PEAK
SENSOR SYSTEMS

6207 Pan American Fwy NE, Albuquerque, NM 87109-3425
tel 505.342.1170 fax 505.342.1772

www.peaksensor.com

PROPAK®

REAL TIME, FULL SPECTRUM
PLASMA MONITORING TOOL

Endpoint Detection

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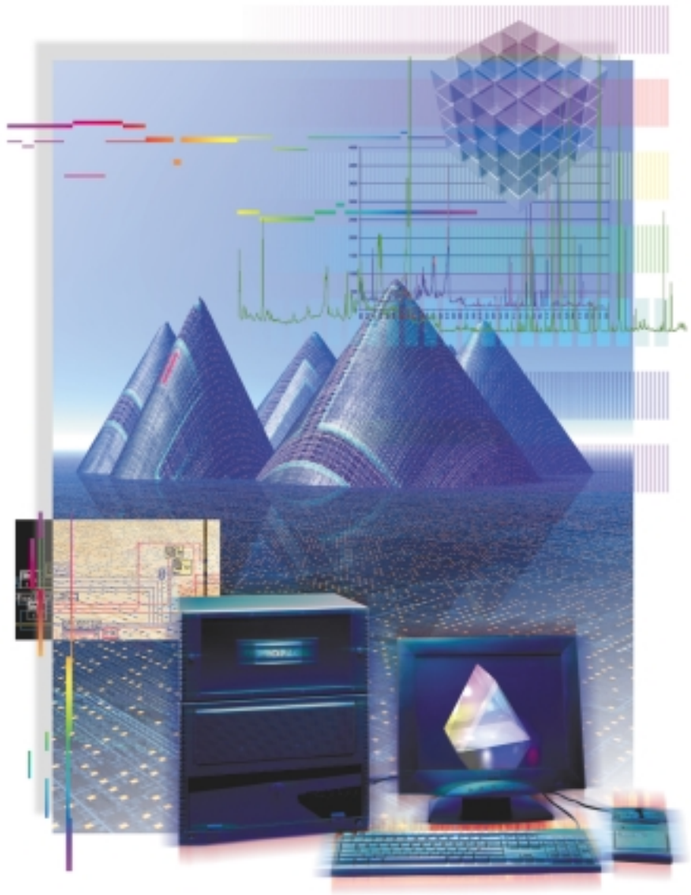


Advanced endpoint

ProPak was designed to deal with the complexities of a very dynamic plasma etch process. Highly resolved full spectrum optical emission spectroscopy (OES) helps the ProPak to detect endpoint more accurately than any other system. But it's not OES alone that makes the ProPak so powerful. It's the unique combination of proprietary hardware, optics and software that makes the ProPak the most advanced tool for plasma monitoring and control available today.

Proprietary components, designed and tested in FAB

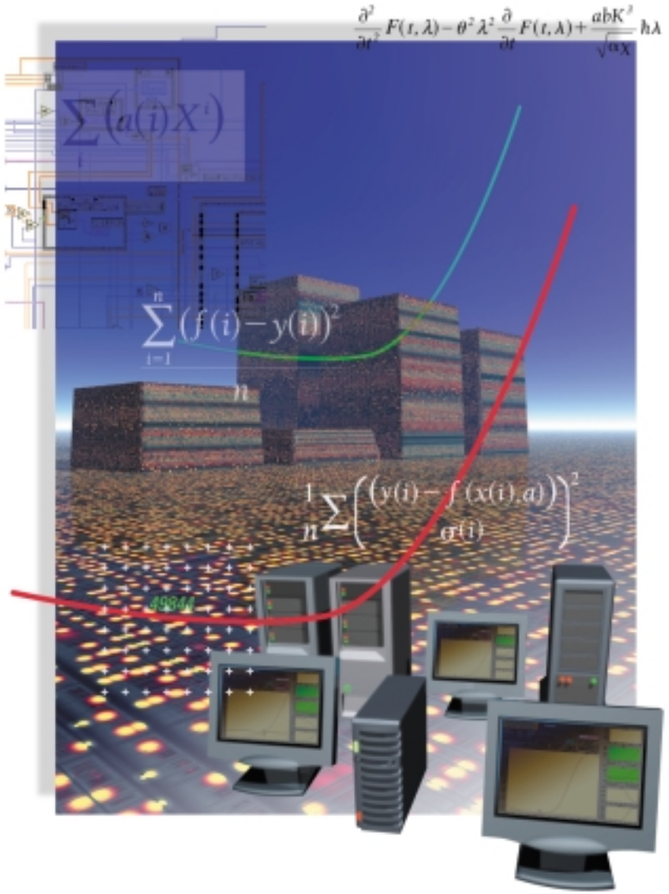
Every part of the system is designed to call endpoint accurately. Custom designed optics, spectral acquisition hardware, and software with patented algorithms make the ProPak unique. All ProPak components, including its industrial hardened computer and robust optics, have been used to call endpoint successfully in FAB for over 5 years.

Patented optics capture more light and more accurate data

The ProPak utilizes a patented window monitoring technique that compensates for changes in the transmitted light as the window ages. UV-enhanced broadband optic probes are custom designed for each chamber to focus and collect the maximum amount of light from the plasma. With corrected spectral data and more light, you get more reliable data from the etch process.

Full spectrum data acquisition

Uniquely designed acquisition hardware gives you better data for more accurate endpoint calls. ProPak gathers highly resolved data across the full spectrum from UV to NIR (200nm to 1000nm). Other endpoint systems may not give you the full spectrum or the number of channels that ProPak does. So they can't help you to call endpoint as precisely. ProPak is designed to collect data at such high resolution, it can even call endpoint on wafers with open areas of less than .1%.



Multi-talented computer hardware and software

The ProPak's powerful computer provides collection, storage and analysis of data from multiple chambers across multiple energy regions with multi-threaded software and multiple endpoint methods.

Multi-processor computer is designed to handle complex mathematical analysis. It's powerful enough to acquire complete data across the full spectrum at sub-second rates, process it in real time, and save all this data (more than 2MB per wafer) for dynamic viewing or later analysis. The data is saved with lot, slot, chamber ID, date, time, or other unique information available from the etch tool or the FAB workstream. Data for more than 10,000 wafers is stored on each disk drive. The ability to collect and analyze such vast quantities of data gives the process engineer wafer to wafer visibility.

Multi-threaded software allows processors to run concurrently. This capability gives ProPak the unique ability to monitor multiple chambers and execute multiple endpoint methods simultaneously.

Multiple chambers (up to 4 on a single cluster tool) can be monitored simultaneously by one ProPak.

Multiple competing endpoint methods give you robust endpoint determination and ensure accurate, precise and reliable endpoint detection throughout the reactor maintenance cycle. This eliminates potential endpoint detection problems associated with chamber aging and allows the engineer to continuously maintain optimum product flow.

Multiple bandpass regions: These endpoint methods can be generated from an unlimited number of bandpass regions within the full spectrum. This gives you robust endpoint determination.

Multiple steps: ProPak can call endpoint on unlimited steps within a single etch process.

Tough, user friendly computer

ProPak's industrial hardened computer is FAB tested. It is also UL listed and CE marked to further ensure reliability. The user friendly ProPak computer accepts inputs from either a touchscreen or mouse interface.

Communications

With the tool

Peak Sensor Systems works closely with all etch tool manufacturers to customize an interface for efficient communication between the ProPak, the tool and the FAB workstream.

With the engineer

ProPak communicates with the engineer or operator in several ways. In the event that endpoint can't be called or some other error is detected, the ProPak will put a warning on the control panel in the FAB. Outside the FAB, ProPak sends a warning via email and/or by pager. ProPak also sends appropriate information via the FAB workstream to allow the AEC/APC framework to alert the tool. ProPak's Desktop Tools software allows remote control of the ProPak and remote viewing of the process in real time.

With the FAB workstream

The ProPak can link to an existing FAB workstream and is compatible with current SEMI protocols and standards.

R&D: From development to production with one wafer

We recognize that in most FABs you can't separate R&D from production. While ProPak is designed primarily as a process monitoring and control system, its Desktop Tools software allows you to move from development to implementation with a single wafer.

Desktop Tools let you play back every detail of the process at your desktop computer for analysis of process failures or for use when working on new product designs. By utilizing the wealth of data ProPak collects from each wafer, you can see what the plasma looks like at every stage of the process, allowing you to find endpoint and finalize recipe specifications quickly.

Complete process monitoring and control

The ProPak is more than just an endpoint tool. Since the ProPak uses highly resolved, full spectrum OES to monitor the plasma performance for endpoint, it can also monitor for process faults and State of Health issues concurrently. Patented fault detection technology is included with your ProPak and patented State of Health technology can be added as an option.