

INDUSTRY

application

Surepharm invests in on-dose printer for sugar-coated tablet

Surepharm is a contract manufacturing organization (CMO) located near Burton on Trent in the UK. The company has been in business for more than 25 years and specializes in solid dosage generic medicines, vitamins, food supplements, and veterinary products.

Recently, Surepharm received an inquiry about manufacturing a product for the European market. The product was a sugar-coated tablet with a volume of about 23 million tablets per year. The project required on-dose printing of a logo, which the CMO hadn't done previously, but the volume was large enough that the company decided it was worth investing in a printer.

Selecting a tablet printer

Darren Lawson, Surepharm's packaging and operations manager, was tasked with sourcing a tablet printer for the project.

"Because we had no previous knowledge of tablet printing," said Lawson, "we had to do a lot of research to understand the process and how to apply ink to tablets. Then we literally searched on Google and found three companies."

Surepharm provided the three suppliers with the project's production volume and printing requirements through a detailed user requirements specification (URS) and received initial quotes. According to Lawson, one company's quote was "ridiculously high" and the second company's printer required that the tablet thickness be very precise for the machine to work properly.

Because the product is sugar coated, however, the coating thickness tends to vary, which would have affected the machine's performance.

The third company, Ackley Machine, based in Moorestown, NJ, provided a quote that was both affordable and that would meet the needs of the application. The supplier offers a range of lab- and production-scale printing, laser-marking, laser-drilling, and vision-inspection equipment for the pharmaceutical, nutraceutical, and confectionery industries. Ackley's Cantilever Ramp printer prints up to 200,000 units per hour on products of all shapes, sizes, and material compositions, including film-, sugar-, and gel-coated tablets, longitudinally compressed tablets, transparent and opaque softgels, and hard-shell capsules.

"We went with the Cantilever Ramp printer because it could achieve the production speeds we needed," said Lawson. "Our target production time if we made all the batches in one go was about three months for this volume of tablets. With their smaller printer, it would have taken seven months to print them, which is a lot of capacity gone."

Customized for the product

The Cantilever Ramp printer is portable, has a small footprint, and is designed to meet both FDA cGMP and European CE regulations. The printer's carrier-bar feeding system includes an adjustable-ramp feed angle, which allows the operator to optimize the feed rate based on product flow characteristics. This results



Photo 1: The printer's continuous-motion, multiple-lane conveyor feed system features carrier bars with pockets that precisely position the tablets and expose their top surfaces for printing.

in a fill rate greater than 90 percent and maximizes production output.

"The Cantilever Ramp printer is a custom-engineered complete system, configured to meet the customer's exact specifications," said Enda McKeon, Ackley's engineering sales manager for Europe. "The customization relates specifically to the carrier bars, which are tailor-made to suit the customers' individual product needs. In this case, they were customized for oval, sugar-coated tablets."

The tablets are fed into the machine hopper, where they are singulated and gravity-fed into carrier-bar pockets for precise positioning. The continuous-motion, multiple-lane conveyor feed system exposes the tablet's top surface for precision printing and vision inspection.

Surepharm decided not to purchase the supplier's optional vision inspection system because the printed tablets didn't require 100 percent inspection, but the company did purchase the optional ink maintenance system. This integrated system monitors and maintains optimal ink consistency throughout a production run by continually mixing and recirculating the ink and solvent, allowing the ink to last longer and reducing waste.

"A lot of companies just do it by eye—adding a bit of ink to thicken

it or a bit of butanol to thin it," said Lawson. "We didn't want that. The ink viscosity machine does it automatically, so an operator doesn't need to worry about it. We also wanted to have validation data to make sure we could reproduce the ink viscosity every time to ensure the same quality."

The printer purchase took approximately six months, including factory acceptance testing, delivery of the machine from the US to the UK, and installation on site.

"I got involved in December," said Lawson. "We got it sourced, and we were taking delivery in May or June. It was very quick."

Ongoing service and parts

Another reason Surepharm chose the machine was its low maintenance cost. As needed, Ackley supplies replacement parts, such as rollers and blades, to maintain the machine's production output.

"The spares are quick and very good," said Lawson. "Our ongoing relationship with Ackley is fantastic. I go and see them at every trade show I go to, and they've had people come to our site to look at the machine."

In addition to providing worldwide on-site service, the supplier offers remote engineering support either by phone or via the printer's remote support capability. The

remote support service is offered at an hourly rate and can prevent machine downtime and reduce costs. The machine is equipped with an ethernet VPN security router, which enables the operator to initiate a secure point-to-point connection with Ackley, so the supplier's engineers can remotely diagnose problems.

Future proofing long-term printing needs

The printer is capable of storing multiple product recipes, allowing one machine to print on a variety of different products. Recipe storage includes machine operating parameters such as feeding, print settings, ink maintenance, and inspection.

"We currently only print this one product, but we've had other inquiries," said Lawson. "And we have a lot of capacity. Because of the training that Ackley gave us, we have a lot of operators trained. You can literally learn to operate the machine in a couple of days."

While changing between products is simple, it does require custom tooling. If a company has a new or unique product type or shape, the supplier can evaluate it and provide a quote on request. The process involves changing out the carrier bars, rubber rolls, stripper plate, brushes, and blades and can be accomplished within 60 minutes for one machine operator. A toolkit is provided with the system.

"Surepharm was looking for a machine that would provide effortless, continuous operation along with accurate, repeatable results and minimal user interaction or downtime," said McKeon. "This versatile, high-output, precision printing machine should future proof their long-term printing needs." *T&C*

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Photo 2: The optional ink maintenance system continually mixes and recirculates the ink and solvent to maintain optimal ink consistency throughout a batch and reduce waste.