

made from laser-grade single-crystal sapphire in sizes as thin as 0.4 mm and less than 25 mm o.d., and with a transmitted wavefront of $\lambda/10$ at 632.8 nm. The waveplates feature 10-5 scratch-dig surface quality and better than 1.0 arcsecond parallelism. These low-order wave plates provide $\lambda/4$ and $\lambda/2$ retardation with tolerances of better than $\lambda/300$ at 0.632 nm, $\lambda/400$ at 1060 nm, and $\lambda/1000$ at 2940 nm. Applications for the wave plates include the creation of circular from linear polarization or vice versa, reflection suppression when used with a polarizer, optical pumping and ellipsometry, electrooptic modulation, rotation of a laser's plane of polarization, and a variable-ratio beam splitter when used with a polarizing cube. *Meller Optics Inc, 120 Corliss Street, Providence, Rhode Island 02904, <http://www.melleroptics.com>*

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Wafers and Services

University Wafer maintains an inventory of a variety of materials in many grades—most often in the shape of wafers that range widely in diameters and thicknesses, including ultrathin for microelectromechanical systems applications. The wafers can be single-sided or double-sided polished. Semiconductor materials include silicon, silicon-on-insulator, germanium, silicon germanium, gallium arsenide, indium phosphide, gallium phosphide, gallium antimonide, indium arsenide, indium antimonide, gallium nitride, silicon carbide, and zinc oxide, sulfide, selenide, and telluride. There is also a stock of sapphire, pyrex, fused silica, quartz, lithium niobate, and lithium tantalate. The company can provide services such as grinding or polishing, stripping, thinning, downsizing, annealing, and reclaiming. *University Wafer, 55 Tall Oaks Drive, Suite 704, Weymouth, Massachusetts 02190, <http://www.universitywafer.com>*

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Nondestructive Testing

The Modal Shop has introduced the NDT-RAM system for nondestructive testing. The testing uses the system's resonant acoustic method, which is based on the company's SDC003 LanSharc hardware platform. That platform incorporates the LanSharc Smart digital controller, a programmable and configurable system for advanced machine process vibration applications. The NDT-RAM features



an instrumented impact hammer and a microphone for the testing of powdered metals and castings via the components' acoustic signature. This technique enables the identification of internal and external flaws due to dimensions, voids, cracks, material density bonding, and manufacturing processes. A manual version, the NDT-MAN configuration, is useful for mobile spot-checking and/or troubleshooting; an automated model, the NDT-AUTO, is also available. *The Modal Shop Inc, 3149 East Kemper Road, Cincinnati, Ohio 45241-1516, <http://www.modalshop.com>*

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Clean Process Ovens

Despatch Industries has announced two new ovens, reportedly the first clean process ovens to offer a 350°C maximum operating temperature while maintaining Class 100 conditions throughout the process cycle. The LCD Stackable Clean Process Oven and the LCD 2-14 Reach-In Clean Room Oven are useful for high-temperature polyimide and other material-curing applications in the semiconductor and electronics industries. The LCD model is available in 45- or 144-L sizes; the LCD 2-14 has a chamber volume of 396 L. Both ovens are available in air or inert atmosphere configurations and provide a recirculated airflow that is HEPA filtered. The LCD's recirculation motor is mounted on the back of the oven so that users can vertically stack up to three ovens. *Despatch Industries, 63 St. Anthony Parkway, Minneapolis, Minnesota 55418, <http://www.despatch.com>*

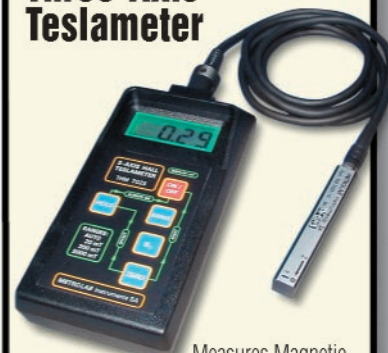
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Diffraction-Optic Dicing Tool

NanoVia LP has developed a diffraction-optic dicing tool called Micro-MultiDice for micropolymer tubing used in microelectromechanical and medical device assemblies. Using a low-power, UV, diode-pumped, solid-state YAG laser, the tool incorporates

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www.gmw.com

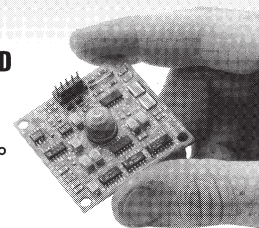
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a beam-shaping and imaging system that allows precision cutting of blind- or through-slots into medical tubing for increased tube flexibility. The tool can also produce through-holes and slots for precision drug delivery, or split sleeves for insulating winding posts used to make electrical coils for solenoid or microelectromechanical systems sensor devices. The Micro-MultiDice is offered with specialized tooling and fixtures designed to user specifications. *NanoVia LP*, 4 Delta Drive, Unit 6, Londonderry, New Hampshire 03053, <http://www.nanovia.com>

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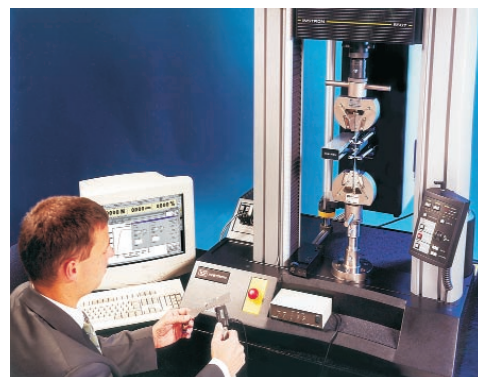
Surface Profiler

Ambios Technology has released the XP-1 Surface Profiler, designed for precision step height, thin-film stress, film thickness, and surface roughness measurements. It incorporates a force-stylus mechanism that produces stylus loads as small as 0.05 mg, well suited for measurement of soft or delicate films. The XP-1's high-resolution optical deflection sensor allows extremely repeatable step height measurements and its 170-mm diameter scan stage and 30-mm maximum sample height accommodates many different sample sizes and shapes. The surface profiler features up to 50 000 data points per scan and a total z range of 100 μm ; that range makes the profiler suitable for surface measurements from nanometers to micrometers. Options include different stylus radii, a vibration isolation system, and reference step height standards. *Ambios Technology*, 303 Potrero Street, Suite 42-303, Santa Cruz, California 95060, <http://www.ambiosotech.com>

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Mechanical Testing Systems

The model 5500 series of materials testing systems from Instron enables the verification of tension, compression, flexure, peel, tear, and friction properties of medical devices such as latex gloves, syringes, sutures, and catheters. Each system includes a load frame—available in floor, table, and single-column configurations—high-bandwidth, digital signal processing-based electronics, an advanced user interface, and accessories such as specimen grips, special purpose fixtures, and extensometers. In addition, the company supplies its Merlin software package, featuring six major



application modules for a wide range of static and cyclic testing, and Series IX Materials Testing software to provide easy test setup, automated data collection, and analysis capability. *Instron Corp*, 100 Royall Street, Canton, Massachusetts 02021, <http://www.instron.com>

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New Literature

The Goodfellow 2002–03 *CD-ROM Catalog of Metals and Materials* contains more than 40 000 items, including a comprehensive selection of pure metals, alloys, polymers, ceramics, and composites in a wide range of forms and sizes. The catalog provides search and print capabilities. *Goodfellow Corp*, 800 Lancaster Avenue, Berwyn, Pennsylvania 19312-1780, <http://www.goodfellow.com>

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Scott Specialty Gases has published an international edition of their *Specialty Gas and Equipment Reference Guide*. The 320-page volume contains technical and safety information, and a description of pure and specialty gases and liquids and of gas regulators and manifolds. *Scott Specialty Gases*, 6141 Easton Road, P.O. Box 310, Plumsteadville, Pennsylvania 18949, <http://www.scottgas.com>

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New literature from CeramOptec Industries describes products such as silica/silica, plastic-clad silica, and hard polymer-clad silica optical fibers, fused capillary tubing, and low-loss bundles and assemblies for the UV, visible, and IR transmission, sensors, and spectroscopy. *CeramOptec Industries*, 515A Shaker Road, East Longmeadow, Massachusetts 01028, <http://www.ceramoptec.com>

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