

Improving Quality in Packaging with VISION

Overview

In the days before computers and digital technology, one had to rely upon the human eye to perform manual quality assurance inspections for proofreading and detecting errors or print flaws in packaging production runs. This process was not only arduous and time-consuming, but it also had limitations, especially when it came to high-volume production of millions of pieces. At best, only a sampling could be expected to pass through a detailed inspection for quality. Compounded by the human factor of distractions, fatigue, inconsistency, and multiple sets of eyes performing inspections at varying times during a run, and the outcome is bereft with uncertainty.

As we journey through the evolution of the digital age, the challenge remains to find effective ways to manage and maintain the highest level of quality.

Current State

For the secondary packaging market, quality inspection is an integral process within the manufacturing operation. As regulated industries within consumer packaged goods, health and beauty, and in particular, the pharmaceutical industry, must adhere to strict labeling and packaging requirements. Failure to comply with regulations can cause delays in product launches and fulfillment, customer complaints, or worse yet, product recalls. Branding errors, mistakes regarding dosing information or other consumer instructions can damage the brand or endanger the consumer.

Solution

Automated vision inspection systems 'fast-forward' the process by bringing speed, accuracy and consistency to secondary packaging operations. By combining these key components: a sensor or camera, the right processing hardware, a conducive environment, and software able to render and communicate the results, we can create an effective vision inspection system, light years beyond prior human limitations. Replicating the system to protect the product from critical errors throughout each stage of the manufacturing workflow renders 100% vision inspection.

Various applications for vision inspection include positioning, identification, verification, measurement, and defect (or print flaw) detection. Unlike the human factor, automated quality inspection using vision technology provides tireless performance, resulting in improved quality, higher yields, and lower downstream waste. Discarding defective parts before packaging arrives at the customers' production or fill line, drives a more positive customer experience and safer and more reliable end-user experience.

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Key Benefits of 100% Vision Inspection

- Secure and verified content is 100% accurate before going to market.
- Reduced rework, wasted material, and labor required to address corrective actions.
- Keeps projects flowing efficiently and opens greater capacity.

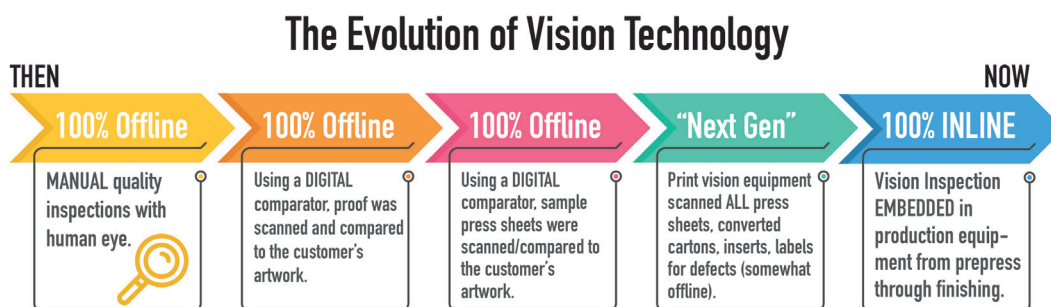
How Vision Inspection Works

Implemented in concert with packaging production equipment from pre-press through printing presses, folder-glueers and packers, the electronic components of the vision system communicate to provide a constant stream of information. These are the eyes that capture images and the brains that process information in milliseconds. Customizations enable the system to analyze data based on a predetermined set of criteria or customer expectations.

The vision system can be deployed to detect characters, pixels, patterns, shapes, edges, presence (or non-presence) and location of glue, barcodes, labels or inserts. Irregularities, flaws or defects determined to be outside the parameters of the QA standard are flagged in pass/fail fashion, and instantly segregated from the lot.

An industry statistic, based on multiple quality control studies initiated in the 1970's, found that human inspectors detect approximately 80% of defects in manufactured parts. The theory was that 20% of defects would squeak by. Over the years, automation and technology have evolved alongside ever-tightening quality standards. Even without taking into account the time factor in conducting offline inspections, previously accepted quality standards remain a stark realization, considering that with today's technology, we can detect practically 100% of defects, and at a very low cost.¹

As with automation tools used in regulated industries such as Pharmaceutical, vision systems software must conform to applicable industry standards and guidelines such as ISO 9001, GMP and GAMP 5, and it must also contain functions required for validation according to U.S. FDA Title 21 CFR Part 11 guidelines.



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Applications For Vision System Implementation

Prepress

Digitally inspect two files, side-by-side: the customer-approved content vs. the file to be ripped for proofing. This presents the first point-of-entry for comparison. Version changes can also be tracked using this method.



Printing

In the production of offset printed paperboard folding cartons, informational inserts, and flexographic printed pressure-sensitive labels, vision systems monitor the quality of the entire print job throughout the run, catching flaws or defects in real time enabling the operator to take corrective action. Only materials that are in conformance will be delivered to the customer.



Content such as text, multiple languages, braille dots, graphics, foils, color variations, registration, filled in or missing characters, print flaws, variable data, 1D and 2D codes is verified. The customer proof or PDF provides the standard against which all these characteristics are assessed for quality. The technology allows for region-specific targeting of inspection priorities, limiting waste and providing predefined parameters of tolerance and acceptability.

Bonus! This also provides a win in terms of sustainability as waste is mitigated through efficient detection, overruns can be minimized, and valuable machine time limited.



Finishing

A vision system ensures the presence of glue on each carton, as well as the position of the glue line on a target area of the carton. It also detects barcodes, mixed, missing, or skewed copy, double feed or jam detection, feed counts, base counts, and batch counts.

About Colbert Packaging

Each day, for 60 years and counting, Colbert Packaging is committed to producing safe, smart and sustainable packaging for customers who include some of the biggest names in the pharmaceutical, healthcare and consumer goods markets. Colbert's Kenosha, Wisconsin facility produces offset and flexographic printed folding cartons, pressure-sensitive roll labels and package inserts; the Elkhart, Indiana operation includes folding carton production and paper tray forming. Learn more at www.colbertpkg.com.

1. Industry Week article – Jan 14, 2020, Machine Vision Promises Nearly Flawless Quality Control, Raminder Sandhu

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