

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

### **Closed-Cycle Gas-Throttle Refrigeration**

**System:** APD Cryogenics' CRYOTIGER™ can cool devices for x-ray detectors, Fourier transform spectroscopy, chemical detection, and superconductivity. The system provides continuous cooling and maintains temperatures in the 80–120 K range without liquid nitrogen cooling. It consists of a closed-cycle cryostat, an air-cooled compressor, and two 10-ft. gas-transfer lines. The system contains no moving parts, and self-sealing refrigerant couplings facilitate connection of the feed and return gas lines.

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### **Monocrystalline Silicon-on-Quartz**

**Substrates:** SOITEC's SIMOX (Separation by IMplanted OXYgen) process has created thin monocrystalline film of silicon-on-quartz wafers. The monocrystalline film is formed on a quartz wafer via a process that results in a 2000 Å film with a thickness uniformity of more than 50 Å. Electrical behavior may be five to ten times better on pure monocrystal than on annealed polycrystal. The material is available in 100-nm thickness, with future wafer size extension up to 200 mm. Applications include thin-film transistor LCDs, CCD detectors, and HDTV projection systems.

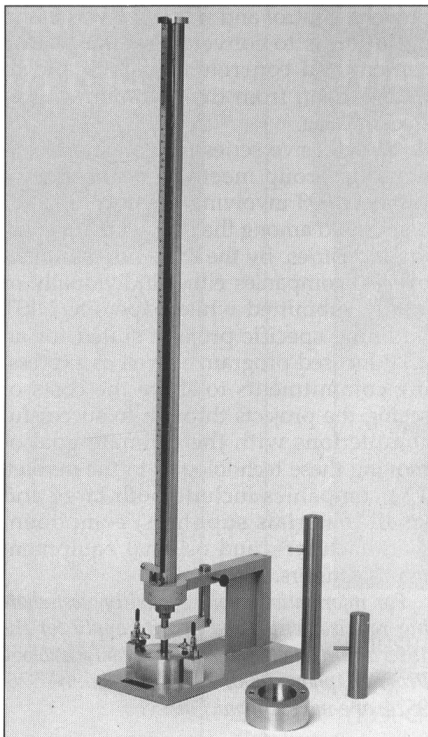
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**Chemical Catalog:** Johnson Matthey's 1995–96 Alfa Aesar catalog features the traditional Alfa Aesar lines of technical grade to high-purity inorganics, organics, pure elements, and alloys; analytical standards; platinum labware; glassware; ceramics; solvents; and catalysts. Merged with these items are more than 1,200 new compounds and pure elements, indicators, buffer solutions, graphite furnace AA tubes, measuring devices, aluminum and copper beakers, books, and other chemicals-related products.

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**Bottom-Loading Furnace:** Keith's Fast-Heat 1700°C furnace is designed for firing oxide ceramics and electroceramic devices. The unit, which is available in an elevator hearth design or with small cars, enables users to handle production in small lots while achieving high yields. The system divides the load into small sections with elements mounted between stacks of setters. The unit features programmable temperature control, along with atmosphere control of inert or reducing gases, dew point, and multiple atmospheres. An optional computer interface is also available.

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▲ **Falling Weight Impact Tester:** Custom Scientific Instruments' CS-126G can determine the impact resistance of plastics, laminates, paints, plating, siding, etc. When a weight is dropped onto an impactor resting on the specimen, the amount and height of the weight are adjusted until half of the specimens fail. Impact resistance is determined by the energy required to cause the sample to fail half of the time. The standard unit contains a set of 2-, 4-, and 8-lb weights; three specimen holders; a safety shield; and a 42-in. drop column with English and metric units. Optional weights and impactors are available, as well as a cold chamber for testing specimens at temperatures to  $-50^{\circ}\text{C}$ .

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**Hinged Test-Head Manipulator:** Electro-glas' hinged test-head manipulator for its Horizon 4060X® and 4080X® wafer probers provides accurate, repeatable docking of the test head to the wafer prober. Controllable 180° rotation provides counter-balanced motorized motion to support test heads up to 500 lbs with minimal operator intervention. The unit has a footprint of 25.5 in.  $\times$  55 in.  $\times$  45 in. The integrity of the spring pins is protected by maintaining a shallow contact rotation angle for the final inch of docking travel. The device may be retrofitted to existing 4060X and 4080X systems.

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**Advanced Waveform Creation:** LeCroy's 16-page application note on arbitrary waveform generators is a series of two-page answers to questions posed by engineers, and covers basic through advanced subjects. Topics include creating jitter tests to specification, simulating phase-encoded data communications signals, generating digital pulse trains with varying duty cycles, and bit jitter tolerance testing (including nonlinear bit shifts). One section explains how to use live sub-sample waveform control for precision waveform time shifts.

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### **Thermal Stimulated Current/Relaxation**

**Map Analysis:** Solomat's TSC/RMA spectrometer, a thermal analyzer and rheological instrument, can probe local motions and determine their interactive cooperation, which dictates the macroscopic viscosity. A high voltage generates a stored charge in the sample at high temperature. By removing the voltage after sample quenching and then reading the current, users can study a material's molecular structure. When related to physical properties, TSC/RMA can predict processing behavior and product performance.

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**High-Resistance Electrometer:** Keithley's Model 6517 6-1/2-digit electrometer has a low current input amplifier that supports an input bias current of  $<2\text{ fA}$  with 0.75 fA peak-to-peak noise and  $<20\text{ }\mu\text{V}$  burden voltage on the lowest range. The input impedance for voltage and resistance measurements is 200 T $\Omega$ , and the built-in  $\pm 1\text{ kV}$  voltage source with a sweep capability facilitates performance of leakage, breakdown, and volume and surface resistivity measurements on insulating materials. The unit offers current measurements of 100 aA to 20 mA, voltage measurements of 1  $\mu\text{V}$  to 200 V, resistance measurements of 100 m $\Omega$  to 10<sup>16</sup>  $\Omega$ , and charge measurements of 1 fC to 2  $\mu\text{C}$ .

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### **Two-Slider Reciprocating Action**

**Positioners:** Velmex UniSlide® Assemblies are offered with dual sliders for applications that require two objects to share a common axis of motion. When a left and right thread lead screw is specified, the reciprocating action moves the objects together or apart. Guide forks can be mounted to the unit to ensure that roll goods of different widths are centered precisely. Assemblies are manual or motor driven, and independently driven lead screws are available.

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