

Hyperspectral imaging, also known as chemical sensing, affords forensic scientists unique advantages in terms of noninvasive analysis of crime scenes, evidence, documents, artwork, artifacts, or other objects of interest.

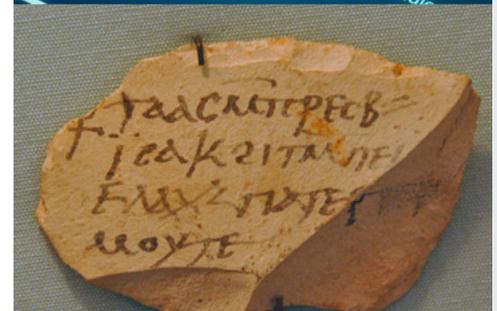
Once limited to the laboratory, Headwall's Hyperspec® imaging technology is small enough and portable to be utilized in a wide range of environments from crime scenes to lab benches. The utilization of high efficiency diffraction optics enables the selection of optimized hyperspectral imagers covering broad spectral regions.

The Hyperspec® sensors are configured with either scene scanning capability (pan & tilt systems) or available as integrated instruments for sample analysis and image rendering in a forensic laboratory.

Since no preparation of the sample or forensic evidence is necessary, this non-destructive spectral technique is invaluable for a wide range of forensic science applications. Within the field of view of the Hyperspec® sensor, hyperspectral imaging simultaneously yields precise information for all wavelengths across the complete spectral range of the sensor. With the creation of the hyperspectral datacube, a data set that includes all of the spatial and spectral information within the field of view, forensic teams are able to more thoroughly evaluate documents and other crime scene evidence that will greatly enhance knowledge of the spectral composition and uniqueness of these samples.

Key advantages of hyperspectral imaging for forensic scientists include:

- Derive the precise spectral signature for every point within the field of view for material classification
- Color-render the image within the field of view based on an established library of known spectral signatures
- Evaluate evidence, forensic samples, or documents for spectral tags
- Pan a crime scene for spectral evidence while maintaining spatial information



- Crime Scene Investigation
- Counterfeit Detection
- Document Analysis
- Document Verification
- Latent Print Analysis
- Materials Investigation

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.

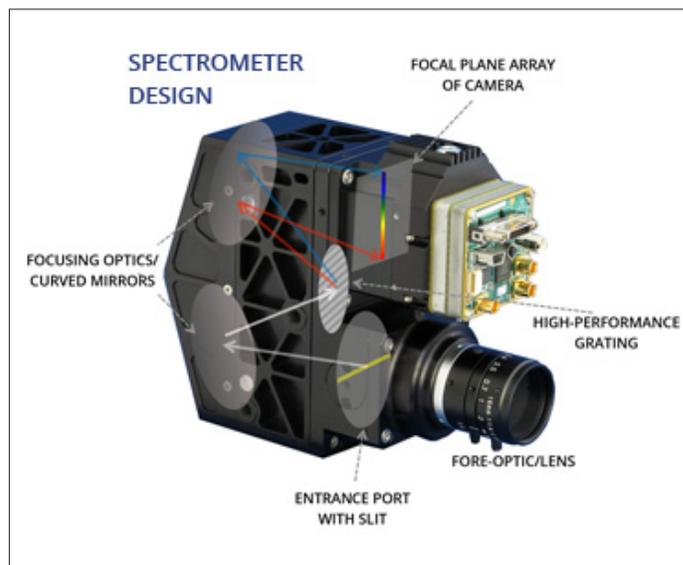
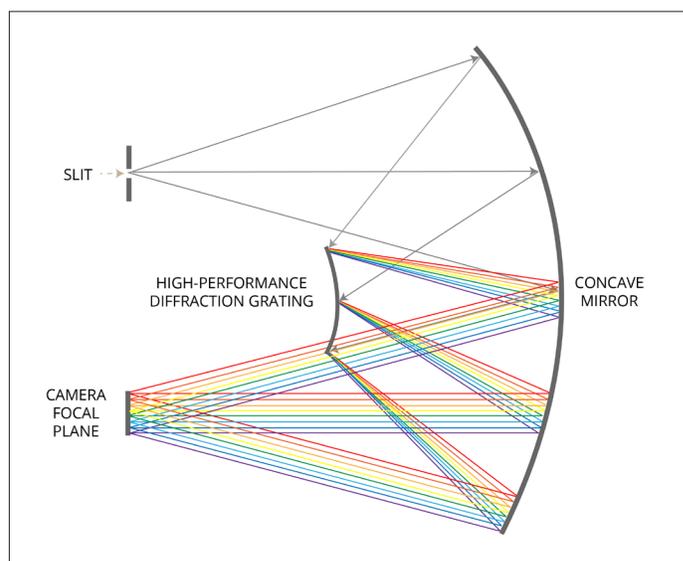
The core technology fundamental to these products is the holographic diffraction grating, which Headwall manufactures to exacting dimensions and tolerances and to customer specification. This allows for small and rugged

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.

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