



Nanoquest II

LOAD LOCK
Ion Beam Etching System

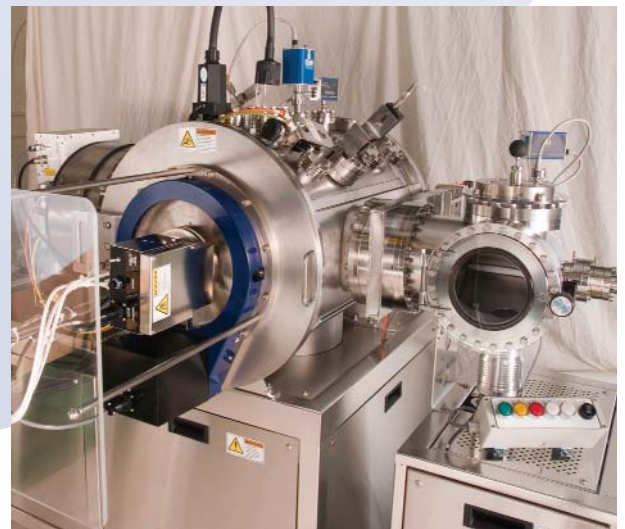


Single wafer load locked Ion Beam Etching System for up to 150 mm wafers

ICP Gridded Ion Source provides user selectable beam potential and current density.

Substrate stage provides active water cooling with simultaneous rotation and tilt during ion beam operation.

Low-profile clean room interface keeps instrument cabinet and etch module behind the clean room wall

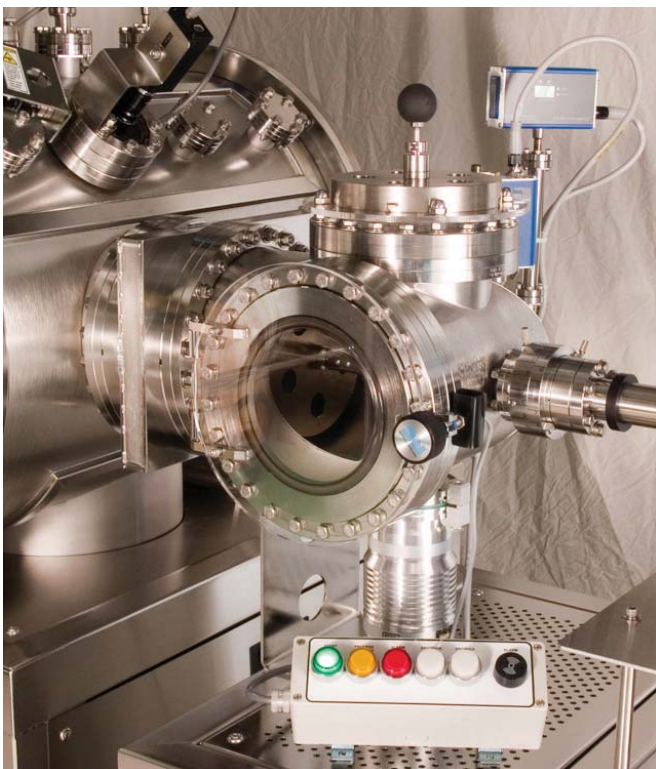
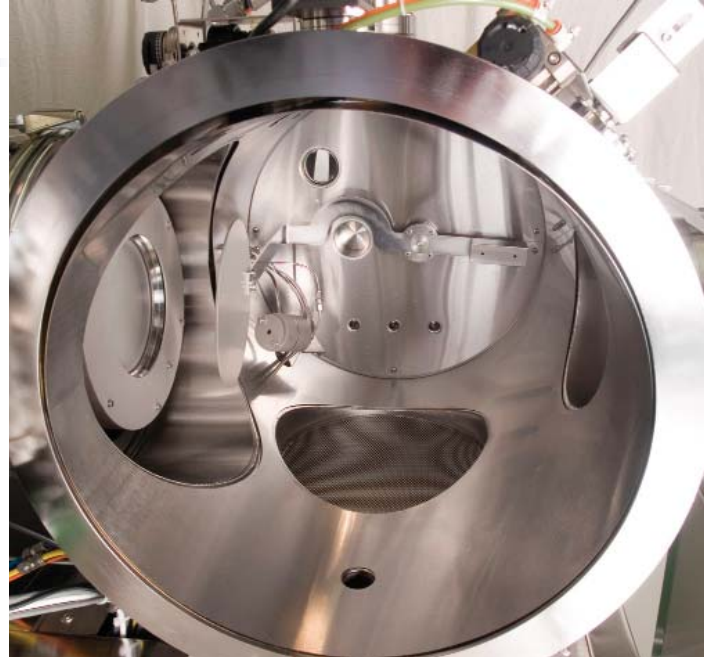




Ion Beam Etching System

Designed for clean room operation, the Nanoquest II keeps the etch module in the service area of the clean room. System components, such as shields and other serviceable items, are easily accessed in the service area. A double door etch module allows servicing from either side of the chamber. UHV design rules ensure that the etch module and load lock chamber achieve very low base pressures. High speed vacuum pumps not only provide a fast pump down, but also reduce ion beam gas collisions.

INTLVAC's Nanoquest II Ion Beam Etching System combines a water-cooled, rotating stage, a 16cm RF ion source, an easily accessible stainless steel vacuum chamber, cryogenic high vacuum pumping system, automatic pump down and venting, atmosphere to high vacuum gauging, mass flow controllers, chamber cabinet, and electronic control console.



High Performance

The Nanoquest comes supplied with 150mm and 100mm wafer platens for batch loading configuration with carbon masks for smaller sized wafers. With uniformity of $\pm 3\%$ over a 100mm diameter, and a repeatability of $\pm 2\%$ wafer to wafer, the Nanoquest is the ideal platform for your process.

System Configuration and Layout

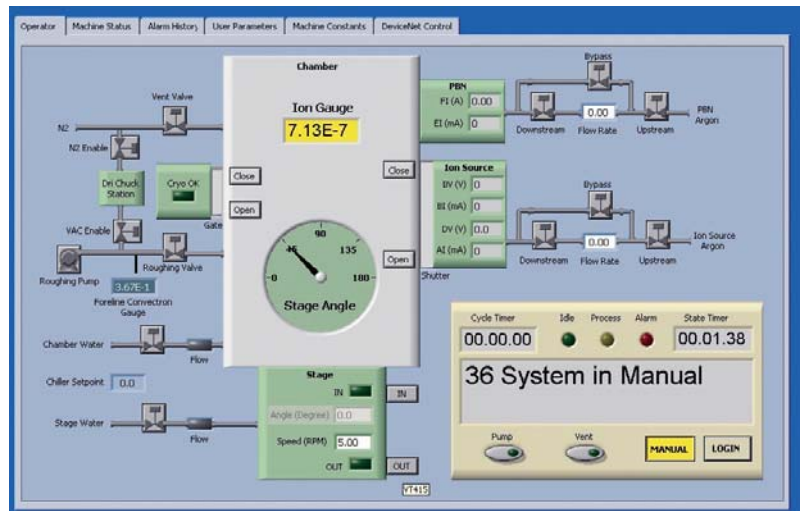
The vacuum chamber is constructed using only stainless steel and UHV compatible fabricating techniques with an electro-polished outer surface for a clean and attractive appearance. Continuous stainless steel cooling channels are welded in a web-like pattern on the outside of the chamber to provide an efficient heat sink. The vacuum chamber has hinged front and rear doors

ion beam etching

for easy access and multiple view-ports for complete process observation, including one view-port for the optional load lock. The Nanoquest system achieves 5×10^{-7} Torr in 2 hours and 5×10^{-8} Torr in 24 hours using a combination of dry vacuum pumps. The Nanoquest may be configured with either Cryopump or Maglev Turbo pump.

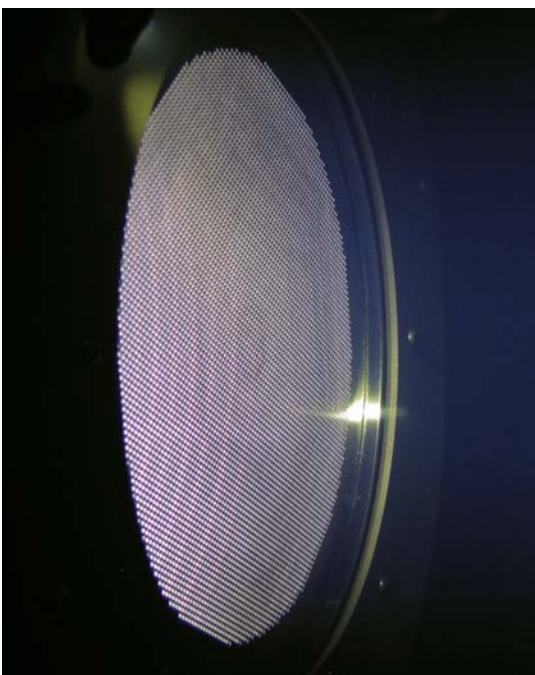
System Control and Monitoring

The LabVIEW based automated computer control system features total system management in an easy to use windows-based package. The LabVIEW Controller allows for automatic sequencing of electro-pneumatic actuators to pump the chamber down from atmosphere to high vacuum pumping. Venting of the system to atmosphere is achieved automatically with INTLVAC's AutoVac Controller.



16cm R.F. Ion Source

The 16cm ion beam source operates over a range of 100 to 1500eV, achieving ion beam currents over 1 Amp. Features of the 16cm ion source include:



- *Plasma Discharge Chamber:* High density plasma generated through RF ICP technology with filamentless ionization enabling long operation before maintenance
- *Ion Optics:* Self-aligning technology ensures repeatable process runs and longer grid lifetime and Molybdenum construction makes them robust and maintenance friendly
- *Modular Design:* Ion source is completely accessible from the chamber for easy serviceability. Internal mounts allow the throw distance to be optimized for etch rates and uniformity.
- *Power Supply:* Frequency matched RF power supply provides rapid response to changing conditions and provides improved contamination resistance.

Operation of the Ion source and Neutralizer is controlled by INTLVAC's LabVIEW user interface with an Allen Bradley PLC controller.



Substrate Holder/Stage Model 8377-M

- ♦ *Platen:* Stainless Steel Construction
- ♦ *Rotation:* 0-7 rpm with variable incident angle and offset, stepper motor driven angle change 0° to $\pm 45^\circ$ tilt
- ♦ *Cooling:* Direct water-cooled platen with DriChuk Pad interface
- ♦ *Assembly:* Mounted on front door of chamber. Stage swings to horizontal position allowing complete access
- ♦ *Substrate:* Can accommodate up to 6" diameter wafers
- ♦ *Shutter:* Pneumatically operated sliding stage shutter with integral beam current probe
- ♦ *Incident angle:* Computer control of incident angle, while under vacuum, better than $\pm 0.5^\circ$



Load Lock System

The Nanaoquest II load lock system uses a magnetically coupled rotary linear drive to safely transport a wafer, that has been mounted to a carrier platen, into the etch chamber.

A remote video viewing system allows the carrier to be monitored during the transfer, from the clean room side of the system.

The load lock enables the user to achieve faster etch turn around times, greater run to run repeatability, and reduces generation of particulates. Water vapor is practically eliminated in the UHV design along with process variability caused by fluctuations in room humidity.

Meeting customers needs worldwide

INTLVAC headquarters has state-of-the-art plant facilities in Ontario, Canada that enable assembly of vacuum systems and gas lines under cleanroom conditions.

We offer on-site installation and training for operators and maintenance personnel worldwide, insuring proper installation, process enhancements, and maximum equipment uptime.

Customer satisfaction

INTLVAC provides individual solutions for service and support issues to each customer, including: Service Contracts, Preventative Maintenance, and Training in System Operation and Maintenance.

All INTLVAC systems equipped with components from selected suppliers are covered by a Comprehensive Warranty and meet International Standards. Our modular design allows for future upgrades of the systems.

INTLVAC

247 Armstrong Avenue
Georgetown, Ontario
L7G 4X6
Canada

T: 905-873-0166
F: 905-873-0168

sales@intlvac.com
www.intlvac.com