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**Achieving
100 % Quality
at the Manual
Workstation.**

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Quality Assurance in the Automotive Industry

Zero defects are the basis for lean production

Times have changed and conventional mass production is a thing of the past. Particularly in the automotive industry, mass production as per Henry Ford is not always appropriate for today's variety of models. Instead of automating entire production lines for the overall production processes, it is now increasingly common to integrate semi-automatic production steps. It is the smaller production batches that are raising the importance of the lean production concept. The aim is to maximize the process efficiency of the production as a whole, while minimizing waste and thereby reducing production costs.

For WEIDMANN Plastics Technology, a supplier of the automotive industry, lean production represents not only an important requirement but also a challenge. On one production line at the site in Treuen, a complete air damper control unit is mounted and then checked. One component of this air damper control unit is a gear motor which regulates several dampers via kinematic.

In order to assemble the kinematic, WEIDMANN needed an ergonomic manual workstation away from the main installation line: At the end of 2013, the company Flexible Montagetechnik (FMT) was commissioned to develop this. As a specialist for manual and semi-automatic workstations, FMT supplies its customers with construction, assembly, commissioning and maintenance services for assembly, transfer and handling technology. The company was assigned to develop an assembly system for WEIDMANN, which would produce and test variable types and numbers of mechanical assemblies according to the principle of lean production. In order to meet these needs, FMT developed an assembly line based on the manual production system of Bosch Rexroth, composed of several independent as well as connected height-adjustable workstations, with a manual component feed within direct reach of the operating personnel.



Ergonomically fitted manual workstation with integrated quality assurance

In addition, the workstation was supposed to also accommodate an assembly process that integrates quality assurance in the form of force-displacement monitoring – an increasingly important requirement of industrial production due to the rising demands in terms of product safety, conservation of resources and quality assurance. On its search for a partner who would be able to realize these challenging quality requirements, there was only one choice for FMT: Since 2008, the company has collaborated with the measuring technique experts from Kistler on projects requiring process monitoring and had always been impressed by Kistler's technology and service.

Kistler, one of the world's leading providers of pressure, force, torque and acceleration sensors as well as the corresponding electronics and software, delivered just the right solution for this project, too: The maXYmos BL force-displacement measuring system monitors, evaluates and documents the quality of each production step and product based on a curve progression.



"Thanks to the excellent advice we received from Kistler while we were planning and realizing the project, we have been able to meet the quality assurance demands set by WEIDMANN for the press-fit of the coupling rod splint in every respect."

Michel Enger, Director FMT

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High Requirements

In the production of the kinematic, a total of eight individual components have to be inserted into a PokaYoke cavity and installed one after the other. During the installation of the coupling rod a splint also has to be press-fit into place.

With these press connections in particular, the joint connection can only be checked afterwards by a destructive testing procedure. In order to avoid damaged products, each step of the assembly process is monitored by the maXYmos BL to ensure that all quality and documentation requirements are fulfilled. A value table shows the process values and the related target limits of the respective evaluation elements. If a process value is within the target limits, it is displayed in green, or otherwise in red. This means that any process deviations are recorded immediately and potential faulty parts can be filtered out at an early stage.

Strong Partnership for Clear Results

Thanks to the efficient teamwork between FMT and Kistler, WEIDMANN was able to put the new workstation into operation punctually after only five months. "The workstation is a great success, which is reflected not only in terms of the lean production requirements, but also in the feedback we have had from our operating personnel," says Michel Enger, Director of FMT. "Thanks to the excellent advice we received from Kistler while we were planning and realizing the project, we have been able to meet the quality assurance demands set by WEIDMANN for the press-fit of the coupling rod splint in every respect."

Force-displacement monitoring by Kistler ensures the basis for zero-defect production. Independently of the operating personnel, the measuring system ensures that all processes are executed to a consistent level of quality. Based on the force-displacement curve in the maXYmos BL, faulty parts are detected at the earliest stage possible and removed from the production line. This contributes significantly to the lean production approach by saving on resources and maximizing production efficiency.

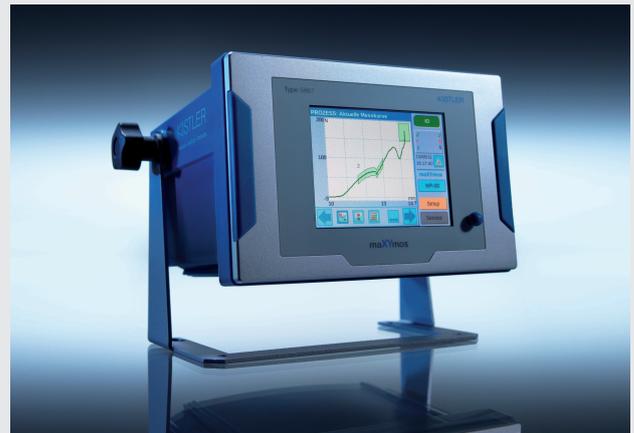
At the same time, the ergonomically fitted workstations offer not only an optimal environment for the operating personnel but also increase their productivity. The working environment can quickly be adjusted to people's varying sizes and individual scope of reach and enables the best possible access to work materials and control elements.

A Solution for the Future

"This project is representative for the needs in the automotive industry of the future," says Enger. "The increasing range of models in this segment means, to a certain extent, ever smaller numbers of pieces calling for further intelligent and semi-automatic assembly lines. I therefore assume that the requirements dictated by lean production and quality assurance are likely to increase – and Kistler will continue to be our first contact partner therein."

Maximum Control for Your Processes

XY monitors by Kistler continuously check and evaluate the quality during manufacturing, mounting and product testing processes.



XY monitoring with maXYmos BL for in-process quality monitoring and product checking during joining and mounting processes



The XY maXYmos monitors oversee and evaluate the quality of a product or production step on the basis of two measured variables in relation to one another

Benefits of XY monitoring with maXYmos

- Easy to integrate within existing facilities and processes
- Intuitive and standardized handling concept
- Powerful diagnostic tools
- Extensive options for fast detection of quality NOK causes
- Standardized interfaces
- Identical signal and data formats

Further information about the application

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