

Auto Ring Welding System for Medical Device Manufacturer Improves Product Yield by 32%

A high-volume medical device manufacturer needed to drastically increase production to meet growing demand while maintaining and improving overall product quality.

Challenge

A medical device manufacturer that performs both component level and device level assembly needed to increase production volume of their ring welding process to meet rising production requirements.

Their previous process, which was manual, was slow and resulted in only 65-70% product yield. Their process involved small parts handling with fine accuracy requirements, precise adhesive dispensing, and additional product types.

Solution

PAR Systems designed an automated ring welding system to specific product and material specifications that introduced automation and precision into the manufacturing process. This system was designed to meet higher targets for throughput, precision, and accuracy.

This system unspools a ~0.010" diameter wire, inserts and positions the wire into a ~0.025" diameter ring, welds the wire within a 0.0015" radius of the weld target, applies an adhesive to the weld using a precision micro-dispenser, cuts the wire to a specified length, and finally winds the end product around a spool to be distributed for final assembly. The system combines multiple processes and key technologies into a single automated production unit while also grading the part quality using machine vision along the way.

About Us

PAR Systems is an industry leader in designing and implementing small parts handling systems and has a long history of automating processes for the medical device manufacturing industry. In this project, PAR worked with the customer to create a customized automated ring welding system that uses advanced technologies to improve cycle times and product quality, resulting in higher production overall for the customer.

System and Project Highlights

- » Customized to unique product specifications
- » Precise and rapid small parts handling
- » Precise adhesive dispensing
- » Vision imaging feedback for a variety of products within one system
- » OEE reporting and tracking
- » Custom software integration with existing MES

Results

Overall product yield increased from 65–70% to 92–97%.

Precise wire placement within 0.0015" of a target radius.

Full part processing in under 50 seconds.

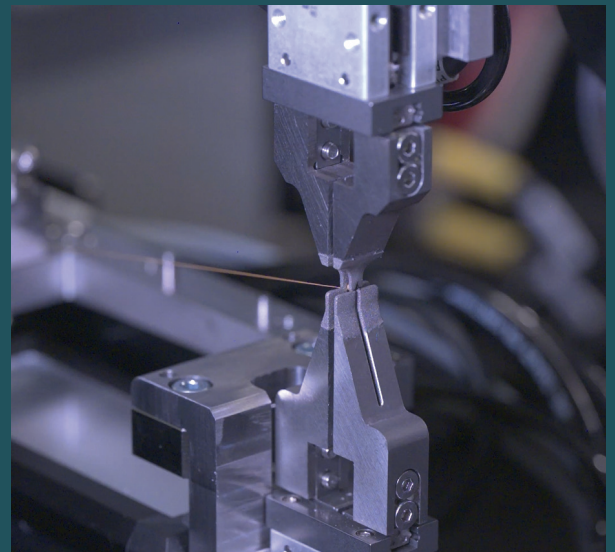
The customer has already seen multiple improvements in terms of operations and product results since receiving the automated ring welding system.

The fully automated system uses precision vision-guided motion to locate and weld the wire within a 0.0015" radius of its target, and apply an adhesive using high precision dispensing system. The various functions of the system (wire measuring and cutting, laser welding, adhesive dispensing and curing, quality inspections, and spool winding) all occur within a single unit. This precise automation reduces human error in the ring welding process and increases overall production speed and repeatability. After implementation, the customer saw a reduction in cycle times and an increase to 92–95% of product yield.

Integrated OEE reporting and tracking allows the customer to monitor key production metrics. PAR prides itself on building relationships with its customers through ongoing support and communication of current production metrics, making process and system improvements as necessary. Throughout this project, our project managers exercised extensive communication with the customer to ensure the system functioned to its highest capability and fulfilled their requirements.

Building Technology for the Future

This project has been proven successful, and with growing demand, PAR is actively building out additional systems to help their customer realize higher production volume and yield. In addition to building more machines, PAR will be implementing additional technologies to further improve the cycle rate, system yield, and quality control.



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