

## PIPE WELDING

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# Covering all the bases with automated welding

Fabricator uses rotary pipe welding cell to conquer multiple market challenges

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**W**hen O'Neal Inc. launched INfab in 2019, the Greenville, S.C., firm wanted to use proven technology to meet the challenges it knew it would face in the modern pipe fabrication business.

The company entered the market with, among other equipment, a Rotoweld 3.0 automatic rotary pipe welding cell from Tecnar. The twin-bay cell is used to weld carbon steel pipes from 3 to 42 in. OD and stainless steel from 6 to 42 in. OD for customers in the chemical, wastewater, and pulp and paper sectors.

Using two different welding guns with the robot, INfab uses 100% CO<sub>2</sub> surface tension transfer to perform the initial root pass on its pipe welds and spray arc transfer welding to fill the rest of the gap. Rotoweld's 4D Synergy welding technology simultaneously tracks and adjusts four welding parameters: traveling speed, wire speed, oscillation, and arc power.

With those parameters locked in, the unit uses a feature called Rotomatic to

automatically maintain the position of the arc in the bevel and accommodate 100% of gap variation from 2 to 4 mm in open welds, even when traveling at full speed, according to Alexandre Nadeau, president/CEO of Tecnar.

When the cell encounters tacks in the weld path—which typically are feathered by a grinder beforehand—it can compensate to make sure that the weld arc is always in front of the weld puddle. Because it uses 100% CO<sub>2</sub> welding gas, the root pass is almost as flat as a GTAW root, Nadeau said.

## SET UP FOR SUCCESS

When welding the complex spools (groups of prefabricated components) of large-diameter pipe that INfab specializes in, the automatic cell routinely does the work of four or five welders, according to INfab Vice President Jason Jones. The key to extracting the maximum amount of value from the welding cell is proper setup, he said.

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“We’re not trying to kill jobs. It’s not that at all. But when you just don’t have the people to fill the jobs, you’ve got to do something as an organization. This is the way to compensate for that.”

—Jason Jones, VP, INfab LLC

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"You have to do a fair amount of work up front in breaking the spools so that you've got enough room to roll," Jones explained. "Our superintendent and our plant manager are really the two that go through that exercise. They will make sure that the spool is built in what we call 'subs.' They'll literally mark on the spool sheet that this is going to fitter A, B, or C, and this is the order that it's going to go to the Rotoweld so that when it comes back, those individual pieces, those individual subs, can get final fit and final weld."

"You have to build it in an order that allows you to put the most welds on the Rotoweld," Jones said. "If you don't spend that time, you may only get one [weld] where you could have gotten four or five welds on a given complex spool. So, when you account for that, then you account for the time it takes to load the positioner with these spools. Our data shows we are getting four to five times the throughput that we do with a manual welder."

Nadeau said that a shop that has done the proper setup should be able to put 70% of the welds on a given spool across a Rotoweld. Some have achieved even more than that, but 70% should be the norm.

"If you're below that, you're probably not thinking through your sequencing properly," Nadeau said.

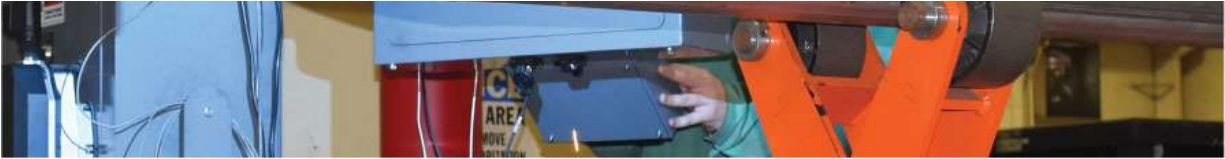
Maximizing time on the welding cell requires a reconfiguration not only of spools but also of the people working on them, Nadeau added.

"Welding is a very artsy profession," said Nadeau, whose father, Francois, started Tecnar and invented the technology that underpins the Rotoweld. "It's different from other disciplines. They used to have their own show—they would set up, they would fit up, they would weld, they would be proud of it. That's how it's been done. Now, you're putting in a workcell. So, you have an operator, and his productivity depends on how nice the fit-up is done."









That need for clear fit-ups and plans requires a new mindset for many shops, one that orients people on the floor around team (rather than individual) key performance indicators, Nadeau said. That will give the person operating the cell someone who can run point on managing fabrication of the entire spool.

"He needs a helper," Nadeau said. "He needs a guy that looks at the floor and says, 'OK, I'm going to turn this flange with this elbow and then we'll fit the elbow on the long pipe.' You need somebody on the floor that sequences what's going to be welded."

## **WORKING ON LABOR**

Because it invested in the welding cell right away, INfab tailored its operation around the technology from the beginning. That not only saved the company the pain of switching from manually intensive processes to more automated ones, but it also kept it ahead of the curve in dealing with the shortage of skilled welders.

"We're not a union shop; we're an open shop," Jones said. "There's no question that the craft labor market, especially for qualified pipe welders and fitters, is shrinking. And we struggle with that. Different parts of the country struggle with that more than others, but you've got to be able to compensate for that. And when you have a machine that can do the work of four to five manual welders, in our case, you've got to leverage that.

"We're not trying to kill jobs. It's not that at all. But when you just don't have the people to fill the jobs, you've got to do something as an organization. This is the way to compensate for that."

Jones noted that using the automated cell enables INfab to make the most of its 50,000 sq. ft. of floor space, which might otherwise be cramped with the welders

needed to accomplish the same amount of work as the cell.

"We're not a massive facility by any stretch," Jones said. "You can only fit so many manual welders in a given square foot [area]. Especially when you're dealing with large pipe, you can get really clogged up really quickly. Your flow is incredibly important. [The welding cell] has allowed us to maximize our revenue within our footprint."

The strategy has paid off. In a little more than four years, INfab has gone from zero to \$20 million in annual revenue. It began by working mainly with existing O'Neal customers and now does 70% of its business with companies that it solicited on its own. Jones attributes a lot of that success to another benefit of the welding cell: consistent on-time deliveries

"We have a strong belief in on-time delivery of quality product," Jones said. "It's absolutely paramount to be successful in our business. Quite frankly, a lot of folks in our overall supply chain just don't share that sentiment anymore, but it's critical, I think, especially for a younger company.

"To overcome delays in material, which is on every project, you've got to have an efficiency backup. Either you've got to throw labor at it, or you have to throw a machine at it."

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