Application Note

Advanced Machine Vision
Hyperspectral Imaging

For high-speed, in-line process inspection, Hyperspec® imaging systems offer advantages over traditional machine-vision cameras in the ability to analyze, discern, and discriminate based on the chemical composition of product on the manufacturing line.

Hyperspectral imaging instruments inspires a new generation of advanced machine vision inspection technology by seeing beyond the visible spectrum. Traditional machine-vision cameras based on red, green, blue (RGB) color are limited in the ability to inspect for differing quality states where color is not the key indicator. Hyperspectral imaging can be a key differentiator with respect to the inspection of fruits, vegetables, poultry, seafood, pharmaceuticals, and more/Agricultural & food products.

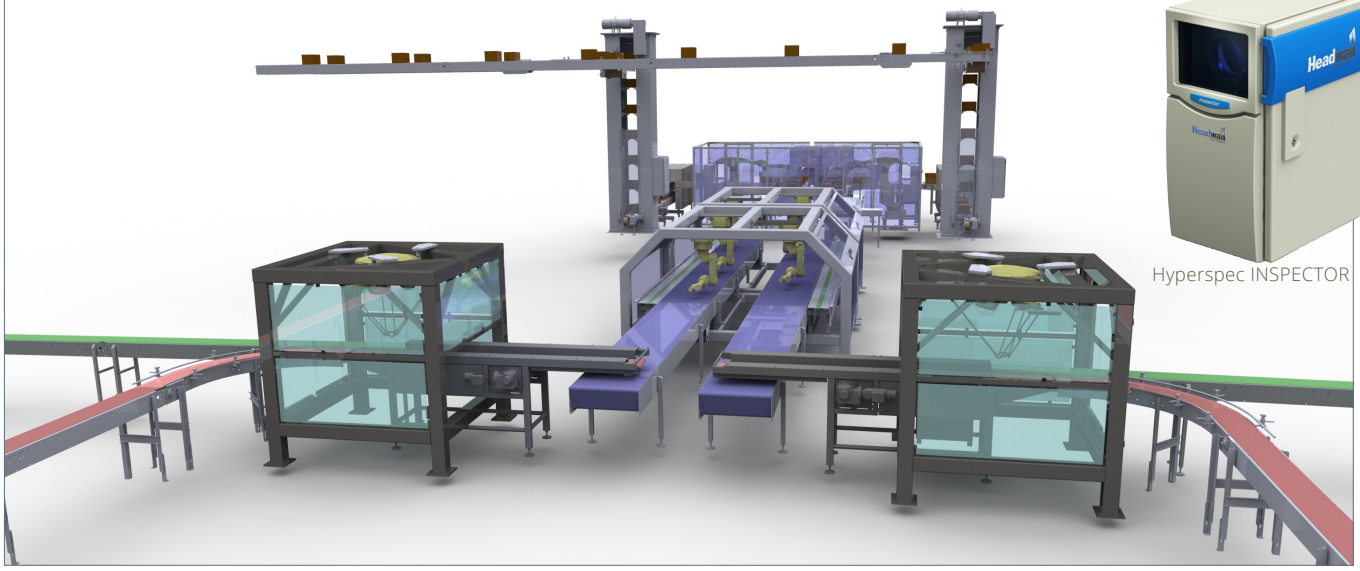
Headwall's Hyperspec® imaging sensors are customized for the spectral regions where product differences can be detected, analyzed, and acted upon in real-time for high speed production operation. Hyperspec® Inspector systems are configured for the following spectral regions: VNIR (380-1000nm); Extended VNIR (550-1700nm); NIR (900-1700nm); and SWIR (950-2500nm).

With our team of experienced system engineers, Headwall works collaboratively with end-users and OEM partners to develop the multispectral algorithms that allows processors and manufacturers to improve product safety and product quality. When integrated into the manufacturing plant, the Hyperspec® Inspector sensors can remove foreign material from the process line, inspect and grade for product quality, and measure and optimize for in-process formulation.

As the world's foremost manufacturer of spectral imaging products and solutions, Headwall is helping companies across numerous industries achieve substantial improvements in manufacturing yield while improving the level of product quality.

Headwall's Hyperspec® Inspector runs 24x7 unattended and is designed for extremely harsh environments. Hyperspec® systems offer attractive, cost-effective solutions very quickly by boosting product quality and plant efficiency while reducing the amount of unnecessary waste.

Use hyperspectral imaging to boost product quality and reduce unnecessary waste

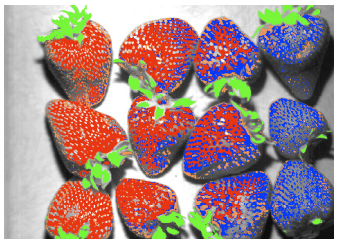


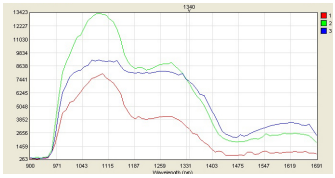
Hyperspec INSPECTOR

ENGINEERING SERVICES

Engineering services provide an inspection configuration that is specifically tailored to integration within the production line. These services range from the development of spectral libraries to inspection rules and the development of user interfaces for the production floor.

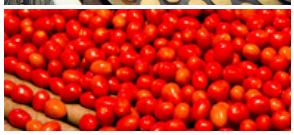
MULTISPECTRAL ALGORITHMS





Understanding the chemical make-up of product - good and bad – provides the basis for processing algorithms that drive the hyperspectral inspection. These algorithms include not only spectral signatures but also shape detection of products passing on the production line.

DOWNSTREAM INTEGRATION



Hyperspec instruments communicate in real-time with downstream production control equipment such as robotic arms or ejection devices for removal of foreign material or management of process flow steps based on quality procedures.

ILLUMINATION TECHNOLOGY

Years of experience are utilized to design and implement industrial lighting that is designed for reliability, stability, and conformance to the uniqueness of the manufacturing location. These industrial illumination systems are engineered for predictable spectral response and repeatable, accurate analytical measurement.

About Headwall Photonics: Headwall is the leading designer and manufacturer of imaging spectrometers and spectral instrumentation for industrial, commercial, and government markets. Headwall's high performance spectrometers, spectral engines, and holographic diffraction gratings have been selected by OEM and end-user customers around the world for use in critical application environments. As a pioneer in advanced, patented optics technology, Headwall enjoys a market-leading position through the design and manufacture of spectral instrumentation that is customized for application-specific performance.

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