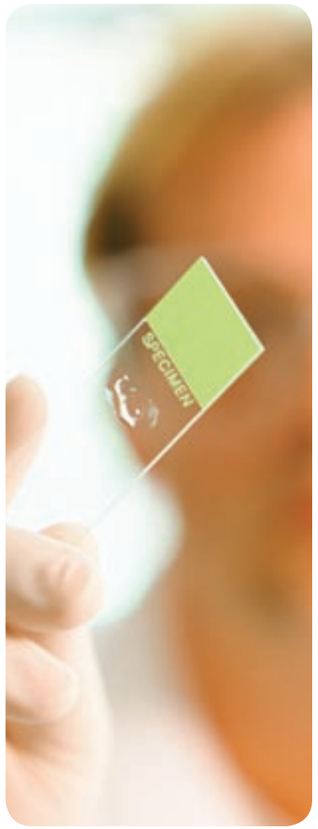
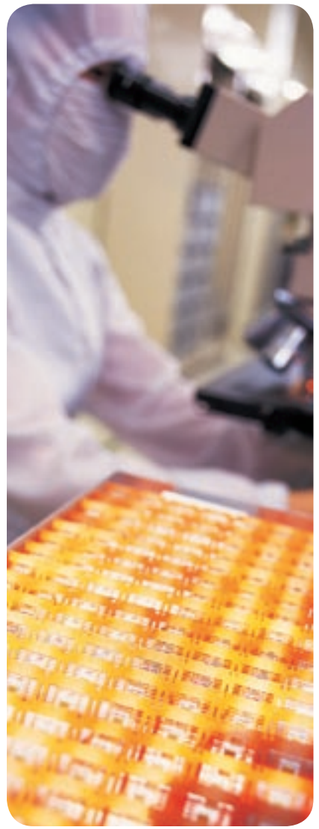
CRAIC

Measure.

Analyze.

Discover.





A new approach to spectral analysis of microscopic samples.

The identification, classification and quantification of microscopic samples and sampling areas is becoming ever more important in science, medicine and industry.

UV-visible-NIR microspectrophotometry, which integrates UV-visible-NIR spectroscopy with the magnifying power of a microscope, is the perfect technique for such applications. As individual components, the UV-visible-NIR spectrophotometer and optical microscope are simple to use. However, when combined together into a system, a number of facts must be considered…facts that are inherent in both the microspectrophotometer as an instrument and the techniques being utilized. Only microspectrophotometers specifically developed for microanalysis guarantee accurate and precise results…microspectrophotometers such as the QDI series from **CRAIC Technologies.**

CRAIC Technologies has designed and developed the QDI series of microspectrophotometers by working in conjunction with the leaders in their fields. The QDI series utilizes the very latest technology and the highest quality components to give unmatched performance when measuring absorbance, transmittance, reflectance, polarization or fluorescence from samples as small as 1 micron. With a spectral range that spans from the deep ultraviolet into the near infrared, these tools are flexible, powerful and durable. Best yet, the technical and scientific talents of the people of **CRAIC Technologies** back these instruments insuring years of the highest performance.

QDI 2000™
Microspectrophotometer

Spectral range from the deep UV to the mid-IR (200-2100 nm with all options) by transmission, reflectance, polarization and fluorescence microspectroscopy.

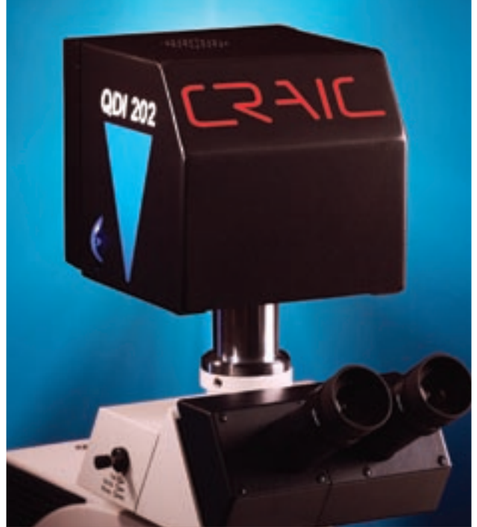
QDI 1000™
Microspectrophotometer

UV-Visible-NIR range (240-850 nm) by transmission, reflectance, polarization, and fluorescence microspectroscopy.

QDS II™
Stereomicrospectrophotometer

Zoomable sampling area enables microspectroscopy of sample sizes ranging from 25 to 250 microns with an ultra-long working distance.

QDI 202™
Microscope Spectrophotometer



Add spectroscopy to a microscope or upgrade an existing microspectrometer with the latest technology and software.

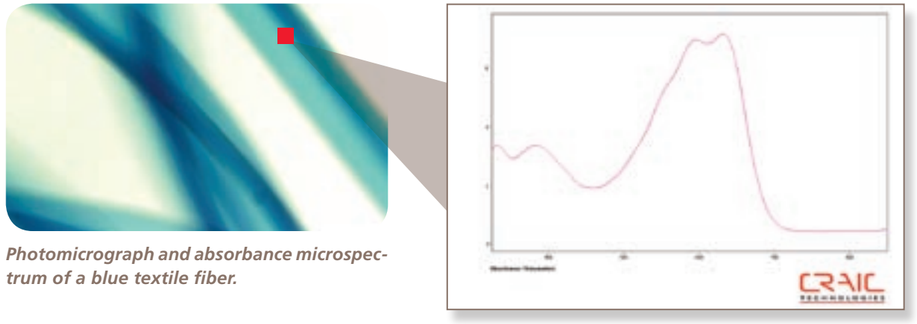
Products At-a-Glance

Applications

Forensics

QDI 2000 | QDI 1000 | QDI 202

Comparison and databasing of trace evidence such as fibers, dyed hairs, glass, automotive and architectural paints, soils and minerals by UV-visible-NIR absorbance, reflectance, polarization and fluorescence microspectroscopy.



Photomicrograph and absorbance microspectrum of a blue textile fiber.

Documents and Currency

QDI 2000 | QDS II

Non-destructive quality control of currency and determination of counterfeiting by micro-analysis of inks and papers by UV-visible-NIR absorbance, reflectance and fluorescence microspectroscopy.

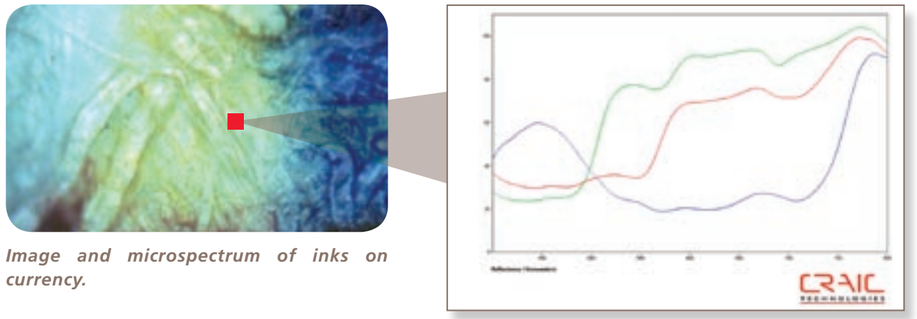


Image and microspectrum of inks on currency.

Biology & DNA

QDI 2000 | QDI 1000 | QDI 202 | QDS II

UV-visible-NIR absorbance and fluorescence microspectral analysis of cancerous tissue, plants, plankton, and bacteria. Quantification and qualification of DNA and RNA for enhanced DNA screening.

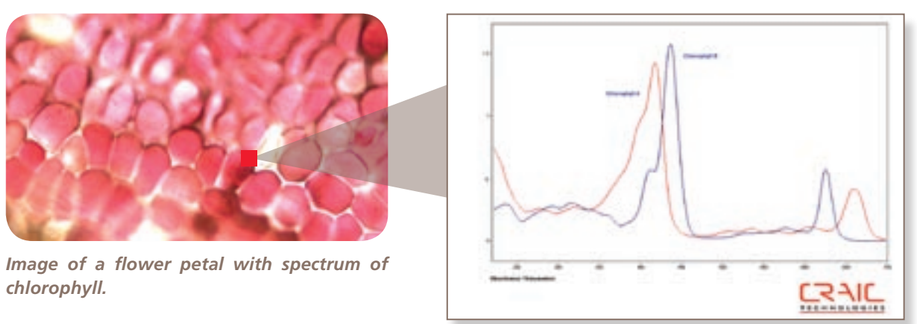


Image of a flower petal with spectrum of chlorophyll.

Semiconductors

QDI 2000 | QDI 1000 | QDI 202

Determination of thickness of thick and thin films on substrates by UV-visible-NIR reflectance and transmission microspectroscopy for research and quality control.

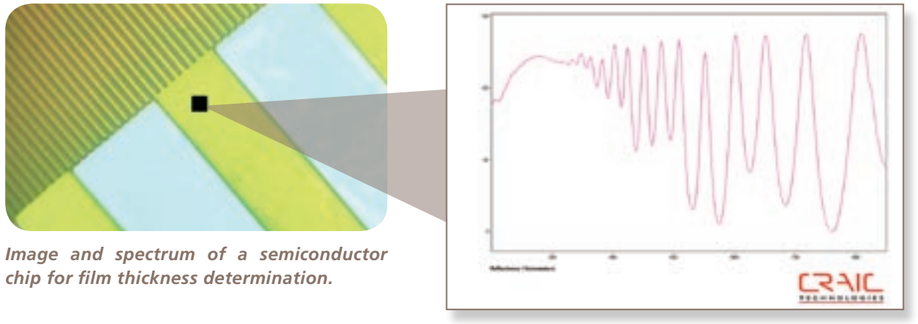


Image and spectrum of a semiconductor chip for film thickness determination.

Process Contamination Analysis

QDI 2000 | QDI 1000 | QDI 202

Using fluorescence microspectroscopy to identify contaminants in a process. Monitoring solarization of photomasks.

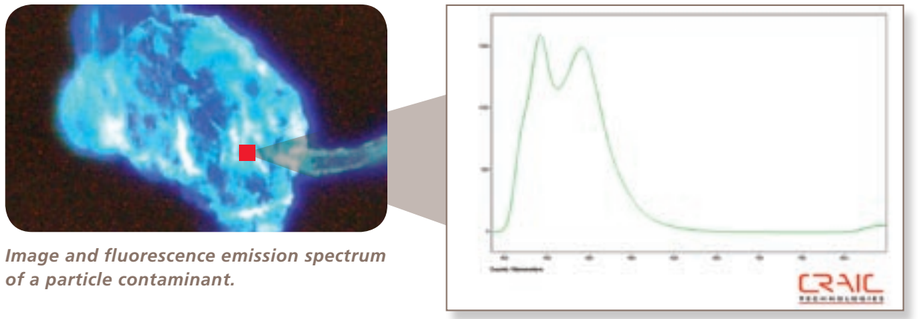


Image and fluorescence emission spectrum of a particle contaminant.

Flat Panel Displays

QDI 2000 | QDI 1000 | QDI 202

Quality control of red, green and blue pixels by absorbance microspectroscopy. Pixel-to-pixel comparisons can be made in addition to monitoring chromophore concentrations within each pixel. UV-visible-NIR microspectroscopy of LED's and OLED's to research spectral output as well as for quality control.

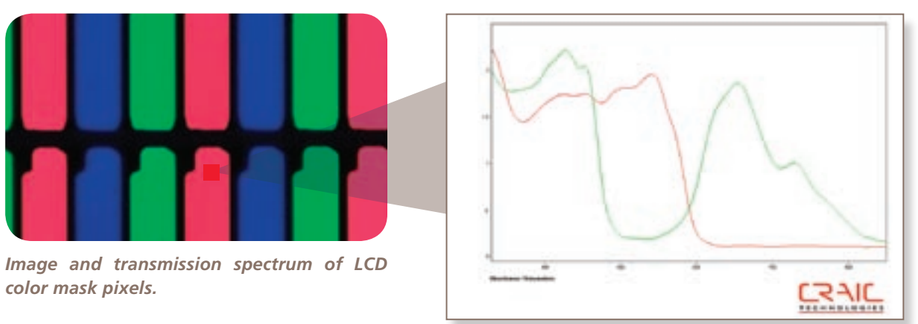


Image and transmission spectrum of LCD color mask pixels.

Applications

Applications

Optics

QDI 2000 | QDI 1000 | QDI 202 | QDS II

Determination and quality control of reflectivity of AR coatings on micro-optical components. Determination and quality control of transmissivity micro-optical components and thickness of optical films.

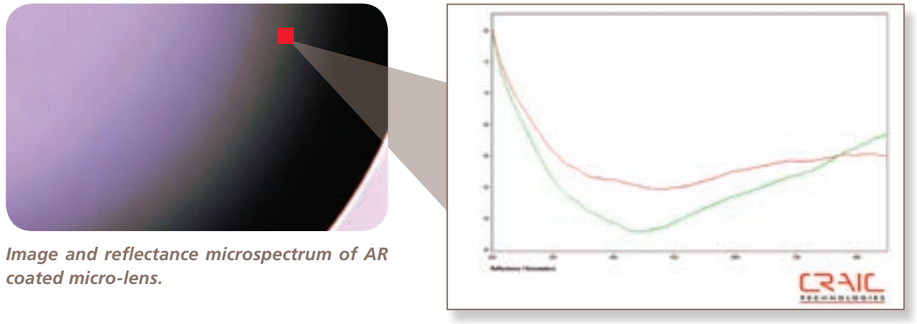


Image and reflectance microspectrum of AR coated micro-lens.

Telecommunications

QDI 2000 | QDI 1000 | QDI 202 | QDS II

Quality control of LEDs, diode lasers and other light sources in the UV, visible and NIR regions. Optimization and quality control of photonic bandgap crystals in the UV, visible, and NIR regions.

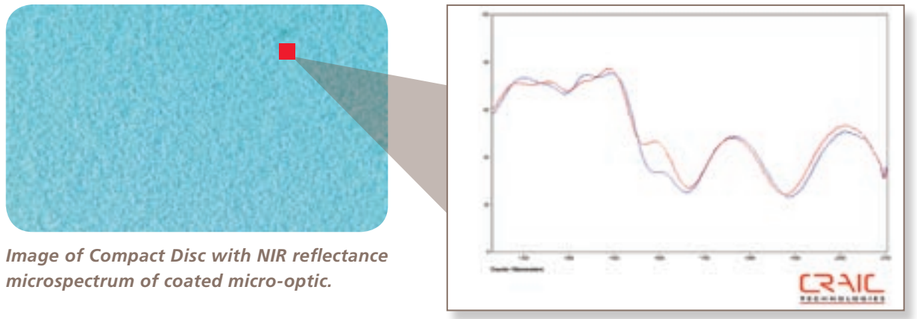


Image of Compact Disc with NIR reflectance microspectrum of coated micro-optic.

Chemistry & Pharmaceuticals

QDI 2000 | QDI 1000 | QDI 202

Analysis and quality control of novel drugs and treatments including fluorescence immunoassays, laboratories-on-a-chip, combinatorial chemistry substrates and tissue samples.

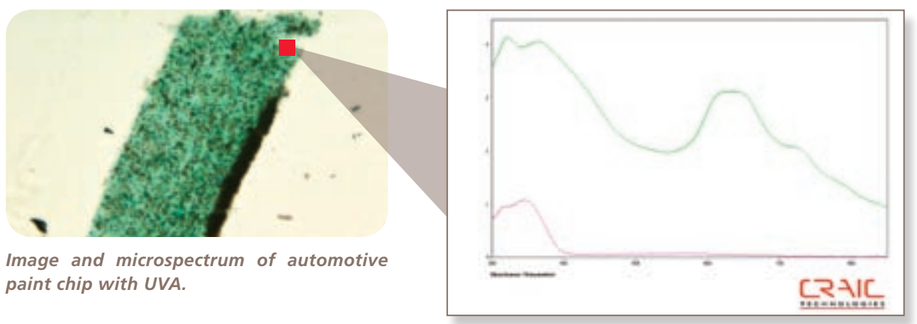


Image and microspectrum of automotive paint chip with UVA.

Vitrinite Coals

QDI 202 | QDS II

Qualification and quality control of coal per ISO and ASTM standard methodologies for vitrinite reflectance in addition to full spectral characterization. Spore Color Index and Thermal Alteration Index capabilities. Additional qualification by full-spectrum fluorescence microspectroscopy.

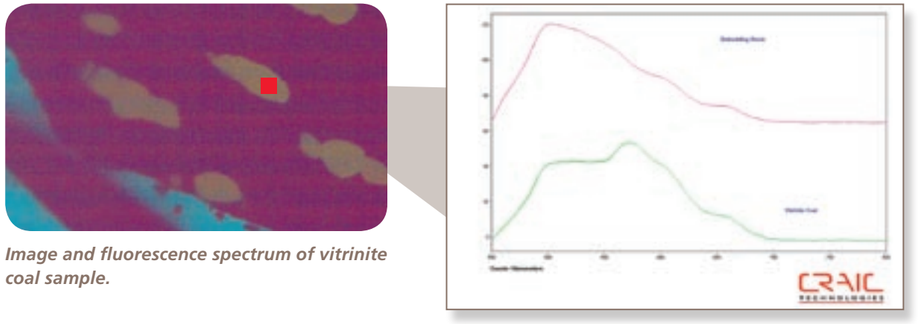


Image and fluorescence spectrum of vitrinite coal sample.

Gems and Minerals

QDI 2000 | QDI 202 | QDS II

Non-destructive microanalysis of gemstones, minerals, soils and ores by reflectometry, transmissivity, and fluorescence microspectroscopy throughout the UV, visible and NIR regions.

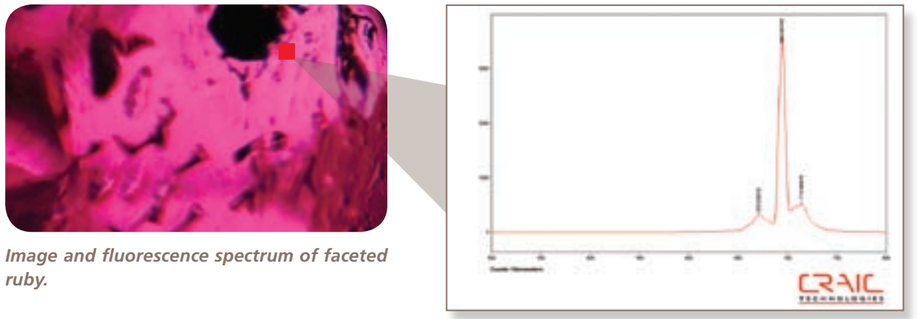


Image and fluorescence spectrum of faceted ruby.

Physics

QDI 2000 | QDI 202 | QDS II

Optimization and quality control of photonic bandgap crystals in the UV, visible, and NIR regions. Analysis of optical semiconductors and novel materials by transmission, reflectance and fluorescence microspectroscopy.

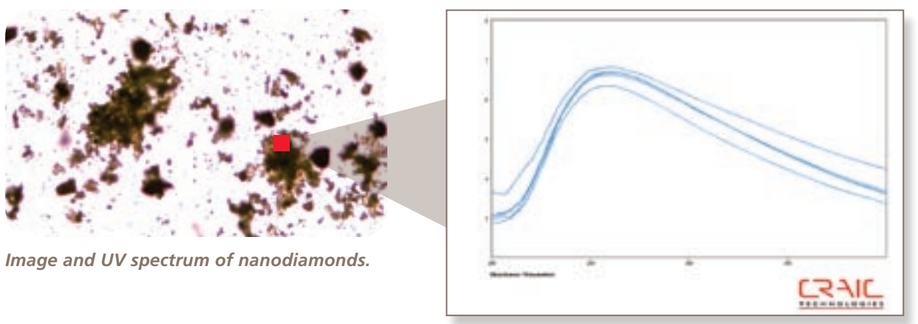
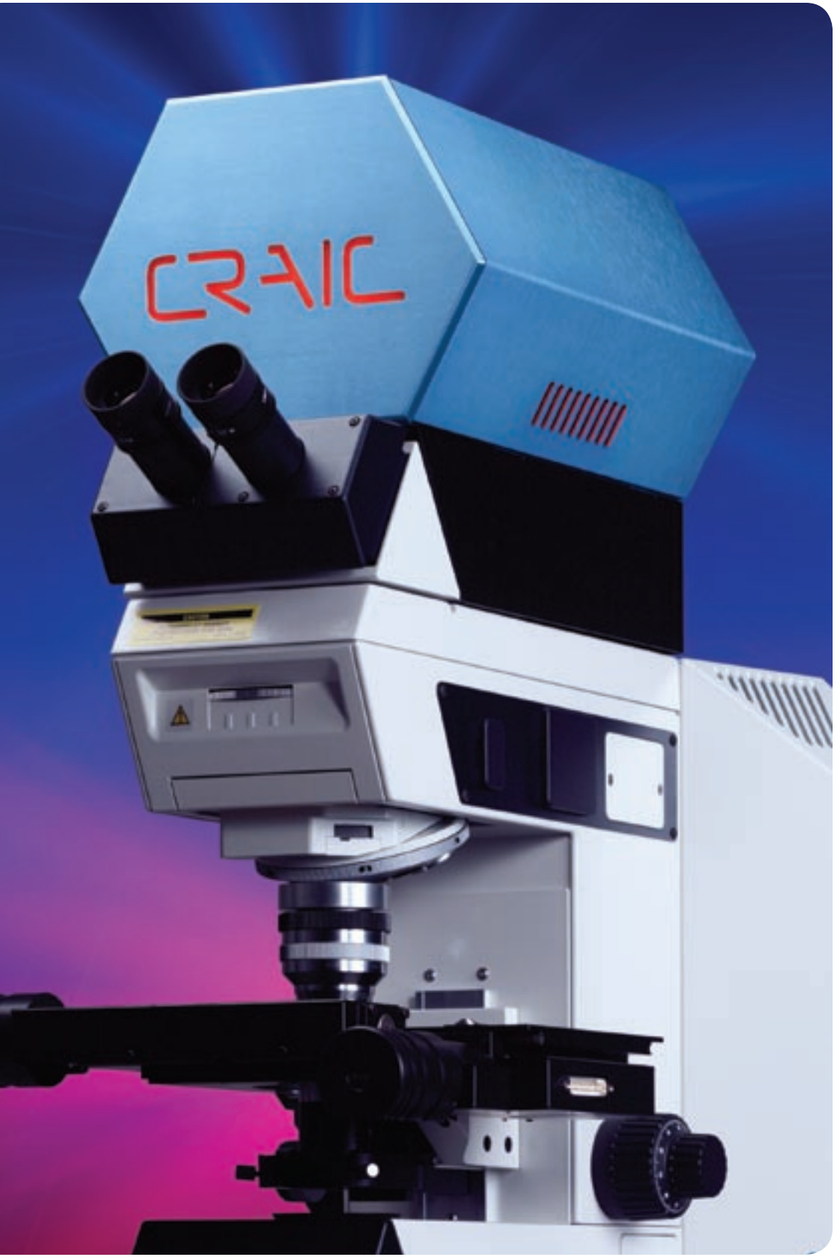
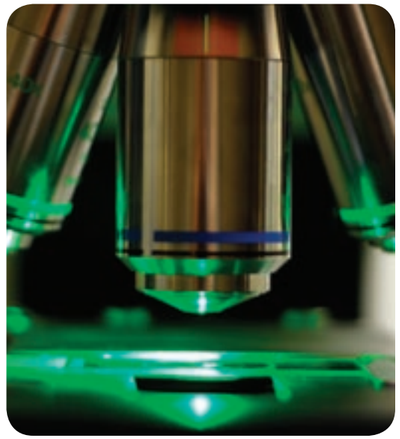


Image and UV spectrum of nanodiamonds.



QDI 2000 Microspectrophotometer



The **QDI 2000™** microspectrophotometer is the new standard for UV-visible-NIR microspectroscopy. The **QDI 2000** is able to measure spectra of microscopic samples from the deep UV to the near IR in one shot. Designed for flexibility and performance, this instrument pushes the limits of scientific and industrial microspectroscopy. It is able to analyze everything from a single textile fiber from a forensic case to a 200 mm wafer from a semiconductor manufacturer. This instrument is equally at home in the lab and the factory.

The **QDI 2000** microspectrophotometer features scientific grade array detectors mounted to a pre-aligned spectrophotometer. Each detector is TE cooled to achieve the lowest noise and long term stability. This results in an instrument with the best signal-to-noise ratio around. Included is a research grade UV-visible-NIR range microscope, a high-resolution color digital imaging system, UV-shielded eyepieces, a computer running Windows XP Professional and an integrated spectral analysis/instrument control software package. The **QDI 2000** is easy to use, durable and will provide cutting-edge results.

Applications

- ▲ Trace Evidence
- ▲ Flat Panel Displays
- ▲ Semiconductor Film Thickness
- ▲ Process Impurity Detection
- ▲ Photonic Crystals
- ▲ DNA Analysis
- ▲ Chemistry

Spectral Range

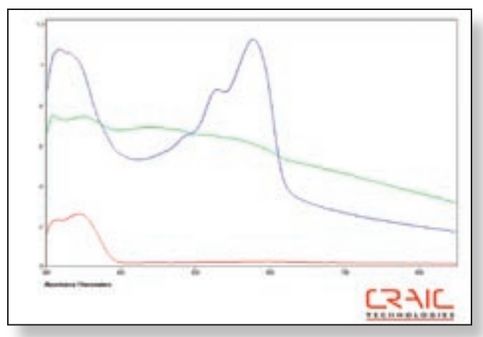
200 — 2100

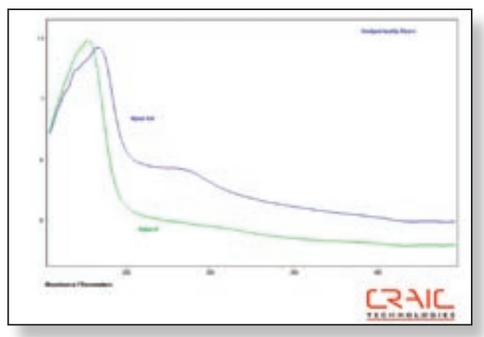
QDI 2000™ Specifications	
Microspectrophotometer Range	200 to 1000 nm
With NIR option	Up to 2100 nm
Fluorescence Range	400 to 1000 nm
Fluorescence Excitation	365 to 546 nm
Laser Illumination	Optional
Sampling Area	Variable from 1 to 50 microns^2
Spectral Bandwidth	0.32 nm
Spectral Resolution	User selectable from 1 to 15 nm
Detector	Solid state array
Detector Cooling	Thermoelectric
Scan Time (Full Range)	1 millisecond minimum
High Resolution Digital Imaging	Included
Image Resolution	1 Megapixel minimum
Programmable Stage with Mapping	Optional
Operating System	Windows XP Professional

Extending the limits of UV-Visible-NIR microspectroscopy.

The **QDI 2000™** is the most advanced UV-visible-NIR microspectrophotometer ever developed. It is able to non-destructively measure the absorbance, reflectance, fluorescence, and polarization spectra of sample areas under 1 micron.

Forensic Analysis: *Trace evidence, such as fibers, paint chips, soils and glass, can be analyzed and identified by obtaining their UV-visible spectra and comparing them with databases and known samples.* ***CRAIC*** *leads this field by being able to take high resolution spectra and images simultaneously.*





QDI 1000 Microspectrophotometer

The **QDI 1000™ microspectrophotometer** is the benchmark for UV-visible-NIR microspectroscopy. The instrument was designed for experimental flexibility as well as durability and ease of use. It is constructed to meet the most demanding tasks, either scientific or industrial, for years to come. Equipped with everything from eyepieces to digital imaging to single-shot spectrophotometers, the **QDI 1000** is at home both in the laboratory and on the fab floor.

The **QDI 1000** microspectrophotometer boasts a scientific grade CCD spectrophotometer with no moving parts, TE cooling of the detector for enhanced stability and low noise levels, a research grade UV-visible-NIR range microscope, a high-resolution color digital imaging system, UV-shielded eyepieces, a computer running Windows XP Professional and an integrated spectral analysis and instrument control software package. The instrument is easy to use, durable and able to provide top-quality results.

Applications

- ▲ Flat Panel Display Color Masks
- ▲ Flat Panel Light Sources
- ▲ Telecommunications
- ▲ Optics
- ▲ Questioned Documents
- ▲ Chemistry
- ▲ Physics

Spectral Range

240 850

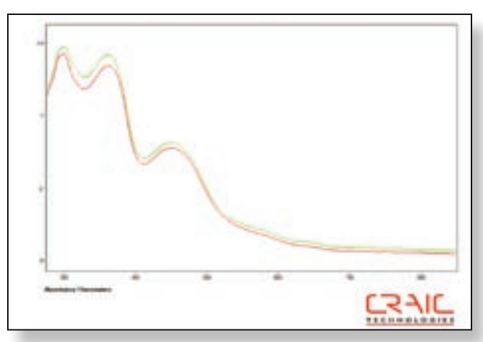
QDI 1000™ Specifications

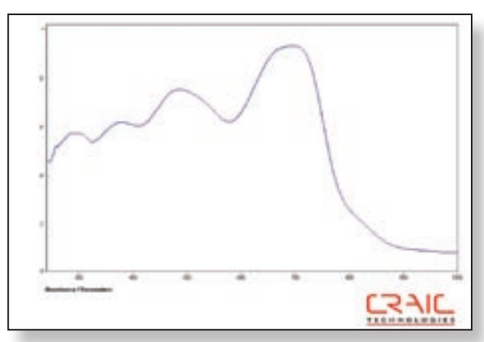
Microspectrophotometer Range	240 to 850 nm
Fluorescence Range	400 to 850 nm
Fluorescence Excitation	365 to 546 nm
Laser Illumination	Optional
Sampling Area	Variable from 2 to 50 microns
Spectral Bandwidth	0.32 nm
Spectral Resolution	User selectable from 1 to 15 nm
Detector	CCD
Detector Cooling	Thermoelectric
Scan Time (Full Range)	1 millisecond minimum
High Resolution Digital Imaging	Included
Image Resolution	1 Megapixel minimum
Programmable Stage with Mapping	Optional
Operating System	Windows XP Professional

The standard for UV-Visible-NIR microspectroscopy.

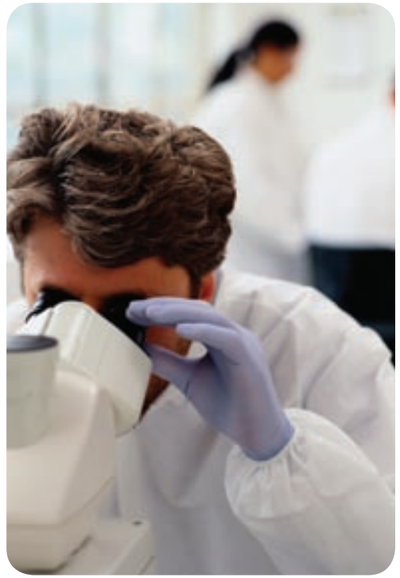
The **QDI 1000™** set the standard for UV-visible-NIR microspectroscopy. This solid, reliable instrument has been used for everything from scientific research to industrial production. The **QDI 1000** was even selected for materials research in space.

OLED Flat Panel Displays: *OLED Flat Panel Displays represent the latest in display technologies. Microspectrophotometers are used to develop, analyze and QC both RGB and broadband electroluminescent phosphors used in the next generation flat panel displays.*





QDI QDS II Stereomicrospectrophotometer



The **QDI QDS II Stereomicrospectrophotometer** is designed to measure microspectra of larger samples and larger sampling areas. This is the only instrument of its kind: it can measure samples much smaller than any standard UV-visible spectrophotometer but avoid many of the inhomogeneity issues seen with microspectrophotometers that measure areas on the order of a micron. Depending upon the final configuration, the **QDS II** can acquire absorbance, transmission, reflectance, and fluorescence microspectra. And with the zoomable optics, the sampling areas range from 25 to 250 microns^2 with a working distance of 100 millimeters. The **QDS II** opens up a new realm in microspectroscopy.

The **QDI QDS II Stereomicrospectrophotometer** features a scientific grade CCD detector, optional TE cooling of the detector for enhanced stability and lower noise levels, spectral grade optics for the stereomicroscope with zoom feature, a high-resolution color digital imaging system, a computer running Windows XP Professional and an integrated spectral analysis and instrument control software package. The instrument is easy to install, simple to use, and will give many years of trouble-free service.

Applications

- ▲ Questioned Documents
- ▲ Forensics
- ▲ Mineralogy
- ▲ Biology & Biochemistry
- ▲ Vitrinite Coal Reflectometry
- ▲ QC of Flat Panel Displays

Spectral Range

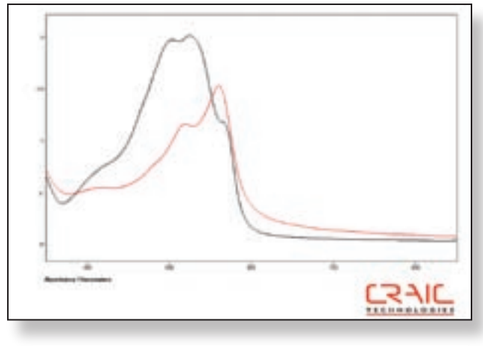
350 — 1700

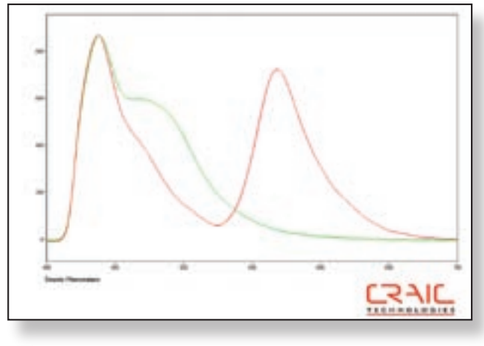
QDI QDS II™ Specifications	
Spectrophotometer Ranges*	350 to 1000 nm
With NIR option*	350 to 1700 nm
Fluorescence Excitation	365 to 546 nm
Fluorescence Range	400 to 1000 nm
Sampling Area	Variable from 25 to 250 microns
Spectral Bandwidth	0.32 nm
Spectral Resolution	User selectable from 1 to 15 nm
Detector	Solid state array
Detector Cooling	Thermoelectric
Scan Time (Full Range)	1 millisecond minimum
High Resolution Digital Imaging	Included
Image Resolution	1 Megapixel minimum
Operating System	Windows XP Professional

Microspectroscopy of larger samples.

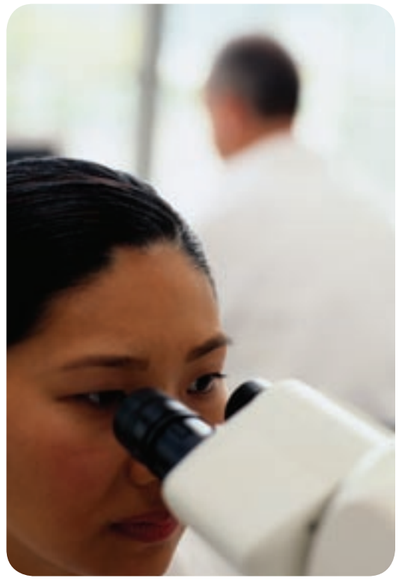
Microspectroscopy of miniature samples and sampling areas can be done with the **QDI QDS II™ Stereomicrospectrophotometer™.** This is essential when your samples won't fit in a standard microspectrophotometer or are heterogeneous on the microscopic scale.

Document Analysis: *On the micron scale, spectra of paper are highly variable. However, when larger areas are measured with an instrument such as the QDS II, the spectra are reproducible. For this reason, the QDS II is the essential tool for spectroscopic document analysis.*





QDI 202 Microscope Spectrophotometer



The **QDI 202** microscope spectrophotometer can easily be added to an existing microscope, probe station or even be used to upgrade an older microspectrophotometer. Depending upon the microscope configuration, you will then be able to take absorbance, transmission, reflectance, polarization and even fluorescence microspectra of samples as small as 1 micron. **CRAIC Technologies** can even supply a microscope that has been specially designed for microspectroscopy…resulting in a greater usable spectral range.

The **QDI 202** microscope spectrophotometer features a scientific grade CCD or PDA detector, optional TE cooling of the detector for enhanced stability and lower noise levels, scientific grade interface optics for the microscope, a high-resolution color digital imaging system, a computer running Windows XP Professional and an integrated spectral analysis and instrument control software package. The instrument is easy to install, simple to use, and will give many years of trouble-free service.

Applications

- ▲ Flat Panel Color Masks
- ▲ Flat Panel LEDs
- ▲ Mineralogy
- ▲ Semiconductors
- ▲ Vitrinite Coal Reflectometry
- ▲ Process Contamination Analysis

Spectral Range

200 — 1000

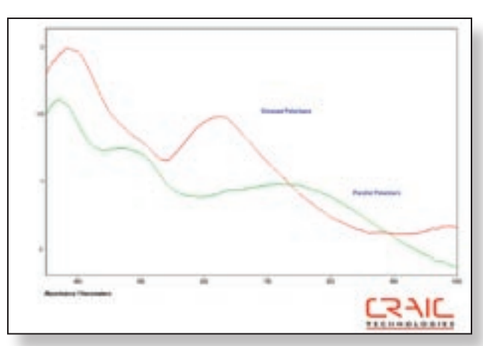
QDI 202™ Specifications

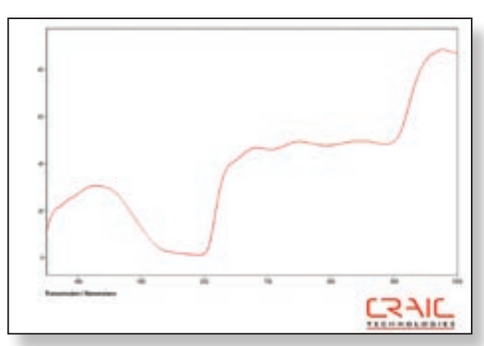
Spectrophotometer Ranges*	200 to 850 nm
(Select one)	350 to 1000 nm
Fluorescence Excitation	365 to 546 nm
Laser Illumination	Optional
Sampling Area	Variable from 1 to 50 microns
Spectral Bandwidth	0.32 nm
Spectral Resolution	User selectable from 1 to 15 nm
Detector	CCD
Optional Detector	Photodiode Array
Detector Cooling	Thermoelectric
Scan Time (Full Range)	1 millisecond minimum
High Resolution Digital Imaging	Included
Image Resolution	1 Megapixel minimum
Programmable Stage with Mapping	Optional
Operating System	Windows XP Professional

Take spectra with your microscope.

The **QDI 202**™ can be added to any microscope with an open photoport. It can even be used to upgrade an older model microspectrophotometer. All it takes is an open photoport.

Upgrade your microspectrophotometer: *simply replace the existing spectrophotometer head and computer with a QDI 202. You now have a cutting edge microspectrophotometer with the latest detectors, software and optics.*





CRAIC Accessories

Accessories for your microspectrophotometer.

CRAIC Technologies offers an array of accessories to improve the throughput and capabilities of your microspectrophotometer. Accessories include hardware and **CRAIC** certified consumables. All are designed to work seamlessly with your microspectrophotometer and enhance its operation and ease of use. Below is just a partial list of what **CRAIC** offers.

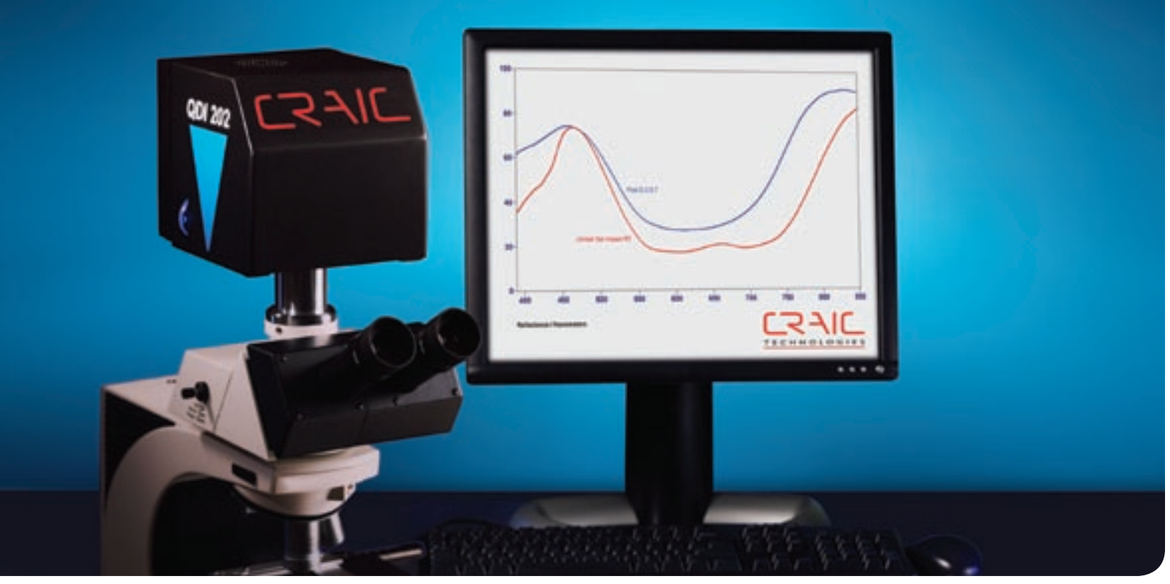
Microspectrophotometer Accessories	
Programmable Stages	Automation of a microspectrophotometer is beneficial not only for throughput but for ergonomics. If many similar samples are being examined, the data points can be programmed. And with the use of a software joystick, the user dos not have to sit in a potentially uncomfortable position.
Sampling Accessories	▲ Spectral grade quartz coverslips ▲ Spectral grade quartz slides ▲ Quartz microplates for UV-Visible analysis of liquids
Precision Lighting	▲ CRAIC certified lamps for UV, visible and NIR regions.
Usability	▲ Flat panel monitors ▲ Color laser printers ▲ High resolution, cooled imaging systems ▲ Power conditioners

CRAIC Standards

Standards designed for microspectrophotometers.

CRAIC Technologies is the world's leader in developing standards to check the calibration and accuracy of UV-visible-NIR microspectrophotometers. All standards were developed to meet ASTM, ISO and SWGMAT guidelines for instrument usage. Standards can also be made traceable to NIST and other internationally recognized certifying bodies. And if the standards are used with **CRAIC** microspectrophotometers, the calibration routine is automated with a full report printed out at the completion of the test series.

Microspectrophotometer Calibration Standards	
Transmission Microspectrophotometer Standards	▲ NIST traceable ▲ Wavelength calibration ▲ Photometric accuracy
Reflectance Microspectrophotometer Standards	▲ NIST traceable ▲ Wavelength calibration ▲ Diffuse and specular ▲ White and color standards also available
Film Thickness Standards	▲ NIST traceable ▲ Multiple materials and thickness
Vitrinite Reflectance Standards	▲ Set with differing levels of reflectivity
Fluorescence Microspectrophotometer Standards	▲ Color calibration ▲ Multiple excitation wavelengths ▲ Broad and narrow band



CRAIC Software

Software solutions for UV-visible-NIR microspectroscopy.

CRAIC Technologies microspectrophotometers feature an integrated and comprehensive instrument control/data analysis software package. This is a 32-bit package which is commonly supplied on a Windows XP Professional computer. **CRAIC Technologies** also offers an array of software to improve the throughput and capabilities of your microspectrophotometer. Below is a partial list of what **CRAIC** offers.

Microspectrophotometer Software Packages	
CRAIC Technologies Standard Software	▲ Spectrophotometer control ▲ Automation of instrument operation to components control ▲ Full spectral analysis capabilities: from smoothing to deconvolution…it's all here. ▲ Intuitive and fast!
Film Thickness Software	▲ Calculate thickness from transmission or reflectance data ▲ Multilayer film stacks ▲ Determine N and K values
Colorimetric Analysis Package	▲ Includes tristimulus, chromaticity, L*A*B, L*U*V, Hunter, whiteness and more ▲ Multiple illuminants and angles
Spectral Database Software	▲ Create databases with spectra ▲ Search by spectra, text, or numbers
Windows XP Professional Upgrade Package	▲ Upgrade older microspectrometers to improve reliability, ease-of-use, and security ▲ Includes computer and all software

CRAIC Service

Backed by a network of experienced scientists and service engineers.

Your worldwide partner for support

With **CRAIC** Service, you've got the power of **CRAIC Technologies** on your side. Our solutions are focused on customer value creation through improving instrument performance, increasing uptime/efficiency and driving lab productivity. **CRAIC** Service offerings include:

- Expert Support and Service
- Instrument Care and Upgrades
- Validation
- Education and Training
- Service Contracts and Extended Warranties

Rapid response

An industry leader in service, **CRAIC** offers technical and support services with a team of highly experienced service professionals. With a fully computerized system, your service engineer will provide you with the most effective and responsive service in the industry.

Applications expertise and support

CRAIC has more UV-visible-NIR microspectrometer specialists than any other instrument manufacturer, offering superior applications support. Our extensive industry knowledge and depth of our support staff assures you of a rapid solution to any problem.

Preventing downtime with on-demand service when you need it

With **CRAIC Technologies** Service Plans, you are assured of rapid response to your microspectrophotometer repair request.

CRAIC Technologies LLC, 2400 N. Lincoln Ave. Altadena, California 91001 USA
Tel: +001-626-296-6422 / Fax: +001-626-296-6324
web: www.microspectra.com / e-mail: sales@microspectra.com