



Clamped component for mechanized SA welding

MORE PRODUCTIVITY ALL AROUND:

Circumferential welding of pump and valve housings with special sensor technology Stefan Kröger – Böhler Welding Automation

The customer's requirement was to increase productivity by means of appropriate automation. Manual metal arc welding was used to weld the cap passes for the large-volume pump and valve housings used in power plant construction. Each component was clamped on a turntable where experienced welders made the circumferential welds by hand. The productive solution: a specially designed submerged arc welding machine from Böhler Welding Automation. This task was concerned exclusively with the welding of the cap passes. The root still had to be welded by hand using the tungsten inert gas method.

Circumferential does not mean circular

For the mechanized submerged arc welding of the cap passes, the asymmetrical course of the circumferential weld presented a special challenge with respect to the guidance of the welding torch (SA head). With a regular, circular circumferential weld, the welding head is fixed, and the component rotates below it at welding speed. This gives a more "elliptical" weld. Böhler Welding Automation developed its own algorithm, whereby the Böhler Welding Automation control technology is based on that of Siemens PLC. This also allows for seam tracking control.

Implementation

For the welding of housings, the movements of the columns and booms and that of the turntable were initially designed as NC axes. Servo motors with integrated incremental encoders serve as drives. The controller can record and store the exact position of the welding head with the aid of a welding path measurement. Additional data are read in and processed by the controller via a special tactile sensor which tangibly scans the weld. This then optimally positions the welding head. All numerical axes are included in order to drive an optimal contour. A positioner specifies the welding speed via the rotary motion. The contour of the weld is set via the tilt axis of the positioner, the longitudinal axes of the columns and booms, and the three axes for the motion of the welding head (height, side and angle of rotation).

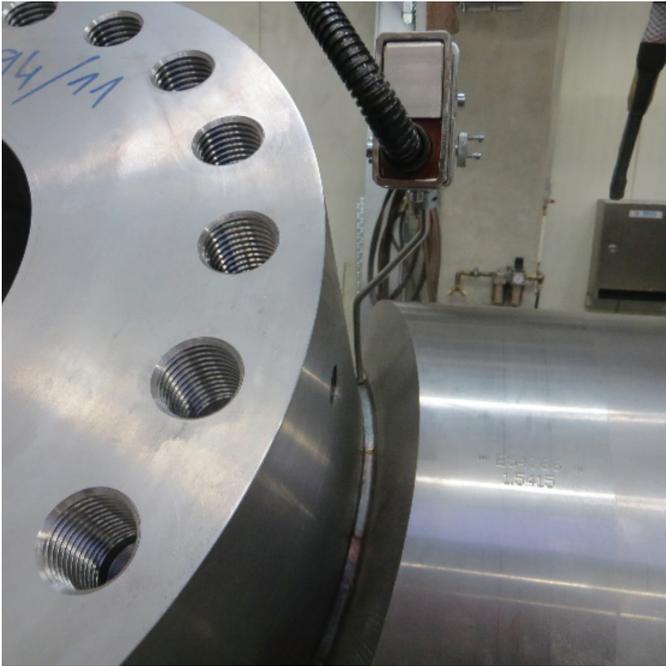
The welder can correct the welding track at any time and decide whether the controller should save this correction or not. The next identical component is then welded again with the same welding track (= position of the welding head) and the same welding parameters.

Result

Productivity is increased many times over by converting from manual arc welding to the SA process. A complete solution with the appropriate Böhler Welding wire/flux combinations produces welds of the highest quality which pass the subsequent testing using the phased-array process without errors.

The exporter

Böhler Welding Automation combines its unique expertise in welding consumables and welding processes for multi-wire submerged arc welding with the highest level of automation expertise brought about by the merger of Böhler Welding with welding automation specialist Weltron. With coordinated complete solutions from a single source, Böhler Welding Automation is your value-added partner for quality, productivity and profitability.



A special sensor records the data for optimum control.



Quality and productivity through automated submerged arc welding

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