

ANALYTE.193

Ultra-short Pulse Excimer Laser Ablation System

PRICE : PERFORMANCE

The Analyte.193 is a new generation of laser ablation platform engineered for one purpose, precision solid sampling in noble gas, quadrupole, high resolution and MC-ICP-MS.

The product of more than a decade of innovative laser ablation instrument design and development experience, the Analyte.193 captures the latest developments in 193nm excimer lasers, beam homogenization, imaging, motion control and software control technology

Including the sub-4ns pulse, 300Hz excimer laser from ATL-LaserTechnik.



- Ultra-short 193nm wavelength
- Ultra-short <4ns pulse length
- Ultra-flat beam homogenization
- Surplus fluence and irradiance
- Variable optical attenuator std.
- Synchronized lasing for superior depth profiling and control
- 30 different spot shapes and sizes
- Brilliant image sharpness, color
- 100 mm sq. XY stage travel
- Petrographic microscope viewing
- Live sample map navigation
- Gabbro vibration dampening
- 75mm Ø fast washout, adaptable Frames™ sample cell
- Sealed gas cabinet
- Unique femtosecond upgrade path

YAG, 193nm YAG lasers and large format excimer lasers.

The Analyte.193 ablates all materials, from opaque to highly transparent including delicate powders, hard quartz and resilient carbonates while controlling depth penetration to as fine as 20nm per shot.

Surplus irradiance, combined with 32 spot selections ranging from <5 to >200mm make the Analyte193 a highly versatile instrument with unique capabilities, ideal for both micro-feature and bulk analysis.

The Analyte.193 system delivers high accuracy and precision and greater utility for the best price-performance of any LA system.

ANALYTE.193

Powered by



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Ver. 2.1



The combination of ultra-short pulse length and 193nm wavelength is unsurpassed in coupling efficiency, with the possible exception of femto-second lasers. As a result the Analyte.193 yields higher peak energy for total ablation of all materials and smaller particles that ionize more readily with less noise and fractionation than 213nm

The Ultimate LA System

The pulse-width of a YAG, the wavelength & beam quality of an excimer laser

GREATER CONTROL

The beam delivery and imaging optics are like no other to eliminate the need for dual purpose laser/imaging objectives that compromise performance. Depth-of-field of the laser beam is elongated for sustained, steady depth profiling without repositioning the focal plane.

VISUALIZATION

Two color CCDs display a high magnification video image plus a live sample map for rapid navigation of samples over a 25mm FOV. The cameras and optional microscope are co-linear with the laser beam and perpendicular to the sample for distortion-free performance.

Image contrast, clarity, focusing and color are dramatically improved. The image focus is easier to find and exactly matched to the laser focus for greater consistency and reproducibility of data.

HOMOGENIZATION

Advanced diffractive optical homogenization technology, proprietary beam delivery techniques and precise energy control result in clean, flat craters of repeatable shape and size.

ATLex300si LASER

Supported by Photon Machines Inc. factory trained service engineers, the ATLex300si, 193nm excimer has a 1-300Hz rep rate, <4ns (FWHM) pulse-length, <3% RSD stability and automated solenoid valves for 1-touch autofill. It is a field proven laser uniquely suited to laser ablation.

SYNCHRONIZED LASING

The Analyte.193 is the first and only system to ablate lines and areas accurately. The laser triggering is precisely synced with stages motion to ablate a line or raster scan an area with continuous motion and edge-to-edge spots (dosage of 1 shot per surface area). Uniform penetration makes it possible to analyze surface effects, contaminants and depth profile without overlap.

MOTION CONTROL

The Analyte.193 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. The system comes with the

FRAMES™ SAMPLE CELL

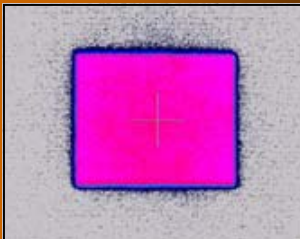
A fast washout design with interchangeable frames. The volume, geometry and flow characteristics can be optimized for the size and shape of sample analyzed with a useful ablation area of up to 75mm Ø.

NEW SOFTWARE

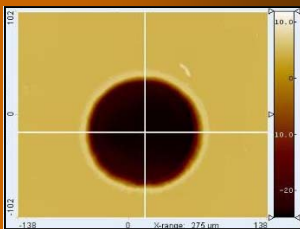
The fresh, intuitive, Windows based software has all the functions one expects of a LA system including automation of multiple solenoids and mass flow controllers that regulate carrier gases and N₂ purging of the beam path. Bi-directional triggering of the ICP-MS instrument and the ability to ablate an unlimited number of spots, lines and raster areas make the Analyte.193 an auto-sampler for solid materials.

Software upgrades are supplied at no cost.

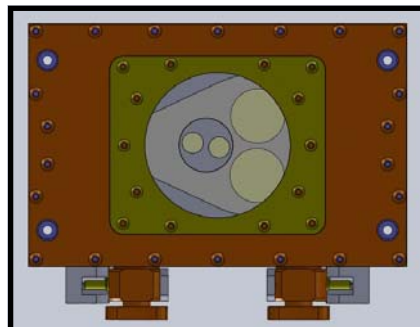
The beam uniformity



The 100µm crater



The crater bottom



Frames™
adaptable sample cell
(patent pending)

Specifications

LASER	193 nm ultra-short ATLex 300si excimer laser
	< 4ns pulse length
	1-300 Hz repetition rate
	Integrated energy meter and active stabilization
	Lasing orthogonal to the sample, confocal and co-linear w/ image focus
	Automated gas refilling
BEAM DELIVERY	Homogenized, flat beam profile
	85mm focal length laser objective
	>3GW/cm ² irradiance
	30 apertures (spots, lines, square, fiducial)
	Aperture imaged spot sizes from <5µm to >200µm
	Sub 200nm femtosecond upgrade (retrofit) compatible
MOTION CONTROL	Stage actuated laser triggering
	Selectable dynamic dosage from 1 shot
	Edge-to-edge spot, on-the-fly line and raster scans
	100mm x 100mm XY travel, 0.25µm resolution
	50mm Z focus travel, 0.25µm resolution
IMAGING	High magnification, color CCD camera
	Motorized video zoom
	400µm to 5mm zoom field of view (FOV)
	LIVE color, sample map camera with 25mm FOV
	Parfocal, confocal, on-axis imaging orthogonal to sample
	Automated coaxial, ring and transmitted light
	Polarizer / analyzer
SAMPLE	Automated carrier gas management
	Adaptable Frames sample cell w/ 75mm diam. window
UTILITIES	220 to 240 VAC, 50/60 Hz, 5A
	Premix laser gas, N ₂ purge gas, He and Ar carrier gas required

OPTIONS

- Trinocular microscope head and oculars
- Mass flow controllers
- CinC small volume cell in large volume cell
- High efficiency noble gas MS sample chambers

Contact Photon Machines for the latest accessories

The autosampling LA system

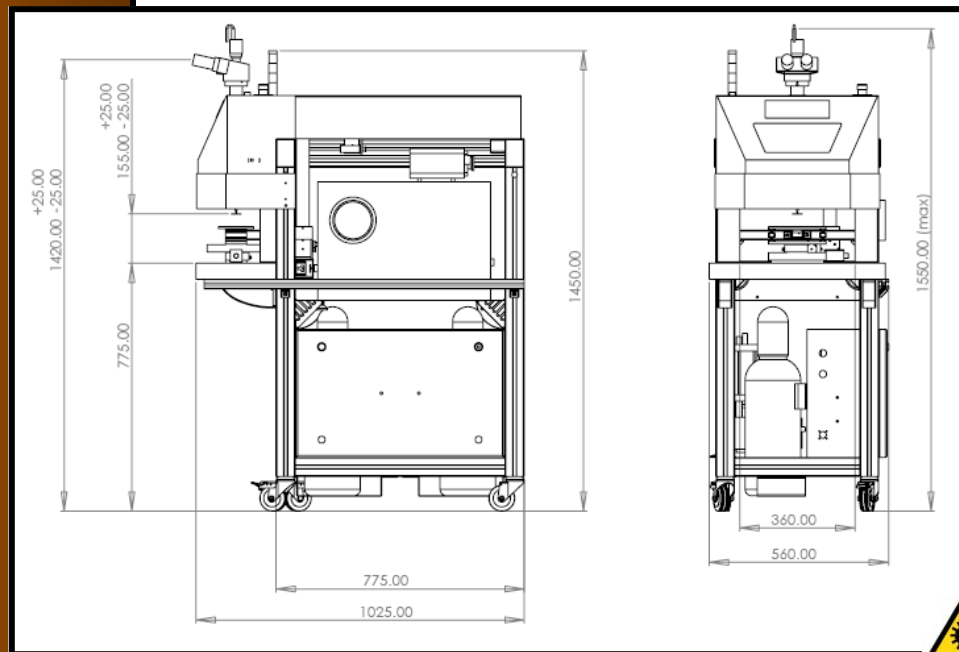
ANALYTE CUSTOMERS (PARTIAL LIST)

Carnegie Institute
UC Santa Barbara
UCLA
TU Frieberg
U San Paulo
U Waterloo
Arizona State
NIST
USGS
U Wisconsin
NR Canada
and more

TURN - KEY OPERATION

The Analyte.193 is an integrated, mobile workstation with the smallest footprint built around a Gabbro rock, vibration dampened super-structure that dampens vibrations. All gas plumbing and laser gas bottles are contained within the cart. All functions can be conducted manually or set for automated analysis in concert with the mass spectrometer.

A fully open work area and Class 1 laser safety provisions provide unencumbered access and viewing of the sample without compromising safety. The work area is large enough to accommodate high vacuum and custom sample cells.



OUR COMPANY

The people of Photon Machines are proven industry innovators with decades of experience in laser ablation for noble gas, isotope ratio and ICP-MS and ICP-OES. Innovative designs, quality manufacturing and skilled service support make Photon Machines a qualified and dependable supplier.

Photon Machines also specializes in hyphenated techniques including LIBS, LAMPS, TDL, Raman. For additional information go to www.photon-machines.com

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