Precision in focus

For productive, efficient machining many companies use solid carbide tools that are specially matched to the production process which can reliably maintain tolerances even in the micron range. In order to be able to manufacture these tools consistently, Wolf relies on Werth coordinate measuring machines. Solutions reports.

Wolf's Mould and Tools division GmbH was founded in 2000 and is part of the Wolf Group.

It started with the manufacture of tools for cutting and bending systems and then added forming, bending and punching tools to the product portfolio. Through sister company Wolf Coatings a range of coatings could be applied to the tools depending on application.

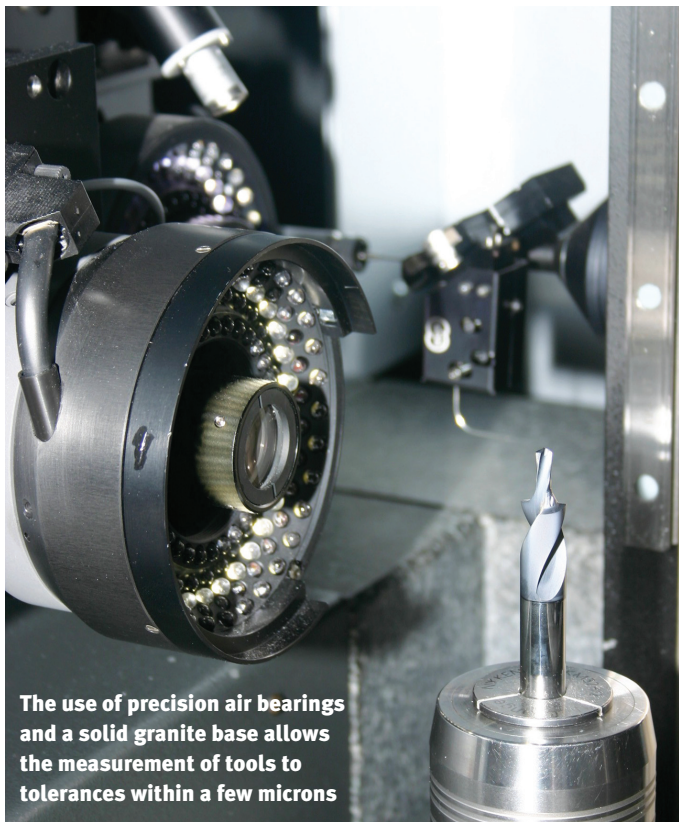
Today the division positions itself broadly offering products and services ranging from 3D milling, contract eroding and the construction of bending and punching tools through to plastic injection moulds and the manufacture of prototype parts for the automotive industry.

In order to facilitate further expansion, a new building was acquired in 2002 and at the same time, significant investment was made in updating production equipment. This included a Werth VideoCheck IP 3D coordinate measuring machine with multi-sensor technology which allows rapid measurement of 2D and 3D geometries. With the image processing sensor, 2D features can be captured and evaluated precisely and for measuring cylindrical shapes or undercuts, for instance, the VideoCheck IP also features a motorised, tilting mechanical probe.

Positive experience

The multi-sensor device therefore has the ability to combine various measurement methods, using direct and backlighting, tactile or laser supported processes. A 2D BestFit software package also facilitates the graphical comparison of scanned profile data against 2D CAD data. Through the use of ToleranceFit software, which allows tolerances to be taken into consideration, the machine can also be used as a modern profile projector.

Horst Wolf, managing director of the Wolf Group, explains: "This kind of measurement system is a very important piece of equipment for us. The automotive industry in particular requires documented evidence that parts meet dimensional requirements – whether they are manufactured from plastic, sheetmetal, or solid carbide. For punching dies – which are also checked using ToleranceFit software, safety is the primary concern. Also if the die doesn't have the correct amount of clearance and the punching unit is damaged, this can escalate operating costs significantly."



The use of precision air bearings and a solid granite base allows the measurement of tools to tolerances within a few microns

Wolf's Tooling Technology division is the strongest element of the Wolf Group, accounting for around 50% of total sales. Its speciality is special cutting tools manufactured from solid carbide – especially step drills and other multiple tools for production processes. In order to be able to produce these precision tools – which can have tolerances of ±3µm – having the appropriate measuring equipment is essential.

Based on positive experiences gained from its mould and die division, the decision makers at Wolf Tooling Technology decided on a multi-sensor coordinate measuring machine from Werth Messtechnik, Giessen - the VideoCheck V HA. The use of precision air bearings and a solid granite base has resulted in precision levels that allow measurement of tools with tolerances in the range of a few microns. Together with a maximum scale resolution of 10nm and 3D error compensation, maximum measurement errors (MPE) of up to 0.25µm can be obtained with traceability to national standards.

Each micron is documented

Additional touch trigger and measuring probe systems, laser probes, or the patented Werth Fiber Probe (with a probe sphere diameter as small as 20µm) can be combined with the image processing sensor. The flexibility that this provides ensures that all features of various tools, such as hobs, saw mills, reamers, taps, step drills, twist drills, grinding and dressing rollers, or inserts, can be measured.

Detlef Ferger, sales manager at Werth Messtechnik emphasises a special feature: "Our machines are specified on the basis of ISO 10360 and VDI/VDE 2617 which means our measurement systems are traceable to the length standard at the German National Metrology Institute. For us and our customers, this means the results are totally reliable and fully documented."

The Werth coordinate measuring machine serves as a reference machine for measurement equipment comparisons which can then be used to assign appropriate contract tolerances for a particular customer order.

"In the future, tooling technology will depend not just on the micron, but on the tenth of a micron," Horst Wolf predicts. "When I look at the increases in requirements over the last three or four years, then I look at Werth Messtechnik's high precision tool measurement machines, it becomes obvious that this is a company with its finger on the pulse in terms of forward thinking technology and innovation."

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