

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

**DOE EMaCC Annual Report:** The 440-page FY1994 Annual Technical Report from the Department of Energy's Energy Materials Coordinating Committee, contains brief summaries of the materials research projects supported by DOE, including the work funded by Energy Efficiency and Renewable Energy, Energy Research, Environmental Management, Fossil Energy, Nuclear Energy, Defense Programs, and Civilian Radioactive Waste Management. The report summarizes the goals and objectives of each DOE office and provides an abstract for each project that includes principal investigator and institution, budget, and DOE contact. The projects are also referenced by keywords in the index.

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### Surface Brillouin Scattering System:

The BriSc from Bede Scientific is an SBS system in a cabinet-based instrument with an 850-mm square footprint. Samples are horizontally mounted, and the instrument is air cooled. All optical components are combined in one assembly and mounted vertically on a curved slideway above the sample. A frequency-doubled Nd:YAG laser provides single-mode light at 532 nm. A multipass servo-controlled Fabry-Perot interferometer ensures stability and immunity to vibration.

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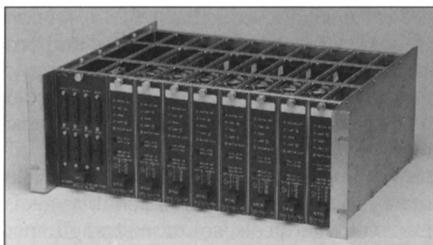
### PC-Based Imaging Systems:

The Ni1000, developed by Nestor and Intel and available from Pryor Knowledge Systems, includes an integrated 16-bit ISA board powered by a recognition accelerator chip that executes up to 2.3 billion operations per second. Featured are a Windows program for training, testing, and classifying user-defined datasets in a batch environment. Aided by an intuitive GUI, users can create pattern recognition memories. Users then can optimize the memories stored on chip by developing and optimizing neural networks using P-RCE and PNN algorithms, and by defining and modifying the datasets presented to the system. A complete assembler and debugging environment is provided.

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**Fiberoptic Circulator:** E-TEK Dynamics' SPFC single polarization maintaining fiberoptic circulator has 60 dB isolation at either 1310 or 1550 nm. The device transmits an incoming signal from port 1 to port 2, and another from port 2 to port 3. Features include high isolation of >60 dB, low insertion loss of 1.0 dB, low crosstalk of -50 dB, and high polarization extinction ratio of 25 dB. Applications include laser diode optical amplifiers, signal routing, WDM networks, and optical transceivers.

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### Modular Control for Stepping Motors:

With the Step-Pak from Advanced Control Systems, users can mount up to eight motor-driven modules in a 19-in. (48.3 cm) rack, with a ninth position available for an indexer or interconnect module. Unipolar bi-level drive modules provide smooth motor shaft rotation, relatively free from torsional pulsations induced by chopping-type drives in full- and half-step modes. Modules include microstepping, bipolar, and five-phase motor drivers.

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**Materials Property Database:** ESM Software's MAPP, a graphic interface to the ASM International<sup>®</sup> Mat.DB<sup>®</sup> engineering materials properties databases, provides access to mechanical, physical, and chemical properties of more than 6,000 commercial alloys and polymers. From either a Windows or Macintosh platform, a graphic interface displays materials properties in seconds. Users can search for alloys or polymers by name, designation, property values, chemistry, or application. Users also can add new materials, and either supplement or edit data for materials in the Mat.DB databases.

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**Electric Hot Air Blower:** The Thermo-blower<sup>™</sup> from Micropyretics Heaters International provides temperatures up to 1100°C and is available in 12, 120, and 220V models. A typical model can heat over 1020 L/min of air to 200°C or be user-adjusted to heat over 113 L/min of air to 1000°C. Applications include drying refractories, sealing plastics, curing ceramics, and retrofit of gas ovens. The blower also may be used as a regenerative incinerator for air cleaning and burn out furnaces.

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**Metals and Materials Catalog:** Free 560-page catalog from Goodfellow offers a selection of research metals and materials that are available in small quantities. Almost 4,000 items are listed, with technical specifications and comparative data. Featured are pure metals, alloys, polymers, ceramics, composites, and honeycombs in various forms and sizes. Custom services are available.

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**Aerosol Refractory Paints:** Alfa Aesar offers refractory coatings for applications in which nonadhesive, barrier, molten-metal resistant coatings are needed, whether the substrates are ceramic, graphite, or metal. Used in areas where abrasion resistance is not required, the coatings are available for yttrium oxide, aluminum oxide, boron nitride, titanium nitride, and zirconium oxide. Applications include coating high-temperature containers or structural components, glassmaking, metal forming, protective coatings, lubricants, welding, and sintering.

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**Sealed CO<sub>2</sub> Lasers:** Geolase<sup>™</sup> sealed, DC-excited CO<sub>2</sub> lasers from MerchanteK<sup>™</sup> Electro-Optics are suitable for marking, drilling, perforating, welding, and ablating. Available with 12 or 30 W of output power, the lasers yield uniform and repeatable results as well as output stability of 5%. The units offer continuous wave output and superpulsing up to 2 kHz, enabling deep penetration and small spot sizes for ablating materials. They also can be defocused for surface treatment tasks. The internal gas reserve for the laser heads eliminates the need for an external gas supply.

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**Mixer Torque Rheometer:** The Caleva MTR from GEI Processing can characterize wet granulation in a laboratory or plant, and facilitates the availability of rheometry data for scale-up studies, formulation development, and quality control. The MTR measures binder/excipient interaction, the effect of variable mixing times, and sample-to-sample excipient differences from a 15- to 30-g sample. The instrument is suitable for granulation process investigations, binder-substrate interaction studies, and process control in pharmaceuticals, cosmetics, agricultural, and general manufacturing.

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### Nondestructive Analytical Technique:

The PHI 680 Scanning Auger Nanoprobe<sup>™</sup> from Physical Electronics can be used to identify and quantify chemical elements in the top few atomic layers of a surface or exposed interface. Users can analyze materials such as silicon, steel, and ceramics without the time-consuming and low-yield sample preparation usually required. The instrument features a cylindrical mirror analyzer with a multichannel detector, Schottky field emission electron source, a motorized five-axis stage, and SED imaging. Semiconductor applications also can be utilized.

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