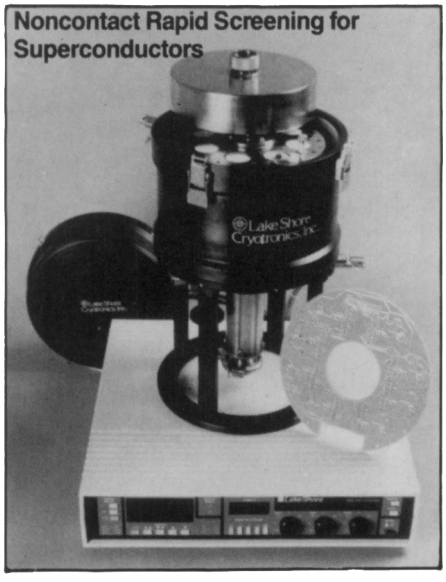
A summary of new products and services for materials research...



Noncontact Rapid Screening for Superconductors: Using technology developed at Los Alamos National Laboratory, this noncontact rapid screening system can characterize eight superconductor samples at a time. Unlike conventional four-lead dc measurement techniques, which tend to modify the surface of a superconductor, no electrical contacts are required. The Model 7500 operates efficiently through a temperature range from 10 K to 320 K, with controllability to within ±0.1 K. For eight-sample measurements, the system will accommodate sample sizes up to 0.125 inches thick and a diameter of 1 inch. Operating frequency is 20 MHz; data resolution is 0.1 K (temperature) and 50Hz (frequency). The system includes a high-efficiency, continuous flow cryostat with eight eddy current sensing coils mounted on the cold plate with clamping hardware and associated electronics, temperature controller and silicon diode sensors, operation software, and IBM PC-XT compatible Hewlett-Packard Vectra series CS personal computer. Lake Shore Cryotronics, 64 East Walnut Street, Westerville, OH 43081; (614) 891-2243.

Containerless Processing for Industry: New company is making available to industry containerless processing and noncontact measurement services using technology derived from NASA space experiments and other related work. Containerless processing, which suspends liquid or solid materials, freeing them from contact with any container and enabling processing in a stable ultraclean environment, uses several methods, including acoustic, electromagnetic and aerodynamic levitation. Substances can be heated, melted, processed, cooled or supercooled, and precipitated from solution under well-controlled conditions. New proprietary materials (metals, alloys, ceramics, glasses, semiconductors, superconductors) can be developed and processed. CPInc will specialize in ground-based processing. Future services will offer access to ground-based NASA and commercial facilities that simulate low-gravity environments. Technology bulletins describing the containerless processing and noncontact measurement technologies are available. CPInc, 3453 Commercial Avenue, Northbrook, IL 60062; (312) 272-1772.

Excimer Laser Processing/Systems Design Center: Laser technology and materials processing center specializes in the industrial applications of excimer lasers, offering applications testing, high volume processing, and custom engineering design of excimer laser subsystems and accessories. Processing abilities span micro-drilling (glass, ceramics, metals, plastics); micro-machining (thin ceramics and hard dialectrics, sapphires, glass, diamond); selective material removal (kapton, polyimides, flex circuits); heatless marking, micro-marking, and photochemical color changing. The company promises fast turnaround service on both custom and high-volume processing work. Resonetics Inc., 4 Bud Way, Bldg. 21, Nashua, NH 03063; (603) 886-6772.

Sight Glass for High Temperature Furnaces: Sight glass permits thermal-distortion-free viewing of a heated cavity. The window minimizes the thermal distortions associated with previous sight ports by providing a concentrated area of heat at the cavity's entrance to reduce convective and radiative heat transfer from within the heated cavity. Originally developed for use with the company's crystal growth system and as part of its ongoing research in the intelligent processing of materials, the window has many applications with other high temperature systems. Mellen Company, Inc., Route #5, Penacook, NH 03303; (800) 633-6115 and (603) 648-2121 NH only.

Electron Multiplier: New model electron multiplier gives higher sensitivity to the Hewlett-Packard MSD 5970 Mass Selective Detector and the HP 5990 series of instruments. Improvements include a modified gain curve which allows convenient use at voltages in excess of the auto-tuned voltage, a larger input aperture, and greater ion collection efficiency. Each of these changes leads to improved instrument sensitivity. The AEM 2101H also features replaceable dynodes, which allows aged multipliers to be inexpensively restored. ETP Pty. Limited, 31 Hope Street, Ermington, New South Wales 2115, Australia; (61)(2) 858-5122.

Multilevel X-Ray Microanalysis System: Series II system offers three levels of operation, each configured to match the instrumentation needs of a broad range of laboratories. On the quantitative level, accurate peak identification allows users to quickly locate, identify, and quantitate (either with or without standards) the elements in samples. The micro-imaging level totally integrates digital imaging with quantitative analysis and includes the abilities to perform digital image acquisition and interactive SEM beam positioning, produce digital x-ray maps and line scans, and perform unattended multipoint quantitative analysis as well as host of other functions. This level includes all the other capabilities of the quantitative level system. The integrated imaging level provides high performance imaging hardware and powerful imaging applications software all under control of one keyboard. Images can be acquired, stored and analyzed using either electron microscope or video camera inputs. Also offered is electron microscope automation, which allows the system to control and automate stage positioning, WDS spectrometers, beam positioning, and beam current monitoring. Tracor Northern, 2551 W. Beltline Highway, Middleton, WI 53562-2697; (608) 831-6511.

Synthetic Diffusion-Pump Fluid: Synthetic (arylalkyldiphenylether) diffusion-pump fluid combines the best properties of silicones and polyphenylethers. Invoil 46 was developed to accommodate the performance requirements of such applications as CRT evacuation, optical coatings, evaporation and sputtering, vacuum metallurgy, leak detection, and mass spectrometry. It offers excellent thermal stability and radiation resistance and can attain untrapped ultimate pressures of near 10^{-8} torr. Its ability to recover from accidental exposure to atmosphere during normal operation is comparable to that of silicone diffusion-pump fluids. In addition, deposits formed in the event of ionization or fluid breakdown are conductive and do not accumulate static charges. Nontoxic, noncorrosive and reclaimable, Invoil 46 is compatible with Buna-N, neoprene and Viton elastomers, and miscible with petroleum-based oils, Freon and aromatic solvents. Inland Vacuum Industries Division of IVAX Industries, 35 Howard Avenue, Churchville, NY 14428; (716) 293-3330. □

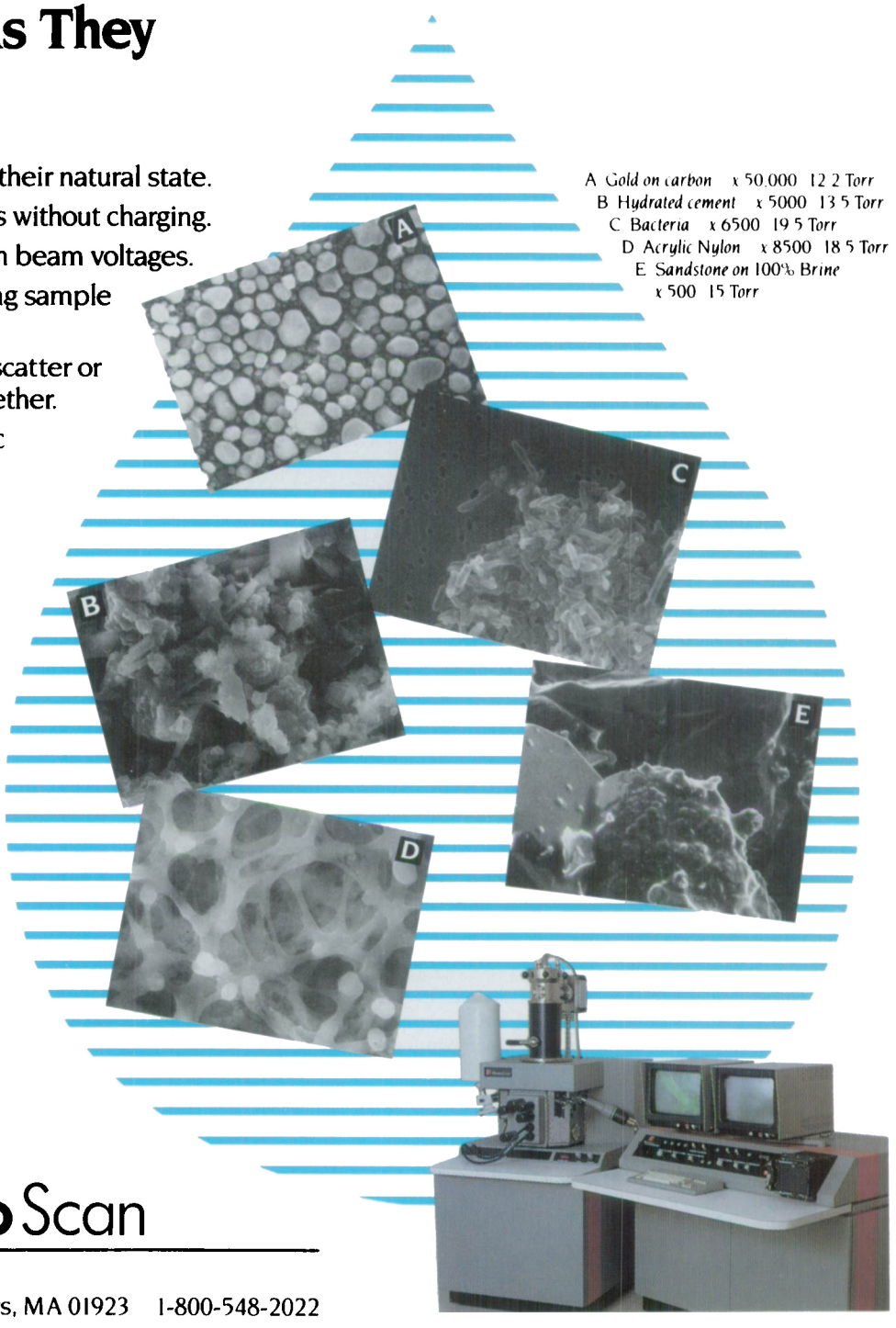
World's only Environmental Scanning Electron Microscope...

Put Your Company's Research, Development and Quality Assurance on the Leading Edge of Digital Scanning Microimaging Technology

See Things As They Really Are

- Observe wet samples in their natural state.
- Run uncoated specimens without charging.
- Analyze insulators at high beam voltages.
- Eliminate time-consuming sample prep.
- Choose secondary, backscatter or x-ray, or use all three together.
- View and record dynamic processes in real time.
- Achieve 50 Å resolution at 15 Torr
- Operate with chamber pressures up to 50 Torr with the exclusive ElectroScan Secondary Detector (ESD).

For your demonstration or information on the ESEM, contact ElectroScan.



A *Gold on carbon* x 50,000 12 2 Torr
B *Hydrated cement* x 5000 13 5 Torr
C *Bacteria* x 6500 19 5 Torr
D *Acrylic Nylon* x 8500 18 5 Torr
E *Sandstone on* 100% *Brine* x 500 15 Torr

ElectroScan

ElectroScan Corporation
100 Rosewood Drive, Danvers, MA 01923 1-800-548-2022

https://doi.org/10.1557/S0883769400061170 Published online by Cambridge University Press

Creative Science II...

Your Imagination and Our Superconductor MBE Systems

Magnet levitating over thin film superconductor at LN_2 temperature

HTS - the world's most advanced UHV deposition system

VG Special Systems' HTS models are adaptable molecular beam epitaxial (MBE) systems for growing high or low Tc superconductors. Up to three e-beam evaporation and three Knudsen effusion sources, operating simultaneously, can deposit elemental metals, oxides or fluorides on substrates sized from ½″ to 4″ diam. Each source has a 40cc volume, permitting long runs between recharging.

The chamber has a guaranteed ultimate vacuum of less than 5×10^{-11} torr. Either turbo or diffusion pumping is available with Ti sublimation assistance. Two internal cryo-shields, water and LN_2, partition the source and substrate zones.

Deposition rates are controlled by quartz crystal sensors or VG's unique **molecular beam analyzer**. . .a quadrupole mass spectrometer which controls the flux of every characteristic mass species in the co-deposition stream. Rates as low as 1 to 2 Å sec^{-1} are possible with the high speed feedback to the source power supplies. The exclusive VG Special Systems fast-acting shutters, initiated by the quadrupole sensor, permit abrupt composition changes to be made.

The versatile HTS systems can be specified to include:

- — sample entry lock
- — pre-deposition surface preparation
- — mass flow controlled injection of 0_2, 0^+, $0^\bullet$
- — post-deposition oxidation* and annealing to 900°C
- — precision manipulator with sample heating/cooling provisions
- — in-situ surface analysis methods: RHEED, laser reflection elipsometry, Auger, reflectometry, resistivity, and Raman.

** with VG's exclusive oxidation-proof furnace.*

Unique design of high stability Knudsen cell

Please visit Booth No. 601-602 at the MRS Show in Boston, November 28-30, 1989.

HTS systems are manufactured by **VG Special Systems** and represented in USA by:

Kurt J. Lesker Company

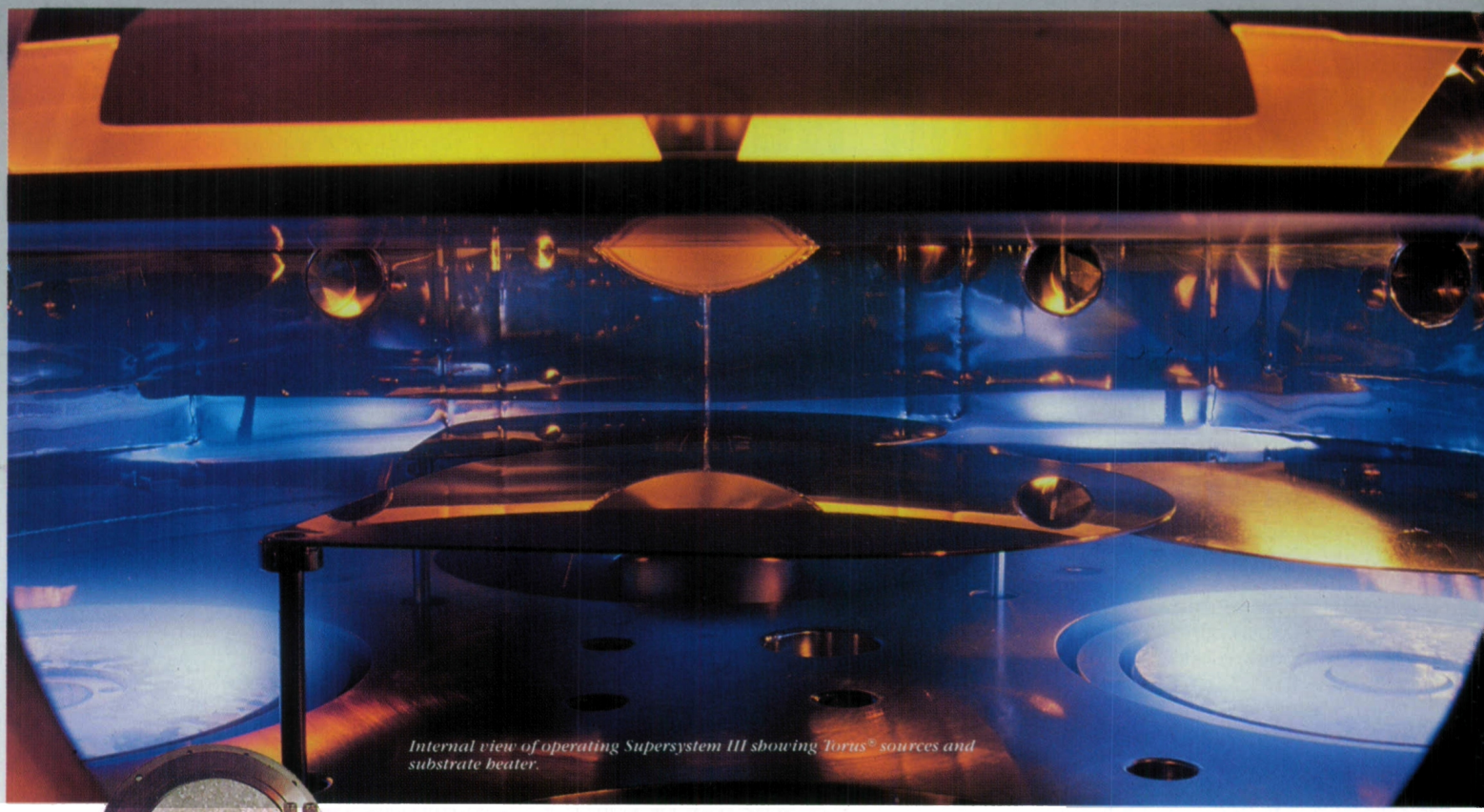
". . .vacuum science is our business"

800-245-1656 USA
800-242-0599 (PA) **800-848-5386 (CA)**
FAX 412-233-4275 Telex 710-664-2195
1515 Worthington Ave., Clairton, PA 15205

https://doi.org/10.1557/S0883769400061170 Published online by Cambridge University Press

Creative Science III...

Your Imagination and Our Superconductor Deposition Sources



Internal view of operating Supersystem III showing Torus® sources and substrate heater.

The family of patented Torus® magnetron sputter sources.

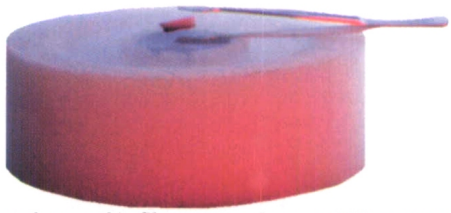
The Torus® magnetron is the pinnacle of sputter source development, ideally suited for thin film superconductor deposition. Its patented auxiliary magnetic ring intensifies the magnetic fields near the target surface, extends the area where magnetic and electric field lines are perpendicular, and expands the plasma volume.

The powerful magnets and special cooling design, give the Torus® source characteristics unmatched by normal magnetrons. For a given target diameter, the Torus® cathode: dissipates more power; deposits at a higher rate; sputters over a larger erosion zone; gives a uniform deposit over a wider area; operates with thicker targets; and has a higher target utilization than any competitive source. The result is sharply reduced operating costs and infrequent target replacements.

Torus® targets range from 1″ to 8½″ diameter in a variety of mounts including: 1″ and 1½″ base-plate ports; Conflat and O-ring flanges; and right angled flange mounts for chamber side ports. Cluster mounts with 3 or 4 shuttered sources on a single flange are available, as are, UHV compatible sources and mountings that vary the target to substrate distance.

Please visit Booth No. 601-602 at the MRS Show in Boston, November 28-30, 1989.

All Torus® sources operate with RF or DC power, in normal and reactive sputtering modes, and are easily adapted for powder targets. Every source operates at pressures up to 200 mtorr under RF power and *up to 4000 mtorr* with DC. Using the magnets initially supplied, all sources sputter magnetic targets of 0.090″ thickness. With an optional magnet set that thickness is increased to 0.125″.



A magnet levitated over a thin film superconductor at LN2 temperature.

Technical details covering uniformity, rate, power and pressure are given in our Torus® brochure. For complete Deposition Systems with Torus® sources mounted, ask for our Systems brochure.

Kurt J. Lesker Company

"...vacuum science is our business"

800-245-1656 USA **800-544-3940 CAN** FAX 412-233-4275
800-242-0599 (PA) **800-848-5386 (CA)** TLX 710-664-2195
1515 Worthington Ave., Clairton, PA 15025

https://doi.org/10.1557/S0883769400061170 Published online by Cambridge University Press