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New coating system brings multiple payoff for Fawn Engineering

It's not often that a single decision creates so many solutions. But the call that brought a state-of-the-art powder coat finishing system to Fawn Engineering Corporation, the Des Moines, Iowa-based industry leader in the manufacture of vending machines, is still paying dividends after nearly three years.

When Director of Manufacturing Rich Redburn oversaw Fawn's transformation from liquid to a powder coat system in 1996, there were four important issues that needed resolution. Most important was an improvement in finish consistency from that offered by the liquid system that had been in place.

"We wanted to meet or exceed the highest finish quality standards in the industry in order to help us grow our business in the U.S. and especially Europe, where finish standards are somewhat higher, at least in our market," says Redburn. "With our liquid system, we had some sags, some finishes would be too light, some too heavy — generally inconsistencies that we thought could be eliminated with an automated system.

"Our second goal was to improve our efficiencies and reduce production costs. Our liquid system seemed to produce a continuous bottleneck as a result of rejects, which totalled roughly 10 percent of the output.

"Third, we wanted to get out of the hazardous waste business. We were spending approximately $250,000 a year on the disposal of hazardous waste that came from our liquid system, and that's the kind of stuff that doesn't go away. In a sense, you own it forever.

"And finally, research indicated that there was a market for powder finishing services locally, if the price was right. This new system would be the largest in the area and we could essentially get into the 'job shop' business."

A new automated powder coating system, complete with 80 robotically controlled application guns (facing page) handles coating tasks for virtually all of the coated metal parts of vending machines produced by Fawn Engineering.

Versatile system

Fawn, a division of the Wittern Group, custom-builds its vending machines, which dispense items ranging from postal stamps to soft drinks, snacks and even live minnows for fishing. So when Redburn committed to a new multimillion dollar finishing line he knew it would have to be versatile enough to handle a wide range of parts.

He also knew he'd need a solid commitment from his suppliers in the project — Nordson for booth equipment and Milbanks Systems Inc. for system setup and additional equipment.

"We realized that we were going to have to rely heavily on our suppliers for technical expertise," says Redburn. "The ones that we couldn't depend on for design, support and troubleshooting aren't here anymore. These people continue to help us with problem-solving and I think that comes from making teammates out of our suppliers. If something went wrong, we'd get them over here and just ask questions.

"Some of those questions might seem stupid, but you'd have to ask. At one point, I asked, 'Where are the hooks for the conveyor?' The answer was, 'We didn't bid any.' We could've sat here and blamed each other all morning and had no hooks to hang the parts from the

A conveyor system carries parts into an eight-stage washer to start the powder coating process.

From the washer, parts are conveyed into an environmentally controlled coating room.

parts from the conveyor, but we all had the same goals. Our intentions and their intentions meshed, so we figured out a way to get hooks here quickly."

While Fawn has used several coatings suppliers, Sherwin-Williams has recently made a positive impression with its Powdura™ powder coating line.

"I like the consistency of Sherwin-Williams powder," says Redburn. "I also like the fact that the rep lives in my town and has access to all the technical support we might find necessary. We can be pretty demanding that way. If we need technical support, we expect it to be there. Sherwin-Williams has been very responsive."

System in place

Once Fawn's system was installed, which required the construction of additional building space and an environmentally controlled room for the coating booths (72 degrees F, 50 percent relative humidity and a positive pressure differential), startup was quick.

"We went from wet to total powder in three weeks and we maintained our production levels," says Redburn.

Virtually any vending machine part requiring coating can be hung from the conveyor line, which carries pieces at a rate of up to 20 feet/minute and starts with an eight-stage washer. While similar lines may feature five-stage or even three-stage washers, Redburn feels this is a critical part of the operation.

"A good finish is 20 percent a result of the quality of the coating," says Redburn. "The other 80 percent is cleanliness."

"Powder is not forgiving," adds Sherwin-Williams technical sales representative Jay Pender. "It's not like a solvent coating that can bite in and adhere. That's why the cleaning system is so important."

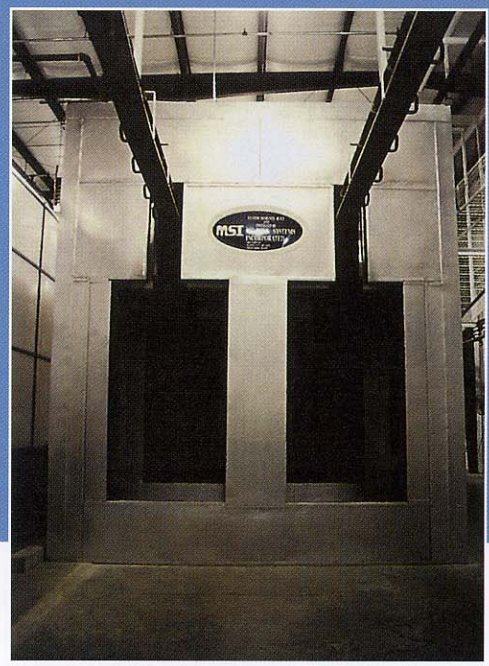
The eight-stage pretreatment system consists, respectively, of two alkaline wash stages, two rinse stages, an iron phosphate stage, another rinse stage, a non-chrome sealing stage and a de-ionizing rinse stage.

Next, the parts are conveyed to the first of three polypropylene Nordson coating booths in the environmentally controlled coating room. The parts first travel past rows of electronic sensors that identify the part — over 3,000 parts are catalogued — and program the 80 robotically-maneuvered high-efficiency guns. Powder is electrostatically applied at 2 to 2.5 mils, and reclamation equipment in the booths gathers overspray and recycles it, thereby creating a 97 percent efficiency of powder usage.

The final element of the coating system is a pair of MSI bake ovens. The ovens have a capacity of 10,000 pounds/hour and an operating range of between 250 and 500 degrees F. Typically, finished parts are baked at 400 degrees

Electronic sensors identify the part before application begins inside the coating booth.

The final step is the bake oven, where the cure is completed in 20 minutes.



for 20 minutes, at which point cure is complete and the parts are conveyed to an assembly area.

All told, the trip from one end of the coating conveyor to the other covers 458 feet and takes about 2 hours.

Issues resolved

Redburn's four major concerns with his former liquid system have disappeared with the successful installation of his powder system.

• **Quality improvement**. "We heard about that from our customers immediately," he says. "And as a result, our export business is growing. Between 15 and 20 percent of our business is now overseas and a lot of that has to do with our improved finishes."

• **Improved efficiencies**. "We had 32 people working six days a week on the liquid paint line," he says. "Now we have 11 working five days a week and the bottleneck is gone. Rejects have gone from 10 percent to 1 or 2 percent. And, I'm happy to report, nobody lost a job because of this. We were able to place them in other growing areas of the company."

• **Hazardous waste reduction.** "The powder system took us to zero hazardous waste. Anything we do create is landfillable, and basically that's just the cartons. Our ultimate goal is to get powder delivered in totes, and then we'll have zero landfillable waste."

In related environmental issues, the coating operation is 100 percent VOC-compliant and the application system is all UL approved. Fawn also treats its own wastewater and is now showcased locally as a positive example of environmental compliance.

"Des Moines now uses us as an example of what other companies can do with wastewater treatment," says Redburn. "We're very proud of that."

• **A growing new branch of business.** "We've gone from a finishing line bottleneck to a situation where we now can sell time. We do outside work such as agricultural parts, parts for ultralight airplanes, window wells, etc. We've added enough automation that I think we can paint almost anything.

"And with the continued support of our suppliers, we will."

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