



CNC enables high-precision, high-volume grinding

12,000 Parts with Micron Precision

Siemens VDO produces more than 12,000 diesel fuel injection parts per day – parts which have tolerances in the few micron range. The job is accomplished using grinders from Bahmueller Technologies, which guarantee accuracy through the precision of the Sinumerik CNC and Simodrive digital drive package. An extra benefit: the ability to monitor peripheral equipment.

A combination of 11 high-speed CNC internal and internal-external grinders help Siemens VDO in Blythewood, South Carolina produce more than 12,000 diesel fuel injection parts per day. The carburized 8620 intensifier bodies for diesel injection are produced by VDO for international engines, which go into Ford F-Series trucks. The grinders were supplied by Bahmueller Technologies, Inc., Pineville, North Carolina, the U.S. subsidiary of Bahmueller GmbH of Pluderhausen, Germany.

These grinders were turnkeyed for the specific application involved, explains Bah-

mueller Project Engineer Kelsey Hadley. “Our company began to focus on high-precision, high-volume work more than 20 years ago. During that time, we developed a relationship with our control supplier, also a Siemens group, as it happens. The ability of their Sinumerik 840D CNC to run our machine was a key component of our growth into the high-end market segment.

“Onboard our grinders, the control offers great flexibility for fine tuning of the machining process, which in turn achieves a maximum efficiency of operation. A collateral benefit is the control’s ability to integrate peripherals such as gauges, auto-

mated parts handling devices, balancing systems and process monitors,” says Hadley.

“In contrast to the NC control used before, the flexibility of the CNC control was imperative when entering the high-precision, high-volume manufacturing market,” continues Hadley. “The Sinumerik enables Bahmueller and eventually the end user to have exact control over the process. The control has the ability to create a closed-loop system for monitoring and controlling the grinding process. This is the type of system our customers need when manufacturing parts with tolerances in the few micron range.”



The Sinumerik control on the grinders provides the ability to integrate a variety of peripherals



Bahmuller grinders are used primarily for hardened steel and some ceramic parts, for which tight production tolerances must be maintained

Lots of parts, lots of accuracy

John Bergeron, Senior Process Engineer at Siemens VDO in Blythwood echoes this assessment. "The machines are extremely accurate," he says. "We'd run the parts on other grinders and had far less success. These machines run multiple axes, with high production rates, plus we have automatic loading devices and 5-micron tolerance gauges, running in-process on the grinders. All these factors are seamlessly monitored by the onboard CNCs."

Bahmuller grinders are used primarily on hardened steel and certain ceramics. Customers include not only fuel injection system manufacturers such as Siemens VDO, but also producers of bearings, electrical, hydraulic and even medical parts such as shafts and collets for dental drills, where concentricity is paramount.

The packaged CNC on the Bahmuller grinders controls spindle movement, axis positioning and axis oscillation. The Sinumerik 840D CNC is coupled with a Simodrive 611D digital drive package,

which achieves a resolution to 0.0001mm (0.000004in).

In this application involving diesel fuel injector intensifier bodies, the use of Bahmuller grinders helps the customer perform simultaneous internal or face grinding operations in one chucking. High frequency spindles are used in ranges up to 90,000 rpm. The onboard CNC is a 32-bit PC with serial interface, Pentium processor, 16 MB RAM, 3-1/2-in floppy disk drive and continuous path control. Plain language commands and predictive maintenance alerts facilitate easy operator interface and training.

Kelsey Hadley of Bahmuller cites Siemens service, from application engineering to on-site training support, regular control updates and troubleshooting as additional upsides of this builder's control supplier. Local Siemens support is provided by Mark Miller, Southeast Regional Account Manager.

VDO's Bergeron also finds training key. He cites the training assistance provided by Bahmuller as very helpful in reducing

start-up time and maintenance troubleshooting.

Grinding at the edge of technology

Bahmuller was founded in Germany in 1945 and is today a leading supplier to the German metal cutting industry. Its U.S. subsidiary was opened in 1999, offering the company's grinders, toolholders and corrugated board converters.

Bahmuller grinders can be provided with complete automation packages such as loading gantries, robotic articulation and integrated, fully automatic loading and unloading devices for bulk material, nested or standing workpieces.

Bahmuller has other customers in the diesel injection market that produce other components, such as needles, nozzles, plungers, armatures and pump bodies. They are used in auto and truck engine applications. ■

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