



MALDI-TOF/TOF MASS SPECTROMETER

MALDI-7090

Identification of biomolecules
and study of their structure

A representative of a completely new generation of MALDI-TOF/TOF mass spectrometers is specially designed for the identification of biomolecules and the study of their structure with the highest productivity and efficiency, which are provided by a set of unique SHIMADZU technologies in the field of mass spectrometry.

The high-performance MultiPlex™ platform maximizes the efficiency of using the MALDI-7090 by combining a simultaneous loading device for up to 10 MALDI plates, a 2 kHz ultrafast solid-state UV laser and the

multi-user MALDISolution™ software. Plates prepared for analysis can be loaded and unloaded from the instrument simultaneously with measurements. The loading chamber can be operated at atmospheric pressure or purged with nitrogen to protect labile samples.

MALDI-7090 is indispensable both for performing precision proteomic and genomic studies, and for conducting mass analyzes in centers of collective use.

Original design of the ionization source

Wide aperture ion optics

- Focused ion beam.
- Minimal risk source pollution ionization.
- Minimal need for cleaning and maintenance of the ionization source.

Patented ultrafast laser

- 2 kHz ultrafast 355 nm solid state UV laser compatible with various matrices and samples.
- Variable beam focusing from 10 μm to more than 100 μm .
- Long period of continuous operation.

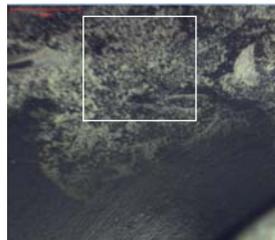
Visualization of the sample in HD quality

- State-of-the-art optics for visualization of samples with high resolution and crystal clear image.
- Color image in FullHD format (1080p).
- Controllable variable focus for viewing different surfaces.

TrueClean™

- Patented fully automated laser ion source cleaning system.
- Highly efficient fast cleaning in autonomous mode.

Before



After



Surface cleaning using TrueClean technology

Technical specifications

Sample processing

- System for simultaneous loading of 10 MALDI format tablets
- XY device for precise (10 µm step) sample positioning
- Option for storing tablets in an inert atmosphere (N₂) to protect labile samples

Sample Viewing System

- Color image in FullHD format (1080p)
- Resolution 10 µm
- Software controlled variable focus

Ionization system

- Matrix-assisted laser desorption-ionization
- Pulse ion extraction
- Variable ion extraction energy (up to ± 20 kV in linear and reflectron modes)
- Positive and negative ionization mode
- Unique wide aperture ion optics to minimize source contamination
- TrueClean™ – automatic laser source cleaning function

Laser

- Patented solid-state ultra-fast laser
- Wavelength: 355 nm
- Variable focus: from 10 µm to > 100 µm
- Variable pulse frequency: from 1 Hz to 2000 Hz
- Orthogonal geometry of the laser beam

Mass analyzer

- Drift length in linear mode is 2.1 m
- Effective drift length in reflectron mode is 4.1 m
- Vacuum created by 2 turbomolecular pumps with a rotary base
- Unique curved field reflectron system providing 20 keV collisional dissociation (CID) energy without self-acceleration
- Beam quenching to eliminate unwanted signals of high intensity, for example, from matrix ions
- Unique ion gate with high resolution for separation of precursor ions with close nominal masses
- Collisional cell (20 keV for high-energy collisional dissociation (HE-CID), 20 keV)
- Fragmentation with preservation of all metastable ions decays in the analyzer

- ASDF™ Ion Focusing Technology
- Mass resolution in MS/MS mode is virtually independent of laser intensity and sample topography

Detectors

- Linear mode: electron multiplier
- Reflectron mode: ultra-fast electron multiplier

Software

- MALDI Solutions™
- Multi-user environment with customizable security
- Automatic or manual data collection modes
- Data export according to standards (imzML, mzML)
- Access/prohibition of user access to device settings and analysis results
- Centralized database for secure data storage
- Audit trail, 21 CFR part 11 compliance

Dimensions

- Dimensions W x H x D (m): 2.84 x 1.2 x 1.3; min. distance to wall from rear part – 100 mm; weight: 875 kg

Analytical characteristics

- Mass range:
 - 1–500 kDa (linear mode)
 - 1–70 kDa (reflectron mode)
- Mass resolution:
 - 6'000 FWHM (linear mode)
 - 25'000 FWHM (reflectron mode)
 - 10'000 FWHM (MS/MS mode)
- Ion barrier resolution: 500 FWHM
- Sensitivity: 100 aM (peptides, linear mode)
 - 100 fM (proteins, linear mode)
 - 100 aM (reflectron mode)
 - 500 aM (MS/MS mode)
- Mass determination accuracy:
 - 20 ppm (linear mode, internal standard)
 - 100 ppm (linear mode, external standard)
 - 2 ppm (reflectron mode, internal standard)
 - 20 ppm (reflectron mode, external standard)
 - 50 ppm (MS/MS mode)



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