

# HTX SubliMATE™

MALDI Matrix Nano-Coating System



# HTX SubliMATE™ MALDI Matrix Nano-Coating System

The HTX SubliMATE™ is an easy-to-use MALDI matrix deposition system offering speed, throughput, reproducibility, and the smallest available matrix crystals for sub-micron resolution mass spectrometry imaging.



The HTX SubliMATE™ is a robust and easy-to-use sublimation system offering a standardized and controlled method for sample preparation for matrix assisted laser desorption/ionization (MALDI) mass spectrometry imaging. The sublimation chamber is designed for speed, multiplexed sample preparation, and reduced matrix consumption.

A fully integrated ceramic heater is used to quickly heat MALDI matrix to sublimation temperatures up to 300°C. Slides are cooled with ice or dry ice bath for temperatures ranging from 15 to -78 °C to produce ultra-small matrix crystals. The high capacity slide holder (4 standard microscope slides, 25 x 75 mm each) allows for high throughput sample preparation.

MALDI matrix solution is pipetted onto a stainless steel Matrix Wafer before each sublimation cycle (Figure 1). The patented HTX Matrix Wafer ensures homogeneous distribution of matrix crystals across a large area of up to 4 glass slides.



Figure 1. Patented HTX Matrix Wafer.

## Key Characteristics

- ◆ Patented sublimation chamber producing ultra-small matrix crystals (<1 micron)
- ◆ 4 slide capacity for increased throughput
- ◆ Fast heating and cooling for quick sample preparation
- ◆ Highly consistent matrix deposition across slides (+/- 4% by fluorescence gray values and slide weight)
- ◆ Patented Matrix Wafer design for even distribution of matrix prior to sublimation
- ◆ Validated protocols for most MALDI matrices (ex: 9AA, CHCA, DAN, DHAP, DHB, DMACA, NEDC, NRM)
- ◆ Fully automated sublimation cycle control (*optional*)
- ◆ Can be used under ultra-high vacuum (*optional turbo pump capability*)

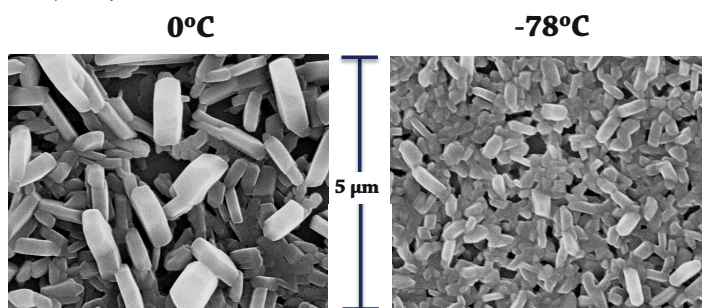
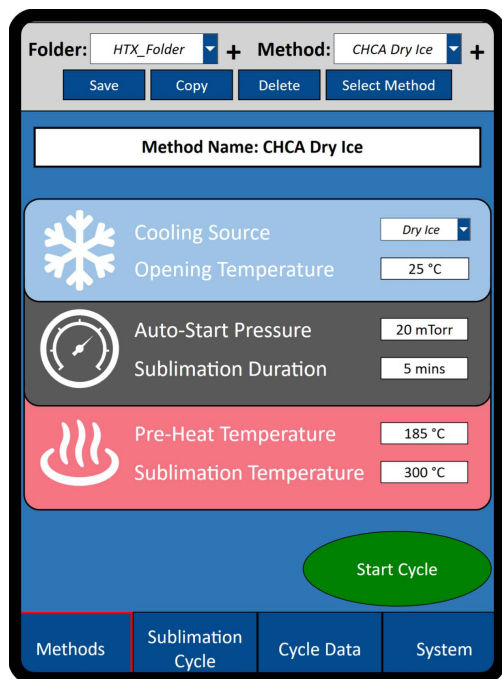


Figure 2. Impact of cooling temperature on matrix crystals. DHAP matrix was sublimated on slides that were cooled with either ice (left) or dry ice (right). Crystals imaged using scanning electron microscopy.

## Benefits of Sublimation

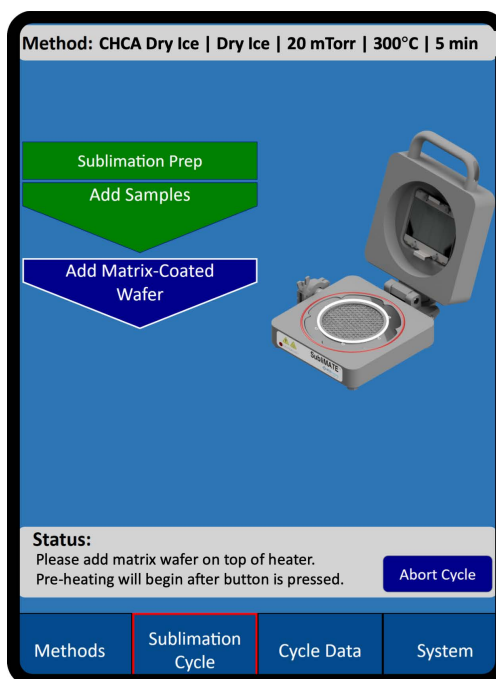
1. **Spatial Resolution:** Sublimation provides minimum crystal size in the nanometer range
2. **Minimum Delocalization:** By skipping the liquid phase in the matrix deposition process, more spatial information is preserved in samples
3. **Efficient:** The matrix layer can be applied in one single process

## Fully Automated Sublimation Cycle via Optional Smart Controller



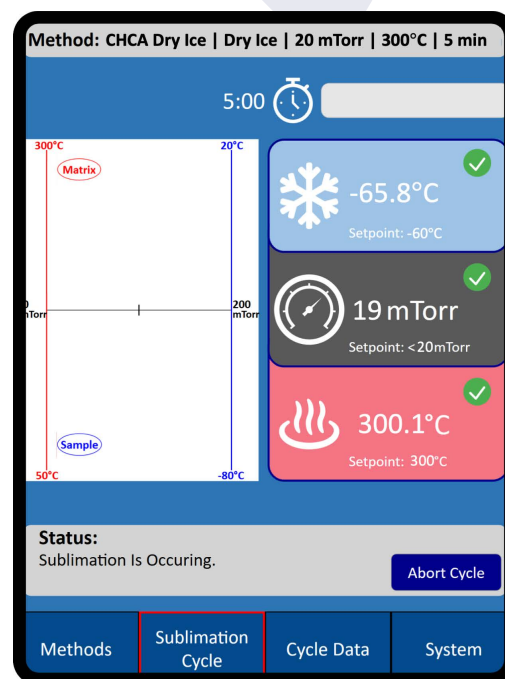
### Select/Edit Method

The HTX SubliMATE™ comes preloaded with validated protocols, while also allowing users full control over editing method parameters. Samples can be cooled down to -78°C with dry ice, and matrix heated up to 300°C.



### Add Samples & Matrix Wafer

Up to 4 slides can be added per sublimation cycle, with matrix usage ranging between just 5-30 mg per cycle depending on protocol and sample type.



### Watch Sublimation Occur

Real-time dynamic display of pressure and temperatures allow the user to observe the sublimation process in detail. Cycle data can be fully exported for logging and QC.

## Case Study #1: Imaging of Lipids in Human Kidney Biopsy by Sublimation

### Experimental Summary

Tissue Type	Human Kidney, Frozen
MALDI Matrix	DHAP
Sublimation Device	HTX SubliMATE™
Sublimation Time	5 minutes
Heating Temperature	200°C
Cooling Temperature	-78°C
MALDI MS	timsTOF fleX (Bruker)
Laser Raster	5 μm

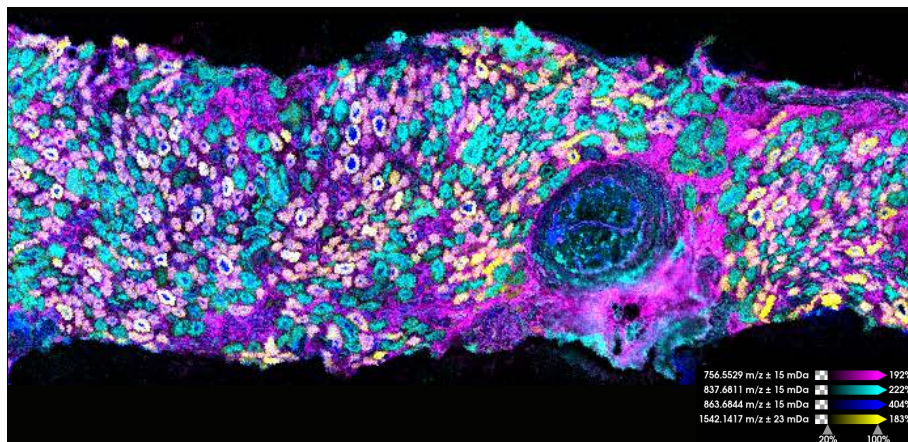
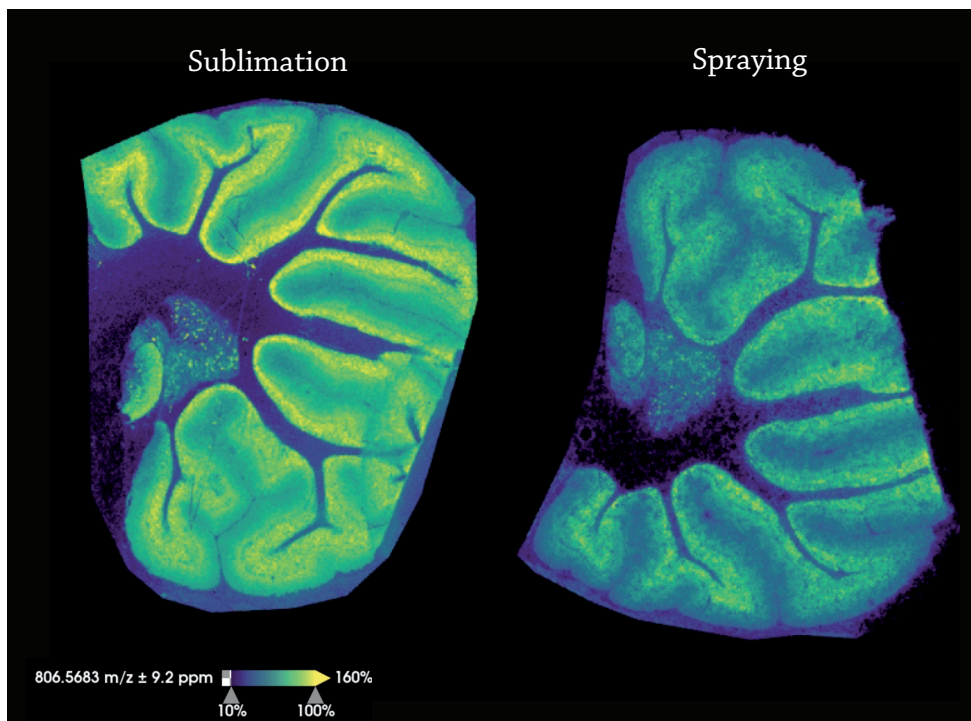


Figure 3. MALDI lipid imaging data of human kidney tissue biopsy. Imaging was performed in positive ion mode at 5 μm with samples coated with sublimated DHAP matrix.

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## Case Study #2: Imaging of Brain Lipids by Sublimation or Spray-based Matrix Application



### Experimental Summary

Tissue Type	Mouse brain, frozen
MALDI Matrix	DHB
Spraying Device	HTX M5 Sprayer™
Sublimation Device	HTX SubliMATE™
Sublimation Time	5 minutes
Heating Temperature	200°C
Cooling Temperature	0°C
MALDI MS	timsTOF fleX (Bruker)
Laser Raster	10 µm

Figure 4. Comparison of sublimated vs. sprayed DHB matrix for lipid imaging in mouse cerebellum. Imaging was performed at 10 µm. Images courtesy of Drs. David Anderson and Jeffrey Spraggins, Mass Spectrometry Research Center at Vanderbilt University.

### Technical Information

HTX SubliMATE™ Specifications	
<b>Sublimation Chamber</b>	
Dimensions	9.5"x13"x4" (24 x 33 x 10 cm)
Weight	17.5 lbs (8 kg)
Cooling	Ice or Dry Ice
Heating	Ceramic, Max 300°C
Vacuum Connector	NW10
<b>Vacuum Pump Capable of 0.02 mBar</b>	
<i>Recommended: Edwards nXDS15i (dry scroll pump)</i>	
Dimensions	17 x 11 x 12" (43 x 28 x 30 cm)
Weight	45 lbs (20.5 kg)
Inlet Flange	NW25
Vacuum Level for Sublimation	< 40 mTorr

### Applications of the HTX SubliMATE™

**N-glycans** - HTX App Note 65

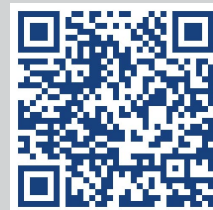
**Lipids** - HTX App Notes 62, 64, 67, 68

**MALDI-IHC** - HTX App Note 66

**Metabolites** - HTX App Note 69

**Small Molecules** - HTX App Note 68

and more! Check out [www.htximaging.com](http://www.htximaging.com) to keep up with our latest sublimation Application Notes



The HTX SubliMATE™ is available worldwide exclusively from HTX Technologies, LLC and authorized resellers.

To request further information contact:

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HTX Technologies offers innovative sample preparation systems for advanced analytical platforms. Our integrated workflow solutions include user training, instruments, software, consumables and method development services.



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