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VACUUM**
A Plasma-Therm Company



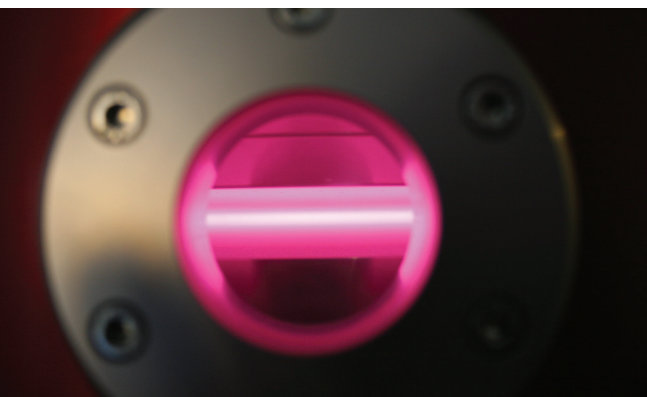
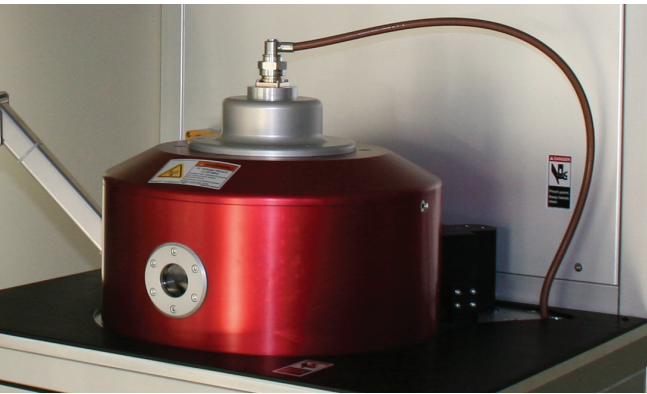
Vision 310 PECVD

INNOVATION ♦ EXCELLENCE ♦ PARTNERSHIP
ENABLING SUSTAINABLE SUCCESS

Advanced-Vacuum.com

Vision 310 PECVD – Innovative Design and Construction

Vision systems provide a flexible, highly reliable, and economical platform for fundamental plasma deposition processing



Easy access for outstanding ease of service and maintenance

- ◆ Allows quick removal of chamber components for cleaning or swap
- ◆ Minimized maintenance intervals
 - ◆ Shorter clean cycles with small plasma volume
 - ◆ Low particulates
- ◆ Innovative showerhead design for highly uniform gas delivery
- ◆ Only un-doped depositions possible
- ◆ Stress control of Si_3N_4 achieved by using mixed-frequency deposition or low-damage He dilution
- ◆ $\text{N}_2\text{O}/\text{SF}_6$ etch back process (high rate when using low frequency)
- ◆ Showerhead-to-substrate distance is adjustable, accommodating non-standard substrates

Elegant design and construction has made the Vision highly valued by many prominent research institutions and Fortune 500 companies

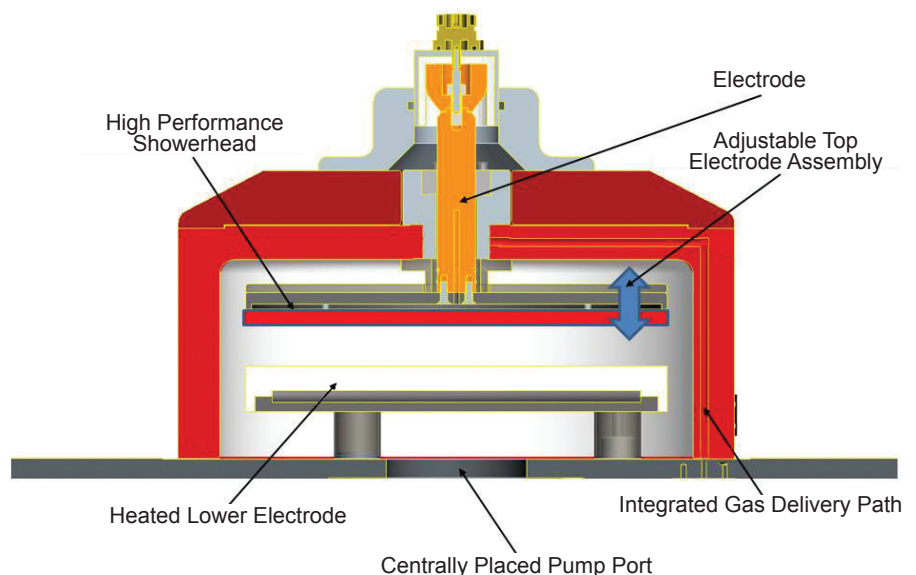
- ◆ Field proven with reliable proprietary technology
- ◆ Simple, robust, and intuitive operation and maintenance
- ◆ Compact footprint ($<0.6\text{m}^2$) conserves valuable facility space
- ◆ Repeatable and uniform in-wafer and wafer-to-wafer performance
- ◆ Large (280mm) platen and easily accessible manual loading for standard and non-standard substrates

Vision PECVD configurations are fully characterized for a wide range of deposition processes:

- ◆ a-Si:H
- ◆ SiO_2
- ◆ Si_3N_4 (stress control)
- ◆ SiON
- ◆ SiC

Built for users with demanding and critical applications

- ◆ R&D – Fundamental semiconductor and material science research for thin film deposition
- ◆ Prototyping and Low Volume Production – economical solutions



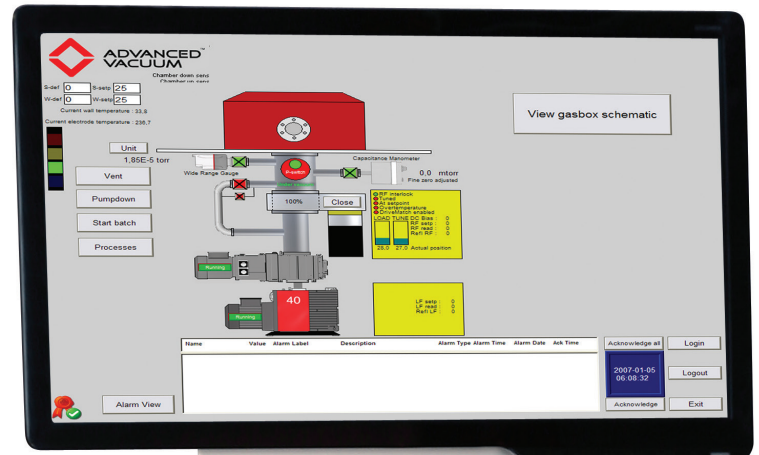
Cross section of Vision 310 PECVD chamber

Productivity Enhancements

- ◆ **Process Library:** Vision systems come with a well-developed process library.
- ◆ **Data Logging:** Simplified data collection for sharing process monitoring and recipe information.
- ◆ **Factory Communication:** When enabled and combined with advanced self-diagnostic features, the system communicates status to the factory, assisting preventive maintenance scheduling and detecting abnormal issues.
- ◆ **Best-of-breed (Tier 1) OEM components:** Standard off-the-shelf for fast parts availability and efficient maintenance.

Proven open load system installed worldwide at leading universities and facilities

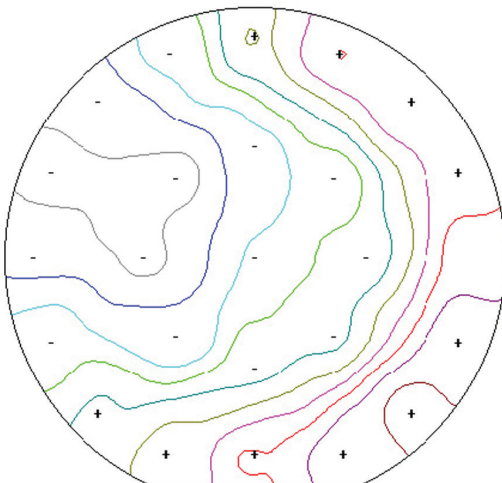
- ◆ User-friendly graphical control system
- ◆ Digital communication using DeviceNet
- ◆ Data logging and recipe management through open SQL Server environment
- ◆ Alarm history, on-the-fly recipe control
- ◆ Real-time process data display
- ◆ Easy and safe override maintenance screens
- ◆ Multiple user access levels



User-friendly interface

Patented endpoint system available for in-situ chamber clean (OES) using EndpointWorks®

Deposition uniformity



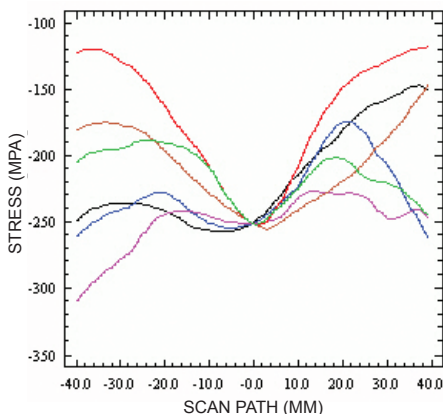
Nanospec / AFT - Contour Map

Program: SiO ₂ on Si 25pt	
200mm - 3mm edge exclusion	
STATISTICS	
No of Data:	25
Min:	3733.8
Max:	3827.0
Range:	93.2
Mean:	3774.86
SD:	28.87
3SD:	86.62
% 3SD:	2.29%
%Range:	1.23%
%MinMax:	1.23%

Mixed-frequency stress control capability

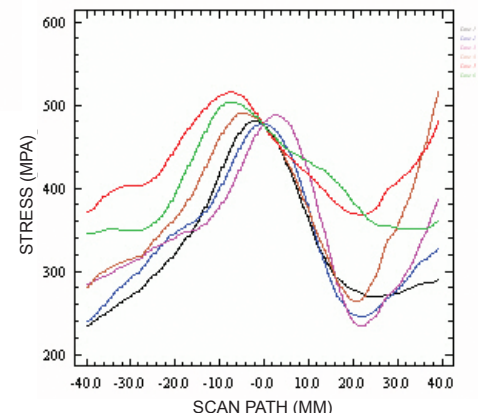
Tensile

LOCAL STRESS ALONG THE SCAN PATH
Wafer ID: Si₃N₄ - whole wafer scan
Wafer 4, Scan 2, laser:780, cassette: 101712R



Compressive

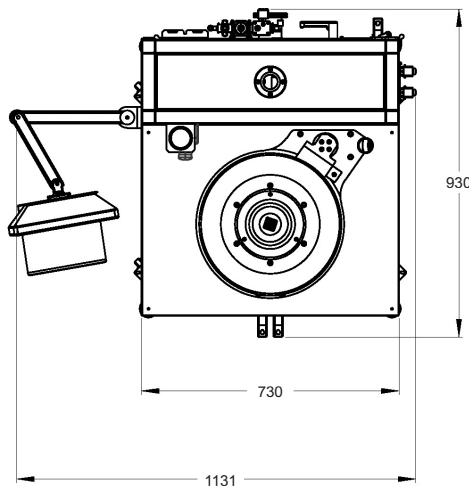
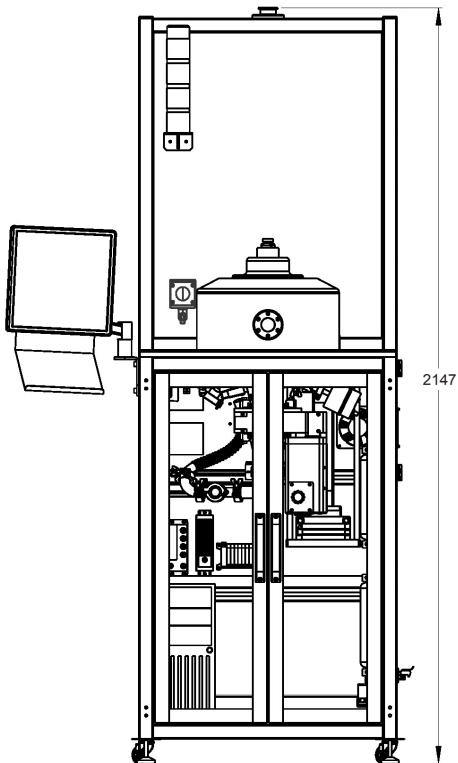
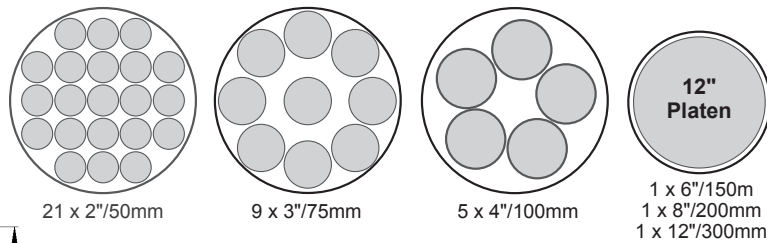
LOCAL STRESS ALONG THE SCAN PATH
Wafer ID: Si₃N₄ - whole wafer scan
Wafer 5, Scan 2, laser:780, cassette: 101712R



Vision 310 PECVD Specifications

Electrode Size	12" (305mm) diameter
Electrode Temperature	≤380°C
Electrode Material	Aluminum
Upper Electrode RF Power	Capacitive, 300W power supply, 13.56 MHz
Vacuum Pumping	250 m ³ /h Roots blower package
Base Pressure	<1.0 x 10 ⁻⁶ Torr
Pressure Control	Automatic, 0 – 1 Torr
Gas Lines	5 channels standard, (Digital MFCs)
Control System	PLC, DeviceNet
Software	Graphical control system with data logging
Power Requirements	32A @ 200/208 V, 60 Hz, 3 phase 25A @ 380/400 V, 50 Hz, 3 phase
Dimensions	Height 117.2 cm (214.7 cm with gas box mounted on system) Depth 93.4 cm Width 73.0 cm
Certifications	CE, SEMI-2, S8
Options	Mixed-frequency stress control option for SiNx (500W 100-460 KHz) Endpoint: Optical Emission Spectroscopy (OES) Dry backing pump Additional gas lines (up to 10 total) Chamber wall heater Industrial communication SECS/GEM

Flexible Substrate Loading Configurations



Units: mm

