SUCCESS

LINCOLN ELECTRIC
THE WELDING EXPERTS

Fire Suppression Tank Manufacturer Virtually Eliminates Rework With Custom Weld Solution

Power Wave® AC/DC 1000™

Fike Corporation

Fike Corporation manufactures fire protection systems, fire detection systems, an extensive line of rupture disc (or rupture disk) products and industrial explosion/dust explosion systems.

-CHALLENGE-

- Reduce rework
- Eliminate arc blow

-SOLUTION-

Lincoln's Power Wave® AC/DC 1000™ submerged arc power source and Waveform Control Technology®.

-RESULTS-

- Minimal rework
- Arc blow eliminated

LINCOLN ELECTRIC NEXTWELD®

What do companies managing telecommunications facilities, clean rooms, data processing centers and priceless artifacts all have in common? An acute need to protect their assets from a variety of hazards and threats. This includes fires, which can have an irreversible and devastating effect on equipment, data and products.

Fike Corp. has built a successful business out of providing fire protection systems, fire detection systems and other products that arm companies with tools to minimize business interruption, save money and protect valuable assets.

One of the key components of Fike's fire protection systems is fire suppression tanks with a capacity of 10 to 1,000 lbs., which contain the chemicals necessary to immediately suppress any threat of fire in sensitive commercial environments, such as a telecommunications facility or laboratory.

All of the fabricating for the suppression tanks, which vary in thickness from 10 gauge to 3/8" steel, takes place on site at Fike's Blue Springs, Mo., facility.

Fike's manufacturing process includes submerged arc welding for the longitudinal and circumferential seams of these vessels.

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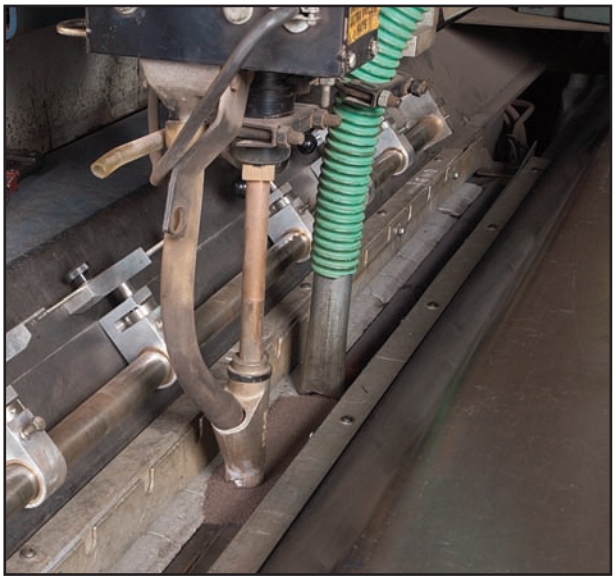

The manufacturing process includes submerged arc welding for the longitudinal and circumferential seams of these vessels. Because of the type of materials they house, the containers also go though a rigorous inspection process, including real-time x-ray to examine the integrity of the longitudinal welds immediately after the welding process and pressure testing upon completion of the tanks.

Fike began experiencing weld quality issues, including arc blow and cracking. Although the end cracking issues were resolved by Fike's weld team, the porosity was still an issue and the team speculated that the problems were due to the magnetism in the machine fixture.

"At its worst, we found ourselves reworking up to 50 percent of our longitudinal seam welds," said Bill Schwagerman, Fike's process improvement analyst. "The longitudinal seam welder was a bottleneck in the production flow process. And with both our quality standards and DOT's to meet, we were simply spending too much time reworking containers to get them to meet those standards. The problem was costing us significant money both in time and materials."

The company spent considerable time investigating the reasons for the welding issues. It had marginal success by reducing the arc voltage, which tended to create undercut and poor bead appearance. In some cases, they needed to use a second weld pass to further correct these issues. However, this approach did not provide a viable, long-term solution.

Unable to correct the apparent arc blow issues in house, Schwagerman and his team turned to outside help. They invited the leading welding equipment manufacturers to work with them to identify and solve the problem.

"We tested and experimented – we tried different fluxes, welding wires, grounding, and demagnetizing the process," Schwagerman explained. "Though we would see small improvements from time to time, we still weren't finding the magic bullet."

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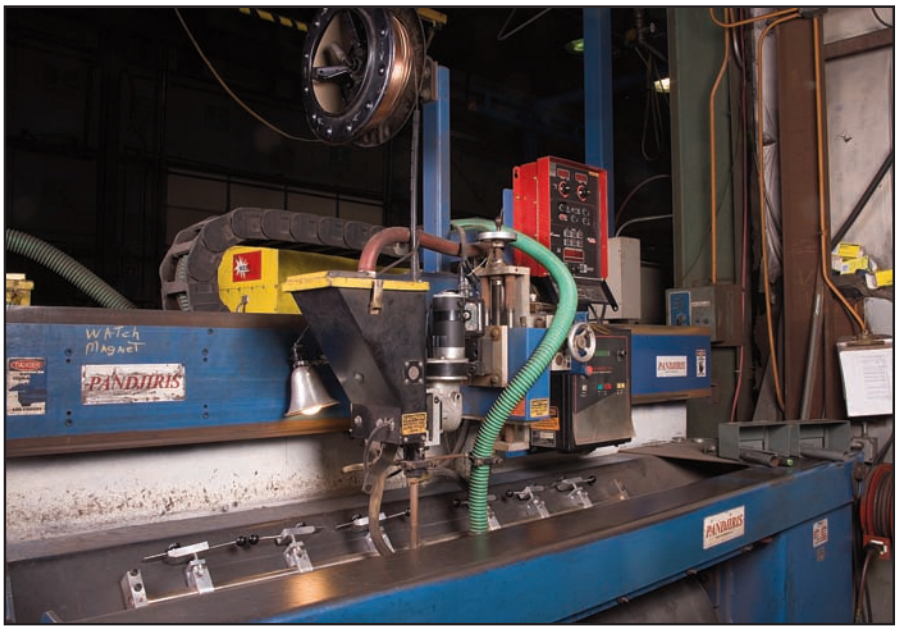
The answer was located in the application engineering department at Lincoln Electric®'s Cleveland, Ohio, headquarters. The department frequently recreates customer



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manufacturing environments and scenarios to identify ways to improve welding techniques and productivity and solve problems that arise, such as the one encountered by Fike.

"The result of this exhaustive and methodical process is very minimal rework. The welds on all thicknesses are visually beautiful, and their integrity is proven by our x-ray equipment."

Lincoln application engineer Dave Barton and Technician Greg McCall examined the rework that Fike was experiencing due primarily to internal porosity, undercut and centerline cracking at the end of the welds. With its current equipment, the manufacturer was limited to using DC current with its horn-style seam welding system, and the assumption continued that arc blow was the root cause of the quality defects.

Working with Fike's team, Kirk Welding Company's Andrew Latas (a local Lincoln distributor), and Lincoln sales representative Bob Simmons, Barton and McCall found themselves challenged to identify a solution that would drastically reduce or eliminate weld defects. Based on their combined years of experience, they suspected that the answer lay in utilizing Lincoln's Power Wave® AC/DC 1000™ submerged arc power source and Waveform Control Technology®.

They tackled the issue in two parts – working in Lincoln's application engineering lab, the team first performed hands-on demonstrations that the system could produce acceptable results and furnish a starting point by welding on the thickest tank shell Fike produces. The second phase was to further refine the welding procedures on site at Fike.

The combination of Lincoln's Power Wave® AC/DC 1000™ and Waveform Control Technology® provides variable frequency and amplitude AC, DC positive or DC negative for maximum control of the weld metal deposition and penetration. Weld speeds can be increased, higher quality welds typically result and efficiency is improved in both single and multi-arc applications.

The application engineers conducted the weld trials on 5/16" thick steel and used the Power Wave®'s AC capabilities. In the lab, they were able to eliminate the small pores.

"The result of this exhaustive and methodical process is very minimal rework. The welds on all thicknesses are visually beautiful, and their integrity is proven by our x-ray equipment," Schwagerman stated. "We're able to get product to our customers faster. This means more up-time for our team, significantly increased productivity and nothing but benefits for our bottom line."

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Featured Lincoln® Products

Power Wave® AC/DC 1000™

The Power Wave® AC/DC 1000™ is the first power source to introduce Waveform Control Technology® to submerged arc welding. An operator can increase welspeeds, yeild higher quality welds and improve efficiencies in a single or multi-arc environment.

WHAT IS NEXTWELD®?

The challenges facing industrial fabricators today are growing in number and complexity. Rising labor, material and energy costs, intense domestic and global competition, a dwindling pool of skilled workers, more stringent and specific quality demands all contribute to a more difficult welding environment today.

Through our commitment to extensive research and investments in product development, Lincoln Electric® has established an industry benchmark for applying technology to improve the quality, lower the cost and enhance the performance of arc welding processes. Advancements in power electronics, digital communications and Waveform Control Technology® are the foundation for many of the improvements.

NEXTWELD® brings you a series of Process, Technology, Application and Success Story documents like this one. NEXTWELD® explains how technologies, products, processes and applications are linked together to answer the important questions that all businesses face:

- *How can we work faster, smarter, more efficiently?*
- *How can we get equipment and people to perform in ways they've never had to before?*
- *How do we stay competitive?*

NEXTWELD® is the future of welding but its benefits are available to you today. Ask your Lincoln Electric® representative how to improve the flexibility, efficiency and quality of your welding operations to reduce your cost of fabrication.

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