

NEW PRODUCTS

Focus on cryogenics, vacuum equipment, materials, and semiconductors

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 its description. Please send all new product submissions to ptpub@aip.org.

Andreas Mandelis



High-vacuum pumping station

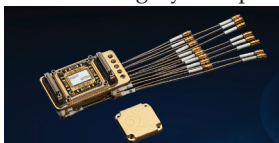
Pfeiffer Vacuum now offers its HiCube Neo turbo pumping station for demanding high and ultrahigh vacuum applications in industry and R&D. With pumping speeds ranging from 80 to 800 l/s, the HiCube Neo can be prepared for a wide

range of applications that use an array of backing pumps, such as diaphragm, rotary vane, scroll, and multistage Roots. Applications include analyzing gases, calibrating vacuum gauges, and pumping down cryostats. It can also be used in vacuum furnaces. The plug-and-play HiCube Neo is ready for immediate use, and the intuitively operated 7-inch touch screen, remote control via a Web server, and detailed data recording make it user-friendly and efficient. Its design is open to facilitate maintenance and easy access to the components. And it is versatile, so it can be used as a desktop solution or a stand-alone unit. The backing pump's energy-efficient standby mode not only reduces energy use but also operating costs. **Pfeiffer Vacuum Inc.**, 24 Trafalgar Sq, Nashua, NH 03063, www.pfeiffer-vacuum.com

Cryogenic sample holder

Quantum Machines now offers its QBoard-II cryogenic sample holder to simplify and enhance quantum experiments. Designed for low-temperature spin-qubit chips, general transport experiments, and superconducting circuits, the QBoard-II improves on the performance and usability of the original QBoard. It is more compact and features new designs for the printed circuit board, interposer, and daughterboard. An added shielding lid protects the daughterboard from radiation. The QBoard-II's plug-and-play modular design enables the easy exchange and reuse of sample chips. Support for transmission up to 8 GHz lets users conduct a wide range of experiments. The chip carrier minimizes RF losses and reduces cross talk. To preserve the integrity of experiments, all materials used in the QBoard-II are nonmagnetic. A versatile set of mounting brackets ensures its full compatibility with popular dilution refrigerators.

Quantum Machines, HaMasger St 35, Tel Aviv-Yafo, 6721407, Israel, www.quantum-machines.co



Color-changing epoxy

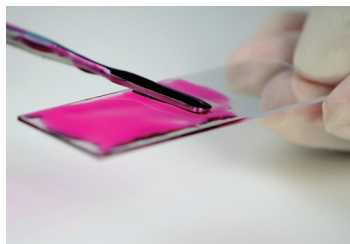
Master Bond's UV15RCL is a low-viscosity, cationic-type UV-curing system with a color-changing feature. Originally red, the material's color becomes clear once exposed to UV light and thus confirms that the light has reached the polymer. That immediate visual feedback offers processing and handling advantages over conventional systems, according to the company. Curing under UV light typically takes 30–60 s with a broad-spectrum UV lamp emitting light with a wavelength range between 320 and 365 nm. The minimum energy required is 20–40 mW/cm².

The UV15RCL features a high glass transition temperature of 90–95 °C and a service temperature range from –80 to 350 °F. It is not oxygen inhibited and provides light transmission properties and, with a refractive index of 1.517, good optical clarity. It is an excellent electrical insulator with a volume resistivity exceeding 10¹⁴ Ω-cm. Suitable for spin coating and for bonding and sealing applications, the UV15RCL adheres well to metals, glass, ceramics, and many plastics, including acrylics and polycarbonates. **Master Bond Inc.**, 154 Hobart St, Hackensack, NJ 07601, www.masterbond.com



Magnetic research system

Lake Shore Cryotronics has released the MagRS, a new magnetic research system for material characterization. The base system comes with either a 4- or 7-inch electromagnet base platform and the capability to customize it for specific experimental needs. Options can be specified for vibrating-sample magnetometer and ferromagnetic resonance measurements and for two types of Hall effect measurements for low-mobility material analysis. The AC field Hall option is two times as quiet as the company's 8400 series Hall effect measurement system. The MagRS comes standard with ExactGAP magnet pole gap indexing and GlideLOCK precision sample positioning. Also forthcoming for the MagRS is an electron transport option that integrates Lake Shore's MeasureReady M81-SSM synchronous source measure system for AC and DC field transport measurements. The M81-SSM is easily adaptable for a wide range of characterization applications. **Lake Shore Cryotronics Inc.**, 575 McCorkle Blvd, Westerville, OH 43082, www.lakeshore.com

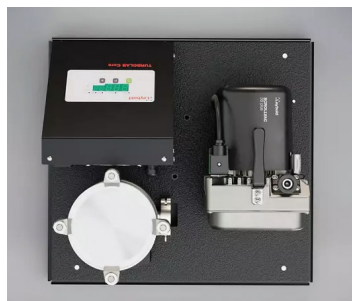


temperature range from –80 to 350 °F. It is not oxygen inhibited and provides light transmission properties and, with a refractive index of 1.517, good optical clarity. It is an excellent electrical insulator with a volume resistivity exceeding 10¹⁴ Ω-cm. Suitable for spin coating and for bonding and sealing applications, the UV15RCL adheres well to metals, glass, ceramics, and many plastics, including acrylics and polycarbonates. **Master Bond Inc.**, 154 Hobart St, Hackensack, NJ 07601, www.masterbond.com

NEW PRODUCTS

Ultralow-vibration cryostat

Attocube has launched its attoDRY2200 closed-cycle cryostat for ultrasensitive scanning probe microscopy measurements. It can be used in state-of-the-art research in 2D materials, domain walls, multiferroics, superconducting samples with nanostructures, and more. The attoDRY2200 is equipped with a proprietary ultraefficient vibration-damping system, a choice of vector magnets, and automated variable temperature control. It offers a fully automated cooldown from 300 K to a base temperature of 1.65 K without requiring liquid helium. Complemented by an automatic magnetic field control, the superconducting vector magnets make the maximum magnetic field easily accessible over the whole temperature range. Efficient cooling performance via exchange-gas coupling provides initial system cooldown in roughly 15–20 h; the turnaround time during sample exchange is about 5–8 h. The top-loading design enables fast, easy sample exchange and offers a generous sample space of 49.7 mm in diameter. The integrated touch screen allows the desired magnetic field and temperature to be set without using a PC. **Attocube systems AG**, Eglfinger Weg 2, 85540 Haar, Germany, www.attocube.com



Environmentally friendly vacuum station

Leybold has improved its TurboLab Core range of entry-level vacuum stations designed for scientific and industrial settings. Combining a primary pump, turbomolecular pump, and controller into one unit, the series especially suits smaller-scale academic research laboratories. The TurboLab Core 90i and 250i can now be supplied with the company's recently introduced ScrollVac 3S as the backing pump. Along with a pumping speed increase from 1.4 to 3 m³/h, the ScrollVac 3S delivers better ultimate pressure of 0.1 mbar in the same footprint. That and the oil-free, scroll-vacuum technology that the ScrollVac 3S employs demonstrate the company's commitment to environmentally friendly, clean, and carbon-neutral products. With fully replaceable parts and an integrated inlet valve to provide extra protection in the

event of a power failure, the new variant is long lasting and reliable and requires fewer maintenance intervals. **Leybold GmbH**, Bonner Str 498, 50968 Cologne, Germany, www.leybold.com

Spectroscopic ellipsometer for 4- to 8-inch wafers

With the release of its μ SE-2300 microspot spectroscopic ellipsometer, Semilab expands its SE series for metrology in semiconductor device and wafer manufacturing. Featuring a compact, stable platform arrangement with a newly designed metrology head, the μ SE-2300 provides high accuracy and improved throughput. It can be combined with a spectroscopic reflectometer and laser ellipsometry in the same system. Various extensions, such as bow and warp metrology, global stress calculation, and model-based dimension (MBD) options, are available. The highly configurable platform can be adapted to support several sample types, including wrapped, thick, or transparent wafers. The versatile μ SE-2300 is suitable for various applications, such as thin-film dielectric and semiconductor layer stacks on polished surface substrates. Additional industrial applications involve pattern-capable spectroscopic ellipsometry on high-performance silicon CMOS and III–V devices after deposition and etching processes organic LED displays, and More-than-Moore configurations. **Semilab USA LLC**, 12415 Telecom Dr, Tampa, FL 33637, <https://semilab.com>



High-precision metrology in the mid-IR

The Mid-IR Comb, the latest development in Menlo Systems' family of optical frequency combs, extends precision metrology into the 3–14 μ m mid-IR spectral range. That molecular fingerprint signature region allows for unambiguous characterization and provides insights into the chemical composition and reaction kinetics of organic and inorganic materials. The Mid-IR Comb enables highly sensitive and accurate measurements, such as with Fourier-transform mid-IR spectroscopy, nano-FTIR spectroscopy, mid-IR dual-comb spectroscopy, and frequency-locking of mid-IR quantum cascade lasers. The turn-key, all-in-one system is based on Menlo Systems' figure-9 fiber mode-locked oscillator technology and difference frequency generation. The resulting optical frequency comb, free of carrier-envelope offset (CEO), can cover the spectral ranges of 3–5, 5–8, and 8–14 μ m and provides up to 200 mW of average optical power within a large spectral bandwidth of 50–300 cm⁻¹. The Mid-IR Comb can also be fully CEO-stabilized in order to obtain comb lines that feature hertz-level linewidths in the mid-IR. **Menlo Systems Inc**, 6205 Lookout Rd, Unit D, Boulder, CO 80301, www.menlosystems.com

