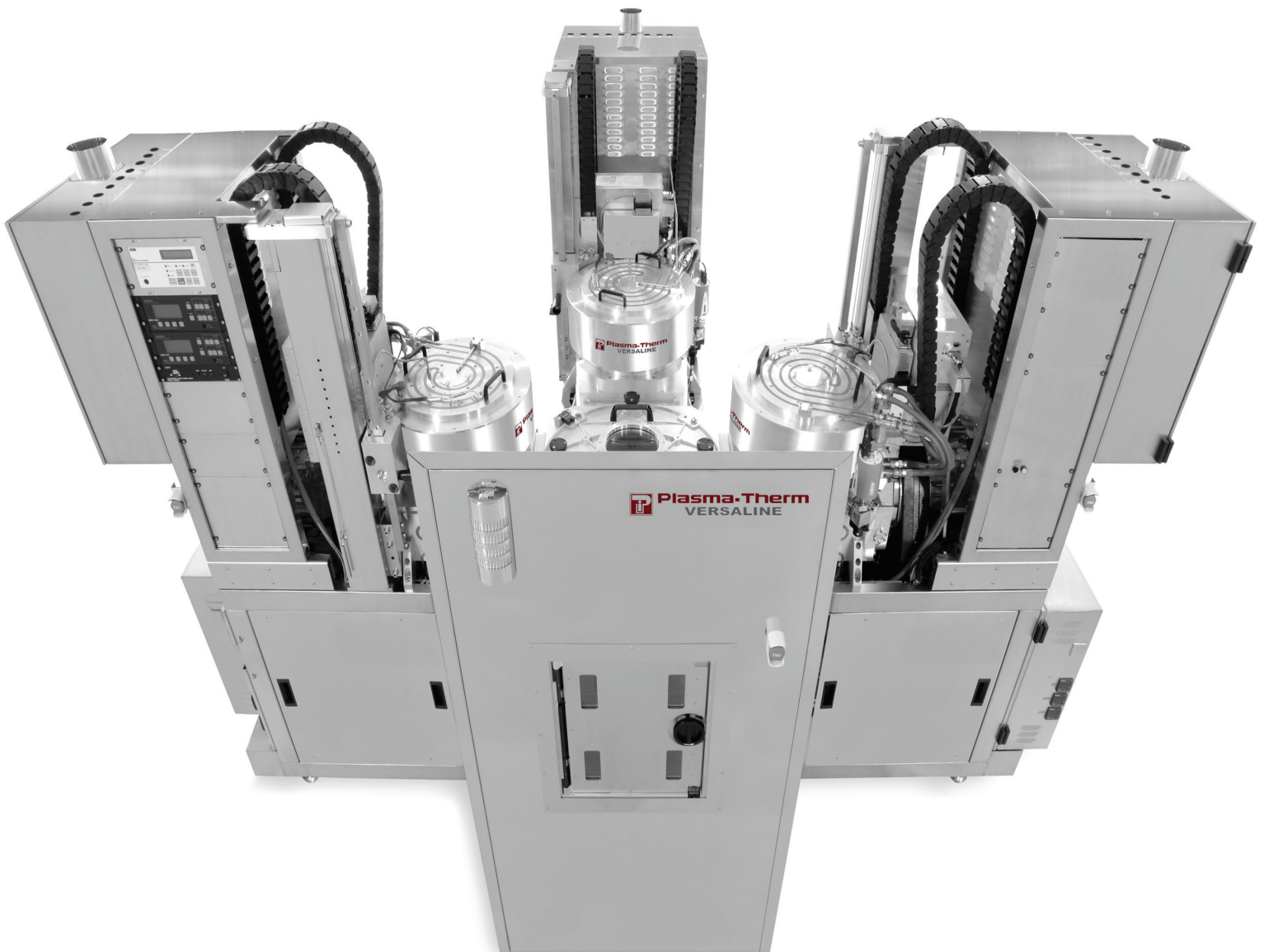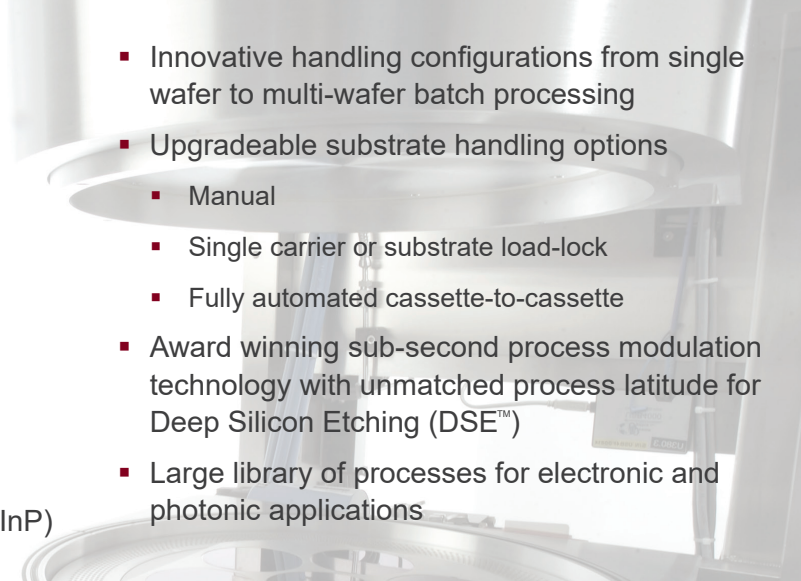# VERSALINE® ETCH

The VERSALINE® platform's modularity facilitates upgradability from R&D through production
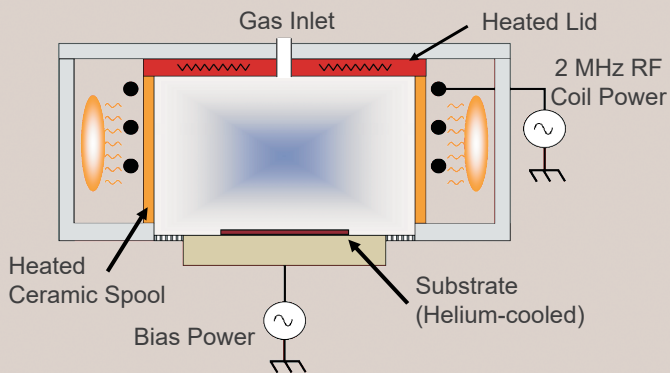

Plasma-Therm

VERSALINE Sets Performance and Flexibility Standards for Rapidly Changing Specialty Markets from R&D through High Volume Production

The VERSALINE platform provides a choice of upgradeable configurations ranging from manual to fully automated loading. The process flexibility for specific applications and requirements can be achieved through technologies such as RIE, DRIE, ICP and Pulsed High Frequency RIE.
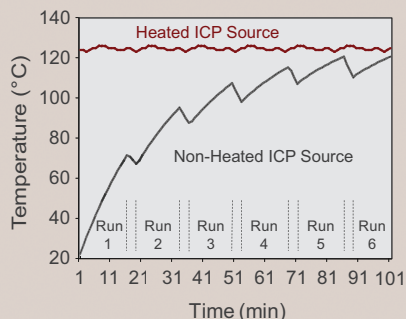
- Maximized productivity and low cost of ownership
  - High uptime (>90%)
  - Low maintenance with heated source
  - Advanced system controls and software
  - Minimize cleanroom costs with small footprint
  - Fast maintenance with easy access
- Clean 2 MHz to optimize performance and reduce capacitive coupling without Faraday shield
- High rate, pillar-free III-V via etching (GaAs, InP)

- Innovative handling configurations from single wafer to multi-wafer batch processing
- Upgradeable substrate handling options
  - Manual
  - Single carrier or substrate load-lock
  - Fully automated cassette-to-cassette
- Award winning sub-second process modulation technology with unmatched process latitude for Deep Silicon Etching (DSE™)
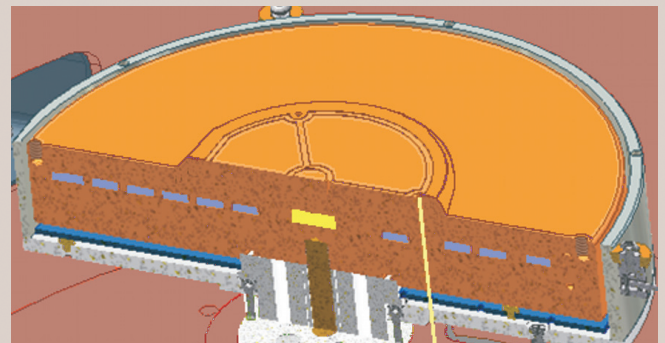- Large library of processes for electronic and photonic applications

Maximum System Stability and Process Repeatability with Optional Heated ICP

Gas Inlet — Heated Lid — 2 MHz RF Coil Power — Heated Ceramic Spool — Substrate (Helium-cooled) — Bias Power

- Eliminate first wafer effects
- Wafer-to-wafer repeatability
- Minimize wet clean cycles
- Extend life of ceramic spool

Heated ICP Source

Non-Heated ICP Source

Run 1 | Run 2 | Run 3 | Run 4 | Run 5 | Run 6

Temperature (°C): 20 40 60 80 100 120 140
Time (min): 1 11 21 31 41 51 61 71 81 91 101

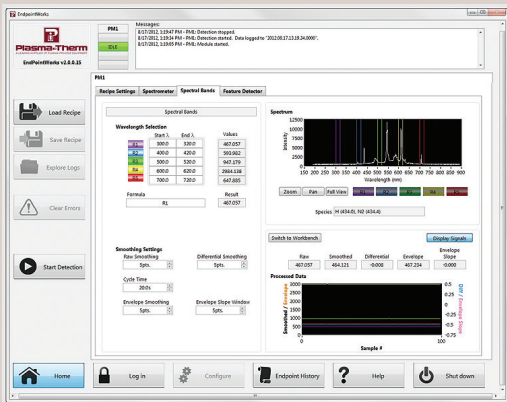## Efficient Substrate Thermal Management

- Monoblock electrode efficiently provides wafer cooling during high rate processes
- Continuous perimeter mechanical clamp for improved helium sealing
- Optimal thermal performance with optional electrostatic chuck (ESC)
- Gentle 3-pin lifting
- Accommodates various substrate thicknesses

- Demonstrated robust software on installed production systems

  - User-friendly control software
  - Comprehensive data logging
  - Automated clean programming
  - Real-time process data display
  - Fully integrated with endpoint system
  - Factory automation compatible (SECS/GEM)
  - Edit recipes during runs
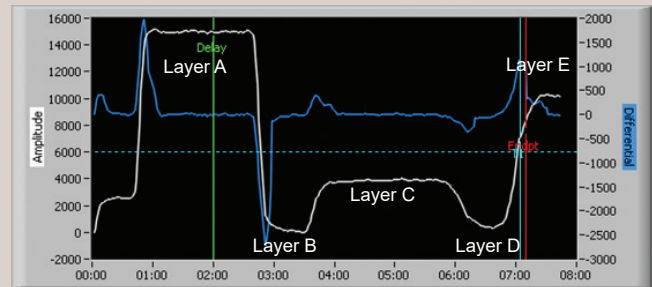 - Multiple user access levels
  - Alarm history
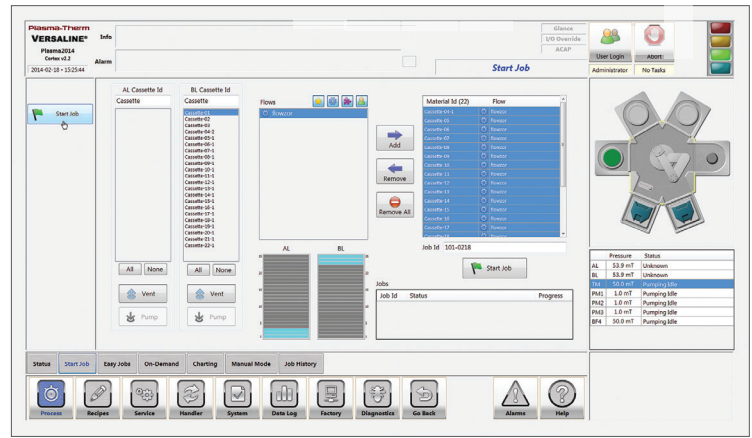
Cortex® Control System

EndpointWorks® Graphical User Interface

- Advanced process control using Plasma-Therm's unique EndpointWorks®

- Capable of various endpoint inputs
  - Laser Interferometry (LES)
  - Optical Emission Spectroscopy (OES)
  - Optical Emission Interferometry (OEI)
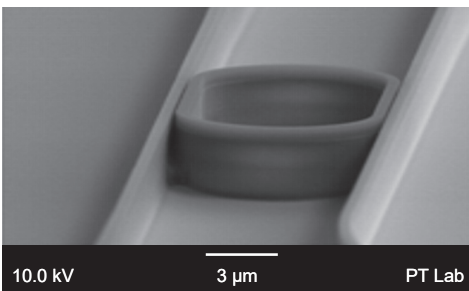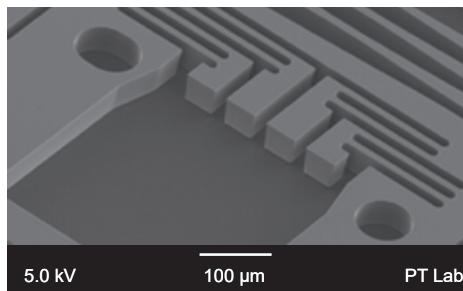 - System parameters
  - Custom inputs

- Optical Emission Spectroscopy (OES)
  - Capable of endpointing on multi-layer stacks
  - Process control of target etch depth
  - Enhanced run-to-run repeatability

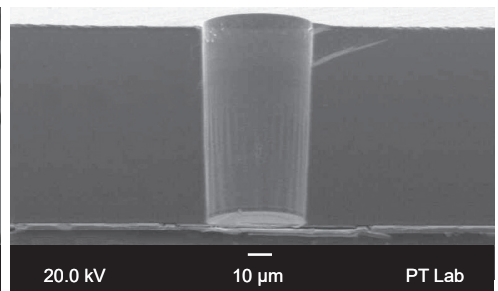- Available for a wide range of process applications
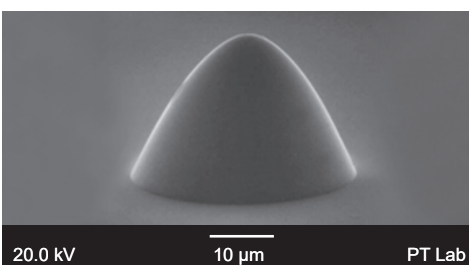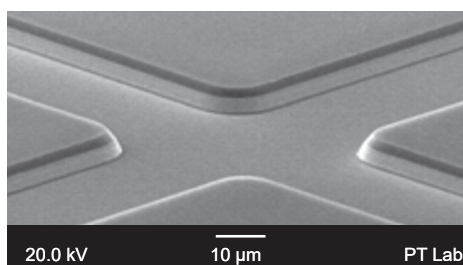

OES Trace of Multi-Layer Etching

10.0 kV | 3 µm | PT Lab

InP Ring Oscillator

5.0 kV | 100 µm | PT Lab

MEMS Micro-Actuator

20.0 kV | 10 µm | PT Lab

GaAs-Via

20.0 kV | 10 µm | PT Lab

Aspherical Quartz Micro-Lens

20.0 kV | 10 µm | PT Lab
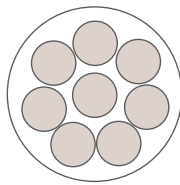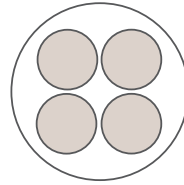
GaN LED

22.5 kV | 1 µm | PT Lab
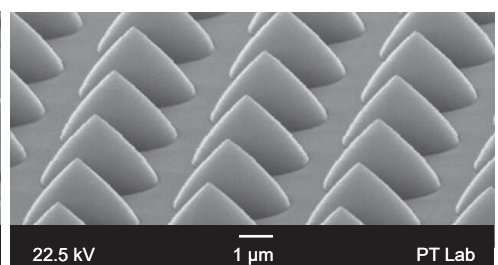
Patterned Sapphire Substrate (PSS)

FLEXIBLE SUBSTRATE LOADING CONFIGURATIONS

8 x 2"

4 x 3"
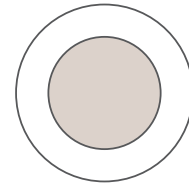
Single 3" to 8"
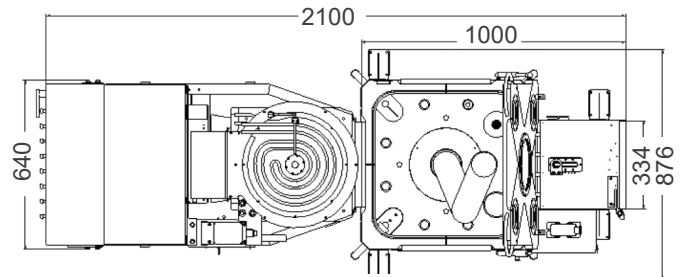
SPECIFICATIONS

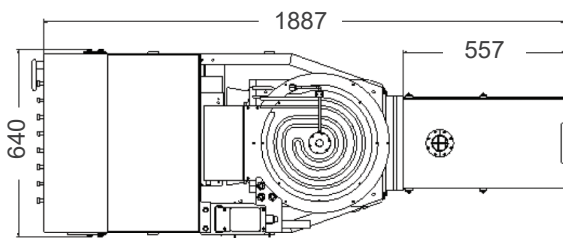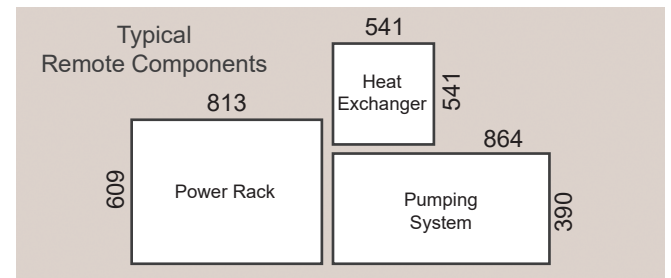|	
Processing Temperatures	-40°C to 40°C 10°C to 60°C 10°C to 200°C
Electrode Size	8" (200 mm) diameter
Loading	Manual, load-lock or cassette
Control System	Cortex® (with data logging)
Pumping	Dry pump
Gas Lines	Up to 8 channels
Endpoint Detection (with EndpointWorks™ Control System)	Optical Emission Interferometry (OEI) Optical Emission Spectroscopy (OES) Laser Endpoint System (LES)
RF Power Supply	2 kW @ 2 MHz ICP 3.5 kW @ 2 MHz ICP Dual range 600 W @ 13.56 MHz
Installation Configuration	Through-wall or Ballroom
Power Requirements	200-230 V, 50/60 Hz
Certifications	CE, SEMI-S2, S8

FLEXIBLE HANDLER CONFIGURATIONS

1180

640
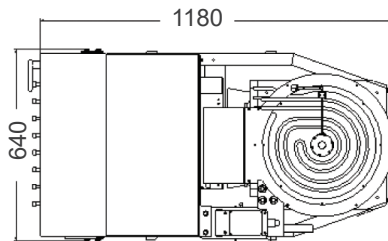
Single Wafer/Batch Manual Loading (RIE only)

1887

640

557

Single Wafer/Load-lock

2100

1000

640

334

876

Cassette-to-Cassette/Load-lock

Typical Remote Components

541

Heat Exchanger

541

813

609

Power Rack

864

Pumping System

390

Units: mm