

HyperScope™

MAKING THE INVISIBLE VISIBLE



Hyperspectral
seal inspection of
rigid plastic packages

ENGILICO™

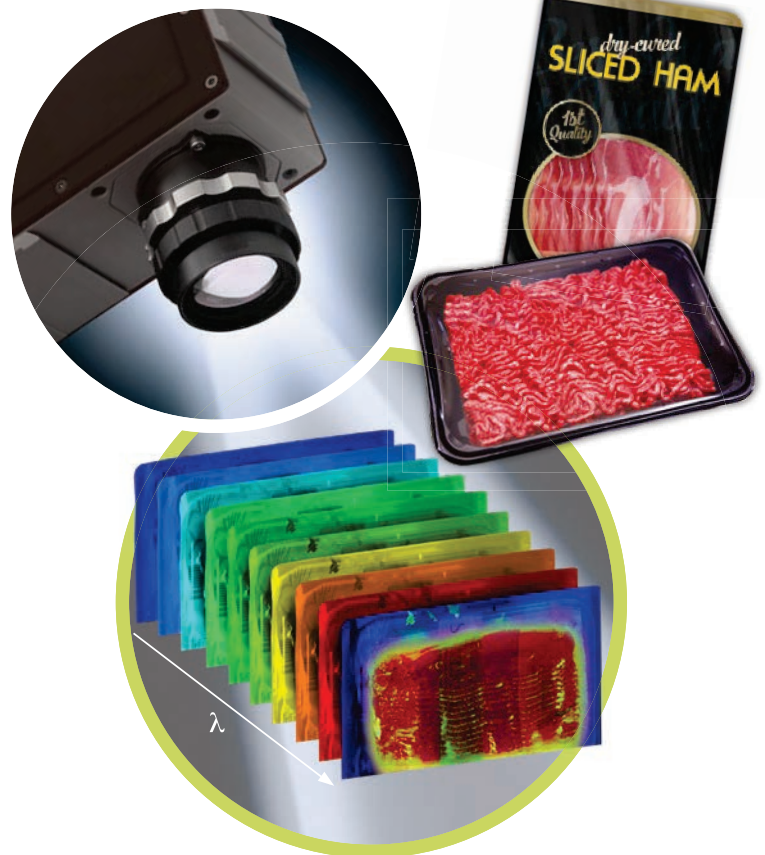
HyperScope

100% IN-LINE HYPERSPECTRAL SEAL INSPECTION FOR TRAYS, POTS AND THERMOFORMS

Seal contamination in food packages leads to leakage, growth of molds or bacteria and consequently reduced shelf-life, health risks and even expensive recalls. Automatic detection of contaminated seals is essential for both food safety and production automation.

HyperScope™ is a new in-line seal inspection system that detects foreign materials or contamination in the sealing area that may lead to leaking packages.

Hyperspectral camera technology enables to identify substances with different compositions such as plastics, paper, organic products, fat, liquids with a much higher contrast than traditional vision-based camera systems. In addition, when printed film is used, hyperspectral is the only imaging technology that detects contamination through the sealing film reliably.



Benefits

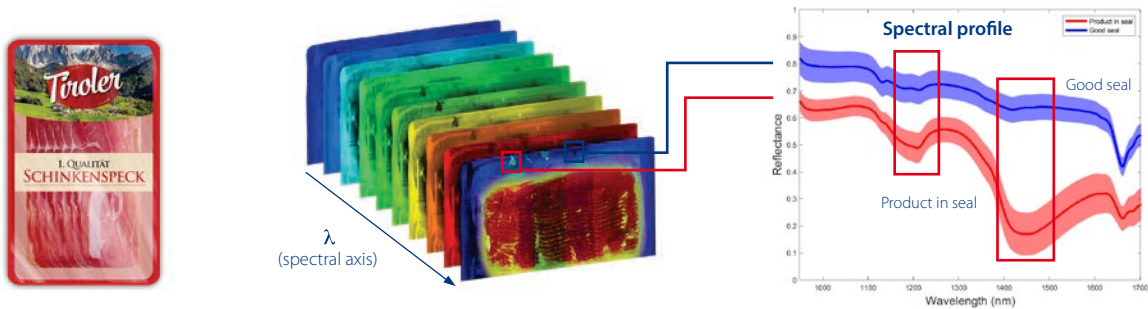
- 100% Inspection
- Improves outgoing packaging quality
- Enables end-of-line automation
- Eliminates manual inspection
- Reduces product returns & scrap

Features

- Non-destructive inspection
- Fast inspection at up to 160 ppm
- Automatic recognition of package position, orientation and sealing area
- Detects contamination through printed film, invisible for standard vision cameras
- Easy installation above existing or its own conveyor

How it works

- **HyperScope™** provides a spectral profile over a broad wavelength range: depending on the camera type, ranging from visual (400 nm) over near-infrared (950 nm) to shortwave infrared light (1700 nm)
- The spectral profile from the package is built from the reflecting light containing information on the materials in the package and sealing area
- Near-infrared light with longer wavelengths is transmitted and reflected through the sealing topfilm, even when printed
- Substances such as plastics, organic products, fat, liquids can be identified in different wavelength bands



A standard industrial camera image is built from 3 wavelength ranges (RGB) and only provides visible information

The hyperspectral 3D spectral image map is built from a broad wavelength spectrum. Every pixel is analyzed individually and differences in materials or composition are detected, even through printed foil. A contaminated seal has a different spectral profile than the profile of a clean seal.

Seal inspection examples



Visual image

When product and film have similar colors (yellow-on-yellow), contamination in the seal is hardly visible.

Hyperspectral image

The higher contrast clearly reveals contamination (red) in the seal (green).

Visual image with detail of contamination

With similar (e.g. red-on-red) or transparent colours, the contamination (e.g. fat, meat) is not visible.

Hyperspectral classification

The image with higher contrast allows to detect different substances, even through printed film.

Applications

Seal inspection of trays, pots and thermoformed packages sealed with plastic film

- Cheese
- Fillets
- Sliced meat
- Minced meat
- Ready-meals
- Fresh produce
- Snacks
- Dairy



Setup

The **HyperScope™** system consists of a hyperspectral camera, dedicated lighting and a controller unit with proprietary software. The system is installed over an existing or its own¹ conveyor belt and inspects every individual package.

Results are analyzed in real-time and immediate feedback on the sealing quality is displayed on the controller touch screen. A reject signal is sent to an ejector¹ to eliminate defective packages.



Specifications

Seal inspection	HyperScope NIR	HyperScope VNIR
Wavelength range	950 - 1700 nm	400 - 1000 nm
Sensor type	InGaAs	CMOS
Scan speed ²	400 - 2000 lines/sec	
Tray inspection speed ²	160 packages/minute	
Use case	Printed and transparent seal	Transparent seal
Max. width conveyor band	700 mm	

¹ Optional devices

² Typical speeds: actual values depend on the specific application



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Engilico reseller

