

Schering-Plough hits quality goal with Nutec/Wolke system

The Nutec/Wolke thermal inkjet system, utilizing HP technology, adds operational simplicity to lines. Setup is 21CFR11 "friendly"

When Schering-Plough expanded its packaging capacity for Claritin allergy medication, it had three key criteria for putting codes on the cartons:

- Lot and expiration date codes had to be clear and crisp.
- They had to allow inspection by a machine vision system.
- The equipment to do that had to be installed with a minimum of complication and run with a minimum of maintenance.

What answered those criteria was an HP thermal inkjet printer system delivered through Nutec Systems Inc. It offered the best solution when compared to several options considered in engineering two new lines.

The two new lines are in a Kenilworth, NJ, facility, and each produces blister packs. Blister cards come off a thermoform/fill/seal unit. They feed into a Marchesini cartoner where SBS paperboard blanks are erected, loaded, folded shut, and glued at speeds of up to 320 cartons per minute.

The coding and inspection system had to fit within the cartoner. Alternatives considered were laser coding, matte printing, and embossing.

Crisp codes from HP thermal inkjet equipment, coupled with vision-system inspection, assure easily readable lot and date codes on Claritin packages.



"Snap-in" installation allows easy change of print heads during line changeovers. Compact print heads—coupled with "no mess" operation—made HP technology the perfect choice for coding on Claritin line. HP partner Nutec Inc. provided equipment and support including ink specification.

Al Martino, Schering-Plough project engineer, explains some of the thoughts that went into the decision:

"One trend has been toward laser coders—they're high-tech and sexier. But there's the issue of the laser head insider the cartoner. Lasers are large. They create dust and odors as they burn off the cartonboard," Martino explains. "You have to have a dust extraction system and a hood."

Alternatives such as matte printing and embossing were dismissed because they could not deliver the print quality needed for the subsequent machine-vision system.

System considerations

As Schering-Plough's engineers probed deeper into the requirements, the use of the HP thermal inkjet system began to emerge as the solution. A key difference in this system—compared to other inkjet systems—is the HP configuration with the ink in a cartridge that is also the print head.

Chinna Chinnakaruppan, manager of project engineering, believes that the cartridge approach is cleaner than other inkjet printers where ink supply configurations sometime lead to drips. "There are spots on the floor with other systems," he says.

The HP system prints a two-line code on each carton. The first line is a production code and the second an expiration date. Nutec specifies the ink formulation tailored to the SBS board's porosity.

The coding and inspection system on the packaging line has several features that simplify operations and make it compliant with Food and Drug Administration 21CFR Part 11 regulations.

One step that adds simplicity is the procedure of installing new print heads/ink cartridges each time a line is changed over to

a new lot. The cartridges hold 42 milliliters of ink. That is more than enough for the top-end 300,000 carton quantities run on the lines. While there would be ink left over for the subsequent runs, changing cartridges when changing to a new lot precludes the need for changes in the middle of later runs.

"It is less expensive to change out the print heads with each new lot rather than stop the line and change heads in the middle of a run," explains Martino.

Linking print heads, vision system

The linkage between the print head, its controller, and the vision system was a key issue in engineering the line.

The print head is driven by the Wolke m600 controller. The unit is a non-PC, solid-state controller that helps simplify the line's operation. Nutec Systems, Inc. is the exclusive U.S. distributor for the Wolke system.

Immediately following the coder is an optical character vision system. Its camera scans the imprint made by the HP thermal inkjet printers.

In a move to add accuracy, the code to be printed for each run is actually set up in the vision system's controller and then linked to the Wolke m600 controller for the print heads. The information is verified by keying in the information into the Wolke controller. If the two data sets match, then the system accepts it as a valid setup.



The system was integrated at the Marchesini facility in Europe, and the machine builder's familiarity with the Wolke and HP technology helped smooth the process. "It really was a team effort with Marchesini, Nutec, Wolke, and the vision system supplier," says Martino. "The HP system has simplified the process. It takes up less space, is pretty much zero maintenance and its print quality opened up the world of machine vision."

Implementing the printing technology is part of Schering-Plough's quality improvement strategy. Raymond Jahn, Director of Maintenance & Engineering says, "Schering has been working diligently the past few years to be a pharmaceutical industry leader in quality and compliance. It's been a collaborative effort with the Packaging, Qualification, and Quality departments."

Jahn continues, "Several years ago Kent Brown, Director Packaging Operations, laid out a strategic plan for packaging. It included the latest in on-line verification and facilities. My group, led by Chinna Chinnakaruppan, translated Kent's plan into a four-year roadmap. A large part of the success relied on finding the right technology and companies to deliver quality levels we are aspiring to." ●

Wolke m600 controller fits easily into footprint of Marchesini cartoner running at speeds of up to 320 cartons per minute.

Nutec ink specification expertise meets quality, security needs

The right specification for the ink in an inkjet coder is a key to optimizing system performance. Expertise in specifying inks is strength of Nutec Systems Inc., a partner of HP in delivering thermal inkjet solutions.

In straightforward applications such as printing on SBS board, matching the ink to the substrate is essential in getting clear, legible codes.

However, another area where ink formulation is important is package security, an issue high on the list of packaging priorities. The ink offers an especially effective medium to permit package authentication, a step that reduces the risk of counterfeits.

Packaging security consultants say one of the best places to apply a security mechanism is as close to the end of the packaging operation as possible. That keeps security under the packager's direct control.

Coding offers unique opportunities to enhance security, explains Nutec's Mike Shaw. "Within the coding inks, we can incorporate both overt techniques—those you can see readily—and covert methods which you can't see. And the application can all be done under the packager's control," he says.

Overt techniques include color-shifting inks. These hard-to-duplicate inks reflect different colors as they are viewed from different angles.

Coding inks can also carry covert mechanisms such as visual and organic taggants. Optical taggants such as fluorescent and phosphorescent inks identify whether a package came off a specific manufacturer's production lines. Viewed in the distribution chain with the proper lighting, these inks "glow" to display their "pedigree." In addition, DNA or enzyme-based taggants provide security at the forensic level.

Another way thermal inkjet technology delivers security is in its ability to print codes. The HP print heads can print RSS and data matrix codes. These codes, printed in millions of variations, add a unique ID to each package. That ID helps packagers track-and-trace individual units, further verifying authenticity.

Nutec has a large install base in the pharmaceutical industry. "Virtually all of them are capable of delivering the security inks and the serialized codes that add to package security," Shaw says.

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