

Reference

Satisfied customers: Our primary objective
Müller Weingarten AG



Form follows technology



MÜLLER WEINGARTEN

Müller Weingarten AG

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Company profile

Müller Weingarten AG develops plant and processes for forming, cutting, forging and casting a variety of materials, primarily for the automotive industry. The former company Umformtechnik Erfurt was taken over in 2002 by Müller Weingarten AG. This move created the second largest manufacturer of pressing and forming technology worldwide. Following the takeover, Müller Weingarten AG transferred its entire welding portfolio to Thuringia.

The company employs around 550 people at the Erfurt site, with a hundred people working in the welding shop.

Submerged arc gantry - a very special welding machine

Having amalgamated all its welding activities in Erfurt, Müller Weingarten AG now required a plant for both the submerged arc and MAG welding processes using two-wire technology and for material thicknesses up to 400 mm.

The staff in the welding shop designed a column and boom with an 8 m high pillar and 10 m reach. Four companies tendered

for the corresponding system and OERLIKON won the contract. The overall weight of the final installation is around 35 tons; which took more than a year from design to commissioning.

INTERVIEW: Which questions had to be taken care of before awarding the contract?

In the first phase we weighed up the basic alternatives of an automated versus a robotic system. The comparison clearly showed that an automated solution was the better option. There were several reasons for this. First, there was the problem that the column and boom essential to the overall concept owing to the part dimensions and the resulting design of the supporting structure would lead to vibrations.

This is not permissible with robot welding. In addition, the weld tracking system for submerged welds is not yet sufficiently developed. The not inconsiderable tolerances due to the distortion of the workpieces during the welding process and unevenness in the sheet would have to be measured by a camera and transmitted to the system. The controller would also process this information when a weaving movement began in addition to welding parameters. If MAG processes with high melt-off rates were to be used in view of the weld volume occurring at Müller Weingarten, an automatic welding head would be needed with nozzles that – with their very small opening angle of 40° – would scarcely fit into the welds. A pendulum action would then be impossible. Furthermore, the component structure at Müller Weingarten is rarely repetitive, so that the major benefits of robots for high-volume production rates could not be exploited. Practical tests were carried out, of course, to compare the different processes before the actual investment decision was made. A welding tractor was purchased specifically in order to test the twin-wire submerged arc welding technique. Intensive welding trials were carried out at the same time using robotic techniques. These tests confirmed once again that the column and boom was the right system for the job.

What made you choose OERLIKON?

OERLIKON is a centre of expertise. It provides support to the Müller Weingarten submerged arc welding team in many different ways and offers valuable experience from a whole range of areas. We also expressly decided to use



OERLIKON auxiliary materials and remain a customer after the end of the project.

This installation is a reference project for OERLIKON and its smooth running is a matter of pride. However, this eventual success is not always easy to predict along the way. Müller Weingarten values fair, long-term customer/supplier relations and is also reliant on expert rapid assistance for service operations. This requires good personal relationships as well as sound business agreements. The commissioning of the submerged arc welding column and boom involved a great deal of effort. OERLIKON employees were hard at work for five weeks, day and night, during which their commitment and energy never failed. This is what made the difference for us. The point at which you would normally expect to hear “That’s the equipment, the wire goes there, the gantry works but you need to do the welding yourself” was the point at which the OERLIKON team set to work. All problems were solved jointly with no argument and tremendous dedication. By then at the latest, the project team were certain they had found the perfect partner. The

cooperation continued to be outstanding even afterwards. “OERLIKON was and still is the optimum choice. We have a very good system and we value their excellent service.”

How was the project management?

The Müller Weingarten project team had very strict requirements regarding the dimensions and performance of the column and boom. All welding positions were defined, as were the welding processes to be used (up to 95% twin wire welding, gravity position). In addition, provisions had to be made for tandem welding. A particular challenge here was the wire feed system, since it would be impossible to integrate drums due to the very long feed path. We now use standard welding wire spools which are changed more frequently for longer seams. As tandem welding represents only about 5% of our total applications, this solution is feasible.

How does the system perform commercially?

The welding system has been in use at Müller Weingarten for two and a half years and has

significantly exceeded our expectations. We had a few teething problems at the start, of course. None of our competitors use this kind of system in pressing operations. We were in fact pioneers. The project was well supported in terms of communication with our employees. We sought the involvement of all affected personnel, who very quickly accepted the machine and recognised its benefits. The submerged arc welding machine meanwhile runs for 3,800 hours a year. The longest parts that have ever had to be welded on the machine are 14,600 mm. 75% of our welding volume is still carried out by hand, while 25% is now automated.

What has changed with the installation of this machine?

It was very important to provide the design engineers with comprehensive information about the welding machine’s potential benefits. All technical design departments now consider the principles of automated welding design from the start. We also now work differently in the welding shop. During the work planning



phase we consider the extent to which the technical designs can be broken down into sub-assemblies and which parts lend themselves to automated welding. Two different parts are often welded at the same time to make optimum use of the two welding heads. As well as automated seams that are specified in the work plan, the crew – which works as a team – also arranges for additional welding operations to pass through the column and boom if this appears practical. The team generally increases its efficiency in this way. Around 800 hours of work have meanwhile been completed and accounted for in this manner. It is not only economy that drives the team to experiment with the system, however. They also want to improve working conditions (restricted access, welding in difficult positions and in confined spaces) and are now attempting to automate this kind of work. In addition, welding capabilities are today also offered to customers from outside the pressing industry and welding subcontracts are carried out on the column and boom. Demand is increasing both internally and externally.

How do you view Germany's current position as a welding location?

With its production site in Erfurt, and particularly with the implementation of numerous projects within the welding plant, Müller Weingarten AG has invested in a comprehensive way in Germany's position as a welding location. In global terms the problem is that manual welding in Germany is a highly wage intensive process. This can be offset by a willingness to invest in technology and processes. By steadily increasing productivity, leveraging the synergy of engineering design and production and

concentrating our welding, machining and assembly capacities at one site, we have managed to make single in-house sourcing of large, machined and assembled welded parts the most favourable route for our company. There is a future for welding in Germany with the right concepts.

Do you have service agreements in case of emergencies?

Since the individual processes are heavily interdependent, bottlenecks build up particularly when the machine is idle. In extreme cases OERLIKON has always managed to provide a working solution within a maximum of 48 hours.

Technology:

Melt-off rate

The melt off rate for a wire feed rate of 8.7 m per minute is up to 26 kg per hour if both welding heads are in use simultaneously. This corresponds to around 10 times the output of a manual welder.

Welding process and auxiliary materials

The twin-wire submerged arc welding process with 2 mm wires is operated on the column and boom. Müller Weingarten uses OP 181 flux. Electrodes and filler wires are likewise supplied by OERLIKON



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