

Case Study: Robotic Sprayer Increases Consistency and Reduces Waste

Application: Painting / Spraying

Robot Model: Kawasaki RS080N general purpose robot

OVERVIEW

In the eyes of some manufacturers, installing an industrial robot can seem intimidating. Misconceptions of having to rebuild everything from the ground up and having to adopt a completely new process can make automation seem like a bigger endeavor than it truly is. In reality, there are many ways to embrace automation without starting from scratch, and the available resources make programming and maintaining a robot possible for all knowledge levels – including first-timers.

Baton, LLC, a Louisville-based manufacturer of AirStone faux stone veneers and siding, learned this firsthand when they installed their first robot with the help of Dakswan Automation. Once implemented, the Kawasaki RS080N general purpose robot helped Baton cut down production time and significantly reduce waste, with minimal changes made to their existing production line and tooling.

CHALLENGES

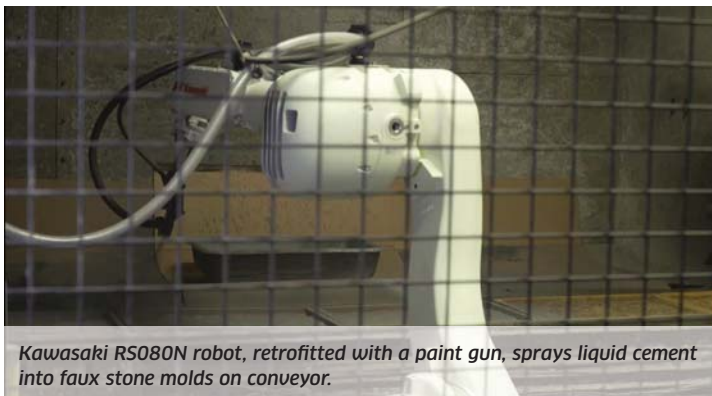
- Inconsistent manual process yields high amounts of waste
- Unfriendly work environment for employees
- Must automate production line using existing equipment

Product inconsistencies

In order to produce AirStone prior to automation, four painters sprayed liquid cement onto molds as they approached on a conveyor. Each painter used a different amount of material, resulting in inconsistent products and over use of materials.

“Human un-friendly” environment

Workers were required to wear respirator masks while spraying the molds to remain safe and minimize exposure to liquid cement particles while on the job.



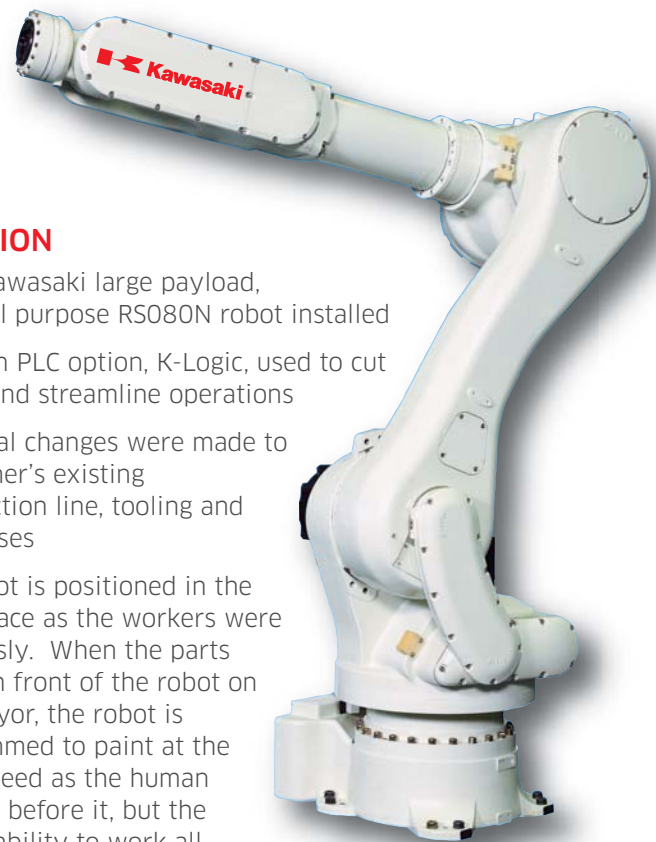
Kawasaki RS080N robot, retrofitted with a paint gun, sprays liquid cement into faux stone molds on conveyor.

For manufacturers whose products are constructed in harsh environments, it can be difficult to retain employees, and that task is even more challenging during an industry-wide labor shortage. This lack of consistency can lead to low production, and is a primary reason why Baton decided to automate their spraying process.

Minimal process changes only

The RS080N was Baton's first robot, so the manufacturer was hesitant due to concerns that this new equipment would be disruptive to the process they'd developed over the past five years. Dakswan needed to design a customized solution that aligned with their customer's manual process

“It took years to develop our spray system that applies color into our product, and the manual gun we use works well for a number of reasons. It would have been hard to replace”, Tom Scanlan, Owner and President of Baton, LLC said.



SOLUTION

- One Kawasaki large payload, general purpose RS080N robot installed
- Built-in PLC option, K-Logic, used to cut costs and streamline operations
- Minimal changes were made to customer's existing production line, tooling and processes

The robot is positioned in the same place as the workers were previously. When the parts arrive in front of the robot on a conveyor, the robot is programmed to paint at the same speed as the human workers before it, but the robot's ability to work all day without breaks saves Baton an average of 2.5 hours of downtime each week.

Choosing a robot from Kawasaki's line of high performance general purpose robots, as opposed to paint robots, was a purposeful choice by the integrator, who picked this specific model due to its long reach capabilities. The RS080N robot's extended reach (2,100 mm) made it perfect for Baton's application, which required the robot to spray a large area from one fixed location.

Kawasaki's R series robots are designed to be effective in workspaces large and small. In addition to their extended reach, the large rotation range of the R series' axes translates to a larger usable work area with minimal dead space, so multiple robots can be installed in high-density applications without impeding performance. The slim arm design of the R series requires very little floor space, making them a great option for tight spaces, like Baton's paint booth.

Kawasaki's option for a built-in PLC, called K-Logic, was another major selling point for Dakswan Automation. K-Logic streamlines operations for the end user because all communication between the production line and the robot is done internally. K-Logic also kept costs down by eliminating the need for an external PLC, and minimizing the amount of external cabling needed.

Same Process, Modernized

Because the RS080N robot isn't designed for performing paint/spray applications, Dakswan designed a custom end-of-arm tool to hold the exact same paint system their customer was currently using. This allowed Baton to retrofit their current paint gun, utilize spare parts they had acquired over years of using this machine, and keep their end product consistent with what they've sold in the past.

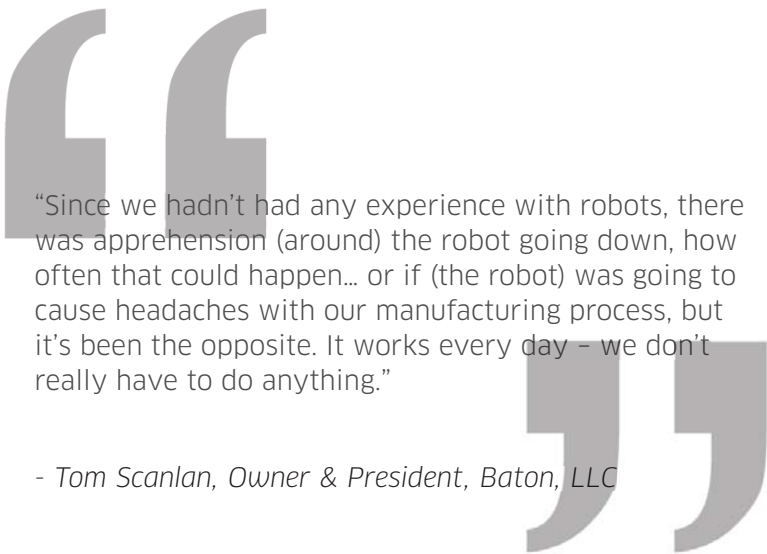
Dakswan installed the robot in the same place the human workers stood during the manual process, which meant Baton could keep their existing machinery and equipment in the same location, and only small adjustments needed to accommodate the new robot.

RESULTS

- Downtime reduced by 2.5 hours / week
- Workers removed from harsh environment & redeployed to safer roles
- Product quality and consistency increased significantly
- Amount of over-spray reduced
- Customer is programming and maintaining robot based on knowledge gained from Kawasaki training course

Although Baton is technically a first-time robot user, the knowledge their maintenance staff acquired from the Operations & Programming training course they took at Kawasaki's training center has enabled them to keep their robot up and running smoothly entirely on their own. Additionally, they are able to reprogram the robot to test out different spraying patterns for new products.

After installing their RS080N robot to perform a "human un-friendly" task, the benefits of automation showed themselves in multiple ways throughout the company. Baton saw a boost in production, so the workers who formerly sprayed the AirStone molds were redeployed to the different areas of the company that don't require exposure to harsh chemicals or protective gear.



"Since we hadn't had any experience with robots, there was apprehension (around) the robot going down, how often that could happen... or if (the robot) was going to cause headaches with our manufacturing process, but it's been the opposite. It works every day - we don't really have to do anything."

- Tom Scanlan, Owner & President, Baton, LLC

From an operational standpoint, Scanlan uses the words "worry-free" to describe using the new Kawasaki robot - despite his initial concerns as a first-time robot user.

"It was a very easy process to convert over from manual to robotic. Without a doubt, worth the investment," Scanlan said. "It's been such an apparent positive to our plant... the reduction of material costs, reduction of downtime - all of it. Using the robot is just kind of worry-free."

For Baton, automation didn't mean overhauling a proven process or experiencing stress from complex programming or unexpected shutdowns. The robot has improved their manufacturing process while creating a safer work environment for their employees. Dakswan Automation designed and implemented a cost-effective solution that utilized the machinery and tooling Baton had spent years adopting, making for a seamless transition and a robotic solution they are able to maintain entirely on their own.

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