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Technical Specifications

ANALYTE G2 Excimer Laser Ablation System

LASER SOURCE

Laser 193nm ATLEX 300 LR ultra-short pulse, compact, air-cooled excimer laser

Pulse length < 4 ns

Pulse to pulse stability < 2% RMS

Energy density Up to 15 J/cm^2

Repetition Rate 1 - 300Hz

Modes Single shot, burst, continuous, fixed dosage

Spot Size 1 µm to 180 µm aperture imaged spots, up to 400 µm with switchable demagnification.

Apertures 30 spot selections, including 20 circular (progressive volume) spots, squares and slits

Energy control Integrated energy detector with PID closed-loop energy stabilization.

Beam delivery Open architecture optical path (up, over and down) for easy alignment and reconfiguration to accommodate specialized beam conditioning optics. Customizable beam path with the ability to add or remove specialized optics as defined by any particular application.

Includes solenoid actuated, software controlled, N_2 purge of laser beam path with automatic shut-off.

Synchronized fire control Stage-priority, synchronized triggering of the laser for controlled dosage, including “dosage 1” edge-to-edge setting for “true” depth profiling of line and raster scans

Homogenizer State-of-the-art, zero order, flat-field diffractive optical homogenizer for flat craters.

Optical Attenuator Continuously variable optical attenuator from 10% to maximum, including ‘open gate” position whereby the attenuator is removed from the beam path automatically for 100% energy output to the sample.

IMAGING

High definition Zoom Video Microscope Zoom video microscope system consisting of a continuously variable zoom magnification optics combined with a proprietary aspheric objective lens and high definition, color GigE color camera capable of resolving sample features down to 2 µm in diameter. The microscope is perpendicular to the sample and co-axial with the laser beam for distortion free, imaging and ablations. This “on-axis” orientation also enables the use of reflective lighting with cross polarizers and distortion-free viewing.

Lighting Software controlled reflected, transmitted, and ring lighting.

Polarizers Rotating cross-polarizers for both transmitted and coax lighting.

SAMPLE HANDLING

Motion control 100 X 100 mm XY and 50 mm Z travel, sub-micron resolution stages as standard

Optional 150 X 150 mm XY and 50 mm Z travel stages available.

Stage platform Vibration-dampened, open architecture design of granite, steel and plate metal construction.

Sample chamber Fast Washout 2-Volume HelEx II Cell; Washout to 0.1 % in less than 1 sec (0.7 sec typical).

Specialty upgrades available (Cryo-Cell, High Vacuum Noble Gas Cell)

Sample holders Each sample chamber comes with a versatile sample holder configured to hold standard slides, thin and thick sections, 1" round mounts, grains, NIST or USGS standards, depending on the application.

Gas management Automatic, solenoid actuated sample cell gas routing—purge, bypass and on-line.

MFC Precision, integrated, mass flow controllers (MFC) are included for the carrier gas.

Optional argon MFC for make-up gas (if not available on the ICP-MS), and micro-flow MFC for hydrogen or nitrogen addition, are available.

Mobility The Excite is self-contained with a small footprint that takes up little space. Its ruggedized construction and roller casters make it possible to move among various instruments and different laboratories while maintaining optical alignment.

Triggering Electronic and software interface provisions for all ICP-MS instruments via TTL, contact closures or direct software script are included.

Safety The Excite has a CLASS 1 enclosure with safety interlocks that prevent exposure to UV laser light. Its transparent laser safety shield permits direct viewing of the sample from the front of the system. An integrated gas cabinet with halogen filter contains the excimer premix gas and helium gas bottles.

SOFTWARE

Includes CHROMIUM, the feature-rich, laser ablation software program developed by Teledyne Photon Machines with scan sequencing functionality. Upgrades are provided at no charge.

Chromium facilitates triggering of the laser to co-ordinate the acquisition process with the associated ICP or ICP-MS. Where applicable this triggering is bi-directional and includes starting and stopping of a scan, ability to control the gas management system, and “status” monitoring to ensure that both the mass spec and laser ablation system are operating correctly. In addition, where a spectrometer has the capability to monitor and trigger from a blank level, it is used as the trigger to start each laser analysis.

Chromium includes a complete sample cell map and ability to build a mosaic of the whole sample to quickly move from position to position. The software also has the ability to import SEM images and overlay a re-coordinated image on top of the laser image for easy targeting of features of interest.

Specifications subject to change without notice.
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