

Meiko Maschinenbau

Case study: Metal Fabrication

Application

- Bending

Products

- Commercial dishwashing machines and systems



Bordering on the impossible

An automatic robotic bending system is producing more than 120 parts without manpower in a three-shift operation at hygiene specialist Meiko. The complex system is setting new standards with high continuity and reproducibility in the robot-supported automation of bending processes.

> The German company Meiko Maschinenbau GmbH is a world leader in commercial dishwashing, cleaning and disinfection technology. To maintain this status, it depends on both rationalizing production and increasing quality. In this, three-point bending presses made by Hämmerle and a fully automated robotic bending cell, also based on three-point bending technology, play a major role, along with automated laser cutting systems. The cell supplied by the Swiss bending and laser technology specialist Bystronic in cooperation with ABB is unique. It has a bending length of 4,000 millimeters and an extremely high degree of automation, in which an ABB robot shapes sheet metal with a thickness ranging from

0.5 millimeter to 2 millimeters. Bystronic delivered the press with a robotic interface and sensors at the back-stops. The complete system came from ABB Friedberg and was pre-manufactured at its plant.

Meiko's main plant, situated in Offenburg, in Baden-Württemberg, processes about 2,300 tons of stainless sheet metal annually. The company considers itself the world leader in automated bending with robotic bending cell. "We know all the relevant systems in detail, and there is not a single alternative available that outperforms our system in productivity, performance, throughput and, especially, flexibility," states Franz Nöst, production manager at Meiko. "We were in search of an automatic

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The ultra-modern production environment is a must for Meiko, in the company's quest to guarantee greater bending lengths with one-tenth accuracy.

bending system with robots that was easy to program externally, so we could start with production at the plant right away, without great effort." However, that search proved to be more difficult than expected. "When we started our inquiries, many promised us the world," Nöst recalls. "But when we arrived with our reference parts, the suppliers had to face the hard facts, and they got cold feet."

Because of the specification profile, it quickly became clear that the three-point technology made by Hämmerle would become the manufacturing basis for the systems. "The welding and connecting technology marks the end of our process chain," explains Christoph Homburger, manufacturing manager at Meiko. "If you want to automate this, you have to contribute corresponding preliminary services in the form of optimal precision. This applies especially with the currently still-dominant WIG welding technology, and even more with

the implementation of robot-supported laser welding, where gaps of 0.1 millimeter are required as the basis for high-process assurance without compromise." Precision plays a major role, especially with bending, thanks to the increasing functionality of production parts that have more and more bends, so that subsequent welding is kept to a minimum. Increased demand for bend accuracy is inevitable. "We are acting on the border of the impossible with our quality demands," says Nöst. "In the past there were dimensional variations that allowed us to work with inaccuracies in the 1 millimeter range on a bending length of 2,000 millimeters. Today, we are forced to produce with a one-tenth accuracy even with far greater bending lengths."

Once the technical requirements for bending had been clarified, there was still the need to program the robotic system and, especially, the integrated software solution off-line. "Our vision was to enter the geometry and material specifications and program the robot and bending program externally at the touch of a button, and then switch the plant to automatically process the order with minimal setup efforts," Kolb explains. "Even though it is easy to read, it presented a great challenge for Bystronic and ABB. An open interface was required to transfer the specifications of the Bystronic bending software, Bybendpart, to the ABB programming system, BendWizard. The robot program for the bending sequence then had to be generated based on this information."⊙

>FACTS

The importance of precision bending:

- Robot-supported laser welding demands high-process assurance.
- Less allowance for dimensional variations, combined with greater bending lengths.