

NEW PRODUCTS

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers, and in some cases by independent sources. 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.

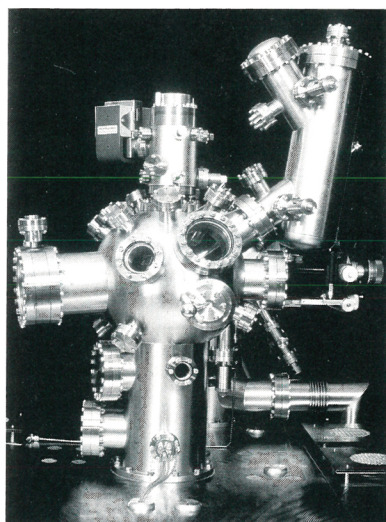
Cleanroom-Compatible Atomic Force Microscope

The Dimension 7000 Autowafer from Digital Instruments is an atomic force microscope intended for three-dimensional measurement of semiconductor wafers in a class 1 cleanroom environment. Possible measurements include feature depth and width, roughness, planarization and grain size. The Dimension 7000 has cassette-to-cassette wafer handling, and it is capable of measuring up to 60 sites per hour with contamination levels of less than ten particles per pass over an 8-inch wafer. Because a single scanner covers scan ranges from nanometers to 90 μm , hardware changes are unnecessary. Optional pattern-recognition software and automation software and hardware are available. *Digital Instruments, 520 East Montecito Street, Santa Barbara, California 93103*

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Combined Scanning Tunneling and Scanning Electron Microscope

Omicron has developed a measuring device that allows an *in situ* combination of ultrahigh-voltage scanning tunneling and scanning electron microscopy. The device can achieve an SEM resolution of 20 nanometers using a Schottky-type field-emitter two-lens electron column. This allows precise positioning of the STM tip above the sample. One can also use the SEM to study the shape and quality of the STM tip before measurement. The device has a three-dimensional sample-positioning stage mounted on a single-axis goniometer, which makes possible eucentric SEM imaging. The main chamber of the instrument allows



a wide variety of complementary analysis techniques, including scanning Auger microscopy, photoelectron spectroscopy, ion-scattering spectroscopy, Auger electron spectroscopy and low-energy electron diffraction. The device should be useful in surface physics. *Omicron, 1738 North Highland Road, Suite G101, Pittsburgh, Pennsylvania 15241*

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Flexible ${}^6\text{LiF}$ -Polymer Neutron Shielding

The Houston Research Center for Advanced Materials has developed a flexible polymer shielding material containing a high level (up to 97% enrichment) of ${}^6\text{LiF}$. The polymer is a rubberlike material that can be folded without breaking and can be cut and shaped with ordinary scissors. Because ${}^6\text{Li}$ has a large cross section for thermal-neutron absorption without secondary gamma radiation, the material is said to be well suited for applications with high neutron flux, including nuclear spectroscopy and nuclear therapy. The material has a density of 1.8 grams per cm^3 , and it is available in sheets of up

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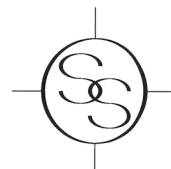
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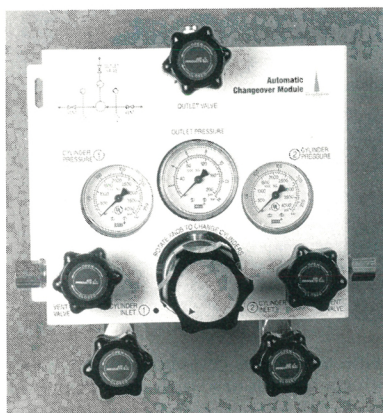
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to 500 mm × 1000 mm and thicknesses from 1.5–4.0 mm. Thicknesses greater than 1.7 mm are opaque to neutrons with wavelengths greater than 2.35 Å. *Houston Research Center for Advanced Materials, 4615 Post Oak Place, Suite 287, Houston, Texas 77027*

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Gas Delivery System for Semiconductor Manufacturing

Tylan General's Intelligent Gas Panel is designed for gas-delivery in semiconductor manufacturing. The panel uses a microprocessor-controlled, digital mass flow controller to adjust in real time the flow and pressure of mul-



multiple gases. The panel allows real-time data collection and analysis of process parameters, automated gas purging, integrated temperature control, integrated rate-of-rise analysis and *in situ* calibration of the mass flow controller. Built-in diagnostics are said to reduce the usual downtime associated with gas panel diagnostics and repair. *Tylan General, 9577 Chesapeake Drive, San Diego, California 92123*

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Liquid-Metal Ion Gun for Time-of-Flight Mass Spectroscopy

Hessler Technical Services has made available a liquid-metal ion gun for time-of-flight secondary ion mass spectroscopy. The IOG 25, which is manufactured by the British firm Ionoptika, has an optimum lateral resolution of 500 Å and a peak current of 50 nanoamperes, with typical running parameters of better than 2000-Å resolution at 1 nA. The IOG 25 gen-

erates a 10–20-nanosecond beam pulse using a technique called beam blanking, in which the beam is passed over an aperture. The pulse is then bunched by retarding its front and accelerating its rear to give a pulse length of 600–700 picoseconds. The ion gun can be controlled manually or by computer, and a raster scanning system is available. The ion gun should be useful for TOF-SIMS applications in studies of polymers, semiconductors and catalyst particles. *Hessler Technical Services, 44 Strawberry Hill Avenue, Suite 8G, Stamford, Connecticut 06902*

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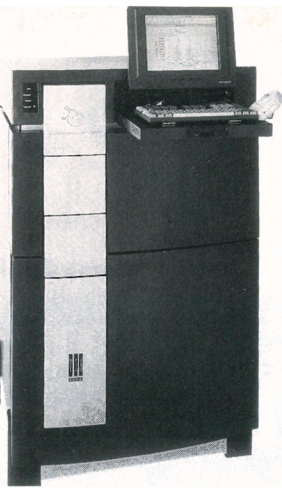
Large-Scale Friction Wear Tribometer

Micro Photonics has made available a friction wear tribometer manufactured by AMRA Technologies of Montreal. The tribometer is said to simulate wear conditions similar to those encountered in real machinery. Using the system's data acquisition and control software, one can simulate the desired load (up to 1000 pounds) and speed (1–78 feet per second) for the measurement. One can also control and record the viscosity, temperature (–30–250 °C), flow rate (up to 3 gallons per minute) and pressure (up to 17 bar) of the lubricant. The system measures and records the sample's friction coefficient and wear characteristics. Lubricant is filtered on line and the system is said to be self-aligning. Options include an on-line viscometer, an on-line flowmeter and an on-line wear-particle detector. The system is intended for tribological research as well as applications in the automotive, aviation and transportation industries. *Micro Photonics, PO Box 3129, 4949 Liberty Lane, Allentown, Pennsylvania 18106-0129*

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Small-Footprint, Transportable Secondary Ion Mass Spectrometer

Oryx Technology's TTS-1000 secondary ion mass spectrometer is designed as a transportable system that provides parts-per-billion sensitivity in trace analysis for surface studies. The system weighs 250 pounds and has a footprint of 2 feet × 2 feet. It uses a mass spectrometer to identify the atoms and molecules (from 1 to 700



atomic mass units) that are sputtered from surfaces, thin films and interfaces when bombarded with an ion beam. The TTS-1000's beam is rastered. It has an energy range of 3–5 kilovolts and a current range of 10–1000 nanoamp; the beam diameter can be adjusted from 50 to 1000 micrometers. The spectrometer's vacuum system employs a turbomolecular pump with a dry-diaphragm backing pump. The unit is controlled by means of Windows-based software installed on an embedded computer. The TTS-1000 can complete a measurement in a few minutes, we are told, and it should find applications in surface physics and quality control. The system can be used to characterize and compare semiconductor, metal, ceramic and polymer samples. *Oryx Technology, 47341 Bayside Parkway, Fremont, California 94538*

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Photodefinable Polyimide Coatings for Optoelectronics

Ultradel 9020D and 9120D from Amoco Chemicals are polyimide plastics designed for use in optical waveguides and optoelectronics. The polyimides are extremely transparent at visible and infrared wavelengths, we are told, and so are suitable for use with laser diodes, light-emitting diodes and compact disk lasers. Ultradel 9120D has a slightly higher refractive index and is used as the core material, while 9020D is used as cladding. The two materials have loss rates of 0.1–0.3 decibels per centimeter and 0.3–0.5 dB/cm, respectively. They can be fashioned into passive single and multimode waveguides,

or used as hosts for nonlinear optical chromophores in optical switches and modulators. Because the polyimides are thermally stable up to 400 °C, they can be C4 bonded, wave soldered or metallized without degrading their optical or mechanical properties. The polyimides can be used in optical data links, packaging of laser diodes and LEDs, splitters, couplers and integrated optoelectronics. *Amoco Chemicals, Mail Code C-1, PO Box 3011, Naperville, Illinois 60566-7011*

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2-Watt, Diode-pumped Visible Solid-State Lasers

The Series 240 diode-pumped solid-state visible lasers from Lightwave Electronics supply two watts of continuous-wave green light, making them suitable replacements for the larger ion lasers of similar power output used in medicine, spectroscopy and the pumping of tunable lasers. The laser head of the Series 240 includes resonator optics and intracavity doubler and closed-loop water cooling. The system runs with standard line voltages. *Lightwave Electronics, 1161 San Antonio Road, Mountain View, California 94043*

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New Literature

Thin-film materials catalog—

Mat-Vac Technology has released its 30-page 1995 thin-film materials catalog, which covers the company's selection of sputtering targets, target bonding, evaporation materials and crucible liners. *Mat-Vac Technology, PO Box 160, Flagler Beach, Florida 32136-0160*

X-ray fluorescence brochure—

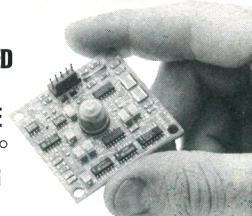
Veeco Instruments has published an 8-page full-color brochure describing their XRF-5000 series of x-ray fluorescence coating thickness and composition analyzers. *Veeco Instruments, Terminal Drive, Plainview, New York 11803*

Radio frequency special issue—

The most recent issue of National Instruments' quarterly *Instrumentation Newsletter* covers microwave virtual instrumentation, S-parameter measurements, microwave testing, microwave, rf- and telecommunications-instrument drivers. *National Instruments, 6504 Bridge Point Parkway, Austin, Texas 78730-5039*

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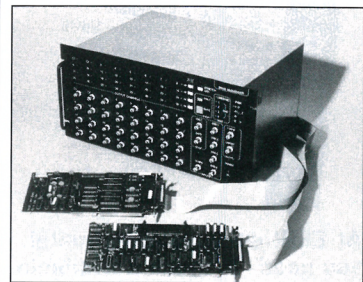
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