On the 4th of July, 2008 the WENZEL Group announced the take over of the computer tomography company Volumetrik GmbH.

The WENZEL Group is pleased to announce that it has taken over the world’s leading manufacturer of reverse engineering software.

"By the strategic acquisition of Knotenpunkt, WENZEL expands its leading position as provider of design systems for the recording and processing of surfaces", said Frank Wenzel, managing director of the WENZEL Group, about the take over. Furthermore, WENZEL has now its own 3D line scanner technology ‘Shapetracer’ for the recording of surfaces and contours of physical parts by using WENZEL coordinate measuring machines.

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The WENZEL Group has been successful for five years now in the field of gear metrology. Since October 1st 2003 WENZEL and the Karlsruhe-based WENZEL GearTec have been active within this market and are now among the global market leaders.

The experienced founder team of WENZEL GearTec with managing director Hans-Helmuth Rauth have worked together successfully in the area of gear metrology for many years. They know about the business requirements of their customers and take these into account when designing and extending their measurement machines. The substantial amount of machines sold to well-known companies, national and international, as well as the progressive trend in sales and market share indicates how good WENZEL GearTec meets market needs.

Within a very short period of time they established a customized portfolio for measuring rotational parts with gears, extended by the tomography machines it is possible to make contactless 3D-measurements of internal as well as external features.

Dear Madame or Sir,

A journalist asked us recently: „What does innovation mean to your company? “ This is a question, which affects us every day, in the form of technical highlights, or the constant improvement of our existing products and internal processes.

The development of new products is the basis for our future. This ensures our technological advance and our global competitive position. It is the only way to exist in times of economic downtown; whether during the oil crises in the seventies or during the recession at the beginning of the nineties, we have always had a good position, as it is now. Therefore we are not so concerned about economic fluctuations or the consequences of the actual financial crises.

Good companies come out strengthened from crisis.

Read in this WENZEL Journal how it goes forward at our house.

We wish you a pleasant read.

Dr. Heike Wenzel-Däfler
Granite for highest precision

Granite is a volcanic plutonic rock which has been aged over millions of years. Its physical characteristics make granite to the perfect material for metrology. It is the perfect basis for high precision measuring machines. For Wenzel, granite is the basis of success for sophisticated and efficient coordinate measuring devices.

Numerous gains
Due to its natural features this material provides unique advantages. The most important is the low linear thermal expansion coefficient, which describes how much a material expands or contracts if the temperature rises or drops.

For granite this factor is approx. 6.5 \(10^{-6}/K\). Steel has an expansion coefficient almost twice as high and for aluminium it is 23.8. This means for example, that a base plate made of aluminium with a length of 3 meters and exposed to an increase in temperature of 10°C has a linear extension of more than 0.7 mm. For highest accuracy such numbers are not acceptable.

The first impression that aluminium is much lighter than granite is proven to be incorrect. With a specific weight of 2.8 \([g/cm^3]\) granite is only slightly above the weight of aluminium, which is 2.7. The specific weight of steel is with 7.8 \([g/cm^3]\) much higher.

Further comparisons with steel or aluminium, granite provides additional advantages. For example, it is neither magnetic nor electro conductive, it has a very low thermal conductivity and above all it is harder. Furthermore, granite is a pure natural product, thus its production has a low-energy input, which is in turn of benefit for our environment.

And granite offers even more: optimal vibration absorption as well as a high resistance to abrasion and corrosion.

**WENZEL’s strength**

With this perfect base material, WENZEL products provide the highest stability and intrinsic accuracies. Guide ways for airbearings can be manually lapped to tolerances within 1µm/m. Lapping is a working process by careful hand movement for smoothing surfaces within close tolerances. This method requires highly skilled staff with many years of experience. A further strength of WENZEL is that all relevant measuring machine parts are made of granite. As the base plate, cross-beam and sleeve are made of the same material a homogeneous thermal behaviour is provided.

**A clever move**

By acquiring a granite company in 2006 WENZEL has secured its supply with this important base material and thus strengthened its leading position in the market for the future. WENZEL Steintechnik GmbH in Gross-Bieberau maintains the best relationships with stone pit suppliers and can provide short delivery times.

WENZEL now conducts all process steps from cutting to milling and grinding. With the biggest granite saw in Europe, stones with a length of up to 8 metres and with a weight of up to 32 tons can be machined.

The granite, which is mined from stone pits in South Africa, takes approx. 5 weeks to travel to Europe, a distance of about 13,500 km. For the largest granite pieces required by WENZEL, delivery time in the past could be up to 6 months. Today, via an intermediate store in Amsterdam, the required granite can be collected at short notice.

**Granite for highest precision**

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  - Acquired granite company in 2006
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**WENZEL Journal**

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**Responsible:**

Dr. Evelin Arnold
Measuring solution for castings

Rexroth Guss, the subsidiary of Bosch Rexroth AG in Lohr am Main, is a specialist in hydraulic castings. To assure product quality, the Quality Management decided to investment on the Shapetracer 3D line scanner from Wenzel.

The hydraulic casting components made at Rexroth Guss are characterised by the complex, core-intensive construction and many free-form surfaces. These costly parts, made of cast iron or spheroidal graphite iron, are invariably designed in 3D. The transition from 2D to 3D design some years ago also prompted the quality department to look for an appropriate measuring solution.

“The requirements for quality assurance have increased with 3D technologies”, stressed Frank Mill, Manager of Product Quality Management at Rexroth Guss, “earlier all major dimensions could be taken from a 2D drawing for tactile measurement which is no longer the case today.

Modern 3D drawings include little in the way of explicit dimensions. The curves of the free-form surfaces are almost impossible to verify, using traditional tactile measurement techniques."

Having already found what they were looking for, the quality team in Lohr am Main reviewed the decision after discovering that the metrology provider Wenzel from neighbouring Wiesthal was offering a low-cost non contact scanner: The Shapetracer. -

The high-precision line scanner was developed together with the Pointmaster evaluation software from Wenzel Knotenpunkt.

The C-technology specialist from Swabian Balingen has been part of the Wenzel Group since the middle of 2008. Shapetracer is an extremely compact scanner that can be connected to the Renishaw PH6M or RS1012 horizontal arm machine, its storage together with other measurement heads is no problem.

Not all of the functions offered by the Pointmaster software have yet been used. “Target data to actual data comparisons are top of our wish list for getting started in the new measurement technology,” explains Achim Werthmann (measurement technician) who is well versed in operating the scanner solution, “one of our next priorities will be surface reconstruction.”

Roughly summarized, the workflow in target-to-actual comparisons is as follows: Scanning of the workpiece where the operator is supported by the Pointmaster kinematics module and the software takes over the full command of the measuring process. The measuring machine can be completely automated so that simulations of the measuring process are also possible. A point cloud is generated from the scan data and, from that a polygon model with homogeneous surface is computed (triangulation). Finally the polygon model is converted into a CAD model in IGES format. The quality technicians receive the CAD data, also in IGES format, from the design department. Both datasets are now aligned and compared with the software.

Pointmaster highlights the differences between the two models in pseudocolours; the variances in dimension can be discretionally selected and marked by flags. All dimensions are listed and contrasted in the evaluation protocol. “As this involves complex workflows, the measurement technician must fully master the individual process steps. For this reason it was important to us to build up the relevant expertise inside our company,” stressed Frank Mill. In the transition phase to 3D an external measurement service provider was appointed for a while. “Any outsourcing of such work involves a lot of uncertainties as well as time loss.”

This applies particularly to components with complex inner workings. These parts must be dissected in order to simulate both the external and internal contours. "This software means it is no longer a problem to construct a model from the component scanned in different directions,” said Achim Werthmann in praise of the solution. The system provides a series of functions, both for aligning the components and for manufacturing homogeneous contour transitions in order to remove any cut surfaces and to add consecutively scanned areas.

As the developer Wenzel Knotenpunkt indicates, the assembly of the contours does not rely on mathematical tricks, but always uses real data so a highly precise scanner is a prerequisite.

The measurement technician was able to satisfy himself of the level of accuracy in the meantime: “We don’t know of any comparable systems that offer such high precision.” After the CAD model has been generated the finest surface structures become visible. Ingrained lettering, for example, appears distinctly and clearly legible on the display screen.
Performance of the Highest Level via the WENZEL Design Packet

The WENZEL in-house developed 2 Axis-CNC-Milling Head ‘Excalibur’ has contributed comprehensively to major changes within Automobile Design Studios, Tool, Form as well as Product Development Areas, eradicating for ever the concept that a Coordinate Measuring Machine can only be used for Quality Control.

The Prototype development, carried out in cooperation with existing customers, resulted in Design changes such as a more Streamlined Head, giving easier access to complicated areas as well as a new Rotary, Spindle Locking Knob and Emergency Stop Button for enhanced safety.

With a tool length of 200 mm and variable spindle speed of 0 - 8500 rpm there is repetition accuracy of +/- 25 µm at the cutter with both left and right rotation. Simple adaption to the Measuring Machine and a Control System which is integrated within the Milling Head, create an extremely user friendly process where all system and data operation can be followed and controlled on the Computer Screen. The swivel range of the 2 Axis Milling Head parallel to the machine’s X Axis is +/- 105 Degrees and Y Axis +/- 180 Degrees and is infinitely variable.

With DesCAD3D, Milling Programmes can be produced quickly and easily via either Measuring Machine Data or External CAD sources. Machining Processes can be done directly on the machine and Milling Programmes with differing Head Positions can be joined together to gain the full benefit of the New 2 Axis CNC Milling Head ‘Excalibur’.

WENZEL sold biggest Gear Measuring Machine

WENZEL GearTec announces North America’s largest Gear Measuring Machine order for inspecting windmill Gears and gearboxes.

Third generation British Columbia gear manufacturer tools up for next generation wind power.

Vancouver Gear Works Ltd. in Richmond, British Columbia has purchased what is believed to be North America’s largest gear measuring machine GMM. The Wenzel model LHF GMM 30.60.20 is a traveling bridge configuration with a 6 meter (19.68 ft) x 3 meter (9.84 ft) x 2 meter (6.56 ft) measuring range capable of measuring gears up to 3 meters (9.84 ft) in diameter as well as other large housings and components. The unique gear measuring machine design, Fig. 1, has two three meter measuring zones; one equipped with a 1000 mm hydrostatic rotary table capable of accommodating gears up to 30,000 lbs, while the other 3 meter zone is equipped with a cast-iron surface plate for traditional prismatic inspection of housings and other large components.

Jim Mantle, General Manger of Vancouver Gear Works Ltd. explains, “Vancouver Gear is a third generation family-owned manufacturer of hardened precision ground gears and other related precision machining services. Since our founding in 1952, we have focused more resources on the energy-related industries where gears and gear related products are prominent. We have invested upwards of $10 million dollars during that time for state-of-the-art gear manufacturing equipment and ultimately found the need for better methods of inspecting and verifying those precision tolerances. We attended the 2008 IMTS Show specifically for the purpose of finding the optimum measuring equipment for our business, and subsequently selected a $ 1.5 million Wenzel Gear Measuring Machine.” The recommendation came from Great Lakes Gear Technology, which already made very good experiences with products from Wenzel.

Keith Mills adds, “Wenzel GearTec only commenced delivering its gear measuring machines in 2004 and already has a 30 % share of the world gear inspection market and are the dominant supplier in the large wind-energy gear market.

Other gear inspection equipment manufacturers have tried to ‘scale-up’ existing small machine designs to meet the needs of this rapidly emerging large gear market, their equipment has not achieved the critical levels of accuracy and productivity demanded by this market sector.”

Additional features on the Vancouver Gear Wenzel LHF 30.60.20 GMM include a rotary table with an air bearing stage for ease of part positioning, Renishaw laser based scanning probe that offer sub-micron accuracy and OpenDMIS measuring software.

Bavarian leading politicians visit WENZEL

Invited by the CSU district chapter the Bavarian Minister of Economic Affairs Emilia Müller and the leader of the Bavarian State Chancellery Eberhart von Kuenheim visited on Tuesday 26th August both plants of WENZEL Präzision in Więsthal.

During the company tour, the politicians were able to get a picture of the high WENZEL quality standards. Despite the global expansion of the company, Managing Director Dr. Heike Wenzel-Däffer emphasized, “We will grow further in Germany!” She also took the opportunity to address problems with which medium-sized companies face today. The Minister of Economic Affairs was sympathetic and promised to take care of public obligations which put constraints on further expansion.

New subsidiary in Munich

The construction works for the new selling and service base in Karlsfeld near Munich will be finished soon.

The official opening will be in October. The purpose of this base is to offer additional services to the customers in Southern-Bavaria and to push the sales for new coordinate measuring machines. The new facility is over 700 square meters in size. In the fully air-conditioned measuring room metrological services will be performed in the near future. A separate store area for spare parts will ensure short service reaction times. All interested customers can take a look at the product portfolio to see for themselves the advantages of WENZEL. Coordinate measuring machines of the LH series (Bridge Type), the RSplus series (Horizontal Arm) and the SMART, which is a production floor hardened entry level model are on show.