

## RESOURCES

A summary of new products and services  
for materials research...

**XRF Elemental Analyzers:** The table-top Eagle II  $\mu$  Probe™ from EDAX uses capillary optics to concentrate the x-ray beam size down to a 100- $\mu$ m diameter on the sample. Coupling this with a large sample chamber, the instrument provides non-destructive simultaneous element analysis in air or vacuum with a sensitivity range from PPM to 100% concentrations. The Eagle II XPL uses polycapillary x-ray optics to generate an ultrahigh-intensity x-ray beam down to  $\sim$ 40  $\mu$ m diameter on the sample. The spot size can be varied up to >100  $\mu$ m diameter on the sample.

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**Accelerator Systems:** Designed to produce a variety of highly stable ion beams for material modification and analysis, High Voltage Engineering's HVEE Singletron accelerators are now available with either an in-line or coaxial solid-state HV power supply with terminal voltages up to 5 MV. The HVEE Tandetron accelerator systems, designed to produce MeV ion beams of virtually all periodic system elements, are also available in voltage ranges up to 5 MV. Their modular design allows for customized systems using standard components, making future system extensions possible.

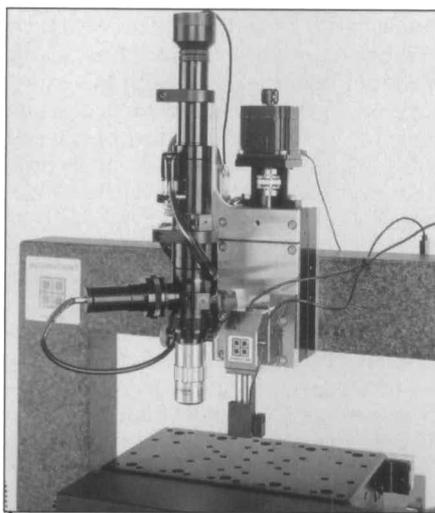
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**Digital Camera:** Polaroid's DMC Ie camera, available from Electron Microscopy Sciences, captures color images at a rate of up to 11 frames per second. The preview mode provides accurate images and allows for framing and focusing of the sample before the image is taken. Resolution is up to 1600  $\times$  1200 color lines from any standard microscope. The camera offers automatic white balance and color correction, preview zoom, thumbnail display, 12-bit linear RGB for analytical applications, and dual SCSI connectors to link several peripherals to one computer.

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**Material Analyzer:** The Prometheus from Alpha M.O.S. is designed for simple characterization of volatile compounds relative to contamination, taste, smell, and odor. The analyzer combines mass spectroscopy with multisensor array technology to allow direct reproducible analysis of samples without pretreatment or separation. It produces a fingerprint specific to any liquid, gaseous, or solid sample, and determines appropriate analytical technology for a range of QC applications.

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**Automated Nanomechanical Test Instrument:** Hysitron offers the Tribo-Indenter® with which high throughput is achieved through a combination of transducer bandwidth, stability and robust unattended execution of user-defined indentation patterns, such as line patterns across interfaces or grid patterns for statistical sampling of elastic modulus and hardness. Unique panning, image-capture, and tiling features enhance the optical field-of-view for locating microscale components on macroscale devices. Additional options available for acoustic emission testing of ultrathin overcoats and *in situ* imaging of nanoscale features.

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**Magnetic Field Transducers:** Sentron AG of Switzerland offers transducers, distributed by GMW Associates, with a Hall sensor that allows all three components of a magnetic field to be measured at a common point. The sensors have better than 0.1° alignment accuracy, an active volume of less than 0.25 mm  $\times$  0.25 mm  $\times$  0.2 mm, and a dc to 10 kHz frequency response with a full-scale differential output of  $\pm$ 10 V for each field component. Full bandwidth resolution is  $\sim$ 50  $\mu$ T; at 10 Hz, it is  $\sim$ 7  $\mu$ T.

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**Microhardness Tester:** The Wilson® Tukon® 2100 from Instron uses a closed-loop load control design, rather than weights, to facilitate operation and accuracy. The indenter and load cell are mounted on the testing axis to prevent friction problems. Drift and inconsistencies are automatically eliminated, allowing test loads to be applied with precision. Loading ranges are 50 g to 30 kg. The tester has an area large enough to have two indenters and three measuring objectives.

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### Interface for GPC/FTIR Polymer Analysis:

The Series 180 LC-Transform interface is designed for GPC/FTIR polymer analysis from LabConnections. Features include a simplified control system and a wide-bore capillary nozzle that is tolerant of high solid content solutions. The eluent from the GPC is sprayed onto a collection disc, forming a continuous track from high to low molecular weight. The disc is transferred to a transmission optics module mounted in the FTIR spectrometer and is then rotated in the spectrometer's beam, allowing its spectra to be recorded as a function of molecular weight. Software provides 3D display and analysis of the spectral data set.

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### High-Speed Steel Alloy with Carbide Performance:

Micro-Melt® Maxamet™ from Carpenter Technology bridges the hardness gap between high-speed steel and cemented carbide. The alloy has consistently achieved a room-temperature hardness of HRC 70 minimum, approaching carbide hardness of HRC 75 and above, as converted from the HRA scale. The alloy approximates the performance of carbide at less cost, and typical analysis is carbon 2.15%, chromium 5.0%, cobalt 9.0%, tungsten 13.0%, vanadium 6.0%, and the balance iron.

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### 157-nm Excimer Laser:

Lambda Physik's Photonic Hammer LPF™ fluorine laser series offers a laser wavelength of 157 nm and a quantum energy of almost 8 eV carried by 157-nm photons. Pulse energies are up to 25 mJ, repetition rates are up to 300 Hz, and output power exceeds 5 W. The laser is suitable for micromachining of materials (i.e., quartz/fused silica, Teflon/PTFE, and glass); developing optics, resists, and scanners for DUV lithography at 157 nm; micro-optic fabrication and testing; and surface analysis.

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### 8-W and 10-W Green Lasers:

Coherent's Verdi-V8 and Verdi-V10 are continuous-wave 532-nm diode-pumped solid-state green lasers that provide 8 and 10 W, respectively, in the same footprint as a 5-W system. The lasers offer large-area-exposure capabilities in interferometric applications such as nondestructive testing and holography. The systems are sealed and permanently aligned, and are pumped by two field-replaceable aluminum-free laser diode bars.

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