VERSALINE® PECVD

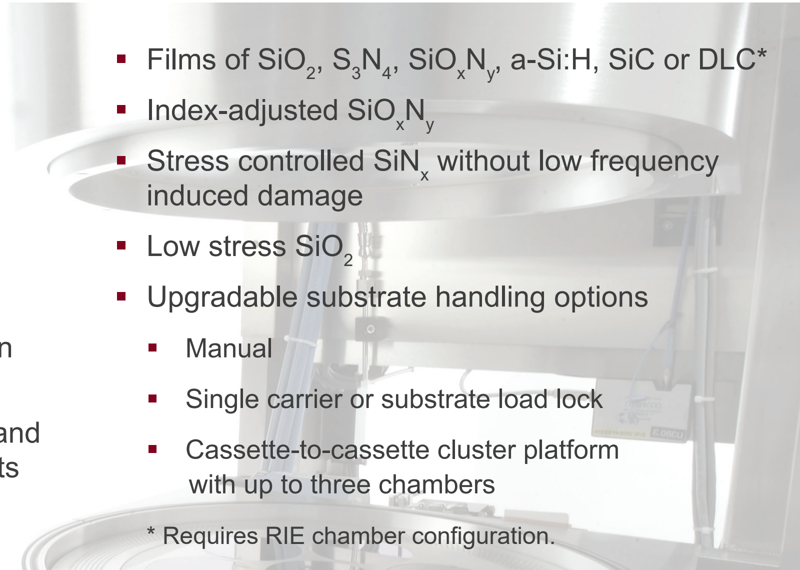
VERSALINE® leverages modularity and flexibility from R&D through production with upgradability

Plasma-Therm

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

A wide variety of dielectric films can be deposited both parallel-plate and high-density plasma deposition systems. Film thickness, composition and stress control, as well as excellent uniformity are easily managed through a wide range of process chemistries and parameters.

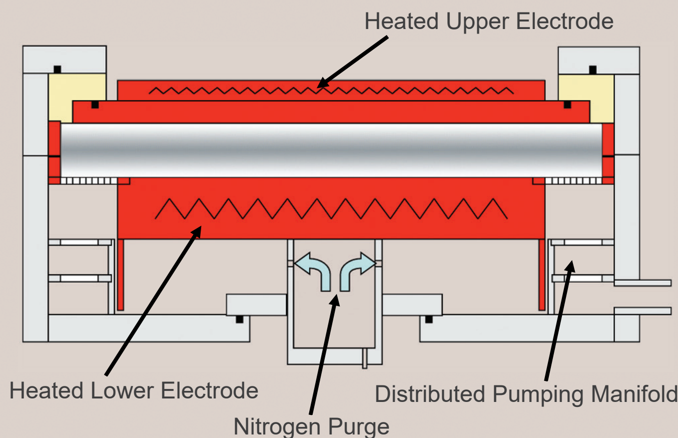
- Maximized productivity and low cost of ownership
  - High uptime (>90%)
  - Fast deposition rates
  - Fast chamber clean rates (etch-back)
  - Large batch sizes
- Flexible batch or single wafer processing on 279 mm (11”) electrode
- Easy handling of non-standard substrates and carriers is ideal for R&D and special projects
- Small footprint minimizes cleanroom costs



- Films of SiO_2, S_3N_4, SiO_xN_y, a-Si:H, SiC or DLC*
- Index-adjusted SiO_xN_y
- Stress controlled SiN_x without low frequency induced damage
- Low stress SiO_2
- Upgradable substrate handling options
  - Manual
  - Single carrier or substrate load lock
  - Cassette-to-cassette cluster platform with up to three chambers

* Requires RIE chamber configuration.

High Quality Films with Isothermal Plasma Process Reactor



- Low maintenance

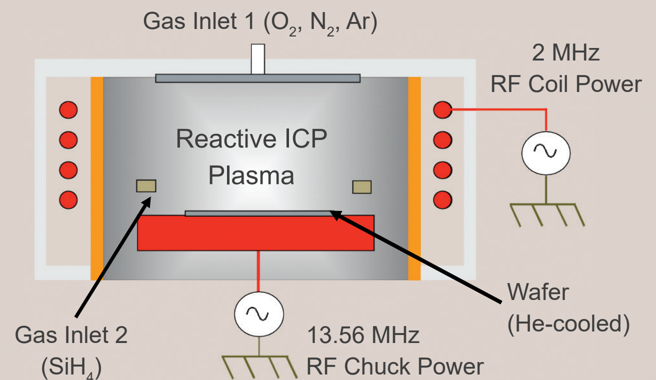
  Shorter clean cycles with small plasma volume

  Low particulates with better film adhesion to chamber walls and showerhead

  Cleaner internal chamber components using nitrogen purge

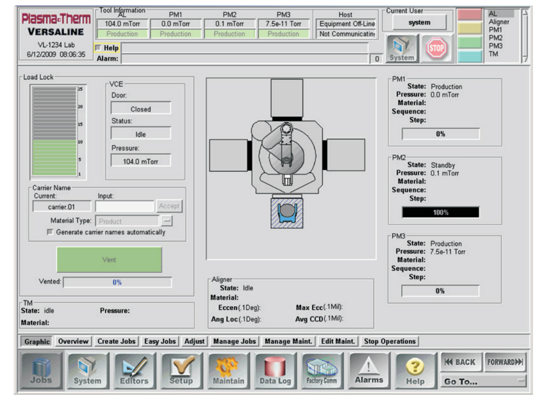
  Faster chamber cleans with optional 2kW RF Supply
- Enhanced uniformity with distributed gas

Low Temperature Deposition with High-density Plasma (HDP-CVD)

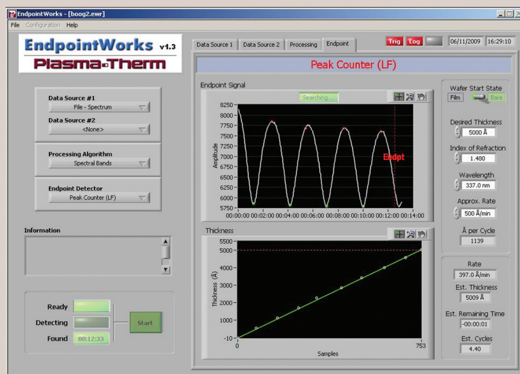


- Efficient independent control of ion flux and ion energy
- Minimize ion damage
- Efficient trench fill capability
- Enhanced step coverage
- Improved film density at T≤150°C

- Demonstrated robust software on installed production systems
  - User friendly ControlWorks™- based 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



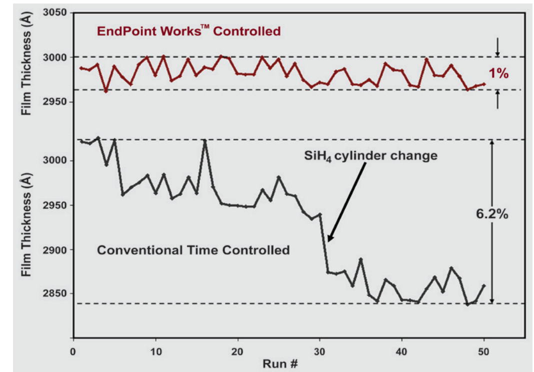
VERSALINE Software Graphical User Interface



EndpointWorks® Graphical User Interface

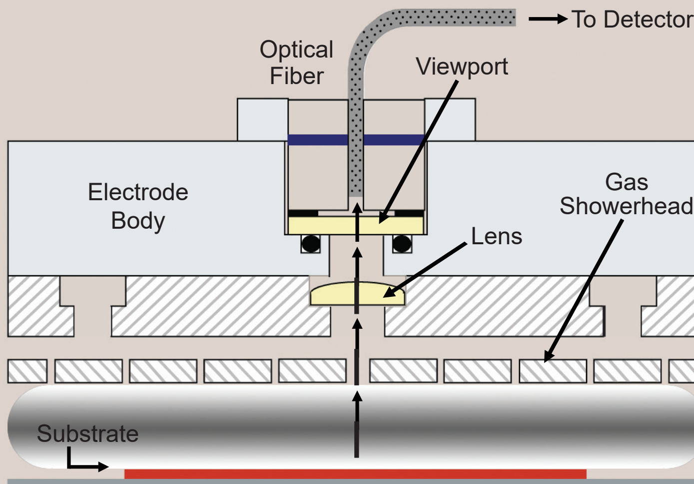
- Advanced process control using Plasma-Therm unique EndpointWorks®
  - Real time deposition rate monitoring
  - ± 1% repeatability with real time thickness monitor
  - Optimized plasma clean processes
- Highly uniform within wafer and wafer-to-wafer films
  - ± 2.5% film thickness uniformity within wafer
  - ± 2.5% film thickness uniformity wafer-to-wafer

- Process control of target film thickness
  - Optical Emission Interferometry endpoint (OEI)
  - Film thickness reproducibility demonstrated to compensate variability of production environment
  - Data shows film thickness consistency even with source gas cylinder change



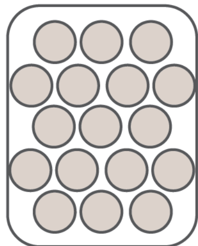
Run-to-Run Repeatability

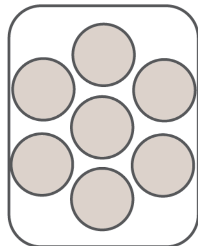
Cross Section of OEI on PECVD Chamber

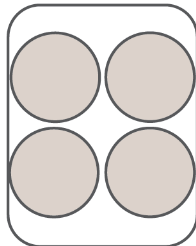


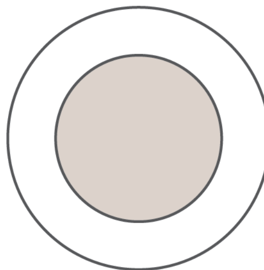
- Patented OEI endpoint system
  - No alignment needed
  - No laser to adjust
  - Higher resolution of thin-films than laser
  - Dual purpose: OEI and OES

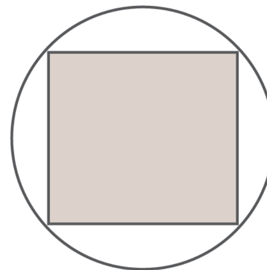
FLEXIBLE SUBSTRATE LOADING CONFIGURATIONS


17 x 2"


7 x 3"


4 x 4"


Single
4" to 8"

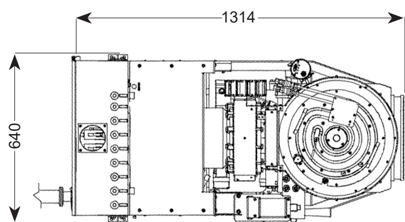

Ø 11" platen for custom sizes

LAYOUT / SPECIFICATIONS

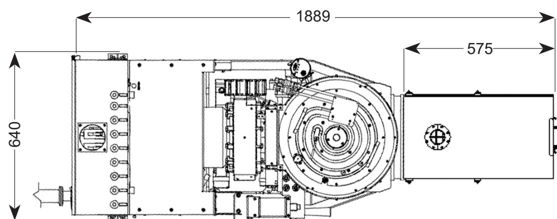
Processing Temperatures	80°C to 350°C
Electrode Size	11" (279mm) diameter
Loading	Manual, load lock or cassette
Control System	Cortex® (with data logging)
Pumping	Roots blower
Gas Lines	Up to 8 channels

Endpoint Detection	Optical Emission Interferometry (OEI) Optical Emission Spectroscopy (OES)
RF Power Supply	Dual range 60/600W 13.56 MHz Optional 2kW 13.56 MHz 2kW 2MHz ICP (only with HDP-CVD)
Power Requirements	200-230V, 50/60 Hz
Certifications	CE, SEMI-2, S8

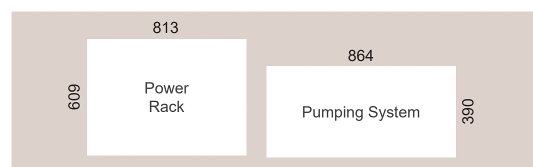
FLEXIBLE HANDLER CONFIGURATIONS



Single Wafer/Batch Manual Loading

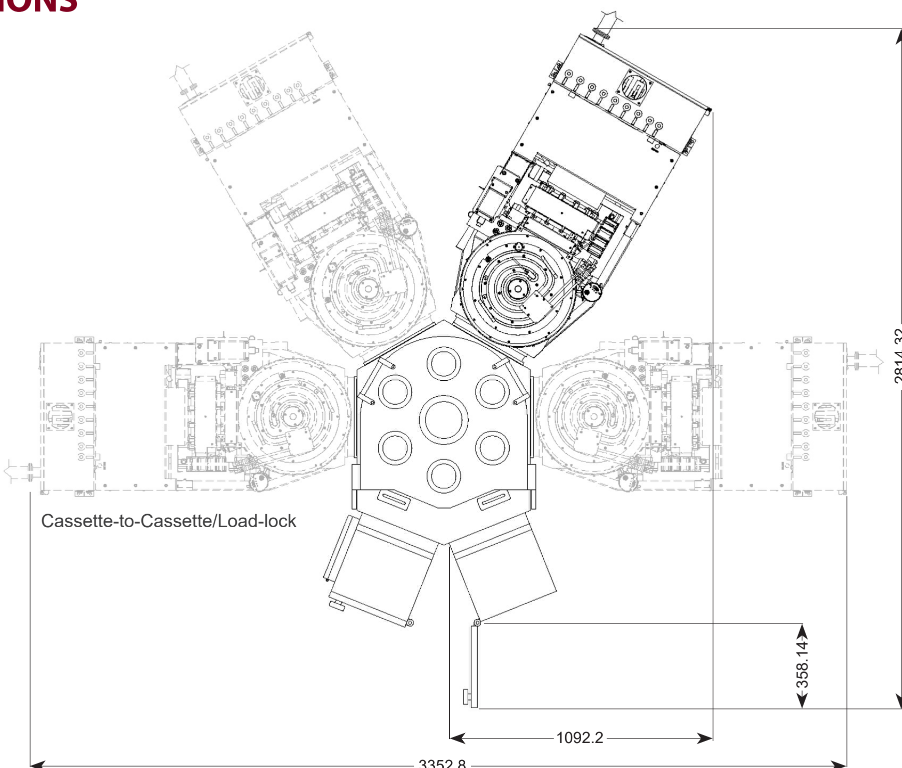


Single Wafer/Load-lock



Typical Remote Components

Units: mm



Cassette-to-Cassette/Load-lock

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VLN-PECVD-2020-0227