

# New Products

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Lawrence G. Rubin

## Focus on Materials

### Thin-Walled Tubes

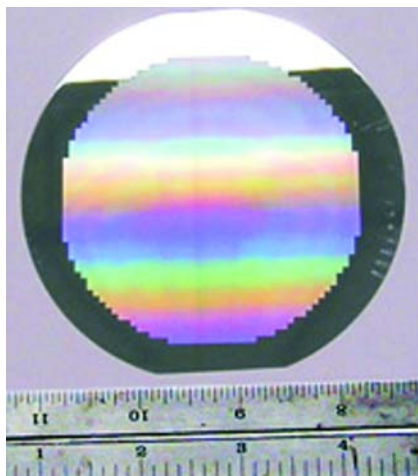
Goodfellow Corp can supply tubes of pure metal, alloy, polymer, and ceramic with walls as thin as 0.10 mm. Applications for thin-walled tubes vary widely and include medical devices, valves, fluid handling devices, electronics, and electrical and chemical insulation. Among the pure metal tubes available are platinum, gold, tantalum, palladium, molybdenum, silver, copper, nickel, iron, and aluminum. Also included are alloy tubes of nickel, silver, aluminum, iron, and palladium; tubes of fused quartz, alumina, and silicon carbide; and tubes of such polymers as polyimide and polyamide. If continuous lengths are required, that must be specified; otherwise more than one length may be supplied. Users may order from one piece up to small production quantities. Custom fabrication and finishing services are available. *Goodfellow Corp, 237 Lancaster Avenue, Suite 252, Devon, PA 19333-1594, <http://www.goodfellow.com>*  
See [www.pt.ims.ca/7375-131](http://www.pt.ims.ca/7375-131)

### Measurement of UV Curability

The TFC-9000 from UV Process Supply is a thin-film calorimeter that quantitatively measures the curing effectiveness of inks, coatings, and adhesives. Evaluating curing characteristics by using calorimetry is advantageous because measurements are not affected by cross-linking reactions and the TFC-9000 offers direct measurement of the polymerization rate. A recent test performed by the TFC-9000 involved a determination of the exothermic heat reaction from a polymerizing sample by means of a highly sensitive sensor. An analysis of the results revealed that one of three UV LED lamps used for curing (at 415-nm wavelength) produced the highest peak of heat. Also measured was the time to peak—the cure rate—so that the total number of LEDs needed to achieve a desired speed could be determined. *UV Process Supply Inc, 1229 West Cortland Street, Chicago, IL 60614-4805, <http://www.uvprocess.com>*  
See [www.pt.ims.ca/7375-132](http://www.pt.ims.ca/7375-132)

### IR Long-Pass Filters

Lake Shore Cryotronics has developed a new line of mid- and far-IR long-pass filters, scattering-type filters based on electrochemical etching of silicon. The random macroporous silicon scatters the short waves within the blocking range of the filter. The rejection edge can be adjusted from the mid-IR to wavelengths as long as 100  $\mu\text{m}$  and above. Blocking in the rejection band provides optical densities of less than 3; because a single filter is sufficient for blocking of all wavelengths below its rejection edge, multiple filtering of higher orders is not required. The all-silicon design offers excellent thermal and mechanical properties—even at cryogenic or elevated temperatures—and



the filters will not delaminate under harsh conditions. Diameters from 0.5 to 4 inches are available. *Lake Shore Cryotronics Inc, 575 McCorkle Boulevard, Westerville, OH 43082, <http://www.lakeshore.com>*  
See [www.pt.ims.ca/7375-133](http://www.pt.ims.ca/7375-133)

### Spray Particle Analyzer

Malvern Instruments has introduced the new Spraytec system, which uses the technique of laser diffraction for in-situ real-time measurements of the particle size distribution of aerosols and sprays. Incorporating just two lens systems, the Spraytec can measure the distributions over the broad range of 0.1–2000  $\mu\text{m}$  without the

need for endless lens changes. The instrument's multiple scattering analysis allows direct spray measurements, regardless of the spray concentration. With acquisition rates of up to 10 kHz (one measurement every 100  $\mu\text{s}$ ), the Spraytec provides the complete characterization of both pulsed and continuous spray events, capturing the changes in particle size observed as a function of time. Flexible triggering options ensure that measurements can be synchronized with external devices. *Malvern Instruments Inc, 10 Southville Road, Southborough, MA 01772, <http://www.malvernusa.com>*  
See [www.pt.ims.ca/7375-134](http://www.pt.ims.ca/7375-134)

### Precious-Metal-Clad Products

Anomet Products can supply precious-metal-clad products that are metallurgically bonded to a core material to meet specific high-reliability requirements for contact- and corrosion-resistance, and biocompatibility. Fabricated by hot and cold drawing, the clad products have a smooth, consistent surface finish. The cladding can be produced thinner than filled-wire or ribbon, thicker than plated wire or ribbon, and more ductile and formable than either. Functionally equivalent to solid products but much less expensive, the metal-clad products are available as wire and rod in sizes from 0.002- to 0.125-inch o.d. and as ribbon up to 1 inch wide, with 2% or more cladding thickness. Precious metals can include platinum, palladium, gold, silver, and related alloys on cores such as stainless steel, copper, niobium, nickel-iron, molybdenum, titanium, and Kovar. *Anomet Products Inc, 830 Boston Turnpike Road, Shrewsbury, MA 01545, <http://www.anometproducts.com>*  
See [www.pt.ims.ca/7375-135](http://www.pt.ims.ca/7375-135)

### Sapphire Windows

Meller Optics has announced that sapphire windows can be manufactured to customer specifications for assembly into viewports used in high-pressure and high-vacuum equipment. Those windows are capable of



withstanding pressures of up to 10 000 psi, depending on configuration; they can feature stepped edges for ease of assembly and metallization or coatings for the faces and edges. Sapphire is impervious to water, most acids, alkalis, and harsh chemicals to 1000 °C (fluorine to 300 °C) and provides a 270-nm to 4.7- $\mu$ m range of transmission. Second only to diamond in terms of hardness (Moh 9), Meller sapphire windows are available in sizes from 0.25- to 10-inch o.d. and 0.5- to 1-inch thickness. Flatness can be held to 0.5 fringes of a helium-neon laser and parallelism from 20 to 2 arcseconds. *Meller Optics Inc, 120 Corliss Street, P.O. Box 6001, Providence, RI 02940, <http://www.melleroptics.com>*  
See [www.pt.ims.ca/7375-136](http://www.pt.ims.ca/7375-136)

## Semiconductor Defect Analysis

FEI Co and PDF Solutions have jointly developed a system for automated in-fabrication defect analysis. FEI's DA 300HP is a 300-mm Dual-Beam field emission/scanning electron microscope that is critical for yield-limiting defect identification and defect- and process-marginality correlation. PDF Solutions addresses the challenge of nonvisual defects through its CVi, which provides a comprehensive set of test-chip designs that contain experiments aimed at identifying process-design yield sensitivities. The integrated system accelerates yield ramps of deep submicrometer semiconductors by speeding root-cause analysis of defects. It has an advantage compared with traditional methods of defect cross-sectioning that have introduced a bottleneck in the sequence of yield improvement activities. *FEI Company, 5350 NE Dawson Creek Drive, Hillsboro, OR 97124, <http://www.feico.com>*  
See [www.pt.ims.ca/7375-137](http://www.pt.ims.ca/7375-137)

## Optical Coatings

ExciLife-193 from Princeton Instruments/Acton is a 193-nm optical coating designed for OEM applications where high durability and long-term resistance to laser damage are important. Such applications include excimer laser vision correction systems (LASIK), immersion lithography, material processing, and wafer exposure systems. The new coatings are available in OEM quantities and can be optimized for use at incidence angles from 0 to 45 degrees. They are guaranteed better than 97% reflectance at 193 nm; the 45° design was tested with an argon fluoride 193-nm excimer laser at 300 mJ/cm<sup>2</sup> at 100 and 200 Hz for 2 million laser pulses, without damage or change in reflectivity. There were also tests to simulate immersion lithography applications. The coatings also pass MIL-SPEC adhesion, abrasion, and humidity tests. *Princeton Instruments/Acton Inc, 15 Discovery Way, Acton, MA 01720, <http://www.piaction.com>*

See [www.pt.ims.ca/7375-138](http://www.pt.ims.ca/7375-138)

## Carbon Nanotube Growth Tool

CEVP has designed a fabrication tool—NanoGrowth—to commercialize the low-temperature carbon nanotube growth process developed by the University of Surrey's Advanced Technology Institute (ATI). The new tool will deliver nanomaterial growth across areas up to 3 inches in diameter. It uses a unique thermal control system to maintain the growth substrate at room temperature, in contrast to current techniques, which can elevate substrate temperatures to 1000 °C or more. CEVP and ATI have collaborated to develop a plasma-enhanced chemical vapor deposition and vacuum process that is optimized for the growth of carbon nanotubes with such highly controlled properties as density, length, and position. The tool may also be used to grow related nanomaterials. *CEVP Ltd, Unit 24 Euro Business*



*Park, New Road, Newhaven, East Sussex BN9 0DQ UK, <http://www.cevp.co.uk>*

See [www.pt.ims.ca/7375-139](http://www.pt.ims.ca/7375-139)

## Spectroscopic Ellipsometer

HORIBA Jobin Yvon has introduced the MM-16 Spectroscopic Ellipsometer, which uses liquid crystal modulators to modulate the polarization without any mechanical movement. The instrument can collect full spectrometric ellipsometric data over the spectral range of 430–850 nm for a wide variety of materials; it can calculate in one measurement of less than 2 s the complete 16-element Mueller matrix. As a result, the ellipsometric angles  $\Psi$  and  $\Delta$  are determined with high accuracy and precision. In the visible range, the MM-16 can characterize thickness, optical constants, surface characteristics, stoichiometry, compositional uniformity, and crystallinity. The instrument extends the capabilities of a classical ellipsometer for the characterization of depolarizing and anisotropic samples. *HORIBA Jobin Yvon Inc, 3880 Park Avenue, Edison, NJ 08820-3012, <http://www.jobinyvon.com>*

See [www.pt.ims.ca/7375-140](http://www.pt.ims.ca/7375-140)

## Software for Rheology System

ATS Rheosystems' RheoExplorer version 6 is designed for flexibility in configuring and using the REOLOGICA Instruments rheology system. Available packages allow a sample to be analyzed via different rheological procedures: viscometry, oscillation under stress and strain control, creep and recovery, constant rate, yield stress, stress relaxation, fast oscillation, process control, and multi-experiment linking. As one of its many attributes, the new software enables simultaneous operation with Mettler-Toledo thermal analysis modules and the performing of new experiments while data from previous experiments is being analyzed. RheoExplorer v.6 runs under Microsoft Windows 2000 and XP; the company's Analyze program allows model fitting, graph and table customization, and cut-and-paste operation to all other Windows-based software. *ATS Rheosystems, 52 Georgetown Road, Bordentown, NJ 08505, <http://www.atsrheosystems.com>*

See [www.pt.ims.ca/7375-141](http://www.pt.ims.ca/7375-141)