In-line hyperspectral sensing is useful for monitoring formulation and inspection processes across numerous industries. The technology represents a valuable analytical technique for capturing important spectral data critical to the operation and maintenance of key steps within an automated process environment.

Hyperspectral imaging simultaneously yields precise information for all wavelengths across the complete spectral range available. Traditionally, the near infrared range (NIR) of 900 to 1700 nanometers and the extended visible-near infrared (Extended VNIR) range of 550 to 1700 nanometers are of considerable interest for process manufacturing applications.

With a wide field of view and optimized spectral and spatial resolution, Headwall's Hyperspec® sensors are customized for in-line and at-line material inspection and quality control. With the creation of hyperspectral datacubes (a data set including all spatial and spectral information), manufacturers can now control and monitor critical process steps by:

• Generating wavelength-specific criteria for pass/fail during high-speed processing

• Collecting the spectral signature of every point within the field of view for material classification

• Color-rendering images within the field of view based on an established library of spectral signatures

Two modes of operation are available for deployment of the Hyperspec sensor – a lens-based input system for capturing spectral images moving along or across the manufacturing line or with a fiber-based input for use as a multi-point, multi-channel spectrometer system.
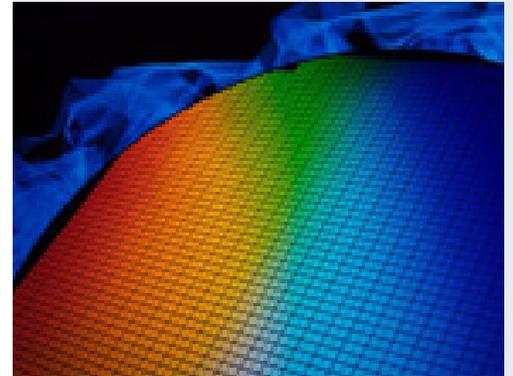
• **Food Processing**

• **Pharmaceuticals**

• **LCD Quality Control**

• **Semiconductor Operations**

• **Photovoltaics**

• **Wafer Inspection**

Headwall is the world's leading manufacturer of hyperspectral imagers (Hyperspec®) for a wide range of industries including remote sensing, advanced machine vision, precision agriculture, and others. The Company also manufactures OEM spectrographs and spectral engines that are exceptionally precise with respect to high spectral and spatial resolution and signal throughput.

The core technology fundamental to these products is the holographic diffraction grating, which Headwall manufactures to exacting dimensions and tolerances and to customer specification. This allows for small and rugged optical imaging instruments that deliver aberration-corrected performance and a very wide field-of-view. Used in Headwall's *concentric-style* imagers along with mirrors, the designs are simple yet elegant and feature no moving parts.

In addition to hyperspectral, Headwall also manufactures Raman imaging instruments that are available in a wide range of laser excitation wavelengths. Raman Explorer and Raman Discovery are very well suited for chemical imaging applications as well as biotechnology and medical applications.

Hyperspectral Ranges	
UV-VIS	250-825nm
VNIR	380-1000nm
Extended VNIR	550-1700nm
NIR	900-1700nm
SWIR	950-2500nm
MWIR*	3-5 microns
LWIR*	8-12 microns
*MWIR and LWIR available upon request	
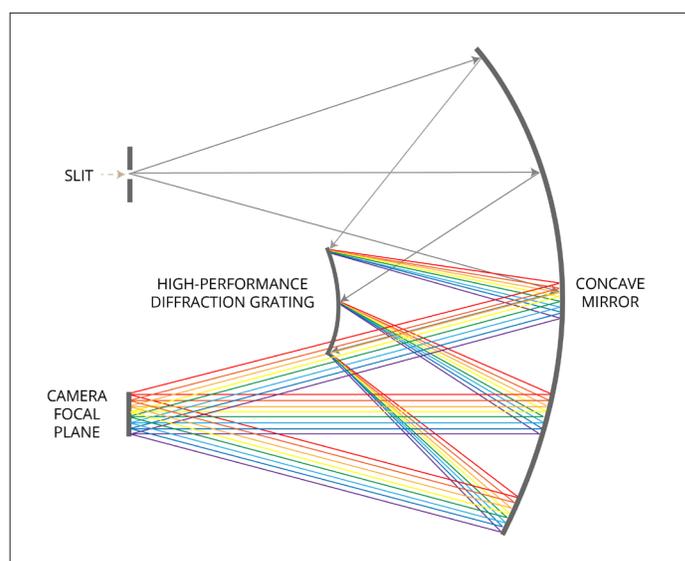
Raman Explorer	
248nm	single input
355nm	single input
532nm	single input
532nm/658nm	dual input
642nm	single input
785nm	single input
785nm	dual input
830nm	single input
Raman Discovery	
532nm	dual input
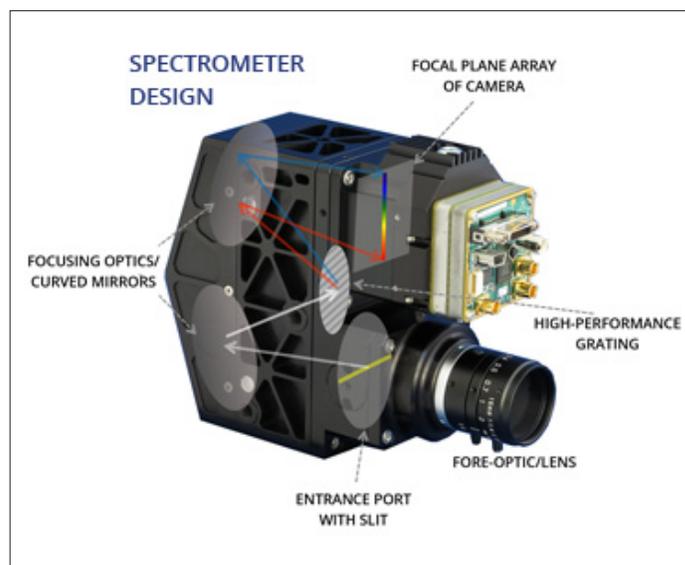
About Headwall Photonics: Headwall is the leading designer and manufacturer of imaging spectrometers and spectral instrumentation for industrial, commercial, and government markets. Headwall's high performance spectrometers, spectral engines, and holographic diffraction gratings have been selected by 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.