

# J200

## Tandem LA - LIBS Instrument

# J200

ENTER ANOTHER DIMENSION  
OF LASER ABLATION WITH  
**J200**



Applied Spectra Inc. is proud to announce a truly groundbreaking advance in laser ablation analytical instrumentation. The J200 is a tandem LA – LIBS instrument designed to perform simultaneous LIBS (Laser Induced Breakdown Spectroscopy) and LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectrometry) measurements. By capturing the emitted light from a laser ablation plasma, the J200 performs rapid spectroscopic analysis while transporting ablated particles to an ICP-MS instrument with high transport efficiency.

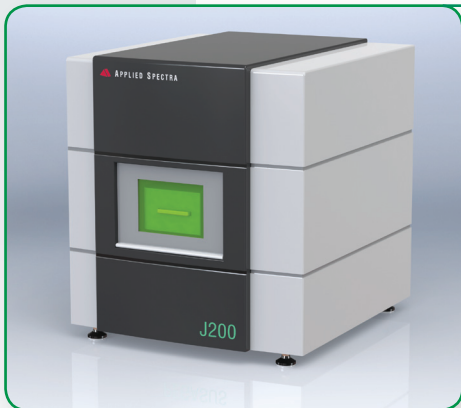
This revolutionary analytical technique enables exciting new measurement possibilities: analysis of organic and lighter elements, rapid elemental mapping, normalization of ICP-MS signal with plasma emission, and simultaneous measurement of major/trace elements and isotopes.

The J200 inherits its proven LA system design and powerful LIBS technology from Applied Spectra's trusted line of state-of-the-art products, including our J100 Femto LA system and RT100 Series LIBS instruments. The laser source for the J200 is a highly reliable Q-switched, Nd:YAG laser with its wavelength down to 213 nm. By eliminating the cost of gas and laser beam delivery optics replacement, the J200 drives down the cost of ownership while providing outstanding analytical capabilities.



# J200 TANDEM LA-LIBS FEATURES:

- ▲ A highly rugged Q-switched, short pulse Nd:YAG laser
  - ▲ Wavelength down to 213 nm
  - ▲ < 5 nsec at 213 nm
- ▲ Innovative modular system design for standalone LA, LIBS, or tandem LA - LIBS configuration
- ▲ Three LIBS detector options for meeting different analytical requirements
- ▲ System sensors to ensure laser ablation consistency
  - ▲ Patent-awarded auto height adjustment
  - ▲ Laser energy stabilization shutter
- ▲ Dual video cameras with one dedicated for high magnification imaging and the other for wide field viewing of a sample surface
- ▲ Applied Spectra's Flex sample chamber with interchangeable inserts to optimize transport gas flow and particle washout performance
- ▲ Compact gas manifold designed to eliminate degassing and memory effects
- ▲ Dual, high-precision digital mass flow controllers and electronically controlled valves
- ▲ Axiom LA system software
  - ▲ Full control of hardware components and measurement automation
  - ▲ Powerful data analytics module for LIBS and LA-ICP-MS analysis
  - ▲ LIBS Chemometric software for discriminatory and classification analysis
  - ▲ Deployment of versatile sampling methods: bulk analysis, micro-spot & inclusion analysis, depth profiling, and elemental mapping
- ▲ Low maintenance cost
- ▲ Easy upgrade path to tandem LA – LIBS configuration
- ▲ Femtosecond LA upgrade path
- ▲ LA/LIBS application support from the experts at Applied Spectra

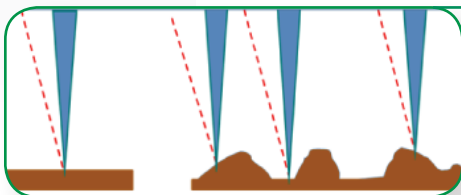


J200's highly compact main instrument packaging

## Compact and Modular System Design for Dual LA/LIBS Capability

The ingenuity of the J200 system lies in its modular system design. The unit can operate in standalone LA or LIBS mode, or as a tandem LA – LIBS instrument. Based on a compact laser source plus an efficient layout of laser beam delivery optics, the J200 is Applied Spectra's most compact laser ablation analytical instrument.

The main housing includes a laser source, laser beam delivery optics, Flex sample cell, gas flow control system, as well as a LIBS detector. To save a valuable lab table space, the laser power supply module can be detached from the main housing and placed beneath a table. For further flexibility, an optional external LIBS detector module can be attached to the main housing to expand the system's LIBS measurements. The J200 can be further upgraded for femtosecond laser ablation analysis.



Auto height adjustment ensuring consistent laser fluence at every sampled areas

## Auto Sample Height Adjustment for Consistent Laser Ablation

The J200 incorporates an auto-height adjustment sensor that accounts for morphological changes on the sample surface. This feature allows the J200 to maintain an accurate laser focus, delivering same laser fluence and achieving consistent laser ablation at all sampled locations, regardless of height differences. This innovative sensor feature is a patented technology, developed by Applied Spectra's world-class scientific team.

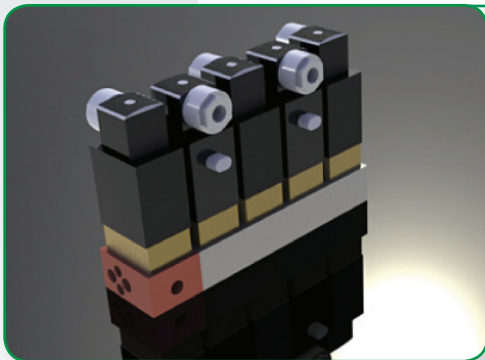
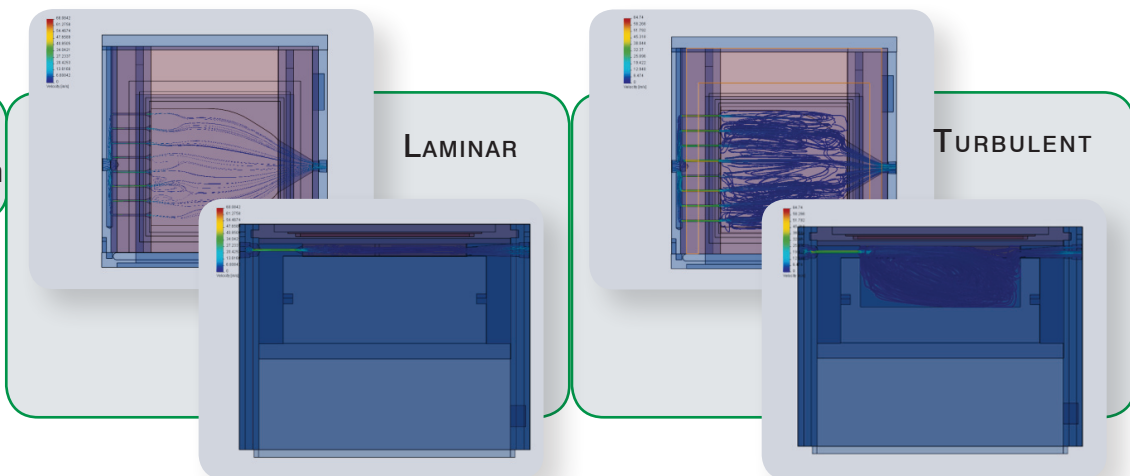


Flex sample chamber with variable volume

## Flex Sample Chamber with Interchangeable Inserts to Optimize Gas Flow and Particle Washout Performance

Depending on the measurement goal (bulk compositional analysis, inclusion analysis, high-resolution depth profiling, elemental mapping, etc), it is sometimes necessary to optimize one of the chamber's performance metrics over others, whether it be washout time, particles' mixing, or flow characteristics inside the chamber. Designed to accommodate sample size as large as 4" in diameter, the J200's Flex sample chamber uses a set of interchangeable top and bottom inserts to adjust flow conditions (laminar versus turbulent) and particle washout time. Furthermore, the Flex chamber is designed to provide an optimum viewing angle for the plasma light, making sensitive LIBS measurements possible during laser ablation.

Adjustment of gas flow condition from laminar to turbulent with bottom inserts.



Innovative gas manifold design of the J200

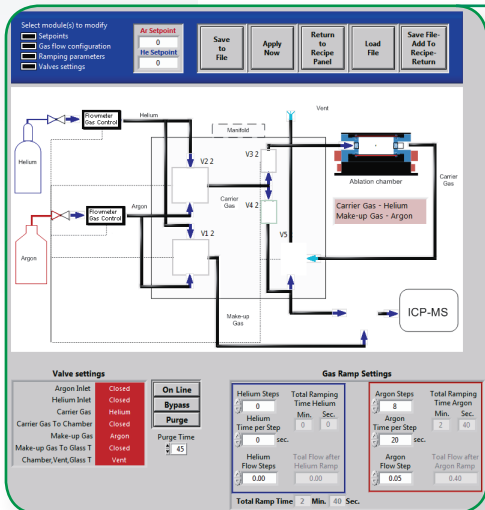
## A Patent-pending, Innovative Transport Gas Manifold Block Design

The J200 employs the advanced transport gas manifold design from Applied Spectra's flagship LA system, the J100 Femto. Manufactured from a combination of stainless steel and copper, this patent-pending transport gas manifold minimizes degassing, prevents build-up of any ablated particles, and eliminates memory effects. The gas manifold allows easy assembly and convenient periodic cleaning of the transport gas tubing.

## High-precision Gas Flow Control System

The J200's gas control system uses two high-precision, digital MFC's, together with electronically controlled valves, for Argon and Helium transport and make-up gases.

The transport and make-up gas flow to the sample chamber and the ICP-MS instrument is automatically sequenced and precisely controlled, resulting in ideal gas flows to prevent plasma flame-outs. The pre-set value configuration allows a choice of Helium or Argon as either the transport or make-up gas.

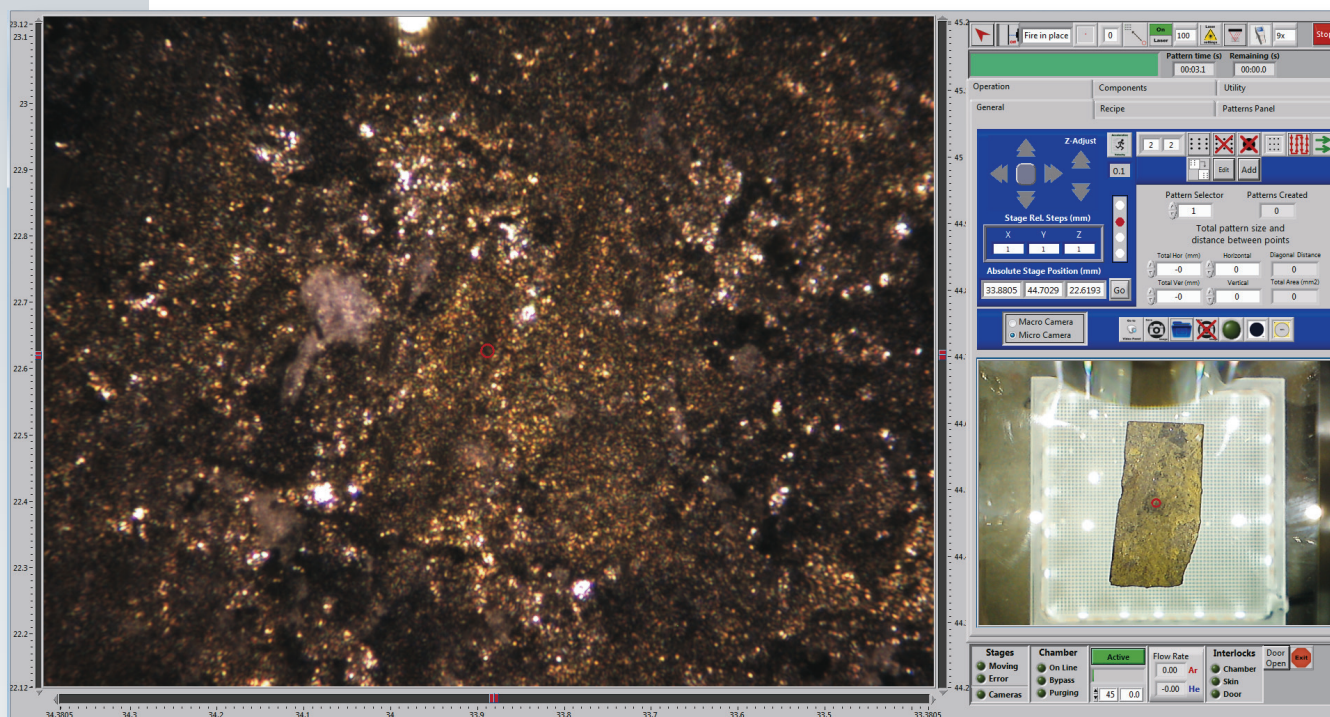


Control of transport and make-up gas flow

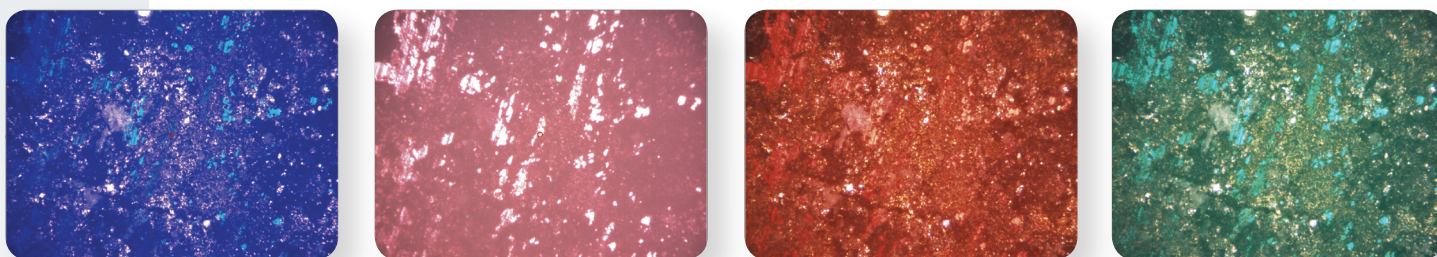


## Superior Sample Visualization via Dual Camera and Advanced Lighting

The J200's advanced lighting system and high-magnification optical zoom (up to 60X) reveals sample surface details with incredible detail. Because it's equipped with dual high resolution CMOS imaging cameras, the J200 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 J200 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



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

## Three LIBS Detector Options Expand Versatility

Three different LIBS detectors are available for the J200: (1) Scanning Czerny Turner spectrograph with ICCD camera, (2) Echelle spectrograph with ICCD camera, and (3) synchronized 6 channel CCD spectrometers. As a standalone LIBS instrument, the J200 can accommodate up to two detectors: one in the main system housing and the other in the external module. These dual detectors open up even more innovative LIBS measurement possibilities. With its robust versatility and innovative detection features, the J200 Tandem LA-LIBS instrument soars above the rest as a revolutionary product for chemical analysis.

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