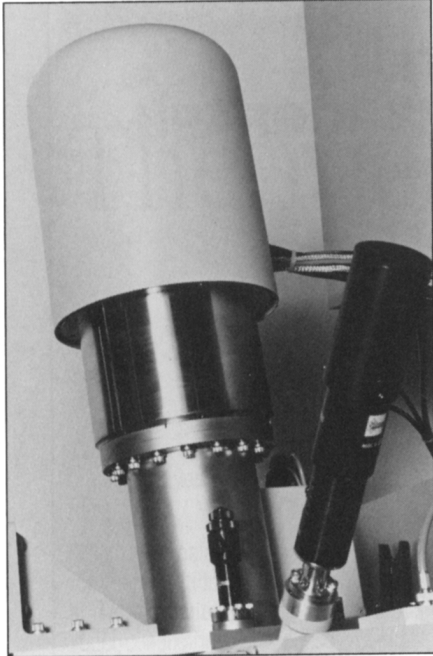


RESOURCES

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

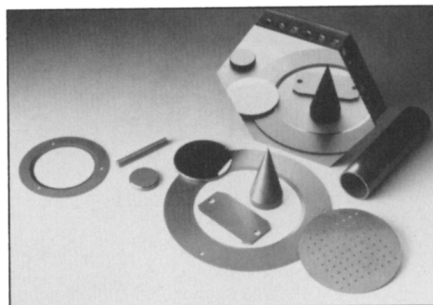


▲ **Focused Ion Beam Workstation with SIMS:** FEI Company's FIB 600 Series Workstation with SIMSmap™ secondary ion mass spectroscopy option enables users to perform *in-situ* chemical identification that includes elemental analysis of submicron features, defects, and particles buried beneath one to several layers; elemental mapping of cross-sectioned areas; dynamic chemical profiling; and material-based end-point detection. The SIMSmap™ module uses a 200 AMU range mass analyzer for positive and negative ions. The workstation features a computer-controlled stage, CAD navigation linkage, electronically variable beam diameter selection, and etch capabilities.
Circle No. 82 on Reader Service Card.

▲ **Vacuum Components Catalog:** MDC Vacuum Products' 360-page catalog details components for high and ultrahigh vacuum systems. Flanges, fittings, valves, roughing components, instrumentation, viewports, and feedthroughs are included. Del-Seal, Wire Seal, and Del-Weld ultrahigh vacuum all-metal seal components are usable to below 10^{-13} torr. ISO Kwik-Flange and Large-Flange O-ring seal systems provide make-and-break connections for use to 10^{-8} torr with tube sizes from 1/2-in. through 20-in. O.D. Also shown are ASA, Del-Base, and Quick-Disconnect systems, bakeable all-metal valves, and a mini-scaffold in-vacuum mounting system.
Circle No. 86 on Reader Service Card.

▲ **Solder Preforms:** Indium's InTE-GRATED™ preforms are joined in a matrix by fine strands of solder which melt and flow to adjacent pads to effect complete preform separation during the reflow process. The units allow simultaneous placement of all solder preforms needed on connector pins, pin grid arrays, and other multiple pad/pin components. Array pitch tolerance is non-accumulative, and center-to-center accuracy can be held to ± 0.0002 in. (0.0051 mm). The technology can also be used in non-array configurations. Indium, tin, lead, and silver, or any combination of two or more of these, can be made into preforms compatible with most reflow methods.
Circle No. 84 on Reader Service Card.

▲ **Polymer Materials Modeling Software:** Molecular Simulations' Professional POLYGRAF™ Version 3.1 and seven available modules enable users to explore molecular structure and physical properties of polymers. Using the DREIDING™ force field and advanced molecular builder tools, modelers may create amorphous/crystalline polymers and determine characteristics. With added modules, users can determine specific characteristics affecting the end-use of a simulated material. POLYGRAF™ runs on workstations and other computing platforms, with interactive and background mode operation on IBM RS6000, HP9000, DECStation 5000, and others. It also runs in background mode on CRAY supercomputers.
Circle No. 88 on Reader Service Card.



▲ **Silicon Carbide Components:** Morton Advanced Materials' CVD SILICON CARBIDE™ is available in preshaped components of many geometries having properties of a cubic (β) material. Morton's CVD process can produce bulk, free-standing substrates several square feet in area and up to 1 in. thick, or to customer specifications. Applications include nozzles, electronic packaging, high-temperature processing tools, seals, and wear parts.
Circle No. 87 on Reader Service Card.

▲ **Electrostatic Voltmeter:** TREK's Model 368 ESVM provides more than 0.1% accuracy and noncontacting voltage measurements from 0 to ± 2 kV dc or peak ac. The unit has a switch-selectable output monitor ratio of 1/200 or 1/1000 of the measured voltage, an output monitor noise of less than 25 mVrms, and a response speed of less than 200 μ s for a 1 kV step input. The voltmeter tracks changing surface potentials and uses both side- and end-viewing miniature probes. Also available is an optional rack mounting package that allows multichannel service in installations where space is critical.
Circle No. 93 on Reader Service Card.

▲ **Photoresist Radiometer:** International Light's microprocessor-controlled IL1440 uses low-profile detector probes to automatically program the instrument and display results. The portable device provides integrated and instantaneous irradiance measurements, and features a choice of three 1/2-in.-high detector probes for measuring three photoresist spectral responses: 300–500 nm, 300–400 nm, and 190–315 nm. The IL1440 provides direct readings on a 32-character LCD display and uses 4 AA alkaline batteries.
Circle No. 85 on Reader Service Card.

▲ **EIA Standards:** Free 120-page catalog from Global Engineering Documents lists more than 1,000 standards, specifications, and publications of the Electronic Industries Association and affiliated groups such as the Telecommunications Industry Association, Joint Electron Device Engineering Council, and EIA Tube Engineering Advisory Panel. Also included are joint standards in collaboration with IPC, ANSI, and NEMA.
Circle No. 83 on Reader Service Card.

▲ **Custom-Built Beam Electromagnet Systems:** Walker Scientific's beam electromagnet systems include analyzing, deflecting, switching, quadrupole, octapole, corkscrew, Chicane, steering, and custom beam magnets. Dipole magnets for beam handling systems with fields above 5 kG have pole edges contoured to approximate a Rogowski profile, and analyzing magnets can be supplied with homogenizing gaps and field clamps. Quadrupole magnets can be produced with yokes and pole roots that operate at flux densities below 12 kG. Magnetic and geometric centerlines coincide within 0.003 in., and pole-to-pole symmetry and gap uniformity are held to within 0.003 in.
Circle No. 89 on Reader Service Card.

CORPORATE AFFILIATES

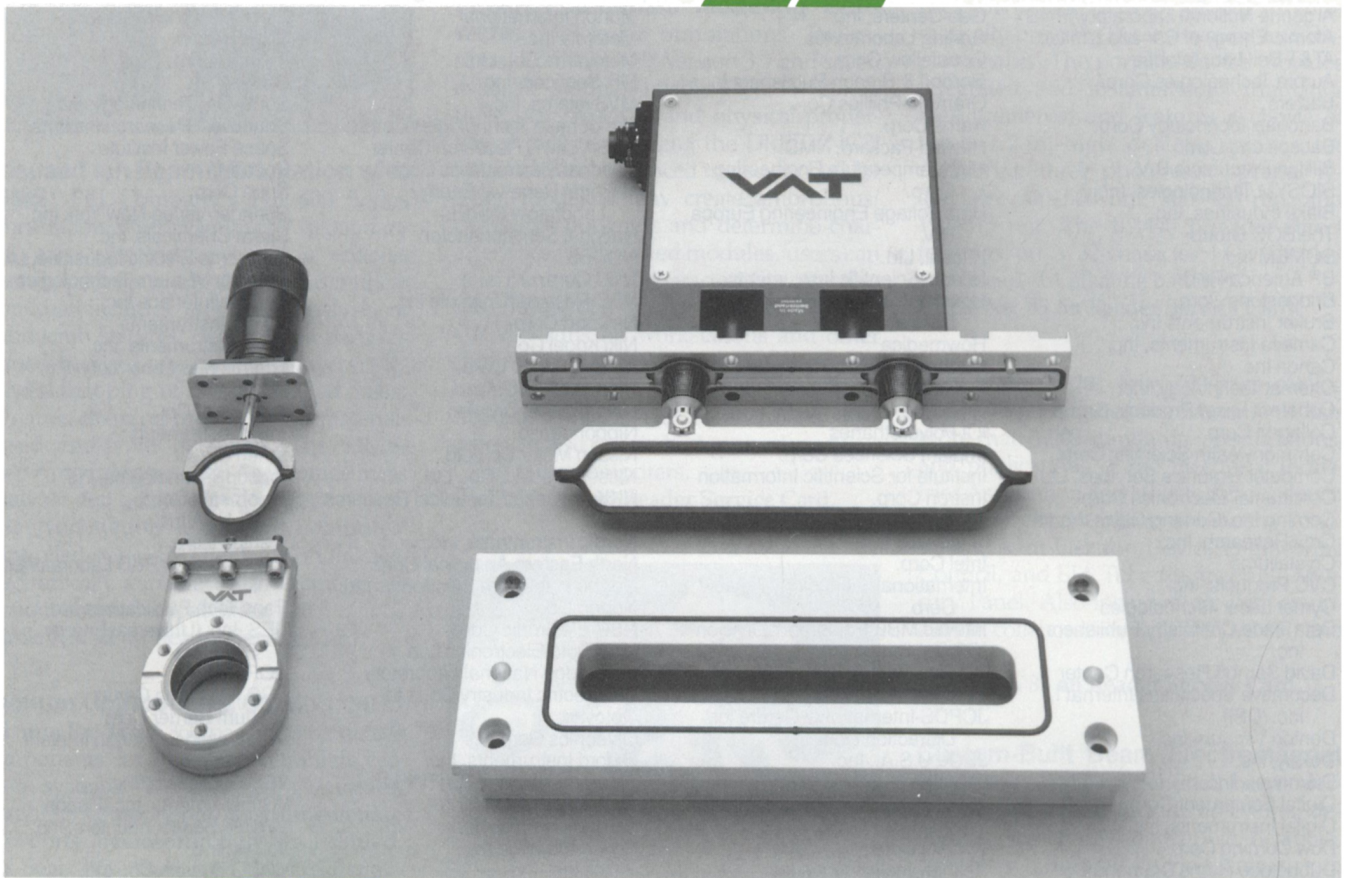
(As of December 1992)

Materials Research Society would like to thank the following for their financial support:

- Academic Press, Inc.
Advanced Control Systems, Corp.
Advanced Energy Industries, Inc.
Advanced Micro Devices
Aerospace Corp.
AG Associates
Air Products & Chemicals, Inc.
Aixtron GmbH
Alcan International Limited
Alcoa
Allied-Signal Inc.
Ames Laboratory
Amoco Chemical Corp.
Amoco Corp.
Amoco Oil Co.
Amoco Technology Co.
Anatech Ltd.
APD Cryogenics Inc.
APL Engineered Materials, Inc.
Applied Materials
Applied Science and Technology, Inc. (ASTeX)
Argonne National Laboratory/IPNS
Atomic Energy of Canada Limited
AT&T Bell Laboratories
Aurora Technologies Corp.
Balzers
Bandgap Technology Corp.
Bausch and Lomb
Billiton Precursors B.V.
BIOSYM Technologies, Inc.
Blake Industries, Inc.
The BOC Group
BOMEM Inc.
BP America R&D
Bridgestone Corp.
Bruker Instruments Inc.
Cameca Instruments, Inc.
Canon Inc.
Chemat Technology, Inc.
Coherent Laser Products Group
Collagen Corp.
Commonwealth Scientific Corp.
Computer Graphics Services, Ltd.
Continental Electronics Corp.
Corning Inc./Corning Glass Works
Cray Research, Inc.
Crystallume
CVC Products, Inc.
Cymer Laser Technologies
Data Trace Chemistry Publishers, Inc.
David Sarnoff Research Center
Decorative Specialties Internat'l, Inc. (DSI)
Denton Vacuum Inc.
DePuy, Inc.
Diamonex, Inc.
Digital Equipment Corp.
Digital Instruments, Inc.
Dow Corning Corp.
Dubbeldree Harris Diamond Corp.
E.I. duPont de Nemours & Co.
Eastman Kodak Corp.
Eaton Corp.
EG&G Instruments, Inc.
EG&G Ortec
EG&G PARC
Electric Power Research Institute (EPRI)
Elettrorava S.p.A.
Elsevier Science Publishers B.V.
Emcore Corp.
Engelhard Corp.
EniChem America, Inc.
EPI Systems Division
- ESCOM Science Publishers BV
Essential Research Inc.
Charles Evans & Associates
Evans East, Inc.
Eveready Battery Co., Inc.
Extrel FTMS
Exxon Basic Chemical Technology
Exxon Production Research Co.
Exxon Research & Engineering Co.
FEI Co.
E.A. Fischione Instruments, Inc.
Ford Motor Co.
Freund Publishing House, Ltd.
Fuji Electric Co., Ltd.
Fujitsu Ltd.
Furukawa Electric Yokohama R&D Lab.
Gatan Inc.
Gelest Inc.
General Electric Corp.
General Motors Research Laboratories
Geo-Centers, Inc.
Gerling Laboratories
Goodfellow Corp.
Gordon & Breach Publishers Inc.
Granville-Phillips Co.
Harris Corp.
Hewlett-Packard, NMD
High Temperature Engineering Corp.
High Voltage Engineering Europa B.V.
Hitachi, Ltd.
Hitachi Scientific Instruments
Hoechst Celanese Research Division
Howmedica
Hughes Research Laboratories
Huntington Laboratories, Inc.
IBM Corp.
ICI Polyurethanes
Implant Sciences Corp.
Institute for Scientific Information
Instron Corp.
Instruments S.A., Inc./Riber Division
Intel Corp.
International Technology Review Corp.
Intevac MBE Equipment Division
IOP Publishing Ltd.
Ion Tech, Inc.
Janis Research Co., Inc.
JCPDS-International Centre for Diffraction Data
JEOL U.S.A., Inc.
Johnson & Johnson
Johnson & Johnson Orthopaedics, Inc.
Kaneka Corp.
Keithley Instruments, Inc.
Kennametal, Inc.
Kobe Research Laboratories, USA
Kobe Steel USA, Inc.
Komatsu Electronic Metals Co. Ltd.
Kyushu Electronic Metals Co. Ltd.
Kratos Analytical, Inc.
Lake Shore Cryotronics, Inc.
Lambda Physik, Inc.
Lawrence Berkeley Laboratory
Lawrence Livermore National Laboratory
Leighton Electronics, Inc.
Kurt J. Lesker Co.
Leybold Vacuum Products, Inc.
- Lockheed Missiles & Space Co., Inc.
Los Alamos National Laboratory
MACCOR, Inc.
Martin Marietta Energy Systems, Inc.
Martin Marietta Laboratories
Matec Instruments, Inc.
Matsushita Electrical Industries Co., Ltd.
MDC Vacuum Products Corp.
MEMC Electronic Materials, Inc.
MER Corp.
Micro-Optics Technologies, Inc.
Microwave Materials Technologies, Inc.
Millipore
Mitsubishi Electric Corp.
Mitsubishi Materials Corp.
MKS Instruments, Inc.
Mobil R&D Corp.
Monsanto Chemical Co.
Morton International
Motorola Inc.
Motoyama Co., Ltd.
MR Semicon, Inc.
MVSsystems, Inc.
Nanophase Technologies Corp.
NASA Lewis Research Center
National Electrostatics Corp.
National Renewal Energy Laboratory (NREL)
National Semiconductor
NCUBE
NEC Corp.
NEC Research Institute Inc.
Newport Corp.
Niki Kogei Co.
Nippon Sanso Corp.
Nippon Steel Corp.
Nippon Steel Division
Nippondenso
Nissan Motor Co., Ltd.
Nissen Electric, Co., Ltd.
NKK Advanced Technical Research Ctr.
Nordic Instruments, Inc.
North Eastern Analytical Corp.
Northern Telecom Electronics Ltd.
Norton Co.
NSC Electronic Corp.
NTT Opto-Electronics Lab
Oak Ridge National Laboratory
Oki Electric Industry Co., Ltd.
Optovac
Osteonics Corp.
Oxford Instruments, Inc.
Paterson Instruments PTY Ltd.
Peak Systems, Inc.
Pergamon Press, Inc.
Perkin-Elmer Corp.
Pfizer, Inc.
Philips Electronic Instruments, Co. (PEI)
Plasma Sciences, Inc.
Plasma-Therm Industries Products, Inc.
Plenum Publishing Corp.
Potomac Photonics, Inc.
PPG Industries Glass R&D Center
Princeton Gamma-Tech, Inc.
The Procter & Gamble Co.
Pure Tech Inc.
Quantum Design, Inc.
Questek Inc.
Radiation Monitoring Devices, Inc.
- Railway Technical Research Institute
Raytheon Co.
Research Laboratory of Innovative Technology for the Earth (RITE)
Resonetics, Inc.
Rockwell International Science Center
Rofin-Sinar, Inc.
Sandia National Laboratories
Sanyo Electric Co., Ltd.
Schlumberger Cambridge Research Ltd.
Schlumberger-Doll Research
Schlumberger Technologies Instruments Division
Sematech Inc.
Semiconductor Processing Co.
Shin Etsu Handotai Co. Ltd.
Siemens Analytical X-Ray Instruments, Inc.
Siemens Solar Industries
Sienna Technologies Inc.
Siltec Silicon
SOPRA Corp.
SOPRA SA
South Bay Technology, Inc.
Southwest Research Institute
Space Power Institute
SpecTran
Spire Corp.
Springer-Verlag New York Inc.
Strem Chemicals, Inc.
Sumitomo Electric Industries, Ltd.
Superior Vacuum Technologies
Surface/Interface Inc.
Tencor Instruments
Texas Instruments, Inc.
Thermionics Laboratory, Inc.
3M Co.
Tokai Kemi Co.
Tokyo Instruments
Tonen Corp.
Topcon Technologies, Ltd.
Topometrix Corp.
Tosoh USA Inc.
Toshiba Corp.
Toyota Central R&D Laboratories, Inc.
Trans Tech Publications Ltd.
UES, Inc. (Universal Energy Systems)
UOP
USG Research Center
Vacuum Barrier Corp.
Varian Assoc., Inc./Ion Implant Systems
VCH Publishers, Inc.
VG Instruments, Inc./Fisons
Virginia Semiconductors, Inc.
Voltaix, Inc.
WAKO Bussan Co., Ltd.
Westinghouse Electric Corp.
John Wiley & Sons Ltd.
W.R. Grace & Co.
Xerox Corp.
Xsirius, Inc.
Carl Zeiss, Inc.
Zimmer

930024

Seal and Protect Your Vacuum System with **MONOVAT** Vacuum Valves.



Because there is only one moving part with no cams or bearings under vacuum, MONOVAT valves operate virtually particle-free and maintenance-free typically far beyond a million cycles. They are available with circular or rectangular openings in a variety of sizes in aluminum or stainless steel.

Please call 1-800-VATLOCK for more detailed information on the benefits offered by MONOVAT gate valves and the many other unique VAT sealing technologies.



600 West Cummings Park
Woburn, MA 01801
Tel: 800-828-5625
Fax: 617-935-3940



Three reasons we entered the gaussmeter market . . .



- 1 We could provide a wide variety of Hall probe configurations, offering varying degrees of sensitivity, style and orientation.

We have 25 years experience in the manufacture of cryogenic temperature sensors and customized probes and thermowells. This experience enables us to easily adapt to in-house production of Hall probes. Assembling Hall probes in-house allows us to easily control the desired gaussmeter/probe performance specifications.

- 2 We recognized the need for a user friendly, cost effective gaussmeter.

Our experience in the design of laboratory instrumentation led us to a line of gaussmeters which offer easy-to-use front panel programming. No scrolling through menus. Operating functions are performed in *one or two keystrokes*.

- 3 We could improve on the stability of existing Hall effect magnetic measurements.

Our design engineers felt that the application of modern techniques and integrated circuits would allow a substantial improvement in instrument stability. This has resulted in significant improvement in warm-up drift, noise floor and time drift performance.

Three reasons that add up to one very good reason - experience

Please visit Booth No. 500 at the MRS Equipment Exhibit in San Francisco, April 13-15, 1993.

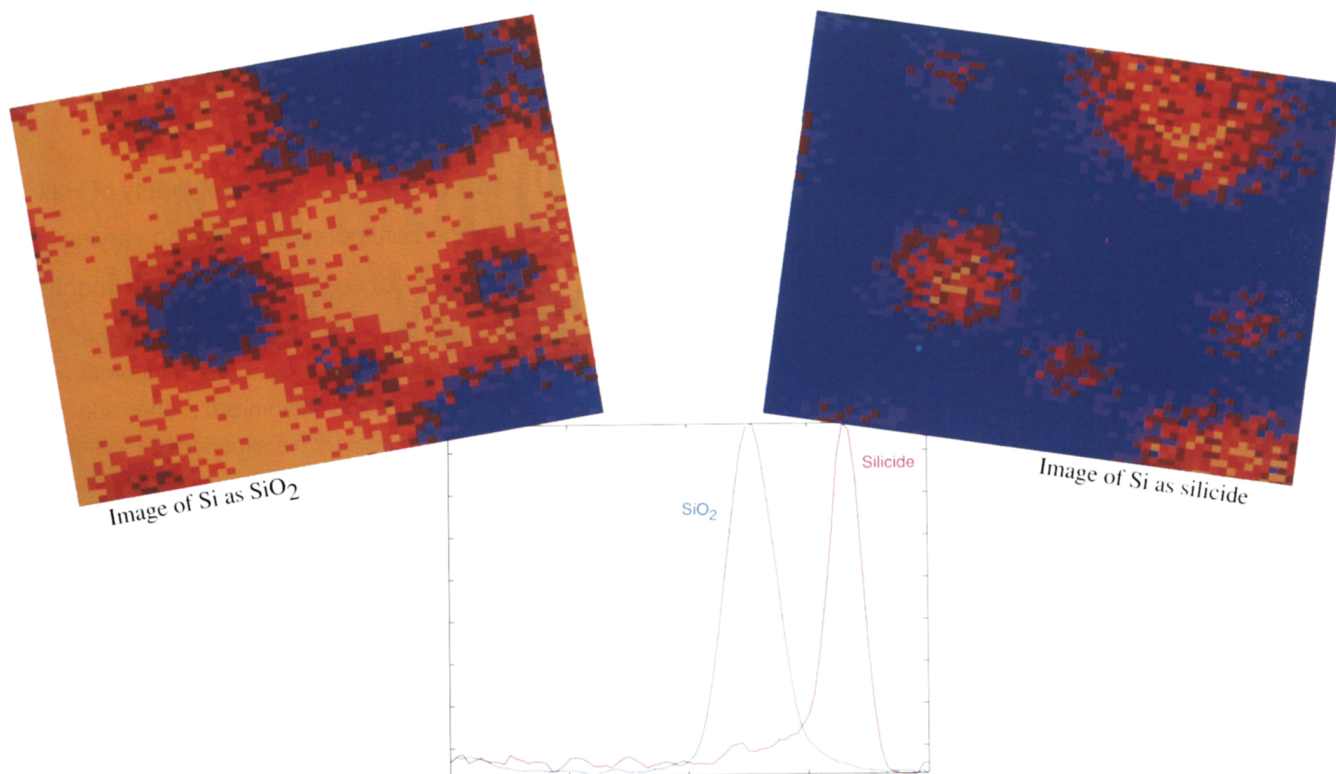
For more information please call
Lake Shore at (614) 891-2243



LakeShore[®]
Measurement and Control Technologies

Lake Shore Cryotronics, Inc.
64 East Walnut Street ● Westerville, Ohio 43081-2399
Fax: (614) 891-1392 ● Tel: (614) 891-2243

A New Definition of Surface Chemical Analysis



The 5600ci was used to image the silicon chemistry of a blistered thin film. Spectral data stored at each pixel were examined and two separate silicon chemical states were identified (bottom). The map was separated into two images -- Si as SiO₂, and Si as silicide.

**SURFACE
ANALYSIS**

**Introducing the best way to analyze the surface of a material
— the PHI 5600ci XPS MultiTechnique.**

The 5600ci offers superior XPS chemical state imaging with spectroscopy in a fully integrated surface analysis system that provides all the capabilities you need:

- Monochromator for unsurpassed energy resolution.
- 16 channel detector for rapid multiple chemical state imaging.
- Multipoint analysis for fast, efficient depth profiling.
- Computer-designed lens for quantitative small area analysis.
- Superior charge neutralization for unambiguous insulator analysis.
- Advanced software for fast, flexible performance and ease of use.
- Optimum image processing and data processing with PHI-MATLAB.
- All the capabilities of the 5600 MultiTechnique, plus imaging of chemical states.

For more information, write or call the regional office listed below.

PERKIN ELMER

Please visit Booth No. 308 at the MRS Equipment Exhibit in San Francisco, April 13-15, 1993.

Perkin-Elmer, Physical Electronics Division, 6509 Flying Cloud Drive, Eden Prairie, MN 55344, 612-828-6100
Bodenseewerk Perkin-Elmer GmbH, Physical Electronics Europe, Bruckmannring 40, D-8042 Oberschleibheim, (Munich), Germany, 49-089-315717-0
ULVAC-PHI, Inc., 2500 Hagisono, Chigasaki-shi, Kanagawa-ken, 253, Japan, 81-0467-856522