

Modular Packaging Systems:

Tablet Counter/Filler Incorporates Smart Camera System to Ensure Labeling Accuracy

Pharmaceutical manufacturers must meet stringent labeling requirements to protect consumer safety, and avoid diversion and counterfeiting. The data contained on pharmaceutical product labels must be accurate and legible throughout the supply chain or manufacturers risk huge financial penalties in the form of costly product recalls, government-imposed fines, and associated lawsuits.

Modular Packaging Systems understands the needs of this industry well, having built tablet counting and bottle filling machinery since 1965. Located in Randolph, New Jersey, Modular's expertise designing and manufacturing fillers, modular conveyors, cottoners, slat counters, tablet counters and labelers, has made them a leader in line integration. The company provides turnkey solutions ranging from small clinical lines to high speed filling automated packaging lines. Given the high degree of accuracy required to ensure product safety and integrity, the pharmaceutical industry was an early adopter of Machine Vision. Modular has extensive experience incorporating the technology into its solutions, and use of vision inspection continues to grow as pharmaceutical manufacturers seek new ways to error-proof their operations and comply with evolving industry requirements.

Flexible Needs

One custom electronic counting/filling/labeling line by Modular relies on machine vision to ensure that each container is properly labelled. Date/lot codes and barcodes on each label are verified for legibility and accuracy; the vision system also confirms that a label has been applied to each bottle.



Microscan's VS-1 smart camera verifies labels before they are applied to containers.

Modular's customer, a contract packager, needed a system that was versatile enough to meet the compliance and internal quality requirements of any of its customers. Because the labels are supplied or specified by the end customer, the contract manufacturer has no control of the print method, code format, or label stock that is used in each run. The solution required the flexibility to read multiple fonts, as well as linear or 2D barcodes printed by hot stamp, thermal transfer, inkjet, or any other means. An inspection to prevent missing labels is also a requirement of the labelling process. Typically for pharmaceuticals, this is accomplished using a sensor to detect a UV varnish on each label; however, since the provided labels may or may not contain a UV element, this system called for a different means of determining label presence. In addition, the system needed to be easy to maintain.

■ **Problem:** Prevent incorrect or missing labels on pharmaceutical bottles.

■ **Project:** Implement label verification and detection into bottle filling line for contract packager.

■ **Solution:** VS-1 smart cameras with I-PAK software interface use OCR to verify date/lot codes. Visionscape's Flaw (Edge Detection) Tool ensures label presence.

■ **Result:** 100% label inspection in a system that provides flexibility for label variations.

Application Case Study: Modular Packaging Systems

System Implementation

Modular Packaging Systems worked with Microscan partner Saddle Brook Controls, of Saddle Brook, NJ, to implement a vision inspection solution for the line. Saddle Brook Controls provides factory automation products and support services to customers throughout the north eastern U.S. “We had a longstanding relationship with Saddle Brook and good success with Microscan in the past, so we were using a platform that we knew was reliable,” says Andrew Smith, Sales Manager for Modular.

Saddle Brook configured a dual camera system using Microscan’s VS-1 smart cameras with the Visionscape® I-PAK® software interface. The first camera verifies that the date/lot code and barcode on each label are correct as the labels are fed through a labeller that runs parallel to the bottle conveyor. Each label is indexed and verified by the system using Optical Character Verification (OCV) to match the date/lot code to an expected string. Using Visionscape’s OCV Fontless tool, text characters are trained by the system to ensure an accurate match. The trainable tool provides the flexibility to verify any font that is printed on the labels. “Microscan products have powerful decode algorithms; they excel at verifying date/lot codes and other human-readable text,” says Saddle Brook’s Mike Montalbano. “In addition, the combination of the VS-1 camera with the I-PAK software interface provides the functionality that is needed at a very attractive price point.”

All labels are applied to the bottles despite the outcome of the inspection. A label that does not meet the required specifications will be tracked to the bottle on which it has been applied, and expelled in a reject station further down the line.

After the label application process, a second VS-1 smart camera checks each bottle to detect any missing labels. The camera detects print and/or graphics on the label to ensure that each bottle has a label on it using Visionscape’s Flaw (Edge Detection) Tool. The vision inspection process does not rely on a particular label stock or the presence of a UV varnish, once again providing maximum flexibility to this contract packager. Any unlabeled bottles are rejected from the line.

Reject stations, bottle tracking, and all other mechanical integration of the line was done by Modular Packaging Systems, while Saddle Brook Controls “configured the Microscan products to work the way we needed them to work to ensure fail-safe operation,” according to Smith. All of the data collected in this process is sent to Modular’s standard Windows-based machine controller, B&R Automation’s PP500, which provides a single operator interface that is integrated to Modular’s PLC inputs and outputs.



Custom tablet counter/filler built by Modular Packaging Systems.



Microscan's Visionscape I-PAK software displays inspection results on an HMI screen.

Future Plans

Moving forward, Smith expects to see more vision inspection incorporated into the company’s product line. “Before, we used vision just for label verification. Now, we are starting to use it in our tablet counting machines, and for cap inspection. The push for serialization in the pharmaceutical industry will necessitate additional vision capabilities.”

Conclusion

Modular Packaging Systems’ customers require 100% inspection to ensure labelling accuracy and meet the stringent requirements of the pharmaceutical industry. Machine vision technology helps these manufacturers to accomplish their objectives in a reliable and flexible way that will enable them to grow with the evolving needs of the market.

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