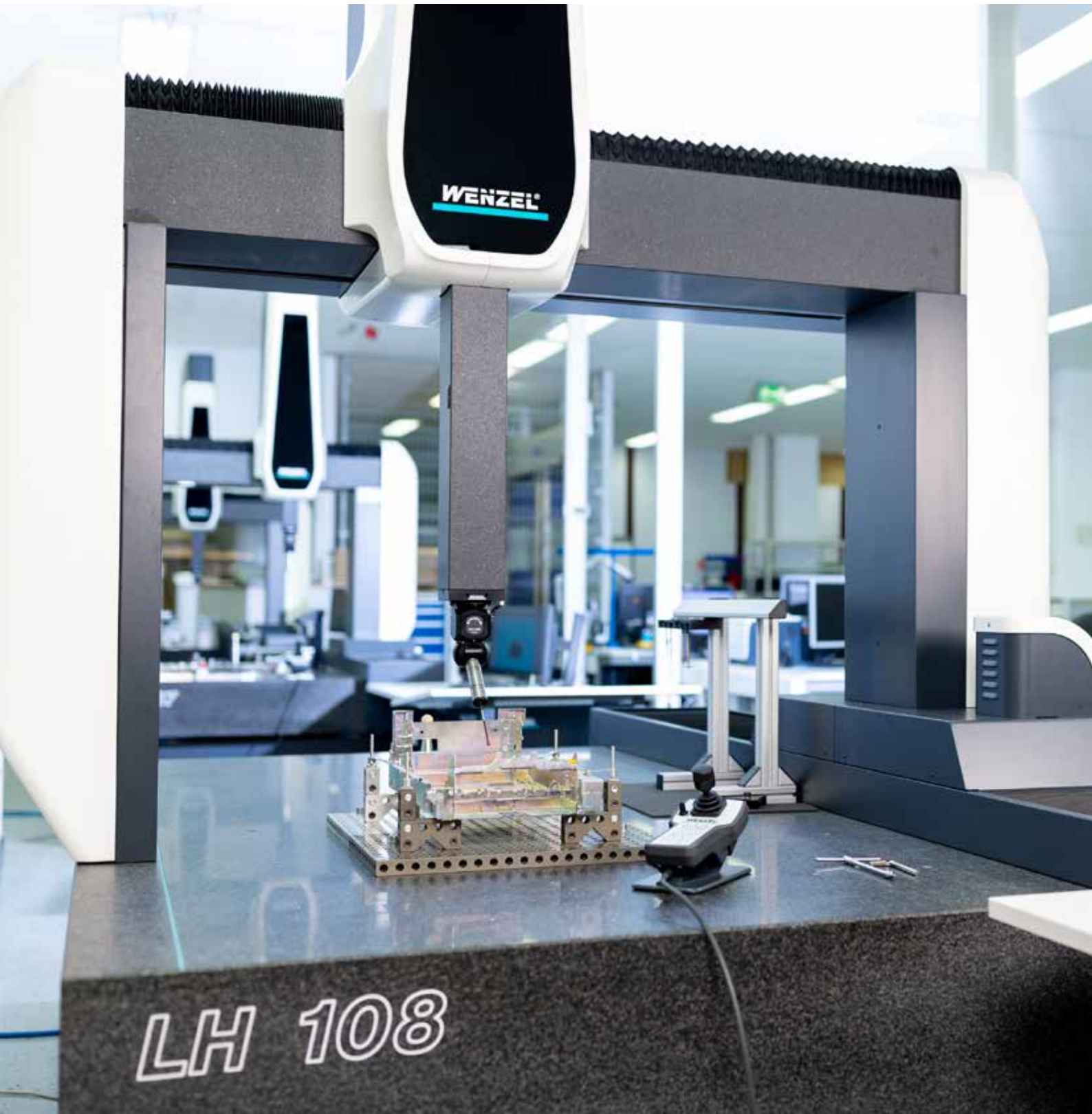
Metrology World

2022

Precision | Productivity | Passion



PREFACE

In the last weeks and months we have to doubt many of our everyday rituals and certainties. Is there a life like “pre-Corona”? Do we continue to live in a globalized world? Will we continue to live in freedom and peace? If there is anything positive in all this terrible news, perhaps it is the gratitude we now feel again for many things that have become too normal for us: family, friends, always available resources such as water and electricity, travel to other countries, and many more.

We are therefore happy that business life has returned to normal: we meet our customers and prospects again at trade shows, do real machine demos or travel to meet partners, prospects and customers. It’s a great feeling, despite all the visible benefits of digitization - we humans want to meet people, exchange ideas, and see and experience in person the advantages that the technical solutions available on the market can bring.

The world of coordinate measuring technology is also changing: our solutions are not only used in the measuring room, but also increasingly in production, loading and unloading is automated and the measurement results are used “real time” to improve products and processes. This is all a result of digitalization throughout the industry and will certainly remain an impulse driver for our machines and the appropriate software in the years to come.

But: metrology is and remains the service provider to ensure and improve the quality of products. We have to provide measurable benefits here in very different applications. Whether in automotive or
Whether in automotive or mechanical engineering, in aviation or medical technology - success is based everywhere on the repeatable, precise manufacture of preliminary or end products. In addition to our “classic” coordinate measuring machines from small to very large, we present industrial CT solutions. Here, too, metrology is becoming increasingly important. In this issue, you can get to know some of the machines at our customers’ facilities.

We would be pleased if you would also trust us in the future to make your success measurable.

Thank you for your trust!

Dr. Heike Wenzel

Prof. Dr. Heiko Wenzel -Schinzer

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WENZEL INTERNAL

Wiesthal - The WENZEL Group GmbH & Co. KG introduced the 4-day week in production at its headquarters in Wiesthal at the beginning of the year. With the new working time model, the globally active machine manufacturer is a pioneer in its industry and the region.

The year 2021 has finally gone well again for WENZEL, the consequences of the car crisis and the Corona pandemic well digested: also the order books for 2022 are already well filled again. But nevertheless, WENZEL is now not just going about business as usual, but is introducing a new working time model that is very innovative for machine construction companies: the 4-day week as standard in production and as an option in administration.

Employee-oriented, innovative and sustainable

The new working time model, which has been in preparation since mid-2021 and was implemented at the beginning of the year, was to be employee-oriented, innovative and sustainable. Employee-oriented, because many employees had signaled that the short-time work temporarily required by Corona actually fit very well with their own demands. “We launched the 4-day week under the motto ‘Modern workplaces for the future,’” emphasizes Managing Director Dr. Heike Wenzel. “There is more time for one’s own interests, family and friendships. For us, however, the new working time model is also a great way to score points as an attractive employer, a clear advantage in the competition for the best talent on the labor market.”

4 DAY-WORI

The model is innovative because the motivation and satisfaction of our employees are more important to us than the utilization of the machines required for production, some of which are very capital-intensive. However, it requires very good planning to ensure that the same number of machines can be produced in the 4 days as before. The new working time model also has a sustainable effect, as many energy-intensive machines, compressed air and air conditioning systems can now be switched off on Thursday evenings, resulting in energy savings of 10 - 15% for the same production output.

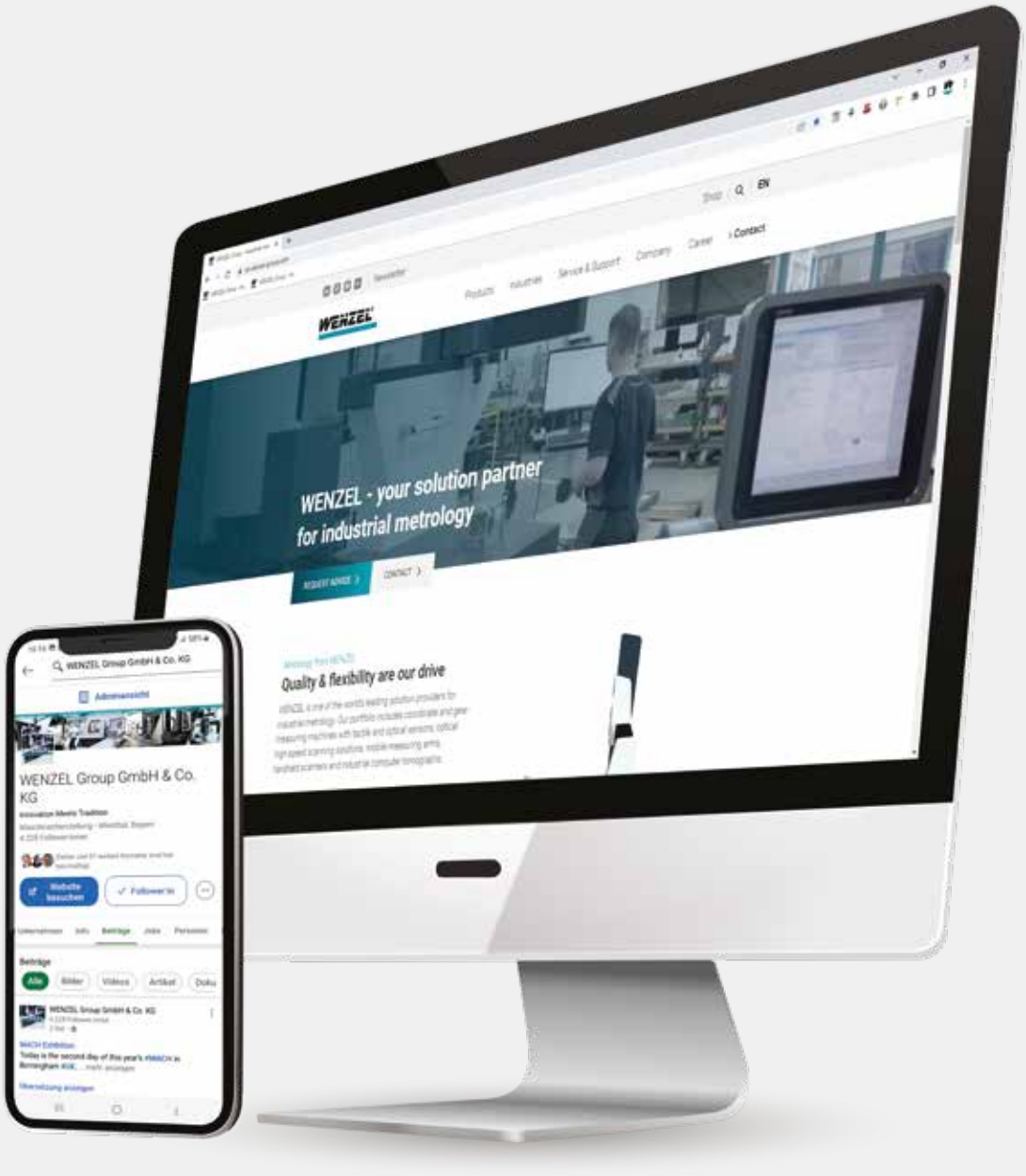
Options extended to working from home

"The reduction of working days from five days to four days per week takes effect in all departments where implementation is possible," explains HR Manager Daniel Eisler. The employees were able to decide individually about the change of the working time model. The majority of female employees were happy to accept the change, especially as the reduction in working hours from 37.5 to 36 hours was made without any loss of pay. Employees with 40-hour contracts had a choice: either reduce to the 4-day week with 36 hours as well with a "deductible" or stay with the old contract. "For those who wanted to stay with their existing model, we expanded the options to include working from a home office," Eisler continues. Currently, the 40-hour workweek is still the standard at most companies. However, studies and practical examples show that with effective time management, the 4-day week also has the potential to increase motivation and productivity. In the meantime, the new model has already been put into practice for a month. Employees have settled in and positive voices report that productivity remains the same as expected despite the reduction in hours.

K-WEEK

NEW ONLINE PRESENCE OF WENZEL

MODERN, RESPONSIVE, INTUITIVE, STATE-OF-THE ART. THE NEW APPEARANCE OF WENZEL ON THE WEB!



New WENZEL Website!

www.wenzel-group.com

Even more informative with new content, more modern and of course responsive, intuitive and faster: We are pleased to present our new website, which has been modernized both visually and in terms of content.The new site tells you everything you need to know about our company, our innovative measurement solutions, services and the industries we support. We hope you enjoy exploring our new website.

The project team behind the new site: Lorenz Köper, Patricia Welzenbach, Titziana de Genaro & Steffen Hochrein (from left to right).

LH 1210 FOR KS HUAYU ALUTECH

WHERE THERE IS A WILL, THERE IS A WAY

This photo collage shows the insertion and assembly of a WENZEL CMM LH 1210 at our customer KS HUAYU AluTech GmbH in Neckarsulm. The granite slab weighing several tons was delivered over the roof with special equipment. Thanks to the great teamwork, everything ran highly professional and smoothly. Now the customer can start his measurements in combination with the powerful measuring software WM | Quartis and the ultra-fast 5-axis measuring head REVO from Renishaw. For example, cylinder crankcases, structural components, transmission parts and e-mobility components are measured. We wish you much pleasure with the new WENZEL machine.

WENZEL'S PROJECT COMPETENCE

We have tailor-made solutions ready for our customers' special requirements: from conception and planning to turnkey handover. In addition to the production and installation of our measuring equipment, this includes, for example, the necessary static calculations as well as the complete setup of the measuring room including the control and safety technology. Starting with the floor construction up to the software configuration. Even the more difficult machine installation is not an isolated case for us. The machines get bigger, but the measuring or production environment remains the same. With our know-how, we support you in the professional implementation and offer you, together with our partners, a comprehensive service with the highest safety precautions for man and machine.

1zu1 Prototypen GmbH & Co KG, based in Dornbirn, Austria, was founded in 1996 by managing partners Hannes Hämmerle and Wolfgang Humml. Today, the company has 160 employees, has been part of the internationally active Prototal Group since mid-November and produces prototypes, small series and series parts for customers from all over the world and for every conceivable industry. In manufacturing, 1zu1 uses the most important 3D printing processes such as laser sintering and stereolithography. When developing new components for its customers, 1zu1 likes to push the limits of what is possible in terms of complexity and precision. Metrology plays an extremely important role in measuring and checking the finest details and tightest form and position tolerances.

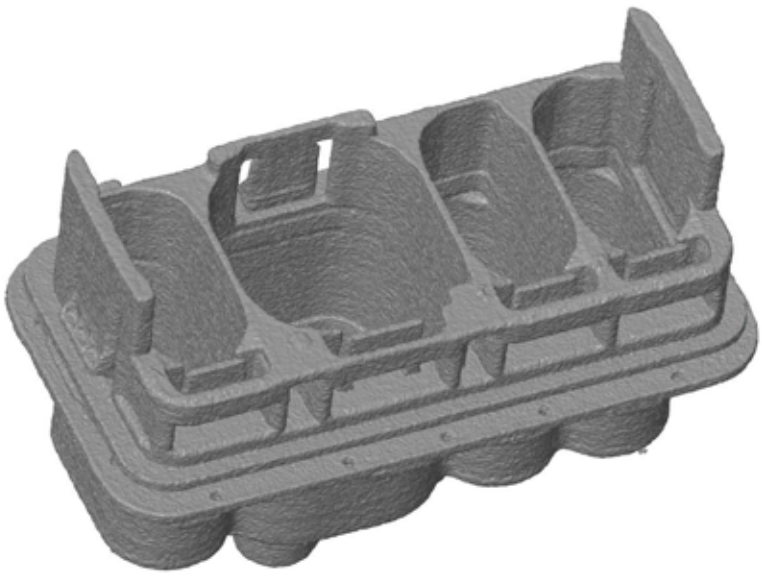
MORE INNOVATIVE, MORE PRECISE & FASTER

The focus was on the accuracy of the measurement result over the entire 3D part and not just for the area that can be captured with optical measurement technology. Here, industrial computed tomography has clear advantages. Compared to tactile or optical measuring machines, the computer tomograph (CT) can also measure internal features with high precision in a non-destructive manner. Optical metrology clearly has its limits, especially for measuring transparent components as well as parts with high-gloss mirror surfaces. Measurement without prior treatment with a laser scanning antireflection spray is not possible for such parts. In addition, the required measurement accuracy cannot be achieved with a spray application. Another major advantage of industrial computed tomography is the speed of the scans and evaluation. Thousands of measuring points can be measured within seconds. In addition, the performance of so-called pallet scans (several components in one scan) offers a shortening of process cycles and an increase in economic efficiency.

INDUSTRIAL COMPUTED TOMOGRAPHY VERSUS OPTICAL METROLOGY

The focus was on the accuracy of the measurement result over the entire 3D part and not just for the area that can be captured with optical measurement technology. Here, industrial computed tomography has clear advantages. Compared to tactile or optical measuring machines, the computer tomograph (CT) can also measure internal features with high precision in a non-destructive manner. Optical metrology clearly has its limits, especially for measuring transparent components as well as parts with high-gloss mirror surfaces. Measurement without prior treatment with a laser scanning antireflection spray is not possible for such parts. In addition, the required measurement accuracy cannot be achieved with a spray application. Another major advantage of industrial computed tomography is the speed of the scans and evaluation. Thousands of measuring points can be measured within seconds. In addition, the performance of so-called pallet scans (several components in one scan) offers a shortening of process cycles and an increase in economic efficiency.

After an extensive selection process, 1zu1 chose the exaCT L CT system with 150kV from WENZEL Metrology GmbH in Wiesthal. “Decisive for the purchase were ultimately the guaranteed measurement uncertainty of +/- 5 µm, the convincing CT measurement of our five benchmark problem parts and the impressive surface imaging accuracy without software smoothing,” Humml elaborates. “We were so impressed with the measurement results that we were happy to order the first machine built with this configuration, and we are happy to have the system up and running at our facility. The scan times of the system are impressively fast, so we were able to do about 120 scans in normal working hours in the first three weeks of operation.” The high efficiency of the CT solution enables faster development times, saving time and costs for the end customer as well.



exaCT L

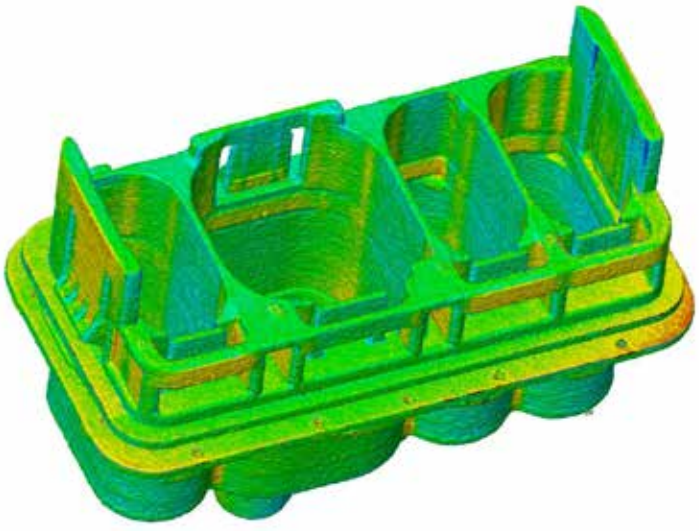
Space Requirements (L x W x H)	**1810 x 905 x 1910 mm**
Max. Measuring range	**Ø 235 / H 330 mm***

EXACT L AT 1 ZU 1 PROTOTYPENBAU

High scanning volume with small footprint

In addition, WENZEL's CT solution has the smallest footprint in its class at 150kV and also offers a scan volume of 400 mm in height and 235 mm in diameter. "The desire for the largest possible measuring volume with a comparatively small machine design was another important requirement criterion," emphasizes Humml. In addition to the small footprint and large scan volume, the exaCT L offers another major advantage - transport and assembly do not require any breakthroughs of doors or aisles, which ensures fast and smooth installation without additional effort. The exaCT L is also best in class when it comes to system weight, at only 2,650kg, which allows for flexibility in set-up locations.

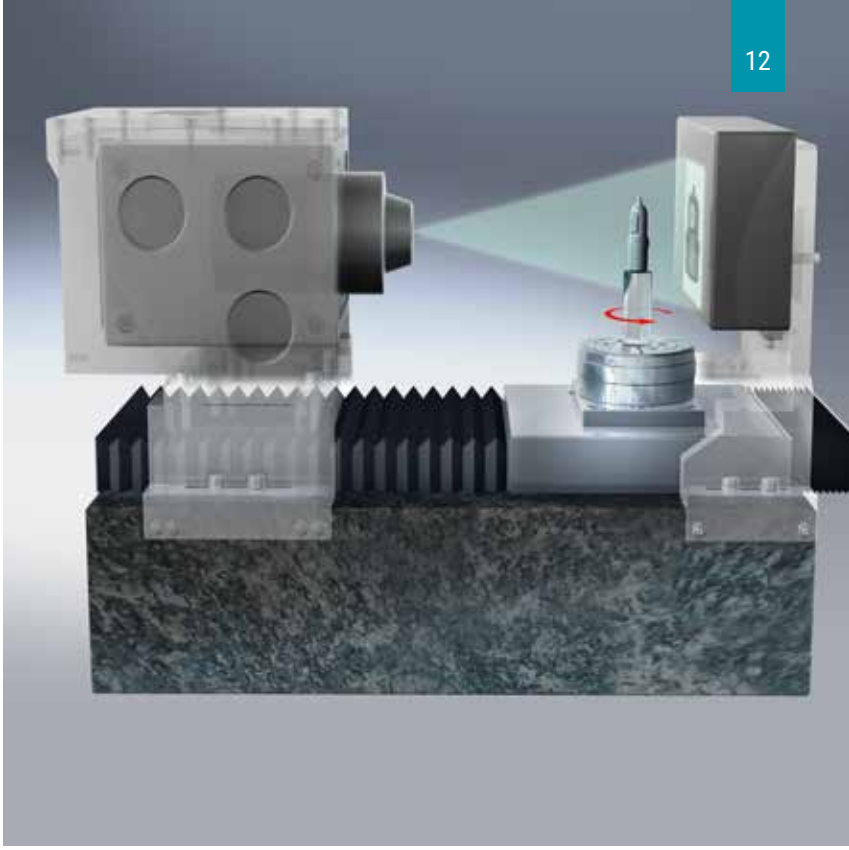
The exaCT L is the latest development in WENZEL's extensive exaCT series. The system won Frost & Sullivan's 'Global New Product Innovation Award 2020' at the end of 2020 based on a worldwide market analysis for industrial computed tomography. "The exaCT L has superior X-ray performance combined with a fast detector, allowing it to quickly measure objects and defects," said Mariano Kimbara, senior industry analyst at Frost & Sullivan. "WENZEL has taken an important step into the market with an intuitive user interface that uses intelligent software to automate all measurement parameters, providing robust customer value." Three independent travel axes provide great flexibility and enable high speeds and short measurement and inspection times.



From additive manufacturing to machining

Due to the high quality awareness, 1zu1 has to solve numerous measuring and testing tasks for its customers: Whether dimensional evaluations, compensation of shrinkage and warpage, testing for inclusions and impurities, geometric tests, assembly analyses (Multiscan) and process monitoring (measurement series), the measurement and test reports are always presented in a customer-friendly and comprehensible manner.

In doing so, 1zu1 relies on technologies such as 3D printing, plastic vacuum and injection molding, and mechanical manufacturing. A large part of 1zu1's investment flows into additive manufacturing. Here, the company is among the world leaders and has been a pilot customer and development partner of new 3D printing technologies for EOS, one of the world's leading suppliers of equipment for industrial 3D printing, since 2020.



Industrial computed tomography and additive manufacturing are two comparatively young technologies that can be excellently combined. While “additive manufacturing” allows new structures, the quality assurance of these novel products is performed by a CT. Based on these results, correction data is generated, which can decisively improve both the dimensional accuracy and the mechanical stability of 3D-printed parts. Especially the complex shapes created by 3D printing often pose difficulties for conventional measuring systems. Only CT technology enables non-destructive material analysis and dimensional accuracy testing.

An investment with pleasure and added value

“At WENZEL we appreciate the competent advice and the ability to listen in sales and to understand our needs and high requirements. Our direct contact person, Bernd Fleckenstein, gave us the feeling at every stage of the decision that we were with the right manufacturer,” enthuses Wolfgang Humml. For him as the managing director, the preliminary acceptance of the system was also convincing, which was accompanied by Dr. Uwe Hilpert, CT product manager at WENZEL, who was able to explain the measurement of each individual pixel on the ultra-fast 7.5 megapixel detector in a well-founded and competent manner.

“The CT training was also carried out by Dr. Hilpert on our premises in Dornbirn. After a week of intensive training and an in-depth introduction to CT technology, our measurement technicians were ‘ready to go’, but from the very first measurement task they were ideally equipped to operate the system. This is how investments are fun and create added value for us and our customers,” sums up Managing Director Humml.

With the exaCT S industrial computer tomography from WENZEL, Neo Dens, manufacturer of dental implants, raises its quality assurance to the highest level. Every day, the Croatian company produces an average of about 20 individual single parts and 500 serial parts with state-of-the-art manufacturing technologies.

Neo Dens products are used in dental implantology and dentistry. In addition to providing the desired esthetics, they also help end users replace the parts of the teeth or jawbone elements that have naturally degraded. Managing Director Marko Živko explains the high-quality requirements for implant prosthetics: “The abutment, for example, serves as an abutment as well as a fastening element and provides stability for the dental prosthesis as a supporting pillar. Our products guarantee treatments of the highest quality. The permanent tooth preservation of our customers is our focus.”

Professional inspection of medical single and serial parts with WENZELs exaCT S

FEELING TOOTH

The parts vary in size and weight, e.g. implant screws can be 3.5 mm long and gingiva formers 12 mm long. The parts are usually very delicate and weigh only a few grams. The surface roughness values of the manufactured workpieces are in the order of 0.001-0.0001 mm. The tolerance of certain dimensions is about 0.01 mm and concerns any part that is a mating surface in relation to another part.

ABOUT NEO DENS

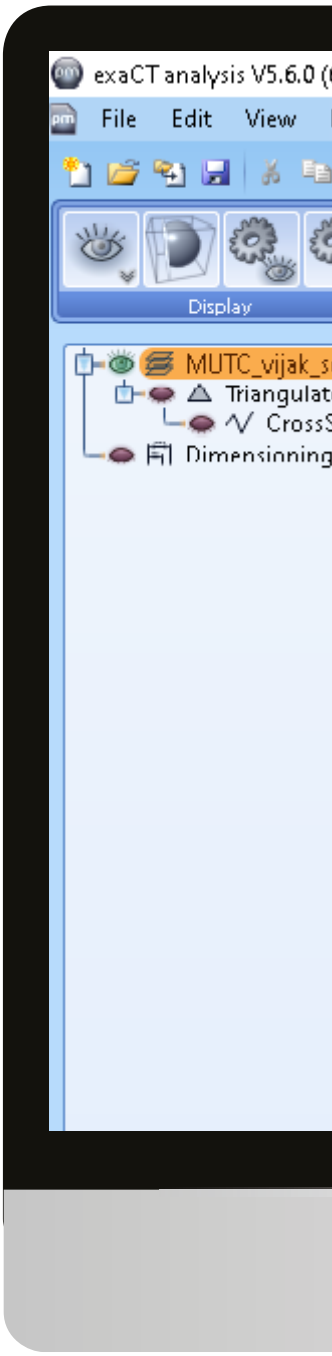
Neo Dens d.o.o., based in Zagreb, Croatia, manufactures both single and serial parts used in dental implantology. Products include parts such as abutments (connecting element between a dental implant and a prosthetic restoration such as a dental crown), Ti base links, temporary cylinders, healing abutments, implant screws. Special products such as customized abutments, customized multi-unit all-on-X solutions, customized copings/bridges and/or crowns/bridges, customized partial frameworks are all manufactured using CNC milling machines and the SLM metal printing process.

www.neo-dens.hr

High measurement accuracies required!

“Since our parts are very small and therefore often difficult to measure using conventional methods, as well as due to their geometric complexity, it was necessary to perform measurements that capture the entire dimension of the products, including inside the component,” says Marko Živko. Medical parts must have special mechanical properties, as they are exposed to various forces and loads. Therefore, it is often necessary to be able to inspect the inside of the product to check for possible material deterioration that would not be visible without CT.

Up to now, quality assurance was carried out using conventional methods such as calipers or micrometers, or contract measurements with computer tomography were ordered from external suppliers. Now the products are completely scanned directly in the company with the exaCT S 130 computer tomography from WENZEL after production. After the measurement, Neo Dens uses the exaCT Analysis software to inspect the inside of the part, then triangulates the volume and creates cross sections that can be easily and quickly measured using the proven WM | Quartis measurement software.



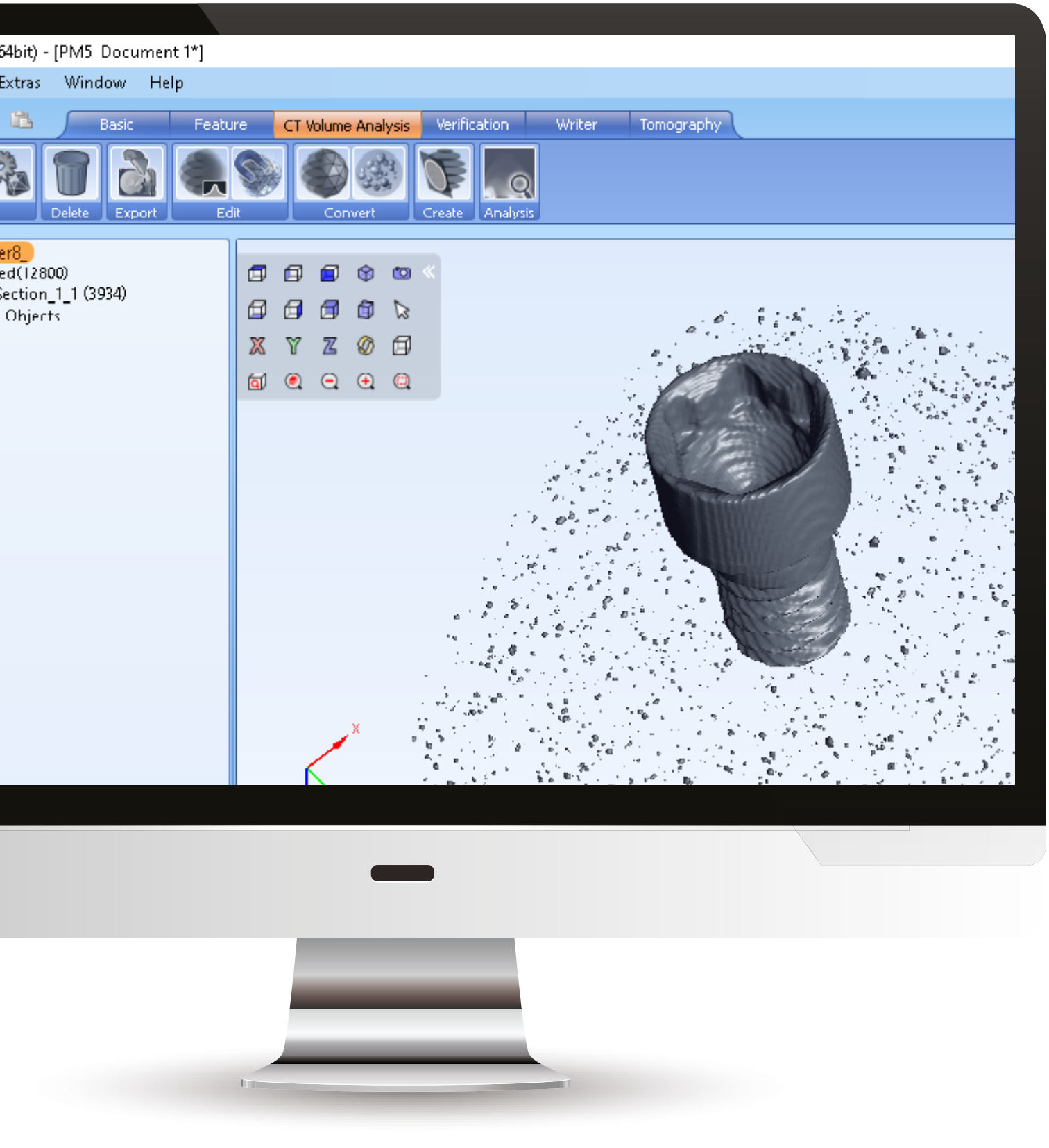
DUE TO THE ABILITY TO PERFORM FAST & RELIABLE MEASUREMENTS WE HAVE CHOSEN A CT FROM WENZEL”.

MARKO ŽIVKO

High-quality hardware meets user-friendly software

WHY WENZEL?

“We chose a CT from WENZEL because of its ability to perform fast and reliable measurements,” Marko Živko elaborates. “We also appreciate the quality of the hardware and the user-friendly software interfaces. We were completely convinced by the short-term responses to requests we sent, as well as the qualified and straightforward cooperation with support technicians and engineers.”



High-precision measuring, grinding and being able to prove the result in black and white - that was the goal of Stefan Radke, Managing Director of Schleifzentrum WEST. He achieves this goal with the LH6-12-5 X3M/25 Premium from WENZEL. In the middle of the countryside, near Jülich, you will find high-end grinding technology behind an inconspicuous and simple barn door in a small, well-kept farm. There, in fully air-conditioned surroundings, is the WENZEL measuring machine. This is how Radke combines life and work in a dreamlike atmosphere.

Stefan Radke is a trained toolmaker and works with his company, Scheifzentrum WEST, in two areas. On the one hand in the production of special tools and prototypes, on the other hand in the grinding technology of hardened workpieces, in many variations.
75% of the work of Schleifzentrum WEST consists of the production of parts for research & development. Radke also supplies universities. The remaining 25% comes from general mechanical engineering. Tools

PASSION

are also produced for the pharmaceutical sector. The problem of the WEST grinding center at that time, before the arrival of the Wenzel LH65, was that many tasks could no longer be solved and documented.
Many jobs had to be rejected because there were contours that could not be measured. With the arrival of this measuring machine, the high precision of subcontracting could finally be comprehensively documented. “On the one hand, this has brought confidence, and on the other, it has opened up new customer groups,” says Radke. In the case of machining tasks for research and development departments, measurement reports are always supplied with almost 100 % of the orders. Complaints are virtually zero.

The main measuring tasks of the WEST grinding center include the recording of very tight dimensional tolerances, as well as all form and position tolerances. The narrowest tolerances that are machined are far below one hundredth of a millimeter. Before each measurement, the measuring machine is calibrated. The spans during calibration of the SP25 scanning probe from RENISHAW are often less than one micrometer.

TRADITION

GRINDING TECHNOLOGY AT HIGH-END LEVEL MEETS COUNTRY LIFE

The main competences of Schleifzentrum WEST are profile grinding. In addition to classic surface grinding, so-called profile grinding allows "technically feasible" geometry to be introduced into grinding wheels in order to machine contours other than flat and level.
With an optimum grinding wheel design, this process can also be used to economically machine very delicate and very difficult-to-machine materials that are tough due to their high strength and low thermal conductivity, such as those found in engine construction (nickel, cobalt and titanium-based alloys, Nimonic, Inconel, Udimet).

Radke became aware of the WENZEL measuring machine through one of his main customers, who has been using a large WENZEL portal measuring machine for more than 20 years. Radke was fascinated by the reliability of WENZEL measuring machines. He was equally impressed with WENZEL's granite-based machine building that all surfaces where precision is required are not only ground, but also lapped by hand.

In order to adapt his grinding center to the challenges that had arisen in the meantime, Radke compared the measuring machines of three different manufacturers. Radke felt he was in particularly good hands with his responsible sales partner, Klostermann GmbH from Remscheid.
In two demonstrations, the company Klostermann presented the machines and the software on components brought along.

> *WHAT THIS MACHINE HAS BROUGHT US CANNOT BE DESCRIBED AT ALL. INCREDIBLE, REALLY INCREDIBLE!"*
>
> ***STEFAN RADKE, MANAGING DIRECTOR SCHLEIFZENTRUM WEST***

Confidence in own work & new customers through proven quality!

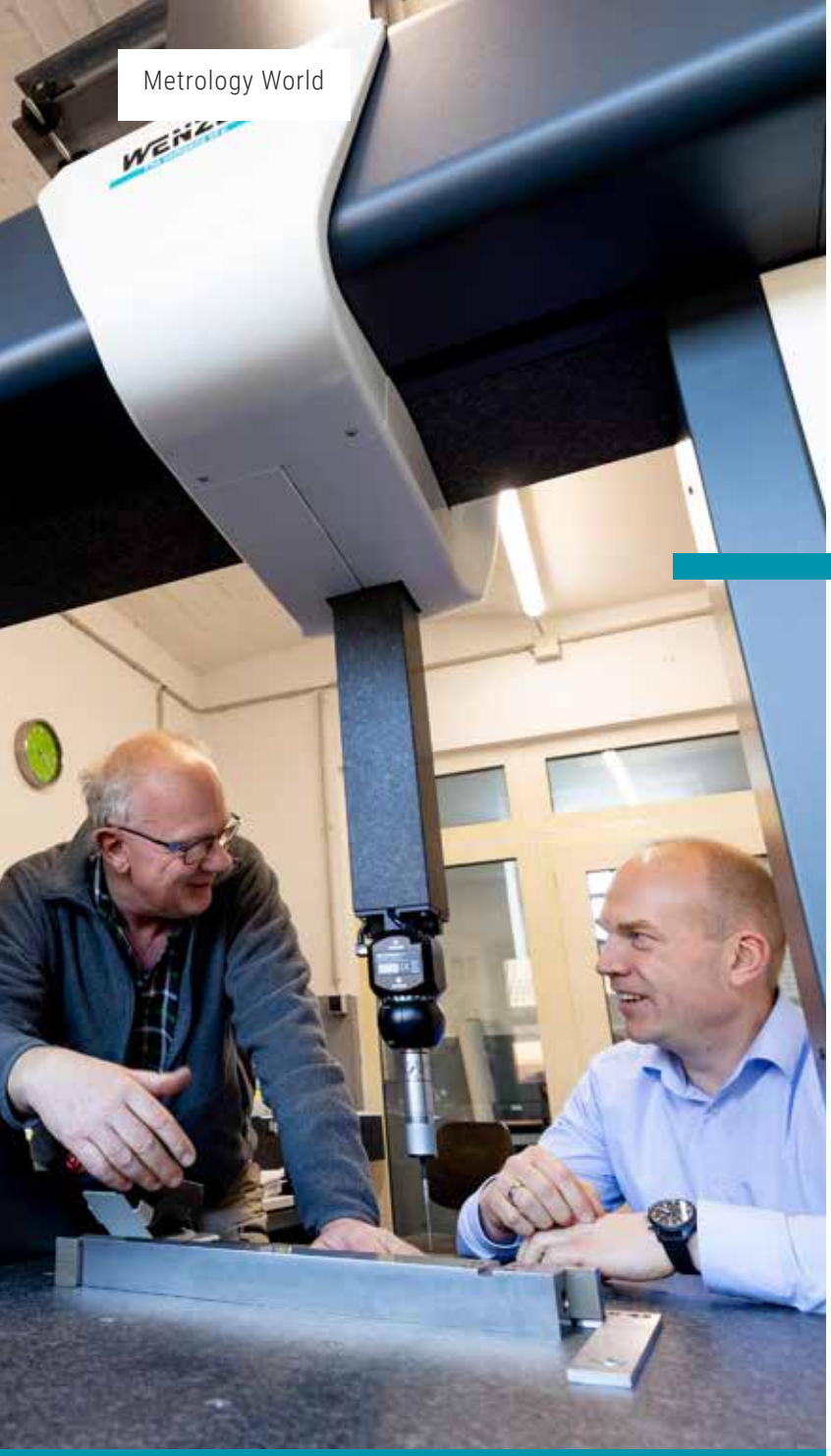
WHY WENZEL?

Radke was convinced here by the overall package of high-quality machine construction and easy-to-use software, in addition to the very good customer support provided by Klostermann. Thus Radke decided a little over two years ago for the LH65 from WENZEL. This, according to Radke, gives him a great competitive advantage. The clientele has changed since then: away from the previous standard business to more lucrative orders.

Man at the machine:

Radke started an apprenticeship as a toolmaker at the age of 15. For 45 years, he has done virtually nothing but deal with tools. “You’ve seen it all before, but you’re still learning all the time. Materials science is his hobbyhorse. He is asked by many companies for advice regarding materials, hardening and annealing processes. His opinion is in demand among experts. As a very successful training company, Radke has mentored 6 apprentices in recent years. Three of them have become chamber winners in the area of “Best Apprentice in the Apprenticeship Profession “Toolmaker” and “Machinist” in the Aachen district.

In 2017, the best apprentice from NRW was trained at the state level at Schleifzentrum West. Mr. Pinkwart personally congratulated the company on this at the time and WDR reported on it. “Something like that fills us with pride,” says Radke. There is still contact with all of the apprentices from that time. Some still visit regularly two or three times a year. Either for a delicious coffee and a chat, but often also with a question or two.



MEASUREMENTS WITH A VIEW OF THE HORSE PASTURE

The special feature of the Schleifzentrum West is that an extra measuring room has been built on the farmstead for the LH 65 from WENZEL, which is approx. 25 sqm in size and of course fully air-conditioned. The new measuring machine is located behind a barn door.

From the production hall, one can look out onto the horse pasture. Sometimes Radke simply has to hold his breath because he can hardly believe his luck.

EVERY THOUSANDTH & EVERY CENT

LH AND WM | MMA IN USE AT DIEBOLD NIXDORF. CUSTOMIZED SOLUTIONS FOR ATMS & POS SYSTEMS

As we all know, the fun stops when it comes to money. It doesn't matter whether you receive it or have to pay it. Everything has to be right down to the hundredth. Diebold Nixdorf as a manufacturer of ATMs and POS systems has to be even more precise - here the thousandth is the measure of all things. And WENZEL is the first choice.

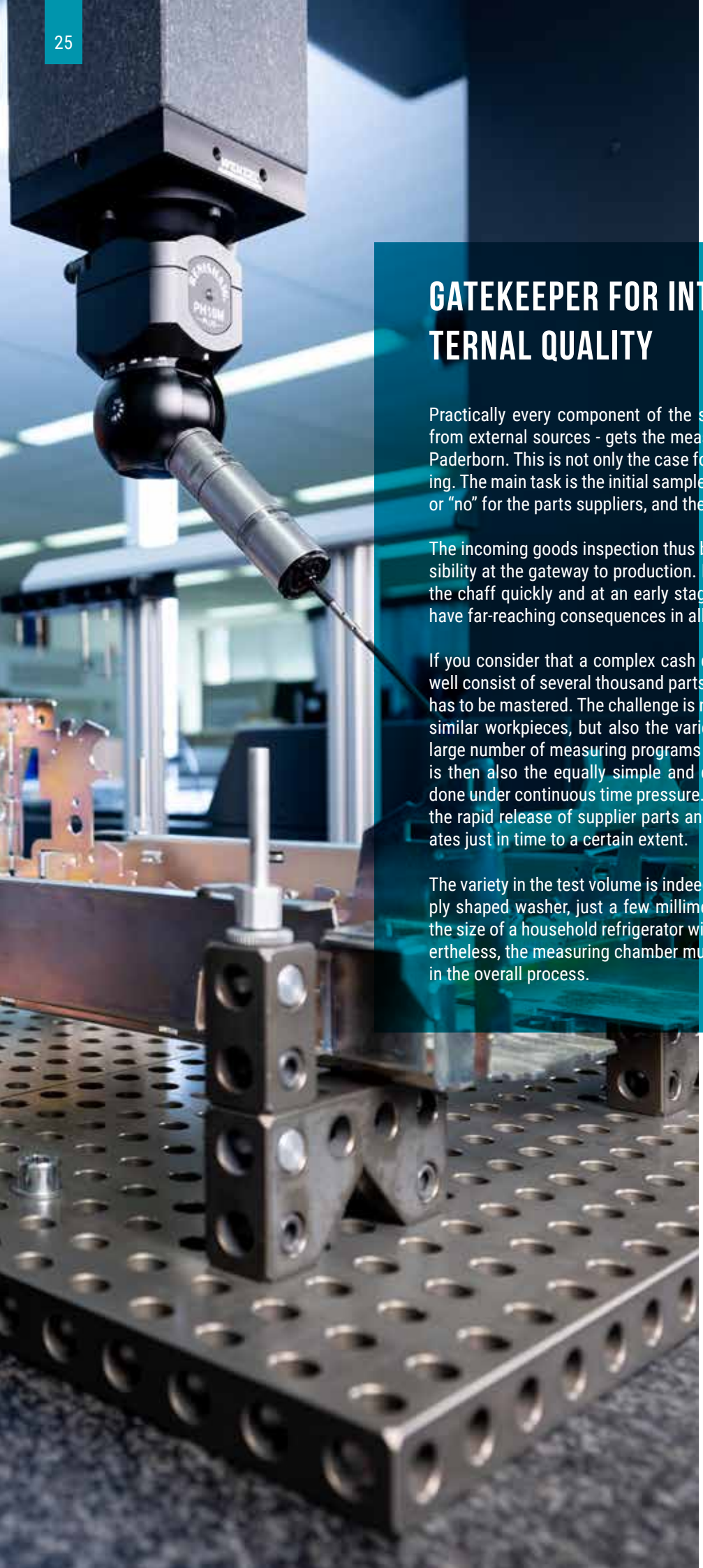
Diebold Nixdorf is one of the world's leading providers of IT solutions for banks and retailers. The company offers hardware, software, consulting and services from a single source. Diebold Nixdorf is the market leader in Germany for ATMs and POS systems.

The offer for banking includes the complete range of automation and self-service systems, such as ATMs, information and transaction terminals or receipt printers.

For retailers, Diebold Nixdorf offers checkout systems, so-called self-checkout systems. As well as information systems and solutions for store automation, such as electronic shelf labeling systems.

Diebold Nixdorf is active worldwide, with its largest development and production site in Paderborn.

Tens of thousands of ATMs and self-checkout systems come out of the plant in East Westphalia every year. The state-of-the-art manufacturing facility has its own sheet metal production, surface technology, component production with final assembly and extensive testing capacities. Internal resources are augmented by an extensive network of specialized suppliers. On this basis, complete cash register and cash dispensing systems are produced in Paderborn, from individual parts to final assembly in each case.



GATEKEEPER FOR INTERNAL AND EXTERNAL QUALITY

Practically every component of the systems - whether from in-house or from external sources - gets the measurement technology on the table in Paderborn. This is not only the case for series and production-related testing. The main task is the initial sample inspection for qualification, the “go” or “no” for the parts suppliers, and the tool release for internal production.

The incoming goods inspection thus bears the central gatekeeper responsibility at the gateway to production. If the wheat was not separated from the chaff quickly and at an early stage with the greatest care, this would have far-reaching consequences in all subsequent process steps.

If you consider that a complex cash dispensing or checkout system may well consist of several thousand parts, you can imagine the challenge that has to be mastered. The challenge is not only the rapid inspection of many similar workpieces, but also the variety of parts. And this results in the large number of measuring programs required. Quality instead of quantity is then also the equally simple and demanding motto. This, however, is done under continuous time pressure. This is because production requires the rapid release of supplier parts and in-house production, since it operates just in time to a certain extent.

The variety in the test volume is indeed considerable. It ranges from a simply shaped washer, just a few millimeters in size, to a complete housing the size of a household refrigerator with numerous measuring points. Nevertheless, the measuring chamber must not become the eye of the needle in the overall process.

Old measurement equipment exceeds zenith

However, precisely this case threatened in 2014 with the obsolescence of the measuring machines that had been in use up to then and for a good two decades. For one thing, their manufacturer discontinued hardware service for the devices in question. On the other hand, the user software no longer met Diebold Nixdorf's requirements, such as measuring against 3-D CAD data models.

In search of a more motivated and technically convincing alternative, those responsible for quality at Diebold Nixdorf looked to other positive business relationships in the measurement sector. These existed in the form of WENZEL's sales partner Klostermann from Remscheid, who had already been entrusted with measurement services from Paderborn for years.

Klostermann Ingenieurbüro und Vertriebsgesellschaft mbH has been involved in the various areas of coordinate measuring technology for more than four decades: sales of 3-D measuring machines, scanning systems, clamping and fixture systems, contract measuring technology, service for measuring machines and a comprehensive range of training courses.

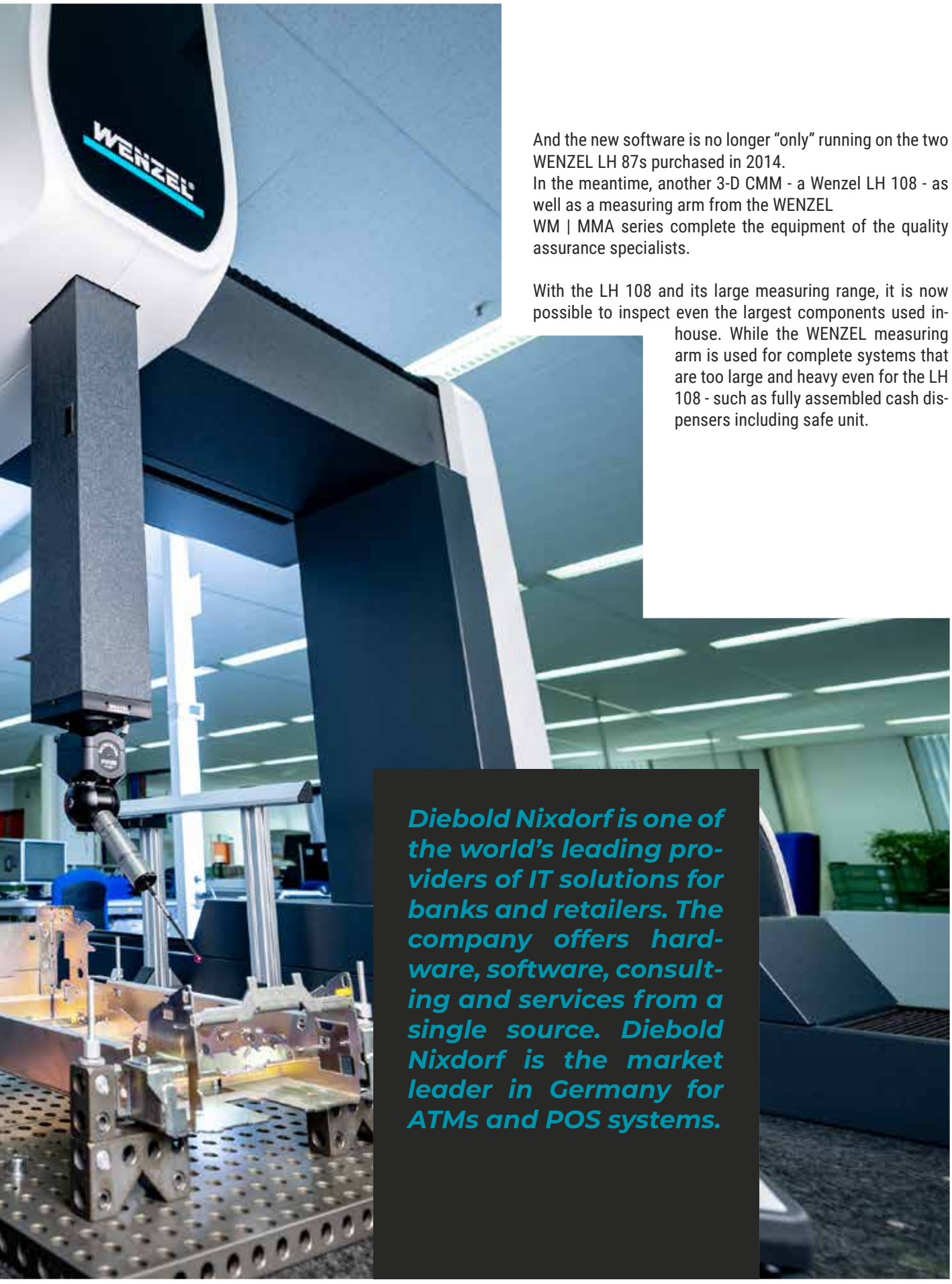
"With this profile - especially the distribution of WENZEL measuring machines - we obviously exactly met Diebold Nixdorf's expectations for a future-oriented reorganization at the Paderborn plant," says a pleased Managing Director Christian Klostermann.

LARGE GANTRY MEASURING MACHINE COMBINES COORDINATE & GEAR MEASURING TECHNOLOGY

Based on this combination of competences, a conclusive overall concept for the new equipment with initially two WENZEL LH 87 3-D coordinate measuring machines was quickly developed in close cooperation with the Paderborn managers.

In addition, the WM|Quartis measuring software from WENZEL installed by Klostermann opened up a whole new world of possibilities. For example, a quick selection panel for triggering stored measuring programs allows even less experienced users to perform the inspection.

This means that practically all employees in Diebold Nixdorf's incoming goods department and measuring room can now work with the systems, regardless of their level of metrological qualification. With several hundred measurement programs stored, this is a real boon and an enormous productivity boost.



And the new software is no longer “only” running on the two WENZEL LH 87s purchased in 2014.
In the meantime, another 3-D CMM - a Wenzel LH 108 - as well as a measuring arm from the WENZEL
WM | MMA series complete the equipment of the quality assurance specialists.

With the LH 108 and its large measuring range, it is now possible to inspect even the largest components used in-house. While the WENZEL measuring arm is used for complete systems that are too large and heavy even for the LH 108 - such as fully assembled cash dispensers including safe unit.

Diebold Nixdorf is one of the world’s leading providers of IT solutions for banks and retailers. The company offers hardware, software, consulting and services from a single source. Diebold Nixdorf is the market leader in Germany for ATMs and POS systems.

Fully automatic measurement with the WENZEL SF 87

FROM THE MEASURING ROOM TO THE PRODUCTION LINE

By using a special store floor measuring machine from WENZEL in the production process, PLANIMOLDE has been able to significantly increase its measuring throughput. The Portuguese manufacturer of high-quality injection molds relies on the SF 87 coordinate measuring machine and has integrated it fully automatically into the production cell.

Every day, the company produces up to seventy high-quality components for the automotive and plastics industries, for medical technology as well as electronic components, household goods and toys. “It is important to us to constantly improve the quality level of our product range and our services,” explains Managing Director Telmo Ferraz. “That’s why we were looking for a new solution that could map the measuring process not only in the measuring room but also directly on the production line.”

High measurement throughput and perfect accessibility

The contact with WENZEL came about through ‘MICROSENSE Industrial Metrology’, WENZEL’s sales and service partner for the Portuguese market. In addition to the many years of trustful cooperation between PLANIMOLDE and MICROSENSE, the SF 87 coordinate measuring machine quickly scored points with its sophisticated design.

“Due to its open structure in terms of accessibility and small footprint, the SF 87 is optimally suited for use in the production line and placement by a robot,” enthuses Pedro Pereira, XXX Manager at MICROSENSE. The required accuracy of usually 10 µm is no problem at all, even under the temperature conditions outside the measuring room.

AUTOMATED MEASUREMENT & MANUFACTURING PROCESSES

The strategic involvement of ISICOM - Robotea, which was responsible for integrating the automation of the entire cell with its SolidSET CELL solution was also crucial to the success of the project. This made it possible to manage in a single system the part operations for the CNC machines (milling machines, coordinate measuring machines, EDM Machines, robot arms, cleaning devices, I/O active devices). All fixturing (its50-80, UPC) are also managed by SolidSET, releasing the manager from the process details and allowing an advance preparation of machine jobs

„Manufacturing high-quality injection molds and producing high-quality plastic parts, naturally in close cooperation with our customers, is one of the principles of our philosophy," sums up Telmo Ferraz. "Strictly complying with our customers' requirements in terms of technical specifications is a matter of course for us, and can be seamlessly documented with our new measuring solution."

WENZEL
PLANIMO

SF 87 LDE

My grandfather worked in a factory called Troqueles y Esmaltes (Dies and Enamels) from 1945 to 1966. In 1966 he decided to start a small machine shop with his sons in the center of Monterrey in their house. The name PELGO came from his name Pedro Leonardo Gonzalez Solis. The two brothers, Jesus Caser Gonzalez Garza and Javier Gonzalez Garza worked tirelessly for the initial growth of PELGO.

PELGO outgrew the house quickly and began searching for a new facility, eventually settling in our current location. This has been our home for 40 years now. There have been many challenges over the years, but the most important has been keeping up with customer production demands and quality. “Quality has always been what we pride ourselves on and we have been using manual equipment before we decided to look at purchasing a CMM (Coordinate Measuring Machine).” said Jesus Caser Gonzalez Garza.

FAMILY

BUSINESS

XO 107 AT PELGO, MEXICO

Unfortunately, we had a terrible experience buying a CMM previously which made us skeptical of the buying process, and the sales representatives we had to deal with. But then we met the team of Borbolla Metrology, and their partner WENZEL. Jorge Borbolla arranged a meeting with the WENZEL and Borbolla team, and they worked with our concerns. WENZEL and Borbolla gave us peace of mind to make the investment with confidence. Their thorough knowledge and understanding of what we needed to accomplish are why we are much more competitive in today's market. Thanks to the WENZEL XO CMM with Quartis software for this advantage.

Here at PELGO we had never used a CMM before but now with this innovative technology we can produce reports of the parts that we send to our customers. This gives our customers more confidence in the product they receive.

We are still learning a lot but there is no comparison between using manual equipment, to a new automated Coordinate Measuring Machine! In the past, we would spend hours inspecting parts and some of the requirements our customers were requesting were not even possible to measure with manual equipment – which meant we were not able to provide them with the information they wanted. Now we can give them the requested information with better quality data and provide them with extra information that they did not even ask for. We have gained time; better utilization of our staff produces more accurate data with confidence. This gives us a stronger ability to compete in today's market.

The support that we have received from the WENZEL and Borbolla team has been great and we are impressed with our WENZEL XO 10.12.7 and the Renishaw PH20. Its performance is fantastic and serves us flawlessly. After further training, we are getting to know this machine so well and are extremely impressed. We were even more excited when we compared our new WENZEL CMM results to one of our customer's CMM and ours were performing more accurately!

To build a sustainable company over many years it is important to be there for your clients consistently and to give them the absolute best product. After the pandemic things will never be the same. We not only sadly lost two of our shop floor personnel, but we know that business, as we knew it, will never return to how it once was.

WENZEL's partners here in Mexico, Borbolla Metrology, have been a great support and have also done the on-site training for us. We could not have asked for more. When precision and quality are important in your business, we can recommend the WENZEL CMM, their team, and their partners!

THE SUPPORT THAT WE HAVE RECEIVED FROM THE WENZEL AND BORBOLLA TEAM HAS BEEN GREAT AND WE ARE IMPRESSED WITH OUR WENZEL XO...!“

JESUS CASER GONZALEZ GARZA

COORDINATE AND GEAR M

TECHNOLOGY COMBINED

The Timken Company is known worldwide as a leader in the field of rolling bearings and power transmission. The founder Henry Timken is the inventor of tapered roller bearings, one of the main products of the plant in Xiangtan, China. Bearings are immensely important components in the industrial sector. Proper inspection and evaluation are the essence of quality assurance at Timken. The high quality requirements often demand accuracy in the µm range. The LHF Gear 4015 coordinate measuring machine from WENZEL plays an important role in ensuring the quality of Timken's large taper bearings.

MEASURING

Scrap reduced to a minimum

Timken's shops use some manual measuring equipment to measure diameters. Manual measurement places high demands on the operator, making it prone to measurement errors, incurring higher costs and reducing production efficiency. Other properties, such as shape and position tolerance or waviness, cannot or cannot always be satisfactorily measured manually.

The high-precision CMM LHF Gear from WENZEL represents the perfect solution for Timken's quality assurance challenges. It is a measuring machine that combines the functions of coordinate metrology and gear measurement. It was specially developed for large parts and complex workpieces with high precision requirements. The CMM quickly and reliably measures rotating precision parts. "For the parts that cannot be measured manually on the line, we use the high-precision coordinate measuring machine LHF Gear from WENZEL. It is the most important measuring device in our company and has helped us reduce scrap to a minimum," explains Mr. Zhou from Timken.

"I have worked with the experts from WENZEL in Germany & Shanghai and know and appreciate their know-how and professionalism."

Han Zhou, Quality Manager

Durable machine and optimal service

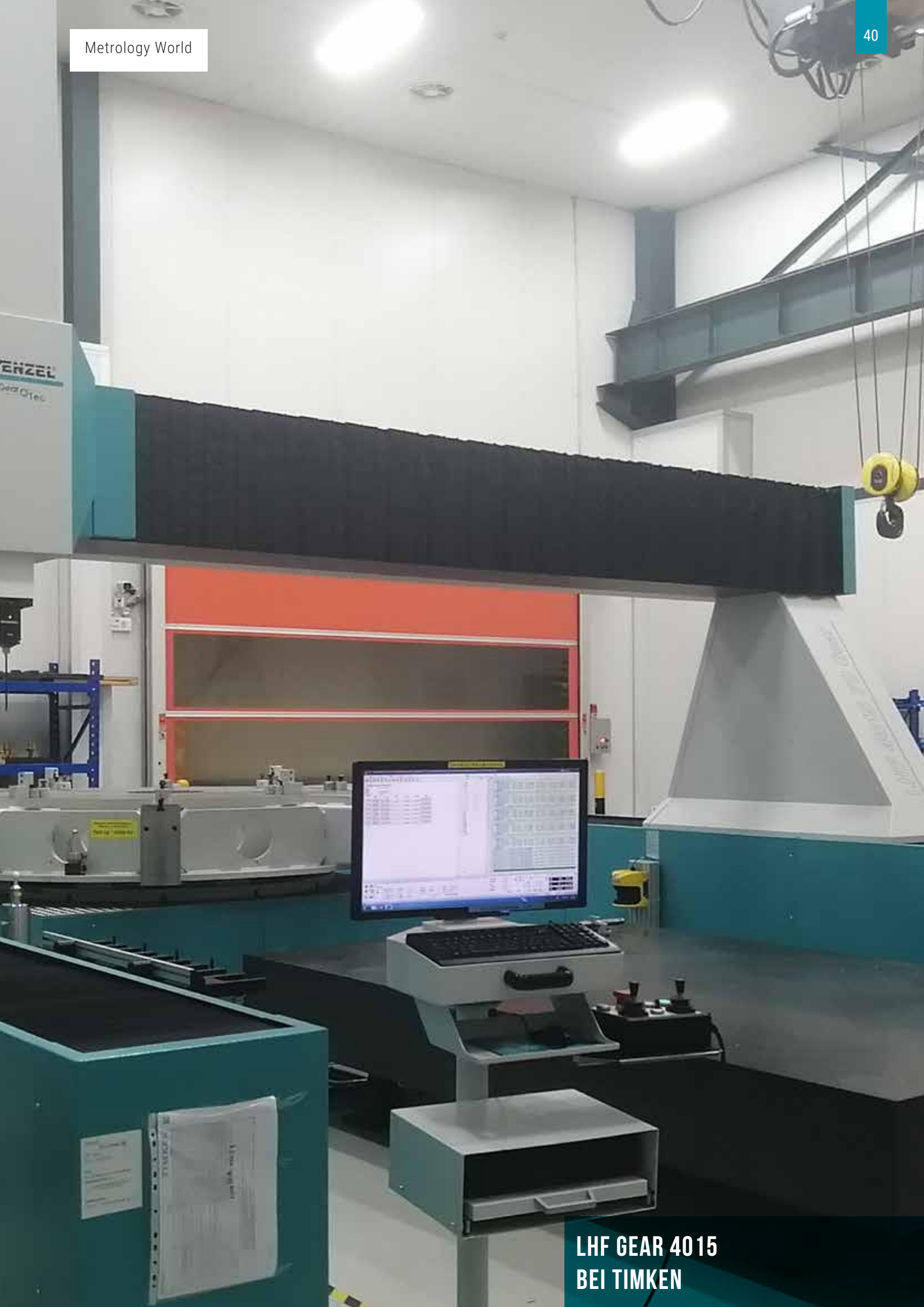
When asked which criteria were decisive for the decision to purchase the WENZEL measuring machine, Zhou answers: “Firstly, the selected model had to be able to continuously provide stable and accurate measuring results. Second, it had to be durable and error-free, and third, it had to provide optimal after-sales service. For this reason, we finally chose the solution from WENZEL.”

The horizontal design of WENZEL’s LHF Series CMMs provides excellent accessibility for large parts. The large measuring range allows the highest degree of freedom of movement. The dual drive in the Y-axis of the LHF provides unparalleled dynamics and the guiding device provides unique stability. An air bearing, specially designed for high-precision measurement of large parts and complex workpieces, ensures wear-free running and precise guidance. The beam and the guide bearing are made of dark natural granite, so that these components have the same thermodynamic properties.

Loyal partnership

Timken and WENZEL maintain a loyal partnership. “In addition to Timken’s plant in Xiangtan, the LHF Gear is also used in our plant in Romania for measuring large bearings,” reports Zhou. “The stroke of the X-axis is ‘only’ 4 meters, but with the help of the rotary table, which extends the measuring stroke, a diameter of up to 4.3 meters can be achieved.” This feature is undoubtedly the icing on the cake and fulfills Timken’s desire for the widest possible measuring range.

“I have worked with WENZEL’s experts in Germany and know their know-how and professionalism. In addition, I have also worked with the colleagues from WENZEL Shanghai for more than ten years. Their reliability and responsible approach have left a lasting impression on me. Over the past ten years, I have come to know the excellent performance of WENZEL’s measuring equipment and I am convinced that WENZEL is a reliable partner,” praises Zhou.



LHF GEAR 4015
BEI TIMKEN

AUTOMATION IN QUALITY ASSURANCE

INTERVIEW MIT THOMAS WERNER, HEAD OF CONSTRUCTION AT THE WENZEL GROUP

What is the current status of automation in quality assurance?

A CNC coordinate measuring machine has always been suitable for automation in itself. Among many other advantages, automation also has the effect of eliminating the influence by the operator, on which the measurement results basically depend to a high degree. Via standardized software and hardware interfaces, our measuring solutions can easily cooperate and be integrated with automation systems.

Has there been an increased demand for automation solutions in measurement technology in recent years?

We definitely notice that. In the past, individual parts were measured in the measuring room under optimal conditions. Nowadays, much more is measured, tolerances are tighter and series production is becoming more and more perfect. Suppliers have to produce perfect parts with low variance under high cost pressure in competition. Measurements must be continuous and fast. The feedback of the measurement results into the production process allows the manufacturers to quickly identify trends and react immediately before, for example, rejects occur.

When is automation worthwhile? Is this only the case when high quantities have to be inspected or measured? What about smaller batch sizes, which are increasingly the focus of flexible production To what extent can automation keep pace here?

For the measuring solution, it is initially irrelevant whether the same or different parts are always measured. However, new measuring programs or work piece fixtures are required for each additional part. The entire process must be automatable. This requires at least a certain similarity of the parts so that the measuring system, the measuring range and the sensors fit. In most cases, there are already fixed manual processes that the customer then wants to automate. Here we can support him well with our many years of experience.

THE WAY TO THE CLOSED LOOP

How is automation implemented? Who takes care of it - users, measurement technology manufacturers or automation experts?

It is often not the user who is our first point of contact when it comes to automation. It is rather the production planners who talk to us. As a manufacturer of measurement technology, we then bring our automation partners on board. The other case is that complete production lines are requested and we as a partner are responsible for the integration of an automated measuring cell or measuring machine.

How does your company address the issue of automated quality assurance?

We have our own task force in this area and strong automation partners. Our measuring machines are already pre-equipped for use in production lines and automation solutions and can be easily integrated via the WENZEL Automation Interface (WAI). Our automation projects are usually very individual and are often subject to high secrecy guidelines, as the manufacturers do not wish to show their hand. Ultimately, however, it boils down to the fact that we individually adapt our standards and our large product portfolio to the respective customer processes.

To what extent is the closed loop already a reality - i.e. using measurement and test results, to optimize manufacturing processes?

In principle, Close Loop means that our measurement results are used again at the beginning at the end of the production chain in order to readjust if necessary. In principle, Close Loop means that the results of one production line are reused at the beginning of the next one. We deliver the target/actual deviation to a statistics database. The result can then be used to readjust production accordingly. If certain intervention limits are reached, the operator can react. However, it is not an easy task and the more complex the component, the more complicated it becomes. A challenge from practice is when the measuring machine and the production machine have different coordinate systems and axes. Here, algorithms are needed to help with the conversion so that the processing machine can be adapted. However, the effort helps to optimize the manufacturing processes in any case.

THOMAS WERNER
HEAD OF CONSTRUCTION

WENZEL PRODUCTION 4.0

In the course of the WENZEL 4.0 project “Rollout Digital Workplace”, the digital line for portals was designed by the assembly team. Through the elaboration, the requirement of the workplace, ergonomics, to provide all required information, operating resources and materials in one place, was fully met. Likewise, it was possible to develop a device to greatly facilitate the handling of parts. Transparency also improves the smoothing of the flow of materials.

PROGRESS THAT IS MEASURABLE

25% lower stock levels
95% shorter set-up times
20% shorter throughput times
High process reliability
Video instructions
3D assembly instructions
Paperless assembly

Is the closed loop - i.e. using measurement and test results to optimize manufacturing processes - already a reality or still a vision of the future?
The Closed Loop is an implemented and proven reality for process control, process optimization as well as process control in series production of all kinds.

In which areas/industries are you the furthest along here?
For large series and component manufacturers (e.g. automotive, powertrain). Pioneers included suppliers who determined the complete process, machining / tool data (offset data) and tolerance deviation for workpieces, assigned them and stored and used them in a retrievable form.

In addition, a trend was determined after operation by the actual values. From these findings, tool life was optimized and event-dependent interventions were carried out (e.g. offset data correction after correspondingly determined wear or direct correction of the processing machines). These processes usually run fully automatically with standardized interfaces of the respective manufacturers of measuring and processing machines as well as CAQ, process monitoring and CAD software manufacturers.

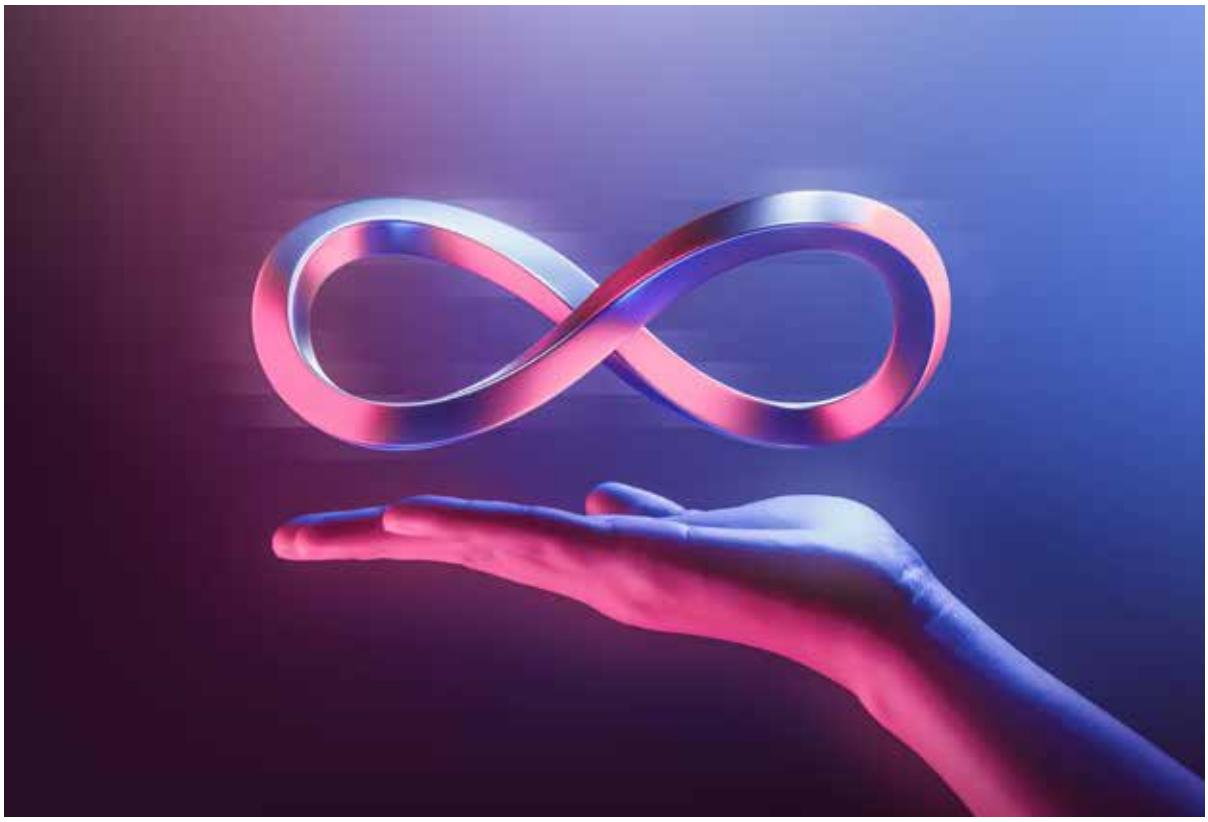
CLOSED

What hurdles still stand in the way of the Closed Loop? What are the biggest challenges to implementing a closed loop?
Define a common standard (interface and format) for corrections and output data. In some cases there are missing “infrastructure” process building blocks. Here WENZEL Metrology is ready to fill this gap with its own standard building blocks.

When/in which cases is the closed loop a desirable goal? When is it not? Which technologies are necessary for this? What is the effort behind it?
The closed loop is desirable for series production where consistent dimensional accuracy must be achieved. This is due, among other things, to the necessary interchangeability of parts of the same quality and class.
It is not desirable for the production of one-offs or components that may have to be paired.

The effort is great to operate online monitoring in series, e.g. corrections and process interventions are carried out automatically as soon as characteristics drift into a warning limit. This applies to upstream and downstream processes.

A large part of the effort consists of linking the corresponding devices and systems from the beginning to the finished product via interfaces and communication technology.
Furthermore, the nominal and actual information and results of high quality must be traceable and reproducible. Likewise, the possibly different conditions of the manufacturing processes and manufacturing environments and their influences must be taken into account.



LOOP

INTERVIEW PARTNER:
STEFAN STAAB
BUSINESS DEVELOPMENT MANAGER

How does your company address the issue? What technologies does your company offer to enable a closed loop?

WENZEL Metrology offers its customers multiple process interfaces and integration options for all devices in its portfolio.
In addition, the project teams take care of the entire process chain and integration, i.e. the implementation, according to the customer's requirements.

Due to this "know-how" and experience, the projects are then implemented with WENZEL standard tools, which, however, also allow the respective tailoring to special customer requirements.

Are these always turnkey, i.e. individual projects? Will closed-loop solutions also be available "off the shelf" in the future? In which areas would that make sense?

No, it is not always individual projects, solutions can also be transferred, since interfaces and components that are implemented are also used in other projects. In this way, projects become "series models".

Off-the-shelf in so far as the same environment can be implemented almost one-to-one at further locations, providers.

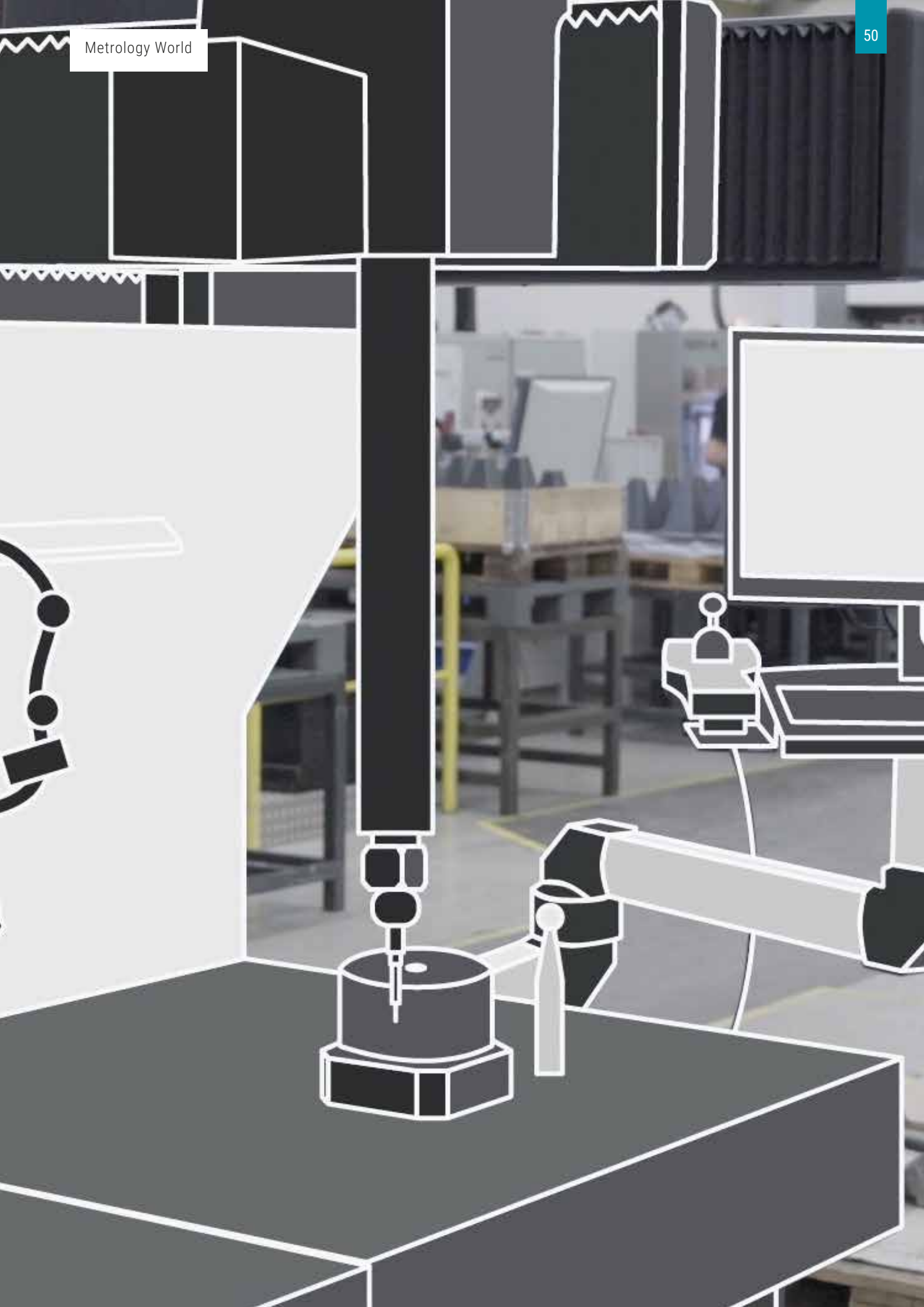
In reality, it often happens that a proven closed-loop process is then mapped to other, different production processes.

Are there any practical examples in which the closed loop has already been implemented? What advantages do customers have here?

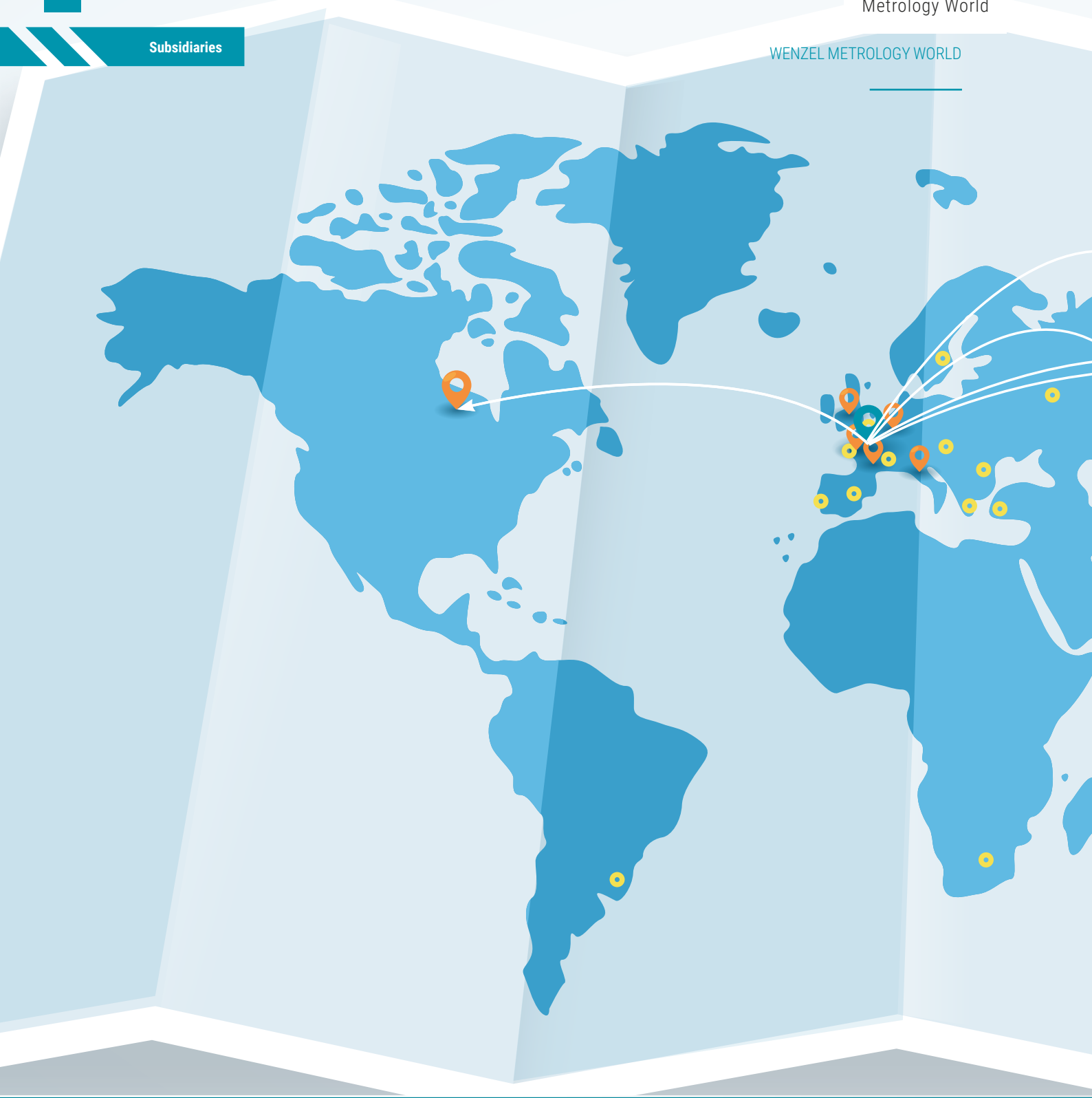
Based on values and specifications theoretically calculated during development, tools, processing machines, processes are put together for production.
The process is monitored by the tolerances determined from this.

If, for example, several production lines are linked in parallel or one after the other, any necessary process optimizations can be initiated immediately or executed automatically if the results are determined "online". By the automatic assignment of the parts to the processing machine, their tools and/or forms also these individual operations / process sections can be optimized and/or corrected or replaced if necessary (e.g. wear which can no longer be corrected).

After the corresponding series runtime, findings from the process data results can also flow automatically back into development in order to adapt the theoretical specifications to the actual conditions, if necessary, thus closing a closed loop.



WENZEL METROLOGY WORLD



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INNOVATION MEETS TRADITION

The WENZEL Group is one of the leading suppliers in the field of industrial metrology and styling solutions. WENZEL's product portfolio includes coordinate and gear measuring machines with tactile and optical sensors, multi-sensor systems, optical high speed scanning and 3D X-ray measuring technology based on computer tomography. In addition to these systems WENZEL also offers comprehensive metrology software, which is used by many thousands of users for the measurement and analysis of parts. WENZEL´s measuring solutions are used in various industries, including the automotive sector, aerospace, power generation and medical devices. Our solutions also support reverse engineering, inspection, and analysis for a variety of fields including power generation, vehicle electrification, and additive manufacturing. Over the years WENZEL has installed more than 10,000 machines worldwide. Subsidiaries and agencies in more than 50 countries support the sales and ensure the after sales service for our customers. The WENZEL Group employs more than 600 people worldwide.

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