BUILDING IT UP TO BREAK IT DOWN

How Lincoln Electric's HyperFill® Dual-Wire MIG Solution Boosted Productivity and Weld Quality for Storied St. Louis Manufacturer

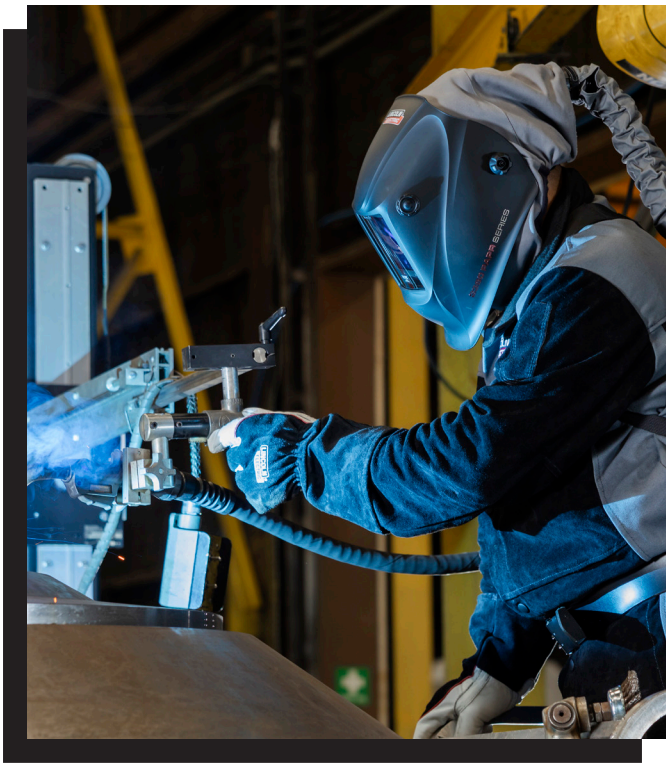
ARTICLE

For nearly 150 years, Williams Patent Crusher and Pulverizer Co. has specialized in designing and building size-reduction equipment that breaks down large-grade metal, wood, coal and other heavy materials into smaller grades. This type of equipment needs to meet a high standard of strength, durability and efficiency – and by association, the welds that hold them together need to be just as strong, durable and efficient. When Williams needed to improve the quality of their welds to meet the challenge, Lincoln Electric was ready with their HyperFill® dual-wire technology.

Williams Patent Crusher is based in St. Louis, with a main manufacturing site located in Bonne Terre, MO - about 70 miles south of St. Louis.

Williams' site in Bonne Terre, Missouri, located about 70 miles south of their headquarters in St. Louis, accounts for 80 to 90 percent of the company's production. Williams is a family-owned company that's been in business for four generations and currently serves a range of domestic and international customers.

In addition to making crushing and pulverizing equipment designed to handle anywhere from fifty pounds to several tons of material at a time, their semi-automated production line also makes conveyor systems to move materials into and out of the processing machines. Given the heavy-duty nature of the machines and the demands that are put on them during operation, construction usually requires as many as six or eight passes in a given weld.



Arroyo welding with HyperFill

The HyperFill alternative

"We were looking for a better alternative to structural welding," says Danny Boyer, Assistant Plant Manager at the Bonne Terre site. "Our previous wire had slag in it, and we had a lot of failures over the years with slag entrapment, so we were looking for a better solution. We needed something that would put down more wire and be easier for production workers to handle."

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The answer was Lincoln Electric's HyperFill twin-wire MIG solution. HyperFill allows for increased deposition rates and optimal penetration without compromising puddle stability or weld quality. Using a single power source, wire feeder, single tip, and Lincoln Electric premium wire, HyperFill delivers a wide, smooth arc cone that allows for deposition rates above 18 pounds per hour, and up to 25 pounds per hour for robotic applications without added system or operator complexity.

HyperFill's wider arc cone results in a more favorable, robust penetration profile that can lead to fewer defects at higher deposition rates.

Collaborative approach

The implementation of the HyperFill solution is one of the more recent chapters in an ongoing relationship that Williams has maintained with Lincoln Electric for decades. "I've been here for 45 years," says Boyer. "We've always liked Lincoln, and we've always had good luck with Lincoln."

So it made sense that Boyer and other members of the Bonne Terre crew would initiate discussions with Lincoln Electric's technical sales rep in 2020 to address their deposition concerns. The rep brought a HyperFill demo to the facility.

"He walked us through the process," says Boyer. "We all went through it with him, and we were sold. Within six months, after getting approval to make the purchase, we bought one."

But the process didn't end there. "As with any new process, HyperFill had its own learning curve," says Boyer. "But the same rep was there to guide us through any initial challenges. In the end, we found it to be easier and more efficient than our previous process."

The satisfaction and success didn't end with the first unit. Once the Bonne Terre crew realized that HyperFill was effective not only for structural welding but for the welding of castings and other applications, Williams invested in a second unit. By the beginning of 2025, the company had purchased a third and was preparing to get it online by the spring. Through it all, Lincoln Electric has continued to offer guidance and support.

"When the rep comes down, he sees what we do and always offers good advice about how to improve it, and he helps us along," says Boyer. "Even now, four or five years after we've started using HyperFill, he looks at ways we can fine tune our process. The suggestions and the help are always there."

Danny Boyer, Assistant Plant Manager (center) and Antonio Arroyo, a production worker at the Bonne Terre plant (left) found great success with the HyperFill process. Their current Lincoln Electric rep, John Taltavall (right) has guided them through the process of setting the plant up with more HyperFill systems.

Downtime down, quality and productivity up

The proof of Williams's success with HyperFill is in the numbers. Since the implementation of the process and the resulting reduction in slag, downtime between MIG welds on the production line has decreased by as much as fifty percent, and the welds themselves have not failed a single x-ray test.

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"You don't have to stop, move the manipulator out of the way, clean your weld, put the manipulator back in place, and then re-weld," says Adam Dornbach, Shop Foreman at Williams' Bonne Terre site. "It would normally take two to three days to weld up a mill stem sometimes. But we shortened that timetable once we started using the manipulators and the dual wire. Once we got the hang of it to the point where we were really using it to its full potential, we were able to cut it back to about a day. That's a reduction in downtime by anywhere from fifty to sixty-five percent."

Results: By The Numbers

50% Reduction in Downtime
Up to 24 lbs/hour Deposition Rate
Zero X-Ray Test Failures

Previously, Williams had been using cored wire, which increased the operation's weld deposition rates but also caused slag entrapments. "If we didn't stop and really clean off the slag before prepping for the next weld, the slag would get trapped and the weld would fail the x-ray," says Dornbach. "After a certain percentile of those welds failing, you have to cut the entire weld out and redo it – and that's when you really start creating delays in your production schedule. Now that we're using HyperFill, we're passing x-ray tests consistently. "

The increase in success with the x-ray tests was sharp enough to draw attention at the local testing lab. "The welds we do at Bonne Terre go back to a test lab in St. Louis," Boyer explains. "The technician at the St. Louis lab asked us: 'What are you guys doing differently?' He was seeing how much better the welds were once we implemented HyperFill. The improvement in the quality of the welds was so dramatic that it made him curious."

The reduction in downtime has also doubled – and sometimes tripled – the productivity rate on the Williams production line, according to Antonio Arroyo, a production worker at the Bonne Terre site. "When I run the regular cored wire, I'm able to put down anywhere from eight to twelve pounds per hour," he says. "But when I run the dual feed with HyperFill, I'm able to push it to 24 pounds an hour. So it does speed up the process and enable me to put down more welds in the course of a single shift."

A final HyperFill welded part

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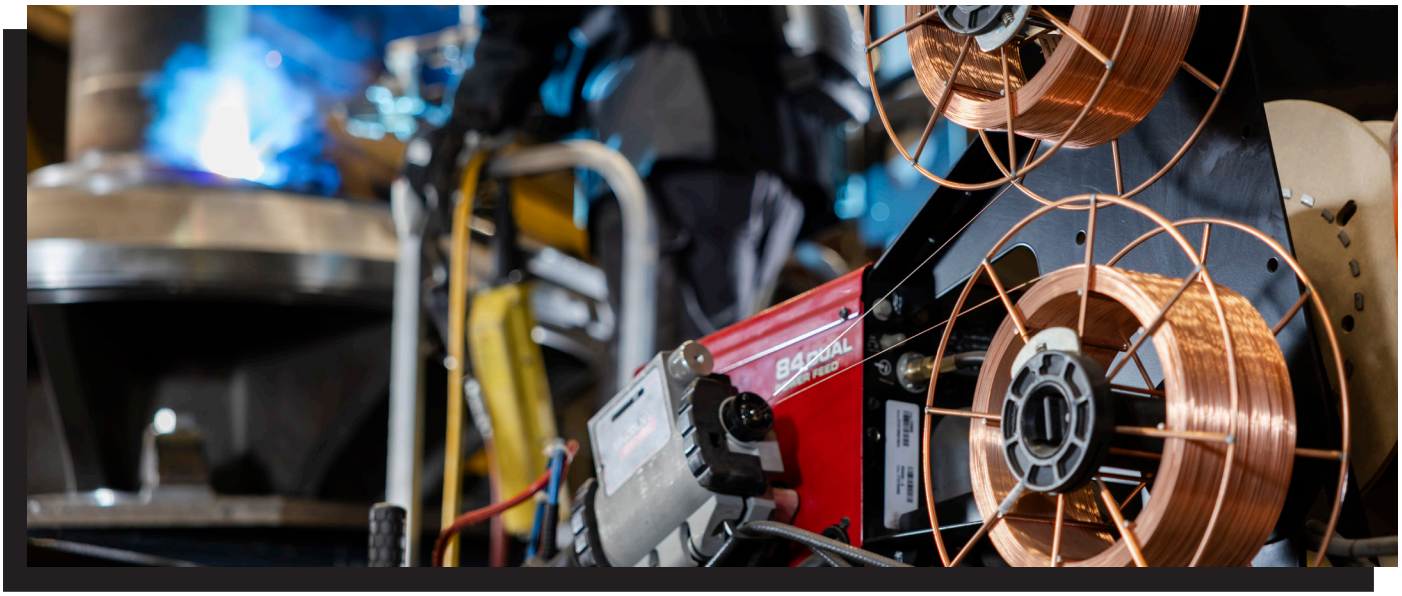
Recognizing success

The Williams crew at Bonne Terre has been more than happy to share the good fortune they've experienced with HyperFill. They've passed the word to a subcontractor in the St. Louis area that Williams works with when production demands at the Bonne Terre site get too heavy.

"They recognized the success we were having with HyperFill, and they purchased two units of their own," says Boyer. "When our subcontractor is using the same production equipment as we are, and getting the same quality in their welds, that helps to ensure that the quality of our products will be consistent regardless of where they're made."

After some trial and error during the training phase in the initial months after implementation, Arroyo considers HyperFill an essential tool on Williams' production line four years later.

"I love it, to be honest with you," he says. "My background in the field was in stick welding, so when I came to work with HyperFill in the shop, I had to adjust my approach a little bit. But I wouldn't want to trade it for another system simply because I'm already used to something else. HyperFill does everything I need it to do in terms of weld deposition, quality and productivity. I enjoy the fact that every day with this machine is a learning experience, and I continue to be engaged and interested in the work. Every day I'm figuring out ways to improve our welding operation that I didn't know the day before."



HyperFill is Lincoln Electric's patented twin-wire welding solution, offering operators higher deposition rates and increased weld quality.

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