

Case Study

Prima Provides Perfect Solution

Afinitas company HawkeyePedershaab's cutting-edge production management system is a game-changer for Ontario, Canada, precast manufacturer.



Doug Galloway, president of M-Con Pipe & Products Inc.

The problem: Inefficiency and Floor Space

Doug Galloway had a problem and an idea. The president of Ontario-based M-Con Pipe & Products Inc., Galloway was out of space on his wetcast production floor and looking for ways to work more efficiently.

That was the problem. The idea? Some type of carousel system that would move forms to workstations set up on a production line – like an auto assembly plant. Instead of moving buckets of concrete and production teams around the plant to strip, prep and fill the forms, bring the forms to the workers.

Galloway took the idea to HawkeyePedershaab in 2013, and, little more than a year later, the Precast Industrial Management System, or Prima, was born. The HawkeyePedershaab engineering and sales team took Galloway's concept and brought it to life, creating a revolutionary wetcast production system that saves space, reduces labor, increases throughput of products and provides comprehensive analytics to management.

Based in Ayr, Ontario, just west of Toronto, Canada, M-Con Pipe is known as an innovative leader in providing precast concrete infrastructure products throughout Central and Southwestern Ontario. Even though they have a 100,000 sq. ft. manufacturing facility, things were tight on the production floor.

"We were doing a lot of wetcast products and they were taking up a lot of floor space," Galloway said. "The floor space was crammed with products and forms and we were having to move them with lift trucks to strip the product and to pour concrete. So, we were looking for a more efficient way to manage wetcast forms. That's when we started thinking of this system. Because of the work we had done in the past with Hawkeye, we approached them about putting together this carousel-type system that they eventually called Prima."



Prima offers the efficiency of assembly line work stations.

The solution: Prima Automated Wetcast Production

To understand how Prima works, let's follow one form down the production line. At the beginning of the day, the form is located in its assigned spot on the floor, monitored by an RFID tag. As the production line starts, the previous day's product is stripped from the form and moved out to the yard by a chain conveyor.



The form filling station can be configured in numerous ways, including with concrete conveyor belt, with concrete pump or with concrete bucket



RFID reader system for form identification

The form sits on a cart that rides on a moving conveyor that sends it to the next station, where the form is cleaned, oiled and set up for pouring. From there, it moves to the reinforcement station, where the steel is placed. At this stage there may be an option to pull the form offline if it needs any special preparation, reinserting it after the additional prep.

The next stop is the form filling station, where the operator confirms that all the preparation has been completed and the concrete is poured into the form. An automated overhead manipulator then moves the green product to a predetermined curing location where the product cures in the form until it is ready to return to the production loop to start the process over.

There is much more to the system, of course, according to Randy Beelman, Eastern North America Sales Manager for HawkeyePedershaab. "The system has a lot of possibilities and a lot of intricacies that can be built into it," Beelman said. "The joy of it is that you can use your existing forms. Rollback forms that can be stripped easily work better than overhead forms, but the system can be designed to accommodate whatever types of forms are being used."

Any type of product can be sent down the line, as long as it is less than the maximum size of 72 inches in diameter and 8 feet in height. An operator can input the day's expected production into the system and the Prima software will determine the optimal order of production, Beelman said.

"Let's say you're going to run 25 risers, 20 basins, 10 median barriers and 15 Stone Strong products," Beelman said. "The operator tells the system, and the system manages how to produce them in the most efficient way. Our SmartCast basins have Styrofoam in them to produce the inverts, for example, so those are typically done later because stripping takes a bit longer than other products."

Results: More Production in Less Space

The Prima system freed up space on the floor and gave M-Con Pipe the efficiency gains that Galloway was seeking.

"Now we can manage the floor space and gain the efficiency and have all the forms come to one station to get the concrete filled into them, rather than driving lift trucks or having cranes bringing the concrete to the forms," Galloway said. "It's a basic assembly line, and it has an exit line as well for QC and whatever finishing touches are needed. There are no lift trucks or concrete buckets or cranes running around the plant maneuvering around the forms. So, the pinch points have pretty much been eliminated."

For the wetcast products that M-Con Pipe manufactures with the Prima system, labor hours have been cut by at least a third, Galloway said. When the system is running at full speed, it pushes a finished product out the door about every five minutes.



Inventory is automatically handled by an overhead manipulator

The labor savings can be significant, Beelman said. When he is describing Prima to a potential customer, Beelman works through an ROI sheet to show the impact of producing more product with fewer employees.

“Most companies can go down to five employees operating this system,” he said. “Let’s say if you went from 13 down to five and you do 71 products per day. You would have a savings of about \$500,000 per year, so you could pay for the system in four years just in labor savings.”

At a time when the vast majority of precast manufacturers in the U.S. and Canada say that finding reliable skilled labor is their most pressing problem, any automation that reduces the need for labor is an attractive possibility.

“Labor has always been an issue for us,” Galloway said. “Whenever we go into an expansion or when we’re coming into construction season it’s nothing to hire six or eight people just to get one to stay. Finding good quality labor is becoming more difficult.”

More Benefits: [Lean Manufacturing](#)

There are efficiencies built in to every part of the system, which makes the Prima system a beacon of lean manufacturing.

“We’re putting out more products in fewer hours with less effort,” Galloway said. “The fact that concrete is poured in one place and you’re not dragging concrete around the plant has drastically reduced the cleanup at the end of the day. The assembly line approach has made things simpler and easier. You’re not having to carry steps around the plant to take them to the manholes – they are all in one place. The steel fabrication happens at one point and it’s dropped right into the form, so you’re not moving steel cages. You don’t have to carry raw materials all around the plant.”

Another critical piece of the Prima system is the data it collects from each phase of the process to enable managers to pinpoint any slowdowns on the line.

“At the end of the day you’re going to get a report that might show a delay at the steel station,” Beelman said. “Now you can delve into what was causing the delay. You can look into it and maybe you’ll see that the operator was not getting the steel on time.”

Galloway said the Prima system has enabled his team to set production targets that can be closely measured. Employees who work at the same station every day will develop expertise that makes them even more productive, and the analytics will show it.

“The database that the system manages lets you see how long it takes to make one piece and the various product mixes and the results you’re getting with them, so it certainly helps,” Galloway said. “When you get a good group of workers they always want to do better, so now they have some targets.”



One of the advantages of PRIMA is its ability to build a “smart” production queue utilizing data inherent to each form.

The Perfect Partnership for Parent Company Afinitas

The M Con Pipe partnership with HawkeyePedershaab in developing the Prima system is just the type of relationship that Hawkeye's parent company, Afinitas, seeks to establish, said Brad Schmidgall, CEO of Afinitas.

"Prima is a perfect example of the type of products we at Afinitas are excited to introduce and promote moving forward," Schmidgall said. Afinitas was formed in 2018 to create a comprehensive, global platform of reinforced concrete and precast concrete technologies. In addition to HawkeyePedershaab, the Afinitas platform also includes BFS (headquartered in Blaubeuren, Germany), and USA-based companies New Hampton Metal Fabrication, Spillman Company and CAM Products.

"With the labor challenges facing our markets, we are laser-focused on providing smart automation solutions to areas of precast manufacturing that have historically relied upon manual labor," Schmidgall added. "Working together with M-Con Pipe & Products to design and build this Prima plant and seeing it completed successfully was extremely rewarding."

M-Con Pipe has been running the Prima system for nearly four years, and the HawkeyePedershaab team has continued to work closely with Galloway's team to work out the bugs and continually improve the system. M-Con Pipe is currently the only plant running Prima, Beelman said, but another plant is constructing a building for a new Prima system and several other companies are seriously looking at it.

"It's really going to start to take off," Beelman said. "Like any new system, you need to get the bugs out and make sure it works for the customer. But this is a system that can be tailored around anybody's products."

Both Beelman and Galloway said they appreciate the partnership that made Prima possible. "M-Con Pipe came to us with this carousel idea and asked us how we could get it to work," Beelman said. "Over the years, we have worked very well together as partners. They knew this was going to be a process to develop this system. They were willing to work with us and we were willing to work with them, so it's been a great cooperative effort."



HawkeyePedershaab
Concrete Technologies Worldwide

BFS

NEW HAMPTON
Metal Fab

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www.SpillmanMetalFab.com

CAM
PRODUCTS

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Benefits of the Prima System

Reduced Labor

- No walking around
- No time moving concrete around to the forms and back to the mixer
- No searching for tools
- Production standards prevent "sandbagging"

Improved Safety

- Prima system is fully safety compliant and protected
- Elimination of fork lift traffic in plant
- No overhead transport of products or concrete buckets
- Ergonomic work stations with tool balancers

Increased Throughput

- Assembly line approach eliminates wasted motions
- Specialized workstations allow for faster turnaround

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