



The GageMax CMM from Carl Zeiss provides a flexible measurement solution at Visteon's factory in Düren, Germany. From left to right: Ralf Stocki, line supervisor; Frank Lamberty, head of production planning and production of differential gears; Peter Bachem, process planner; and Dieter Finner, gear specialist.

ZEISS GAGEMAX CMM

REPLACES STANDARD GAGING AT VISTEON

Most people who drive cars don't even know about the pinions and gears in their automobile's differential set, but these are among the most critical components in a modern car, ensuring that each driving wheel optimally transfers engine power to the street.

During production of these bevel gears, maximum value is placed on high-quality production and measuring procedures, with tolerances in the hundredths of a millimeter range.

One place where they're taking that measurement seriously is at the Visteon factory in Düren, Germany. Centrally located between Aachen and Cologne, the factory manufactures several thousand pinions and drive wheels per day. The requirements from the automotive industry are for efficient, customer-oriented production, so the emphasis is on quality, flexibility and delivery reliability.

Because of this emphasis, a correspondingly flexible measuring strategy is required to satisfy customers' increasingly

shorter development times. Standard electronic gages that are primarily used in the automobile supplier industry are simply not enough. Electronic gages can only occasionally be used after a product group has been discontinued. Conversions are often technically impossible or not cost-efficient.

GageMax – The Flexible Measuring Strategy

The Visteon factory has used a GageMax 3-D measuring machine from Carl Zeiss Industrial Metrology for more than a year. The main feature of GageMax is that it can be used directly in production without an enclosure for climate control. The quality inspection of finished bevel gears occurs at specified intervals under the responsibility of the respective machine operator.

“When we decided on the GageMax strategy,” explains Frank Lamberty, head of production planning and production of differential gears, “it was important to us that we could also efficiently use this 3-D measuring machine beyond the product cycle for bevel gears and other products, particularly prototypes.”

Looking back, Lamberty emphasizes that the measurement strategy with GageMax has achieved the required flexibility.

The acceptance and response of the machine operators also underscore the GageMax strategy. This is mainly due to the very good user interface with a touch screen that was implemented in close cooperation between Visteon and

Carl Zeiss. The measurement results are displayed via CMM reporting, providing the operator with an easy and clear interpretation of the measurement results. The measurement plan is designed in a way that corrected values can be immediately transferred to the production machine. Storing and evaluating the measurement data with the third-party statistical software *qs-STAT* and Zeiss’ *CALYPSO* software allow the GageMax to be fully integrated with the factory’s statistical process control and other measuring software.

GageMax Designed for Production

With GageMax, Visteon is armed with measuring equipment that combines the advantages of gages with the flexibility of a 3-D measuring machine. “As

a result of the sturdy design, insensitivity to temperature, vibrations and dirt, the measuring machine is ideal for the rough production environment,” explains production planner Peter Bachem. “The high level of safety, the robustness and the reliability of the GageMax measuring machine make standard gages practically unnecessary.” ■

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Pinions produced at Visteon's factory in Düren, Germany.