

Pretreatment Instruments for MALDI Imaging

With mass spectrometry imaging (MSI), suitable pretreatment is important. High quality MSI analysis results are obtained from a combination of the spray method and the vapor deposition method.

Work Flow



Automation of pretreatments conventionally requiring expertise

Automatic Sprayer

iMLayer AERO (Option)

The iMLayer AERO incorporates a sample stage that moves at a controlled rate while maintaining the same distance from the spray nozzle, enabling stable matrix spraying.

Over multiple strokes, the sample becomes laminated with fine matrix crystals, enabling high sensitivity and high spatial resolution.

Sample stage and Spray nozzle

The newly developed spray nozzle provides a fine spray. The distance between the sample and nozzle can be adjusted between 5 and 10 cm.



Imaging with High Reproducibility

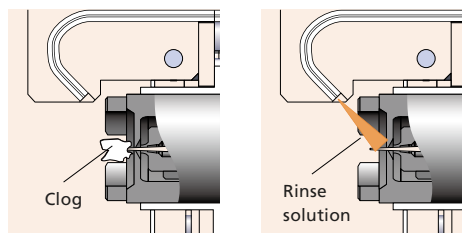
• Humidity Control

Humidity does not impact matrix deposition because the atmosphere within the spray chamber is replaced before pretreatment. Spraying can be performed under more stable conditions than with a hand spray.



• Clog-Free Reagent Delivery

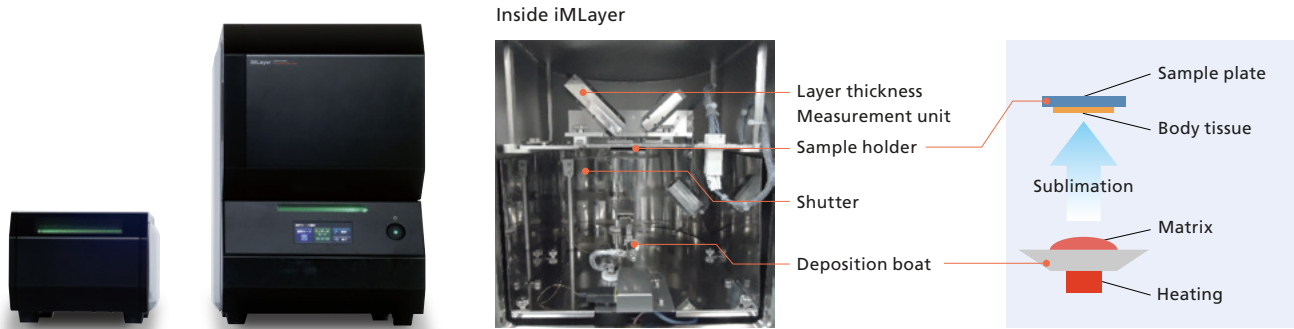
If the matrix clogs the nozzle tip, the spray becomes unstable, which can lead to lower reproducibility. The rinsing mechanism allows for clog-free stable spraying which enables high reproducibility in MALDI analyses.



Matrix Vapor Deposition System

iMLayer (Option)

Applying the matrix by the vapor deposition method supports high resolution MALDI imaging.



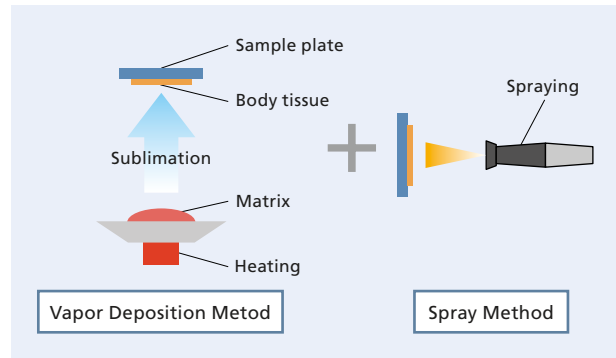
Applying fine matrix crystals by vapor deposition

Both Spatial Resolution and Sensitivity Thanks to the Two-Step Vapor Deposition Method

• Two-Step Vapor Deposition

A two-step vapor deposition method has been developed*, which provides high spatial resolution (5 to 10 μm) and high sensitivity, thanks to a combination of iMLayer (vapor deposition method) and iMLayer AERO (spray method). This unique experiment can only be implemented using Shimadzu sample preparation solutions.

* Patent No.: JP6153139 and JP6183779



Two-Step Vapor Deposition Allows for Very Fine Images with Minimal Blur

Hand Spray

- Matrix: 9-AA
- Volume used: 200 μL

Two-Step Vapor Deposition

1 step: iMLayer (vapor deposition method)

- Film thickness: 1 μm
- 2 step: iMLayer AERO (spray method)
- Solution delivery volume: 120 $\mu\text{L}/\text{min}$
- Stage speed: 70 mm/sec
- Laminating layers: 4

