RESOURCES

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

AES and XPS Data Reduction Software: Physical Electronics' MultiPak™ works with the company's auger electron spectroscopy and x-ray photoelectron spectroscopy software to quantitatively determine sample composition, to obtain chemical information, and to provide advanced numerical analysis capabilities. The software provides report generation including chemical separations, curve fitting, atomic concentrations, image processing, and background subtractions. It can operate with instrument control software or on a stand-alone data reduction station.
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Tap Density Technique: The PSRM 4000's nontoxic pycnometric powder from Quantachrome produces volume and density results within ≤1% agreement of the classic method of mercury immersion pycnometry. The material has a particle size distribution such that it can enter into pores or is excluded from pores similarly to liquid mercury. By combining the material with an unknown porous solid or particulate sample, the volume occupied by the sample's geometry (exterior surface enveloping the sample) is determined by using the Quantachrome AUTOTAP to measure tap density.
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Capillary Rheometer: The ACER 2000 from Rheometric Scientific can be used to test the flow of properties of materials over a range of shear rates and viscosities. These materials include polymer melts, ceramic pastes, and pharmaceutical products. Ample clearance under the die allows room for options such as extrudate swell monitor, slit flow monitor, and extrudate temperature monitor. Analysis routines include Bagley and Cogswell corrections for entrance loss and Cross-Carreau and Hershel-Bulkley models for curve fitting.
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High-Voltage Power Supplies: UltraVolt's catalog features more than 260 standard models of UL-approved power supplies. These include "A" Series bias supplies from 0–125 V through 0–30 kV, 4–30 W; "-F" Ripple Stripper Output Filter® which provides HV ripple levels of 0.01–0.0005% Vpp; "C" Series capacitor charging supplies up to 15 kV at 20–250 W; and "FL" Series Floating LV Power with isolated digital and analog controls to 15 kV. Also included are sections on accessories and connectors.
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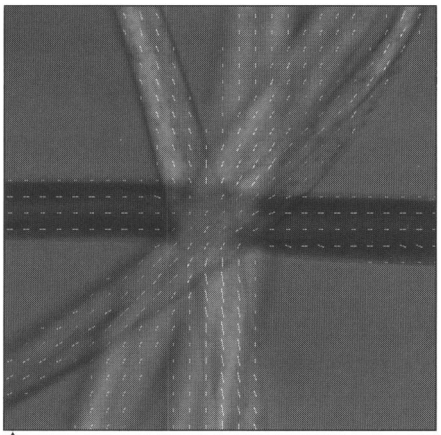

Birefringence Imaging Software: The MetaPolScope™, developed by Universal Imaging in collaboration with Cambridge Research & Instrumentation, enables users to quantitate magnitudes and angles of birefringence for optical components, plastics, metals, fibers, and petrography and chemical crystallography samples. Birefringence imaging is a contrast enhancement technique that can be used to visualize microscopic structures with high resolution, sensitivity, and speed. It converts polarized light microscopes to quantitative retardance imaging systems and is insensitive to specimen orientation. The figure shows orlon fiber in polarized light overlayed with magnitude and orientation vectors.
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Thin Film Metrology Tool: The Film Tek 2000™ from Scientific Computing International combines use of a fiber-optic based spectrophotometer with modeling software for simultaneous measurement of film thickness, index of refraction, and extinction coefficient. Most translucent single and multilayer films ranging from <150 Å to ±25 μm thick can be measured using á deep uv to NIR spectrophotometric technology. Applications include films such as SiO_x, photoresist, polysilicon, and anti-reflective layers.
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Optical Parametric Oscillator: The MOPO-HF from Spectra-Physics Lasers can measure linewidths over a typical scanning range average of <0.07cm^{-1}. Tuning with a single optics set exceeds 440–690 nm, and energies in excess of 75 mJ are available. The unit uses the alignment and power stability of BeamLok PRO series Nd:YAG lasers and a narrow linewidth master oscillator. Options include frequency doubling and extending wavelength operation into the uv from 220–450 nm.
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Metallographic Consumables Guide: Free product guide from Struers features abrasive cut-off wheels, grinding discs, and other metallographic consumables. Separate sections focus on cutting, embedding, grinding and polishing, polishing processes, and products for special applications such as hardness testing.
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Electron Beam Mask Pattern Generation System: Ultratech Stepper's UltraBeam V2000 is designed to meet the fine reticle writing requirements for integrated circuits with 0.25-μm and below design rules. The device can write masks faster than commercially viable 0.25-μm tools and provides CD uniformity and placement accuracy. When coupled with its vector architecture, high brightness source, and 500-MHz chip set, the V2000 can write on fine address structures while maintaining high throughput.
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Microminiature O-Rings and Seals: Apple Rubber Products' MicrOring™ seals are less than 1 mm in either inside diameter or cross section. The largest has an inside diameter or cross section of 1.0 mm, with the smallest down to 0.20 mm. They are available in more than 2,000 sizes. Free 10-page brochure details selection criteria and a size chart.
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PVD Materials: Tosoh offers target materials for sub-0.25-μm design rules and 300-mm wafers. The materials include copper, copper alloys, tantalum, tantalum alloys, and cobalt. Copper targets feature 6N purity with low gas content and 50-μm fine grain size. Tantalum targets deliver consistent nitrided or non-nitrided films, and tantalum silicide alloy targets result in amorphous films that provide good barrier properties. Cobalt is available in 3N and 4N5 purities.
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Material Weathering Handbook: Plastics Design Library's handbook on material weathering covers the causes, effects, and countermeasures of weathering as well as test methods, evaluations, stabilization, and biodegrading. Included are weathering data and sensitivities for many specific plastics. A free catalog is also available, featuring books and software on adhesives, additives, joining, welding, joint design, and materials compatibility.
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