

Engineering Excellence

SUCCESS STORY

Machine Vision Feasibility Testing: Food Industry Packaging



THE COMPANY

The customer is a prominent manufacturer in the food packaging industry, specializing in packaging fresh produce for retailers and consumers. They are committed to ensuring the highest quality standards and operational efficiency in their production process. With a focus on product consistency, the customer strives to meet the strict regulatory requirements for food packaging, ensuring that every bag of produce meets precise quality control standards.

OVERVIEW

In the fast-paced food packaging industry, maintaining product quality while keeping production speeds high is a constant challenge. The customer needed a solution to automate the inspection of perforated holes in flexible packaging (web), ensuring they met the strict 50 μ m size requirement. With production speeds running at 1500 feet per minute, manual inspection was inefficient and prone to errors. The solution required a high-precision, high-speed system capable of providing real-time quality assurance and measurable data without slowing down the production line.

CHALLENGE

The customer's primary challenge was maintaining tight quality control while managing a fast-paced production line. The perforated holes in their flexible packaging (web) needed to meet a strict 50 μ m size requirement, but with production running at 1500 feet per minute, manual inspection was both time-consuming and ineffective. The solution required automation to inspect the holes in real-time at high speeds, while ensuring precision and providing measurable data for quality assurance.

SOLUTION

Tri-Phase Automation designed and implemented a custom machine vision system to meet the customer's needs. The system was tailored to inspect perforated holes in plastic bags at high speeds while ensuring 5µm precision. By installing high-resolution cameras and advanced software, we enabled real-time inspection and automated quality control, providing immediate feedback for every product.

Testing Setup:

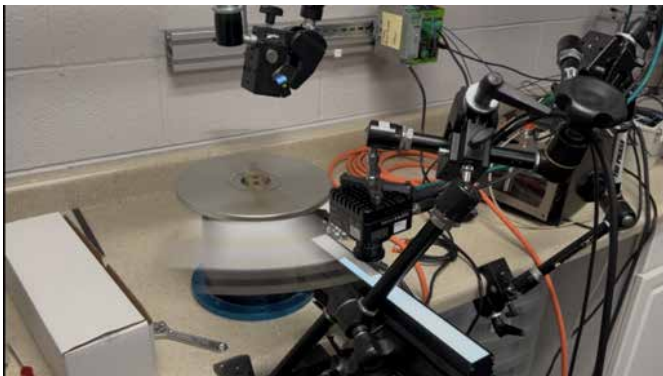
A high-resolution camera was mounted 5mm from the target to meet the 5µm tolerance. Special lighting was used to ensure clear images despite the low exposure time caused by the highspeed production line (16 inspections per second).

Machine Vision Programming:

The system was programmed to measure non-circular holes using distance tools at 5° intervals, allowing accurate measurement of irregular hole shapes. The output provided calculations for the average diameter and standard deviation, which the customer could use to determine whether the product met the specifications.

Real-Time Inspection:

The system allowed for real-time inspection of the perforated holes as the bags moved along the conveyor belt, automating the quality control process and providing instant feedback.



RESULTS & OUTCOMES

The machine vision system that Tri-Phase Automation implemented provided significant improvements across multiple facets of the customer's production process. By automating the inspection and quality control processes, the system was able to operate at high speeds without sacrificing accuracy or efficiency. The following results demonstrate how the solution addressed the customer's challenges and led to measurable improvements in their operations:



HIGH-SPEED INSPECTION

The machine vision system was capable of inspecting 16 bags per second, keeping up with the 200 feet per minute conveyor speed.



PRECISION

The system achieved 5µm accuracy in measuring hole diameters, meeting the customer's strict quality control standards.



IMPROVED EFFICIENCY

Automation significantly reduced manual inspection time, improving overall operational efficiency.



REAL-TIME FEEDBACK

The system provided instant feedback on product quality, ensuring that every bag met the required specifications before it continued down the production line.

