

PlasmaPro™ NGP®80 Range

Next Generation Plasma Systems

Compact open-loading tool for plasma etch and deposition



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PlasmaPro NGP80 range

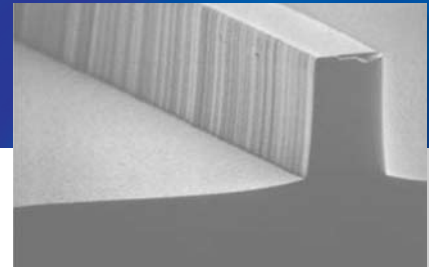
Multiple process technologies

PlasmaPro NGP80 offers versatile plasma etch and deposition solutions on one platform with convenient open loading. This compact, small-footprint system is easy to site and easy to use, with no compromise on process quality.

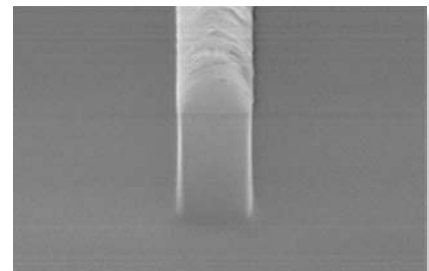
The **PlasmaPro NGP80** is ideally suited to R&D or small-scale production, and can process from the smallest wafer pieces to 200mm wafers. The open load design allows fast wafer loading and unloading, ideal for research, prototyping and low-volume production.

Wide range of applications

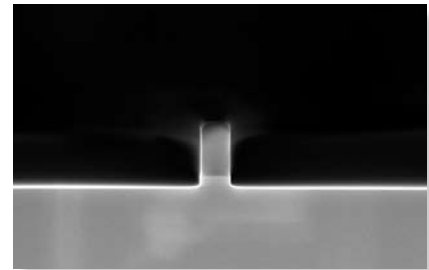
- III-V etch processes
- Silicon Bosch and cryo-etch processes
- Diamond Like Carbon (DLC) deposition
- SiO₂ and quartz etch
- Failure analysis dry etch de-processing using the specially-configured **PlasmaPro NGP** FA tools, with RIE, dual-mode RIE/PE and ICP processes ranging from packaged chip and die etch through to full 200mm wafer etch
- High quality PECVD of silicon nitride and silicon dioxide for photonics, dielectric layers, passivation and many other uses
- Hard mask deposition and etch for high brightness LED production



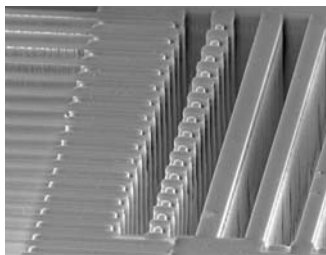
RIE of InP waveguide



7 μm polyimide feature RIE



Sub μm Si mesa etch



Deep Si feature etch by ICP-RIE cryo process



Failure analysis - fast metal layer exposure in the **PlasmaPro NGP** FA ICP



PlasmaPro NGP80

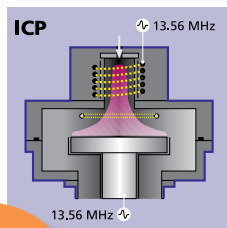
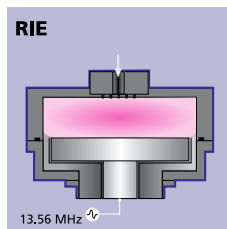
Process technology configuration options

PlasmaPro NGP80 RIE

Proven dry etch technology used successfully throughout the industry on a wide range of applications.

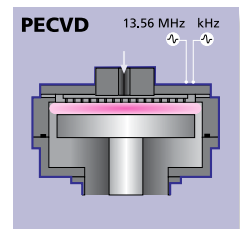
PlasmaPro NGP80 ICP

High density plasma for high rate etching. Independent control of ion energy allows low damage, highly selective processing to be achieved.



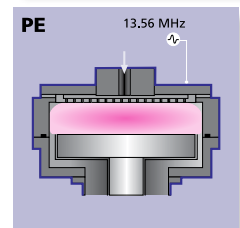
PlasmaPro NGP80 PECVD

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



PlasmaPro NGP80 RIE/PE

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



The 240mm electrode accommodates wafers up to 200mm in size for all system configurations

The electrostatic shield design in the **PlasmaPro NGP80 ICP** configuration avoids energetic ion bombardment and capacitive coupling, providing low substrate damage, with long life for the ICP tube and reduced maintenance.

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



Benefits of **PlasmaPro NGP80** range

The **PlasmaPro NGP80** is the tool of choice for open load, plasma etch and deposition, with high performance processes using optimised electrode cooling, excellent substrate temperature control, and advanced Auto Matching Unit (AMU) allowing easy set up.

High performance processes

PlasmaPro NGP80 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
- The addition of 50ms datalogging of the capacitor values offers traceability and history of chamber and process conditions
- A close-coupled turbo pump provides high pumping speed and excellent base pressure

Easy open access

The pneumatic hoist mechanism is designed to allow clear access to the lower electrode and smooth chamber opening with minimal particle generation.





Substrate temperature control

Substrate temperature control is provided by a range of fluid-cooled and/or electrically-heated electrodes, 240mm in diameter, with a temperature range up to 400°C. This results in excellent electrode temperature control and stability.

Options are available for helium-assisted substrate backside cooling, for optimum wafer temperature control during processes. Cooling can be further extended down to -150°C with the cryogenic electrode option, enabling Si cryo-etch processes.

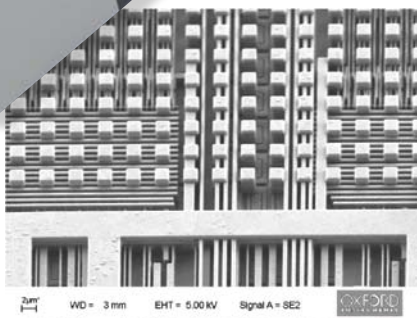
Advanced Auto Matching Unit

The **PlasmaPro NGP80** advanced AMU allows easy set up, fast matching over a wide range, and excellent RF transfer. This results in effective process repeatability & fast response time. AMU control is managed through the front end software.

Plasma Accelerator for Advanced Die Processing

Innovative processes developed for fast de-processing of packaged devices using focussed plasma.

Delivers up to 20 times faster etching rates



Four metal layers of a packaged device can be exposed in less than five minutes using both ICP and RIE processes. The standard process would take more than 60 minutes



The plasma is concentrated above the packaged device to be etched

System control and diagnostics

Process Control – Etch end point detection

Excellent etch control and rate determination can be provided by optional end-point detection, integrated with **PC4000™** process tool software.

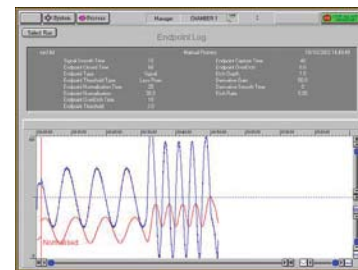
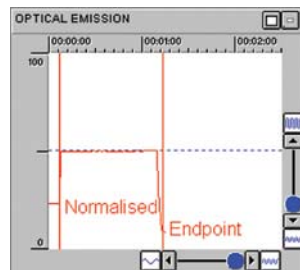
- Laser end-point detection using interferometry to measure etch depth in transparent materials on reflective surfaces (for example, oxides on Si), or reflectometry for non-transparent materials (such as metals) to determine layer boundaries
- Optical emission spectrometry (OES) for large sample or batch process end-pointing by detecting changes in etch by-products or depletion of reactive gas species, and for chamber clean end-pointing



Reliability and diagnostics

Fault and tool status diagnostics is achieved through the front end software. The system provides information about the status of key components, leading to rapid and detailed fault identification.

- Easy access to the main components for maintenance through quickly removable panels
- Extended 'uptime' via rapid component change and ease of chamber cleaning



Gas Control System

A modular upgrade path for gas lines enables users to maximise the flexibility of the **PlasmaPro NGP80** system. The remote gas line by-pass facility allows broad functionality & ease of use.

- The gas pod offers maximum process flexibility. The design enables the easy addition of further gas lines, up to 12
- 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
- Optional purge facility

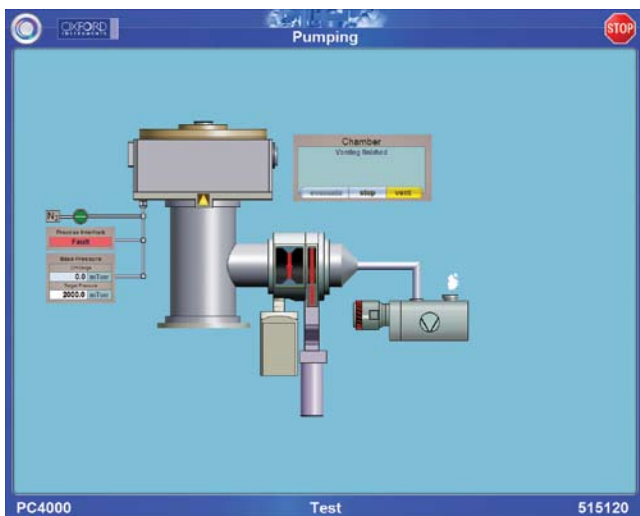


Software control and system support

Process tool software

PlasmaPro NGP80 includes a new and improved user interface based on tried and tested 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 system
- 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 functions
- Continuous system data logging (50ms) ensures effective traceability of each wafer and process run
- Fully GEM/SECS 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

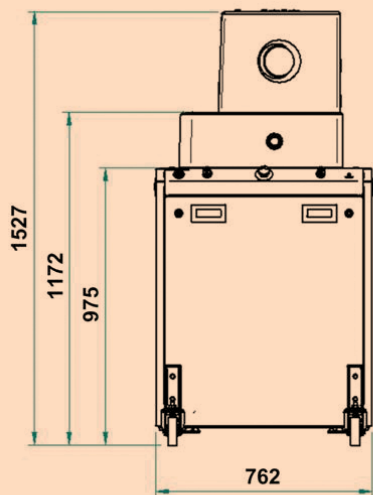
Superior environmental efficiency

PlasmaPro NGP80 has a low heat load and high energy efficiency. The tool's efficient ergonomics and compliance to Semi S2 make this a tool of choice for both research and small-scale production users.

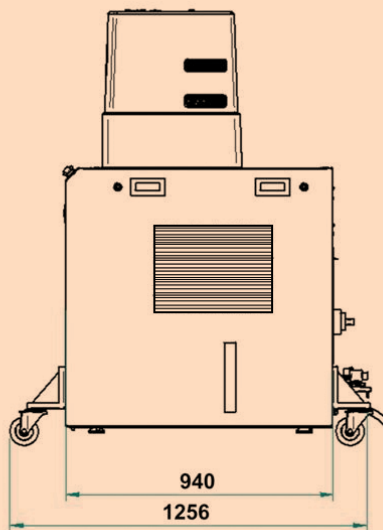


Technical specifications

Overall dimensions of the PlasmaPro NGP80



Wheels are removable and for transportation purposes only.



Dimensions in mm.

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