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HP inkjet in action



Reliability key to GE choice of inkjet coders from RSI

Greater productivity from proven technology eliminates coder changeovers that waste time

Reliability is the biggest challenge we had in putting codes on shippers in our plant,” says Steve Dominik. He is plant engineer at General Electric’s Advanced Materials-Sealants & Adhesives plant in New Smyrna Beach, FL. “Our old equipment had a lot of moving parts and wasn’t reliable.”

That was a major problem for Dominik who continues, “You shouldn’t have to stop a line for an ancillary piece of equipment like a printer.”

The plant packages tubes of caulk for the consumer, constructions, and industrial markets. Twelve tubes of caulk go into a corrugated shipper. The plant packages tubes in a standard shipper with different graphics for various customers. And, the customers require different codes, both alphanumeric and bar codes.

Faced with a reliability issue, Dominik began to assess the industrial configuration of thermal inkjet technology. “I was familiar with the HP technology for years as desktop printing

Thermal inkjet coding technology delivers precise bar codes that scan well, and it provides human-readable information. Shippers run at General Electric’s Advanced Materials-Sealants & Adhesives operation. The thermal inkjet printer’s capabilities let General Electric replace two coding technologies with one.

technology,” Dominik explains. “I am particularly impressed with the reliability of the printers.”

Dominik and his peers at the plant arranged for a demonstration of equipment using HP thermal inkjet technology. It was in an industrial-quality configuration engineered by RSI Print Systems, Gaithersburg, MD. RSI set up the equipment for a demonstration in the GE plant. “We saw first hand how this set-it-and-forget-it technology could work in our plant,” Dominik said.

The RSI-engineered equipment replaced two different coders on a packaging line. One was a print-and-apply unit using a heat-transfer ribbon and contact technology to put bar codes on labels that were then applied to shippers. The other was a valve inkjet system for putting human-readable codes directly onto shippers. GE had to use both to deliver what its customers demanded.

The coding task’s complexity gave Dominik reliability headaches, both in terms of complicated changeovers and maintenance. The valve inkjet coders would require expensive rebuilds to maintain quality.

Duplicates existing format

Dominik’s goal was to duplicate existing codes using only one unit. The unit had to print all information—including bar codes—within the 4 by 4 inch dimensions of the previous pressure-sensitive label. And, the codes had to be directly on the shipper.

RSI engineered a single unit, using eight HP thermal inkjet print heads on a common frame. It is adjacent to a conveyor,



Case holding caulk tubes receives an imprint with both bar code and human-readable data applied in one pass. Controller sequences eight print heads to deliver “seamless” codes.



Controller's screen presents operator with WYSIWYG image of code. Controller holds multiple codes in memory; the only entry the operator makes is a new batch number.

downstream of the case packer, but before the palletizer. The unit needs about $\frac{1}{8}$ inch clearance between the print heads and the shippers as they pass by. A controller sequences the pattern in which print heads fire to deliver a "seamless" code.

A PC-based controller gives operators a WYSIWYG (what-you-see-is-what-you-get) view of each code on a screen. It holds all codes in memory, and the operator simply keys in the distinct batch code for each run. The task takes seconds, compared to the lengthy set-ups for the previous coders.

Installation of the inkjet system from RSI Print Systems delivered quicker changeover times. "Usually we needed 5 to 10 minutes to changeover the old printers, but sometimes, we needed as much as 30 minutes," Dominik elaborates. "We actually had to stop the line to get the printers set up for a new run. It was so complicated, I'm not sure I could do it today."

The plant runs two shifts a day, five days a week. It is not uncommon to have as many as three changes during a shift.

To its customers, General Electric's change to the new system was "transparent." GE staffers use a hand-held scanner to verify that codes are readable. "We haven't had any negative comments from our customers on the bar codes' quality. We are proactive in being sure they read," Dominik says.

Another element of simplicity is changing the ink cartridges. Each of the HP print heads incorporates a cartridge that holds 42-milliliters of ink. The print head/cartridge combination is a snap-in, snap-out configuration, letting operators quickly change a head when an ink supply runs low. The software from RSI Print Systems includes a warning when an ink supply cartridge is running low.

"What RSI did with this installation was to take a good thing and make it better." Dominik said in assessing how the installation is delivering in the plant.

The next step in the plant's evolution of the thermal inkjet system is to evaluate a bulk ink supply to extend the intervals between changes to replenish ink. (See sidebar for consideration on using a bulk ink supply.) ●

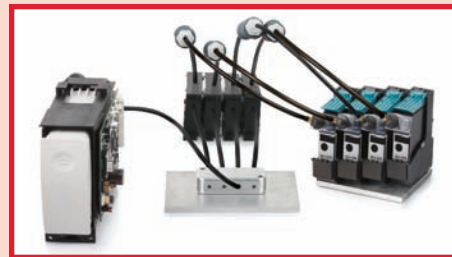
to Drive Down Costs

What are the options when you have longer packaging runs and run multiple shifts that need a robust coding ink supply? One answer is a bulk ink delivery system such as the RSI Print Systems' Industrial Manifold System (IMS).

The reliable, state-of-the-art system is built around a 350-milliliter ink supply that extends running time compared to the standard 42-milliliter ink capacity of HP thermal inkjet cartridges. The bigger supply can offer cost advantages with reduced per-imprint costs and less operator attention in monitoring systems.

The bulk supply system uses a sturdy, molded plastic cartridge to hold 350 milliliters of ink. It fits into an ink supply stall assembly that permits snap-in, snap-out installation of the cartridge. The changeover is so fast that cartridges can be "hot swapped"—changed on the line by an operator while the line is in operation.

The IMS is engineered by RSI and jointly developed with HP. It uses modular components that permit it to be tailored to specific lines and specific needs. Key components of the system include the cartridges and cartridge stalls. It also includes the enclosed regulator assembly that allows the ink supply and the regulator itself to be mounted some distance from the packaging line. That way, engineers can fit the application to a specific location and orientation of print heads.



Newest addition to bulk ink supplies is HP Black 4500 Pigment. Offers superior print quality on a variety of porous substrates, including corrugate and kraft.

The IMS utilizes quick-to-attach, leak-proof connectors. They create a clean ink delivery system that is reliable and helps reduce the overall cost of printing. Electronic connection and components in the system allow integration into plant production management systems.

The modular components allow a range of configurations. The simplest could be one ink supply cartridge feeding one regulator, which, in turn, delivers a single color of ink to as many as four print heads. The system could be as complex as a four-stall setup that feeds different colors of ink to four different print heads.

"The easy, snap-in 350 milliliter cartridges can be replaced while the production line is in operation," notes Jim Constantine, eastern regional manager for RSI. "This is a distinct advantage over other replacement methods, which could only be done while the printer was off."

Individual 350-milliliter ink supplies can hold a variety of HP-developed inks. Dye-based ink often produces brighter, superior colors and generally adheres well to glossy stocks. Pigmented inks offer better light-fastness and water-fastness.

However, generalizations about inks provide only guidelines. RSI recommends testing inks on the specific substrate to be printed. Drying time, contrast, and durability are factors that change with different substrates.

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