



“With Alicona’s Focus-Variation, we now have possibilities in quality assurance that no other supplier could offer!”



Bruker alicon

KLEINER uses the high-resolution 3D measurement system InfiniteFocus in combination with a motorized rotation unit. “The rotary axis allows us to ideally position and measure any number of surfaces and surface features in just one measuring process,” Hamann says.

Christian Hamann, Business Unit Manager Tool Technology is the mastermind and initiator of the KLEINER 4.0 project. This is how the stamping technology company entitles the production cell and thus establishes the context to Industry 4.0.

Faster and more efficient production with the same team

KLEINER Stanztechnik combines machine tools, measuring technology and robotics in a new production cell. It aims at autonomous, fully automatic production of tool components including measuring protocol. Alicona is not only a selected measurement technology partner because of its automation capabilities.

Christian Hamann, Business Unit Manager Tool Technology at KLEINER Stanztechnik, remains modest: “I can’t just say whether our new production cell makes us stand-alone worldwide. But our customers confirm that they have not yet seen a comparable production cell with integrated measurement technology at this high degree of automation.” The German stamping technology company has been proud to combine expertise in the field of precision stamped parts and high-performance stamping tools with new technologies since its foundation, thus meeting increasing customer demands from various industries. With its new production cell, combining technologies from tool and mold making, metrology and industrial robotics, KLEINER once again proves its innovative strength. For Christian Hamann, the commissioning is a milestone: “At the moment, man and individual components of the cell are still interacting with each other. The production cell in its final state will enable completely self-sufficient production with a fully automatic process. We hand over a raw part to the cell, and at the end we receive a completely manufac-

tured tool including measuring report without any further intervention.”

Optical measuring technology as initiator for automatic production

The KLEINER production cell is based on a combination of different state-of-the-art technologies and machines. Two HSC milling machines, a die-sinking EDM machine, a cleaning system as well as tactile and optical measuring technology are currently in use. A 6-axis industrial robot controls the production and takes care of the assembly. KLEINER describes the process as follows: “We load a pallet system with the raw part, which is transferred to the cell or robot via a transfer station. First, a tactile measuring station determines the position of the workpiece. These references or coordinates are fed to the HSC milling machine, which mills the electrode. The electrode is then optically measured with Alicona in 3D and transferred to the die-sinking EDM machine, that finally produces the individual tool part.”

The optical measurement of the electrode is already automated. Measurement results are currently monitored and processed by a worker, who, based on the measurement data, manually initiates necessary changes in the production process. KLEINER lays the foundation for smart manufacturing á Industry 4.0: “With Alicona we are already able to automatically start and execute the measuring process in our production process. We are currently working on enabling networking with other machines so that machine parameters are automatically and continuously adjusted based on the measurement results,” explains Haman, initiator and mastermind of the KLEINER 4.0 project. This is how the stamping technology company entitles the production cell and thus establishes the context to Industry 4.0.

Measure larger components faster and more precisely

KLEINER cannot imagine quality assurance without the use of optical measuring technology. Alicona is mainly used to measure molds within a tolerance range of up

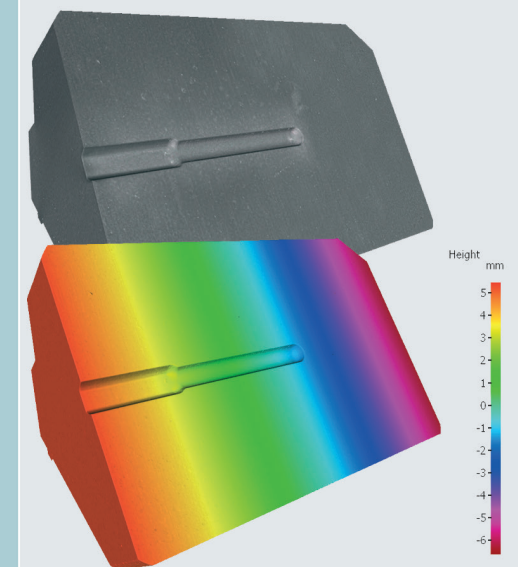
to 0.01mm. Dimensional accuracy plays a decisive role in the further production and compliance with all quality specifications of the tools. The stamping technology company benefits in particular from the motorized rotation unit, which was purchased together with the high-resolution InfiniteFocus measuring system. Hamann on the advantages of the so-called Advanced Real3D Rotation Unit: “The rotary axis allows us to ideally position and measure any number of surfaces and surface features in just one measuring process. This makes the measurement not only very precise compared to our measuring equipment used up to now, but also very economical due to the short measuring time.”

Fast measurement times, high accuracy and intuitive handling, together with the requirement of being able to automate measurements in production, were decisive criteria for the evaluation of a suitable measurement system. Part of the requirement specification was also the implementation of open interfaces for integration into the system landscape of the production cell. Several providers were carefully examined and

the decision was easy in the end. Christian Hamann: “Latest at the point where it was a matter of measuring the steep flanks of our molds, many other measuring technology suppliers shrugged their shoulders. Only Alicona has met all our criteria.” An additional bonus for KLEINER is the measurement in registered 3D true color information, which “provides users with a first clear and fast result,” says the head of Tool Technology. “Our eyes detect color much faster than simple numerical results. Color information has become a common procedure that we would not want to do without.”

KLEINER expects the use of the production cell to increase productivity while maintaining the same resources. “We can achieve significantly higher productivity and increased efficiency with the same team, as we gain speed and flexibility. We are already producing several different tool components in a shorter time at this stage of the cell,” Haman summarizes. This is a promise to its customers from the automotive, plastics, electronics and medical technology industries with which KLEINER will continue to strengthen its leading position

as a manufacturer of unique tools with high quality standards.



3D measurement of a die in true and false color visualization.



The KLEINER production cell combines two HSC milling machines, a die-sinking EDM machine as well as tactile and optical measuring technology. Alicona is used to optically measure the electrode, which is then further transferred to the EDM machine. Christian Hamann: “The production cell in its final state will enable self-sufficient production.”

