

NEW PRODUCTS

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

LAWRENCE G. RUBIN

FOCUS ON SEMICONDUCTOR TECHNOLOGY

Spectroscopic Ellipsometer

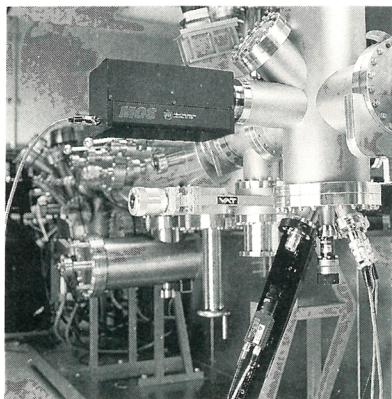
KLA-Tencor has announced a 300 mm thin-film tool for advanced material development and 0.13 μm technology. The ASET-F5 collects measurement data across a continuous wavelength spectrum from 193 to 800 nm. This system combines broadband spectroscopic ellipsometry with dual-beam spectrophotometry to simultaneously measure the film thickness, refractive index and extinction coefficients of single- or multilayer thin-film stacks, without the need for referencing or extrapolation.

The ASET-F5 can be used to measure thicker films (up to tens of micrometers) for pre- and post-etch chemical-mechanical planarization applications and to directly measure ultraviolet reflectivity for photolithography and metals process control at the operating wavelength of the stepper. *KLA-Tencor Corp., 160 Rio Robles, San Jose, California 95134*

►Circle number 181 on Reader Service Card

Measurement of Thin-Film Stress and Strain

k-Space Associates has introduced the kSA multibeam optical sensor, a sensitive laser-based system for *in situ* real-time measuring of thin-film stress



and strain. The measurement is performed by monitoring the substrate curvature via reflection of an array of parallel laser beams from the thin-film surface. Input of the elastic constants and film thickness yields the absolute real-time strain. Monitoring the complete two-dimensional laser array yields surface curvature and strain topography mapping of the surface. Since the technique is optically based, it is compatible with chemical vapor deposition, sputtering and molecular beam epitaxy environments, provided that optical access to the substrate is available. Single-port (near normal incidence) and two-port configurations are available. The system is suitable for real-time feedback to process control systems. *k-Space Associates Inc., 555*

South Forest Avenue, Suite 4B, Ann Arbor, Michigan 48104

►Circle number 182 on Reader Service Card

Nickel Sputtering Targets

Tosoh SMD has developed a nickel alloy target that offers an alternative to titanium silicide and cobalt silicide in semiconductor device contacts. Nickel is a promising candidate for advanced semiconductor devices because it has a wide process window and forms a low resistivity silicide that is stable at elevated temperatures, making it ideal for use with low-dielectric constant dielectrics. By doping its nickel targets with silicon, Tosoh has

HIGH VACUUM COMPONENTS

WE KNOW WHAT YOU WANT.

The results of doing our home work.

Get to know us.

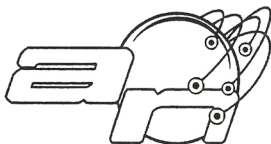
When you call us in need of a high vacuum component, you won't be asked to jump through hoops. In fact, you don't even need to know the part number.

Our customer service people are experienced and will know what you're talking about. Why? Because each one has had "hands on" training in our manufacturing facility before they put their hands on a telephone.

No other manufacturer of high vacuum components can make it better or faster.

Our 40,000 square foot facility utilizes the latest in machine tool technology, TIG welding and helium leak detectors. With our multi-million dollar inventory you can expect delivery within 24 hours; also fastest delivery on custom fabrications.

A&N CORPORATION
High Vacuum Manufacturers Since 1965



707 SW 19th Ave.
Williston, FL 32696

1-800-FLANGE 1



reduced the undesirable ferromagnetic properties of nickel. As a result, the targets exhibit very uniform erosion and long life, leading to the production of consistent, highly uniform films. The targets can be made in common target thicknesses ranging from 6 to 12 mm. *Tosoh SMD, 3600 Gantz Road, Grove City, Ohio 43123-1895*

►Circle number 183 on Reader Service Card

Power Supplies for Plasma Processes

The PDX series of light-weight, compact mid-frequency power supplies is now available from Advanced Energy Industries. The supplies are said to deliver precise power for applications such as plasma-enhanced chemical vapor deposition, etching, dielectric sputtering and plasma polymer processes. They feature sinusoidal output with low harmonic distortion, operation over a wide frequency range (235 to 460 kHz at up to 8 kW output), tight power regulation based on user setpoints, internal load matching, arc suppression that reacts in less than 2 ms and almost no energy storage at the output.

These supplies are said to be useful in the manufacture of semiconductors,

data storage media, flat panel displays and many other products. *Advanced Energy Industries Inc, 1625 Sharp Point Drive, Fort Collins, Colorado 80525*

►Circle number 184 on Reader Service Card

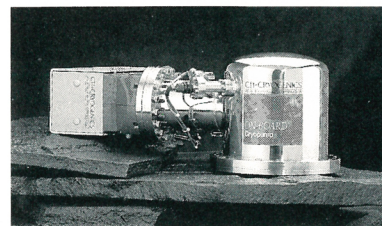
Planar Magnetron Cathodes

Vacuum Coating Consultants has announced that its new VARI-MAG PM/6 planar magnetron cathodes are available in 5-, 6- and 8-inch diameters, for either internal or external mounting. These cathodes feature a variable-field-strength center pole in round geometries only. (Rectangular designs will be available in the future). The cathodes can be operated over a wide range of conditions, from balanced to unbalanced film deposition, without breaking the vacuum. The power supply that controls the center pole's magnetic field can be used in a pulsed mode to grade a film during deposition between low and high energy conditions. The magnetics are based on a computer-generated design that optimizes target use and magnetic field variability. *Vacuum Coating Consultants, 5547 Central Avenue, Boulder, Colorado 80301*

►Circle number 185 on Reader Service Card

Cryopump for Sputtering Processes

CTI-Cryogenics has developed the Enhanced On-Board 8F cryopump, which is said to pump roughly twice as much feed gas between regenerations in sputtering processes, thereby cutting the regeneration frequency in half. This translates into higher availability and weekly throughput for plasma vapor deposition cluster tools and other sputtering equipment. Less frequent



regenerations allow users more time to perform other necessary tool maintenance, such as chamber shield or sputter target changes.

The Enhanced On-Board 8F cryopump can be integrated into new process tools or easily retrofitted to existing sputtering tools. It features full on-board monitoring and control, including that necessary for one-hour regenerations. *CTI-Cryogenics, Nine Hampshire Street, Mansfield, Massachusetts 02048*

►Circle number 186 on Reader Service Card

Residual Gas Analyzers

Two new residual gas analyzers have been introduced to the Dycor product line by AMETEK. The conductance-limited ion source is designed for monitoring semiconductor and thin-film manufacturing processes with system pressures in the millitorr range, and it offers increased sensitivity with decreased background noise. The enclosed ion source is designed for process off-gas analysis where the gas sample is near or above atmospheric pressure, also with increased sensitivity. Both sources feature a removable ion volume for easy cleaning, accessible filaments for quick and easy replacement, and minimal contamination of the analytical signal with the background gases in the sensor chamber. *AMETEK Inc, 150 Freeport Road, Pittsburgh, Pennsylvania 15238*

►Circle number 187 on Reader Service Card

HIGH VACUUM COMPONENTS

YOU WANT PRECISION.

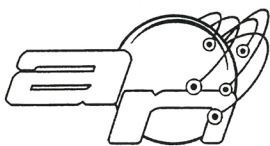
**Anything less
will cost you more.**

Get to know us.

This philosophy of achieving the ultimate in precision has propelled A&N Corporation to its lofty position in the industry. Our high vacuum components are utilized by many of the world's leading corporations... *including one out of this world.*

Our 40,000 square foot facility utilizes the latest in computerized machine tool technology, TIG welding and helium leak detectors. So we're not only fast, we're precise.

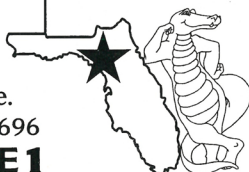
A&N CORPORATION
High Vacuum Manufacturers Since 1965



707 SW 19th Ave.
Williston, FL 32696

1-800-FLANGE 1

We build it right. We get it out fast. What more can we do? How about being closer to you? We maintain a national and international web of qualified distributors and representatives ready to respond to your requirements. You'll probably save on freight charges. You'll surely save on delivery time.



Circle number 44 on Reader Service Card

Thickness Standards for Film Thickness Metrology

Rudolph Technologies has released the results of a one-year study on the stability of a very thin SiO₂ film used as a thickness standard. The stability of film thickness metrology tools is a crucial issue in wafer processing, and so it is important to use a reproducible reference standard, to facilitate accurate tool matching. Tests were performed using a Rudolph research-grade ellipsometer.

In the study, the data indicate that an oxide film grows rapidly on a bare silicon surface and that the measured film thickness continues to increase at about 0.02 nm per month, due primarily to what is believed to be airborne molecular contaminants adsorbing onto the oxide surface. H₂O₂ cleanings of the surface performed every two to three months thereafter seemed to stabilize the film thickness. *Rudolph Technologies Inc, One Rudolph Road, P.O. Box 1000, Flanders, New Jersey 07836*

►Circle number 188 on Reader Service Card

High-Resolution Mass Spectrometer

VG Elemental has introduced the VG Axiom, a compact inductively coupled plasma mass spectrometer (ICP-MS) that features high power and high resolution. Designed to meet the analytical requirements of the semiconductor materials industry, the Axiom can resolve spectral interferences from the potential contaminants of importance to fabrication processes, such as sulfuric acid, phosphoric acid and photoreists. Its upright design results in a small footprint, said to be the smallest ICP-MS for its power and well suited to use in a clean room.

The Axiom is available in a single collector configuration (model SC) for high-resolution elemental analysis, and in a multicollector model (model MC) that includes all of the single collector's functions and also performs simultaneous isotope ratio measurements. *VG Elemental, 27 Forge Parkway, Franklin, Massachusetts 02038*

►Circle number 189 on Reader Service Card

Workstation for Rapid Response Defect Characterization

FEI Co offers the DualBeam XL860 FIB/SEM workstation which combines

rapid and precise focused ion-beam (FIB) milling and cross-sectioning with high-resolution scanning electron microscopy (SEM). It can perform advanced three-dimensional defect review and characterization in a clean room environment and is designed for process evaluation, yield management and failure analysis. The software automatically handles the complex interrelationships between FIB and SEM operation, allowing the operator to concentrate on analysis of the results. The XL860 is said to provide the highest available SEM resolution for defect characterizations—3 nm over the 1–30 kV range. *FEI Company, 7451 Northwest Evergreen Parkway, Hillsboro, Oregon 97124-5830*

►Circle number 190 on Reader Service Card

In Situ Wafer Temperature Measurement

SensArray's Thermal TRACK/TC is designed to log and monitor temperature data in real time from an array of up to 17 thermocouple sensors embedded in wafers. The new tool supports chemical vapor deposition and rapid

thermal process temperature control.

The display shows a wafer image with digital temperature indicators at each sensor location, with calculated minimum, maximum and average temperatures. Acquisition periods are



user-defined from 200 ms to 5 minutes.

Applications for the Thermal TRACK/TC include checking and adjusting pyrometer calibrations and rapid troubleshooting of temperature-related process problems. *SensArray Corp, 3410 Garrett Drive, Santa Clara, California 95054*

►Circle number 191 on Reader Service Card

HIGH VACUUM COMPONENTS

YOU WANT IT WHEN?

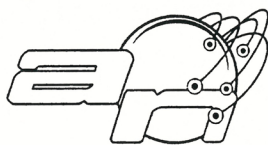
OK!

Get to know us.

No other manufacturer of high vacuum components can ship faster than we can. With our multi-million dollar inventory you can expect delivery within 24 hours. We also provide the fastest delivery on custom fabrications.

Our 40,000 square foot facility utilizes the latest in computerized machine tool technology, TIG welding and helium leak detectors. So we're not only fast, we're precise.

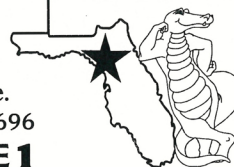
A&N CORPORATION
High Vacuum Manufacturers Since 1965



707 SW 19th Ave.
Williston, FL 32696

1-800-FLANGE 1

We build it right. We get it out fast. What more can we do? How about being closer to you? We maintain a national and international web of qualified distributors and representatives ready to respond to your requirements. You'll probably save on freight charges. You'll surely save on delivery time.



Circle number 45 on Reader Service Card