

PRESS INFORMATION

Laser welded towel radiator: a hint of wellness in everyday life

Hamburg, Germany/Deventer, Netherlands, August 2016: The fitness and wellness trend is popular worldwide. After a strenuous workout or relaxing spa day, a little pampering goes a long way. Heated towel radiators are popular luxuries found at gyms and spas worldwide. A Russian radiator manufacturer has had an automated welding system developed by the Dutch special purpose machine manufacturer Rodomach, relying on fiber lasers from ROFIN in the process.

Complex task – simple solution

The radiator manufacturer had a clear vision when he approached Rodomach to find a solution: the complete product range of towel radiator models is to be converted from the present TIG welding by hand to an automated laser welding. In the process, the system is to be able to weld models with round pipes and models with angular pipes and special pipes. The welding depth is to be 100% and the 25 bar pressure test of has to be passed. The last and most important requirement is a uniform, beautiful and flawless seam weld that requires no post-processing, so the final step, an electro-polishing, can shine the stainless radiators to a mirror finish.

First and foremost was the precise analysis of the products to achieve the automated weldability. Robin Le Roy from the Dutch ROFIN subsidiary in Alblasterdam was involved in the project at an early on. “The end customer absolutely wanted laser welding and already had positive experiences with his two PWS tube welding systems from ROFIN” says Le Roy. “So it was clear to him to also employ ROFIN lasers in the new system.”

First trials in the Hamburg Application Laboratory showed that the used austenitic Cr-Ni-Steel AISI 304 was easy to process, but the wide gap was too large and therefore a consistent, high-quality welding seam could not be guaranteed. The product requirements were determined together with Rodomach and suggestions for improvement were recommended to the end customer to enable automation and weldability with consistent high quality.



Pic. 1: Roel Doornebosch (right), General Manager Rodomach and Robin Le Roy (left), Sales ROFIN and the new system for welding towel radiators



Pic. 2: Laser-welded towel radiator

“My experience with Rofin’s Application staff was excellent. They were extremely knowledgeable, provided solid recommendations for process improvement, and were easy to work with,” reports Roel Doornebosch, Manager at Rodomach. Clamping the part and preventing warping were the main obstacles for this project as it is a key factor for successful welding results. With collaboration and “out of the box” thinking”, the team came up with a clever solution. Instead of using traditional clamp tooling, servo-controlled clamping with integrated cooling is utilized. This tooling method evenly clamps the part at all welding points and the cooling prevents the joints from warping.



Pic. 3: System for welding different towel radiators

After conclusion of the trials, the applicators from Hamburg recommended a 2 kW fiber laser ROFIN FL 020 with a 300 µm fiber and a focal length of 300 mm. “With the high depth of field, the customer has a greater process tolerance and can therefore reduce scrap parts and improve productivity,” states Peter Kallage, Manager of the applications lab in Hamburg. Through the use of a beam switch, a laser can operate two robot welding stations which weld the two sides of the radiator alternately. “We have pooled the control of the system, the two robots and the laser on one terminal, to allow the customer simple operation of the system,” reports Doornebosch. “The customer was aware of the complexity of the requirements right at the beginning of our collaboration and was eager to find out what we could offer him. It seems that we have surprised him, because he had not expected such a simple solution in the end.” With a welding speed of 2 m/min, successful pressure test results, which resisted even 250 bar far exceeding the 25 bar specification, and the constant high weld quality, the customer’s expectations have been surpassed. So much so, that the customer has followed the initial order with an additional two systems. A true success story for all parties involved.

Further Information:

RODOMACH –Special machines from the Netherlands

Rodomach Speciaalmaschinen B.V. was established in 1997 by Roel Doornebosch and today employs about 25 staff at the Dutch location in Deventer. The medium-sized company has specialized in special mechanical engineering, focusing on connection technology and has been offering, in addition to conventional methods, systems with laser technology since 2010, which in the meantime make up about half of all sold systems. Specialised machines always require a precise analysis of the customer requirements and thus the customer is the centre of attention with the Dutch company: “We try to gain as much information from the customer and his expectations ahead of the project, to analyse these precisely and then offer him what he really needs and not what he thinks he must have. Added value is a major point for us which is also honoured by our customers,” comments the Dutchman. The special machines are used, among other areas, in the automotive and metal industries as well as in many other industrial sectors.

The ROFIN Macro Group

The ROFIN Macro Group, located in Hamburg, Germany, focuses on high-powered industrial material processing with lasers and is associated primarily with sheet metal processing within the machine tool or automotive industry. Fiber and CO₂ lasers in the multi-kW range are used in production facilities all around the globe – mainly for cutting but also for welding applications. For surface treatment applications, the fiber-coupled diode lasers and the diode-pumped, Q-switched lasers add to the product range. The portfolio is rounded off by intelligent system solutions for scanner welding as well as for process safe welding of tubes and profiles.

ROFIN Fiber laser – brilliant laser for almost every application

ROFIN's FL-Series are brilliant fiber lasers which are available with an output ranging from 500 Watt to 8 kilowatt. Through the choice of the different fiber diameters, the laser can be used for almost every task in industrial material processing. In the Compact Version, the lasers are available with solid "spliced" fiber, or in the Standard Version with a separate housing for beam management. The Standard Version has up to four fiber outputs for beam switching or division, which is fitted with a two-channel safety interface respectively.

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