

Analyte G2

Excimer Laser Ablation System



- Ultra-short 193 nm wavelength
- Ultra-short < 4 ns pulse length
- Ultra-flat beam homogenization
- Surplus fluence ablates all materials
- Optical attenuator energy control with "open gate" 100% energy
- Synchronized fire-on-the-fly lasing for best depth profiling and control
- 30 fast-change masks ~3 to >250 μm with progressive mass / signal
- Brilliant, color HD video microscope
- Plus live, wide field-of-view, color sample navigation camera
- 100 mm sq. XY stage travel
- Gabbro vibration dampening super structure
- HelEx 2-volume sample chamber with new, adaptable inner cell
- Sealed gas cabinet

LASER ABLATION

The evolution of laser ablation.

THE ULTIMATE LA SYSTEM

THE PULSE-WIDTH OF A YAG, THE WAVELENGTH & BEAM QUALITY OF AN EXCIMER LASER

ADAPTIVE

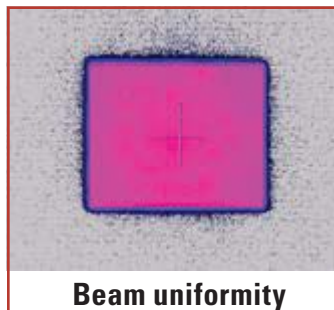
CETAC Technologies and Photon Machines Inc. have launched the next generation of excimer laser ablation system, the **G2**, which includes the acclaimed **HelEx** 2-volume sample cell and its unique **adaptive** inner cell. This new generation of Analyte system delivers finely controlled, flat (homogenized) ablations with high sensitivity and split second response for **shot-to-shot**, spatially resolved analyses. **Fire-on-the-fly** lasing triggered by the stage motion controller provides depth profiling of lines and raster areas like never before. The G2 offers safety interlocked hands-on access to the beam delivery compartment for easy reconfiguring and alignment to enable the addition of application enhancements such as our rotating variable slit, specialized apertures, and hyphenated detection experiments. The G2 features a color HD zoom video microscope plus a live, wide field of view, sample map camera for fast navigation of the sample cell. The combination of ultra-short pulse length and 193nm wavelength is unsurpassed in coupling efficiency. As a result the G2 yields higher peak energy for total ablation, producing smaller particles that ionize readily with less noise and fractionation than large format excimer lasers.

The G2 **ablates all materials**, from opaque to highly transparent, including delicate powders, hard quartz, and resilient carbonates, with depth penetration in the 10's of nanometers per shot.

Thirty (30) spot size selections ranging from ~3 μm to >250 μm make the G2 a highly versatile instrument with unique capabilities, ideal for both micro-feature and bulk analysis.

GREATER CONTROL

The beam delivery and imaging optics are like no other with laser and imaging specific components. The depth-of-field of the laser beam is elongated for sustained, steady depth profiling without repositioning of the focal plane.



VISUALIZATION

Two color CCD cameras display a high magnification HD video image plus a live wide field of view (FOV) of the sample for rapid navigation. The cameras and laser beam are perpendicular to the sample for distortion-free performance.

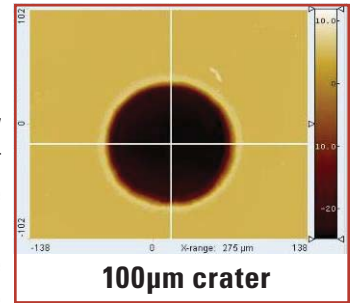


Image contrast, clarity, focusing and color make it easy to find image focus. The laser's focal plane is matched to that of the image of the sample for greater consistency and reproducibility of data.

HOMOGENIZATION

Advanced diffractive homogenization technology, proprietary beam delivery techniques and precise energy control result in clean, flat craters of repeatable shape and size without micro-fractures common to large format excimer lasers. The product of photolithography technology, the homogenizer distributes the energy density of the laser beam to better than 5% uniformity. The beam is then aperture imaged onto the sample surface.

SYNCHRONIZED LASING

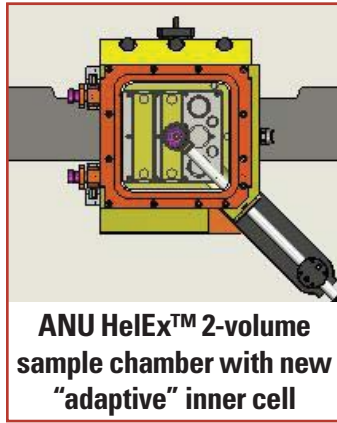
The G2 is the first and only system to ablate lines and areas accurately through Fire-On-The-Fly dosage control. The firing of the laser is precisely synchronized to the XY stage motion making it possible to ablate a line or raster scan with edge-to-edge spots (dosage of 1 shot per surface area) without overlap when analyzing surface effects and depth profiling.

MOTION CONTROL

The G2 is equipped (standard) with sub-micron resolution 100X100mm XY stages and a 50mm Z-focus travel stage to accommodate larger cells that hold more samples, including specialty cells.

HeLEX™ CELL

The Analyte G2 is now available with the HeEx 2-volume sample cell. The HeEx has uniform response through its 100 mm square sampling area and washout time of up to 2.5 orders of magnitude per second for the ultimate sensitivity, accuracy and precision. It holds four thin / thick sections plus three 1" round mounts plus two standards or nine 1" round mounts and two standards. Custom sample holders are also available.



ATLex 300si LASER

Supported by factory trained service engineers, the ATLex 300si, 193nm excimer has a 1-300Hz rep rate, <4 ns (FWHM) pulse-length, <2% RSD stability and automated solenoid valves for one-touch autofill.

NEW SOFTWARE

The fresh, intuitive, Windows based software has all the functions one expects of a LA system including automation of multiple solenoids and mass flow controllers that regulate carrier gases and N₂ purging of the beam path.

Bi-directional triggering of the ICP-MS instrument and the ability to ablate an unlimited number of spots, lines and raster areas make the Analyte G2 an auto-sampler for solid materials.

Software upgrades provided at no cost.

Technical Specifications

LASER

193 nm ultra-short ATLex 300si excimer laser
< 4 ns pulse length
1-300 Hz repetition rate
Integrated energy meter and active stabilization
Lasing perpendicular to the sample
Automated N ₂ beam delivery purge
One-click gas refilling

BEAM DELIVERY

Homogenized beam profile for flat craters
Long focal length laser objective
>3GW/cm ² irradiance
30 apertures (spots, lines, squares, fiducials)
Aperture imaged spot sizes from ~3 μm to >250 μm
Femtosecond upgrade (retrofit) path

MOTION CONTROL

Stage actuated laser triggering
Fire-on-the-fly line and raster scan depth profiling with dosage control
100 mm x 100 mm XY sub-micron resolution travel
50 mm Z focus travel accommodates custom cells

IMAGING

HD color CCD camera
High magnification zoom, video microscope
LIVE color, sample navigation camera with wide FOV
Parfocal, confocal, on-axis imaging perpendicular to the sample
Automated coaxial, ring and transmitted light
Rotating cross polarizer, removable analyzer, filter holder

SAMPLE

Automated carrier gas management
ANU HeEx 2-volume cell 100 mm square useful sample area
Washout to 0.1% in less than 1 second

UTILITIES

208 to 240 VAC, 50/60 Hz, 5A
Premix laser gas, N ₂ purge gas, He and Ar carrier gas required

OPTIONS

Additional mass flow controllers
150 mm XY travel
Cryocell and other specialty cells

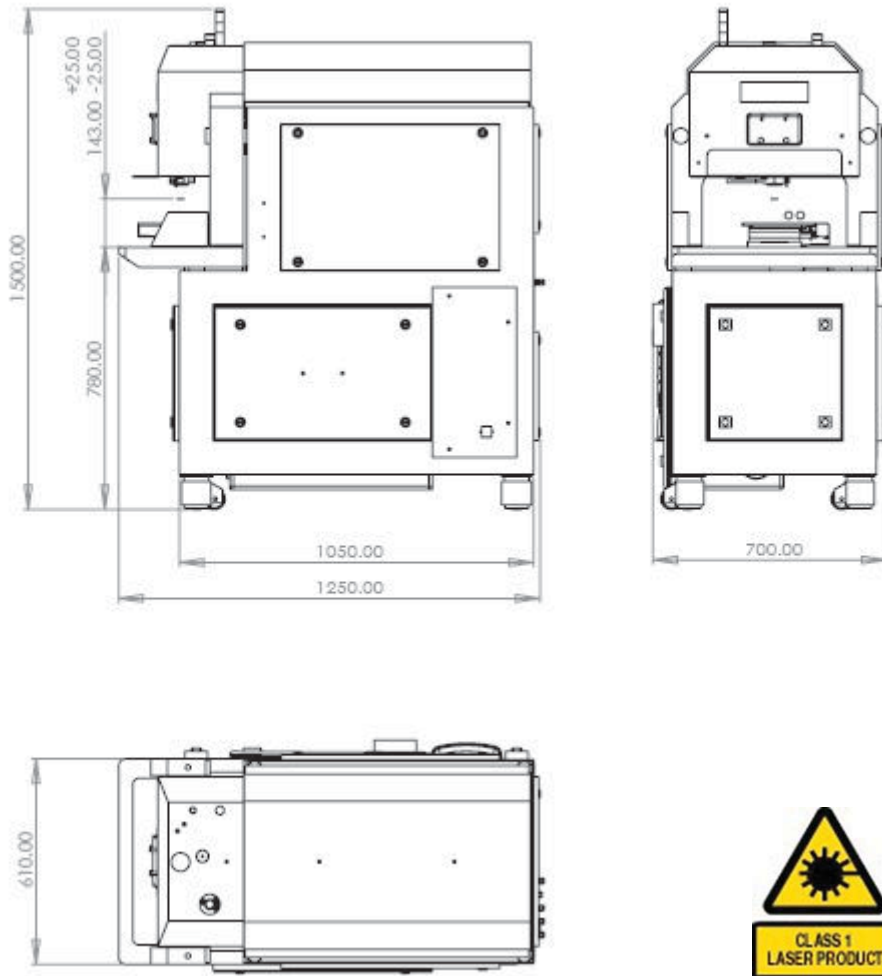
Contact CETAC for the latest accessories.

THE AUTOSAMPLING LA SYSTEM

TURN-KEY OPERATION

The G2 is an integrated, mobile workstation with the smallest footprint built around a Gabbro rock, super-structure that dampens vibrations. All gas plumbing and laser gas bottles are contained within the cart. All analysis functions can be conducted manually or set for automated analysis in concert with the mass spectrometer.

The G2 has an open architecture, Class 1 laser safety enclosure that provides unencumbered access and viewing of the sample without compromising safety. The work area is large enough to accommodate high vacuum and custom sample cells.



Compatible with all major brands of ICP-MS and noble gas MS instruments

ABOUT US

Photon Machines Inc. of Redmond, WA and CETAC Technologies of Omaha, NE, have formed a joint venture for the advancement of LA-ICP-MS technology and offering a full range of laser ablation products world-wide. This collaboration brings Photon Machines' experienced design team and long history of laser ablation innovations together with CETAC's sample introduction expertise and global sales and service support network. It will provide customers with a broad selection of laser ablation products, in-depth applications knowledge and regional support. This partnership allows us to offer the scientific community not only cutting-edge laser ablation technology, but also unprecedented support. Rock-solid instruments combined with unsurpassed technical expertise is what our customers can expect.