At-Line Measuring Technology Is Becoming Modular

Identifying and fixing defects as quickly as possible in car body production requires that numerous characteristics be inspected in-line. Now the ZEISS AIBox bridges the gap between performing inspections that do not disrupt production and the highly precise measurements in the measuring lab. With the AIBox flex, ZEISS is putting an enhanced version of the AIBox on the market. The new digitalization system offers car makers a wide range of options and increases the throughput rates of scanned workpieces.

Quality assurance in car body construction is more essential than ever for preventing expensive recalls. Consequently, ZEISS is already seeing greater interest in metrology solutions which can be performed at-line and even in-line. “Measuring and inspection technology will be a steering tool in the Smart Factory because it will only be self-organizing when quality data from the workpieces are continuously captured parallel to production,” says Dr. Kai-Udo Modrich, who is responsible for ZEISS Car Body Solutions. Industrial measuring and inspection technology will form the interface between the virtual world, where

Another ZEISS AIBox flex application example demonstrates how various components are measured and loaded at different measuring positions.
production processes are automatically prepared and simulated, and the real world, where not everything runs according to plan.

**Multiple solutions: in-line and at-line**
In-line inspection during the production cycle is becoming increasingly important. 100% inspection integrated into production is already in use in car body construction. To prevent defects before they occur, inspection data are evaluated in real time and constantly visualized as trends in data sequences. In-line monitoring requires relatively high precision and image resolution from the measuring and inspection technology under manufacturing conditions – and this must all happen at a speed suitable for the production line.

**Efficiency and quality**
An important piece of the puzzle on the path to defect-free manufacturing is the ZEISS AIBox flex, an enhanced version of the AIBox launched by ZEISS last year. This digitalization box makes it possible to perform a complete optical scan of attachments near the production line while still measuring them with great precision. Thanks to its modular structure, customers can significantly modify the ZEISS AIBox flex to meet their needs.

For example, they can now choose how the loading systems are inserted into the box. They can also determine the number and size of the available measuring positions in the ZEISS AIBox flex. Many automotive manufacturers want to be able to scan side panels near the production line, which ZEISS accommodates by putting the measuring robot on a rail. “With the implementation of the seventh axis, we have given the robot translational movement capabilities,” says Modrich. This change significantly increases the utilized capacity of the sensors and consequently the throughput of the scanned parts. To take an example: while the system performs a scan at the first measuring position, the system is already being loaded at the second measuring position. The robot then travels immediately to the second measuring position after scanning the attachment at the first one. “With the further evolution of our robot, our customers’ investment in an at-line solution pays off much more quickly,” concludes Modrich. “This may further increase their readiness to use the digitalization box, which ultimately reduces the number of rejects or parts which need to be reworked in car body manufacture.”