WeldComputer
The Technology Leader in Resistance Welding

Case Study

Resistance Welding Manufacturer **Improves Consistency, Eliminates Destructive Testing** After Implementing **WeldComputer's Adaptive Control**

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THE COMPANY

WeldComputer worked with a $20B+ American multi-national power management and manufacturing company that produces mechanical supports, cable tray systems, strut systems and accessories, and more. Their operation uses an automated seam welding line to make welds approximately every four inches along a strut. These struts come in various materials (plain steel, stainless steel, or galvanized steel) with 12, 14, or 16-gauge thicknesses.

THE CHALLENGE

The Manufacturer started to notice increasing levels of variability and inconsistency with their welds. The main source of variability stemmed from poor part fit-up on the ends of the struts as the parts did not fit flush together over the entire length of the struts. The Company requested an on-site visit from WeldComputer to analyze the performance of its production operation, implement strategies, and provide recommendations to achieve the goals of:

- improving weld consistency,
- reducing the incidence of problem welds, and
- reducing or completely eliminating destructive testing.

THE SOLUTION

The Company was able to improve weld quality by using the WeldComputer Adaptive Control. Parts were produced with superior consistency and fewer failed welds. Confirmatory destructive tests demonstrated that the weld outcome information was instantly reported to the PLC after each weld matched up with the destructively tested results.

POOR FIT-UP ISSUES ARE SOLVED BY AUTOMATIC HEAT AND FORCE ADJUSTMENTS

Using WeldComputer's adaptive schedule, the control detected when there was a fit-up problem with a part, automatically applied the right amount of heat to soften and squeeze the materials together, and once it successfully corrected the problem, applied the correct heat and force to produce a successful weld within the appropriate parameters. Using the WeldComputer Adaptive Control, the Manufacturer was able to significantly reduce weld variability caused by variations in their part geometry. This allowed consistent welding to occur in situations where acceptable welds could not otherwise have been produced.

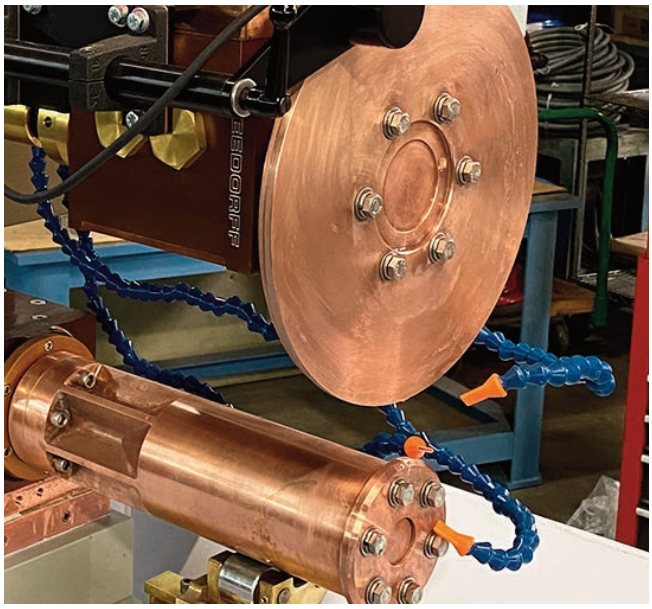
SAY GOODBYE TO EXPENSIVE DESTRUCTIVE TESTING. SAY HELLO TO QUALITY DATA.

After the Adaptive Control started consistently producing and correcting previously undetected problem welds, the next step for the Manufacturer was to ensure they were able to measure the quality of the welds produced. By using the built-in thermal expansion measurements for each material type and thickness welded, the welding engineers were able to prove acceptable strength welds based on the thermal response exceeding the minimum value set in the schedule. The Result: the Manufacturer was able to eliminate the need to perform costly destructive testing through data.

If a weld was produced outside of the minimum acceptable standards, the adaptive schedule would trigger a warning and an alarm reporting the conditions to the welding operator and transmitted to the PLC after each weld. The alarm alerted the PLC that the weld created should be rejected. The data can be leveraged across multiple reporting levels to provide the PLC with the ability to track the process trend over time. If the degraded process continues, it may indicate that proactive corrective action is most likely required to remediate the poor quality welding.

AUTOMATICALLY ADJUST CORRECTIVE HEAT FOR SUPERIOR WELDING QUALITY

The Adaptive Control further reduced rejected welds passing through production by configuring the system to automatically apply a repair weld action when a condition would occur such as expulsion prior to completion of a weld. This meant that instead of reporting a problem to the PLC, a code is reported to indicate successful welds driven by the Adaptive Control. This action further improved production weld consistency and reduced the incidence of welds that had to be rejected.



ALERT OPERATORS OF ISSUES AND HOW TO REMEDIATE THEM

During the visit, another unique challenge was uncovered that prevented efficient welding; when an adhesive-backed barcode label had been placed near the welding location, it would hinder the system from maintaining its programmed current. To remedy this issue, an adaptive schedule was configured to transmit a code to the PLC to report whenever this condition occurs so the operator can be alerted to move the label.

MINIMIZE MATERIAL LOSS DUE TO EXPULSION VARIABILITY

Occasionally, issues with expulsion during weld formation (loss of material from lack of ability of the electrodes to fully contain the molten material throughout weld formation) would create poor welds. The Adaptive Control was able to instantly terminate the heat during the weld, followed by engaging in a repair weld operation, whenever expulsion was detected. This significantly minimized the material loss, further increased weld consistency, and reduced the incidence of rejected welds.

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