Spray control aids lean manufacturing

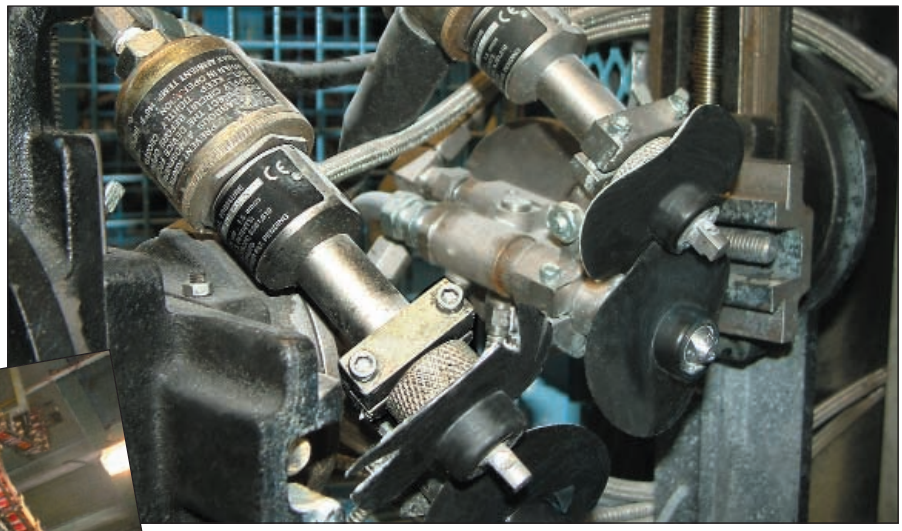
Costs are being reduced while maintaining quality at Rexam's beverage can plants by using more sophisticated inside-spray systems

As the world's largest manufacturer of drinks cans with production of more than 50 billion a year, Rexam continually looks for ways to improve processes and reduce costs while maintaining the highest standards for its customers, which are the biggest and most respected brand names in the world. And its beverage can manufacturing facility at Wakefield in the UK aspires to the company's vision of world leadership in packaging excellence.

Wakefield has three lines producing 33cl aluminium cans with a total output of nearly 5,000 per minute. Many of these are destined for one of the plant's main customers, bottler Coca-Cola Enterprises next door, which is supplied through a hole-in-the-wall link that removes the need for palletising.

That means Rexam must offer consistently top quality in a real-time production environment to meet Coca-Cola's lean manufacturing requirements.

With a focus on Six Sigma, the facility is always looking to better understand processes by measuring and collecting data to reduce variation and improve quality. "We operate in a very mature, stable market, so margins are always important while still focusing on quality," says Nigel Curless, Rexam's quality manager at Wakefield.



Above: Nozzle tips are kept clean and wet automatically using the Nordson CleanSpray system. Left: "The more you can get all your spray guns running at the same constant input pressure the better," says Nigel Curless of Rexam's Wakefield, UK, plant

As a critical component in its manufacturing process, its inside-spray operations are one area that has received considerable attention. The facility has updated its spray lines over a number of years to improve quality and reduce costs. "We always look at ways to improve quality," says Curless. "We want to spray the can the same every single time, which means understanding variation. That wasn't always easy to do before updating the spray line."

One key change includes the upgrade of its inside spray guns to the Nordson MEG® electric spray guns — with two guns on each of its spray machines and eight spray machines per line. The MEG gun has less than a two-millisecond response time, which is more than twice as fast as standard guns. According to Curless, fast response time is important for accuracy and uniform can coating. "The fast response time of the MEG means it has less variation and more consistency shot-to-shot, which helps when trying to spray at lower pressures."

Rexam also looked for ways to reduce spray pressures and further minimise variation for accurate control of coating weights, to reduce costs while maintaining high quality. The company installed a Nordson Spray Pressure Control System and with it, now has hydraulic pressure control for each spray gun, which eliminates fluctuations caused by the pump or other guns in the spray circuit. Precise control of coating weights is possible while getting a cleaner, more-efficient operation. Curless says that keeping the machines clean is half the battle in the spray area. If they're not clean, other issues will arise. With the cleaner operation, system maintenance has been reduced.

According to Curless, there could be a lot of variation in spraying pressure before the new system was installed. "We thought we were spraying at 1,000psi when only five guns were running, but it could have been totally different," he says. "It's important to know what variation we have to drive out to control the amount of lacquer we use."

Another challenge Rexam faced was to obtain real-time diagnostics to ensure that its spray guns ran at the same constant input pressure. "We wanted to reduce input variation to any process, and the more you can get all your spray guns running at the same constant input pressure the better," says Curless. Nordson provided a solution with its CanWorks® SM-1 Spray Monitor, a modular diagnostic system that immediately identifies spray malfunctions that occur during can coating operations. The system records variations in spray pressures, worn nozzles or partially clogged nozzles, which often cause inconsistent quality and variable spray weights. It was often difficult for the company to identify these problems during production, which could result in hundreds of improperly coated

cans. Constant monitoring and reliable data tells Rexam how each gun is performing.

"We can collect and store data from our spray guns, including monitoring their opening and closing, to evaluate the constant performance of our internal lacquer application," says Curless. Spray gun-related problems are detected by the CanWorks system and the spray machine is automatically stopped, thus preventing any bad cans from entering production. Line technicians can then use the on-board diagnostics to quickly pinpoint and rectify the fault. The system also maintains a fault and calibration history along with an individual can-counter per gun. "It's a good diagnostic tool to help prevent things before they become a major issue." Curless adds that the first step is to use the spray pressure control system to control pressure, and then use the spray monitor so the system is used proactively to predict possible future problems, which is particularly important in a real-time environment.

According to Curless, if you put an even film in the can and almost eliminate the spray variation, then potentially it is possible to reduce lacquer consumption while still being well above the customer's requirements. "Any over spray is a waste of the wet lacquer and is always going to be a cost to us," he says. Not only does controlling film weights save costs, but also VOCs.

Another problem was that the water-based lacquers would skin over the nozzle tips during label changes or if the line was down. Nordson's CleanSpray® system is now used to automatically keep the nozzle tips clean and wet. Nozzles are cleaned during production, without turning off the spray machine, using a low-pressure, ultra-fast spray of water directly across the nozzle to wash away excess coating between lacquer sprays. The company was able to reduce manual nozzle cleaning, which freed up resources to refocus on proactive maintenance.

Another part of its success was a focus on training, says Curless. Using Nordson's training facility and lean initiative techniques together has created a higher-skilled workforce, allowing line technicians to also maintain the equipment properly and perform quality checks to keep the machinery in top condition.

"The objectives in upgrading our spray line were to improve quality, reduce variation and reduce costs," says Curless. "We have achieved all three."

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