

m&h PROBING SYSTEMS AND SOFTWARE

Walther Wolf GmbH, Wendelstein, Germany



Enormous time gains

by Karl-Heinz Gies

Measuring contours on the machine tool not only ensures quality but also considerably shortens set-up times and speeds up manufacturing cycles. A mould making and jobbing company reports its experiences using m&h 3D Form Inspect software and proves that quality assurance also reduces manufacturing time.

There are two things that sum up the business at Walther Wolf, a mould maker and jobbing shop in the Franconian Wendelstein near Nuremberg – the parts it produces and the company's history. Founded in 1907, the company is still owner-operated today but by another generation, the greatgrandson of the founder.

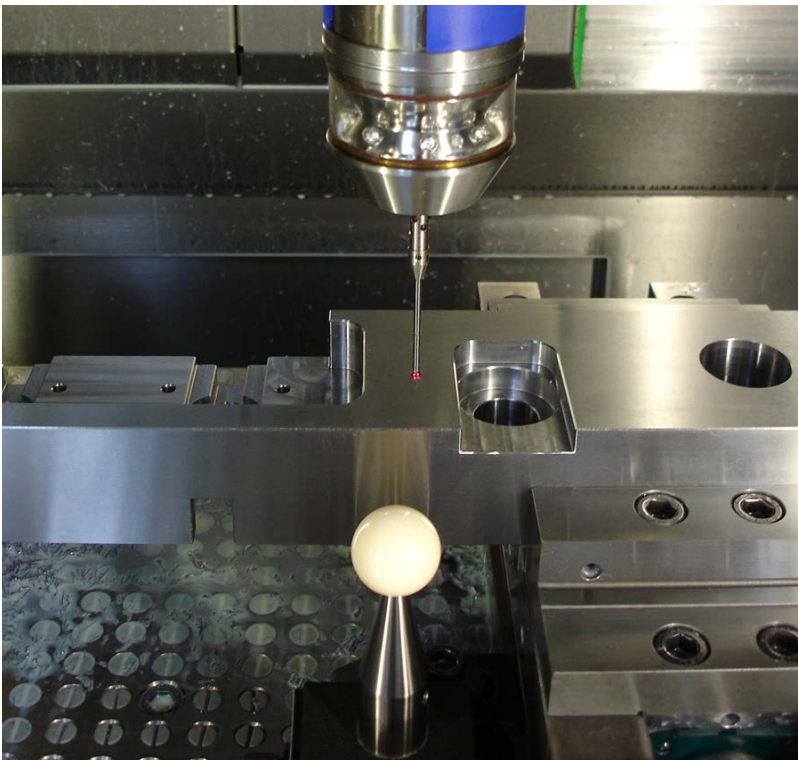
67 members of staff specialize in the manufacture of moulds and insert tools as well as production of high-precision parts primarily for the automotive industry. Rather unusual is how daily production is achieved on the machines – very successfully using a high degree of automation.

The company operates a number of large machining centres of different sizes and from different manufacturers. As in other companies, a variety of different materials both soft and hard, are cut. Copper and graphite are machined in electrode-manufacturing with graphite prevailing and increasing due to considerably shorter machining times. Wolf measure workpieces while still clamped on the machine, something becoming more prevalent at companies using m&h state-of-the-art technology.

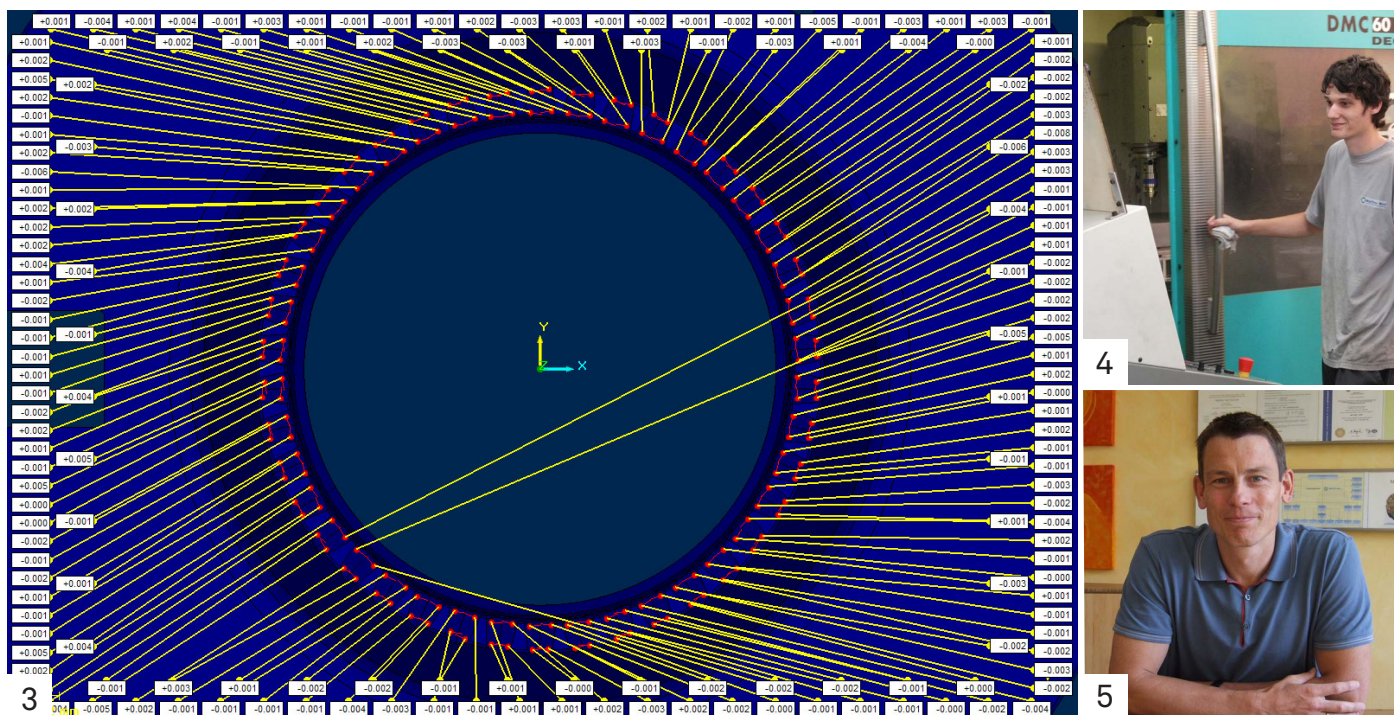
Everything at this company is different. For example, a machining centre with pallet changer is used for mould making. The aim is to achieve an output as high as possible with shortest set-up times. However, due to the fact that workpieces constantly change, this seems to be only conditionally possible. Since Wolf started using m&h's 3D Form Inspect software, considerable time savings have been achieved. For the past year, a licence of m&h's 3D Form Inspect has been run on a computer also using the module "Best Fit". This is used on different machines, a Hermle C40U and machines from DMG and Rüdgers. "With the introduction of the Best-Fit module, labour times for set-up have been more than halved," Jochen Dörlöchter, managing director at Walther Wolf, proudly tells us. "The calibration

period for workpieces is considerably shorter. It is now about 1.5 hours compared to 3 hours before". This not only means clear improvement in profitability but also higher productivity from the machine. Additionally, the time that is no longer needed on the measuring machine must be taken into consideration. This means a further gain in profitability because the well-equipped inspection department is also used for jobbing production. "Today, the workpiece is no longer adjusted on the machine, it is just roughly clamped in the required position". The machine changes the pallet and, using 3D Form Inspect software and m&h touch probes, the exact position of the workpiece is found based on critical areas of the workpiece contour. This results in correction values for the individual axes of the machine. The control adjusts the machining program to this actual workpiece position. Time after time, the position is detected with μ precision and this applies to cases of complex geometries or in mould inclines.

This is an advantage that is also reflected in jobbing production. Wheels for clutching gears, with a hardness of 56 HRC and diameter of 200mm for special inserts, are hard-milled. This requires highest accuracy and exact fit as well as a surface quality of Rz 0,8. "Until now the positioning of the gear wheels presented a problem, since it was extremely difficult to precisely set the position of the cog's flank when reworking the gear wheels", Jochen Dörlöchter explains. "Now it is probed using Best Fit and the position of the cog's flank is precisely set. Subsequently, the machining program in the control is adjusted to the position of the workpiece on the machine and not vice versa. Finding the reference is far more precise when the workpiece is



- 1] Setting workpieces based on their contour using "Best Fit"
- 2] Faster, more precise manufacture of complex workpieces with 3D Form Inspect "Best Fit"



3| Screenshot of 3D Form Inspect “Best Fit” used for aligning the machining program to cut a ring gear in relation to the position of its addendum flanks. 4| Quicker set-ups and productivity gains with m&h touch probes and software 5| A visibly satisfied managing director: Jochen Dorlöchter

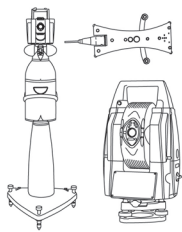
clamped on the machine”. Using engineering data from the CAD drawing, the contour points around which the workpiece must be adjusted are determined by mouse click via 3D Form Inspect software. The software automatically generates a measuring program, which the machine uses with the touch probe. When measurement begins, the touch probe is automatically calibrated in the machine to compensate for any temperature influences and axis errors in the machine. Then the module “Best fit” determines the calculated adjustment of the axis coordinates in the control. The actual position of the workpiece is found by the probe in relation to critical contour areas, even if there are deviations from default positions. As well as the enormous time gains through easier set-up, this also results in a striking improvement of manufacturing quality even in volume production. The machining results show processreliable repeatability and are dependable. When a quality problem occurred some time ago, the m&h software and touch probes were initially suspected to be the cause. Comparison measurements were made on both the machine tool and the measuring machine. “We can absolutely confirm that the m&h probe measures with the same accuracy as the measuring machine”, Jochen Dorlöchter is pleased to report. This is achieved using m&h’s patented, integrated calibration strategy. The staff at Walther Wolf confirm the userfriendliness of the m&h software. “The thing is easy to operate and the operator doesn’t have to be skilled in measurement technology. That has convinced us”, Jochen Dorlöchter tells.

This technology considerably facilitates and speeds up work compared to standard methods. For example, Walther Wolf does not manufacture its moulds with deep cavities as they’re difficult to machine, but it splits the mould into slices or plates. As a result, these plates have openings instead of cavities. These openings are much easier to machine and can often be cut on a wire cutting machine. The closing plate comprises the contour, which can be cut more easily since it is not located deep inside. “The advantage for the customer is that mould repair is much easier”, Mr Dorlöchter explains Wolf’s method of success. There is no need to send the entire mould to our factory; he can simply exchange the damaged plate itself. Today, we manufacture all parts exactly according to drawing or CAD drawing, ensuring everything fits perfectly and can be exchanged without requiring much die spotting”.

Wolf intends to measure even more parts on the machine in the future. If parts are precisely manufactured, all further machining up to final assembly of the mould is speeded up. “If I practice quality assurance in manufacturing at an early stage, we’ll use less labour afterwards,” Jochen Dorlöchter explains his experience. “If manufacturing is precise, I will always recover the costs afterwards.” Ultimately, time does not just mean money. Nowadays, the scheduled delivery date and quick response is often decisive for winning orders. Short cycle times are always favourable.

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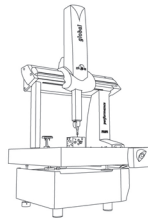
Jochen Dorlöchter



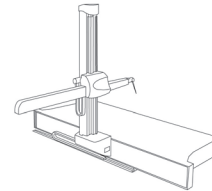
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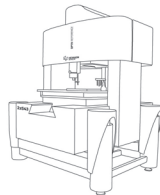
BRIDGE CMMs



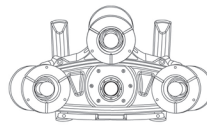
HORIZONTAL ARM CMMs



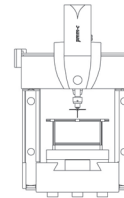
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