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PlasmaPro® 800Plus

Large capacity open-loading process solutions
for plasma etch and deposition



The Business of Science®



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PlasmaPro 800Plus



Versatile plasma etch and deposition solutions

The **PlasmaPro 800Plus** offers a large area plasma etch and deposition solution with convenient open loading in a compact, small footprint system, making it easy to site and easy to use, with no compromise on process quality.

The **PlasmaPro 800Plus** with 380mm or 460mm diameter table offers full 300mm or large batch 43 x 50mm (2") capacity, enabling full production solutions and establishing the **PlasmaPro 800Plus** as a well proven market leading product.

Wide range of applications, including:

- Failure analysis dry etch de-processing using our specially configured failure analysis tools, with RIE and dual-mode RIE/PE processes ranging from packaged chip and die etch through to full 300mm wafer etch
- High quality PECVD of SiN_x and SiO_2 for photonics, dielectric layer passivation and many other applications
- SiO_2 , SiN_x and quartz etch
- Metal and polyimide etch
- Passivation deposition for high brightness LED production
- III-V etch processes

The PlasmaPro 800Plus offers numerous benefits, including:

- High performance processes
- Excellent substrate temperature control
- Precise process control
- Etch end point detection for reliability and servicability
- Range of electrode sizes and wafer capacity
- Large electrodes delivering market leading Cost of Ownership



Process Performance

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Range of electrode sizes and wafer capacity

Wafer stage (lower electrode) sizes	380mm RIE/PE	460mm RIE & PECVD
Wafer loading capacity		
50mm/2"	30	> 43
75mm/3"	13	21
100mm/4"	8	12
150mm/6"	3	5
200mm/8"	1	2
300mm/12"	1	1



High performance processes

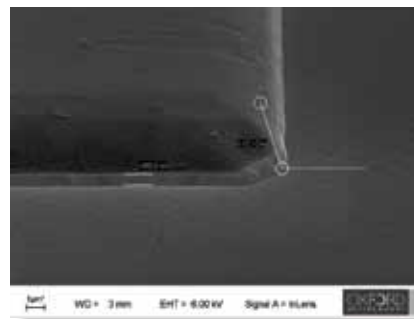
The **PlasmaPro 800Plus** optimised electrode cooling results in excellent process control, wafer temperature uniformity and great flexibility, covering a wide range of processes.

- Enhanced process uniformity and rates are guaranteed by using a high-conductance radial (axially symmetric) pumping configuration
- A close-coupled turbo pump provides high pumping speed and excellent base pressure
- The addition of datalogging offers traceability and history of chamber and process conditions
- Optimised plasma conditions are enabled by three levels of control of matching capacitor values:
 - Easy automatic plasma generation using full automatic matching network
 - Faster switch-over between widely differing processes using the range of preset capacitor values

- Process fine tuning and diagnostics with the use of recipe-settable capacitor values in **PC4500™** software

Substrate temperature control

Substrate temperature control is provided by a range of fluid-cooled and/or electrically-heated electrodes, 380mm or 460mm in diameter, with a temperature range up to 400°C. This results in excellent electrode temperature control and stability.



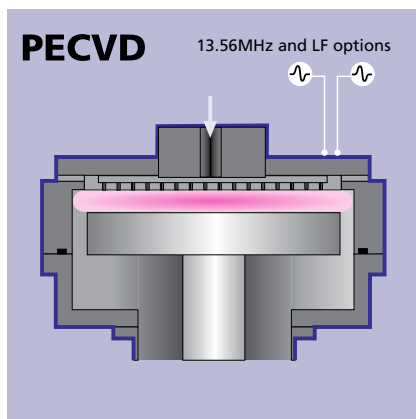
Pt etched down to fused silica with good uniformity and 70° profile. Etch rate 4nm min with 1:1 selectivity to photoresist.

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Multiple process technology configurations

PlasmaPro 800Plus PECVD tool

Designed to produce high quality uniform dielectric films. Stress control in PECVD is provided by selectable or mixed high/low frequency plasma power, enabling deposited films to be tuned for tensile, compressive or low stress.

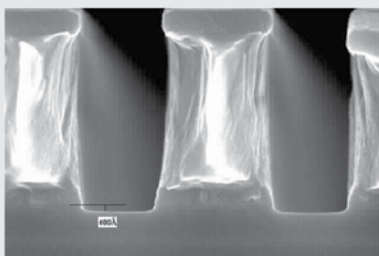
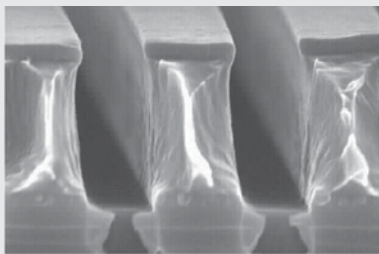
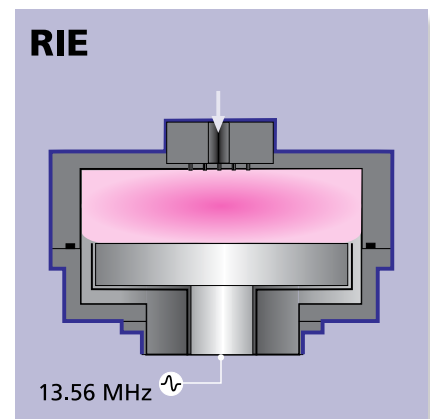
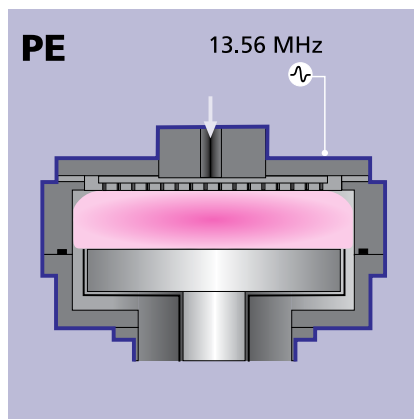


PlasmaPro 800Plus RIE/PE tool

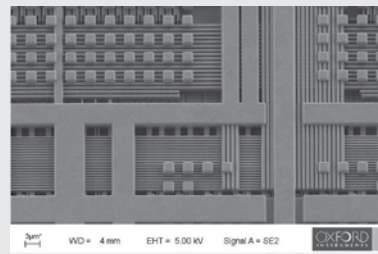
Combines anisotropy of RIE with selectivity of PE mode etching in a single system.

PlasmaPro 800Plus RIE tool

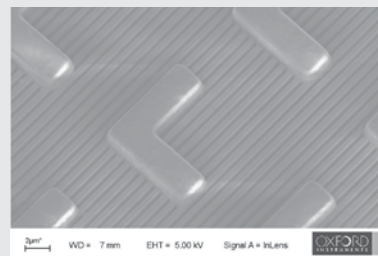
Proven dry etching used widely throughout the industry.



SEM measurements across 300mm wafer for SiNx etch PE mode process, from centre point and edge point.



Focused plasma process used to remove oxide layers and expose four metal layers in less than 5 minutes.



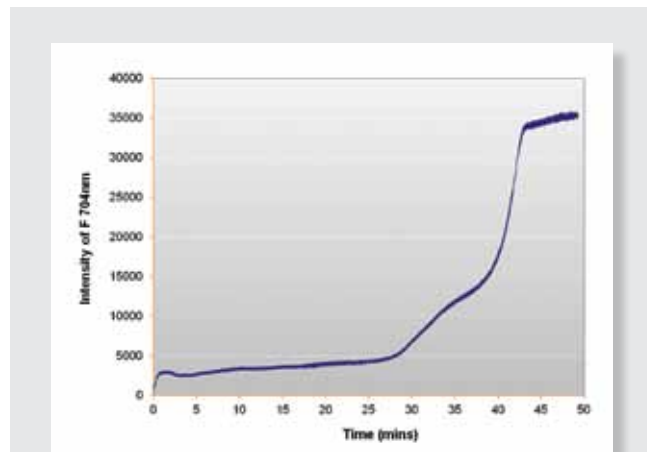
Oxide layer removed using RIE process.

Process control - end point detection

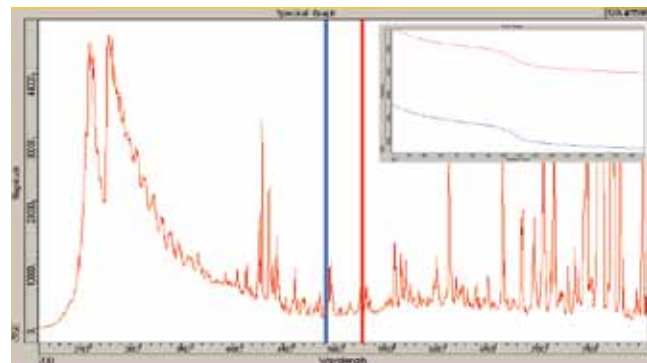
Process control – end point detection

Excellent etch control and rate determination can be provided by optional end-point detection, integrated with **PC4500** process tool software.

- Optical Emission Spectrometry (OES) for large sample or batch process end-pointing by detecting changes in etch by-products or the depletion of reactive gas species
- Enables real-time chamber clean endpoint detection
 - Increases tool availability
 - Reduction in the cost of ownership (determines precisely when the clean process has ended)
 - Reduces possibility of chamber erosion from over cleaning, and assists in extending the life of the chamber
 - Reduces particulate generation by preventing over-clean, leading to improved process yield



The intensity of the fluorine emission line at 704nm increases as the chamber becomes clean, since it is no longer being consumed in etching the material on the chamber walls.



Measurement of the amount of light at a specific wavelength allows a relative measurement of the quantity of a given species in the plasma. This type of measurement is primarily used to determine an end point at a boundary between two layers.

	CCD1	Verity SD1024
Detector range	200-850nm	200-800nm
Pixels	3648 Pixels	1024 pixels
Signal-to-noise ratio	300:1 (at full signal)	2000:1 (at full signal)
A/D resolution	16 bit	16 bit
Dark noise	50 RMS counts	<5 RMS counts
Resolution	-1.5nm	<2nm

Hardware

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Easy open access

Clear access to the lower electrode and smooth, particle free chamber opening operation is provided by the reliable pneumatic hoist mechanism.



Optimised plasma sources

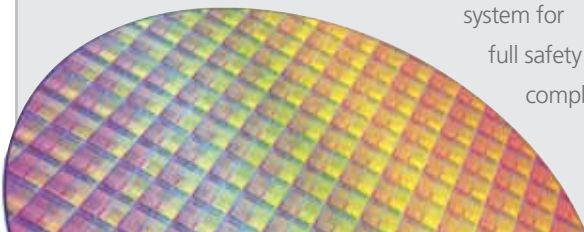
Optimised showerhead design delivers high performance PECVD processes with excellent deposition uniformity.

High performance process control with etch end pointing

Gas control system

12-line gas pod enables maximum process flexibility - configurable with up to 12 gas lines.

- The gas pod may be sited remotely in a service area, and is vented and ready for ducting into an extraction system for full safety compliance



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Software control and system support

Process tool software

Oxford Instruments software is renowned for its clarity and ease of use, making it quick to train process operators while retaining full functionality for fab managers and service staff.

- The front end visual interface, which controls and monitors the process tool, is configured exactly for the customer's requirements
- Process recipes are written, stored and recalled through the same software, building a library
- Password controlled user login allows different levels of user access and tasks, from 'one-button' run operation to full system functionality
- Continuous system data logging ensures effective traceability of each wafer and process run
- Fully SECS/GEM compatible

Cost of ownership and customer support

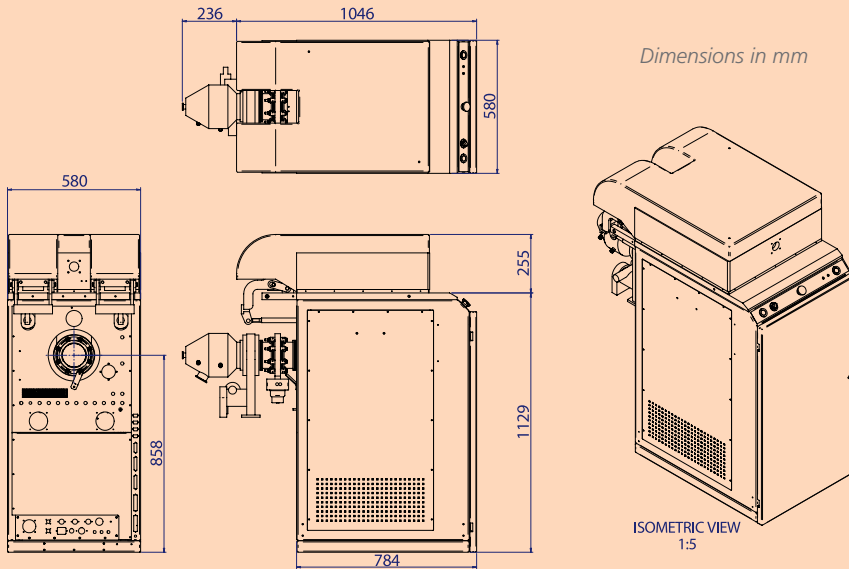
We work with our customers to create the right system, process, and support package to meet your specific requirements, so our range of Service Level Agreements (SLA) will be tailored to your needs. This can include:

- Guaranteed response times for support engineer visits and technical hotline calls
- Choice of support coverage up to 24/7
- Scheduled preventative maintenance calls
- Managed spares inventory options, including customer dedicated stock, via our parts locations worldwide
- Preferential spare part pricing
- Process training
- Certified maintenance training courses for customer's own engineers in preventative maintenance and first level troubleshooting



Technical specifications

Overall dimensions of the PlasmaPro 800Plus



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Worldwide Service and Support

Oxford Instruments is committed to supporting our customers' success. We recognise that this requires world class products complemented by world class support. Our global service force is backed by regional offices, offering rapid support wherever you are in the world.

We can provide:

- Tailored service agreements to meet your needs
- Comprehensive range of structured training courses
- Immediate access to genuine spare parts and accessories
- System upgrades and refurbishments



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