TECH OFFER

Modular Food Packaging Vision Inspection Machine

KEY INFORMATION

TECHNOLOGY CATEGORY:
Foods - Quality & Safety
Foods - Processes

TECHNOLOGY READINESS LEVEL (TRL): **TRL7**
COUNTRY: **SINGAPORE**
ID NUMBER: **TO175382**

OVERVIEW

In Singapore's space-constrained and high-cost manufacturing landscape, maintaining food safety and product quality efficiently is critical. This technology provides a smart, adaptable solution designed to meet these unique local challenges.

Currently, product packaging inspections are often assigned to production operators who juggle multiple responsibilities. Since this manual process relies heavily on human judgment, outcomes vary with individual skill levels and are vulnerable to worker fatigue - leading to inconsistent inspection standards. Random sampling is commonly used, where only a subset of packages within each batch is checked. However, this approach risks missing foreign objects, which may contaminate products and compromise food safety. Product recalls are costly and damaging to brand reputation, in addition to posing significant food safety risks. It is therefore essential to prevent them wherever possible.

This solution minimises this problem by replacing manual inspections with an automated system capable of examining packaging in the production line before product filling. Its modular design allows seamless integration with existing production lines,

minimizing the need for extensive modifications and lowering the cost of adoption for food manufacturers.

Ultimately, the modular vision inspection system goes beyond quality assurance - it represents a strategic investment in resilient, efficient, and future-ready food manufacturing in Singapore.

TECHNOLOGY FEATURES & SPECIFICATIONS

This machine vision solution uses a camera with an AI algorithm software to perform QC inspection on product or packaging continuously. It detects and rejects foreign objects on packaging or food surfaces to relief the production operators from repetitive and mundane QC duties, thereby enhancing overall productivity while ensuring the food safety standard are being well maintained.

- **Modular:** Easily adaptable to existing production line to include machine vision on detection of foreign objects. Technology owner provides expertise in system integration if required.
- **Transparent-on-transparent detection:** Able to detect as small as 3mm of glass particle against glass material e.g. jars with up to 95% accuracy.
- **Detection of other challenging contaminents:** E.g. Opaque items such as hair, insect as small as 1mm in size.

POTENTIAL APPLICATIONS

- Food manufacturing facilities such as:
  - Sauce Production Facilities
  - Pre-mix powder production facilities
  - OEM
  - Packaging inspection and qualification
- Other applications includes:
  - Medtech manufacturing
  - Semiconductor manufacturing
  - SMEs who are looking to integrate vision inspection with incremental features

UNIQUE VALUE PROPOSITION

- AI data interpretation has the ablilty to detect transparent on transparent material (e.g. glass on glass, white hair, insects) on packaging or food surfaces.
- Modular and able to adapt into existing production set up easily.
- Potentially more cost effective as a modular solution compareed to available solutions with extended systems and features.