Discover our 193nm excimer laser systems, incorporating Laurin Technic sample cells and GeoStar Software, for the very best in LA-ICP-MS.

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The RESolution 193nm excimer laser ablation systems are a robust design, offering an industry leading *Laurin Technic* sample cell and pioneering *GeoStar* μGIS™ software. Incorporating the latest in excimer laser technology for longest laser life, increased optical performance and minimal laser maintenance.

**S155 Ablation Cell**

The Laurin Technic laser ablation cell was developed by Mike Shelley, formerly of the ANU. Its design incorporates many sophisticated features that combine to deliver excellent results.

The S155 is the only constant volume, dual-volume sample cell available on the market. This unique design ensures that your sample reaches the ICP as quickly and efficiently as possible.

Published results demonstrate that this cell delivers:

- Fast washout times
- Outstanding signal sensitivity
- Highly uniform signal across the entire cell
- Minimal fractionation

The S155 Laurin Technic laser ablation cell incorporates the same advanced features as the earlier M50A sample cell, with over six times the accessible area.

- Movement range of 155mm x 105mm
- Mount up to 20 standard 1” mounts
- Mount up to 6 full-size thin section slides
- No performance compromise
Samples in the cell are imaged using a motorised off-axis viewing system and a high resolution camera, all effortlessly controlled via our GeoStar software. All gas controls are completely automated, making sample exchanges easy and safe for the torch. Gas operations are customised to specific ICP requirements using a powerful scripting language.

To assess how this cell will revolutionise your research, please consult the reference below or contact us for more information.


S155 Flexible Mounting Options

The S155 sample cell includes three (3) sample holders as standard. These can be chosen from a wide selection including a universal holder, all thin sections, all round mounts, or a combination of the two.

The universal holder is the most versatile and flexible holder available and can handle arbitrarily-sized objects, while ensuring they present a flat surface to the incident laser beam.

Additional holders are designed to accommodate thin section slides with widths of 25mm (1”), 28mm or 30mm, and epoxy round mounts with diameters of 12mm, 25mm (1”), 30mm or 40mm. Sample holders are also available with combination thin section/round options.

S155 Cryogenic Development

The M50A cryo cell achieved successful results with ice core sample studies (Müller et al., JAAS, 2011, 26, 2391) and as a result, a cryo sample holder will soon be available for the leading S155 sample cell.
GeoStar µGIS™ Software

GeoStar µGIS™ software has been specifically written for RESOlution instruments. Its intuitive interface is easy to learn and it allows new users to get started very quickly. An extensive range of sophisticated features ensures that any researcher can easily program an ablation sequence. The software is great for both manual point selection and for automated runs thousands of points long.

Special design features make sample navigation a breeze: rich sample imagery and automated mosaic collection will ensure you always choose the correct grain, phase, or growth band for ablation.

The unique structured interface is simple for users to learn, along with many powerful features for the conscientious laboratory manager:

- Completely automated instrument control
- Integrated on-sample fluence calibration and laser energy management
- Visual-Stage-Correction offers sub-micron positioning
- Import images from any source, such as an SEM or petrographic microscope
- Integrate with any ICP-MS

Laser fluence management ensures the correct on-sample fluence throughout the working week. Laser output is continuously monitored for reliable gas handling and exceptional laser ablation.
GeoStar is designed for complete automation, while also offering manual point-by-point ablation. When creating an automated sequence the software supports many thousands of points, and offers:

- Drag and drop reordering
- Cut and paste reordering
- Undo and redo operations
- Visual and name-based selection
- “Distribute” feature automatically brackets samples with standards

**RESOlution-SE Specifications**

<table>
<thead>
<tr>
<th>Ablation Cell</th>
<th>S155</th>
<th>Maximum Fluence</th>
<th>&gt;20 J/cm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser Safety</td>
<td>Compliant to FDA/CDRH 21 CFR, Class I laser system, laser fully interlocked, fully enclosed beam path.</td>
<td>Round / Square Spot Sizes</td>
<td>2–300 μm* (with Beam Expander option)</td>
</tr>
<tr>
<td>Laser Wavelength</td>
<td>193 nm</td>
<td>Rectangular Slit Sizes</td>
<td>Length: 2–300 μm* Width: 2–300 μm* (with Beam Expander option)</td>
</tr>
<tr>
<td>Laser Pulse Width</td>
<td>5 - 7 ns</td>
<td>Stage Movement Range</td>
<td>155 x 105 mm</td>
</tr>
<tr>
<td>Internal Energy Meter</td>
<td>Yes (closed-loop feedback)</td>
<td>Stage Reproducibility</td>
<td>&lt; 3 micron 2 sigma</td>
</tr>
<tr>
<td>*Maximum Pulse Energy</td>
<td>12 mJ</td>
<td>System Weight</td>
<td>750 kg (1650 lbs.)</td>
</tr>
<tr>
<td>†Maximum Average Power</td>
<td>1.5 W</td>
<td>System Length</td>
<td>124 cm (49&quot;)</td>
</tr>
<tr>
<td>Pulse-to-Pulse Energy Stability</td>
<td>&lt; 2 % RSD</td>
<td>System Width</td>
<td>89 cm (35&quot;)</td>
</tr>
<tr>
<td>Maximum Repetition Rate</td>
<td>300 Hz</td>
<td>System Height</td>
<td>172 cm (68&quot;)</td>
</tr>
<tr>
<td>Laser Cooling</td>
<td>Air</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RESOlution Options**

**ICP-MS Signal Distribution & Split Stream Acquisition**

Compatible with all major ICP-MS brands, RESOlution systems can now be supplied with a module that provides connections for up to three (3) ICP-MS instruments for dedicated signal distribution. Specialised fittings are also available, for simultaneous split stream analysis.

**Beam Expander (RESOlution-SE)**

Extends the standard spot size range from 2-100μm to 2-300μm, providing a total 40 spot selections (circles & Squares).

**Motorised Rotating Slit**

Motorised rotating rectangular aperture that allows a rectangular spot (width as small as smallest spot, length as wide as largest spot) to be placed on the sample and aligned to banded structures in the sample.

*Measured at low repetition rate. †Measured at maximum repetition rate.
Firsts in LA-ICPMS

- First dual-volume cell brought to market that delivers highly precise analytical abilities to all of our users. This cell ensures:
  - Minimal fractionation
  - Signals stable in time
  - Sensitivity uniform over the entire 155x105 sample area
  - Fast wash-out time, and optional smoothing when required
- First exhaust valve for diversion of unwanted ablation material from the ICP, reducing the service interval on the ICP: less cone cleaning!
- First off-axis camera on a LA instrument, for improved sample imaging and navigation.
- First rotating rectangular slit for dynamic high-resolution tracking of banded samples.
- First ultra large spot sizes available for bulk analyses, maximized sensitivity, or delicate surface and thin film analyses.
- First software with powerful image import to assist with identification of complex structures in samples, such as inclusions and growth zones.

- First software with freely available offline point definition for collaboration with remote users and improved efficiency of instrument use.
- First software with advanced “μGIS” sample navigation for ease of use, fast user training times, and enhanced convenience.
- First system with secondary mass flow controller (MFC) for N₂ (or other diatomic gas by request) as standard, for improved sensitivity.
- First system with advanced “squid” device for perfect signal smoothing at low repetition rates without over extending washout time or introducing memory effects.
- First independent cross platform ICP-MS torch-out detection system
- First system with fully integrated support for remote control and remote work-station options.
RESOchron for double dating

Combining the well-established RESOlution and Alphachron™ technologies, RESOchron integrates a 193nm excimer laser ablation sampling system, ultra-high vacuum (UHV) sample cell and 3He/4He mass spectrometer (both pictured right).

A RESOchron coupled to an ICPMS (not supplied by ASI) enables researchers to:

1. Rapidly determine both the (U-Th)/Pb and (U-Th-Sm)/He ages on a single mineral;
2. Avoid using hazardous chemicals for mineral dissolution;
3. Generate up to 50 mineral ages in the time it previously took to obtain a single age result.

This new instrument platform permits more accurate and cost-effective thermochronology and geochronology age determination in addition to novel applications such as He distribution visualisation and thermal history reconstruction.

UHV Cell for Noble Gas Geochemistry

The noble gas cell is designed to provide an Ultra High Vacuum (UHV) environment for the analysis of nobles gases in geological samples via laser ablation. The cell is mounted on top of an XY stage and enables analysis of multiple samples mounted in two styles of sample holder. The noble gas cell is integrated with the RESOlution system via the GeoStar software. Connection of the sample cell to the mass spectrometer is made through a flexible bellows.

Key specifications:

- Fully compatible with existing RESOlution instruments.
- Stage reproducibility <+/- 3um.
- Hot plate and wrapped gas transfer lines are controlled with an integrated PID heater control unit for both manual and timed automated bake-out of samples prior to analysis.
- The standard unit is supplied with a 43 position conical sample holder and a multi-sized flat bottom sample holder. Multiple sample holders are available and custom styles upon request.
- Available fused silica or Z-cut quartz window.
Crater Gallery

**Transparent Zircon**
- Instrument: RESolution-LR
- Spot Size: 100µm
- Fluence: 2.7 J/cm²
- Image: SEM-SEI
- Sample Tilt: 35°
- Magnification: 480x

**NIST610 Glass**
- Instrument: RESolution-LR
- Spot Size: 89µm
- Fluence: 2.4 J/cm²
- Image: SEM-SEI
- Sample Tilt: 35°
- Magnification: 700x

**Microscope Slide Glass**
- N=300 PULSES
- N=100 pulses
- N=30 pulses
- Dia = 360 um; F = 2.7 J/cm²; SEM tilt = 85 deg

**Calcite**
- Instrument: RESolution-LR
- Spot Size: 89µm
- Fluence: 2.4 J/cm²
- Image: SEM-SEI
- Sample Tilt: 35°
- Magnification: 700x

**BCR-2G Glass**
- Instrument: RESolution-LR
- Spot Size: 26µm
- Fluence: 2.1 J/cm²
- Image: SEM-SEI
- Sample Tilt: 35°
- Magnification: 800x