

## RESOURCES

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

**Ceramic-to-Metal Sealed Components:** Ceramaseal's 1996 product guide describes a line of feedthroughs, connectors, viewports, thermocouples, and other specialty components. New products include high-voltage plugs, quartz rod assemblies, bakeable crystal quartz viewports, and type "N" thermocouple connectors. The guide is available in domestic and international versions. The international version presents all dimensions and other features using the metric system.

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**Tabletop Extruder:** Atlas Electric Devices' CS194 laboratory extruder analyzes the effects of variables such as temperature, shear, mixing, and extrusion rate on the extrudability of plastics and rubbers. A screwless design incorporates a cylindrical rotor and stationary scroll for maximum material mixing and homogenization from rotational shearing against a heated header. Users can adjust rotor and header temperature, as well as rotor speed. The rotational shearing facilitates production of polymer blends or alloys.

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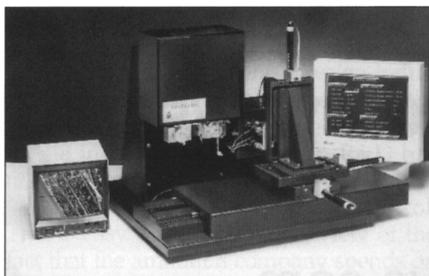
**In-Beam Thermal Processing:** The PYROSCAN/IR from CDS Analytical permits placement of the Pyroprobe heating element directly in the FTIR beam for analysis of fibers, laminates, coatings, polymers, composites, and other complex solids. The system is configured to interface most FTIR instruments and incorporates standard 24-mm windows. A separate purge flow for the cell permits analysis in a gas other than the optical purge at pressure up to 500 psig. The cell temperature is settable from ambient to 300°C. The Pyroprobe filament is independently controlled for pulse or programmed heating of the sample up to 1400°C while positioned below the beam of the FTIR.

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### Scanning Digital Color Camera:

The Micro Lumina from Electron Microscopy Sciences captures images 36 bits deep at up to 2700 × 3400 pixels in one pass. The camera produces images at approximately 30 times the resolution of video, enabling users to enlarge macroscopic and microscopic images without pixelization. Files from 100 K to a full resolution of 26 megabyte file can be created, and the camera works with a Macintosh or PC, without the need for a framegrabber. Applications include brightfield microscopy, scanning gels, and grain analysis.

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**Nano- and Micromechanical Test Systems:** With MicroPhotonics' NanoTest 600 from Micro Materials, users can test soft materials such as polymers and hard materials such as steel and PVD coatings. A dual stylus design which eliminates the need to reconfigure the instrument when changed from high (up to 20 Newtons) to low (up to 500 mN) load ranges. Samples up to 200 mm in diameter can be accommodated. Users can test for properties such as thin film hardness, elastic properties, room temperature creep, surface roughness, wear, and scratch resistance.

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**Nanomechanical Test System:** Hysitron's TriboScope™, when used in conjunction with AFM/STM microscopes, combines nanoindentation and high-resolution *in situ* imaging of nanoindentations in one system. When the material area is visible on screen, the instrument's diamond tip is positioned for precise indentation. After testing, an image and force versus displacement curve is available as soon as an AFM/STM can scan one frame. The device is suitable for testing protective coatings that are less than 20 nm thick.

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**Organic Chemicals Catalog:** Alfa® Aesar® offers a 1996–1997 Avocado Organics catalog featuring more than 7,000 new organic R&D chemicals. The catalog also contains a selection of inorganic chemicals commonly used in the synthesis of organic materials. The organics catalog complements the 1995–1996 product catalog, providing a combined range of almost 20,000 items. Bulk quantities and custom synthesis are available for most products.

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**Sphere Systems and Instrumentation:** Free 120-page catalog from Lab-sphere describes integrating sphere systems and sphere instrumentation. Included are product specifications, applications, and technical data for integrating sphere systems for lamp measurement, light source calibration, laser power measurement, and reflectance/transmittance measurement.

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**Dense Wavelength Division Multiplexer:** Lucent Technologies' 1450D multiplexer, developed by Bell Laboratories Research, improves the capacity of light-wave communications systems. Used at the receiving end of a fiber-optic transmission link, the device sorts and routes wavelength signals carried on eight information channels within one filament of optical fiber. In a recently installed broadband transmission system that includes the 1450D DWDM, each channel carries 2.5 Gbits/s of information, making the total capacity 20 Gbits/s—approximately eight times faster than most long-distance fiber-optic systems.

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**Digital Imaging and Processing Software:** EDAX International's Windows-based iDX<sup>PRIME</sup> software facilitates collection of images and x-ray maps without multiple open windows. Capabilities include spectra collection, editing, exporting, and saving of data in one package, as well as electron image and x-ray map acquisition. Image processing capabilities range from image overlays and frame operations to median and selected kernel filtering and image enhancement through histogram manipulation. Options include quantification of x-ray data for each pixel in a map and digital line scan.

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**High-Resolution Chromatography Products:** J&W Scientific's 348-page catalog features 150 new GC columns. More than 250 chromatograms are illustrated and indexed for market applications such as industrial chemicals, life science, NIOSH methods, and petroleum. Products for SPE, CE, and LC also are included with technical reference and chromatographic examples, as well as electropherograms featuring  $\mu$ PAGE and  $\mu$ SIL and  $\mu$ SIL-WAX columns. Other chromatograms demonstrate the capabilities of the LC (HPLC "gold") columns.

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**Stainless Steel Alloy:** Custom 450® Stainless from Carpenter Technology exhibits corrosion resistance similar to that of Stainless Type 304 but with three times the yield strength. Yield strength is greater than 100 ksi in the annealed condition but is easily fabricated. A single-step aging treatment provides high strength with good ductility and toughness. The stainless can be machined, hot-worked, and cold-formed in the same manner as other martensitic age-hardenable stainless steels.

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