



Analyte Excite⁺

Homogenized Excimer Laser Ablation System

Application Areas

Environmental Analysis
Geological Analysis

- Isotope Ratios
- Fluid Inclusions
- Geochronology

Forensics
Isotope Fingerprinting
Imaging / Mapping
Depth Profiling
(Paleo) thermometry

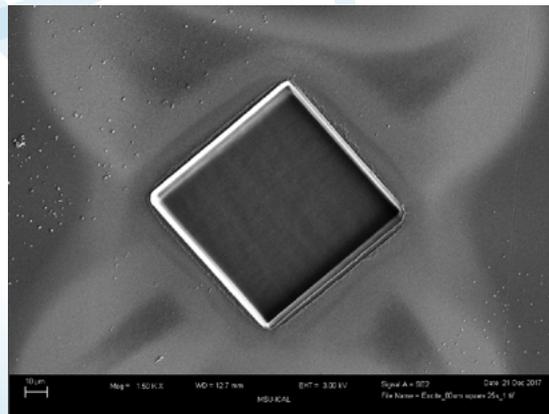
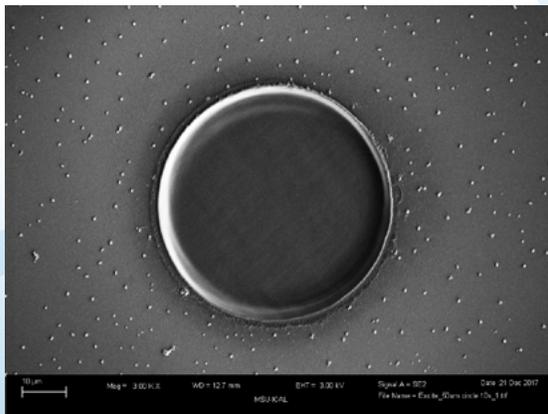
Example Materials

Calcite / Aragonite
Transparent Glasses
Bone / Fossils
Zircons
Ceramics
Plastics
Thin Coatings
Various Minerals

About the Analyte Excite+

The Analyte Excite+ is the ultimate excimer based laser ablation system. It utilizes the latest, highly developed iteration of ATL's solid-state switched laser engine and includes the acclaimed HelEx II Active 2-Volume Ablation Cell and its unique adaptive inner cell. The system delivers finely controlled flat (homogenized) ablations with high sensitivity and split-second response for shot-to-shot spatially resolved analyses. Stage-synchronized "fire-on-the-fly" lasing provides depth profiling of lines and raster areas like never before. Energy density from 1 J/cm² to 15 J/cm² ablates all materials.

The Excite+ also comes fully equipped with the ARIS fast washout accessory, eQC and ExiCheck to allow the best possible performance and flexibility of any excimer-based laser system on the market today. In addition the Analyte Excite+ also has a software controlled integrated Demag switch that allows the selection of 64 spot sizes from 1 µm to 245 µm as a standard feature. All spots are achieved with aperture imaging of the beam to ensure energy densities always remain constant when changing spot sizes.



Using a proprietary component to enable maximum beam homogenization the Analyte Excite system is able to generate beautiful flat bottomed craters with sharp edges and with no visible melting. The 50 µm circle (left) is the result of 10 ablation shots, and the 80 µm square (right) is from a 25 shot ablation.



Included with the Excite⁺

HelEx II Active 2-Volume Ablation Cell

The HelEx II Active 2-Volume Ablation Cell is the most peer reviewed sample chamber on the market today. The cup can accept a variety of inserts with washout varying from 0.25 seconds to less than 0.75 seconds for washout to <0.1% peak signal, offering the ultimate flexibility for the user faced with a range of application needs.

Analytical resolution in laser ablation is limited by aerosol transfer efficiency. The HelEx uniquely uses two mass flow controllers to independently control flow to the main chamber and flow to the inner volume (the cup). This allows the signal intensity and washout to be optimized to the requirements of the analysis and offers tangible benefits over alternative designs.

A unique leveling drawer design means that all samples remain in the focal plane of the laser, and can hold 4 thin sections and 3 one-inch rounds and 2 half-inch rounds for standards, or 9 one-inch round with 4 half-inch rounds. Total useable area is 100 x 100 mm. A 150 mm version can be made available; contact a sales representative for details.

Customizable Sample Drawers

Allows flexibility in sample handling; either fixed positions for standard sample shapes or fully open for irregular sample shapes.

Dual Independent Mass Flow Controllers

Separate inner and outer cell flow control allows the signal intensity and washout to be optimized to the application and the specific ICP-MS.

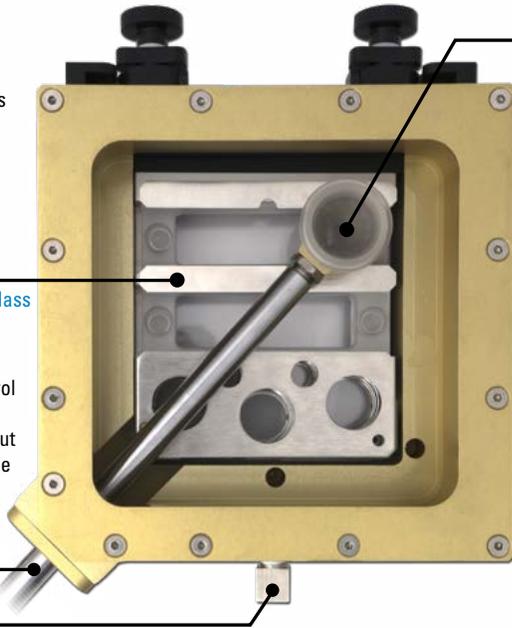
Exchangeable Active Cup Inserts

Sealed inner cup for optimal flow control.

Tunable active flow to control ablated aerosol: can be tuned for fast washout (imaging applications) or stable signals (nuclide ratio analysis).

Unmatched Vacuum Purge Performance

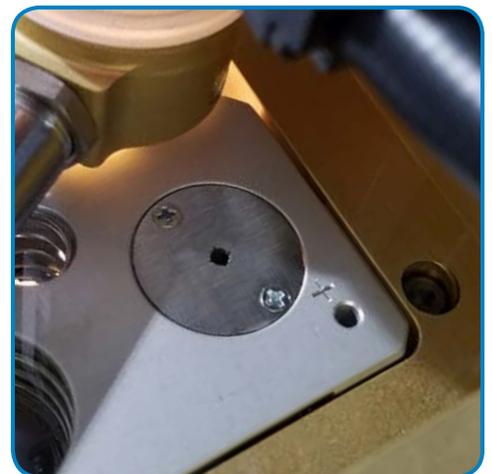
Rids the cell of air when changing samples in less than 5 minutes.



eQC Energy Monitoring Accessory

The patented eQC accessory integrated into the HelEx II Active 2-Volume Ablation Cell can be used to accurately monitor the actual energy delivered to the sample surface, allowing correction for atmospheric ionization effects for ultimate data quality and accuracy.

Specially designed optics in the sample holder redirect laser energy to a high-accuracy detector mounted to the wall of the cell, which is isolated to prevent possible sample contamination. This position can be queued automatically in the software for real-time energy verification during an analysis, or requested "on-demand" by the user. It is the first and only in-situ energy detection system that provides a reading of the actual energy density utilized at the sample surface. The eQC system monitors the laser beam delivery health allowing the user to spot any losses or degradation in the performance of the laser and beam path optics. The eQC automatically calibrates the energy density display within Chromium for user assurance that the desired energy density is truly achieved at the sample surface.

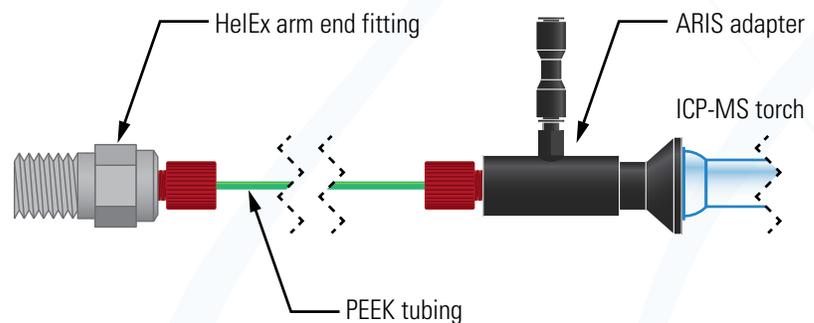


ARIS Aerosol Fast Introduction System

The ARIS enables the analysis of small spots and the generation of high spatial resolution sample maps without the need for specialist niche sample chambers or bespoke and expensive diode laser systems.

Developed in collaboration with the Ghent University, Belgium, the Aerosol Rapid Introduction System (ARIS) connects a HelEx II laser ablation cell to an ICP-MS instrument with minimal transfer volume and turbulence. Unlike 'injector' devices, the ARIS delivers the sample directly to the torch without the use of internal valves or torch modifications to deliver ultrafast washout. The user can capture single shot events, significantly reduce sampling time, increase throughput, and dramatically reduce gas usage with around half the He consumption of a system without ARIS.

Combined wash-in and wash-out times of < 30 ms to baseline with the Excite+ allow the user to resolve individual pulses at sample rates of up to 30 Hz for biological materials and up to 60 Hz for geological materials. Washout can be altered to suit application needs, and the ARIS can be quickly removed when not required without compromising the original HelEx II cell performance in any way.



The ARIS kit is a set of components designed to reduce the dead volume inside the cell all the way to the torch to enhance the performance characteristics of the standard HelEx II cell. The high transfer speeds of the ARIS negate fractionation attributed to moderate flexing of the extraction line, while preserving aerosol pulse shape.

ExiCheck Gas Exchange Accessory

The patented ExiCheck Accessory connects to your excimer gas system and allows fully unattended preservation of the laser. Rest assured, the laser is filled on a routine basis whether actively in use or temporarily at rest while the user is away. The system is an intelligent control module that will exchange the laser gas automatically at a preprogrammed interval to maintain passivation in the laser cavity and internal tubing lines without any user interaction whatsoever. As a result the laser system will always be ready to operate at 100% of its potential irrespective of how much time has passed since it was last used.



ExiCheck installs directly into the laser system.

CETAC Technologies and Photon Machines joined forces back in June 2010 with a view to advance laser ablation technology for elemental analysis, and to offer a full range of products globally. This collaboration brought together the experience in Photon Machines' design team with the sample introduction expertise of CETAC. This partnership has taken the next natural step and both companies have merged under the Teledyne Instruments banner.

Teledyne Photon Machines, a brand of Teledyne CETAC Technologies, provides laser ablation systems including CO² and diode lasers, 213 nm solid state Nd:YAG, 193 excimer laser systems and femtosecond laser systems. In addition, the company provides accessories to enhance the capabilities of laser ablation systems.



TELEDYNE
CETAC TECHNOLOGIES
Everywhereyoulook™



TELEDYNE
PHOTON MACHINES
Everywhereyoulook™

www.teledynecetac.com