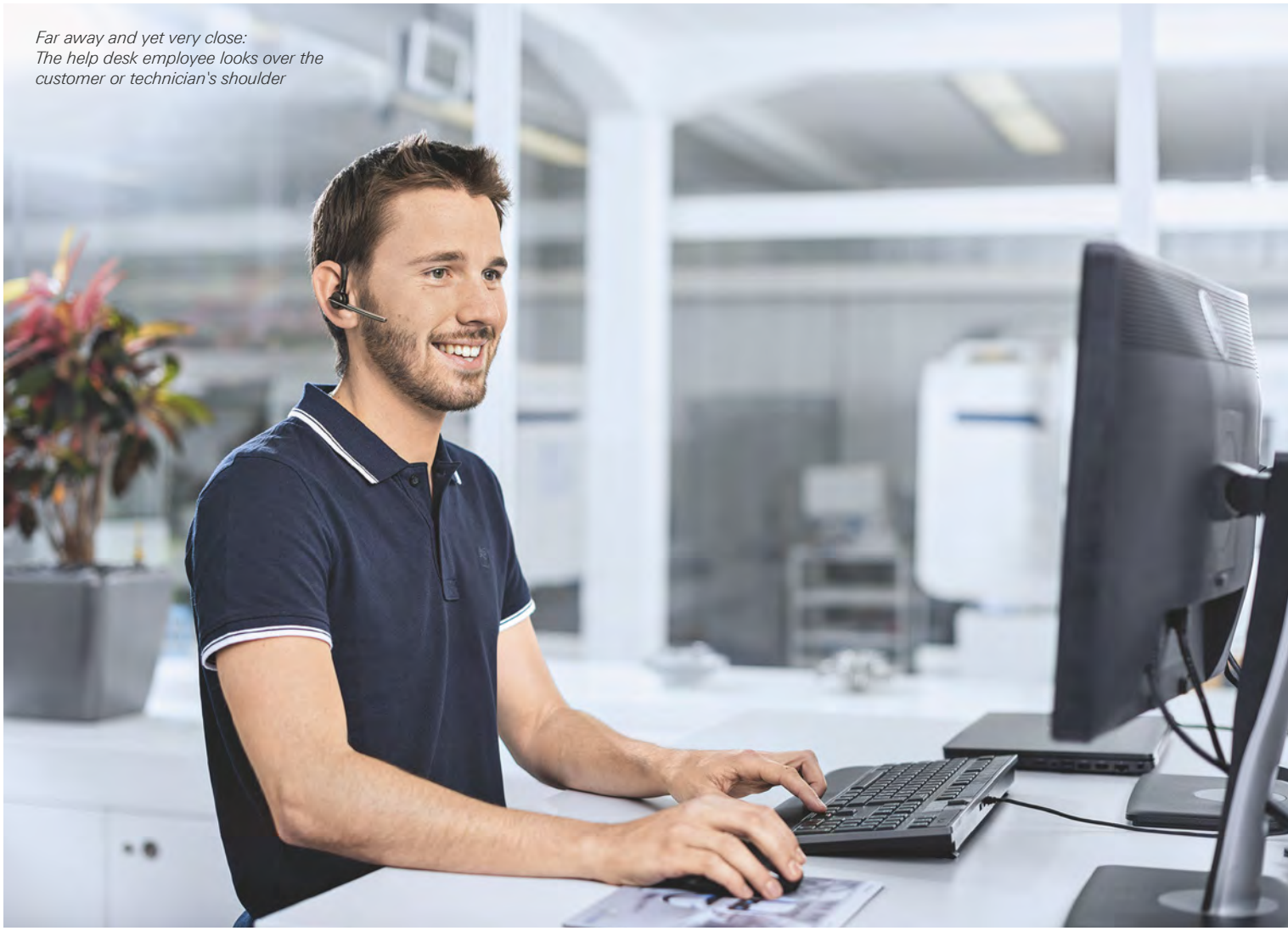
"Our benchmark in all of this is always the benefit of the customer," he says. Smooth machine commissioning and stable software that requires minimal service deployment – these are the goals that Berger and his colleagues pursue with great commitment and team spirit.

Full freedom of movement, targeted support: Contextual information can be displayed on Smart Glasses and the help desk sees the same as its counterpart on the machine

MAGIC WORD: REMOTE

The fastest help is digital. That's why the UNITED GRINDING Group has developed a range of services based on the principle of remote maintenance and assisting customers with problems in a timely manner. They have also proved their worth during the coronavirus pandemic

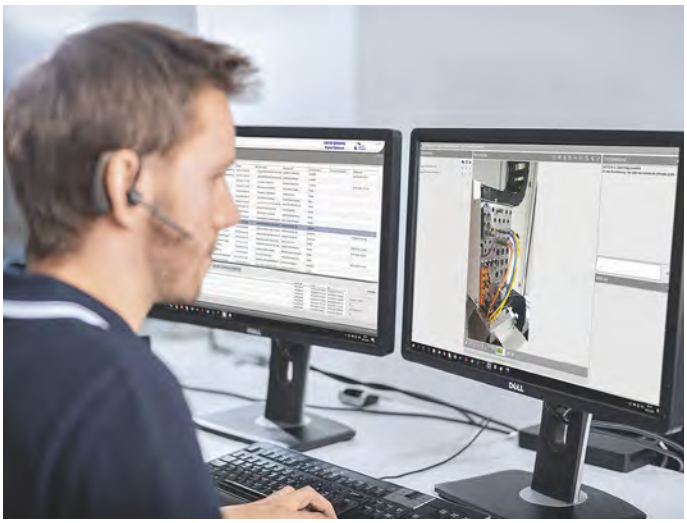
Text: Heinz-Jürgen Köhler
Photography: David Schweizer



Far away and yet very close: The help desk employee looks over the customer or technician's shoulder

OFTEN IT IS ONLY SMALL OBSTACLES that cause production to come to a halt. A backup battery, for example, which maintains the power supply of a machine control system in the event of a power failure, must be changed from time to time. The machine operator receives a notice on their operating panel in a timely manner. The production manager has already seen this on their production monitor and therefore has replacement batteries already in stock. The user manual and installation instructions are available to both of them in the Customer Cockpit.

If you still need the help of UNITED GRINDING, you can send a service request directly through the Digital Solutions app. The service technician is connected live via the Conference Center integrated in the Customer Cockpit and can provide tips and hints. Images can be sent via the whiteboard function and the helpline technician can draw markers directly into the images. And so the battery is quickly replaced and production can start again.



Helpline employees always have access to all relevant data that is useful for customers or service technicians

"OUR GOAL: TO HELP CUSTOMERS INCREASE THEIR PRODUCTIVITY WITH DIGITAL SOLUTIONS."

Christoph Plüss, Chief Technology Officer

SAVE MONEY AND TIME

Not only in the times of coronavirus: Not having an appointment for the technician's attendance often saves time and money. If customers can help themselves with problems, it means that operations can usually start up again faster. However, the UNITED GRINDING Group does not leave its customers alone, but supports them with innovative solutions from UNITED GRINDING Digital Solutions™. "Helping our customers increase their productivity with digital solutions is our top priority," explains Chief Technology Officer, Christoph Plüss.

UNITED GRINDING Digital Solutions™ currently offers customers three products: the Production Monitor, the Service Monitor and the Remote Service. The two monitor solutions help customers keep track of their production. When is maintenance work required and what type of maintenance? How does production work, how busy are machines, where may problems arise? This is demonstrated by the service and the production monitor – in real time.

SECURE DATA CONNECTION

The Remote Service helps to support the UNITED GRINDING help desk over a data connection. Of course, you could always call the help desk. "But technical enquiries on the phone without image support can be very lengthy, as experience has shown," explains Philipp Liesenfeld, Product Manager Digital Solutions. That's why the specialists at UNITED GRINDING have integrated the Conference Center into Digital Solutions. The Conference Center app has now been redesigned. "We primarily want to reach customers on the device that everyone always has in their pocket – on their smartphone. And we want to make new apps available to them as easily as possible," emphasizes Christian Josi, Head of Digital Engineering.

Also, due to the travel restrictions of the coronavirus pandemic, these remote services have been introduced into the daily work of the group of companies and their customers. Remote training was carried out in all brands and the services were immediately used by customers.

"WE WANT TO REACH THE CUSTOMER ON THE DEVICE THAT THEY ALWAYS HAVE IN THEIR POCKET – ON THE SMARTPHONE."

Christian Josi,
Head of Digital Engineering

CAMERA IN THE MACHINE

"Demand for it particularly increased in the times of coronavirus. During the lockdown, there were 2,500 remote deployments worldwide, more than 1,000 of them taking place in North America. This involved problems that the customer had with the machine or application support," explains Head of Business Development & Marketing, Paul Kössl.

UNITED GRINDING North America also performs customer preliminary acceptances remotely. For this purpose, the application team produces videos of the required processes. "We mount a GoPro camera in the machine to capture the grinding cycle," explains Joseph Szenay, Vice President Customer Care. A time code is used to document the duration of the processing cycle from loading the blank to measuring the final specifications of the finished part. "Our customers can see that their individual processing process succeeds in the required cycle time and grant the delivery approval as if they were on site."

The UNITED GRINDING Digital Solutions™ app Conference Center enables easy and efficient communication

"DURING THE LOCKDOWN, THERE WERE 2,500 REMOTE DEPLOYMENTS WORLDWIDE, MORE THAN 1,000 OF THEM TAKING PLACE IN NORTH AMERICA."

Paul Kössl,
Head of Business Development & Marketing

"SOME CUSTOMERS ONLY NEED MACHINE-SPECIFIC INSTRUCTIONS FROM OUR HELP DESK."

Philipp Liesenfeld,
Product Manager Digital Solutions

Important feedback:
The potential of new technologies can only be fully utilized in teamwork

Other digital tools are also being worked on in the USA. In order to further train the sales partners of the Group and to give them the opportunity to serve their customers even better, virtual sales trainings were also held – with overwhelming success. "Instead of the expected 50 sales partners, 125 took part," says Joseph Szenay.

SMART GLASSES AS A DEVICE

After the integration of smartphone/tablet (mobile devices), the Digital Solutions team is now working on Smart Glasses as a device. "Smart Glasses offer several great opportunities," emphasizes Head of Digital Engineering Christian Josi. On the one hand, the technicians on the machine have their hands free, and on the other hand, the specialist at the help desk of UNITED GRINDING shares the exact view of their counterpart on the machine – the so-called "See what I see" effect. An additional extension would be contextual information, which can be applied directly to the employee on the machine via augmented reality applications. This is already being tested in Bern.

What interventions can customers perform with help desk support? "This is very different and depends on the customer individually," Liesenfeld emphasizes. "Some of our customers have fully trained maintenance teams. All they need is machine-specific hints from our help desk." In addition, many mixed forms are conceivable. "In the case of major repairs, the customer staff, guided by the Remote Service, may already be doing preparatory work and our technician will only do the actual repair."

Nor does it necessarily have to be about repair and maintenance. "Remote process optimization is also conceivable," explains CTO Christoph Plüss. In this way, production processes could be optimized using remote technology. Of course, the data from the Production and Service Monitor would also be included in such a process. "This is a full circle of our digital solutions", says Plüss.

"WE MOUNT A GOPRO CAMERA IN THE MACHINE TO CAPTURE THE GRINDING CYCLE."

Joseph Szenay,
Vice President Customer Care,
UNITED GRINDING North America

Watch this video to discover how quickly and easily remote technologies can help eliminate production disruptions:

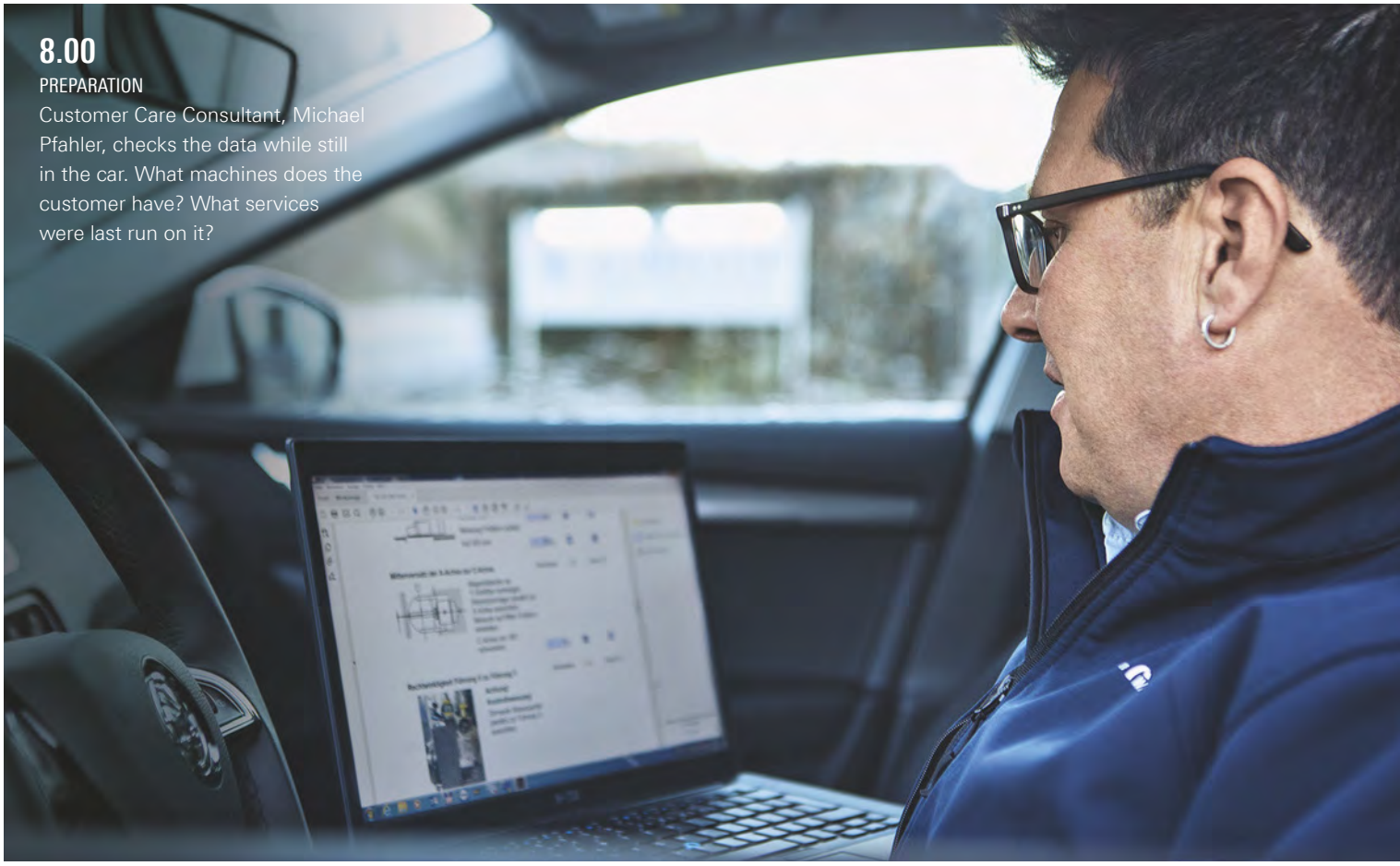
UNITED GRINDING DIGITAL SOLUTIONS APP
The UNITED GRINDING Digital Solutions™ app for iOS and Android can be downloaded from the AppStore and Google Play

FIVE TECHNICAL COMPONENTS

The UNITED GRINDING Group's Remote Service is based on five technical components:

1. A consistent data architecture **across brands enables** the connection of all machines in the group of companies and the integration of further functionalities and end devices
2. **Edge Computing:** The peripherals in the customer machines are also equipped with intelligence, for example with smart sensors. This guarantees smooth communication with the central help desk at UNITED GRINDING
3. A secure **tunnel** between helpdesk and machines guarantees a TüVIT-certified secure connection
4. A separate **server structure** at UNITED GRINDING ensures data security
5. **Smartphone/Tablet** (Mobile Devices) with the customer enable the integration of the customer employees and their communication with the help desk

Smart Glasses are constantly evolving. That is why the UNITED GRINDING Group is testing the use of different models and concepts in parallel



8.00
PREPARATION
Customer Care Consultant, Michael Pfahler, checks the data while still in the car. What machines does the customer have? What services were last run on it?

A DAY WITH … MICHAEL PFAHLER

The Customer Care Consultant visits customers proactively. Not only does he take stock of existing machines, but also demonstrates new features in the use on the machine

Text: Sabrina Waffenschmidt
Photography: Natalie Bothur

HERE A TECHNICIAN, THERE AS A SALESMAN – this is the classic classification. The example of the Customer Care Consultant shows how to combine the advantages of one with the other. "We go out like salesmen, but we are really technicians," says Michael Pfahler. He and his colleague, Thomas Schanz, are Customer Care Consultants at WALTER. Both have been working for the company since 1998, Schanz started as a mechanic in application technology, Pfahler as a mechatronics technician. They proactively visit customers. "The first thing we do is carry out a machine inpsection," explains Pfahler. They then introduce customers to new solutions. "We test new features with the customer on their machine and show how to use them," Pfahler emphasizes. The other brands of the UNITED GRINDING Group also employ Customer Care Consultants such as Pfahler and Schanz.

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8.30
ARRIVAL
Neuhäuser in Prüm, Rhineland-Palatinate, is a traditional manufacturer of machining, cutting and forming tools for metals and works for various industries – from aviation to medicine

8.45

ARRIVAL

Neuhäuser employee Daniel Schoden receives Pfahler. People know each other well, for six years Pfahler has been looking after the customer

9.00

CHANGE OF CLOTHES

From the salesman's shirt, Pfahler changed into the technician's shirt. During a machine inspection, he now checks the geometry of the grinding machines

11.00

CHECKLIST

The results of the machine inspection are clearly entered on a checklist. What wear is there on axles and guides, where is the need for action?

"THE MACHINE STATUS INSPECTION IS WIDELY USED BY CUSTOMERS."

12.00

INVENTORY

Pfahler and Daniel Schoden discuss the findings of the machine inspection. The trained mechatronic technician, Pfahler, recommends appropriate measures

2.30

SOFTWARE

Pfahler checks the programming. Is the machine software still up-to-date?

3.30

FEED RATE OPTIMIZER

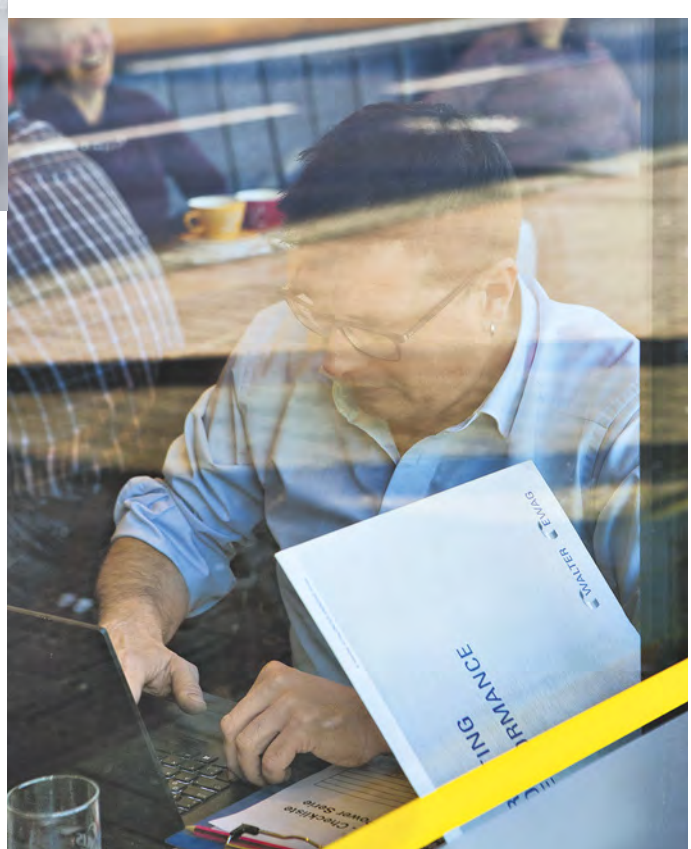
Pfahler explains the feed rate optimizer in action. The feature optimizes the travel distances of a machine and thus reduces redundant movements

"WE TEST NEW FEATURES, SUCH AS THE FEED RATE OPTIMIZER DIRECTLY ON THE CUSTOMER'S MACHINE AND EXPLAIN THEIR USE TO THEM IN REAL TIME."

4.00

DEPARTURE

Once everything has been discussed with the customer, Michael Pfahler sets off again



4.30

FOLLOW-UP

In a café, Michael Pfahler writes up the minutes of his customer visit and notes any orders that may have been agreed to

TOOLS & TECHNOLOGY

NEWS FROM THE UNITED GRINDING GROUP

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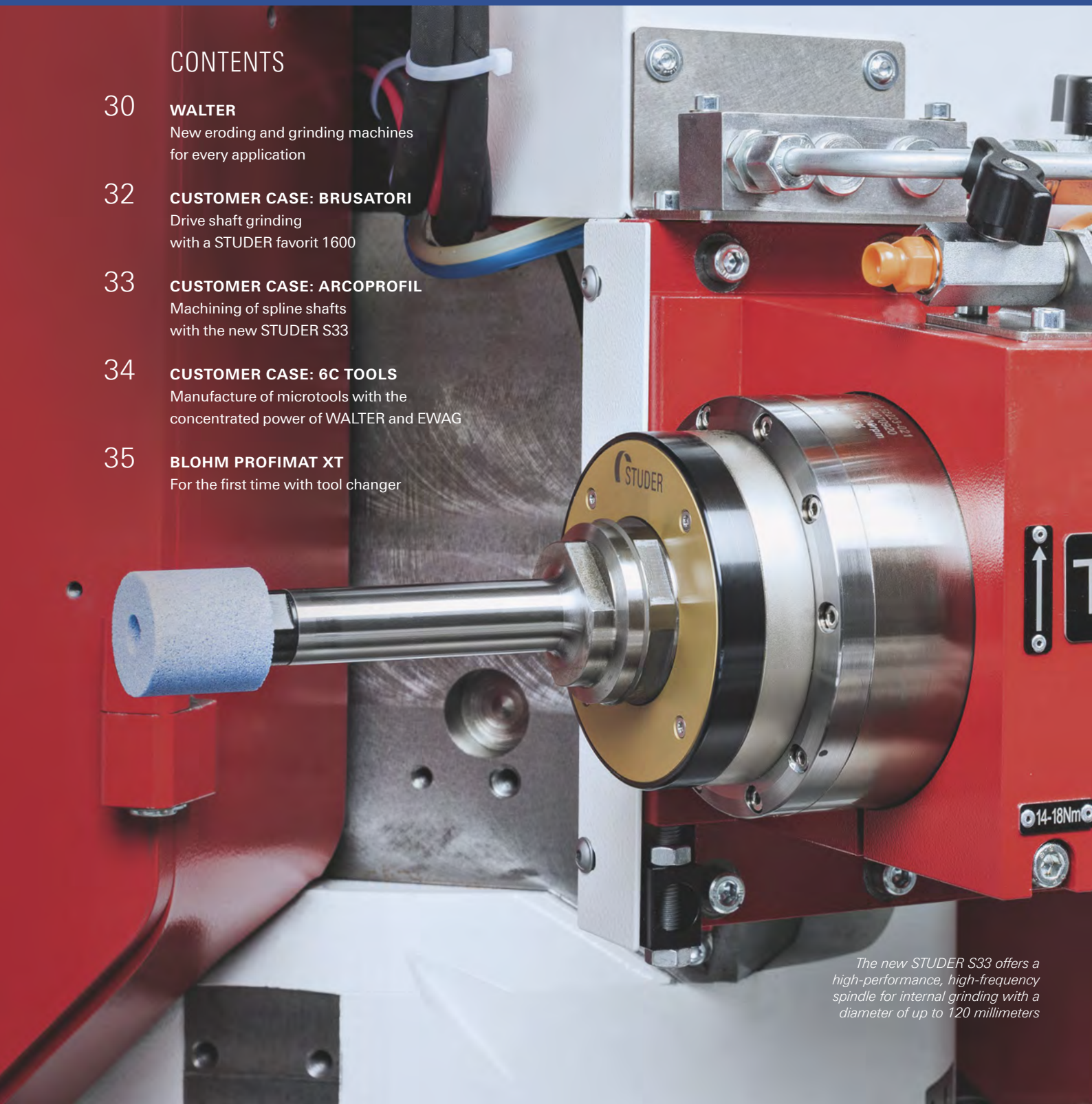


The new STUDER S33 offers a high-performance, high-frequency spindle for internal grinding with a diameter of up to 120 millimeters

UNIVERSAL AND SPECIALIZED IN PARALLEL

With its new eroding and grinding machines, WALTER expands its machine portfolio to satisfy all customer requirements

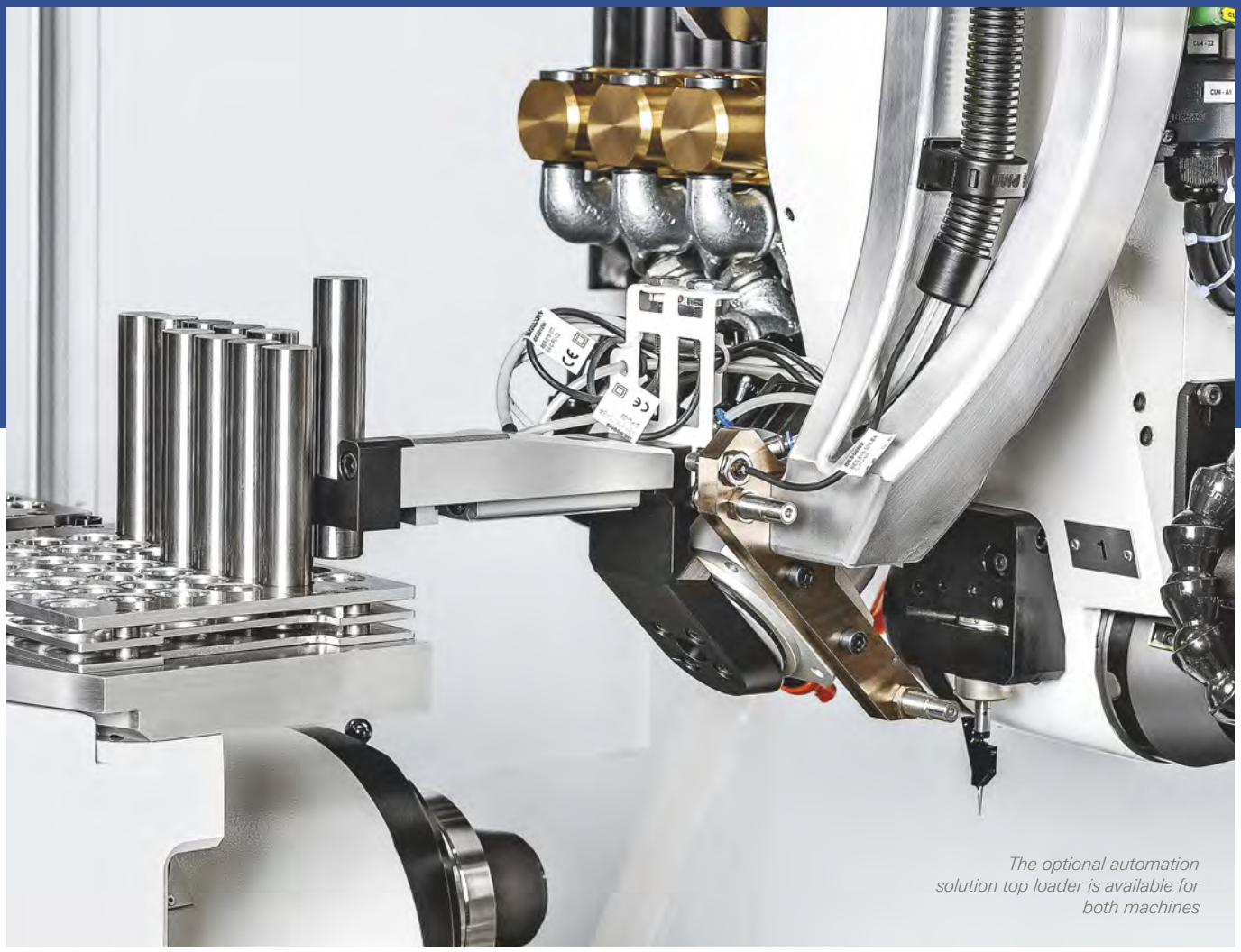
New in the WALTER portfolio: the HELITRONIC RAPTOR DIAMOND eroding/grinding machine and the HELITRONIC RAPTOR grinding machine

IF YOU ASK THE USERS of machine tools about their wishes, the answer is usually that the machines must be flexible and universally applicable, specialized and automatable and, last but not least, inexpensive. Requirements that are difficult to reconcile.

Nevertheless, WALTER has now achieved exactly this – with the expansion of the machine portfolio to include the HELITRONIC RAPTOR DIAMOND eroding machine and the HELITRONIC RAPTOR grinding machine. The specialists for tool processing now offer the right machine solution for every application. The highly flexible and universal eroding and grinding machine HELITRONIC RAPTOR DIAMOND is based on the proven "two-in-one" concept from WALTER.

RESHARPENING PCD

Equipped with FINE PULSE TECHNOLOGY, it guarantees PCD tools with perfect surface finishes and cutting edges without taking any additional time. The new machine was designed, amongst other things, to meet the requirements of resharpening as well as for the production of PCD tools. With a spindle motor with a peak output of 11.5 kW, it allows the machining of complex tools for wood and metalworking with a diameter of



The optional automation solution top loader is available for both machines

up to 400 and a length of up to 270 millimeters (end face machining). The HELITRONIC RAPTOR DIAMOND therefore guarantees the high degree of flexibility in the working area required for the resharpening and production of the various tools.

Optionally, a top loader integrated in the working area is available for the automatic loading of up to 500 round shank tools. Also optional are glass scales, measuring probe for measuring the grinding wheels, manual tool support and a torque drive for the A-axis.

FOR BEGINNERS AND RESHARPENERS

The compact HELITRONIC RAPTOR is the ideal entry-level machine for the efficient production and resharpening of rotationally symmetrical tools made of HSS, HM, cermet and ceramics. It allows fully automated, complete machining in one clamping.

Like the HELITRONIC RAPTOR DIAMOND, the HELITRONIC RAPTOR is equipped as standard with a belt-driven grinding spindle with increased peak power (11.5 kW) and automatic clamping.

OPTIONAL WITH TOP LOADER

As an automation solution, a top loader integrated into the working area is also available on request. Other options include a direct path measuring system (glass scale), an HSK interface for the grinding spindles, manual support systems and a measuring probe for measuring the grinding wheels. The HELITRONIC RAPTOR is suitable for machining tools with diameters from 3 to 320 millimeters and lengths up to 280 millimeters (end face machining) and tool/clamping device weight up to 50 kilograms.

MORE EFFICIENT WITH FEED RATE OPTIMIZER

Both the HELITRONIC RAPTOR and HELITRONIC RAPTOR DIAMOND are equipped with the HELITRONIC TOOL STUDIO grinding and eroding software. The efficiency of the grinding process can be further increased with the help of special software options, such as the feed rate optimizer or the tool balancer.

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HELITRONIC RAPTOR DIAMOND – THE BENEFITS AT A GLANCE

- FINE PULSE TECHNOLOGY
- Spindle motor with 11.5 kW power
- Workpieces up to 400 mm in diameter and 270 mm in length (end face machining)
- Top loader for automatic loading of up to 500 shank tools
- Software HELITRONIC TOOL STUDIO

HELITRONIC RAPTOR – THE BENEFITS AT A GLANCE

- Fully automated complete machining in one clamping process
- Spindle motor with 11.5 kW power
- Workpieces up to 320 mm in diameter, 280 mm length (end face machining) and 50 kg weight
- Software HELITRONIC TOOL STUDIO

MORE PRECISE SHAFTS, QUIETER MOTORS

Brusatori grinds the drive shafts of its motors on a new generation STUDER favorit and benefits from a more efficient grinding process

The CNC universal cylindrical grinding machine favorit 1600 for single and serial production of long workpieces

BRUSATORI, based in Cuggiono near Milan, specializes in the production of torque and servo motors. Since the beginning of 2019, Brusatori has been grinding the bearing seats of the drive shafts on a STUDER favorit with a center distance of 1600 millimeters. The external cylindrical grinding machine for the entry-level segment is one of the first machines of the new generation to be delivered. With the STUDER favorit, Brusatori was able to significantly increase its productivity. Loading takes place manually. For a future digital connection, the machine is equipped with an OPC-UA interface.

HIGH ERGONOMICS

A machine bed made of Granitan® provides the favorit with the legendary STUDER precision. The wheelhead can be positioned automatically every 3° and can accommodate a belt-driven external and internal grinding spindle respectively. The dresser position can be manually adjusted in the T-slot. Service doors at the rear and on the right of the machine ensure high ergonomics.

Thanks to a machine base with integrated coolant tray and temperature control, the machine reaches operating temperature quickly. The automatic swiveling wheelhead can be equipped with two tools. Geometry clarifications are avoided by placing the dressing spindle behind the workhead or the tailstock.

For use at Brusatori, STUDER replaced the standard face driver with the model of an Italian manufacturer. "Now the face driver is perfectly matched to the geometry of our shafts. It allows the complete machining of the entire shaft in one clamping and guarantees maximum concentricity for all diameters," emphasizes Managing Director, Antonio Brusatori.

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The machine bed made of Granitan® with longitudinal and transverse guideways

THREE QUESTIONS FOR ANTONIO BRUSATORI

Managing Director of the family business, Brusatori

Why did you choose the STUDER favorit with a center distance of 1600 millimeters?
Other machines that came into contention were too large for our purposes, and the favorit also uses the most modern software.

What are the benefits of the machine?
The favorit is our first STUDER and works much more efficiently than our old machine. The significantly shorter cycle times enabled us to increase our overall productivity. It grinds with much higher precision, allowing us to further optimize the concentricity and tolerances of our shafts.

Can you pass on these benefits to your customers?
Of course. The higher quality of the shafts increases the service life of our motors, and they run quieter. These are improvements that our customers really value.

THE BENEFITS AT A GLANCE

- Workpiece table with double T-slot
- B-axis 3° Hirth automatic
- Fixed wheelhead 0°/15°/30°
- 2 tools (1 x OD/1 x ID)
- Belt spindle (external + internal)
- Control system: Fanuc 0i-TF

Arcoprofil uses three STUDER S33 to produce its transmission shafts

HIGH PRODUCTIVITY

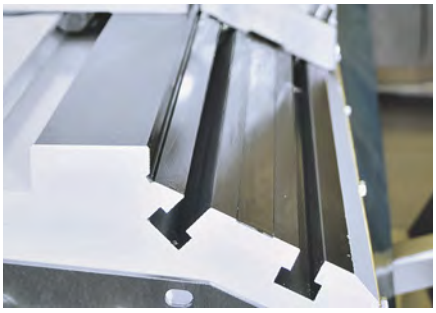
Arcoprofil relies on the new CNC universal cylindrical grinding machine S33 from STUDER for shaft grinding

ARCOPROFIL, based in Santorso, North-East Italy, specializes in the production of cold-forged spline shafts for heavy-duty vehicles and has been relying on STUDER cylindrical grinding machines for 25 years. There are currently three S33s in use, each of which was put into operation at an interval of one year. The newest, with a center distance of 1600 millimeters and a synchronous tailstock, went into production in 2019. This makes Arcoprofil one of the first users of this latest generation machine. The spline shaft specialists primarily use the STUDER S33 for the complete machining of transmission shafts for tractors as well as flange, axle and fan shafts for agriculture and forestry.

DYNAMIC AND THERMALLY STABLE

The machine is based on STUDER's T-slide concept and features an extended stroke of the X-axis. An innovative machine base temperature control ensures optimum dynamic and thermal stability of the machine. The dresser sits on the double T-slot of the longitudinal slide, which reduces the set-up and realignment effort and therefore increases the flexibility of the machine.

The synchronous tailstock and the wheelhead, which can be equipped in various arrangements with two motor spindles for external grinding and an internal grinding unit, allow Arcoprofil to grind all diameters of the shafts in one clamping. This means a significant increase in productivity!



Double T-slot and clamping surface for holding dressing tool holders

The internal grinding unit of the STUDER S33

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THREE QUESTIONS FOR ROBERTO CASOLIN

Managing Director of Arcoprofil

How long have you been working with STUDER cylindrical grinding machines?
We purchased our first STUDER, an S36, in 1995. A year later, we bought a S30leanPRO. Both machines performed very well, but have since been taken out of service. But we have remained faithful to STUDER.

What prompted you to purchase another S33?
For the machining of large shafts, we needed a machine with the corresponding working envelope. The STUDER S41 with a center distance of 1600 millimeters was "overqualified" for the task. When the S33 was introduced to the market with a center distance of 1600 millimeters, it was clear: This is the machine for us.

What has improved with the new S33?
Thanks to the synchronous tailstock, the set-up time is close to zero. The cycle time is 50 percent lower than with the older STUDER machines and also compared to the machines of the competitors.

THE BENEFITS AT A GLANCE

- Center distances: 400/650/1000/1600 mm
- StuderGuide® guideway system
- Thermal stability thanks to innovative machine base temperature control (center distance 650 to 1600)
- Double T-slot for dressing systems
- Numerous wheelhead configurations
- StuderWIN programming software with StuderTechnology
- Easily automated

The 6C Tools Managing Directors Maximilian Warhanek and Jens Boos (from left) have developed a strategy for processing their tools with Dr. Claus Dold (2nd from left). Achim Schurius (l.), Sales Director Europe at WALTER, tells us about further optimization possibilities

STRONG TRIO FOR HARDNESS 10

The tool manufacturer 6C Tools, which specializes in micro tools made of extremely hard cutting materials, benefits from the combined machining on grinding, eroding and laser machines from WALTER and EWAG

IN THE WATCH INDUSTRY and medical technology, tools made of polycrystalline diamond (PCD) are becoming increasingly popular to process materials that are difficult to machine, such as glass or ceramics. Until a few years ago, however, it was not possible to economically produce the corresponding filigree tools with precisely machined PCD cutting edges.

EXTREMELY HARD CUTTING MATERIALS

This changed seven years ago when Maximilian Warhanek, now Managing Director of 6C Tools, together with EWAG laser specialist, Dr. Claus Dold and ETH Zurich, developed the first industrial strategy for laser processing of complex geometries for cutting tools made of ultra-hard materials. This EU-funded project resulted in the laser processing machines EWAG LASER LINE ULTRA and LASER LINE PRECISION, as well as 6C Tools AG in Zurich. It specializes in the production of micro-drilling and milling tools with soldered PCD cutting blades.

"When manufacturing PCD tools with complex cutting geometries, the laser can have clear advantages," explains Warhanek. Lasers work without force and wear, can produce even the smallest details with high precision and deliver smooth, error-free surfaces and edges.

The software used is decisive for successful laser processing. "Especially for special geometries, we are constantly improving machining cycles from operational experience to optimize accuracy and speed," says Warhanek.

COMBINED PROCESSING

In order to optimize the production of PCD tools and shorten lead times, 6C Tools also invested in a HELITRONIC DIAMOND EVOLUTION from WALTER. The machine, which works according to the "two-in-one concept", allows tools to be completely eroded (PCD), to grind exclusively (carbide) or to combine both processes.

With the trio of combined tool eroding and grinding machine HELITRONIC DIAMOND EVOLUTION from WALTER, laser processing machine LASER LINE ULTRA from EWAG and high-quality optical measuring machine HELICHECK PLUS, also from WALTER, 6C Tools is ideally equipped to produce microtools with PCD cutting edges even in series of 500 tools and more economically.

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THREE QUESTIONS FOR JENS BOOS

Jens Boos,
Managing Director of 6C Tools AG

What was the reason for founding 6C Tools?
Maximilian Warhanek and I founded 6C Tools in 2015 as a spin-off of the Chair of Machine Tools and Manufacturing at ETH Zurich, because at that time we discovered the great potential of lasers for the production of micro-tools with PCD cutting edges. Today we sell our high-precision micro tools to the high-tech markets of Europe.

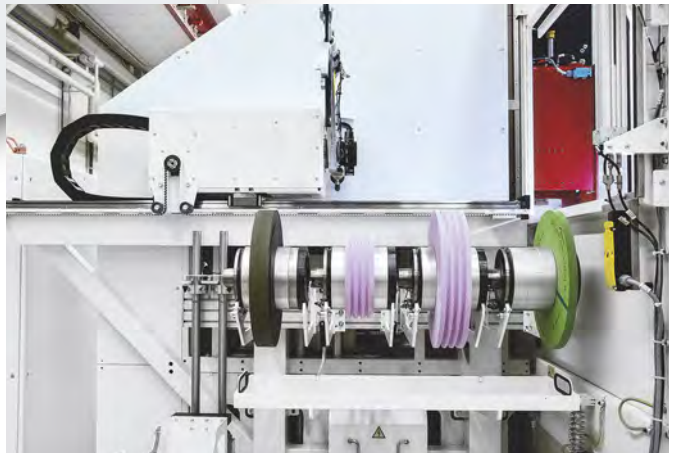
What does 6C Tools offer its customers?
On the one hand, we now manufacture micro-tools for drilling and milling with four employees. With their PCD cutting edges, they are used for the efficient processing of components made of ceramics, precious stones and glass. On the other hand, we also develop application-specific solutions for our customers in cooperation with ETH institutes and inspire AG.

What role does the software play in laser processing?
The software significantly influences the processing results and continuously develops with the experience gained from practice. For special geometries, we constantly optimize machining cycles, therefore improving the precision and speed of machining.

One machine, four technologies: the BLOHM PROFIMAT XT

The loading aid enables fast changing of the grinding wheels

Flexibility: Four grinding wheels in the magazine of the tool changer



FAST CHANGING

Reimagined: The BLOHM PROFIMAT XT is offered for the first time with tool changer. The cost-effective solution is unique in this market segment

FOUR GRINDING TECHNOLOGIES in one machine - the highly productive PROFIMAT XT features: reciprocate, creep feed, CD and speed-stroke grinding. Thanks to the tool changer these processes can now be automated. Beside this, the changer offers users other benefits: It allows loading with several tools of the same type to be able to replace worn grinding wheels quickly and automatically. In addition, it allows unsupervised operation even for complex workpieces that require grinding wheels with different profiles. As the tool changer can be loaded during the process, the set-up times are also reduced.

At the same time, it improves the overall handling of the machine. This is because it is easier for the machine operator to load the changer with large wheels than to mount these directly in the machine. Users also benefit from significantly more efficient machining. For instance, roughing and finishing wheels can be prepared in the changer and therefore a high stock removal rate can be achieved combined with an excellent surface finish quality.

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BENEFITS AT A GLANCE:

- Automated production
- More efficient machining
- Automatic operation of complex workpieces
- Option to load sister tools
- Set-up while process is on-going
- Simplified handling

KEY TOOL CHANGER DATA:

- Automated production
- Magazine with 4 grinding wheels
- Max. grinding wheel diameter 400 mm
- Max. grinding wheel weight 40 kg

A COUNTRY IN TRANSITION

More and more companies are choosing Vietnam as their location in Southeast Asia. This also opens up new opportunities for the machine tool industry in the country with 95 million inhabitants

TEXT: MATHIAS PEER

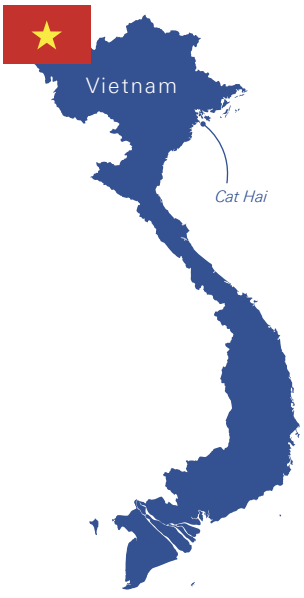
THE RAPID ECONOMIC CHANGE in Vietnam has specifically been felt hard by the residents of the island of Cat Hai. Just a few years ago, their homeland was a long way away from the flow of goods in the global economy. The existence of the inhabitants was based mainly on fish farms and agriculture. Those who had something to do in the neighboring metropolis of Haiphong depended on the ferry boat, which stopped twice a day on the island.

Solitude has been over since September 2017: After three years of construction, the five-and-a-half kilometer long Tan Vu Lach Huyen bridge opened – the longest sea bridge in Southeast Asia that connects the once sleepy island to the mainland. Just a few months later, an international container terminal began operations on Cat Hai – North Vietnam's first port of call for large container ships.

With the infrastructure came the industry: Since the middle of last year, production by Vietnam's first car manufacturer has been up and running on the island. Under the Vinfast brand, billionaire Pham Nhat Vuong wants to produce a quarter of a million cars a year.

"VIETNAM HAS BECOME THE NEW PRODUCTION CENTER IN SOUTHEAST ASIA."

Vu Trong Tai, Exhibition Company Reed Tradex



The establishment of its own automotive sector is a milestone in economic development for the country, which has a population of around 100 million. After the end of the Vietnam War and the victory of the Communists, Vietnam was one of the poorest countries in Asia until the 1980s. The hardship forced the leadership of the Socialist Republic to reform. The ensuing economic opening initiated a historic upswing that continues to this day – even in the face of the coronavirus crisis, economists in the country expect growth of up to five percent by 2020. While Vietnam has long been known primarily for cheap textiles and footwear, it is now increasingly establishing itself as a location for high-tech production and offering machine builders good sales opportunities.

Vu Trong Tai is one of the profiteers of the trend. He heads the Vietnam branch of the Southeast Asian trade fair company Reed Tradex and is responsible for the Metalex machine tool trade fair. Until the coronavirus crisis began, he was able to look forward year after year to a growing number of exhibitors and visitors. "The rapid industrial development is causing the demand for machine tools to rise sharply," he says. The

The two faces of the Cat Hai Island: The container terminal is North Vietnam's first port of call for container ships ...

... and next door in Halong Bay traditional junks still sail

Illustration: iStockphoto; Photos: Haiphong International Container Terminal, iStockphoto

"OVERALL, THE MARKET PROSPECTS FOR GRINDING AND MACHINE TOOLS IN VIETNAM ARE VERY GOOD."

Robert Puschmann,
Managing Director Technology for Singapore, Malaysia & Vietnam, DKSH Singapore

trade dispute between the US and China, which disrupted global supply chains last year, has encouraged development. "Many companies have migrated from China to Vietnam with their factories," he says. "This has helped the country to become the new production center in Southeast Asia." In 2020, manufacturing will continue to be the main driver of economic growth, which last year was more than seven percent, exceeding the government's expectations.

The massive rush of foreign companies was one of the main reasons for the economic boom: 3,880 projects received investment licenses last year, an increase of 28 percent. The total volume of announced foreign direct investment also rose sharply, growing by seven percent to 38 billion dollars. Two-thirds of the capital that went to Vietnam went to the manufacturing sector. With new factories in Vietnam, many companies tried to escape the punitive tariffs imposed on each other by China and the US.

In Vietnam's third largest city, Hai Phong, Vinfast wants to produce mid- and high-end cars for the international market

GLOBALIZATION AS AN OPPORTUNITY

The country is considered as an ideal alternative location: The population is young and comparatively well educated. And the government sees globalization as a great opportunity for the country and has signed a number of free trade agreements: With the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Vietnam has been in a free trade area with countries such as Japan, Canada, and Mexico since 2018. At the end of June 2020, Vietnam signed a free trade agreement with the EU that abolishes 99 percent of reciprocal tariffs. The RCEP trade pact, which includes Vietnam and its Southeast Asian neighbours, is also due to be completed in 2020.

The German automotive supplier, Schaeffler, invested 45 million euros in its new plant in Bien Hoa, 30 kilometers south of Ho Chi Minh city

The good conditions particularly attracted electronics manufacturers: Nintendo announced that it would move part of its game console production to Vietnam. Sharp relies on the site for its production of LCD displays for the US market. And the Apple supplier, Goertek, also opted for another mainstay in the Southeast Asian state.

Vietnam was also able to convince other industries: In May 2019, the automotive and mechanical engineering supplier, Schaeffler, opened a 45 million euro plant in the South Vietnamese industrial city of Bien Hoa, with the declared goal of becoming more independent from China. The supplier ZF Friedrichshafen built a factory for chassis module technology right next to the Vinfast factory on the Cat Hai island. The Chinese engineering company, Omnidex, also moved part of its production to the neighboring country.

Photos: picture alliance/REUTERS, Vinfast, Schaeffler AG, iStockphoto

The plant of the Vietnamese car manufacturer Vinfast opened in June 2019

"Vietnam has established itself as an important component of international supply chains," says the Association of German Machine Tool Manufacturers (VDW). In order to be competitive on the world market, manufacturers are dependent on sophisticated production technology. However, the machine tool industry in Vietnam itself is only slightly developed, according to an analysis by the association. The German foreign trade development agency GTAI also observes a pent-up demand: "In order to increase their productivity, Vietnamese companies need new or at least modernized equipment," said Vietnam expert, Frauke Schmitz-Bauerdick, in a market analysis.

GREAT SCOPE FOR GROWTH

The situation of Vietnamese machine tool builders has changed little since then. "It is a great challenge for local manufacturers to keep up-to-date with modern technologies, in order to be able to compete," says industry expert, Vu Trong Tai. Currently, Vietnam's economy primarily relies on machine imports from abroad. In the first nine months of last year, they had a total value of 26.9 billion dollars – 12 percent more than in the same period last year. Imports come from Europe, America, Japan and South Korea – but above all from China, which last accounted for almost 40 percent of machine deliveries.

Chinese machine builders still have a strong advantage over Vietnamese ones, Tai finds. This is due to the fact that Chinese manufacturers can rely on industrial supply chains that are significantly better developed. Vietnam is also lagging behind in terms of infrastructure. Tai, however, is convinced that this will soon change. The government is working to improve the conditions, he says. Import restrictions adopted last year could also help local manufacturers: For example, used machinery older than ten years may no longer be imported into the country. "The time has come for foreign manufacturers to increasingly engage with production in Vietnam," Tai says. He is optimistic: "There is great scope for growth." ◦

Author Mathias Peer reports as a world reporter from Bangkok/Thailand on the political and economic development of Southeast Asia

Landmark 81 in Ho Chi Minh city is the tallest building in Vietnam

FOCUS: CYLINDRICAL GRINDING MACHINES

The Vietnamese grinding machine market is still comparatively small. Cylidrical grinding machines worth about 8 million dollars were imported into the country in 2019, the market for the other grinding technologies is even smaller. "But until the coronavirus crisis, the overall market outlook was good," explains Robert Puschmann, Managing Director, Technology for Singapore, Malaysia & Vietnam at DKSH Singapore Pte Ltd. DKSH represents the brands of the UNITED GRINDING Group in the country.

According to Puschmann, this perspective results from three developments. On the one hand, from the interim upswing in the automotive market, initiated by international and Vietnamese suppliers: Not only global players such as Bosch or Schaeffler are active in the country, Vinfast also produces cars of a Vietnamese brand. Secondly, Puschmann also observes that Vietnam benefits from the trade dispute between China and the US. Thirdly, due to the different wage levels, there is a shift in production from Taiwan and Korea to Vietnam. According to Puschmann, there will be an upgrade from low-cost to premium grinding machines in the area of contract manufacturing. Here, too, there are opportunities for manufacturers such as the UNITED GRINDING Group.

Data centers, such as Google's in Berkeley, California, are estimated to consume two percent of the total global energy

THE PRICE OF PROGRESS

It allows cars to drive autonomously, controls complex production systems and, by the way, beats people in demanding strategy games like Go. Artificial intelligence is attributed to true miracles. However, the number of resources it consumes is often neglected

Text: Dr. Nico Piatkowski

ARTIFICIAL INTELLIGENCE (AI) IS DESIGNED TO SUPPORT HUMANS. In fact, it can do one thing above all: control. AI controls what advertising we see on the internet, controls autonomous robots for rescue and recovery, controls self-driving cars. In view of the global climate problem, however, there is a growing question about the impact of this support on our environment.

The last key digital technology that has changed our daily lives has become an integral part of our energy balance: Every single one of the 3.5 billion searches per day consumes 0.3 watt hours, according to Google. That's a gigawatt hour in total – as much as 50,000 households consume every day. And what about the power consumption of AI systems? Of course, anyone who does superhuman work will also have to be allowed to use superhuman energy. But how much more can it be?

Well-known representatives of such AI systems are IBM's Watson and Google DeepMinds AlphaGo. Watson won the TV quiz "Jeopardy!" and has declassified the former winner of the game. AlphaGO defeated one of the world's best players in the board game Go. In both cases, artificial intelligence stands out from humans – at least in terms of the implementation of clearly defined rules of the game. If you ask about the energy consumed, AI systems perform worse: The hardware used suggests that the power consumption of both systems is about 100,000 watts. Compared to this, the power consumption of the human brain is a five thousandth.

This is no difference for current AI systems. At the largest annual computer linguistics conference in 2019, results were presented showing that learning natural language using the most advanced AI methods takes more than 0.5 gigawatt hours at the moment. If the later application of the learned language model is calculated, it comes to about 10 kilowatt hours for learning; the same that is extracted for a Tesla Model 3 or a VW ID.3 from the charging cable in an hour.

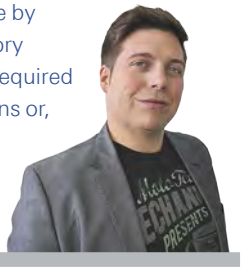
AUTONOMOUS VEHICLES

Most of the energy is consumed by special hardware (GPUs) needed to learn and apply a learned AI system. In particular, the energy consumption of the application of a well-learned AI can become a major problem in the coming years. This is due to the frequency of the application. The learning takes place once, even if gigawatts are consumed, after which the system has "learned" it and it can be copied and applied millions of times. For example, this is the case of fully autonomous vehicles. There, the AI system is continuously active, evaluates information and makes decisions. Prototypes consume up to 2.5 kilowatts per hour. Admittedly, energy

ABOUT

DR. NICO PIATKOWSKI

At the Fraunhofer Institute for Intelligent Analysis and Information Systems IAIS, under the direction of Prof. Dr. Stefan Wrobel, Dr. Nico Piatkowski deals with machine learning for resource-restricted systems. The aim of his research is to minimize the resource consumption of artificial intelligence by reducing the memory requirements, the required arithmetic operations or, the complexity of computational operations.



Photos: imago/PR, Privat

consumption is not currently the biggest problem of autonomous mobility. But it should be clear that such a high demand for performance is far from any practicality, especially at a time when we are trying to substitute fossil fuels and maximize the efficiency of our vehicles.

When discussing the level of energy requirements of current AI systems or their practicality, it must be made clear: Apart from Watson, all of the systems mentioned so far have been research prototypes. They were not brought to series production and were often only used a few times under semi-real conditions. Of course, many AI systems are already in use in business and industry, but these are well-researched methods, some of which have been studied for decades, and not techniques that have just been used for the first time.

Thinking about what is just around the corner: With "Jeopardy" you have to find the right questions for given answers. IBM's Watson has beaten its human opponents

USE RESOURCES SKILLFULLY

If future mobile, battery-powered everyday objects, medical devices or autonomous vehicles themselves are to be able to identify new connections and react to them independently, we must first understand what resources the various AI methods need and how to reduce consumption, if necessary. Otherwise, the energy consumption is simply too high to be integrated into the mobile device.

A recent study by Microsoft called "Zero Redundancy Optimizer" shows how skillful resource utilization (specifically, efficient use of GPU memory) can reduce the required GPUs and therefore the energy required to learn many AI models to a quarter. Researchers at TU Dortmund have already gone one step further in 2018.

It showed that calculations that are fundamental to learning and applying AI systems can also be performed on micro-computers, so-called ultra-low-power (ULP) devices. Such ULP devices only consume a few milliwatts, some of which are sufficient for operation with a small solar panel. In this way, future AI systems could be used completely energy-neutrally and instead of doing what it was originally intended to do in the basements of the data centers in the smart home, in intelligent delivery drones or household robots, they could do what it was originally intended for: to support humans. ◦

Photos: picture alliance/AP Photo, imago/ZUMA Press

Much more complex than chess: Go is considered one of the most demanding board games ever. AlphaGo defeated South Korean Go champion, Lee Se-dol

AT A GLANCE

MORE ENERGY THAN RUSSIA

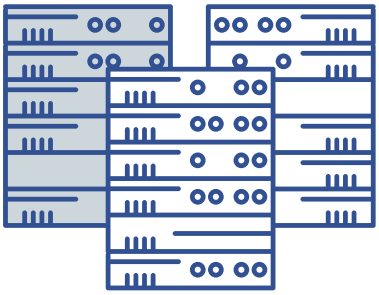
If the internet were a country, it would be the country with the sixth-largest electricity consumption on the planet. Digital applications have an immense energy consumption, which many often forget. An overview

60

Watt hours are needed to iron a shirt, which corresponds to 200 Google searches [2]

0.3

Watt hours is consumed by a Google search [1]

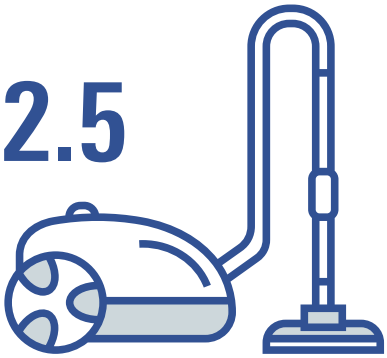


14

Terrawatt hours of electricity are consumed at data centers worldwide 2018 [5]

0.5

Gigawatt hours is needed by an AI to learn a language [3]



2.5

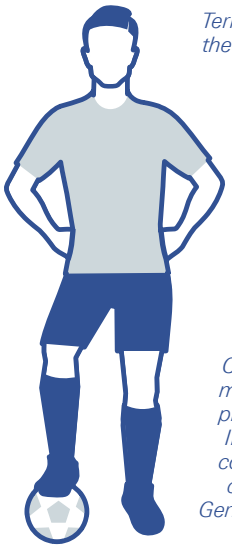
A fully autonomous vehicle consumes kilowatt hours for computing power. With the energy you can vacuum about 2.5 hours (as of 2018) [4]

1,000

Terrawatt hours is consumed by the entire internet per year [6]

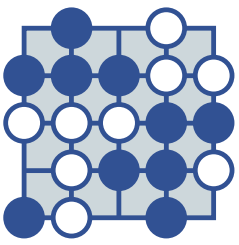
200,000,000,000

Kilowatt hours is consumed by streaming platforms such as Netflix per year [7]



30

Cristiano Ronaldo spends megawatt hours posting a photo for his 199.2 million Instagram followers. This corresponds to the energy consumption of six large German households per year [9]



100,000

Watt hours were used by AlphaGo and Watson to defeat people in Go and "Jeopardy!" respectively. 20 watt hours is what people use for the game [8]

Sources: [1] Goethe Institute; [2] Südwestrundfunk (South West Radio); [3] Mitteldeutscher Rundfunk; [4] Cornell University; [5] EnBW; [6] Der Stern; [7] Tagesspiegel; [8] Arbeitsblätter News; [9] Wirtschaftswoche

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