J200 LIBS Instrument

Proven Elemental Analysis Solution for Speed, Flexibility, and Performance

Applied Spectra's J200 LIBS Instrument allows customers to realize the true potential of LIBS (Laser Induced Breakdown Spectroscopy). The J200 LIBS Instrument uses a high energy and luminous plasma source, created by laser ablation, for sensitive, accurate, and precise elemental analysis. We deliver the highest LIBS analytical performance for demanding applications in industry and research. Our flexible instrument platform enables smooth component upgrades, thus maximizing your ROI as your measurement needs change. Powerful data analysis software delivers analysis easily and straightforward for sample identification, elemental distribution visualization, qualitative screening, and full quantification of target elements.

Mature and Dependable LIBS Solutions from the Experts

LIBS has been heralded as the "Superstar" of atomic spectroscopy because of its tremendous technical advantages over conventional techniques. Our customers skip sample preparation, receive results in seconds, and can count on accurate multi-elemental detection with high chemical specificity.

Based on our 3rd generation instrument platform that resulted from more than a decade of engineering advances and refinements, the J200 LIBS Instrument boasts a long list of hardware and software features that makes LIBS analysis dependable and reliable.

Applied Spectra's world-class scientific team has over 85 years' combined experience with Laser Ablation analytical research and LIBS method development. Our customers continue to expand analytical applications during instrument ownership period with the industry best method development support from our scientific team.

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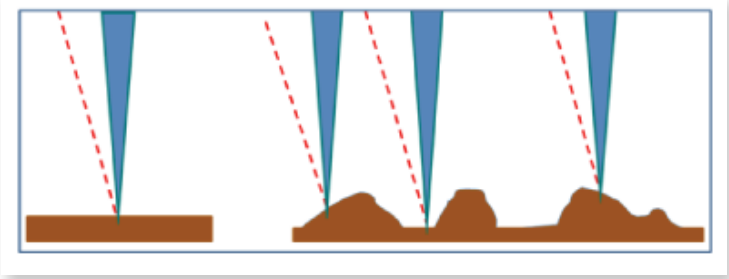
J200 LIBS Instrument Highlights

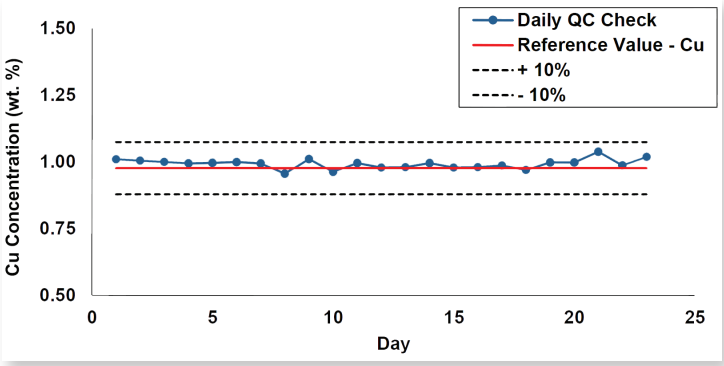
- Full system automation geared towards setting up efficient and effective laser sampling protocols
- Auto sample height control for high precision LIBS measurement
- Laser energy stabilization shutter for stable laser energy delivery
- Deployment of versatile sampling methods, including:
  - Bulk analysis
  - Inclusion and micro-spot analysis
  - Depth profiling
  - 2D/3D elemental mapping
- Superior detection sensitivity
- Dual detector capability – broadband CCD and high performance ICCD detector
- LIBS chamber with He/Ar purge gas control for improving detection sensitivity
- Laser spot size control down to sub-10 micron range
- Powerful LIBS spectra analysis tools
  - Proprietary TruLIBS™ emission line library, built for real LIBS plasma
  - Comparative analysis of LIBS spectra
  - LIBS emission line integration with background correction
- Built-in calibration models
  - Univariate
  - Multivariate
- Sample classification with PCA and PLS-DA
- High resolution 2D/3D elemental mapping software
- Hardware component upgrade path
  - Adding 2nd LIBS detector
  - Tandem configuration to enable LA sampling capability for ICP-MS
- Low maintenance costs

Instrument Design and Measurement Automation for Maximum Precision Performance

The J200 LIBS Instrument provides an unprecedented level of system automation and laser parameter stability for your LIBS measurements due to Applied Spectra's patent-awarded auto-height adjustment, laser energy stabilization shutter, and fully automated high precision 3-D stages. With these innovative hardware solutions, each laser pulse produces consistent laser ablation and each measurement becomes repeatable and reproducible.



Auto height adjustment ensuring consistent laser fluence at every sampled area.



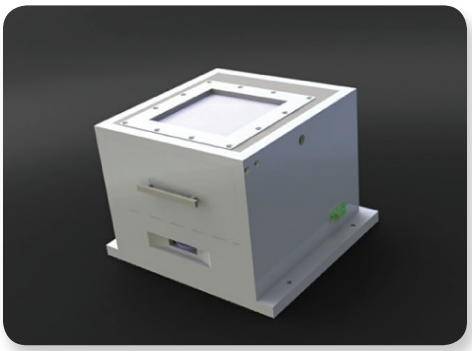
Long term repeatability of the J200 LIBS Instrument (EC model) based on built-in calibration model and NIST SRM 630 sample.

Improved Detection Sensitivity with Innovative Light Collection Optics

The J200 LIBS Instrument features a smart collection optics design that maximizes the light throughput of the collected plasma emission. The light collection optics of the J200 LIBS Instrument is also designed to minimize chromatic aberration and provides consistent emission collection throughout the entire spectral range from UV to NIR.

Flex™ LIBS Sample Chamber with Purge Gas Flow Capability

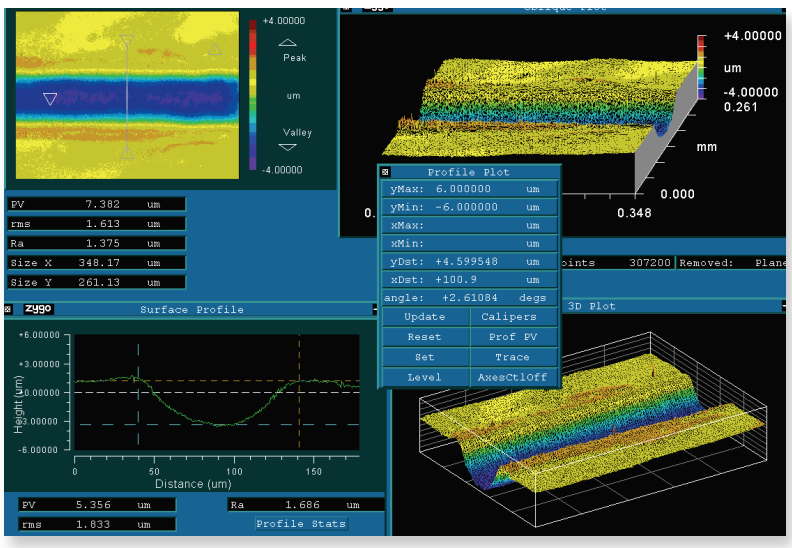
The Flex™ sample chamber of the J200 LIBS Instrument provides a large sampling area of 10" X 10". With customizable chamber inserts available, analysts are able to place samples of different size and number. The Flex™ chamber uses a high-precision digital MFC (Mass Flow Controller) to backfill the chamber or control steady flow of the purge gas. By providing pure Helium or Argon gas environment without air interference, the Flex™ chamber enables accurate measurement of H, O, and N. Furthermore, the purge gas flow capability of the Flex™ chamber enhances the detection sensitivity of many elements.



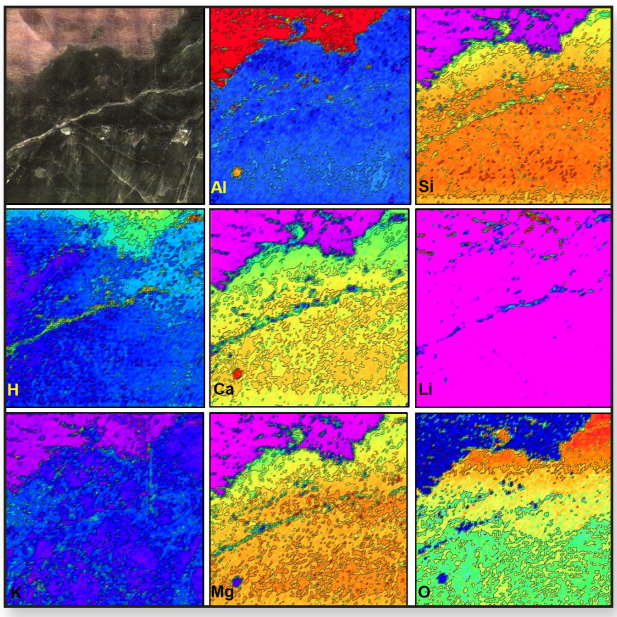
Flex™ LIBS sample chamber

Rapid Bulk & High Spatial Resolution Mapping Analysis

Standard instrument features such as variable spot size control with 3-D automatic stage allows analysts to develop versatile solid sampling methods. The sample can be raster-analyzed at high laser repetition rate for fast bulk analysis. For high spatial resolution mapping, a grid of points or line raster pattern can be deployed in the selected sample areas with laser spot size as small as 10 microns.



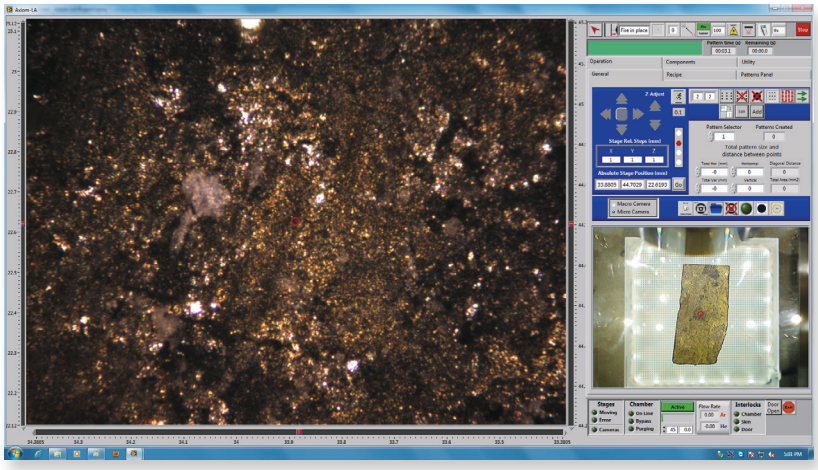
Bulk elemental analysis of glass while laser rastering the sample.



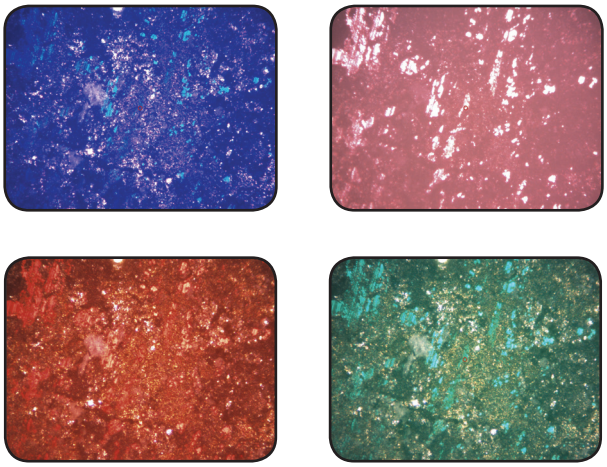
Fast elemental imaging of ruby-in-zoisite over 13 mm X 13 mm area with J200 LIBS Instrument.

Superior Sample Visualization via Dual Camera and Advanced Lighting

The advanced lighting system and high-magnification optical zoom (up to 60X) (optional) reveals sample surface details with incredible resolution. Because it is equipped with dual high resolution CMOS imaging cameras, the J200 LIBS Instrument provides wide-field viewing alongside high magnification imaging for precise investigation of detailed areas (see image below). The wide-field view can be saved and used to navigate different sample locations and investigate the sample using the high magnification camera. The sample lighting system also features three independent lighting modes to enhance the image quality and contrast: flood LED light, transmission light and coaxial reflection light with intensity and color control.



Crisp, high magnification sample surface imaging.



Add contrast to a sample image with co-axial light color and intensity.

LIBS Detector Options Expand Versatility

Three different LIBS detectors are available for the J200 LIBS Instrument: (1) Scanning Czerny Turner spectrograph with ICCD camera (HP model), (2) Echelle spectrograph with ICCD camera (B model), and (3) broadband multi-channel CCD spectrometers (EC model). A highly unique and innovative platform feature, the J200 LIBS Instrument can incorporate up to two detectors. This patented dual detector configuration, named **LIBS²**, enables even more innovative LIBS measurement possibilities.

Straightforward System Component Upgrades to Maximize ROI

Your choice of a laser and spectrometer/detector for LIBS analysis depends on your analytical application. Your analytical requirements may change over time. The J200 LIBS Instrument is designed for straightforward upgrade of lasers and detectors. Furthermore, the gas flow control system to an ICP-MS instrument can be added to the J200 LIBS Instrument to convert the instrument to the Tandem LA–LIBS configuration, Applied Spectra proprietary and patented analytical technology. With Tandem LA–LIBS capability, our customers can simultaneously perform LIBS and LA-ICP-MS analysis to expand elemental coverage and to increase concentration range of the analysis from ppb to %.

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