

## RESOURCES

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

### Silicon-Matched High-Temperature Glass Substrate:

Silcomat from GEC Alstom is a glass that has a coefficient of thermal expansion matched to that of silicon and is stable at high temperatures. The material is suitable in photovoltaic arrays and offers resistance to conditions used for their growth by deposition techniques at temperatures up to 1100°C. The material is a candidate for production of high-efficiency thin-film transistor displays as used in silicon-on-insulator devices.

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### Thin Film Coatings:

Guernsey Coating Laboratories offers a line of standard and custom thin-film coatings. Included are high-reflector coatings that reflect up to 99.995%, with scatter as low as 50 ppm; neutral density filters that are spectrally neutral from 400 to 1200 nm; protected aluminum and silver mirror coatings; single-layer MgF<sub>2</sub> coatings; broadband antireflection coatings; and metallic and dielectric beamsplitter coatings.

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### Test and Measurement Catalog:

Hewlett Packard's 1997 catalog contains 656 pages of information on test equipment, general-purpose instruments such as oscilloscopes, RF and microwave instruments, component test instruments, light-wave instruments, wireless communications instruments, controllers, software, and accessories. Free publications, application notes, and test and measurement catalogs and directories are also listed.

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### Instrumentation Catalog:

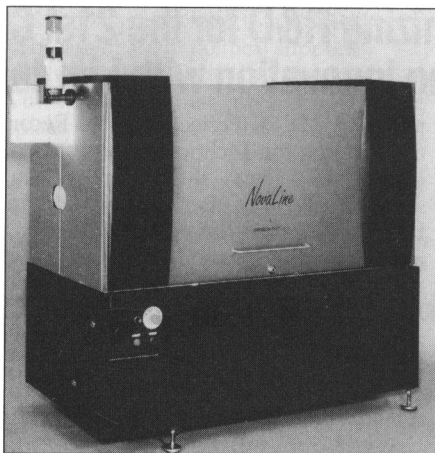
Free 696-page catalog from National Instruments features more than 500 software and hardware products for use in development of integrated, PC-based instrumentation systems for test and measurement and industrial automation. Also included are tutorials on data acquisition, GPIB, and VXI; product line overviews; and selection guides.

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### NASA Technological Resources on CD-ROM:

Video-based CD-ROM from National Technology Transfer Center in collaboration with the NASA Commercial Technology Team contains 300 MB of searchable information from NASA's Commercial Technology Network. Included are abstracts of 19,500 technologies, 11,500 *Tech Briefs* articles, 3,500 patents and licenses, 15,000 contracts including SBIRs, and 600 success stories.

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### Excimer Laser for 248-nm Lithography:

NovaLine™ LITHO from Lambda Physik is an excimer laser suitable for sub-0.25 μm lithography. The laser features 1 kHz repetition rate, <0.8 pm bandwidth, and 10 W stabilized output power (optional <250 pm and 15 W). A solid-state halogen generator eliminates storage and handling of noxious gases, and the polarization coupled resonator design improves laser efficiency.

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### Chemical Mechanical Planarization Cleaning Tool:

OnTrak Systems' SYNERGY™ can perform mechanical brush scrubbing and *in situ* chemical etching simultaneously in one system. The one-step approach enables the tool to deliver high throughput of 55+ wafers per hour for CMP cleaning applications such as interlevel and intermetal dielectric, tungsten, and shallow trench isolation. The system delivers chemicals such as HF and NH<sub>4</sub>OH directly to the brush box and features through-the-brush chemical delivery to the wafer surface. Brush pressure is programmable, and 6- and 8-in. (15.24- and 20.32-cm) wafers can be processed.

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### Nanometer Scale Imaging of Liquids and Weakly Bound Materials:

Ernest Orlando Lawrence Berkeley National Laboratory has developed a scanning polarization force microscope that is a new application of noncontact AFM used to image liquids and weakly bound materials at nanometer scales. The instrument measures and maps the electric field from electrostatic charges in materials and the molecular and atomic polarization fields induced in the materials. The method minimizes the interaction between the microscope tip and the sample surface.

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**Laser Safety Software:** The Laser Hazard Evaluator program from the Laser Institute of America enables users to check safety calculations by seeing the interaction between the laser beam, the eye, a protective eyewear option, and skin surfaces. The software performs repeated calculations of beam irradiance, maximum permissible exposure, necessary optical density, laser classification, and nominal ocular hazard distance. Users can adjust the parameters until safety conditions are met.

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### CVD Deposition Technique:

MV-Systems' multichamber Hot Wire CVD systems can be used for amorphous silicon solar cell development. The technique offers the potential of high deposition rates, the ability to produce polycrystalline films, and low hydrogen concentrations in amorphous silicon solar cells. The cluster tool design allows for retrofits of seven PECVD/sputtering/hot wire CVD process chambers stationed around a central circular evacuated isolation and transfer zone. Deposition of multilayers is possible in any sequence.

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**Cleanroom Standard:** The Institute of Environmental Sciences offers *Cleanrooms and Associated Controlled Environments—Part 1: Classification of Airborne Particulates*, the first Draft International Standard produced by ISO Technical Committee 209. Descriptors include cleanrooms, air pollution, particulate air pollutant, and classifications. The standard is the first of 12 documents on global cleanroom standards. Future standards will include biocontamination, metrology, cleanroom design, and minienvironments.

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### Surface Analysis by Photoelectron and Auger Spectroscopies:

ESCAPROBE from Omicron is designed for optimum ESCA performance and is configured for routine XPS and AES operation. UPS and depth profiling techniques, as well as sample preparation facilities and sample heating and cooling can be selected. The sample entry system with separate turbopump allows up to four samples to be simultaneously introduced. A 180° hemispherical analyzer improves transmission and offer high count rates for sensitive surface analysis. Software comprises full spectrometer control, along with XPS and AES databases.

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