new products

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of the product description.

Lawrence G. Rubin

Focus on materials

Kits of adhesives

Goodfellow Cambridge has introduced a new range of kits with adhesives for various bonding requirements. Adhesives can be considered as bridges between substrate surfaces. The bonding mechanism depends on adhesion, the bonding strength of the adhesives to the substrate, and cohesion, the strength in the adhesive. Kit one consists of a multipurpose, long-working-life substance based on an epoxy adhesive system. In the second kit, a methacrylate system is used to provide rapid-cure toughness. Kit three incorporates a polyurethane material for flexible adhesive applications. In the fourth and fifth kits, a cyanoacrylate system is the base for general purpose, fast-bonding uses; kit five is particularly recommended for porous materials. Each kit includes a technical report and a range of consumables that ensure good bonding results. *Goodfellow Cambridge Limited, Ermine Business Park, Huntingdon, Cambridgeshire PE29 6WR, UK, http://www.goodfellow.com*

See www.pt.ims.ca/16306-131

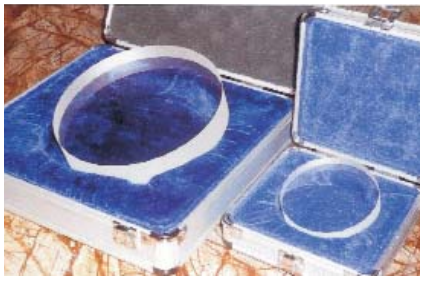
Rotational rheology platform

Kinexus from Malvern Instruments is a new rotational rheometer platform that incorporates design innovations from sample preparation and loading, to measurement setup and operation, to data analysis and reporting. The new instrument takes advantage of the company's expertise in complex materials, including particulate, macromolecular, and multiphase systems, and is available in two versions. The Kinexus pro is suitable for various routine and research measurements. The Kinexus ultra is ideal for low-torque applications, such as weakly structured low-viscosity and small-volume sample determinations. The rheometer incorporates the company's rMotion drive, which uses a dynamically optimized motor with a unique adaptive air bearing, and the rSpace intelligent software system. *Malvern Instruments Inc, 117 Flanders Road, Westborough, MA 01581-1042, http://www.malvern.com*

See www.pt.ims.ca/16306-132

Optical flats

Tower Optical Corp has announced a new line of optical flats that are generally used as a reference against which the flatness of an unknown surface can be determined; they may also be used as windows. Fused silica optical flats are offered with precision surfaces that maintain a flatness of either $\lambda/10$ or $\lambda/20$ on either one or both sides. Their diameters range from 25 mm to 200 mm, and



they have thicknesses up to 38 mm at 200 mm od. Selected sizes are available with a flatness of $\lambda/20$ for single-sided requirements. For less demanding applications, the flats can be manufactured from BK7, a borosilicate crown optical glass. Although the BK7 products are much less expensive, their flatness is specified at $\lambda/4$ or better. All flats are supplied with an interferogram and are available with aluminum storage cases (see photo). *Tower Optical Corporation, 3600 South Congress, Unit J, Boynton Beach, FL 33426, http://www.toweroptical.com*

See www.pt.ims.ca/16306-133

Adhesive for cryogenic applications

Master Bond's EP29LPSP is a two-component epoxy adhesive and sealant for cryogenic applications. It is able to withstand temperatures as low as 4 K and can resist cryogenic drops such as a cool down from room temperature to liquid helium temperatures in a 5- to 10-minute time period. EP29LPSP is optically clear, has a low viscosity, and is easy to apply. It has a tensile strength of 6500 psi and a tensile modulus of greater than 375 000 psi. When cured, it is a superior electrical insulator and a good chemical resistance profile; when curing, it has a low exotherm. The adhesive bonds well to various substrates, including metals, glass, ceramics, and many different plastics. EP29LPSP is readily pourable for potting and casting applications and is available in a thermally conductive version (EP29LPSPAO). *Master Bond Inc, 154 Hobart Street, Hackensack, NJ 07601, http://www.masterbond.com*

See www.pt.ims.ca/16306-134

Seeding material

Microsphere Technology Ltd, specialists in coating microspheres with a range of materials, is offering the Isospheres-T seeding material for use in optical flow diagnostics applications such as particle image velocimetry and laser Doppler analysis. Working in partnership with Laser & Imaging Sciences Ltd, MTL has developed and optimized the new product to deliver enhanced light scattering compared with traditional seeding materials such as silver-coated microspheres. The particles, with a density close to that of water, demonstrate optimal buoyancy characteristics, ensuring virtually all particles remain in suspension. The hollow soda lime glass borosilicate microspheres coated with titanium dioxide have a density of 80%, and their size ranges from 5 μm to 20 μm. *Microsphere Technology Ltd, Pentlands Science Park, Edinburgh EH26 OPZ, UK, http://www.microspheretechnology.com*

See www.pt.ims.ca/16306-135

Moisture and ash analysis

Arizona Instrument has developed the Computrac MAX 5000XL, a temperature-controlled balance that advances the state of the art in rapid moisture and ash analysis. The instrument features a temperature ramp control so it can be used for qualitative analyses that were previously possible only through the use of a thermogravimetric analyzer. The MAX 5000XL has a calibrated, instrument-specific, high-temperature, life-

compensation algorithm that can analyze materials with ash concentrations of as little as 0.5%. It can measure moisture or solids from 0.1% to 99.9% in minutes and can handle sample sizes from 200 mg to 100 g. The balance has an inert gas purge capability, can perform linked tests for multiple results from a single sample, and stores up to 250 user-programmable parameter settings. *Arizona Instrument LLC, 1912 West 4th Street, Tempe, AZ 85281, http://www.azic.com*

See www.pt.ims.ca/16306-136

Plastic-bonding adhesives

DYMAX Corp has introduced the 3000 series of adhesives to form high-strength, environmentally resistant bonds to plastics and other substrates, including polycarbonate, PVC, phenolic, acrylic, metal, glass, and ceramic. The adhesives offer low moisture absorption and low viscosity for easy dispensing. They are compatible with the company's BlueWave LED spot curing system and use the BlueWave's visible light spectrum to completely cure in seconds. The curing system generates light using an array of surface-mount LEDs instead of traditional metal halide or mercury bulbs; thus there are no bulbs to change, and constant intensity is provided for thousands of hours. The relatively narrow band of radiation produced by LEDs enables cooler curing temperatures. Users can adjust the intensity from 0% to 100%. *DYMAX Corporation, 318 Industrial Lane, Torrington, CT 06790, http://www.dymax.com*

See www.pt.ims.ca/16306-137

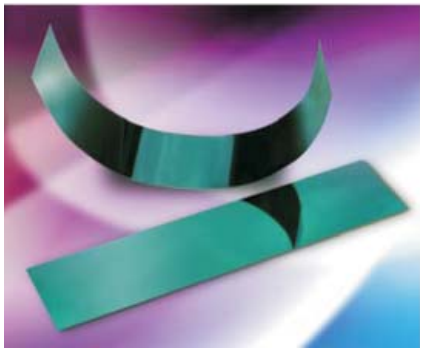
Sapphire protective optics

Sapphire protective optics from Meller Optics provide protection for cameras, telescopes, sensors, and detectors used in harsh aerospace or underwater environments. The optics can be custom made in plano-convex, plano-concave, meniscus, and dome configurations for systems used in conditions of high vacuum and high pressure and in which they might be exposed to abrasion from fast-moving particles, corrosive chemicals, and temperatures to 1000 °C. Sapphire protective optics are available in $^3/_8$-inch- to 4-inch-diameter sizes, with ±0.001-inch tolerances; can have surface finishes to 40–20 scratch-dig; and can incorporate focal lengths from 20 mm to 1000 mm and greater. The optics can have varying thicknesses, drilled holes, special edge treatments, and antireflection coatings. *Meller Optics Inc, 120 Corliss Street, Providence, RI 02904, http://www.melleroptics.com*

See www.pt.ims.ca/16306-138

UV spectral metal

Deposition Sciences has added UV Spectral Metal to its spectral metal hybrid coating family. Developed for the UV-curing and printing industries, the durable, advanced dichroic metal coating is used as the reflector behind the curing lamp. It is designed to maximize the curing wavelengths between 220 nm and 400 nm and minimize the rest of the



visible and IR spectrum from 450 nm to 2200 nm. The product is constructed using two optical coatings. First, a dark mirror stack is deposited on the metal substrate, followed by a dielectric stack deposited on top of that stack. UV Spectral Metal is coated onto highly polished standard-size aluminum sheets that are then cut and formed to specific sizes. The mirrors can be formed into precise curves and cylinders with radii as small as 25 mm. *Deposition Sciences Incorporated, 3300 Coffey Lane, Santa Rosa, CA 95403, http://www.depsci.com*

See www.pt.ims.ca/16306-139

Measurement of thin films

Oxford Instruments Nanoanalysis is offering ThinFilmID for the in situ measurement of composition and thickness of thin films in the scanning electron microscope and uses energy dispersive x-ray spectrometry. The technique offers benefits in terms of speed, optimization of methods, and ease of use. The analysis of a specific point on a sample is made possible by the spatially resolved measurements. The excellent lateral resolution extends to only a few hundred nm at low kilovoltages. ThinFilmID can measure layers as thin as 2 nm and as thick as 1000 nm and also structures with up to seven layers plus substrate with as many as 16 elements. The nondestructive method has no need for cross-sectioning structures. ThinFilmID incorporates a solvability and simulation tool for optimizing data collection. *Oxford Instruments Nanoanalysis, 300 Baker Avenue, Suite 150, Concord, MA 01742, http://www.oxford-instruments.com*

See www.pt.ims.ca/16306-140

Axial/torsion test instrument

Bose Corp has announced the ElectroForce 3510 axial/torsion test instrument, which provides exceptional fidelity, precision, and biaxial loading versatility for various mechanical fatigue and dynamic characterization of engineered materials such as reinforced plastics, composites, and elastomers. It features a dynamic force capability up to 7500 N and two torsional loading configurations that provide either 50 Nm or 70 Nm of torque; the instrument incorporates the company's proprietary linear motor subsystem. The ElectroForce 3510 can be integrated with optional hot or cold chambers; saline baths; specialty lightweight, corrosion-resistant grips; and other specimen fixtures. Other applications include durability testing of automotive and aerospace components and fatigue evaluation of consumer products. *Bose Corporation, ElectroForce Systems Group, The Mountain, Framingham, MA 01701, http://www.bose.com*

See www.pt.ims.ca/16306-141

Polyimide-coated optical fibers

CeramOptec's Optran UV and WF polyimide-coated optical fibers are useful for applications that require high-temperature stability. They can withstand temperatures of up to 400 °C, in comparison to acrylate, nylon, and Tefzel coatings that start to deteriorate between 100 °C and 250 °C. The thin jacketing in the new product is ideal for use in bundles and supports spectral transmission from 160 nm to 2500 nm. The Optran polyimide-coated fibers also feature high laser damage resistance, high core-to-clad ratio options, and prevention of cladding modes; they are made of biocompatible materials. They are radiation resistant to 10^9 rad total, can withstand vacuum environments down to 10^{-9} torr and high pressure to 10 atm, and are resistant

to fluids. *CeramOptec Industries Inc, 515A Shaker Road, East Longmeadow, MA 01028, http://www.ceramoptec.com*
See www.pt.ims.ca/16306-142

Liquid water isotope analyzer

Picarro has developed the L1102-*i* water isotope analyzer that combines simple turnkey operation with the sensitivity and precision—$\delta^{18}O$ less than 0.1%, δD less than 0.5%—better than or equal to the isotope ratio mass spectrometer systems traditionally used in stable isotope laboratories. The new instrument provides one fast simultaneous measurement of both $\delta^{18}O$ and δD directly from water samples. The heart of the L1102-*i* is the same wavelength-scanned cavity ring-down spectroscopy engine that is used in the company's carbon dioxide and water vapor isotope analyzers. The analyzer is equipped with a thermally controlled optical cavity that ensures minimal drift, is fully automatic for running large sample batches, provides data in minutes, and does not need frequent calibration. *Picarro Inc, 480 Oakmead Parkway, Sunnyvale, CA 94085, http://www.picarro.com*

See www.pt.ims.ca/16306-143

Mineralogy analyzer

The MLA 600F from FEI Co is a high-speed, automated mineralogy analyzer used in the mining industry to optimize the performance of mineral-processing operations. The instrument uses a scanning electron microscope equipped with a field-emission gun and multiple high-speed energy-dispersive x-ray spectrometers to acquire imager and composition information from a large number of samples; operators can respond more quickly to changes in feed properties. Specialized software from JKTech, FEI's partner and a mineral analysis leader, enables the measurement of characteristics such as mineral type, distribution, and grain size. The ability of the MLA 600F system to reduce sample turnaround from days to hours derives from both hardware and software enhancements. *FEI Company, 5350 NE Dawson Creek Drive, Hillsboro, OR 97124, http://www.fei.com*
See www.pt.ims.ca/16306-144

Fast chemical imaging

Renishaw has introduced StreamLine Plus Raman chemical imaging technology. Available as an option for the company's inVia Raman microscopes, the new product enables users to produce Raman images in minutes instead of the hours needed previously. It is now possible to collect in less than four minutes spatially resolved chemical information from samples as large and complex as entire pharmaceutical tablets. StreamLine Plus combines a new scanning technique, advanced optics, mechanics, and detector technologies, and it is not limited to the field of view of the microscope; users can image as large an area as the motorized stage allows. It is fast because sample movement, sample illumination, and data readout are performed simultaneously rather than in series. *Renishaw Inc, 5277 Trillium Boulevard, Hoffman Estates, IL 60192, http://www.renishaw.com*
See www.pt.ims.ca/16306-145

New literature

Alfa Aesar has published a new 334-page *High Purity Metals & Materials* catalog, which highlights the company's entire range of metals and alloys from aluminum to zirconium, featuring purities up to 99.9999%. The catalog also contains reference data such as physical properties, a periodic table, and a table of atomic weights. *Alfa Aesar, 26 Parkridge Road, Ward Hill, MA 01835, http://www.alfa.com* ■
See www.pt.ims.ca/16306-146

Letters and opinions are encouraged and should be sent by e-mail to ptletters@aip.org (using your surname as "Subject"), or by standard mail to Letters, PHYSICS TODAY, American Center for Physics, One Physics Ellipse, College Park, MD 20740-3842. Please include your name, affiliation, mailing address, e-mail address, and daytime phone number on your attachment or letter. You can also contact us online at http://www.physicstoday.org/pt/contactus.jsp. We reserve the right to edit submissions.