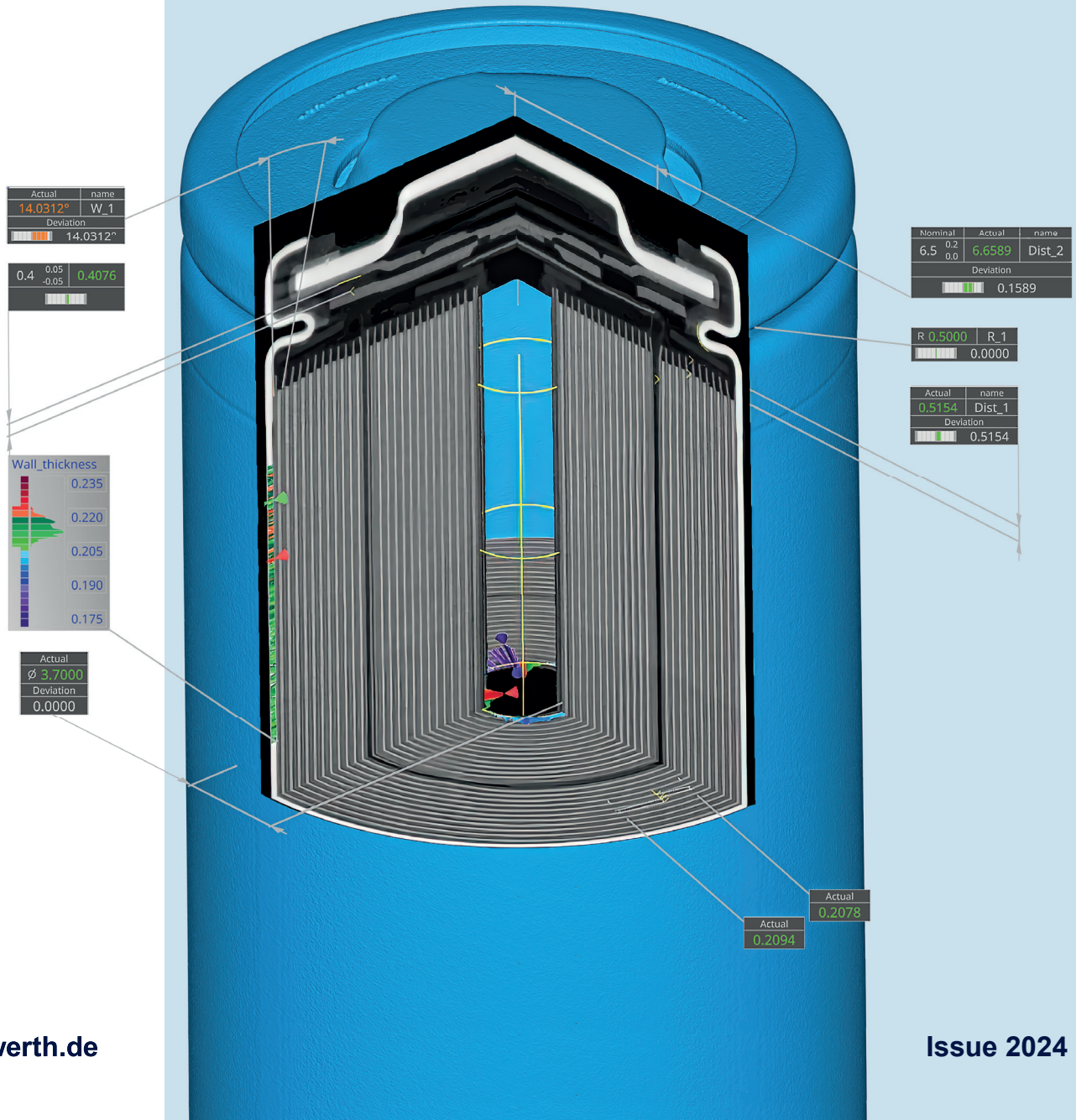
Multisensor

Innovative Metrology for your Quality Products



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Issue 2024

Cover picture: CT measurement of a battery cell with reconstruction of a digital workpiece model for the evaluation of geometrical characteristics, color-coded deviation plots against CAD data and material analysis

The world’s most accurate multisensor coordinate measuring machines, the Werth VideoCheck® series, offer task-specific configurations with low measurement uncertainty and high measuring speed

Werth sets standards in innovative coordinate metrology

In recent years, our technical solutions in the area of coordinate metrology with optical sensors, computed tomography and multisensor systems have often contributed to the rationalization of quality assurance processes. We continue to develop our future-proof technology, despite challenging economic conditions. Because of this, we are in a position to largely compensate for the rather cautious investment in the automotive sector through growth in other business areas such as medical technology. In this year's edition of Multisensor, Werth Messtechnik presents new technical solutions and new applications in various industries.

In manufacturing companies, confidence in measurement results from X-ray computed tomography grows steadily due to positive experience. Extremely short measuring times and simple operation offer great potential for rationalization. For example, our TomoScope® XS and TomoScope® S series are vastly superior to alternative solutions thanks to CT technology specially optimized for coordinate metrology. This is mirrored in the attainable accuracy, the measuring speed and the long maintenance intervals. On average, we achieve five times better cost-efficiency compared to alternative concepts.

We also continue to offer cutting-edge technology in the field of multisensor systems. The VideoCheck® HA and VideoCheck® UA machines are currently the world's most accurate multisensor coordinate measuring systems, offering length measurement errors of (0.25 + L/900) µm or (0.15 + L/2000) µm respectively. In the patented Raster Scanning HD mode large workpieces with many details, such as fiber optic couplers with thousands of small holes, can be measured quickly and fully automatically. The resolution of up to 20000 megapixels is more than a thousand times that of high-resolution photography. As part of SEMI (Semiconductor Equipment and Materials International) certification, we have also optimized Werth machines for the semiconductor industry.

With WinWerth® version 10.46, we have placed particular emphasis on improving ease of use, both for simple and demanding measurement tasks. For example, the measurement of complex geometrical deviations according to current ISO standards can be just as easy as dimensioning on a CAD model. New requirements from our users have initiated developments in the area of computed tomography, allowing us, for example, to inspect automotive batteries completely in just about 20 seconds. In an extremely short measurement time the new Werth ClearCT provides almost artifact-free CT volumes to ensure reliable automatic inspection.

This issue of Multisensor gives you an insight into how our team carries out the initial commissioning of our TomoScope® XS machines. We introduce Werth Magyarország, which was founded in 2011, and the expansion of the sales and service teams at our other subsidiaries around the world. The Control trade show in Stuttgart will once again be the most important platform for exchanging ideas with regional and international users this year. We will also be presenting our machines at a number of other events for various industries and offering regional technology days to exchange information with our users. We are looking forward to interesting discussions again this year, which are sure to provide important ideas and stimulate activities on both sides.

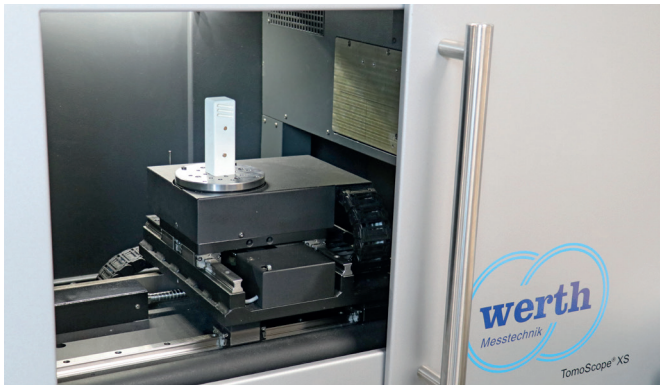
Dr. Ralf Christoph
President and owner of
Werth Messtechnik GmbH Giessen

Multisensor 2024

Content

News about Multisensor Systems

Werth Featured Article



News about X-ray Computed Tomography

News about the Werth Group

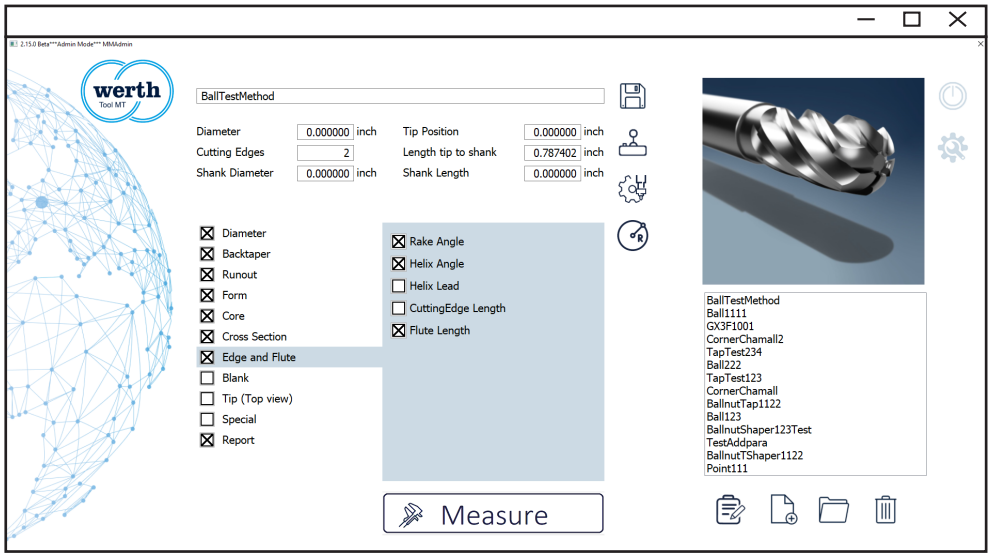
Perfectly integrated multisensor systems in all dimensions

The compact ScopeCheck® S series is the perfect entry into 3D CNC multisensor metrology. The rigid granite construction with protected components and temperature compensation enables economical measurements in the production environment. The potential of highly accurate sensors can be fully exploited with the machines in the VideoCheck® S series, which have a similar measuring range. Werth offers probably the largest selection of sensors for an economical solution to many measuring tasks with just one machine. This includes unique sensors such as the patented Werth Fiber Probe® 3D. With the new VideoCheck® MZ, the proven multi-ram concept with up to three independent sensor axes is also available in this machine class. This enables maximum flexibility when using multisensor systems. The accessibility of the workpiece geometries and the measuring range are not unnecessarily restricted.

Complex workpieces can be fully measured with rotary/tilt axes. A new rotary/tilt unit in a cost-effective and compact design is now available for small machines. The new axis is ideal for the production environment and can be installed in any orientation on the measuring machine. It can be qualified automatically, after which the position and radial run-out are corrected in the background by the WinWerth® measurement software for each measurement. The rotary/tilt axis is also suitable for heavier workpieces, such as valve blocks and housings. With a rotary/tilt unit, almost all geometry elements can be made accessible for each sensor and measured in the same workpiece coordinate system. This also enables the measurement of details such as opposing bores and undercuts.

VideoCheck® MZ with compact rotary/tilt axis for heavier workpieces

Precision Tool Pro with new tool types and simplified operation

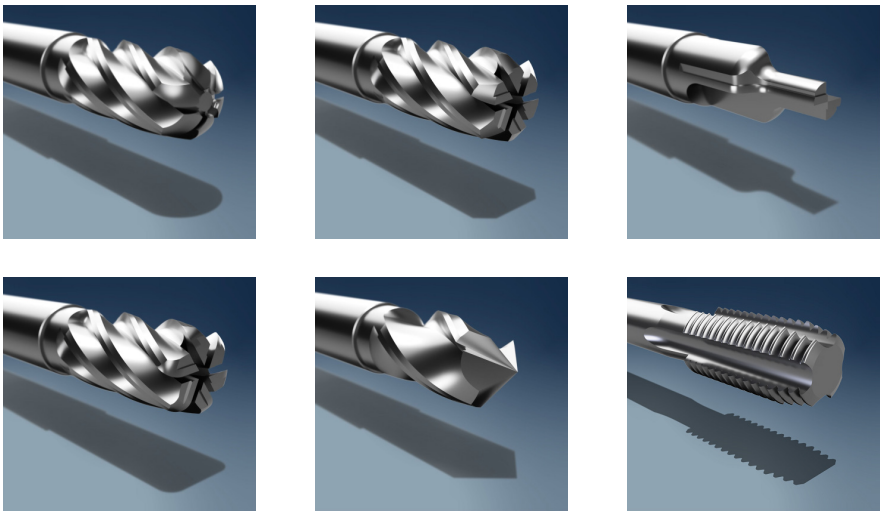


User-friendly program interface for easy, fast and highly accurate measurement of thread, form and standard shaft tools

Werth's Precision Tool Pro tool measuring program enables easy tool measurement on machines with four or five axes. Both mechanical bearing and highly accurate air bearing rotary and rotary-tilt axes are available for this purpose. Virtually wobble-free rotation is achieved by using the Werth V Pro shaft rotary fixture.

Precision Tool Pro can be used on all machines in the ScopeCheck® and VideoCheck® series, guaranteeing optimum adaptation of the coordinate measuring system to the required measuring task. Machines in the V or FB series and, more recently, the VideoCheck® S can be equipped with several independent sensor axes for fast multisensor measurements without any restrictions. The multisensor systems provide the flexibility to fully measure almost all tools.

Precision Tool Pro allows fast measurement of many standard and special, micro and macro tools and is now available for other tool types. The tool measurement program is tailored to measurements close to production, and operation for the tool grinder has been further simplified. After importing the production data and clicking on the geometrical characteristics to be measured, Precision Tool Pro creates a standardized measurement sequence with tested and optimized measurement strategies, e.g. for radial run-out, diameter, form, rake and clearance angle. Manual input of tool data and individual additions to the measurement sequence are also possible. The tool measuring program has full connectivity to SPC and CAQ systems as well as automation solutions and allows, among other things, automatic correction of the grinding paths in one to two iterations.



Comprehensive and clear selection of a large number of different tool types

Multisensor coordinate measuring machines for microstructures in electronics manufacturing

With length measurement errors of MPE Euni up to (0.25 + L/900) µm and (0.15 + L/2000) µm respectively, the Werth VideoCheck® HA and VideoCheck® UA are the world's most accurate multisensor coordinate measuring systems. The VideoCheck® HA enables the measurement of precision workpieces with tolerances in the micrometer range and 3D microgeometries, even on large workpieces. The machine has a unique concept with up to three independent sensor axes for fast multisensor systems without limitations.

In the patented Raster Scanning HD mode, single images captured during movement are superimposed to form a high-resolution overall image. For example, large panels with thousands of small bores can be measured automatically. The overall image has a resolution of up to 20,000 megapixels (approx. 140,000 × 140,000 pixels with a pixel size of 5 µm).

The industry association SEMI (Semiconductor Equipment and Materials International) issues international safety standards for the use of coordinate measuring machines in the semiconductor industry. The guidelines of the SEMI organization are becoming increasingly important worldwide and must be evaluated by an independent third party. In Germany, this certification can be carried out by TÜV (Technischer Überwachungsverein – Technical Inspection Association).

For this purpose, the VideoCheck® HA has been adapted to the international environmental, health and safety guidelines for semiconductor production facilities and equipped with the necessary accessories. The SEMI guidelines contain detailed specifications, in particular for the electrical design and its immunity to interference, but also for the mechanical design, radiation and noise protection and ergonomics. A special fire protection hood, for example, reduces the fire load. Floor anchoring serves as earthquake protection and stabilizes the machine placed on vibration dampers in the event of an earthquake. Light barriers ensure that the machine stops or that the machine axes are operated at safe speeds if the safety corridor is entered.

Werth VideoCheck® HA with image processing sensor, patented Werth Fiber Probe® and Werth Chromatic Focus Point sensor for highly accurate optical and tactile measurements in all three spatial directions

Werth Featured Article

Small plastic workpieces – precise down to the My

Since 2017, Giessen-based metrology equipment manufacturer Werth has been offering the compact TomoScope® XS, which opens up a wide range of metrological applications for computed tomography. It is ideal for use at toolcraft, where the injection molding department uses it for quality assurance of miniature filters, among other things. In the fixture shown on the image, up to 32 of these filters are scanned simultaneously.

toolcraft ensures the quality of wax guards with computed tomography

So-called wax guards protect hearing aids from earwax. To check the geometry and dimensional accuracy of these injection-molded parts, which are just under two millimeters in size, toolcraft relies on a Werth TomoScope® XS, a powerful, compact machine for industrial computed tomography.

The medium-sized family business toolcraft, based in Georgensgmünd and Spalt, was founded in 1989 by Bernd Krebs. Starting out as a machining service provider with just one milling machine, toolcraft has developed into an innovative provider of complete solutions for high-end precision parts. With its 436 employees (including 57 trainees), the company covers the entire process chain. “Cross Dimensional Manufacturing” is what toolcraft calls the consulting and production standard it has developed over the years, which includes CNC machining, additive manufacturing, mold making and injection molding as well as robotics and automation.

One of the many drivers of innovation at toolcraft is Thomas Lender, Head of Injection Molding. He has been with the company since 2008 and has built up a high-performance department during this time. The injection molding machine park grew from zero to 30 and moved into a newly built hall in 2022. His team of 55 employees manages a large number of different projects. Lender emphasizes: “Cooperation with the other departments plays a crucial role for us. This is because we benefit from short distances and the ability to react quickly, making our injection molding here in Germany competitive worldwide.”

Thomas Lender (right), Head of Injection Molding, uses a model to explain the most important test dimensions of the wax guard to Werth Sales Manager Detlef Ferger.

Specialized in small and micro parts

His department works particularly closely with the mold making department, which has been part of the company since 2005. At that time, toolcraft took over Spalter Feinwerktechnik, a small tool and mold making company, formerly part of TRIX Modelleisenbahn. “The existing expertise in the production of small and very small parts still shapes our range of mold making and injection molding services today,” explains Thomas Lender. “We are particularly active for customers from the medical technology sector and especially from the hearing acoustics sector. For example, we produce various hearing aid housings using 2-component technology.”

He presents the wax guard project that a Swiss hearing aid manufacturer launched with toolcraft in 2017 as particularly interesting: “This is where Cross Dimensional Manufacturing comes into its own. We support our customer right from the design stage to ensure that the production of wax guards and housings can be automated and is possible in terms of mold technology. We took over the tool design and mold construction, automated the entire injection molding and assembly process and now exclusively supply the finished, quality-tested products to our customer.”

The wax guard project

To protect the loudspeaker of the hearing aid, which is inserted into the ear canal with an earmold, from soiling and earwax, it is equipped with a wax guard. In the case described, this plastic part has a diameter of 1.6 mm and must be replaced regularly. “For easy replacement, our partner developed the CeruShield Disk, a small, disk-shaped can containing eight new filters and an integrated removal tool,” explains Thomas Lender.

“Our order includes series production of both the filters and the CeruShield Disk. It consists of a bottom, top and label, which we supply fully assembled and equipped with wax guards.” Another component of the order is mass storage with 40 filters, which the customer uses as original equipment for their hearing aids.

The wax guard (here the photo of a model) measures 1.6 mm in diameter (tolerance ±0.02 mm). Its difficult contour with guide nubs and perforations places high demands on the metrology.

The CeruShield Disk contains a removal station with integrated tool (1) and a placement station (2) in which a new filter can be inserted into the speaker. toolcraft produces around 500,000 of these disks equipped with eight filters per month.

Customer demands assured quality

In the course of the project it quickly became clear that the biggest challenge lay in the wax guards. In addition to the reliable handling of these very small parts, the most important thing was to ensure their quality. Thomas Lender had a solution in mind right from the start: “We had already been taking into consideration the idea of purchasing an industrial computed tomography coordinate measuring machine in previous years.” This is because the fundamental possibilities of this technology open up a great many possibilities, especially in the injection molding department. He mentions, for example, the non-contact measurement – even of elastic and transparent parts – as well as the complete capture of all geometries, including internal structures. Another benefit of computed tomography is that the workpieces are measured in just one measuring position without clamping devices. In addition, modern CT machines are able to capture many geometrical characteristics in a short time and with high precision.

If the injection molding team lacked the final push to make such an investment, the wax guard project made the decision easy. “Of course, we could have measured the tiny wax guards optically. But that would have involved a lot more effort,” argues Thomas Lender. So those responsible obtained offers from various manufacturers, qualified them according to the requirements in terms of resolution, accuracy etc. and shortlisted three. This was followed by tests with an n plastic, a workpiece that is very similar to the wax guard in terms of size, complexity and material.

Werth TomoScope® XS with best performance

Werth Messtechnik, Giessen, performed best in these scanning tests with the TomoScope® XS. “The result was clear,” confirms Lender. “Werth delivered the best performance in terms of scan results and evaluation, but also with reference to overall communication and support. In addition, the price-performance ratio of the TomoScope® XS is by far the best in the performance and size spectrum we require.”

The toolcraft injection molders made the choice with a focus on the wax guard project, as Thomas Lender emphasizes: “It was important for us to be able to measure the small wax guards with a diameter of 1.6 mm and a tolerance of ±0.02 mm quickly and reproducibly and to control the difficult contour with guide nubs and perforations. We also measure the filter compartments in the bottom of the disk. They have fine locking geometries that hold the filter in place.”

Fast, precise and cost-effective

Tasks for which the Werth TomoScope® XS is predestined. This is because the core element of this CT machine is a transmission tube in monoblock design, which achieves a small focal spot even at high tube power. This enables fast measurements to be carried out with high resolution. In addition, the air bearing rotary axis minimizes measurement uncertainties by positioning the workpiece with high precision. Another strength: As the reconstruction of the workpiece volume takes place in real time parallel to image acquisition, fast measurements close to production are possible.

Of course, when purchasing the industrial CT machine, the toolcraft managers were already thinking about other possible future uses – for example, for measurement or nominal-actual comparison of other components and materials, including mold inserts from mold making. In this respect, it was very convenient that the tube voltage of the TomoScope® XS is 160 kV. This enables them to scan workpieces with longer radiographic lengths, as well as denser materials.

In addition to the low purchase price, the running costs were also an important factor for division manager Lender. In this respect, the TomoScope® XS convinced thanks to the monoblock design of the tube, voltage generator and vacuum generation, which stands for

long maintenance intervals and a theoretically unlimited service life. This means that downtimes and operating costs are minimized.

Easy to operate

The Werth TomoScope® XS has been in the air-conditioned laboratory in the injection molding hall since 2018. It is primarily operated by metrologist Aleksander Miskic. He is happy with the the smooth delivery and commissioning process, and he attests to the TomoScope® XS and the WinWerth® measurement software being very user-friendly: “I was able to take my first measurements after just 20 minutes of instruction at the start of the 3-day training course.”

In addition, the Werth specialists were always on hand to provide expert advice. This support was particularly important at the beginning in order to obtain evaluable measurement results for the wax guards. The problem: with the small parts made of glass fiber reinforced plastic, the wax guard contours were barely visible in the first scans, but rather the glass fibers they contained. After a short consultation, the problem was solved and the wax guards could be measured with all their details. Aleksander Miskic knows: “The machine is easy to use and eliminates many errors. But the right settings are also important for computed tomography. In this respect, we were able to benefit from the extensive experience of our partner Werth.”

Aleksander Miskic, injection molding metrology technician, primarily looks after the Werth TomoScope® XS. Here he starts a measurement of several wax guards.

"We no longer want to do without the Werth TomoScope® XS."

Industrial computed tomography with the Werth TomoScope® XS has now become established in toolcraft injection molding. Production of the wax guards and CeruShield disks runs fully automated on two systems. To ensure quality, Aleksander Miskic tests two batches from each system every day. For the injection molds with eight cavities each, that is a total of 32 wax guards. Using a 3D-printed fixture he developed himself, he can scan all the filters in a single process. He then visualizes the workpieces and determines the relevant geometrical characteristics. His conclusion: “The CT is really great. If I had to use optical measuring methods to test so many geometrical characteristics, I would need many times more time.”

Using a 3D printer, toolcraft created this fixture, which can hold all 32 cerumen filters of a batch via three drawers.

Thomas Lender is also highly satisfied: “We use the TomoScope® XS not only for the wax guard project, but have also integrated it into the first article inspection and series production of other products. The use of computed tomography is also advantageous in mold correction. As the geometric deviations can be precisely displayed and measured, we save a few iteration loops here compared to before.”

He predicts a successful future for industrial computed tomography: “The process is becoming faster and more precise, so its use in the small parts sector pays for itself very quickly. And not to forget: Compared to other measuring methods, the influence of the operator is relatively low with computed tomography.”

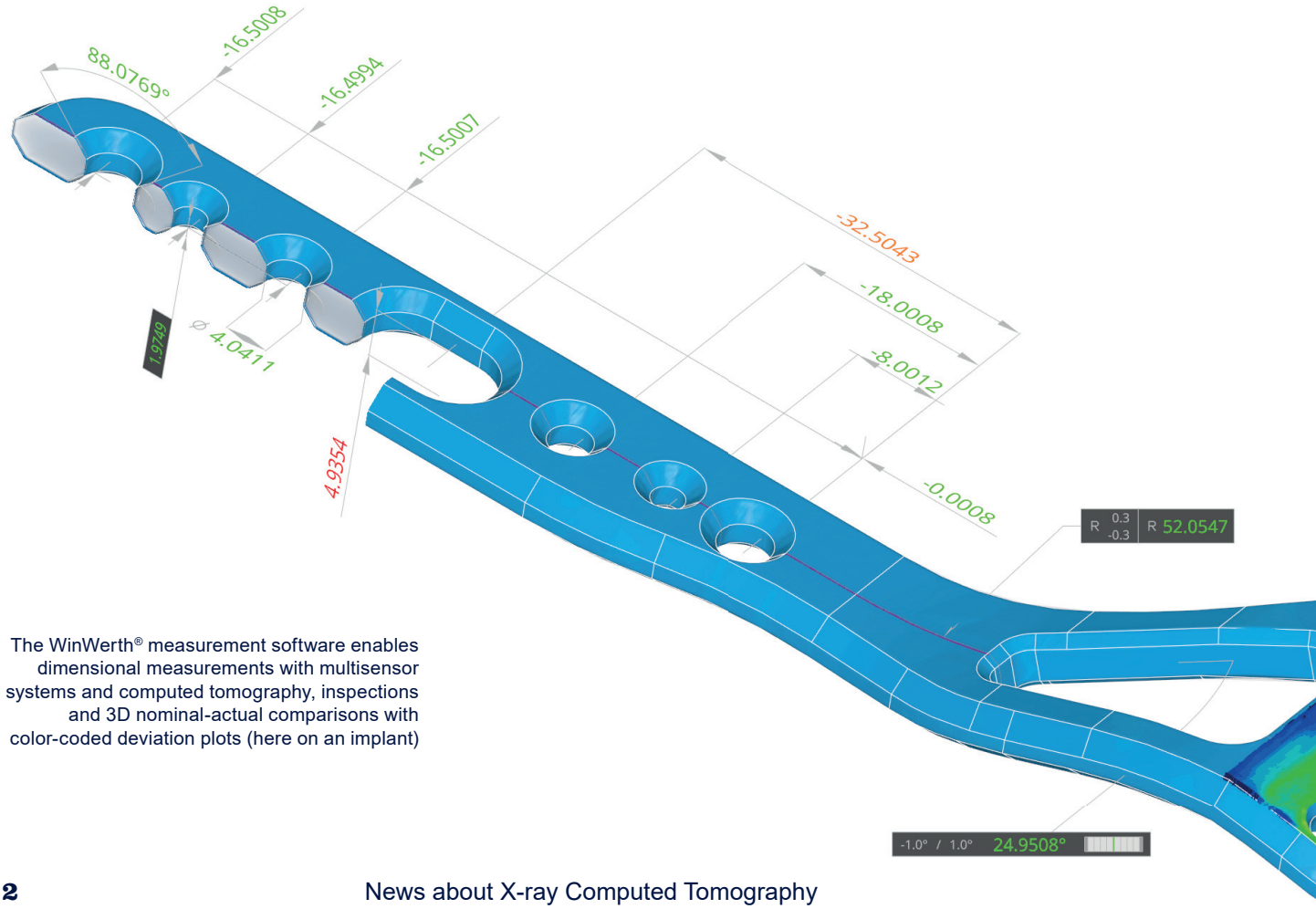
Increased ease of use with WinWerth® version 10.46

In addition to the expansion of the Precision Tool Pro tool measurement program (see p. 6), WinWerth® has been extended with new software procedures for the measurement of implants (see p. 13) as well as measurement and inspection in cylindrical volume sections (see p. 14), and various WinWerth® features have been improved.

A new feature is an interactive WinWerth® tutorial that guides the user step by step, for example when performing a tomography scan, with explanations, images and highlighting of the relevant control panels. The reduced and easy-to-use CT tool makes it even easier to perform tomography scans. A new dialog enables quick 3-2-1 alignments with operator guidance. The coordinate system of the CAD model can now be adjusted directly when teaching the measurement sequence without time-consuming preparation work. By transferring the drawing entry to WinWerth®, complex geometrical tolerances can be easily evaluated even by inexperienced users. The simultaneous application of several selection windows to volumes and point clouds enables significant time savings, for example when cutting or cropping and filtering.

The clarity of the control elements in the 3D graphics has been improved. The arrangement of the controls and the display of elements and element groups can be personalized and saved for the respective user. Also new are a ViewCube for quickly adjusting the perspective and a scale for size estimation. Point clouds in STL format and color-coded deviations are displayed more plastically so that structures on the surface of the workpiece can be better recognized.

In an extremely short measurement time the new Werth ClearCT provides almost artifact-free CT volumes to ensure reliable automatic inspection. Operation of Multi-Spectra CT (MSP-CT-HR) has been simplified; for example, the material boundary to be optimized can now also be marked using a 2D contour in the volume section. The monitoring of the TomoScope® machines has been further automated and even higher availability of the X-ray sources has been achieved. An outlier filter with 95 percent filtration according to ISO 10360-8 is now available for the calculation of geometry elements from point clouds. Also new are detail-preserving smoothing filters for workpiece volumes from CT measurements and point clouds in STL format.



The WinWerth® measurement software enables dimensional measurements with multisensor systems and computed tomography, inspections and 3D nominal-actual comparisons with color-coded deviation plots (here on an implant)

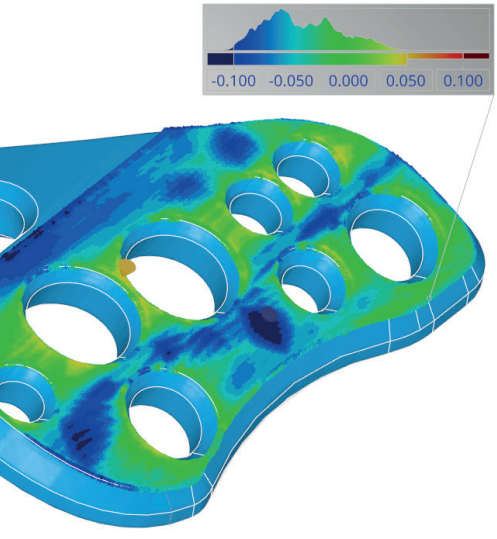
Automatic CT measurement of individualized implants in medical technology

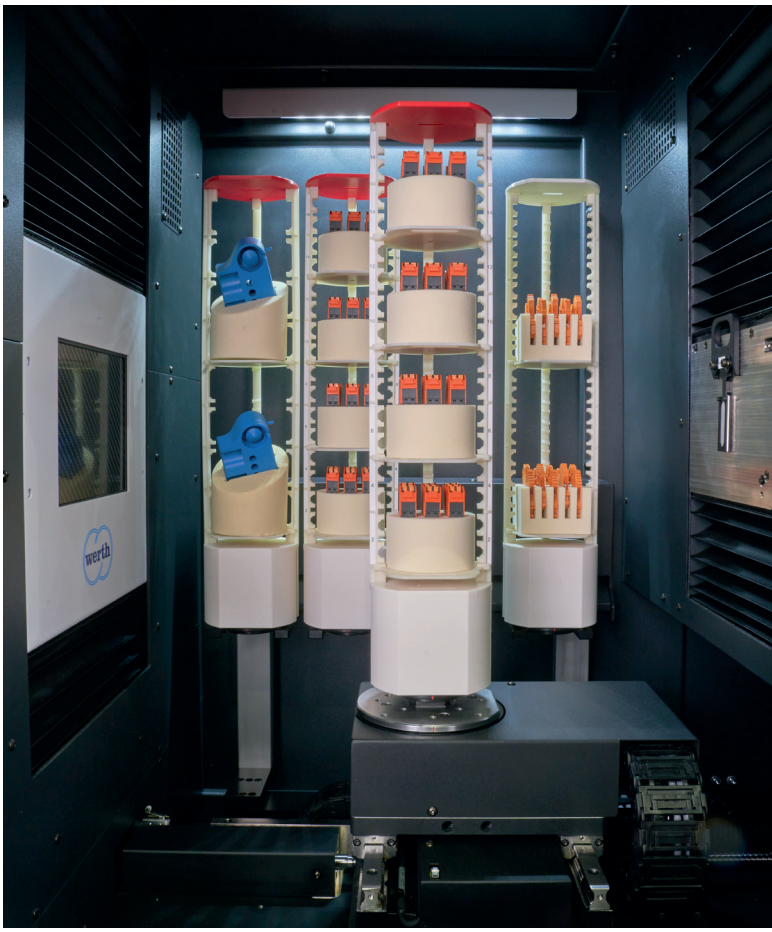
The spread of additive manufacturing methods is the basis for the trend towards the individualization of implants in medical technology. With batch size 1, the workpiece is only designed once, produced once and measured once, resulting in high production costs. The design of the implants is partially automated. According to a medical CT scan of the relevant area, for example a bone fracture, the surgeon can distribute support points directly on the bone data set where the implant is to be screwed to the bone. The implant manufacturer's software calculates the necessary geometry to ensure secure and permanent fixation. The implant can then be manufactured fully automatically, for example using a 3D printing process.

The demands on metrology are high. Some of the implants have extremely complicated geometries that need to be captured in a short time, meaning that a high resolution with a short measuring time is required. In addition, the programming effort for the evaluation and thus the cycle time must be minimized, especially with batch size 1. Several jointly produced orders can be measured in the same fixture to save time and must be clearly assigned to the respective patients.

Werth long-life transmission sources enable the high resolution required for the measurement of thread geometries in bone plates, for example. To rationalize the measuring process, the machines can be equipped with workpiece changers, for example for unmanned measurements overnight. Different workpieces can also be distributed to one or more fixtures as required. The non-contact measurements do not require complex fixtures to hold the workpieces in place.

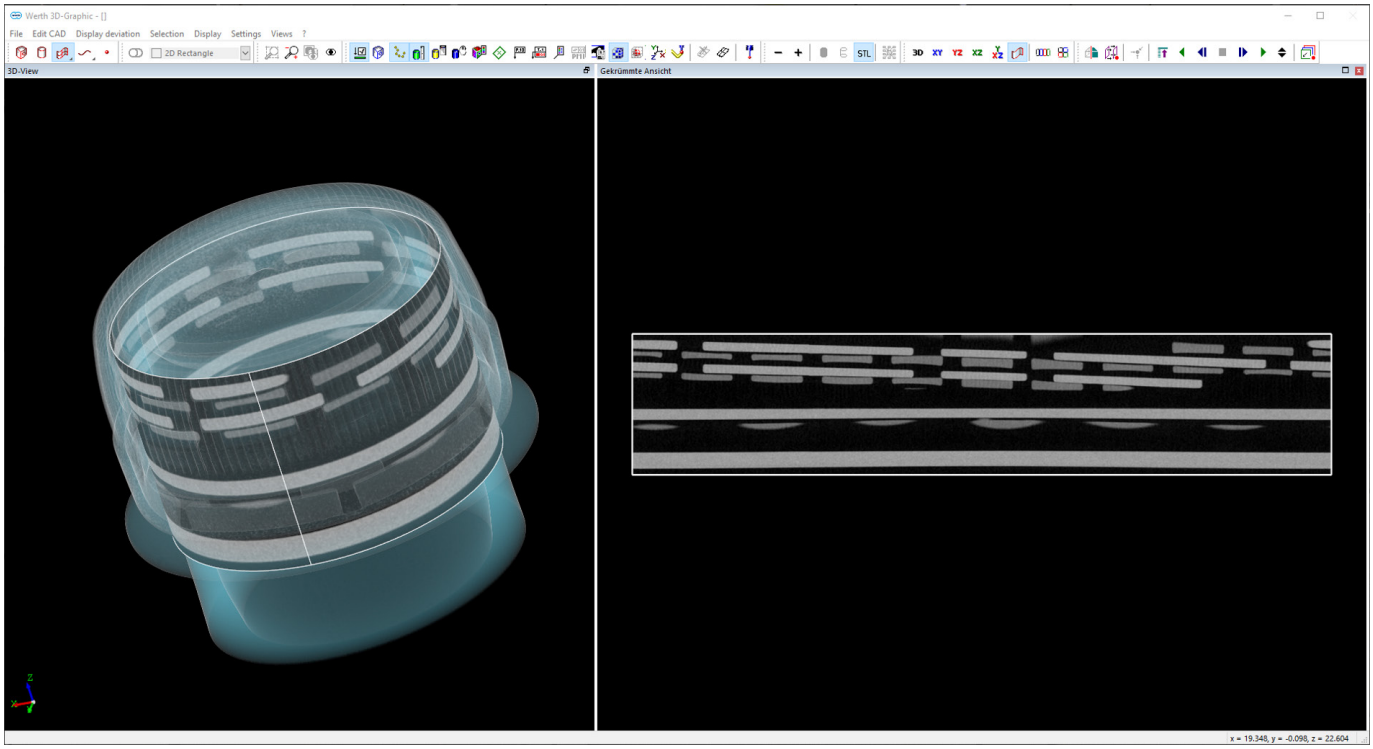
In recent years, Werth has developed intelligent software procedures together with customers and integrated them into the WinWerth® measurement software. WinWerth® recognizes the individual implant fully automatically and then generates the corresponding measurement program. The assignment of the measured data to the patient based on the serial number and the creation of the measurement report are also fully automatic. This eliminates the need for time-consuming individual program creation. In addition, the high measuring speed per workpiece saves a considerable amount of time in the manufacturing process.





New software solution for minimum cycle times and workpiece changer for unmanned shifts.

Flexible volume section for inspection and measurement



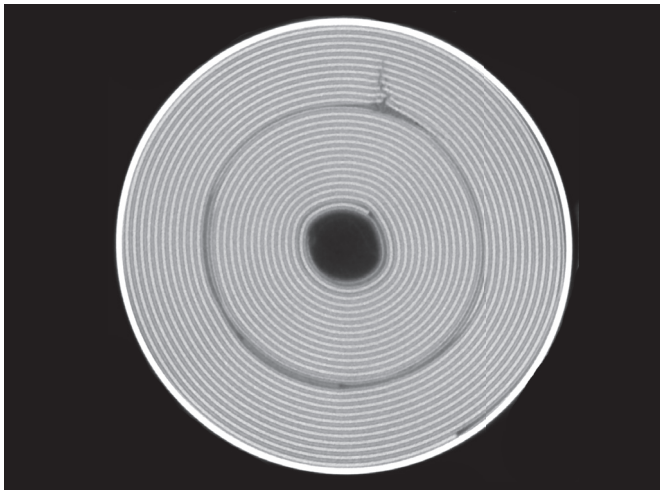
3D (left) and 2D display of a volume section through the thread of a bottle cap

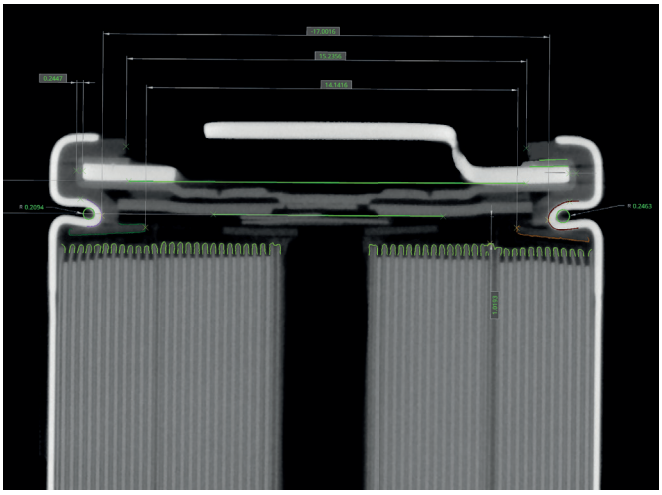
With the Volume Section Sensor, it has been possible to use Werth Contour Image Processing in any sectional plane of CT volumes for several years now. Thus material transitions can be reliably detected, especially for workpieces made of several materials. It is also possible to filter images and capture contours at material transitions with subvoxel accuracy. The measured contours consist of many interrelated points. The information about the proximity of the points to each other is retained and can subsequently be used when applying proven contour filters.

In addition to planar volume sections, cylindrical volume sections are now also possible. The base area of the cylinder is not limited to circles and can take any form. The specifications of the cutting cylinder are defined by a cutting contour of the base area as well as cylinder height and orientation. The contours required for this can be determined, for example, by measurement with patch selection, segmentation or using a CAD model. The size of the base area can be subsequently adjusted. The result is both a 3D view of the cut surface and the unrolled 2D surface of the cutting cylinder.

Like all measurement methods at Werth, the new method is fully integrated into the WinWerth® measurement software and can also be used in automated series measurements. One application example is the thread measurement of bottle caps to determine lead angles and distances. Free-form cross sections through water pump housings, for example, enable the inspection of weld seams, gap dimensions and the fit of seals.

Fast battery cell measurement close to production with Werth TomoScope® XS Plus





Metal particles from the production and assembly process can affect the position of the cathode, separator and anode layers in relation to each other (e.g., delamination), leading to cracks in the layers and thus to short circuits. With a Werth TomoScope® XS Plus, a 100 percent inspection of the battery cells is possible for particle detection. The Werth long-life transmission source allows high measuring speed combined with high resolution and high availability. With these machines, cycle times of a few tens of seconds per battery cell can be achieved, depending on the particle size. New tomography methods are used to reduce artifacts that can superpose the particles. This allows particles down to a few 10 µm in size to be reliably detected.

Severe or repeated deformations of the layers due to charging cycles lead to capacity losses in the medium term and to damage and failure of the battery in the long term. The layer overhangs in individual cells and geometrical characteristics such as the inner and outer diameter of the electrode winding and their form errors can be measured with the image processing sensor in the volume section. The electrode winding and electrolyte solution are safely housed in a block or cylindrical sleeve to save space. The TomoScope® XS Plus is also suitable for measurements of battery sleeves close to production.

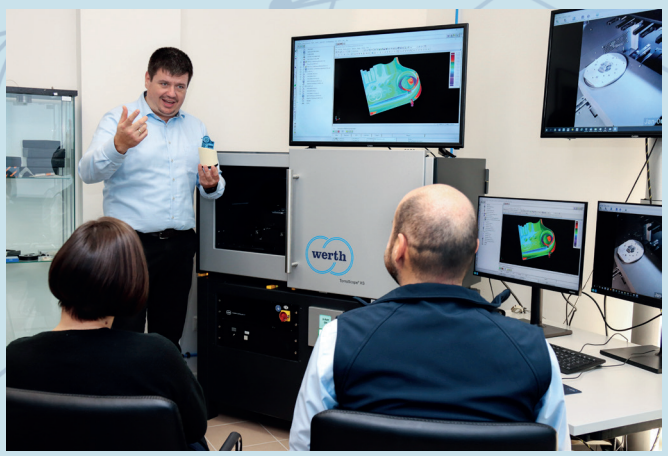
TomoScope® XS Plus 200 for covering the entire quality assurance chain

Werth Magyarország in Hungary

From 1992, Werth coordinate measuring machines were initially offered in Hungary by the calibration laboratory of the Hungarian-German entrepreneur István Székessy. Due to increasing demand, he began to expand his company at the start of the new millennium. Tamás Csontos became part of the team in 2002 after studying mechanical engineering at the Technical University of Budapest. When István Székessy took his well-deserved retirement in 2010, Werth Messtechnik founded Werth Magyarország Kft. together with Tamás Csontos. Today, Mr. Csontos leads the Werth Hungary team as Managing Director and Sales Manager with more than 20 years of professional experience.

Werth Magyarország has a range of measuring equipment in its portfolio, with Werth coordinate measuring systems representing the high-end line. Among other things, a ScopeCheck® FB and a TomoScope® XS Plus are on display in the demonstration center on an area of approx. 250 m². The machines are used for demonstrations and training as well as test and contract measurements. Werth Hungary also takes care of service in Central and Eastern Europe.

In the Werth Hungary team, Zoltán Ullrich is responsible for sales of the Werth machines, while Zoltán Szabó is in charge of application technology. The most experienced service and application expert is Tamás Mohai, who has been working with Werth coordinate measuring machines since the 1990s. Attila Marczis has also gained more than 10 years of experience with Werth TomoScope® machines at a service provider and is now doing his doctorate in this area. Csaba Jeles takes care of maintenance and calibration of the measuring systems.



Managing Director Tamás Csontos explains the measuring principle of the TomoScope® XS Plus

Werth Magyarország is based in Monor, which is conveniently located just 15 minutes from Budapest and Liszt Ferenc International Airport. The first written mention of the up-and-coming town on the Danube-Tisza is found in a document dated March 25, 1398. Monor is located in the middle of Hungary, on the border between the south-eastern and eastern conurbations, and has played a central role in the region since the 19th century as the center of Monor County.

The Werth Hungary team on a company outing

TomoScope® commissioning

What are you doing right now, Mr. Schmidt?

All coordinate measuring systems in the TomoScope® XS, S, L and XL series are produced here in Giessen. During commissioning, I first test the functionality of the hardware components. Then I measure the deviations of the machine axes in all degrees of freedom. An individual geometry model was developed for the software-based geometry correction of the CT measuring systems.

To test the radiation impermeability, the machine is operated at maximum power. First, the escaping radiation on the detector side is measured without a scattering body in the X-ray beam, then the impermeability of the entire housing is tested with a scattering body in various positions. It is also important that the safety switches, which for example switch off the X-ray source when the door is opened, function correctly. Finally, the inspection is carried out by an officially appointed expert, in Germany for example the TÜV. This proves that we are well below the legal limits for radiation exposure.

The subsequent acceptance measurements guarantee that the machine functions within the specifications. Finally, the software options are set up and tested. The machine is then handed over for final reverification testing of critical parameters.

What is your background?

I've always had an affinity for technology, for example I've been model flying since I was seven, and got a recommendation for Werth by an acquaintance. I started my apprenticeship as a mechatronics technician in the fall of 2015 and was able to build on my hobby. The versatility offered by the combination of mechanics and electronics was particularly interesting. After completion of my training in 2019, I was taken on to commissioning of the CT machines.

What do you enjoy most about your work?

I can apply my knowledge of mechanics, electronics and information technology very well in commissioning. Due to the high speed of development in our company, I am permanently learning about new hardware and software, which makes the work very interesting and challenging. On top of that, there are always exciting projects where we test the limits of technology for our customers.

News in Brief

Website with specialist knowledge on coordinate metrology

The well-known book “Multisensor Coordinate Metrology” by Ralf Christoph and Hans Joachim Neumann has been continuously updated since 2003. In addition to explaining the different sensor principles, it also contains specific recommendations for the optimum use of optical, tactile and X-ray tomography sensors. Other focal points with high practical benefits are the topics of probing forces, temperature influence and measurement uncertainty. The new content is now also available online to a wider audience for Control 2024 (www.koordinatenmesstechnik.de), the English version is coming soon.

New partner in Malaysia

Since the middle of last year, MSP Metrology has been a new partner for sales and service of Werth coordinate measuring systems in Malaysia and Singapore. The company is based in Johor Bahru, on the border with Singapore, and celebrated its 10th anniversary in 2023.

MSP Metrology is a turnkey measurement solution provider specializing in optical measuring machines for dimensional measurements, hardness and metallography. The company is known for its competent technical support for its customers and as a calibration laboratory with accreditation according to DIN EN ISO/IEC 17025. In 2022, MSP was honored in Kuala Lumpur with the prestigious SME100™ Award “Fast Moving Companies™” for small and medium-sized companies.

25 years of business relations in Japan

In the mid-1990s, Werth began to take an interest in the Asian market. During this time, contacts were established with a number of sales representatives who still successfully represent the Werth name in the respective countries today. One of the first was Gosho Co. Ltd., founded in 1965 and based in Tokyo.

From the very beginning, the company concentrated on importing highly accurate production machines from renowned European manufacturers and equipment for the automation of production. Since 1999, 3D multisensor coordinate measuring machines from Werth Messtechnik have also been part of the portfolio. In the 25 years of successful cooperation, the Gosho team under the management of Koji Haino has installed numerous Werth machines in the automotive, precision machinery, mold and tool making as well as electronics industries, for example

50th company anniversary in Taiwan

Full Bright was founded in 1974 by Mike Chen. From the very beginning, the company focused on high-end machines for production and quality assurance. It placed particular emphasis on customer satisfaction and the acquisition and transfer of expert knowledge.

Full Bright has been the exclusive representative of Werth Messtechnik in Taiwan since the turn of the millennium. Werth multisensor coordinate measuring systems are particularly suitable for the increasing demands on metrology due to the increase in production quality in recent years. Full Bright offers complete technical support from training and commissioning to after-sales service. Werth machines are mainly installed in the optics, medical technology, electronics, semiconductor and automotive industries.

Promoting science and technology

In 2023, the Dr.-Ing. Siegfried Werth Foundation once again supported six outstanding scientific projects in the field of non-contact metrology. In spring and summer, Marco Roth from the University of Applied Sciences in Eastern Switzerland, Dr. Marco Jagodzinski from TU Berlin, Dr. Martin Landmann from Friedrich Schiller University Jena and Dr. Jiawei Sun from TU Dresden received awards. The award ceremony for Prof. Dr. Gabriel Herl from the Deggendorf Institute of Technology and Dr. Philip Trapp from the German Cancer Research Center in Heidelberg took place as part of the Werth Technology Day at the Giessen headquarters. In addition to presentations from industry and science, the production of Werth coordinate measuring machines was explained during a tour of the company.

Dynamic team in the USA

Werth Inc. in Old Saybrook, Connecticut, continues to expand. Six new employees have joined the team. David Caprio is now responsible for the management of the company as CEO, while David Priebe is in charge of operations as COO.

At the beginning of 2024, Jordan Saffer became the new Sales Manager and Nicholas Arpino joined the sales team. Service continues to be managed by Nicola Hanssmann. In fall 2023, John Baker and Adam Brett joined the service team, which now consists of seven employees with bases in Georgia, Massachusetts, North Carolina, Ohio, Philadelphia, Texas and Utah.

The applications team, led by Jana Groh, was strengthened by Matthew Cook in summer 2023. The specialist for multisensor coordinate measuring machines is already looking forward to his new demonstration machine, the VideoCheck® MZ with three independent sensor axes.

Further publications such as user reports and practical tips in English language can be found on the Werth website (www.werth.de).

Coordinate Measuring Machines with Optics, Computed Tomography and Multisensor Systems

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