UNITED STATES SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K
FOR ANNUAL AND TRANSITION REPORTS
TO SECTIONS 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934

(Mark One)
[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

FOR THE FISCAL YEAR ENDED DECEMBER 31, 2003

OR

[ ] TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

FOR THE TRANSITION PERIOD FROM TO

COMMISSION FILE NUMBER 0-23621

MKS INSTRUMENTS, INC.
(Exact Name of Registrant as Specified in Its Charter)

MASSACHUSETTS (State or other Jurisdiction of Incorporation or Organization)	04-2277512 (IRS Employer Identification No.)
SIX SHATTUCK ROAD, ANDOVER, MASSACHUSETTS (Address of Principal Executive Offices)	01810 (Zip Code)

REGISTRANT'S TELEPHONE NUMBER, INCLUDING AREA CODE:
(978) 975-2350

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:
NONE.

SECURITIES REGISTERED PURSUANT TO SECTION 12(g) OF THE ACT:
COMMON STOCK, NO PAR VALUE

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes [X] No [ ]

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statement incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. [ ]

Indicate by check mark whether the registrant is an accelerated filer (as defined in the Exchange Act Rule 12b-2). Yes [X] No [ ]

Aggregate market value of the voting and non-voting common equity held by nonaffiliates of the registrant as of June 30, 2003 based on the closing price of the registrant's Common Stock on such date as reported by the NASDAQ National Market: $508,588,433; Number of shares outstanding of the issuer's Common Stock, no par value, as of February 13, 2004: 53,334,520.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive Proxy Statement for MKS' Annual Meeting of Stockholders to be held on May 13, 2004 are incorporated by reference into Part III of this Form 10-K.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

MKS believes that this Annual Report on Form 10-K contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. When used herein, the words "believes," "anticipates," "plans," "expects," "estimates" and similar expressions are intended to identify forward-looking statements. These forward-looking statements reflect management's current opinions and are subject to certain risks and uncertainties that could cause actual results to differ materially from those stated or implied. MKS assumes no obligation to update this information. Risks and uncertainties include, but are not limited to, those discussed in the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations - Factors that May Affect Future Results."

PART I

ITEM 1. BUSINESS

We are a leading worldwide provider of instruments, components, subsystems and process control solutions that measure, control, power and monitor critical parameters of semiconductor and other advanced manufacturing processes.

We are managed as one operating segment which is organized around three product groups: Instruments and Control Systems, Power and Reactive Gas Products and Vacuum Products. Our products are derived from our core competencies in pressure measurement and control, materials delivery, gas and thin-film composition analysis, control and information management, power and reactive gas generation and vacuum technology.

Our products are used in diverse markets and applications including the manufacture of, among other things:

- semiconductor devices for diverse electronics applications;
- flat panel displays for hand-held devices, laptop computers, desktop computer monitors and television sets;
- magnetic and optical storage media;
- optical filters and fiber optic cables for data and telecommunications;
- optical coatings for eyeglasses, architectural glass and solar panels;
- magnetic resonance imaging (MRI) medical equipment;
- gas lasers;
- cutting tools; and
- freeze-dried pharmaceuticals.

For over 40 years, we have focused on satisfying the needs of our customers by establishing long-term, collaborative relationships. We have a diverse base of customers that include manufacturers of semiconductor capital equipment, semiconductor devices, data storage equipment, medical equipment and flat panel displays, as well as industrial manufacturing companies, and university, government and industrial research laboratories. During the years ended December 31, 2003, 2002 and 2001, we estimate that approximately 69%, 70% and 64% of our net sales, respectively, were to semiconductor capital equipment manufacturers and semiconductor device manufacturers. Our top 10 customers for the year ended December 31, 2003 were Applied Materials, ASM International, Celerity Group, Lam Research, Micromass UK Ltd., Novellus Systems, Phillips Medical, Toyko Electron, Ulvac and Unaxis.

We file reports, proxy statements and other documents with the Securities and Exchange Commission. You may read and copy any document we file at the SEC's public reference room at Judiciary Plaza Building, 450 Fifth Street, N.W., Room 1024, Washington, D.C. 20549. You should call 1-800-SEC-0330 for more information on the public reference room. Our SEC filings are also available to you on the SEC's Internet site at http://www.sec.gov.

Our internet address is www.mksinst.com. We are not including the information contained in our website as part of, or incorporating it by reference into, this annual report on Form 10-K. We make available free of charge through our web site our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to these reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended as soon as reasonably practicable after we electronically file such materials with the Securities and Exchange Commission.

MARKETS AND APPLICATIONS

We are focused on three market sectors: semiconductor manufacturing applications; thin-film manufacturing applications; and other non-semiconductor manufacturing applications. We estimate that approximately 69%, 70% and 64% of our net sales for the years ended December 31, 2003, 2002 and 2001, respectively, were to semiconductor capital equipment manufacturers and semiconductor device manufacturers. Approximately 10%, 8% and 11% of our net sales in the years ended December 31, 2003, 2002 and 2001, respectively, were for thin-film processing equipment applications, including compact disks, digital video disks (DVDs) and other digital storage media; flat panel displays for computer and television screens; and thin-film coatings for architectural glass and optics. Approximately 21%, 22% and 25% of our net sales in the years ended December 31, 2003, 2002 and 2001, respectively, were for other non-semiconductor manufacturing applications. These include, but are not limited to, industrial manufacturing, magnetic resonance imaging (MRI) medical equipment, biopharmaceutical manufacturing, and university, government and industrial research laboratories.

We estimate that approximately 41%, 36% and 31% of our net sales for the years ended December 31, 2003, 2002 and 2001, respectively, were to customers located in international markets. International sales include sales by our foreign subsidiaries, but exclude direct export sales, which were less than 10% of our total net sales for the years ended December 31, 2003, 2002 and 2001.

SEMICONDUCTOR MANUFACTURING APPLICATIONS

Our products are sold to semiconductor capital equipment manufacturers and semiconductor device manufacturers. Our products are used in the major semiconductor processing steps such as:

- depositing materials onto substrates

- etching and cleaning circuit patterns

- implanting positively charged atoms into a substrate to alter electrical characteristics

Our products are also used for process facility applications such as gas distribution, pressure control and vacuum distribution in clean rooms where semiconductor manufacturing takes place. In addition, we provide specialized instruments that monitor the performance of manufacturing equipment and products that distribute and manage process control information. We anticipate that the semiconductor manufacturing market will continue to account for a substantial portion of our sales. While the semiconductor device manufacturing market is global, major semiconductor capital equipment manufacturers are concentrated in Europe, Japan and the United States.

THIN-FILM MANUFACTURING APPLICATIONS

Flat Panel Display Manufacturing.

Our products are used in the manufacture of flat panel displays, which require the same or similar fabrication processes as semiconductor manufacturing. Flat panel displays are used in electronic hand-held devices, laptop computers, desktop computer monitors, and television sets. Computer monitors and television sets with flat panel display technology are designed to replace bulkier cathode ray tube (CRT) technology in computer monitors and television sets. We sell products to flat panel equipment manufacturers and to endusers in the flat panel display market. The transition to larger panel sizes and higher display resolution is driving the need for tighter process controls to reduce defects. The major manufacturers for flat panel displays are concentrated in Japan, Korea and Taiwan, and the major manufacturers for flat panel display equipment are concentrated in Japan and the United States.

Magnetic and Optical Storage Media.

Our products are used to manufacture:

- magnetic storage media which store and read data magnetically;

- optical storage media which store and read data using laser technology;

- compact disks;

- hard disks;

- data storage devices; and

- digital video or versatile disks (DVDs).

The transition to higher density storage capacity requires manufacturing processes incorporating tighter process controls. The major manufacturers of storage media are concentrated in Japan and the Asia Pacific region, and the major manufacturers of storage media capital equipment are concentrated in Europe, Japan and the United States.

Optical Filters, Optical Fibers and Other Coating Processes

Our products are used in optical filter, optical fiber and other optical thin-film coating processes. Our products are sold both to coating equipment manufacturers and to manufacturers of products made using optical thin-film coating processes. Optical filters and fibers used for data transmission are manufactured using processes to deposit chemical vapors which are similar to those used in semiconductor manufacturing. The requirement for higher data transmission rates is driving the need for tighter control of optical filters and fiber coating processes. Optical thin films for eyeglasses, solar panels and architectural glass are deposited using processes to deposit chemical vapors and gaseous metals similar to those used in semiconductor manufacturing. Optical filter, optical fiber and other optical thin-film processing are concentrated in Europe, Japan and the United States.

Our products are also used in processes for the application of thin films to harden tool bit surfaces, for the application of diamond thin films to enhance surface hardness and durability and for coatings used for food container packaging, jewelry and ornaments. The major equipment and process providers are concentrated in Europe, Japan and the United States.

OTHER NON-SEMICONDUCTOR MANUFACTURING APPLICATIONS

Our products are used in plasma processes used to sterilize medical instruments, in vacuum freeze drying of pharmaceuticals, foods and beverages, and in vacuum processes involved in light bulb and gas laser manufacturing. Our products are also incorporated into several other end-market products such as MRI medical equipment, industrial vehicles, and analytical instruments. In addition, our products are sold to government, university and industrial laboratories for vacuum applications involving research and development in materials science, physical chemistry and electronics materials. The major equipment and process providers and research laboratories are concentrated in Europe, Japan and the United States.

PRODUCTS

During 2002, we consolidated our product groups to accelerate product development, rationalize manufacturing operations, and reduce operating costs. This realignment of operations has organized us into three product groups: Instruments and Control Systems, Power and Reactive Gas Products and Vacuum Products.

1. INSTRUMENTS AND CONTROL SYSTEMS

PRESSURE MEASUREMENT AND CONTROL PRODUCTS. Each of our Pressure Measurement and Control product lines consists of products that are designed for a variety of pressure ranges and accuracies.

Baratron Pressure Measurement Products. Our Baratron products are high-precision pressure measurement instruments. We have five Baratron product families that range from high accuracy digital output instruments to simple electronic switches. These products are typically used to measure the pressure of the gases being distributed upstream of the process chambers, to measure process chamber pressures and to measure pressures between process chambers, vacuum pumps and exhaust lines. Baratron instruments measure pressures at ranges from two hundred times atmospheric pressure to one billionth of atmospheric pressure. We believe we offer the widest range of gas pressure measurement instruments in the semiconductor and advanced thin-film materials processing industries.

Automatic Pressure and Vacuum Control Products. Automatic pressure control products consist of analog and digital automatic pressure and vacuum control electronic instruments and valves. These products enable precise control of process pressure by electronically actuating valves that control the flow of gases in and out of the process chamber to minimize the difference between desired and actual pressure in the chamber. The electronic controllers vary from simple analog units with precise manual tuning capability to state-of-the-art self-tuning, digital signal processing controllers. The valve products vary from small gas inlet valves to large exhaust valves.

In most cases, Baratron pressure measurement instruments provide the pressure input to the automatic pressure control device. Together, these components create an integrated automatic pressure control subsystem. Our pressure control products can also accept inputs from other measurement instruments, enabling the automatic control of gas input or exhaust based on parameters other than pressure.

MATERIALS DELIVERY PRODUCTS. Each of our Materials Delivery product lines consists of products that are designed for a variety of flow ranges and accuracies.

Flow Measurement and Control Products. Flow measurement products include gas, vapor and liquid flow measurement products based upon thermal conductivity, pressure and direct liquid injection technologies. The flow control products combine the flow measurement device with valve control elements based upon solenoid, piezo-electric and piston pump technologies. The products measure and automatically control the mass flow rate of gases and vapors into the process chamber. Our line of thermal-based mass flow controllers, which control gas flow based on the molecular weight of gases, includes all-metal-sealed designs and ultra-clean designs for semiconductor applications, as well as general-purpose controllers for applications where all-metal-sealed construction is not required. We have also developed pressure-based mass flow controllers, based on Baratron pressure instrument measurement and control technology, which restrict flow in the gas line to transform pressure control into mass flow control.

Our flow measurement products also include a calibration system which independently measures mass flow and compares this measurement to that of the process chamber mass flow controller. The demand for our calibration system is driven by the increasingly stringent process control needs of the semiconductor industry and the need to reduce costly downtime resulting from stopping operations to address mass flow controller problems.

GAS AND THIN-FILM COMPOSITION ANALYSIS PRODUCTS. The technologies used in these products include mass spectrometry and infrared spectroscopy. Gas and thin-film composition analysis instruments are sold to a variety of industries including the semiconductor industry.

Mass Spectrometry-based Gas Composition Analysis Instruments. These products are based on quadruple mass spectrometer sensors that separate gases based on molecular weight. These sensors include built-in electronics and are provided with software that analyzes the composition of background and process gases in the process chamber. These instruments are provided both as portable laboratory systems and as process gas monitoring systems used in the diagnosis of semiconductor manufacturing process systems.

Fourier Transform Infra-Red (FTIR) Based Gas and Thin-Film Composition Analysis Products. FTIR-based products provide information about the composition of gases and thin-films by measuring the absorption of infra-red light as it passes through the sample being measured. Gas analysis applications include measuring the compositions of mixtures of reactant gases; measuring the purity of individual process gases; measuring the composition of process exhaust gas streams to determine process health; monitoring gases to ensure environmental health and safety; and monitoring combustion exhausts. These instruments are provided as portable laboratory systems and as process gas monitoring systems used in the diagnosis of manufacturing processes.

Mass spectrometry-based and FTIR-based gas monitoring systems can indicate out-of-bounds conditions -- such as the presence of undesirable contaminant gases and water vapor or out-of-tolerance amounts of specific gases in the process -- which alert operators to diagnose and repair faulty equipment.

Leak Detection Products. We manufacture a range of mass spectrometer-based helium leak detection products. Helium leak detection is used in a variety of industries including semiconductor, HVAC, automotive and aerospace to ensure the leak integrity of both manufactured products and manufacturing equipment. We believe that our product is the smallest mass spectrometer-based leak detector currently available.

Optical Monitoring Instruments. We manufacture a range of optical monitoring instruments that are sold primarily for thin-film coating applications such as the manufacture of optical filters. The optical monitors measure the thickness and optical properties of a film being deposited, allowing the user to better control the process.

CONTROL AND INFORMATION TECHNOLOGY PRODUCTS. We design and manufacture a suite of products that allow customers to better control their processes through computer-controlled automation. The products include digital control network products, process chamber and system controllers and connectivity products. Digital control network products are used to connect sensors, actuators and subsystems to the chamber and system control computers. They support a variety of industry-standard connection methods including DeviceNet, Profibus, ethernet and conventional discrete digital and analog signals. Chamber and system control computers process these signals in real time and allow the customer to precisely manage the process conditions. Connectivity products allow information to flow from the process sensors and subsystems and from the process tool control computer to the factory network. By enabling this information flow, customers can better optimize their processes through new techniques known as Advanced Process Control (APC), and diagnose problems with the equipment and process from a remote location (e-diagnostics).

2. POWER AND REACTIVE GAS PRODUCTS

In the Power and Reactive Gas Products group, we design and manufacture a wide variety of power supplies and reactive gas generation modules used in semiconductor device manufacturing and medical equipment markets.

Power Delivery Products. Our power delivery products are used in the semiconductor, flat panel display, data storage and medical markets. In the semiconductor, flat panel and data storage markets, our microwave, RF and DC power supplies are used to provide energy to various etching, stripping and deposition processes. In the medical market, our power delivery products are used to provide power for MRI equipment. Our power delivery products cover frequencies ranging from DC to 2.45GHZ (gigahertz) at power levels from tens of watts to over 100 kilowatts. A range of impedance matching units transfer power from the power supplies to the customer's process. They are automated with modern digital control electronics that ensure optimum power transfer and rapid response to changing process conditions. Our MRI power amplifiers are used in the most advanced MRI systems including the 3T (three Tesla) machines. These machines provide higher resolution images to medical professionals, allowing better diagnosis and treatment. Our high power and high frequency technology is particularly well suited to these applications.

Reactive Gas Generation Products. Reactive gases are used in many of the process steps in chip fabrication. Reactive gases are used to etch, strip and deposit films on wafers, to clean wafers during processing, and to clean process chambers to reduce particle contamination. A reactive gas is created when energy is added to a stable gas to break apart its molecules. The resulting dissociated gas produces rapid chemical reactions when it comes into contact with other matter. Reactive gas processes have important advantages relative to other types of chemical processes. These advantages include: greater precision in etch, strip and deposition process steps; lower temperatures that protect materials involved in the process from heat damage; greater efficiency and shorter reaction times to improve manufacturing yields; and lower cost. Examples of our reactive gas products include ozone generators and subsystems used for deposition of insulators on to semiconductor devices, ozonated water delivery systems for advanced semiconductor wafer and flat panel display cleaning, atomic fluorine generators for process chamber cleaning, and microwave plasma based products for photo resist removal.

3. VACUUM PRODUCTS

In the Vacuum Products group, we design and manufacture a wide variety of vacuum technology products, including vacuum gauges, valves and components.

Vacuum Gauging Products. We offer a wide range of vacuum instruments consisting of vacuum measurement sensors and associated power supply and readout units. These vacuum gauges measure phenomena that are related to the level of pressure in the process chamber and downstream of the process chamber between the chamber and the pump. These gauges are used to measure vacuum at pressures lower than those measurable with a Baratron instrument or to measure vacuum in the Baratron instrument range where less accuracy is required. Our indirect pressure gauges use thermal conductivity and ionization gauge technologies to measure pressure from atmospheric pressure to one trillionth of atmospheric pressure.

Vacuum Valves and Components. Our vacuum valves are used on the gas lines between the process chamber and the pump downstream of the process chamber. Our vacuum components consist of flanges, fittings, traps and heated lines that are used downstream from the process chamber to provide leak free connections and to prevent condensable materials from depositing particles near or back into the chamber. The manufacture of devices with small circuit patterns cannot tolerate contamination from atmospheric leaks or particles. Our vacuum components are designed to minimize such contamination and thus increase yields and uptimes.

APPLICATION-SPECIFIC INTEGRATED SUBSYSTEMS

We also combine products and technologies to provide application-specific integrated subsystems. Integrated subsystems are made by each product group, depending upon the application of the subsystem. Our integrated subsystems represented approximately 20% of revenues for the year ended December 31, 2003.

For example, we have a line of integrated flow and pressure control subsystems that combine two or more of our products and technologies into products for specific process applications. We have developed a range of Back-Side Wafer Cooling Subsystems which are needed to control the flow and pressure of the helium used to effect the cooling of wafers in semiconductor manufacturing. By combining the functions of our Baratron pressure measurement instruments, flow measurement instruments, control electronics and valves into a range of compact instruments, this product line addresses the need for smaller components that save valuable clean room space.

CUSTOMERS

Each of our product groups' largest customers are leading semiconductor capital equipment manufacturers such as Applied Materials, Lam Research, Novellus Systems and Tokyo Electron, and semiconductor device manufacturers such as IBM and Taiwan Semiconductor Manufacturing Company. Sales to our top ten customers accounted for approximately 42%, 49% and 39% of net sales for the years ended December 31, 2003, 2002 and 2001, respectively. Applied Materials accounted for approximately 18%, 23% and 18% of our net sales for the years ended December 31, 2003, 2002 and 2001, respectively.

SALES, MARKETING AND SUPPORT

Our worldwide sales, marketing and support organization is critical to our strategy of maintaining close relationships with semiconductor capital equipment manufacturers and semiconductor device manufacturers.

We sell our products primarily through our direct sales force. As of December 31, 2003, we had 172 sales employees worldwide in China, France, Germany, Japan, Korea, the Netherlands, Singapore, Taiwan, the United Kingdom and the United States. Sales representatives and agents in countries including Canada, China, India, Israel, and Italy and in select U.S. cities supplement this direct sales force. We maintain a marketing staff that identifies customer requirements, assists in product planning and specifications, and focuses on future trends in the semiconductor and other markets.

As semiconductor device manufacturers have become increasingly sensitive to the significant costs of system downtime, they have required that suppliers offer comprehensive local repair service and close customer support. Manufacturers require close support to enable them to repair, modify, upgrade and retrofit their equipment to improve yields and adapt new materials or processes. To meet these market requirements, we maintain a worldwide sales and support organization in 10 countries. Technical support is provided by applications engineers located at offices in China, France, Germany, Japan, Korea, the Netherlands, Singapore, Taiwan, the United Kingdom and the United States. Repair and calibration services are provided at 22 service depots located worldwide. We provide warranties from one to three years, depending upon the type of product.

RESEARCH AND DEVELOPMENT

Our products incorporate sophisticated technologies to power, measure, control and monitor increasingly complex gas-related semiconductor manufacturing processes, thereby enhancing uptime, yield and throughput for our semiconductor device manufacturing customers. Our products have continuously advanced as our customers' needs have evolved. We have developed, and continue to develop, new products to address emerging industry trends such as the transition from the use of 200mm wafers to 300mm wafers and the shrinking of integrated circuit line-widths from 0.18 micron to 0.13 micron and smaller. In addition, we have developed, and continue to develop, products that support the migration to new classes of materials, such as copper for low resistance conductors, high-k dielectric materials for capacitors and gates and low-k dielectric materials for low loss insulators that are used in small geometry manufacturing. We have undertaken an initiative to involve our marketing, engineering, manufacturing and sales personnel in the concurrent development of new products in order to reduce the time to market for new products. Our employees also work closely with customers' development personnel. These relationships help us identify and define future technical needs on which to focus research and development efforts. We support research at academic institutions targeted at advances in materials science and semiconductor process development. At December 31, 2003, we had 326 research and development employees, primarily located in the United States. Our research and development expense was $47.7 million, $46.0 million and $38.0 million for the years ended December 31, 2003, 2002 and 2001, respectively. Our research and development efforts include numerous projects that generally have a duration of 18 to 30 months. In addition, we acquired in-process technology of $8.4 million in 2002 and $2.3 million in 2001.

MANUFACTURING

Our manufacturing facilities are located in China, Germany, Israel, Japan, Mexico, the United Kingdom and the United States. Manufacturing activities include the assembly and testing of components and subassemblies, which are integrated into products. We outsource some of our subassembly work. We purchase a wide range of electronic, mechanical and electrical components, some of which are designed to our specifications. We consider our ability to flexibly respond to customers' significantly fluctuating product demands by using lean manufacturing techniques to be a distinct competitive advantage.

COMPETITION

The market for our products is highly competitive. Principal competitive factors include:

- historical customer relationships;

- product quality, performance and price;

- breadth of product line;

- manufacturing capabilities; and

- customer service and support.

Although we believe that we compete favorably with respect to these factors, there can be no assurance that we will continue to do so.

We encounter substantial competition in most of our product lines, although no one competitor competes with us across all product lines. Certain of our competitors may have greater financial and other resources than us. In some cases, competitors are smaller than we are, but well established in specific product niches. Mykrolis offers products that compete with our pressure and materials delivery products. Advanced Energy, Horiba/STEC and Celerity/Unit Instruments, each offer materials delivery products that compete with our product line of mass flow controllers. Nor-Cal Products, Inc. and MDC Vacuum Products, Inc., each offer products that compete with our vacuum components. Inficon offers products that compete with our vacuum measurement and gas analysis products. Helix Technology offers products that compete with our vacuum gauging products. Advanced Energy offers products that compete with our power delivery and reactive gas generator products and with certain data management and information products.

PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

We rely on a combination of patent, copyright, trademark and trade secret laws and license agreements to establish and protect our proprietary rights. As of December 31, 2003, we owned 194 U.S. patents, 123 foreign patents and had 84 pending U.S. patent applications. Foreign counterparts of certain of these applications have been filed or may be filed at the appropriate time. Although we believe that certain patents may be important for certain aspects of our business, we believe that our success also depends upon close customer contact, innovation, technological expertise, responsiveness and worldwide distribution.

We require each of our employees, including our executive officers, to enter into standard agreements pursuant to which the employee agrees to keep confidential all of our proprietary information and to assign to us all inventions while they are employed by us.

For a discussion of litigation relating to our intellectual property, see "Item 3. Legal Proceedings."

EMPLOYEES

As of December 31, 2003, we employed approximately 2,144 persons. We believe that our ongoing success depends upon our continued ability to attract and retain highly skilled employees for whom competition is intense. None of our employees are represented by a labor union or are party to a collective bargaining agreement. We believe that our employee relations are good.

ITEM 2. PROPERTIES

As of December 31, 2003, the following table provides information concerning MKS' principal and certain other owned and leased facilities:

LOCATION	SQ. FT.	ACTIVITY	PRODUCTS MANUFACTURED	LEASE EXPIRES
Andover, Massachusetts.........	82,000	Headquarters, Manufacturing, Customer Support and Research & Development	Pressure Measurement and Control Products	(1)
Austin, Texas...........	14,000	Sales, Customer Support, Service and Research &	Not applicable	(2)

Development Berlin, Germany......... 18,250 Manufacturing, Reactive Gas March 31, 2006 Customer Support, Generation Products Service and Research & Development

LOCATION SQ. FT. ACTIVITY PRODUCTS MANUFACTURED LEASE EXPIRES - -------- ------- ---------------------- --------------------- ------------------ Bloomfield, CT.......... 22,500 Manufacturing, Gas and Thin Film January 31, 2008 Customer Support, Composition Analysis Service and Research & Products Development Boulder, Colorado....... 119,000 Manufacturing, Vacuum Products (3) Customer Support, Service and Research & Development Carmiel, Israel......... 7,000 Manufacturing Control & Information September 30, 2004 Management Products Cheshire, U.K. .... 13,000 Manufacturing, Sales, Materials Delivery (4) Customer Support and Products Service Colorado Springs, Colorado.............. 40,600 Manufacturing, Power Delivery (5) Customer Support, Products Service and Research & Development Dallas, Texas........... 29,000 Vacated Not applicable (6) Fremont, California..... 13,600 Sales, Customer Not applicable August 31, 2005 Support and Service Lawrence, Massachusetts......... 40,000 Manufacturing Pressure Measurement (1) and Control Products Le Bourget, France...... 14,000 Sales, Customer Not applicable (1) Support and Service Lod, Israel............. 5,175 Research & Development Not applicable May 14, 2007 and Administration Methuen, Massachusetts......... 85,000 Manufacturing, Pressure Measurement (1) Customer Support, and Control Products; Service and Research & Materials Delivery Development Products Morgan Hill, California............ 27,600 Vacated Not applicable (7) Munich, Germany......... 14,000 Manufacturing, Sales, Pressure Measurement (1) Customer Support, and Control Products; Service and Research & Materials Delivery Development Products Nogales, Mexico......... 8,800 Manufacturing Reactive Gas October 31, 2004 Generation Products Richardson, Texas....... 15,000 Manufacturing, Sales, Pressure Measurement August 31, 2004 Customer Support and and Control Products; Service Materials Delivery Products Rochester, New York..... 156,000 Manufacturing, Sales, Power Delivery (8) Customer Support, Products Service and Research & Development San Jose, California.... 32,000 Sales, Customer Not applicable April 30, 2009 Support and Service Santa Clara, California........... 9,000 Manufacturing, Sales, Control & Information (9) Customer Support, Management Products Service and Research & Development Seoul, Korea........... 10,000 Sales, Customer Not applicable May 31, 2005 Support and Service Shanghai, China......... 6,000 Sales & Service Not Applicable February 1, 2008 Shenzhen, China......... 63,000 Manufacturing Power Delivery January 31, 2005 Products

LOCATION	SQ. FT.	ACTIVITY	PRODUCTS MANUFACTURED	LEASE EXPIRES
Shropshire, U.K.	25,000	Manufacturing	Vacuum Products	October 18, 2010
Singapore...............	4,000	Sales, Customer Support and Service	Not applicable	July 31, 2006
Taiwan..................	13,700	Sales, Customer Support and Service	Not applicable	(10)
Tokyo, Japan............	31,000	Manufacturing, Sales, Customer Support, Service and Research & Development	Materials Delivery Products	(11)
Wilmington, Massachusetts.........	118,000	Manufacturing, Customer Support, Service and Research & Development	Reactive Gas Generation Products; Power Delivery Products	(12)

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(1) This facility is owned by MKS.

(2) MKS leases two facilities, one has 8,000 square feet of space and a lease term which expired December 31, 2003 and we currently lease the facility on a month to month basis and the second has 6,000 square feet of space and a lease term which expires December 31, 2004.

(3) MKS leases two facilities, one has 39,000 square feet of space and a lease term which expires October 31, 2004 and the second has 33,000 square feet of space and a lease term which expires August 31, 2005. MKS also owns a third and fourth facility with 27,000 and 20,000 square feet of space, respectively.

(4) MKS leases two facilities, one has 2,000 square feet of space and a lease term which expires October 5, 2009 and the second has 11,000 square feet of space and a lease term which expires November 30, 2009.

(5) MKS leases one facility with 16,600 square feet of space and a lease term which expires on February 28, 2005. MKS owns another facility with 24,000 square feet.

(6) MKS is subleasing this facility which lease term expires on July 31, 2004.

(7) In December 2003, MKS exited this facility as part of its consolidation plan and is currently negotiating to sublease portions of this facility. The lease term expires on June 30, 2007.

(8) MKS owns this facility and has an Industrial Development Revenue Bond of $5.0 million, due in 2014, that is collateralized by the building.

(9) MKS leases 4,000 square feet of space with a lease term which expires April 30, 2005. MKS owns another facility with 5,000 square feet of space.

(10) MKS leases two facilities, one has 10,300 square feet of space and a lease term which expires October 31, 2004 and the second has 3,400 square feet of space and a lease term which expires August 25, 2004.

(11) MKS leases two facilities, one has 14,500 square feet of space and a lease term which expires April 30, 2005 and the second has 10,500 square feet of space and a lease term which expires on September 30, 2006. MKS owns a third facility of 6,000 square feet.

(12) MKS owns this facility and has a mortgage note payable of approximately $4.6 million outstanding at December 31, 2003.

In addition to manufacturing and other operations conducted at the foregoing leased or owned facilities, MKS provides worldwide sales, customer support and services from various other leased facilities throughout the world not listed in the table above. See "Business -- Sales, Marketing and Support."

ITEM 3. LEGAL PROCEEDINGS

On January 12, 2004, Gas Research Institute ("GRI") brought suit in federal district court in Illinois against us, On-Line Technologies, Inc., which was acquired by us in April 2001, and another defendant for breach of contract, misappropriation of trade secrets and related claims relating to certain infra-red gas analysis technology allegedly developed under a January 1995 Contract for Research and incorporated into certain of our products. GRI has made claims for unspecified damages, attorney's fees and injunctive relief. We are currently evaluating the merits of the claims. We cannot be certain of the outcome of this litigation, but we plan to oppose the claims against us vigorously.

On April 3, 2003, Advanced Energy Industries, Inc. ("Advanced Energy") filed suit against us in federal district court in Colorado ("Colorado Action"), seeking a declaratory judgment that Advanced Energy's Xstream product does not infringe three patents held by our subsidiary Applied Science and Technology, Inc. ("ASTeX"). On May 14, 2003, we brought suit in federal district court in Delaware against Advanced Energy for infringement of five ASTeX patents, including the three patents at issue in the Colorado Action. We seek injunctive relief and damages for Advanced Energy's infringement. On December 24, 2003, the Colorado court granted our motion to transfer Advanced Energy's Colorado suit to Delaware and on February 9, 2004, the Delaware court denied Advanced Energy's motion to dismiss or transfer our Delaware case back to Colorado. The case is in the early stages of pre-trial discovery.

On November 30, 2000, ASTeX, which we acquired in January 2001, brought suit in federal district court in Delaware against Advanced Energy for infringement of ASTeX's patent related to its Astron product. On May 17, 2002, a jury affirmed the validity of our patent and found that Advanced Energy infringed the patent. On May 31, 2002, based on the jury's findings, the Court entered a judgment on the infringement claim in favor of us and against Advanced Energy, and awarded $4.2 million in damages to compensate us for Advanced Energy's infringing activity. Advanced Energy filed motions to overturn the verdict. During August of 2002, we entered into an agreement with Advanced Energy whereby Advanced Energy agreed to pay the awarded damages amount to us and withdraw its motions to overturn the verdict. We received the $4.2 million in September 2002, and recorded the amount as Income from litigation settlement.

On November 3, 1999, On-Line Technologies, Inc. brought suit in federal district court in Connecticut against Perkin-Elmer, Inc. and certain other defendants for infringement of On-Line's patent related to its FTIR spectrometer product. The suit seeks injunctive relief and damages for infringement. Perkin-Elmer, Inc. has filed a counterclaim seeking invalidity of the patent, costs, and attorneys' fees. We believe that the counterclaim is without merit. We cannot be certain of the outcome of this litigation, but we plan to assert our claims and oppose the counterclaims against us vigorously.

We are subject to other legal proceedings and claims, which have arisen in the ordinary course of business.

In the opinion of management, the ultimate disposition of these matters will not have a material adverse effect on our results of operations, financial condition or cash flows.

ITEM 4. SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS

No matters were submitted to a vote of security holders during the fourth quarter of 2003 through the solicitation of proxies or otherwise.

PART II

ITEM 5. MARKET FOR THE REGISTRANT'S COMMON EQUITY AND RELATED STOCKHOLDER MATTERS

PRICE RANGE OF COMMON STOCK

Our common stock is traded on the Nasdaq National Market under the symbol MKSI. On February 13, 2004, the closing price of our common stock, as reported on the Nasdaq National Market, was $24.85 per share. The following table sets forth for the periods indicated the high and low bid prices per share of our common stock as reported by the Nasdaq National Market.

PRICE RANGE OF COMMON STOCK	2003 HIGH	2003 LOW	2002 HIGH	2002 LOW
First Quarter	$20.44	$10.68	$34.29	$22.05
Second Quarter	21.15	11.79	39.46	16.54
Third Quarter	27.55	17.22	20.75	9.75
Fourth Quarter	29.41	20.36	20.15	8.41

On February 13, 2004, we had approximately 205 stockholders of record.

DIVIDEND POLICY

We have never declared or paid any cash dividends. We currently intend to retain earnings, if any, to support our growth strategy and do not anticipate paying cash dividends in the foreseeable future. Payment of future dividends, if any, will be at the discretion of our board of directors after taking into account various factors, including our financial condition, operating results, current and anticipated cash needs, plans for expansion, and changes in tax and regulatory rulings.

ITEM 6. SELECTED FINANCIAL DATA

SELECTED CONSOLIDATED FINANCIAL DATA

	YEAR ENDED DECEMBER 31				
	2003	2002	2001	2000	1999
	(IN THOUSANDS, EXCEPT PER SHARE DATA)				
STATEMENT OF OPERATIONS DATA(1)					
Net sales	$337,291	$314,773	$286,808	$466,852	$265,292
Gross profit(2)	118,109	105,795	85,583	205,396	102,509
Income (loss) from operations(3)	(15,717)	(43,047)	(47,360)	91,535	25,037
Historical net income (loss)(3)	$(16,385)	$(39,537)	$(31,043)	$ 60,260	$ 22,786
Historical net income (loss) per share(3)					
Basic	$ (0.32)	$ (0.79)	$ (0.83)	$ 1.74	$ 0.76
Diluted	$ (0.32)	$ (0.79)	$ (0.83)	$ 1.67	$ 0.72
PRO FORMA STATEMENT OF OPERATIONS DATA(4)					
Pro forma net income					$ 17,161
Pro forma net income per share:					
Basic					$ 0.57
Diluted					$ 0.55
BALANCE SHEET DATA(1)					
Cash and cash equivalents	$ 74,660	$ 88,820	$120,869	$123,082	$ 67,489
Short-term investments	54,518	39,894	16,625	17,904	26,387
Working capital	210,468	192,008	216,855	237,321	137,999
Long-term investments	13,625	15,980	11,029	17,100	1,063
Total assets	692,862	685,623	411,189	454,403	

253,772 Short-term
obligations................. 20,196
18,472 14,815 19,134 20,828 Long-term
obligations, less current
portion...............................
8,924 11,726 11,257 12,386 5,662
Stockholders'
equity.................... 608,310
610,690 352,871 357,522 185,685

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(1) Amounts have been restated to reflect the acquisition of Applied Science and Technology, Inc. ("ASTeX") in a pooling of interests transaction effective January 26, 2001.

(2) Gross profit for the year ended December 31, 2001 includes significant charges for excess and obsolete inventory of $16.6 million. These charges were primarily caused by a significant reduction in demand, including reduced demand for older technology products.

(3) Loss from operations, historical net loss and historical net loss per share for the year ended December 31, 2003 include restructuring, asset impairment and other charges of $1.6 million. Loss from operations, historical net loss and historical net loss per share for the year ended December 31, 2002 include restructuring and asset impairment charges of $2.7 million and purchase of in-process technology of $8.4 million. Loss from operations, historical net loss and historical net loss per share for the year ended December 31, 2001 include restructuring and asset impairment charges of $3.7 million, merger expenses of $7.7 million and purchase of in-process technology of $2.3 million.

(4) The historical net income (loss) per share data does not include provisions for federal income taxes prior to our initial public offering in 1999, because we were treated as an S corporation for federal income tax purposes. The pro forma statement of income data presents net income and net income per share data as if we had been subject to federal income taxes as a C corporation during the periods presented. No pro forma presentation is necessary for the fiscal years ended December 31, 2003, 2002, 2001 and 2000 because we were subject to income taxes as a C corporation for these periods. Management believes this pro forma presentation is useful because it provides for consistent federal income tax treatment for all years presented.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

OVERVIEW

We are a leading worldwide provider of instruments, components, subsystems and process control solutions that measure, control, power and monitor critical parameters of semiconductor and other advanced manufacturing processes.

We are organized into three product groups: Instruments and Control Systems, Power and Reactive Gas Products and Vacuum Products. Our products are derived from our core competencies in pressure measurement and control, materials delivery, gas and thin-film composition analysis, control and information management, power and reactive gas generation and vacuum technology. Our products are used to manufacture semiconductors; thin film coatings for diverse markets such as flat panel displays, optical and magnetic storage media, architectural glass and electro-optical products. We also provide technologies for medical imaging equipment.

We have a diverse base of customers that include manufacturers of semiconductor capital equipment, semiconductor devices, data storage equipment, medical equipment and flat panel displays, as well as industrial manufacturing companies, and university, government and industrial research laboratories. During the years ended December 31, 2003, 2002 and 2001, we estimate that approximately 69%, 70% and 64% of our net sales, respectively, were to semiconductor capital equipment manufacturers and semiconductor device manufacturers. We expect that sales to such customers will continue to account for a substantial majority of our sales.

The semiconductor capital equipment market experienced a significant downturn in 2001, 2002 and the first nine months of 2003. As a result, we experienced a significant reduction in demand for products from our semiconductor capital equipment manufacturer and semiconductor device manufacturer customers during these periods. In the fourth quarter of 2003, we experienced a significant increase in orders and shipments compared to the third quarter of 2003. The semiconductor capital equipment industry has been very cyclical, and we cannot determine how long this recent improvement will last. In the absence of a significant long-term improvement, net sales could decline or remain low, and the amount of goodwill, other long-lived assets, and inventory considered realizable could be impaired.

A significant portion of our net sales are to operations in international markets. International net sales include sales by our foreign subsidiaries, but exclude direct export sales, which were less than 10% of our total net sales for each of the years ended December 31, 2003, 2002 and 2001. International net sales accounted for approximately 41%, 36% and 31% of net sales for the years ended December 31, 2003, 2002 and 2001, respectively, a significant portion of which were sales in Japan. We expect that international net sales will continue to represent a significant percentage of our net sales.

RECENT ACQUISITIONS

On September 30, 2003, we acquired Wenzel Instruments, a privately held developer of solid state MicroElectroMechanical System (MEMS) based vacuum sensor technology for advanced manufacturing processes.

On January 31, 2002, we completed the acquisition of the ENI Business ("ENI") of Emerson Electric Co. ("Emerson"), a supplier of solid-state radio frequency (RF) and direct current (DC) plasma power supplies, matching networks and instrumentation to the semiconductor and thin-film processing industries. We acquired ENI in order to offer higher value and more integrated application solutions by combining ENI's solid-state power conversion technology with our core competency in plasma and reactive gas solutions. The acquisition has been accounted for under the purchase method of accounting.

Also in 2002, we acquired three companies that expanded our position in distributed computer-based process control and data management. On March 13, 2002, we acquired Tenta Technology Ltd. ("Tenta"), a privately held company that designs and supplies modular, computer-based process control systems for 300mm semiconductor process tool applications. On April 5, 2002, we acquired IPC Fab Automation GmbH ("IPC"), a privately held developer and provider of web-based hardware and software that enables e-diagnostics and advanced process control for advanced manufacturing applications. On October 1, 2002, we acquired EquipNet Ltd., a privately held company that develops web-based connectivity equipment for the semiconductor industry.

The results of operations of these acquired companies are included in our consolidated statement of operations as of and since the respective dates of purchase.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

Management's Discussion and Analysis of Financial Condition and Results of Operations discusses our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. On an on-going basis, we evaluate our estimates and judgments, including those related to revenue recognition, inventory, warranty costs, intangible assets, goodwill and other long-lived assets, in-process research and development and income taxes. We base our estimates and judgments on historical experience and on various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

We believe the following critical accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements:

Revenue recognition. Revenue from product sales is recorded upon transfer of title and risk of loss to the customer provided that there is evidence of an arrangement, the sales price is fixed or determinable, and collection of the related receivable is reasonably assured. In most transactions, we have no obligations to our customers after the date products are shipped other than pursuant to warranty obligations. In some instances, we provide installation and training to customers after the product has been shipped. In accordance with the Emerging Issues Task Force ("EITF") 00-21 "Accounting For Revenue Arrangements With Multiple Deliverables", we defer the fair value of any undelivered elements until the installation or training is complete. Fair value is the price charged when the element is sold separately. Shipping and handling fees billed to customers, if any, are recognized as revenue. The related shipping and handling costs are recognized in cost of sales.

We monitor and track the amount of product returns, provide for accounts receivable allowances and reduce revenue at the time of shipment for the estimated amount of such future returns, based on historical experience. While product returns have historically been within our expectations and the provisions established, there is no assurance that we will continue to experience the same return rates that we have in the past. Any significant increase in product return rates could have a material adverse impact on our operating results for the period or periods in which such returns materialize. While we maintain a credit approval process, significant judgments are made by management in connection with assessing our customers' ability to pay at the time of shipment. Despite this assessment, from time to time, our customers are unable to meet their payment obligations. We continuously monitor our customers' credit worthiness, and use our judgment in establishing a provision for estimated credit losses based upon our historical experience and any specific customer collection issues that we have identified. While such credit losses have historically been within our expectations and the provisions established, there is no assurance that we will continue to experience the same credit loss rates that we have in the past. A significant change in the liquidity or financial position of our customers could have a material adverse impact on the collectability of accounts receivable and our future operating results.

Inventory. We value our inventory at the lower of cost (first-in, first-out method) or market. We regularly review inventory quantities on hand and record a provision to write down excess and obsolete inventory to our estimated net realizable value, if less than cost, based primarily on our estimated forecast of product demand. Demand for our products can fluctuate significantly, as demonstrated during 2001 when we recorded charges for excess and obsolete inventory of $16.6 million. The charges were primarily caused by a significant reduction in demand including reduced demand for older technology products. A significant increase in the demand for our products could result in a short-term increase in the cost of inventory purchases from supply shortages or a decrease in the cost of inventory purchases as a result of volume discounts, while a significant decrease in demand could result in an increase in the charges for excess inventory quantities on hand. In addition, our industry is subject to technological change, new product development, and product technological obsolescence that could result in an increase in the amount of obsolete inventory quantities on hand. Therefore, any significant unanticipated changes in demand or technological developments could have a significant impact on the value of our inventory and our reported operating results.

Warranty Costs. We provide for the estimated costs to fulfill customer warranty obligations upon the recognition of the related revenue. We provide warranty coverage for our products ranging from 12 to 36 months, with the majority of our products ranging from 12 to 24 months. We estimate the anticipated costs of repairing our products under such warranties based on the historical costs of the repairs and any known specific product issues. The assumptions we use to estimate warranty accruals are reevaluated periodically in light of actual experience and, when appropriate, the accruals are adjusted. Our determination of the appropriate level of warranty accrual is based upon estimates. Should product failure rates differ from our estimates, actual costs could vary significantly from our expectations.

Intangible assets, goodwill and other long-lived assets. We review intangible assets and other long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of these assets may not be recoverable. Factors we consider important which could indicate an impairment include significant under performance relative to expected historical or projected future operating results, significant changes in the manner of our use of the asset or the strategy for our overall business and significant and negative industry or economic trends. When we determine that the carrying value of the asset may not be recoverable based upon the existence of one or more of the above indicators of impairment, we compare the undiscounted cash flows to the carrying value of the asset. If an impairment is indicated, the asset is written down to its estimated fair value. Intangible assets, such as purchased technology, are generally recorded in connection with a business acquisition. The value assigned to intangible assets is determined based on estimates and judgment regarding expectations for the success and life cycle of products and technology acquired. If actual product acceptance differs significantly from the estimates, we may be required to record an impairment charge to write down the asset to its net realizable value.

We assess goodwill for impairment at least annually, or more frequently when events and circumstances occur indicating that the recorded goodwill may be impaired. If the book value of a reporting unit exceeds its fair value, the implied fair value of goodwill is compared with the carrying amount of goodwill. If the carrying amount of goodwill exceeds the implied fair value, an impairment loss is recorded in an amount equal to that excess. The fair value of a reporting unit is estimated using the discounted cash flow approach, and is dependent on estimates and judgments related to future cash flows and discount rates. If actual cash flows differ significantly from the estimates used by management, we may be required to record an impairment charge to write down the goodwill to its net realizable value.

In-process research and development. We value tangible and intangible assets acquired through our business acquisitions, including in-process research and development ("IPR&D"), at fair value. We determine IPR&D through established valuation techniques for various projects for the development of new products and technologies and expenses IPR&D when technical feasibility is not reached. The value of IPR&D is determined using the income approach, which discounts expected future cash flows from projects under development to their net present value. Each project is analyzed and estimates and judgments are made to determine the technological innovations included; the utilization of core technology; the complexity, cost and time to complete development; any alternative future use or current technological feasibility; and the stage of completion. During 2002 and 2001, we expensed approximately $8.4 million and $2.3 million, respectively, in IPR&D charges primarily related to the ENI acquisition and the On-Line acquisition because the technological feasibility of certain products under development had not been established and no future alternative uses existed. If we acquire other companies with IPR&D in the future, we will value the IPR&D through established valuation techniques and will incur future IPR&D charges if those products under development have not reached technical feasibility.

Income taxes. We evaluate the realizability of our net deferred tax assets and assess the need for a valuation allowance on a quarterly basis. The future benefit to be derived from our deferred tax assets is dependent upon our ability to generate sufficient future taxable income to realize the assets. We record a valuation allowance to reduce our net deferred tax assets to the amount that may be more likely than not to be realized. To the extent we established a valuation allowance, an expense is recorded within the provision for income taxes line on the statement of income. During the year ended December 31, 2002, we established a full valuation allowance for our net deferred tax assets and have maintained this valuation allowance through December 31, 2003. In periods subsequent to establishing a valuation allowance, if we were to determine that we would be able to realize our net deferred tax assets in excess of their net recorded amount, an adjustment to the valuation allowance would be recorded as a reduction to income tax expense in the period such determination was made. Also in future periods, if we were to determine that we would not be able to realize the recorded amount of our remaining net deferred tax assets, an adjustment to the valuation allowance would be recorded as an increase to income tax expense in the period such determination was made.

RESULTS OF OPERATIONS

The following table sets forth for the periods indicated the percentage of total net sales of certain line items included in our consolidated statement of operations data:

	YEAR ENDED DECEMBER 31		
	2003	2002	2001
Net sales	100.0%	100.0%	100.0%
Cost of sales	65.0	66.4	70.2
Gross profit	35.0	33.6	29.8
Research and development	14.1	14.6	13.2
Selling, general and administrative	20.7	24.7	24.5
Amortization of goodwill and acquired intangible assets	4.4	4.4	3.8
Restructuring and asset impairment charges	0.5	0.9	1.3
Merger expenses	--	--	2.7
Purchase of in-process technology	--	2.7	0.8
Loss from operations	(4.7)	(13.7)	(16.5)
Interest income (expense), net	0.3	0.5	1.3
Income from litigation settlement	--	1.3	--
Other expense (income), net	(0.3)	1.3	0.9
Loss before income taxes	(4.1)	(13.2)	(16.1)
Provision (benefit) for income taxes	0.8	(0.6)	(5.3)
Net loss	(4.9)%	(12.6)%	(10.8)%

YEAR ENDED 2003 COMPARED TO 2002

Net Sales. Net sales increased $22.5 million or 7.2% to $337.3 million for the year ended December 31, 2003 from $314.8 million for the year ended December 31, 2002. International net sales were approximately $138.1 million for the year ended December 31, 2003 or 41.0% of net sales and $114.6 million for the year ended December 31, 2002 or 36.4% of net sales. During the year ended December 31, 2002, we acquired ENI, Tenta and IPC. These acquisitions increased our net sales by $9.9 million for the year ended December 31, 2003, as they were included in net sales for the full period in 2003 while net sales for the year ended December 31, 2002 includes their revenues only from the date of acquisition. The remaining increase in 2003 was the result of increased service revenues as well as increased demand for our products from our semiconductor capital equipment manufacturer customers, particularly in the fourth quarter, as compared to the year ended December 31, 2002. The increase in service revenues, which represents less than 10% of total net sales, has been driven by the prolonged slow-down in the semiconductor capital equipment market, as customers tried to maintain equipment rather than invest in new capital.

Gross Profit. Gross profit as a percentage of net sales increased to 35.0% for the year ended December 31, 2003 from 33.6% for the year ended December 31, 2002. The increase in gross profit percent is mainly due to a slight increase in volumes that increased our fixed cost absorption and a favorable foreign exchange impact, offset by higher materials costs of new products in initial production runs.

Research and Development. Our research and development efforts are directed toward developing and improving our instruments, components, subsystems and process control solutions for semiconductor and advanced thin-film processing applications and identifying and developing products for new applications for which gas management plays a critical role. Although overall business activity was down throughout most of 2003, and we implemented initiatives to reduce costs, we continued to invest in research and development activities. Research and development expense increased $1.7 million or 3.6% to $47.7 million or 14.1% of net sales for the year ended December 31, 2003 from $46.0 million or 14.6% of net sales for the year ended

December 31, 2002. The increase was due mainly to increased compensation expense of $1.0 million, as a result of including a full year of costs in 2003 of the companies acquired during 2002 and an increase in project material costs of $0.7 million. Our research and development efforts include numerous projects which generally have a duration of 18 to 30 months.

Selling, General and Administrative. Selling, general and administrative expenses decreased $7.9 million or 10.2% to $69.9 million or 20.7% of net sales for the year ended December 31, 2003 from $77.8 million or 24.7% of net sales for the year ended December 31, 2002. The decrease was due primarily to lower compensation expense, as a result of lower headcount, of $3.5 million resulting from cost savings initiatives and decreased professional fees of $2.5 million.

Amortization of Acquired Intangible Assets. For the year ended December 31, 2003, amortization expense was $14.7 million, an increase of $0.8 million or 5.7% from the $13.9 million for the year ended December 31, 2002. The increase in amortization was due to a full year of amortization of intangibles in 2003 from companies acquired in 2002.

Restructuring, Asset Impairment and Other Charges. During 2003, we continued the consolidation to accelerate product development, rationalize manufacturing operations, and reduce operating costs of prior acquisitions that was started in 2002. In 2003, we recorded restructuring, asset impairment and other charges of $1.6 million, consisting of $0.4 million of severance costs related to workforce reductions, $1.1 million of lease cost, professional fees and other costs related to facility consolidations and an asset impairment charge of $0.1 million. The workforce reduction was across all functional groups.

In 2002, this consolidation of prior acquisitions resulted in recording restructuring and asset impairment charges of $2.7 million. The charges consisted of $0.6 million of severance costs related to a workforce reduction, $1.2 million related to consolidation of leased facilities, and an asset impairment charge of $0.9 million primarily related to the impairment of an intangible asset from the discontinuance of certain product development activities. The workforce reduction was across all functional groups and consisted of 225 employees.

We anticipate incurring additional restructuring charges in 2004, related to prior year initiatives, of up to $2.0 million as we complete the consolidation of leased facilities.

A summary of the restructuring charges, asset impairments and other charges during 2002 and 2003, and the related accrual balance is outlined as follows:

(IN THOUSANDS)	WORKFORCE REDUCTIONS	ASSET IMPAIRMENT	FACILITY CONSOLIDATIONS	TOTAL
Restructuring provision in 2002..........	$ 631	$ 867	$1,228	$ 2,726
Charges utilized in 2002.................	(305)	(867)	(64)	(1,236)
Reserve balance as of December 31, 2002..................................	326	--	1,164	1,490
Restructuring provision in 2003..........	356	92	1,145	1,593
Charges utilized in 2003.................	(483)	(92)	(478)	(1,053)
Reserve balance as of December 31, 2003..................................	$ 199	$ --	$1,831	$ 2,030

The remaining accrual for workforce reductions is expected to be paid by the second quarter of 2004. The facilities consolidation charges will be paid over the respective lease terms, the latest of which ends in 2007. The accrual for severance costs and lease payments is recorded in Other accrued expenses and Other liabilities.

Purchase of In-process Technology. There was no purchase of in-process research and development expenses in 2003. In-process research and development of $8.4 million for the year ended December 31, 2002 arose from the acquisitions we made in 2002.

In January 2002, we acquired ENI in a transaction accounted for under the purchase method. The purchase price was allocated to the assets acquired, including intangible assets, based on their estimated fair values. The intangible assets include approximately $7.5 million for acquired in-process technology for projects, generally expected to have durations of 12 months, that did not have future alternative uses. The value of the purchased in-process technology was determined using the income approach, which discounts expected future cash flows from projects under development to their net present value. Each project was analyzed to determine the technological innovations included; the utilization of core technology; the complexity, cost and time to complete development; any alternative future use or current technological feasibility; and the stage of completion. The cash flows derived from the in-process technology projects were discounted at rates ranging from 25% to 30%. We believe these rates were appropriate given the risks associated with the technologies for which commercial feasibility had not been established. The percentage of completion for each in-process project was determined by identifying the cost incurred to date of the project as a ratio of the total cost required to bring the project to technical and commercial feasibility. The percentage completion for in-process projects acquired ranged from 65% to 80% complete, based on our estimates of tasks completed and the tasks to be completed to bring the projects to technological and commercial feasibility. At the date of the acquisition, the development of these projects had not yet reached technological feasibility, and the technology in progress had no alternative future uses. Accordingly, these costs were expensed in 2002.

Interest Income (Expense), Net. For the year ended December 31, 2003, net interest income was $1.1 million, a decrease of $0.4 million from the $1.5 million for the year ended December 31, 2002. The decrease in net interest income in 2003 is mainly related to slightly lower investment balances and lower interest rates in 2003.

Income from Litigation Settlement. On November 30, 2000, Applied Science and Technology, Inc. ("ASTeX"), which we acquired in January 2001, brought suit in federal district court in Delaware against Advanced Energy Industries, Inc. for infringement of ASTeX's patent related to its Astron product. On May 17, 2002, a jury affirmed the validity of our patent and found that Advanced Energy infringed the patent. On May 31, 2002, based on the jury's findings, the Court entered a judgment on the infringement claim in favor of us and against Advanced Energy, and awarded $4.2 million in damages to compensate us for Advanced Energy's infringing activity. Advanced Energy filed motions to overturn the verdict. During August of 2002, we entered into an agreement with Advanced Energy whereby Advanced Energy agreed to pay the awarded damages amount to us and withdraw its motions to overturn the verdict. We received the $4.2 million in September 2002, and recorded the amount as Income from litigation settlement.

Other (Income) Expense. During the fourth quarter of 2003, we recorded a gain of $0.9 million from the early repayment of premiums related to a split dollar life insurance policy covering the Chairman and CEO of the Company.

During 2001, we sold certain assets for proceeds of approximately $9.0 million, including a note receivable of approximately $3.9 million and warrants of $0.2 million. During 2002, due to the downturn in the semiconductor industry and its result on the acquirer's operations, and the acquirer's inability to raise financing, we considered the value of the note and warrants to be impaired. Accordingly, during 2002, we recorded a charge of $4.1 million to other expense for our estimate of the impairment on the note receivable and warrants.

Provision (Benefit) for Income Taxes. We recorded a provision for income taxes of $2.7 million for the year ended December 31, 2003, as compared to a tax benefit of $2.0 million for the year ended December 31, 2002. As a result of incurring significant operating losses since 2001, we determined that it is more likely than not that our deferred tax assets may not be realized, and since the fourth quarter of 2002 have established a full valuation allowance for our net deferred tax assets. Accordingly, we have not recorded a deferred tax benefit from the net operating loss incurred in the year ended December 31, 2003. The provision for income taxes in 2003 is comprised of tax expense from foreign operations and state taxes. Until an appropriate level of profitability is reached, we will not record deferred tax benefits from our net operating losses in future results of operations.

YEAR ENDED 2002 COMPARED TO 2001

Net Sales. Net sales increased 9.8% to $314.8 million for the year ended December 31, 2002 from $286.8 million for the year ended December 31, 2001. International net sales were approximately $114.6 million for the year ended December 31, 2002 or 36.4% of net sales and $90.0 million for the year ended December 31, 2001 or 31.4% of net sales. The increase in worldwide net sales in 2002 is from the partial year revenues of $58.5 million from ENI, Tenta and IPC, companies which were acquired during the year. This increase was offset by a decline of $30.5 million or 10.6%, due to the worldwide slowdown in demand for our products from our semiconductor capital equipment manufacturer and semiconductor device manufacturer customers, which began in the first quarter of 2001 and continued through 2002.

Gross Profit. Gross profit as a percentage of net sales increased to 33.6% for the year ended December 31, 2002 from 29.8% for the year ended December 31, 2001. The increase in gross margin was primarily due to lower provisions for excess and obsolete inventory in 2002 compared to 2001. In 2001, we recorded significant charges for excess and obsolete inventory of $16.6 million, or 5.8% of net sales. These charges were primarily caused by a significant reduction in demand, including demand for older technology products. During 2002, we realized a benefit of $1.4 million in cost of sales, or 0.4% of net sales, from sales of inventory which were included as part of the excess and obsolete inventory charges in 2001. The lower excess and obsolete inventory charges in 2002 were offset by the addition of manufacturing overhead costs from the companies acquired in 2002, which resulted in a decrease in gross margin of approximately 2%.

Research and Development. Research and development expense increased 21.2% to $46.0 million or 14.6% of net sales for the year ended December 31, 2002 from $38.0 million or 13.2% of net sales for the year ended December 31, 2001. Compensation expense increased by $2.7 million during 2002, which was comprised of an increase of $6.5 million from the companies acquired during the year, offset by a $3.8 million decrease resulting from cost saving programs including workforce reductions, salary reductions, and furloughs. Also, expenses for project materials increased $3.5 million during 2002, primarily from the companies acquired during the year.

Selling, General and Administrative. Selling, general and administrative expenses increased 10.9% to $77.8 million or 24.7% of net sales for the year ended December 31, 2002 from $70.2 million or 24.5% of net sales for the year ended December 31, 2001. The increase was due to increased compensation expense of $4.8 million primarily from the companies acquired during the year, increased professional fees of $1.1 million and other selling, general and administrative expenses.

Amortization of Goodwill and Acquired Intangible Assets. Amortization expense of $13.9 million for the year ended December 31, 2002, represents the amortization of the identifiable intangibles resulting from the acquisitions completed by us. In accordance with SFAS No. 142, we ceased amortizing goodwill on January 1, 2002. Amortization of goodwill and acquired intangible assets of $11.0 million for the year ended December 31, 2001, represents the amortization of goodwill and other intangibles resulting from the acquisitions completed by us, of which $5.2 million relates to acquired intangibles and $5.8 million relates to goodwill.

Merger Costs. On January 26, 2001 we completed our acquisition of ASTeX in a transaction accounted for under the pooling of interests method of accounting. Under the pooling of interests method of accounting, fees and expenses related to the merger are expensed in the period of the merger. During the year ended December 31, 2001, we expensed approximately $7.7 million of merger related expenses, consisting of $6.9 million of investment banking, legal, accounting, printing and other professional fees, and $0.8 million of regulatory and other costs.

Purchase of In-process Technology. In-process research and development of $8.4 million and $2.3 million for the years ended December 31, 2002 and 2001 arose from the acquisitions we made in 2002 and 2001, respectively. As discussed previously above, the $8.4 million of in-process research and development expenses in 2002 related to our acquisition of ENI in January 2002.

In April 2001, we acquired On-Line in a transaction accounted for under the purchase method. The purchase price was allocated to the assets acquired, including intangible assets, based on their estimated fair values. The intangible assets included approximately $2.3 million for acquired in-process technology for various projects, generally expected to have durations of 24 to 48 months, that did not have future alternative uses. The value of the purchased in-process technology was determined using the income approach, which discounts expected future cash flows from projects under development to their net present value. Each project was analyzed to determine the technological innovations included; the utilization of core technology; the complexity, cost and time to complete development; any alternative future use or current technological feasibility; and the stage of completion. The cash flows derived from the in-process technology projects were discounted at a rate of 25%. We believe this rate was appropriate given the risks associated with the technologies for which commercial feasibility had not been established. The percentage of completion for each in-process project was determined by identifying the elapsed time invested in the project as a ratio of the total time required to bring the project to technical and commercial feasibility. The percentage of completion for in-process projects acquired ranged from 55% to 65%, based on management's estimates of tasks completed and the tasks to be completed to bring the projects to technological and commercial feasibility. At the date of the acquisition, the development of these projects had not yet reached technological feasibility, and the technology in progress had no alternative future uses. Accordingly, these costs were expensed in 2001.

Restructuring and Asset Impairment Charges. During 2002 we implemented a consolidation of recent acquisitions to accelerate product development, rationalize manufacturing operations, and reduce operating costs. As a result of these actions, we recorded restructuring and asset impairment charges of $2.7 million in 2002. The charges consisted of $0.6 million of severance costs related to a workforce reduction, $1.2 million related to consolidation of leased facilities, and an asset impairment charge of $0.9 million primarily related to the impairment of an intangible asset from the discontinuance of certain product development activities. The fair value of the impaired intangible asset was determined using the expected present value of future cash flows. The workforce reduction was across all functional groups and consisted of 225 employees. Severance costs of $0.3 million were paid during 2002. The facilities consolidation charges will be paid over the respective lease terms, the latest of which ends in 2007.

When we acquired the Shamrock product line, it was expected that sales of the existing system design and development of new system designs would generate future revenues. We had provided potential customers with purchase quotations for Shamrock systems, including a significant quotation to a potential customer in January 2001 for the sale of several systems. The potential customer did not purchase the systems, and the quotation expired in March 2001. We were unsuccessful in selling any systems of the product line after the acquisition and, with the expiration of the significant quote in March 2001, we evaluated the recoverability of the long-lived assets, primarily goodwill. As a result, based on discounted cash flow analysis we recorded an impairment charge for the carrying value of the related goodwill of approximately $3.7 million in the quarter ended March 31, 2001.

Interest Income (Expense), Net. During the year ended December 31, 2002, we generated net interest income of $1.5 million, primarily from interest on our invested cash and investments, offset by interest expense of $1.2 million on outstanding debt. Interest income declined $2.5 million to $2.7 million for the year ended December 31, 2002 from $5.2 million for the year ended December 31, 2001. The decrease was due to lower interest rate yields on investments during 2002 compared to 2001.

Income from Litigation Settlement. On November 30, 2000, ASTeX, which we acquired in January 2001, brought suit in federal district court in Delaware against Advanced Energy for infringement of ASTeX's patent related to its Astron product. On May 17, 2002, a jury affirmed the validity of our patent and found that Advanced Energy infringed the patent. On May 31, 2002, based on the jury's findings, the Court entered a judgment on the infringement claim in favor of us and against Advanced Energy, and awarded $4.2 million in damages to compensate us for Advanced Energy's infringing activity. Advanced Energy filed motions to overturn the verdict. During August of 2002, we entered into an agreement with Advanced Energy whereby Advanced Energy agreed to pay the awarded damages amount to us and withdraw its motions to overturn the verdict. We received the $4.2 million and recorded the amount as Income from litigation settlement.

Other Expense, Net. During 2001, we recorded a loss on the sale of an investment in a company of $1.1 million, which was recorded as other expense. Also during 2001, we sold certain assets for proceeds of approximately $9.0 million, including a note receivable of approximately $3.9 million and warrants of $0.2 million. The loss on the transaction was $1.2 million and was recorded as other expense in 2001. During 2002, due to the downturn in the semiconductor industry and its result on the acquirer's operations, and the acquirer's inability to raise financing, we considered the value of the note and warrants to be impaired. Accordingly, during 2002, we recorded a charge of $4.1 million to other expense for our estimate of the impairment on the note receivable and warrants.

Benefit for Income Taxes. We recorded a benefit for income taxes of $2.0 million for the year ended December 31, 2002, for an effective tax rate of 4.8%. We recorded a benefit for income taxes of $15.0 million for the year ended December 31, 2001, for an effective tax rate of 32.6% in 2001. The change in our effective tax rate from 2001 to 2002 was primarily due to the recording of a valuation allowance against our net deferred tax assets in 2002. As a result of incurring significant operating losses during 2001 and 2002, and the continuing uncertainty in the semiconductor industry, management determined that it is more likely than not our deferred tax assets may not be realized and, accordingly, recorded a charge of $13.4 million to establish a full valuation allowance for our deferred tax assets in the fourth quarter of 2002. The benefit for income taxes of $2.0 million for the year ended December 31, 2002 is primarily comprised of an estimated current tax benefit of $3.8 million from 2002 United States net operating losses offset by $1.6 million of tax expense from foreign operations and state taxes.

LIQUIDITY AND CAPITAL RESOURCES

Since our initial public offering we have financed our operations and capital requirements through a combination of cash provided by operations, long-term real estate financing and short-term borrowings. Cash, cash equivalents and short-term marketable securities totaled $129.2 million at December 31, 2003, compared to $128.7 million at December 31, 2002. In addition, in January 2004, we issued 1,314,286 shares of our common stock at $26.25 per share in a public offering, which generated net proceeds of approximately $32.8 million.

Net cash used in operating activities of $0.2 million for the year ended December 31, 2003, was impacted by the net loss of $16.4 million and an increase in operating assets of $21.7 million, offset by non-cash charges of $28.2 million for depreciation and amortization and an increase in operating liabilities of $8.8 million. The increase in operating assets consisted mainly of an increase in accounts receivable of $16.3 million due to the increased shipments in the fourth quarter of 2003 as compared to the fourth quarter of 2002, which contributed to a slight increase in our days sales outstanding from 53 days at the end of 2002 to 58 days in 2003, and an increase in inventory of $6.7 million as a result of increased production volumes in the fourth quarter of 2003. The increase in operating liabilities consisted primarily of an increase in accounts payable of $9.7 million resulting from increased production activity in the fourth quarter. Net cash provided by operating activities of $13.8 million for the year ended December 31, 2002 resulted mainly from non-cash charges for depreciation and amortization of $28.7 million, purchases of in-process technology of $8.4 million related mainly to the ENI acquisition, asset impairment charges of $5.0 million consisting primarily of the write-off of an impaired note receivable and a decrease in operating assets and liabilities of $9.6 million, all of which were partially offset by the net loss of $39.5 million. The decrease in operating assets consisted of a reduction in other current assets of $12.3 million from the receipt of income tax refunds in 2002 and a decrease in inventory of $6.6 million, offset by decreases in accrued expenses of $7.3 million.

Net cash used in investing activities of $21.4 million for the year ended December 31, 2003 resulted mainly from the net purchases of $14.0 million of available for sale securities, the purchase of property, plant and equipment of $6.3 million, and the purchase of a small technology business for $2.2 million. Net cash used in investing activities of $51.9 million for the year ended December 31, 2002 consisted mainly of net purchases of short-term and long-term investments of $28.7 million, $17.7 million for the acquisition of businesses and $7.9 million for the purchases of capital assets, partially offset by $2.5 million in proceeds from the sale of assets.

Net cash provided by financing activities of $5.3 million for the year ended December 31, 2003 consisted of $8.6 million in proceeds from the exercise of stock options and purchases under the employee stock purchase plan, net proceeds of $2.2 million from short-term borrowings, offset by $5.5 million of principal payments on long-term debt and capital lease obligations. Net cash provided by financing activities of $5.5 million for the year ended December 31, 2002 consisted mainly of proceeds from the exercise of stock options and purchases under the employee stock purchase plan of $8.9 million and $2.9 million in net proceeds from short-term borrowings offset by principal payments of $6.3 million on long-term debt and capital lease obligations.

On July 30, 2003, our $40.0 million unsecured credit facility with two domestic banks expired and we elected not to renew this facility. There had been no borrowings made under this line of credit.

Certain of our foreign subsidiaries have credit lines and short-term borrowing arrangements with various financial institutions which provide for aggregate borrowings as of December 31, 2003 of up to $28.0 million, which generally expire and are renewed in six month intervals. At December 31, 2003, total borrowings outstanding under these arrangements totaled $17.7 million with $10.3 million available for future borrowings.

Future payments due under debt, lease and purchase commitment obligations as of December 31, 2003 (in thousands) are as follows:

	PAYMENT DUE BY PERIOD				
CONTRACTUAL OBLIGATIONS	TOTAL	LESS THAN 1 YEAR	1-3 YEARS	4-5 YEARS	AFTER 5 YEARS
Debt	$28,969	$20,159	$ 3,810	$ --	$5,000
Interest on Debt	1,174	440	285	120	329
Capital Leases	174	44	130	--	--
Operating Leases	15,829	6,006	7,964	1,859	--
Purchase Obligations	50,152	50,152	--	--	--
Other Long-Term Liabilities(1)	2,671	--	1,912	--	759
Total	$98,969	$76,801	$14,101	$1,979	$6,088

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(1) Excluded from Other Long-Term Liabilities was $1.1 million of operating leases related to restructuring charges that have been accrued on our balance sheet as they are included in the Operating Leases amount above.

We believe that our working capital, together with the cash anticipated to be generated from operations will be sufficient to satisfy our estimated working capital and planned capital expenditure requirements through at least the next 12 months.

To the extent permitted by Massachusetts law, our Restated Articles of Organization, as amended, requires us to indemnify any of our current or former officers or directors or any person who has served or is serving in any capacity with respect to any of our employee benefit plans. Because no claim for indemnification has been made by any person covered by the relevant provisions of our Restated Articles of Organization, we believe that the estimated exposure for these indemnification obligations is currently minimal. Accordingly, we have no liabilities recorded for these requirements as of December 31, 2003.

We also enter into standard indemnification agreements in the ordinary course of business. Pursuant to these agreements, we indemnify, hold harmless and agree to reimburse the indemnified party for losses suffered or incurred by the indemnified party, generally our customers, in connection with any patent, or any other intellectual property infringement claim by any third party with respect to our products. The term of these indemnification agreements is generally perpetual any time after execution of the agreement. The maximum potential amount of future payments we could be required to make under these indemnification agreements is, in some instances, unlimited. We have never incurred costs to defend lawsuits or settle claims related to these indemnification agreements. As a result, we believe the estimated fair value of these agreements is minimal. Accordingly, we have no liabilities recorded for these agreements as of December 31, 2003.

When as part of an acquisition, we acquire all of the stock or all of the assets and liabilities of another company, we assume liability for certain events or occurrences that took place prior to the date of acquisition. The maximum potential amount of future payments we could be required to make for such obligations is undeterminable at this time. Other than obligations recorded as liabilities at the time of the acquisitions, historically we have not made significant payments for these indemnifications. Accordingly, no liabilities have been recorded for these obligations.

In conjunction with certain asset sales, we may provide routine indemnifications whose terms range in duration and often are not explicitly defined. Where appropriate, an obligation for such indemnifications is recorded as a liability. Because the amount of liability under these types of indemnifications are not explicitly stated, the overall maximum amount of the obligation under such indemnifications cannot be reasonably estimated. Other than obligations recorded as liabilities at the time of the asset sale, historically we have not made significant payments for these indemnifications.

DERIVATIVES

We conduct our operations globally. Consequently the results of our operations are exposed to movements in foreign currency exchange rates. We hedge a portion of our forecasted foreign currency denominated intercompany sales of inventory, over a maximum period of fifteen months, using forward exchange contracts and currency options primarily related to Japanese and European currencies. These derivatives are designated as cash-flow hedges, and changes in their fair value are carried in accumulated other comprehensive income until the hedged transaction affects earnings. When the hedged transaction affects earnings, the appropriate gain or loss from the derivative designated as a hedge of the transaction is reclassified from accumulated other comprehensive income to cost of sales. As of December 31, 2003 the amount that will be reclassified from accumulated other comprehensive income to earnings over the next twelve months is an unrealized loss of $2.1 million, net of taxes. The ineffective portion of the derivatives, primarily related to option premiums, is recorded in cost of sales and were immaterial in 2003, 2002 and 2001.

We hedge certain intercompany and other payables with foreign exchange contracts and currency options. Since these derivatives hedge existing amounts that are denominated in foreign currencies, the derivatives do not qualify for hedge accounting. The foreign exchange gain or loss on these derivatives was immaterial in 2003, 2002 and 2001.

Realized and unrealized gains and losses on forward exchange contracts and local currency purchased option contracts that do not qualify for hedge accounting are recognized immediately in earnings. The cash flows resulting from forward exchange contracts and local currency purchased options that qualify for hedge accounting are classified in the statement of cash flows as part of cash flows from operating activities. Cash flows resulting from forward exchange contracts and local currency purchased options that do not qualify for hedge accounting are classified in the statement of cash flows as investing activities. We do not hold or issue derivative financial instruments for trading purposes.

There were forward exchange contracts with notional amounts totaling $41.0 million outstanding at December 31, 2003. Of such forward exchange contracts, $32.5 million were outstanding to exchange Japanese yen for US dollars. There were forward exchange contracts with notional amounts totaling $23.3 million outstanding at December 31, 2002 of which $17.2 million were outstanding to exchange Japanese yen for US dollars. There were no forward exchange contracts outstanding at December 31, 2001. Local currency purchased options with notional amounts totaling $0, $5.1 million and $11.3 million to exchange foreign currencies for U.S. dollars were outstanding at December 31, 2003, 2002 and 2001, respectively.

Foreign exchange gains and losses on forward exchange contracts and currency options which did not qualify for hedge accounting were immaterial during 2003 and 2002. There were no foreign exchange gains or losses on forward exchange contracts which did not qualify for hedge accounting in 2001. Gains and losses on forward exchange contracts and local currency purchased options that qualify for hedge accounting are classified in cost of goods sold and totaled a loss of $1.4 million for the year ended December 31, 2003 and a gain of $0.5 million and $0.2 million for the years ended December 31, 2002 and 2001, respectively.

The fair values of local currency purchased options at December 31, 2002 and 2001, which were obtained through dealer quotes, were immaterial. There were no purchased options outstanding at December 31, 2003.

OFF-BALANCE SHEET ARRANGEMENTS

We do not have any financial partnerships with unconsolidated entities, such as entities often referred to as structured finance, special purpose entities or variable interest entities which are often established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes. Accordingly, we are not exposed to any financing, liquidity, market or credit risk that could arise if we had such relationships.

RECENTLY ISSUED ACCOUNTING PRONOUNCEMENTS

In January 2003, the Financial Accounting Standards Board ("FASB") issued FASB Interpretation No. 46, as amended by FIN 46R, "Consolidation of Variable Interest Entities, an Interpretation of ARB 51" ("FIN 46"). The primary objectives of FIN 46 are to provide guidance on the identification of entities for which control is achieved through means other than through voting rights ("variable interest entities" or "VIEs") and how to determine when and which business enterprise should consolidate the VIE. This new model for consolidation applies to an entity which either: (a) the equity investors (if any) do not have a controlling financial interest; or (b) the equity investment at risk is insufficient to finance that entity's activities without receiving additional subordinated financial support from other parties. In addition, FIN 46 requires that both the primary beneficiary and all other enterprises with a significant variable interest in a VIE make additional disclosures. FIN 46 is effective for all new VIEs created or acquired after January 31, 2003. For VIEs created or acquired prior to February 1, 2003, the provisions of FIN 46 must be applied for the first interim or annual period ending after March 15, 2004. We have not created or acquired any VIEs. The adoption of FIN 46 did not have a material impact on our financial position or results of operations.

FACTORS THAT MAY AFFECT FUTURE RESULTS

OUR BUSINESS DEPENDS SUBSTANTIALLY ON CAPITAL SPENDING IN THE SEMICONDUCTOR INDUSTRY WHICH IS CHARACTERIZED BY PERIODIC FLUCTUATIONS THAT MAY CAUSE A REDUCTION IN DEMAND FOR OUR PRODUCTS.

We estimate that approximately 69%, 70% and 64% of our net sales for the years ended December 31, 2003, 2002 and 2001, respectively, were to semiconductor capital equipment manufacturers and semiconductor device manufacturers, and we expect that sales to such customers will continue to account for a substantial majority of our sales. Our business depends upon the capital expenditures of semiconductor device manufacturers, which in turn depend upon the demand for semiconductors. Periodic reductions in demand for the products manufactured by semiconductor capital equipment manufacturers and semiconductor device manufacturers may adversely affect our business, financial condition and results of operations. Historically, the semiconductor market has been highly cyclical and has experienced periods of overcapacity, resulting in significantly reduced demand for capital equipment. Most recently, in 2001 and 2002, we experienced a significant reduction in demand from OEM customers, and lower gross margins due to reduced absorption of manufacturing overhead. As a result of this significant reduction in demand, particularly for older technology products, we incurred significant charges for excess and obsolete inventory of $16.6 million in 2001. In addition, many semiconductor manufacturers have operations and customers in Asia, a region which in recent years has experienced serious economic problems including currency devaluations, debt defaults, lack of liquidity and recessions. We cannot be certain that semiconductor downturns will not continue or recur. A decline in the level of orders as a result of any future downturn or slowdown in the semiconductor capital equipment industry could have a material adverse effect on our business, financial condition and results of operations.

OUR QUARTERLY OPERATING RESULTS HAVE VARIED, AND ARE LIKELY TO CONTINUE TO VARY SIGNIFICANTLY. THIS MAY RESULT IN VOLATILITY IN THE MARKET PRICE OF OUR COMMON STOCK.

A substantial portion of our shipments occur shortly after an order is received and therefore we operate with a low level of backlog. As a result, a decrease in demand for our products from one or more customers could occur with limited advance notice and could have a material adverse effect on our results of operations in any particular period. A significant percentage of our expenses are relatively fixed and based in part on expectations of future net sales. The inability to adjust spending quickly enough to compensate for any shortfall would magnify the adverse impact of a shortfall in net sales on our results of operations. Factors that could cause fluctuations in our net sales include:

- the timing of the receipt of orders from major customers;

- shipment delays;

- disruption in sources of supply;

- seasonal variations of capital spending by customers;

- production capacity constraints; and

- specific features requested by customers.

For example, the semiconductor capital equipment market experienced a significant downturn during 2001 and 2002. As a result, we experienced a reduction in demand from OEM customers, which has had a material adverse effect on our quarterly operating results during these years. During 2001, gross margins were negatively affected by significant charges for excess and obsolete inventory of $2.6 million in the second quarter and $14.0 million in the fourth quarter. These charges were primarily caused by a significant reduction in demand including reduced demand for older technology products. As a result of the factors discussed above, it is likely that we may in the future experience quarterly or annual fluctuations and that, in one or more future quarters, our operating results may fall below the expectations of public market analysts or investors. In any such event, the price of our common stock could decline significantly.

THE LOSS OF NET SALES TO ANY ONE OF OUR MAJOR CUSTOMERS WOULD LIKELY HAVE A MATERIAL ADVERSE EFFECT ON US.

Our top ten customers accounted for approximately 42%, 49% and 39% of our net sales for the years ended December 31, 2003, 2002 and 2001, respectively. The loss of a major customer or any reduction in orders by these customers, including reductions due to market or competitive conditions, would likely have a material adverse effect on our business, financial condition and results of operations. During the years ended December 31, 2003, 2002 and 2001, one customer, Applied Materials, accounted for approximately 18%, 23% and 18%, respectively, of our net sales. None of our significant customers, including Applied Materials, has entered into an agreement requiring it to purchase any minimum quantity of our products. The demand for our products from our semiconductor capital equipment customers depends in part on orders received by them from their semiconductor device manufacturer customers.

Attempts to lessen the adverse effect of any loss or reduction of net sales through the rapid addition of new customers could be difficult because prospective customers typically require lengthy qualification periods prior to placing volume orders with a new supplier. Our future success will continue to depend upon:

- our ability to maintain relationships with existing key customers;

- our ability to attract new customers;

- our ability to introduce new products in a timely manner for existing and new customers; and

- the success of our customers in creating demand for their capital equipment products which incorporate our products.

AS PART OF OUR BUSINESS STRATEGY, WE HAVE ENTERED INTO AND MAY ENTER INTO OR SEEK TO ENTER INTO BUSINESS COMBINATIONS AND ACQUISITIONS THAT MAY BE DIFFICULT TO INTEGRATE, DISRUPT OUR BUSINESS, DILUTE STOCKHOLDER VALUE OR DIVERT MANAGEMENT ATTENTION.

We have made several acquisitions since 2000. As a part of our business strategy, we may enter into additional business combinations and acquisitions. Acquisitions are typically accompanied by a number of risks, including the difficulty of integrating the operations and personnel of the acquired companies, the potential disruption of our ongoing business and distraction of management, expenses related to the acquisition and potential unknown liabilities associated with acquired businesses.

As a result of our recent acquisitions, we have added several different decentralized accounting systems, resulting in a complex reporting environment. We expect that we will need to continue to modify our accounting policies, internal controls, procedures and compliance programs to provide consistency across all our operations.

If we are not successful in completing acquisitions that we may pursue in the future, we may be required to reevaluate our growth strategy, and we may incur substantial expenses and devote significant management time and resources in seeking to complete proposed acquisitions that will not generate benefits for us.

In addition, with future acquisitions, we could use substantial portions of our available cash as all or a portion of the purchase price. We could also issue additional securities as consideration for these acquisitions, which could cause significant stockholder dilution. Our recent acquisitions and any future acquisitions may not ultimately help us achieve our strategic goals and may pose other risks to us.

WE HAVE HAD SIGNIFICANT OPERATING AND NET LOSSES, AND WE MAY HAVE FUTURE LOSSES.

We have not reported an annual operating profit or annual net income since 2000. We cannot predict whether we will experience operating losses and net losses in the future.

AN INABILITY TO CONVINCE SEMICONDUCTOR DEVICE MANUFACTURERS TO SPECIFY THE USE OF OUR PRODUCTS TO OUR CUSTOMERS, THAT ARE SEMICONDUCTOR CAPITAL EQUIPMENT MANUFACTURERS, WOULD WEAKEN OUR COMPETITIVE POSITION.

The markets for our products are highly competitive. Our competitive success often depends upon factors outside of our control. For example, in some cases, particularly with respect to mass flow controllers, semiconductor device manufacturers may direct semiconductor capital equipment manufacturers to use a specified supplier's product in their equipment. Accordingly, for such products, our success will depend in part on our ability to have semiconductor device manufacturers specify that our products be used at their semiconductor fabrication facilities. In addition, we may encounter difficulties in changing established relationships of competitors that already have a large installed base of products within such semiconductor fabrication facilities.

IF OUR PRODUCTS ARE NOT DESIGNED INTO SUCCESSIVE GENERATIONS OF OUR CUSTOMERS' PRODUCTS, WE WILL LOSE SIGNIFICANT NET SALES DURING THE LIFESPAN OF THOSE PRODUCTS.

New products designed by semiconductor capital equipment manufacturers typically have a lifespan of five to ten years. Our success depends on our products being designed into new generations of equipment for the semiconductor industry. We must develop products that are technologically current so that they are positioned to be chosen for use in each successive generation of semiconductor capital equipment. If our products are not chosen by our customers, our net sales may be reduced during the lifespan of our customers' products. In addition, we must make a significant capital investment to develop products for our customers well before our products are introduced and before we can be sure that we will recover our capital investment through sales to the customers in significant volume. We are thus also at risk during the development phase that our products may fail to meet our customers' technical or cost requirements and may be replaced by a competitive product or alternative technology solution. If that happens, we may be unable to recover our development costs.

THE SEMICONDUCTOR INDUSTRY IS SUBJECT TO RAPID DEMAND SHIFTS WHICH ARE DIFFICULT TO PREDICT. AS A RESULT, OUR INABILITY TO EXPAND OUR MANUFACTURING CAPACITY IN RESPONSE TO THESE RAPID SHIFTS MAY CAUSE A REDUCTION IN OUR MARKET SHARE.

Our ability to increase sales of certain products depends in part upon our ability to expand our manufacturing capacity for such products in a timely manner. If we are unable to expand our manufacturing capacity on a timely basis or to manage such expansion effectively, our customers could implement our competitors' products and, as a result, our market share could be reduced. Because the semiconductor industry is subject to rapid demand shifts which are difficult to foresee, we may not be able to increase capacity quickly enough to respond to a rapid increase in demand in the semiconductor industry. Additionally, capacity expansion could increase our fixed operating expenses and if sales levels do not increase to offset the additional expense levels associated with any such expansion, our business, financial condition and results of operations could be materially adversely affected.

WE OPERATE IN A HIGHLY COMPETITIVE INDUSTRY.

The market for our products is highly competitive. Principal competitive factors include:

- historical customer relationships;

- product quality, performance and price;

- breadth of product line;

- manufacturing capabilities; and

- customer service and support.

Although we believe that we compete favorably with respect to these factors, there can be no assurance that we will continue to do so. We encounter substantial competition in most of our product lines. Certain of our competitors may have greater financial and other resources than we have. In some cases, competitors are smaller than we are, but well established in specific product niches. We may encounter difficulties in changing established relationships of competitors with a large installed base of products at such customers' fabrication facilities. In addition, our competitors can be expected to continue to improve the design and performance of their products. There can be no assurance that competitors will not develop products that offer price or performance features superior to those of our products.

SALES TO FOREIGN MARKETS CONSTITUTE A SUBSTANTIAL PORTION OF OUR NET SALES; THEREFORE, OUR NET SALES AND RESULTS OF OPERATIONS COULD BE ADVERSELY AFFECTED BY DOWNTURNS IN ECONOMIC CONDITIONS IN COUNTRIES OUTSIDE OF THE UNITED STATES.

International sales include sales by our foreign subsidiaries, but exclude direct export sales, which were less than 10% of our total net sales for each of the years ended December 31, 2003, 2002 and 2001. International sales accounted for approximately 41%, 36% and 31% of net sales for the years ended December 31, 2003, 2002 and 2001, respectively, a significant portion of which were sales to Japan.

We anticipate that international sales will continue to account for a significant portion of our net sales. In addition, certain of our key domestic customers derive a significant portion of their revenues from sales in international markets. Therefore, our sales and results of operations could be adversely affected by economic slowdowns and other risks associated with international sales.

RISKS RELATING TO OUR INTERNATIONAL OPERATIONS COULD ADVERSELY AFFECT OUR OPERATING RESULTS.

We have substantial international sales, service and manufacturing operations in Europe and Asia, which exposes us to foreign operational and political risks that may harm our business. Our international operations are subject to inherent risks, which may adversely affect us, including:

- political and economic instability in countries where we have sales, service and manufacturing operations, particularly in Asia;

- fluctuations in the value of currencies and high levels of inflation, particularly in Asia and Europe;

- changes in labor conditions and difficulties in staffing and managing foreign operations, including, but not limited to, labor unions;

- greater difficulty in collecting accounts receivable and longer payment cycles;

- burdens and costs of compliance with a variety of foreign laws;

- increases in duties and taxation;

- imposition of restrictions on currency conversion or the transfer of funds;

- changes in export duties and limitations on imports or exports;

- expropriation of private enterprises; and

- unexpected changes in foreign regulations.

If any of these risks materialize, our operating results may be adversely affected.

UNFAVORABLE CURRENCY EXCHANGE RATE FLUCTUATIONS MAY LEAD TO LOWER GROSS MARGINS, OR MAY CAUSE US TO RAISE PRICES WHICH COULD RESULT IN REDUCED SALES.

Currency exchange rate fluctuations could have an adverse effect on our net sales and results of operations and we could experience losses with respect to our hedging activities. Unfavorable currency fluctuations could require us to increase prices to foreign customers which could result in lower net sales by us to such customers. Alternatively, if we do not adjust the prices for our products in response to unfavorable currency fluctuations, our results of operations could be adversely affected. In addition, sales made by our foreign subsidiaries are denominated in the currency of the country in which these products are sold and the currency they receive in payment for such sales could be less valuable at the time of receipt as a result of exchange rate fluctuations. We enter into forward exchange contracts and local currency purchased options to reduce currency exposure arising from intercompany sales of inventory. However, we cannot be certain that our efforts will be adequate to protect us against significant currency fluctuations or that such efforts will not expose us to additional exchange rate risks.

KEY PERSONNEL MAY BE DIFFICULT TO ATTRACT AND RETAIN.

Our success depends to a large extent upon the efforts and abilities of a number of key employees and officers, particularly those with expertise in the semiconductor manufacturing and similar industrial manufacturing industries. The loss of key employees or officers could have a material adverse effect on our business, financial condition and results of operations. We believe that our future success will depend in part on our ability to attract and retain highly skilled technical, financial, managerial and marketing personnel. We cannot be certain that we will be successful in attracting and retaining such personnel.

OUR PROPRIETARY TECHNOLOGY IS IMPORTANT TO THE CONTINUED SUCCESS OF OUR BUSINESS. OUR FAILURE TO PROTECT THIS PROPRIETARY TECHNOLOGY MAY SIGNIFICANTLY IMPAIR OUR COMPETITIVE POSITION.

As of December 31, 2003, we owned 194 U.S. patents, 123 foreign patents and had 84 pending U.S. patent applications. Although we seek to protect our intellectual property rights through patents, copyrights, trade secrets and other measures, we cannot be certain that:

- we will be able to protect our technology adequately;

- competitors will not be able to develop similar technology independently;

- any of our pending patent applications will be issued;

- intellectual property laws will protect our intellectual property rights; or

- third parties will not assert that our products infringe patent, copyright or trade secrets of such parties.

PROTECTION OF OUR INTELLECTUAL PROPERTY RIGHTS MAY RESULT IN COSTLY LITIGATION.

Litigation may be necessary in order to enforce our patents, copyrights or other intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others or to defend against claims of infringement. We have been in the past, and currently are, involved in lawsuits enforcing and defending, our intellectual property rights, and may be involved in such litigation in the future. Such litigation could result in substantial costs and diversion of resources and could have a material adverse effect on our business, financial condition and results of operations.

We may need to expend significant time and expense to protect our intellectual property regardless of the validity or successful outcome of such intellectual property claims. If we lose any litigation, we may be required to seek licenses from others or change, stop manufacturing or stop selling some of our products.

THE MARKET PRICE OF OUR COMMON STOCK HAS FLUCTUATED AND MAY CONTINUE TO FLUCTUATE FOR REASONS OVER WHICH WE HAVE NO CONTROL.

The stock market has from time to time experienced, and is likely to continue to experience, extreme price and volume fluctuations. Prices of securities of technology companies have been especially volatile and have often fluctuated for reasons that are unrelated to the operating performance of the companies. The market price of shares of our common stock has fluctuated greatly since our initial public offering and could continue to fluctuate due to a variety of factors. In the past, companies that have experienced volatility in the market price of their stock have been the objects of securities class action litigation. If we were the object of securities class action litigation, it could result in substantial costs and a diversion of our management's attention and resources.

OUR DEPENDENCE ON SOLE, LIMITED SOURCE SUPPLIERS, AND INTERNATIONAL SUPPLIERS, COULD AFFECT OUR ABILITY TO MANUFACTURE PRODUCTS AND SYSTEMS.

We rely on sole, limited source suppliers, and international suppliers, for a few of our components and subassemblies that are critical to the manufacturing of our products. This reliance involves several risks, including the following:

- the potential inability to obtain an adequate supply of required components;

- reduced control over pricing and timing of delivery of components; and

- the potential inability of our suppliers to develop technologically advanced products to support our growth and development of new systems.

We believe that in time we could obtain and qualify alternative sources for most sole, limited source and international supplier parts. Seeking alternative sources of the parts could require us to redesign our systems, resulting in increased costs and likely shipping delays. We may be unable to redesign our systems, which could result in further costs and shipping delays. These increased costs would decrease our profit margins if we could not pass the costs to our customers. Further, shipping delays could damage our relationships with current and potential customers and have a material adverse effect on our business and results of operations.

WE ARE SUBJECT TO GOVERNMENTAL REGULATIONS. IF WE FAIL TO COMPLY WITH THESE REGULATIONS, OUR BUSINESS COULD BE HARMED.

We are subject to federal, state, local and foreign regulations, including environmental regulations and regulations relating to the design and operation of our power supply products. We must ensure that these systems meet certain safety standards, many of which vary across the countries in which our systems are used. For example, the European Union has published directives specifically relating to power supplies. We must comply with these directives in order to ship our systems into countries that are members of the European Union. We believe we are in compliance with current applicable regulations, directives and standards and have obtained all necessary permits, approvals, and authorizations to conduct our business. However, compliance with future regulations, directives and standards could require us to modify or redesign certain systems, make capital expenditures or incur substantial costs. If we do not comply with current or future regulations, directives and standards:

- we could be subject to fines;

- our production could be suspended; or

- we could be prohibited from offering particular systems in specified markets.

CERTAIN STOCKHOLDERS HAVE A SUBSTANTIAL INTEREST IN US AND MAY BE ABLE TO EXERT SUBSTANTIAL INFLUENCE OVER OUR ACTIONS.

As of January 31, 2004, John R. Bertucci, our Chairman, Chief Executive Officer and President, and certain members of his family, in the aggregate, beneficially owned approximately 18% of our outstanding common stock. As a result, these stockholders, acting together, are able to exert substantial influence over our actions. Pursuant to the acquisition of the ENI Business of Emerson Electric Co. ("Emerson"), we issued approximately 12,000,000 shares of common stock to Emerson and its wholly owned subsidiary, Astec America, Inc. Emerson owned approximately 19% of our outstanding common stock as of January 31, 2004, and James G. Berges, the President and a director of Emerson, is a member of our board of directors. Accordingly, Emerson is able to exert substantial influence over our actions.

SOME PROVISIONS OF OUR RESTATED ARTICLES OF ORGANIZATION, AS AMENDED, OUR AMENDED AND RESTATED BY-LAWS AND MASSACHUSETTS LAW COULD DISCOURAGE POTENTIAL ACQUISITION PROPOSALS AND COULD DELAY OR PREVENT A CHANGE IN CONTROL OF US.

Anti-takeover provisions could diminish the opportunities for stockholders to participate in tender offers, including tender offers at a price above the then current market price of the common stock. Such provisions may also inhibit increases in the market price of the common stock that could result from takeover attempts. For example, while we have no present plans to issue any preferred stock, our board of directors, without further stockholder approval, may issue preferred stock that could have the effect of delaying, deterring or preventing a change in control of us. The issuance of preferred stock could adversely affect the voting power of the holders of our common stock, including the loss of voting control to others. In addition, our amended and restated by-laws provide for a classified board of directors consisting of three classes. The classified board could also have the effect of delaying, deterring or preventing a change in control of us.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

MARKET RISK AND SENSITIVITY ANALYSIS

Our primary exposures to market risks include fluctuations in interest rates on our investment portfolio, short and long term debt as well as fluctuations in foreign currency exchange rates.

FOREIGN EXCHANGE RATE RISK

We enter into local currency purchased options and forward exchange contracts to reduce currency exposure arising from intercompany sales of inventory. The potential fair value loss for a hypothetical 10% adverse change in currency exchange rates on our local currency purchased options at December 31, 2002 was immaterial. There were no local currency purchased options outstanding at December 31, 2003. The potential loss in 2002 was estimated by calculating the fair value of the local currency purchased options at December 31, 2002 and comparing that with those calculated using the hypothetical currency exchange rates.

There were forward exchange contracts with notional amounts totaling $41.0 million and $23.3 million outstanding at December 31, 2003 and 2002, respectively. Of such forward exchange contracts, $32.5 million and $17.2 million, respectively, were outstanding to exchange Japanese yen for US dollars with the remaining amounts relating to the British pound and Euro. The potential fair value loss for a hypothetical 10% adverse change in the forward currency exchange rate on our forward exchange contracts at December 31, 2003 and 2002 would be $4.8 million and $2.7 million, respectively. The potential losses in 2003 and 2002 were estimated by calculating the fair value of the forward exchange contracts at December 31, 2003 and 2002 and comparing that with those calculated using the hypothetical forward currency exchange rates.

At December 31, 2003, MKS had $18,669,000 related to short-term borrowings and current portion of long-term debt denominated in Japanese yen. The carrying value of these short-term borrowings approximates fair value due to their short period to maturity. Assuming a hypothetical 10% adverse change in the Japanese yen to U.S. dollar year end exchange rate, the fair value of these short-term borrowings would increase by $2,074,000. The potential increase in fair value was estimated by calculating the fair value of the short-term borrowings at December 31, 2003 and comparing that with the fair value using the hypothetical year end exchange rate.

At December 31, 2002, MKS had $13,877,000 related to short-term borrowings denominated in Japanese yen. The carrying value of these short-term borrowings approximates fair value due to their short period to maturity. Assuming a hypothetical 10% adverse change in the Japanese yen to U.S. dollar year end exchange rate, the fair value of these short-term borrowings would increase by $1,542,000. The potential increase in fair value was estimated by calculating the fair value of the short-term borrowings at December 31, 2002 and comparing that with the fair value using the hypothetical year end exchange rate.

INTEREST RATE RISK

Due to its short-term duration, the fair value of our cash and investment portfolio at December 31, 2003 and 2002 approximated its carrying value. Interest rate risk was estimated as the potential decrease in fair value resulting from a hypothetical 10% increase in interest rates for securities contained in the investment portfolio. The resulting hypothetical fair value was not materially different from the year-end carrying values.

Our total long-term debt outstanding, including the current portion, at December 31, 2003 and 2002, was $11.2 million and $15.7 million, respectively, and consisted mainly of a mortgage note and industrial development revenue bond. The interest rates on these debt instruments are variable and range from 1.2% to 2.6% at December 31, 2003 and 2.1% to 3.1% at December 31, 2002. Due to the immaterial amounts of the outstanding debt, a hypothetical change of 10% in interest rates would not have a material effect on our near-term financial condition or results of operations.

The Company from time to time has outstanding short-term borrowings with variable interest rates, primarily denominated in Japanese yen. At December 31, 2003 and 2002, we had $17.7 million and $13.9 million, respectively, outstanding related to these short-term borrowings at interest rates ranging from 1.13% to 1.50%. Due to the short-term nature and amount of this short-term debt, a hypothetical change of 10% in interest rates would not have a material effect on our near-term financial condition or results of operations.

ITEM 8. FINANCIAL STATEMENTS

REPORT OF INDEPENDENT AUDITORS

To the Board of Directors and Stockholders of
MKS Instruments, Inc.:

In our opinion, the consolidated financial statements listed in the index appearing under Item 15(a)(1) present fairly, in all material respects, the financial position of MKS Instruments, Inc. and its subsidiaries at December 31, 2003 and 2002 and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2003 in conformity with accounting principles generally accepted in the United States of America. In addition, in our opinion, the financial statement schedule listed in the index appearing under Item 15(a)(2) presents fairly, in all material respects, the information set forth therein when read in conjunction with the related consolidated financial statements. These financial statements and financial statement schedule are the responsibility of the Company's management; our responsibility is to express an opinion on these financial statements and financial statement schedule based on our audits. We conducted our audits of these statements in accordance with auditing standards generally accepted in the United States of America, which require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

As discussed in Notes 2 and 15 to the consolidated financial statements, the Company changed its method of accounting for goodwill and other intangible assets upon adoption of Statement of Financial Accounting Standards No. 142, "Goodwill and Other Intangible Assets" on January 1, 2002.

PricewaterhouseCoopers LLP

Boston, Massachusetts
January 30, 2004

MKS INSTRUMENTS, INC.

CONSOLIDATED BALANCE SHEETS

	DECEMBER 31	
	2003	2002
	(IN THOUSANDS, EXCEPT SHARE DATA)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 74,660	$ 88,820
Short-term investments	54,518	39,894
Trade accounts receivable, net of allowances of $1,844 and $3,264 at December 31, 2003 and 2002, respectively	65,454	45,505
Inventories	82,013	73,235
Other current assets	5,631	6,098
Total current assets	282,276	253,552
Property, plant and equipment, net	76,121	82,595
Long-term investments	13,625	15,980
Goodwill, net	259,924	259,781
Acquired intangible assets, net	56,192	67,720
Other assets	4,724	5,995
Total assets	$692,862	$685,623
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Short-term borrowings	$ 17,736	$ 13,877
Current portion of long-term debt	2,423	4,263
Current portion of capital lease obligations	37	332
Accounts payable	25,302	15,301
Accrued compensation	7,711	6,117
Other accrued expenses	18,599	21,654
Total current liabilities	71,808	61,544
Long-term debt	8,810	11,469
Long-term portion of capital lease obligations	114	257
Other liabilities	3,820	1,663
Commitments and contingencies (Notes 7 and 19)		
Stockholders' equity:		
Preferred Stock, $0.01 par value, 2,000,000 shares authorized; none issued and outstanding	--	--
Common Stock, no par value, 200,000,000 shares authorized; 52,040,019 and 51,359,753 shares issued and outstanding at December 31, 2003 and 2002, respectively	113	113
Additional paid-in capital	587,910	579,175
Retained earnings	12,238	28,623
Accumulated other comprehensive income	8,049	2,779
Total stockholders' equity	608,310	610,690
Total liabilities and stockholders' equity	$692,862	$685,623

The accompanying notes are an integral part of the consolidated financial statements.

MKS INSTRUMENTS, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

	YEAR ENDED DECEMBER 31		
	2003	2002	2001
	(IN THOUSANDS, EXCEPT PER SHARE DATA)		
Net sales	$337,291	$314,773	$286,808
Cost of sales	219,182	208,978	201,225
Gross profit	118,109	105,795	85,583
Research and development	47,650	45,999	37,964
Selling, general and administrative	69,891	77,830	70,185
Amortization of goodwill and acquired intangible assets	14,692	13,897	11,026
Restructuring and asset impairment charges	1,593	2,726	3,720
Merger expenses	--	--	7,708
Purchase of in-process technology	--	8,390	2,340
Loss from operations	(15,717)	(43,047)	(47,360)
Interest expense	689	1,231	1,513
Interest income	1,745	2,681	5,196
Income from litigation settlement	--	4,200	--
Other expense (income), net	(927)	4,121	2,379
Loss before income taxes	(13,734)	(41,518)	(46,056)
Provision (benefit) for income taxes	2,651	(1,981)	(15,013)
Net loss	$(16,385)	$(39,537)	$(31,043)
Net loss per share: Basic and diluted	$ (0.32)	$ (0.79)	$ (0.83)
Weighted average common shares outstanding: Basic and diluted	51,581	50,000	37,493

The accompanying notes are an integral part of the consolidated financial statements.

MKS INSTRUMENTS, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

FOR THE YEARS ENDED DECEMBER 31,
2003, 2002 AND 2001 ---------------

------ ACCUMULATED COMMON STOCK
ADDITIONAL OTHER TOTAL ------------
------- PAID-IN RETAINED
COMPREHENSIVE COMPREHENSIVE
STOCKHOLDERS' SHARES AMOUNT CAPITAL
EARNINGS INCOME (LOSS) INCOME
(LOSS) EQUITY ---------- ------ ---
------- -------- ------------- ----
--------- ------------- (IN
THOUSANDS, EXCEPT SHARE DATA)
BALANCE AT DECEMBER 31,
2000........ 36,645,665 $113
$263,723 $93,235 $ 451 $357,522
Issuance of common stock from
exercise of stock options and
Employee Stock Purchase Plan.......
693,089 6,391 6,391 Tax benefit
from exercise of stock
options...........................
2,342 2,342 Issuance of common
stock for acquisition of
business........... 659,945 12,110
12,110 Stock option compensation
and
other..............................
686 686 Comprehensive loss: Net
loss..........................
(31,043) $(31,043) (31,043) Other
comprehensive income, net of taxes
of $892: Changes in value of
financial instruments designated as
cash flow hedges and unrealized
gain (loss) on
investment............ 104 104 104
Foreign currency translation
adjustment......................
(1,209) (1,209) (1,209) --------
Comprehensive loss.................
(32,148) ======== Adjustment to
conform ASTeX's year
end................................
5,968 5,968 ---------- ---- -------
- ------- ------- -------- BALANCE
AT DECEMBER 31, 2001........
37,998,699 113 285,252 68,160 (654)
352,871 Issuance of common stock
from exercise of stock options and
Employee Stock Purchase Plan.......
661,054 8,920 8,920 Tax benefit
from exercise of stock
options...........................
1,648 1,648 Issuance of common
stock for acquisition of
businesses......... 12,700,000
282,341 282,341 Stock option
compensation.......... 1,014 1,014
Comprehensive loss: Net
loss..........................
(39,537) (39,537) (39,537) Other
comprehensive income: Changes in
value of financial instruments
designated as cash flow hedges and
unrealized gain (loss) on
investment............ (693) (693)
(693) Foreign currency translation
adjustment......................
4,126 4,126 4,126 --------
Comprehensive loss.................
(36,104) ---------- ---- -------- -
------ ------- ======== --------

BALANCE AT DECEMBER 31,
2002........ 51,359,753 113 579,175
28,623 2,779 610,690 Issuance of
common stock from exercise of stock
options and Employee Stock Purchase
Plan....... 680,266 8,603 8,603
Other...............................
132 132 Comprehensive loss: Net
loss..........................
(16,385) (16,385) (16,385) Other
comprehensive income: Changes in
value of financial instruments
designated as cash flow hedges and
unrealized gain (loss) on
investment............. (1,780)
(1,780) (1,780) Foreign currency
translation
adjustment.......................
7,050 7,050 7,050 --------
Comprehensive loss.................
$(11,115) ---------- ---- --------
------- ------- ======== --------
BALANCE AT DECEMBER 31,
2003........ 52,040,019 $113
$587,910 $12,238 $ 8,049 $608,310
========== ==== ======== =======
======= ========

The accompanying notes are an integral part of the consolidated financial statements.

MKS INSTRUMENTS, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

	2003	2002	2001
	YEAR ENDED DECEMBER 31 (IN THOUSANDS)		
Cash flows from operating activities:			
Net loss	$(16,385)	$(39,537)	$(31,043)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Depreciation and amortization	28,198	28,727	26,705
Purchase of in-process technology	--	8,390	2,340
Asset impairment charges	--	4,988	--
Deferred taxes	716	250	(11,452)
Other	151	1,424	2,496
Changes in operating assets and liabilities, net of effects of businesses acquired:			
Trade accounts receivable	(16,333)	(874)	58,911
Inventories	(6,656)	6,600	16,218
Other current assets	1,328	12,263	(9,637)
Accrued expenses	(924)	(7,271)	(12,170)
Accounts payable	9,720	(1,111)	(14,293)
Income taxes payable	--	--	(7,967)
Net cash provided by (used in) operating activities	(185)	13,849	20,108
Cash flows from investing activities:			
Purchases of short-term and long-term available-for-sale Investments	(93,999)	(102,283)	(22,545)
Maturities and sales of short-term and long-term available-for-sale Investments	80,046	73,568	21,066
Purchases of property, plant and equipment	(6,348)	(7,948)	(14,638)
Proceeds from sale of assets and investment	--	2,500	4,726
Business combinations, net of cash acquired	(2,150)	(17,696)	(7,121)
Other	1,100	(68)	383
Net cash used in investing activities	(21,351)	(51,927)	(18,129)
Cash flows from financing activities:			
Proceeds from short-term borrowings	69,791	12,771	32,117
Payments on short-term borrowings	(67,619)	(9,905)	(36,944)
Proceeds from long-term debt	--	--	833
Payments on long-term debt	(5,029)	(5,846)	(2,810)
Proceeds from exercise of stock options and Employee Stock Purchase Plan	8,603	8,920	6,391
Principal payments under capital lease obligations	(456)	(481)	(706)
Net cash provided by (used in) financing activities	5,290	5,459	(1,119)
Effect of exchange rate changes on cash and cash equivalents	2,086	570	69
Increase (decrease) in cash and cash equivalents	(14,160)	(32,049)	929
Cash and cash equivalents at beginning of period	88,820	120,869	123,082
Effect of excluded results of ASTeX	--	--	(3,142)
Cash and cash equivalents at end of period	$ 74,660	$ 88,820	$120,869
Supplemental disclosure of cash flow information: Cash paid during the period for:			
Interest	$ 664	$ 1,141	$ 1,074
Income taxes	$ 512	$ 1,101	$ 16,032

Supplemental schedule of noncash investing and financing activities: Stock and stock options issued for acquisitions......... $ -- $282,341 $ 12,110 Note receivable from sale of assets..................... $ -- $ -- $ 3,928

The accompanying notes are an integral part of the consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

1) DESCRIPTION OF BUSINESS

MKS Instruments, Inc. was founded in 1961 and is a leading worldwide provider of instruments, components, subsystems and process control solutions that measure, control, power and monitor critical parameters of semiconductor and other advanced manufacturing processes. MKS is managed as one operating segment which is organized around three product groups: Instruments and Control Systems, Power and Reactive Gas Products and Vacuum Products. MKS' products are derived from its core competencies in pressure measurement and control, materials delivery, gas and thin-film composition analysis, control and information management, power and reactive gas generation and vacuum technology.

2) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

BASIS OF PRESENTATION

All significant intercompany accounts and transactions have been eliminated in consolidation. On January 26, 2001, MKS Instruments, Inc. completed its acquisition of Applied Science and Technology, Inc. ("ASTeX") in a transaction accounted for under the pooling of interests method of accounting and, accordingly, the consolidated financial statements reflect the combined financial position, results of operations and cash flows of MKS Instruments, Inc., ASTeX and their respective subsidiaries (together, the "Company" or "MKS"), for all periods presented. These consolidated financial statements combine the historical consolidated financial statements of the Company for all periods presented and the ASTeX share information has been converted to the MKS share equivalent.

NET INCOME PER SHARE

Basic earnings per share is based on the weighted average number of common shares outstanding, and diluted earnings per share is based on the weighted average number of common shares outstanding and all dilutive potential common equivalent shares outstanding. The dilutive effect of options is determined under the treasury stock method using the average market price for the period. Common equivalent shares are included in the per share calculations when the effect of their inclusion would be dilutive.

The following is a reconciliation of basic to diluted net income per share:

FOR THE YEAR ENDED DECEMBER 31,	2003	2002	2001
Net loss	$ (16,385)	$ (39,537)	$ (31,043)
Shares used in net income (loss) per common shares -- basic	51,581,000	50,000,000	37,493,000
Effect of dilutive securities: Stock options	--	--	--
Shares used in net income (loss) per common share -- diluted	51,581,000	50,000,000	37,493,000
Net loss per common share -- basic and diluted	$ (0.32)	$ (0.79)	$ (0.83)

For purposes of computing diluted earnings per share, weighted average common share equivalents do not include stock options with an exercise price greater than the average market price of the common shares during the period. Options outstanding of 8,897,899, 8,284,693 and 5,958,735 during the years ended December 31, 2003, 2002 and 2001, respectively, are excluded from the calculation of diluted net loss per common share because their inclusion would be anti-dilutive.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

STOCK-BASED COMPENSATION

The Company has several stock-based employee compensation plans. The Company accounts for stock-based awards to employees using the intrinsic value method as prescribed by Accounting Principles Board ("APB") Opinion No. 25, "Accounting for Stock Issued to Employees," and related interpretations. Accordingly, no compensation expense is recorded for options issued to employees in fixed amounts with fixed exercise prices at least equal to the fair market value of the Company's common stock at the date of grant. The Company has adopted the provisions of SFAS No. 123, "Accounting for Stock-Based Compensation," as amended by SFAS No. 148, "Accounting for Stock-Based Compensation -- Transition and Disclosure," through disclosure only.

The following table illustrates the effect on net income and net income per share if the Company had applied the fair value recognition provisions of SFAS No. 123 to stock-based employee awards:

	2003	2002	2001
Net loss			
Net loss as reported	$(16,385)	$(39,537)	$(31,043)
Add: Stock-based employee compensation expense included in reported net loss, net of tax	--	1,014	114
Deduct: Total stock-based employee compensation expense determined under the fair-value-based method for all awards, net of tax	(21,820)	(18,245)	(20,466)
Pro forma net loss	$(38,205)	$(56,768)	$(51,395)
Basic and diluted net loss per share:			
Net loss as reported	$ (0.32)	$ (0.79)	$ (0.83)
Pro forma net loss	$ (0.74)	$ (1.14)	$ (1.37)

There is no tax benefit included in the stock-based employee compensation expense determined under the fair-value-based method for the years ended December 31, 2003 and 2002, as the Company established a full valuation allowance for its net deferred tax assets during 2002.

The weighted average grant date fair value of options granted during 2003, 2002 and 2001 was $15.91, $14.22 and $14.65 per option, respectively. The fair value of options at the date of grant was estimated using the Black-Scholes option-pricing model with the following weighted average assumptions:

	2003	2002	2001
Expected life (years)	5.0	5.0	5.0
Interest rate	3.3%	3.9%	4.3%
Volatility	78.0%	81.0%	83.0%
Dividend yield	0.0%	0.0%	0.0%

The weighted average fair value of employee stock purchase rights granted in 2003, 2002 and 2001 under the Purchase Plan was $7.08, $9.35, and $7.19, respectively. The fair value of the employees' purchase rights was estimated using the Black-Scholes option-pricing model with the following weighted average assumptions:

	2003	2002	2001
Expected life (years)	0.5	0.5	0.5
Interest rate	1.2%	1.9%	5.0%
Volatility			

78.0% 81.0% 83.0% Dividend
yield... 0.0%
0.0% 0.0%

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

FOREIGN EXCHANGE

The functional currency of the majority of the Company's foreign subsidiaries is the applicable local currency. For those subsidiaries, assets and liabilities are translated to U.S. dollars at year-end exchange rates. Income and expense accounts are translated at the average exchange rates prevailing for the year. The resulting translation adjustments are included in accumulated other comprehensive income in consolidated stockholders' equity. Foreign exchange transaction gains and losses were immaterial in 2003, 2002 and 2001.

REVENUE RECOGNITION

Revenue from product sales is recorded upon transfer of title and risk of loss to the customer provided that there is evidence of an arrangement, the sales price is fixed or determinable, and collection of the related receivable is reasonably assured. In most transactions, the Company has no obligations to customers after the date products are shipped other than pursuant to warranty obligations. In some instances, the Company provides installation and training to customers after the product has been shipped. In accordance with the Emerging Issues Task Force ("EITF") 00-21 "Accounting For Revenue Arrangements With Multiple Deliverables," the Company allocates the revenue between the multiple elements based upon fair value and defers the revenue related to the undelivered elements until the installation or training is complete. Fair value is the price charged when the element is sold separately. The Company provides for the estimated costs to fulfill customer warranty obligations upon the recognition of the related revenue. Shipping and handling fees, if any, billed to customers are recognized as revenue. The related shipping and handling costs are recognized in cost of sales. Accounts receivable allowances include sales returns and bad debt allowances. The Company monitors and tracks the amount of product returns and reduces revenue at the time of shipment for the estimated amount of such future returns, based on historical experience. The Company makes estimates evaluating its allowance for doubtful accounts. The Company continuously monitors collections and payments from its customers and maintains a provision for estimated credit losses based upon its historical experience and any specific customer collection issues that it has identified.

CASH AND CASH EQUIVALENTS AND INVESTMENTS

All highly liquid investments with an original maturity of three months or less at the date of purchase are considered to be cash equivalents.

Cash and cash equivalents consists of the following:

	DECEMBER 31,	
	2003	2002
Cash and Money Market Instruments	$60,869	$51,538
Commercial Paper	12,645	31,216
Corporate Obligations	270	--
Federal Government and Government Agency Obligations	876	6,066
	$74,660	$88,820

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

The fair value of short-term available-for-sale investments maturing within one year consists of the following:

DECEMBER 31,	2003	2002
Federal Government and Government Agency Obligations........	$41,566	$28,636
Commercial Paper..	10,449	10,400
Corporate Obligations......................................	2,503	858
	$54,518	$39,894

The fair value of long-term available-for-sale investments with maturities of 1 to 5 years consists of the following:

DECEMBER 31,	2003	2002
Federal Government and Government Agency Obligations........	$ 4,807	$ 2,061
Corporate Obligations......................................	5,499	13,919
Commercial Paper..	3,319	--
	$13,625	$15,980

The appropriate classification of investments in securities is determined at the time of purchase. Debt securities that the Company does not have the intent and ability to hold to maturity are classified as "available-for-sale" and are carried at fair value. Unrealized gains and losses on securities classified as available-for-sale are included in accumulated other comprehensive income in consolidated stockholders' equity. Gross unrealized gains and gross unrealized losses on available-for-sale investments were not material at December 31, 2003 and 2002. Realized gains (losses) on securities were immaterial in 2003, 2002 and 2001. The cost of securities sold is based on the specific identification method.

INVENTORIES

The Company values its inventory at the lower of cost (first-in, first-out method) or market. The Company regularly reviews inventory quantities on hand and records a provision to write down excess and obsolete inventory to its estimated net realizable value, if less than cost, based primarily on its estimated forecast of product demand.

PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment are stated at cost. Equipment acquired under capital leases is recorded at the present value of the minimum lease payments required during the lease period. Expenditures for major renewals and betterments that extend the useful lives of property, plant and equipment are capitalized. Expenditures for maintenance and repairs are charged to expense as incurred. When assets are sold or otherwise disposed of, the cost and related accumulated depreciation are eliminated from the accounts and any resulting gain or loss is recognized in earnings.

Depreciation is provided on the straight-line method over the estimated useful lives of twenty to thirty-one and one-half years for buildings and three to seven years for machinery and equipment and furniture and fixtures. Leasehold improvements are amortized over the shorter of the lease term or the estimated useful life of the leased asset.

INTANGIBLE ASSETS

Intangible assets resulting from the acquisitions of entities accounted for using the purchase method of accounting are estimated by management based on the fair value of assets received. These include acquired customer lists, technology, patents, trade name, and covenants not to compete. Intangible assets are amortized from three to eight years on a straight-line basis which represents the estimated periods of benefit.

GOODWILL

Goodwill is the amount by which the cost of acquired net assets exceeded the fair value of those net assets on the date of acquisition. Through December 31, 2001, the Company amortized goodwill on a straight-line basis over its expected useful life of 5 to 7 years. As of January 1, 2002 the Company ceased amortizing goodwill in compliance with Statement of Financial Accounting Standards No. 142, "Goodwill and Other Intangible Assets" ("SFAS 142").

The Company assesses goodwill for impairment on an annual basis during the fourth quarter of each fiscal year, or more frequently when events and circumstances occur indicating that the recorded goodwill may be impaired. If the book value of a reporting unit exceeds its fair value, the implied fair value of goodwill is compared with the carrying amount of goodwill. If the carrying amount of goodwill exceeds the implied fair value, an impairment loss is recorded equal to that excess.

IMPAIRMENT OF LONG-LIVED ASSETS

The Company evaluates the recoverability of its long-lived assets which include acquired amortizable intangible assets, in accordance with Statement of Financial Accounting Standards No. 144, "Accounting for the Impairment or Disposal of Long-Lived Assets" ("SFAS 144"). SFAS 144 requires recognition of impairment of long-lived assets in the event the net book value of such assets exceeds the future undiscounted cash flows attributable to such assets. If an impairment is indicated, the assets are written down to their estimated fair value.

RESEARCH AND DEVELOPMENT

Research and development costs are expensed as incurred and consist mainly of compensation related expenses and project materials. The Company's research and development efforts include numerous projects which generally have a duration of 18 to 30 months.

IN-PROCESS RESEARCH AND DEVELOPMENT

The Company values tangible and intangible assets acquired through its business acquisitions at fair value including in-process research and development ("IPR&D"). The Company determines IPR&D through established valuation techniques for various projects for the development of new products and technologies and expenses IPR&D when technical feasibility is not reached.

ADVERTISING COSTS

Advertising costs are expensed as incurred. Advertising costs were immaterial in 2003, 2002 and 2001.

INCOME TAXES

The Company records income taxes using the asset and liability method. Deferred income tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective income tax bases, and operating loss and tax credit carryforwards. The Company evaluates the realizability of its net deferred tax assets and assesses the need for a valuation allowance on a quarterly basis. The future benefit to be derived from its deferred tax assets is dependent upon its ability to generate sufficient future taxable income to realize the assets. The Company records a valuation allowance to reduce its net deferred tax assets to the amount that may be more likely than not to be realized. To the extent the Company establishes a valuation allowance, an expense will be recorded within the provision for income taxes line on the statement of income. During the year ended December 31, 2002 the Company established a full valuation allowance for its net deferred tax assets and maintained this valuation allowance through December 31, 2003. In periods subsequent to establishing a valuation allowance, if the Company were to determine that it would be able to realize its net deferred tax assets in excess of their net recorded amount, an adjustment to the valuation allowance would be recorded as a reduction to income tax expense in the period such determination was made. Also in future periods, if the Company were to determine that it would not be able to realize the recorded amount of its net deferred tax assets, an adjustment to the valuation allowance would be recorded as an increase to income tax expense in the period such determination was made.

The Company does not provide for a U.S. income tax liability on undistributed earnings of its foreign subsidiaries. The earnings of non-U.S. subsidiaries, which reflect full provision for non-U.S. income taxes, are indefinitely reinvested in non-U.S. operations or will be remitted substantially free of additional tax.

NEW ACCOUNTING PRONOUNCEMENTS

In December 2003, the SEC issued Staff Accounting Bulletin ("SAB") No. 104, Revenue Recognition, which supersedes SAB No. 101, Revenue Recognition in Financial Statements. SAB No. 104 rescinds accounting guidance in SAB No. 101 related to multiple-element arrangements as this guidance has been superseded as a result of the issuance of EITF 00-21, "Accounting for Revenue Arrangements with Multiple Deliverables" ("EITF 00-21"). The adoption of SAB No. 104 did not have a material impact on the Company's financial position, results of operations or cash flows.

In April 2003, the Financial Accounting Standards Board ("FASB") issued SFAS No. 149 ("SFAS 149"), "Amendment of Statement 133 on Derivative Instruments and Hedging Activities." This statement amends SFAS 133 to provide clarification on the financial accounting and reporting of derivative instruments and hedging activities and requires contracts with similar characteristics to be accounted for on a comparable basis. This statement was effective for contracts entered into or modified after June 30, 2003 and for hedging relationships designated after June 30, 2003. The Company adopted SFAS 149 on July 1, 2003 and the adoption did not have a material effect on its consolidated financial position or results of operations.

In January 2003, the FASB issued FASB Interpretation No. 46, as amended by FIN 46R, "Consolidation of Variable Interest Entities, an Interpretation of ARB 51" ("FIN 46"). The primary objectives of FIN 46 are to provide guidance on the identification of entities for which control is achieved through means other than through voting rights ("variable interest entities" or "VIEs") and how to determine when and which business enterprise should consolidate the VIE. This new model for consolidation applies to an entity which either: (a) the equity investors (if any) do not have a controlling financial interest; or (b) the equity investment at risk is insufficient to finance that entity's activities without receiving additional subordinated financial support from other parties. In addition, FIN 46 requires that both the primary beneficiary and all other enterprises with a significant variable interest in a VIE make additional disclosures. FIN 46 is effective for all new VIEs created or acquired after January 31, 2003. For VIEs created or acquired prior to February 1, 2003, the provisions of FIN 46 must be applied for the first interim or annual period ending after March 15, 2004. The Company has not created or acquired any VIEs. The adoption of FIN 46 did not have a material impact on the Company's financial position or results of operations.

In November 2002, the EITF reached a consensus on issue 00-21, "Accounting for Revenue Arrangements with Multiple Deliverables." EITF 00-21 addresses revenue recognition on arrangements encompassing multiple elements that are delivered at different points in time, defining criteria that must be met for elements to be considered to be a separate unit of accounting. If an element is determined to be a separate unit of accounting, the revenue for the element is recognized at the time of delivery. EITF 00-21 is effective for revenue arrangements entered into in fiscal periods beginning after June 15, 2003. The Company adopted EITF 00-21 on July 1, 2003 and the adoption did not have a material effect on its consolidated financial position or results of operations.

In June 2002, Statement of Financial Accounting Standards No. 146, "Accounting for Costs Associated with Exit or Disposal Activities" ("SFAS 146") was issued. This Statement addresses financial accounting and reporting for costs associated with exit or disposal activities and nullifies EITF Issue No. 94-3, "Liability Recognition for Certain Employee Termination Benefits and Other Costs to Exit an Activity (including Certain Costs Incurred in a Restructuring)." The provisions of SFAS 146 are effective for exit or disposal activities that are initiated after December 31, 2002. The Company adopted SFAS 146 on January 1, 2003 and the adoption did not have a material effect on its consolidated financial position or results of operations.

USE OF ESTIMATES

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. On an on-going basis, management evaluates its estimates and judgments, including those related to revenue recognition, inventory, intangible assets, goodwill, and other long-lived assets, in-process research and development, merger expenses, income taxes and investments. Management bases its estimates and judgments on historical experience and on various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

RECLASSIFICATIONS

Certain prior year amounts have been reclassified to be consistent with the current year classifications.

3) FINANCIAL INSTRUMENTS AND RISK MANAGEMENT

FOREIGN EXCHANGE RISK MANAGEMENT

The Company hedges a portion of its forecasted foreign currency denominated intercompany sales of inventory, over a maximum period of fifteen months, using forward exchange contracts and currency options primarily related to Japanese and European currencies. These derivatives are designated as cash-flow hedges, and changes in their fair value are carried in accumulated other comprehensive income until the hedged transaction affects earnings. When the hedged transaction affects earnings, the appropriate gain or loss from the derivative designated as a hedge of the transaction is reclassified from accumulated other comprehensive income to cost of sales. As of December 31, 2003 the amount that will be reclassified from accumulated other comprehensive income to earnings over the next twelve months is an unrealized loss of $2,081,000, net of taxes. The ineffective portion of the derivatives is primarily related to option premiums, is recorded in cost of sales, and was immaterial in 2003, 2002 and 2001.

The Company hedges certain intercompany and other payables with foreign exchange contracts and currency options. Since these derivatives hedge existing amounts that are denominated in foreign currencies, the derivatives do not qualify for hedge accounting under SFAS No. 133. The foreign exchange gain on these derivatives was immaterial in 2003, 2002 and 2001.

Realized and unrealized gains and losses on forward exchange contracts and local currency purchased option contracts that do not qualify for hedge accounting are recognized immediately in earnings. The cash flows resulting from forward exchange contracts and local currency purchased options that qualify for hedge accounting are classified in the statement of cash flows as part of cash flows from operating activities. Cash flows resulting from forward exchange contracts and local currency purchased options that do not qualify for hedge accounting are classified in the statement of cash flows as investing activities. The Company does not hold or issue derivative financial instruments for trading purposes.

There were forward exchange contracts with notional amounts totaling $41,018,000 outstanding at December 31, 2003. Of such forward exchange contracts, $32,488,000 were outstanding to exchange Japanese yen for U.S. dollars. There were forward exchange contracts with notional amounts totaling $23,287,000 outstanding at December 31, 2002 of which $17,213,000 were outstanding to exchange Japanese yen for U.S. dollars. There were no forward exchange contracts outstanding at December 31, 2001. Local currency purchased options with notional amounts totaling $0, $5,053,000 and $11,349,000 to exchange foreign currencies for U.S. dollars were outstanding at December 2003, 2002 and 2001, respectively.

Foreign exchange gains on forward exchange contracts which did not qualify for hedge accounting were immaterial during 2003 and 2002. There were no foreign exchange gains or losses on forward exchange contracts which did not qualify for hedge accounting in 2001. Gains and losses on forward exchange contracts and local currency purchased options that qualify for hedge accounting are classified in cost of goods sold and totaled a loss of $1,411,000 for the year ended December 31, 2003 and a gain of $452,000 and $175,000 for the years ended December 31, 2002 and 2001, respectively.

The fair values of forward exchange contracts at December 31, 2003 and 2002, determined by applying period end currency exchange rates to the notional contract amounts, amounted to an unrealized loss of $2,081,000 and $407,000, respectively. The fair values of local currency purchased options at December 31, 2002 and 2001, which were obtained through dealer quotes were immaterial. There were no purchased options outstanding at December 31, 2003.

CONCENTRATIONS OF CREDIT RISK

The Company's significant concentrations of credit risk consist principally of cash and cash equivalents, investments, forward exchange contracts, and trade accounts receivable. The Company maintains cash and cash equivalents with financial institutions including the bank with which it has borrowings. The Company maintains investments primarily in U.S. Treasury and government agency securities and corporate debt securities, rated AA or higher. The Company places forward currency contracts with high credit-quality financial institutions in order to minimize credit risk exposure. Concentrations of credit risk with respect to accounts receivable are limited due to the large number of diverse and geographically dispersed customers. Credit is extended for all customers based on financial condition and collateral is not required.

FAIR VALUE OF FINANCIAL INSTRUMENTS

The fair value of the term loans, including the current portion, approximates its carrying value given its variable rate interest provisions. The fair value of marketable securities is based on quoted market prices. The fair value of mortgage notes is based on borrowing rates for similar instruments and approximates its carrying value. For all other balance sheet financial instruments, the carrying amount approximates fair value because of the short period to maturity of these instruments.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

4) INVENTORIES

Inventories consist of the following:

	DECEMBER 31,	
	2003	2002
Raw material	$36,834	$36,630
Work in process	15,786	11,617
Finished goods	29,393	24,988
	$82,013	$73,235

5) PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment consist of the following:

	DECEMBER 31,	
	2003	2002
Land	$ 11,827	$ 11,211
Buildings	62,151	59,864
Machinery and equipment	73,381	68,654
Furniture and fixtures	29,201	27,139
Leasehold improvements	5,170	4,105
Construction in progress	1,964	5,626
	183,694	176,599
Less: accumulated depreciation and amortization	107,573	94,004
	$ 76,121	$ 82,595

Depreciation and amortization of property, plant and equipment totaled $13,508,000, $14,830,000 and $11,905,000 for the years ended December 31, 2003, 2002 and 2001, respectively.

6) DEBT

CREDIT AGREEMENTS AND SHORT-TERM BORROWINGS

On July 31, 2002, the Company entered into a loan agreement with two banks, which provided access to a revolving credit facility. The revolving credit facility provided for borrowings up to $40,000,000 and expired on July 30, 2003. The Company decided not to renew the credit facility.

Additionally, the Company's Japanese subsidiary has lines of credit and short-term borrowing arrangements with various financial institutions which provide for aggregate borrowings as of December 31, 2003 of up to $28,003,000, which generally expire and are renewed at six month intervals. At December 31, 2003 and 2002, total borrowings outstanding under these arrangements were $17,736,000 and $13,877,000, respectively, at interest rates ranging from 1.23% to 1.50% and 1.13% to 1.50%, respectively.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

LONG-TERM DEBT

Long-term debt consists of the following:

DECEMBER 31,	2003	2002
Term loans	$ 1,590	$ 3,974
Mortgage notes	9,643	11,758
Total long-term debt	11,233	15,732
Less: current portion	2,423	4,263
Long-term debt less current portion	$ 8,810	$11,469

In connection with the purchase of On-Line Technologies, Inc., the Company assumed term loans of $4,728,000. The principal and interest accrued were due in two installments, the first installment on April 27, 2002, and the second installment on April 27, 2003. This loan was paid off in full in 2003.

In connection with the purchase of Telvac Engineering, Ltd., the Company issued term loans of $752,000. Principal payments of $61,000 are due on an annual basis through December 1, 2004 with the remaining principal due on May 1, 2005. Interest is payable semi-annually at the UK base rate. The fixed interest rate for the term loan is 4.0% and the remaining principal due as of December 31, 2003 was $657,000.

The Company has an outstanding term loan from a foreign bank, with principal due on April 2, 2004. The interest rate in effect for this term loan at December 31, 2003 was 1.19%. The remaining principal balance outstanding at December 31, 2003 was $933,000 and is included in current portion of long-term debt.

In connection with the acquisition of ENI, the Company assumed a long-term debt agreement with the County of Monroe Industrial Development Agency (COMIDA) for a manufacturing facility located in Rochester, New York. The terms are the same as that of the underlying Industrial Development Revenue Bond which calls for payments of interest only through July 1, 2014, at which time the Bond is repayable in a lump sum of $5,000,000. Interest is reset annually based on bond remarketing, with an option by the Company to elect a fixed rate, subject to a maximum rate of 13% per annum. At December 31, 2003 the interest rate was 1.2%. The bond is collateralized by the building. The remaining principal balance outstanding at December 31, 2003 was $5,000,000. The net book value of the building at December 31, 2003 was approximately $10,804,000.

On March 6, 2000, the Company entered into a mortgage note payable with a bank to borrow $10,000,000 to finance the purchase of land and a building. Principal and interest of $119,000 is being paid in monthly installments with final payments due in March 2007. The remaining principal as of December 31, 2003 was $4,643,000 with a variable interest rate of 2.61%. The net book value of the land and building at December 31, 2003 was approximately $18,292,000.

The Company had a loan outstanding from a foreign bank in the form of a mortgage note at December 31, 2002 with a balance of $687,000 and an interest rate of 1.88%. Principal and interest were payable in monthly installments through 2005. The loan was collateralized by mortgages on certain of the Company's foreign properties. This remaining principal balance was repaid in full during 2003.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

Aggregate maturities of long-term debt over the next five years are as follows:

YEAR ENDING DECEMBER 31,	AGGREGATE MATURITIES
2004	$ 2,423
2005	2,024
2006	1,429
2007	357
2008	--
Thereafter	5,000
	$11,233

7) COMMITMENTS AND CONTINGENCIES

On April 3, 2003, Advanced Energy Industries, Inc. ("Advanced Energy") filed suit against the Company in federal district court in Colorado ("Colorado Action"), seeking a declaratory judgment that Advanced Energy's Xstream product does not infringe three patents held by the Company's subsidiary Applied Science and Technology, Inc. ("ASTeX"). On May 14, 2003, MKS brought suit in federal district court in Delaware against Advanced Energy for infringement of five ASTeX patents, including the three patents at issue in the Colorado Action. The Company seeks injunctive relief and damages for Advanced Energy's infringement. On December 24, 2003, the Colorado court granted the Company's motion to transfer Advanced Energy's Colorado suit to Delaware and on February 9, 2004, the Delaware court denied Advanced Energy's motion to dismiss or transfer the Company's Delaware case back to Colorado. The case is in the early stages of pre-trial discovery.

On November 30, 2000, ASTeX, which was acquired by MKS in January 2001, brought suit in federal district court in Delaware against Advanced Energy for infringement of ASTeX's patent related to its Astron product. On May 17, 2002, a jury affirmed the validity of the Company's patent and found that Advanced Energy infringed the patent. On May 31, 2002, based on the jury's findings, the Court entered a judgement on the infringement claim in favor of the Company and against Advanced Energy, and awarded $4,200,000 in damages to compensate the Company for Advanced Energy's infringing activity. Advanced Energy filed motions to overturn the verdict. During August of 2002, the Company and Advanced Energy entered into an agreement whereby Advanced Energy agreed to pay the awarded damages amount to the Company and withdraw its motions to overturn the verdict. The Company received the $4,200,000 in September 2002, and recorded the amount as Income from litigation settlement.

On November 3, 1999, On-Line Technologies, Inc., which was acquired by the Company in April 2001, brought suit in federal district court in Connecticut against Perkin-Elmer, Inc. and certain other defendants for infringement of On-Line's patent related to its FTIR spectrometer product. The suit seeks injunctive relief and damages for infringement. Perkin-Elmer, Inc. has filed a counterclaim seeking invalidity of the patent, costs, and attorneys' fees. The Company believes that the counterclaim is without merit. The Company cannot be certain of the outcome of this litigation, but does plan to assert its claims and oppose the counterclaims against it vigorously.

The Company is subject to other legal proceedings and claims, which have arisen in the ordinary course of business. In the opinion of management, the ultimate disposition of these matters will not have a material adverse effect on the Company's results of operations, financial condition or cash flows.

The Company leases certain of its facilities and machinery and equipment under capital and operating leases expiring in various years through 2003 and thereafter. Generally, the facility leases require the Company to pay maintenance, insurance and real estate taxes. Rental expense under operating leases totaled $7,253,000, $6,278,000 and $5,122,000, for the years ended December 31, 2003, 2002 and 2001, respectively.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

Minimum lease payments under operating and capital leases are as follows:

YEAR ENDING DECEMBER 31,	OPERATING LEASES	CAPITAL LEASES
2004	$ 6,006	$ 44
2005	3,961	44
2006	2,465	43
2007	1,538	43
2008	1,055	--
Thereafter	804	--
Total minimum lease payments	$15,829	174
Less: amounts representing interest		23
Present value of minimum lease payments		151
Less: current portion		37
Long-term portion		$114

As of December 31, 2003, the Company has entered into non-cancelable purchase commitments for certain inventory components and other equipment and services used in its normal operations. The purchase commitments covered by these arrangements are for periods of less than one year and aggregate approximately $50,152,000.

To the extent permitted by Massachusetts law, the Company's Restated Articles of Organization, as amended, requires the Company to indemnify any current or former officer or director of the Company or any person who has served or is serving in any capacity with respect to any employee benefit plan of the Company. Because no claim for indemnification has been made by any person covered by the relevant provisions of the Company's Restated Articles of Organization, the Company believes that its estimated exposure for these indemnification obligations is currently minimal. Accordingly, the Company has no liabilities recorded for these requirements as of December 31, 2003.

The Company enters into standard indemnification agreements in the ordinary course of business. Pursuant to these agreements, the Company indemnifies, holds harmless and agrees to reimburse the indemnified party for losses suffered or incurred by the indemnified party, generally the Company's customers, in connection with any patent, or any other intellectual property infringement claim by any third party with respect to the Company's products. The term of these indemnification agreements is generally perpetual any time after execution of the agreement. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is unlimited. The Company has never incurred costs to defend lawsuits or settle claims related to these indemnification agreements. As a result, the Company believes the estimated fair value of these agreements is minimal. Accordingly, the Company has no liabilities recorded for these agreements as of December 31, 2003.

When as part of an acquisition, the Company acquires all of the stock or all of the assets and liabilities of another company, the Company assumes liability for certain events or occurrences that took place prior to the date of acquisition. The maximum potential amount of future payments the Company could be required to make for such obligations is undeterminable at this time. Other than obligations recorded as liabilities at the time of the acquisition, historically the Company has not made significant payments for these indemnifications. Accordingly, no liabilities have been recorded for these obligations.

In conjunction with certain asset sales, the Company may provide routine indemnifications whose terms range in duration and often are not explicitly defined. Where appropriate, an obligation for such indemnifications is recorded as a liability. Because the amount of liability under these types of indemnifications are not explicitly stated, the overall maximum amount of the obligation under such indemnifications cannot be reasonably estimated. Other than obligations recorded as liabilities at the time of the asset sale, historically the Company has not made significant payments for these indemnifications.

8) STOCKHOLDERS' EQUITY

COMMON STOCK

In May 2002, the Company amended its Restated Articles of Organization to increase the authorized number of shares of Common Stock to 200,000,000 shares from 75,000,000 shares.

STOCK PURCHASE PLANS

The Company's 1999 Second Restated Employee Stock Purchase Plan (the "Purchase Plan") authorizes the issuance of up to an aggregate of 700,000 shares of Common Stock to participating employees. Offerings under the Purchase Plan commence on June 1 and December 1 and terminate, respectively, on November 30 and May 31. Under the Purchase Plan, eligible employees may purchase shares of Common Stock through payroll deductions of up to 10% of their compensation. The price at which an employee's option is exercised is the lower of (1) 85% of the closing price of the Common Stock on the Nasdaq National Market on the day that each offering commences or (2) 85% of the closing price on the day that each offering terminates. During 2003 and 2002 the Company issued 101,102 and 110,947 shares, respectively, of Common Stock to employees who participated in the Purchase Plan at exercise prices of $16.16 and $16.49 in 2003, and $18.33 and $16.18 in 2002. As of December 31, 2003 there were 256,479 shares reserved for issuance under the Purchase Plan.

The Company's Second Restated International Employee Stock Purchase Plan (the "Foreign Purchase Plan") authorizes the issuance of up to an aggregate of 75,000 shares of Common Stock to participating employees. Offerings under the Foreign Purchase Plan commence on June 1 and December 1 and terminate, respectively, on November 30 and May 31. Under the Foreign Purchase Plan, eligible employees may purchase shares of Common Stock through payroll deductions of up to 10% of their compensation. The price at which an employee's option is exercised is the lower of (1) 85% of the closing price of the Common Stock on the Nasdaq National Market on the day that each offering commences or (2) 85% of the closing price on the day that each offering terminates. During 2003 and 2002, the Company issued 25,809 and 18,435 shares of Common Stock to employees who participated in the Foreign Purchase Plan at exercise prices of $16.16 and $16.49, and $18.33 and $16.18 per share, respectively. As of December 31, 2003 there were 10,175 shares reserved for issuance under the Foreign Purchase Plan.

STOCK OPTION PLANS

In April 2001, the Company's Board of Directors approved an annual increase in the number of shares that may be granted under the Second Restated 1995 Stock Incentive Plan of 5% of the total shares of the Company's stock on July 1 of each year. In March 2002, the Board of Directors approved, and in May 2002, the stockholders of the Company approved an increase in the number of shares that may be granted under the Second Restated 1995 Stock Incentive Plan to 15,000,000 shares. The annual increase will occur until such time as the aggregate number of shares which may be issued under the Plan is 15,000,000 shares, subject to adjustment for certain changes in MKS' capitalization.

The Company has granted options to employees under the 1995 Stock Incentive Plan and the 1993 Stock Option Plan and to directors under the 1996 Director Stock Option Plan and the 1997 Director Stock Option Plan (the "Plans"). The Plans are administered by the Company's board of directors.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

At December 31, 2003, 1,863,186 options to purchase shares of the Company's common stock were reserved for issuance under the Plans. Stock options are granted at 100% of the fair value of the Company's common stock. Generally, stock options granted to employees under the Plans in 2003, 2002 and 2001 vest 25% after one year and 6.25% per quarter thereafter and expire 10 years after the grant date. Generally, stock options granted under the Plans prior to 2000 vest 20% after one year and 5% per quarter thereafter, and expire 10 years after the grant date. Generally, options granted to directors vest at the earlier of (1) the next annual meeting, (2) 13 months from date of grant, or (3) the effective date of an acquisition.

The following table presents the activity for options under the Plans:

	YEAR ENDED DECEMBER 31,					
	2003		2002		2001	
	OPTIONS	WEIGHTED AVERAGE EXERCISE PRICE	OPTIONS	WEIGHTED AVERAGE EXERCISE PRICE	OPTIONS	WEIGHTED AVERAGE EXERCISE PRICE
Outstanding -- beginning of period	8,284,693	$19.33	5,958,735	$18.11	4,023,374	$14.65
Granted	1,603,552	$24.64	3,815,042	$21.37	3,111,119	$21.05
Exercised	(565,134)	$11.52	(531,672)	$12.68	(567,921)	$ 8.86
Forfeited or Expired	(425,212)	$21.27	(957,412)	$23.49	(607,837)	$18.87
Outstanding -- end of period	8,897,899	$20.69	8,284,693	$19.33	5,958,735	$18.11
Exercisable at end of period	4,880,231	$19.73	3,774,382	$17.90	3,400,592	$16.90

The following table summarizes information with respect to options outstanding and exercisable under the Plans at December 31, 2003:

OPTIONS OUTSTANDING	OPTIONS EXERCISABLE

	NUMBER OF SHARES	WEIGHTED AVERAGE EXERCISE PRICE	WEIGHTED AVERAGE REMAINING CONTRACTUAL LIFE (IN YEARS)	NUMBER OF SHARES	WEIGHTED AVERAGE EXERCISE PRICE
$ 4.43 -- $ 8.92..............	963,882	$ 5.54	3.68	963,882	$ 5.54
$10.86 -- $19.00..............	3,033,220	$16.52	7.82	1,290,378	$16.45
$19.24 -- $29.50..............	4,149,994	$24.94	8.25	2,006,492	$24.30
$30.02 -- $61.50..............	750,803	$33.49	6.03	619,479	$33.85
	8,897,899			4,880,231	

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

ACCUMULATED OTHER COMPREHENSIVE INCOME

The balance of accumulated other comprehensive income (loss) was comprised of the following:

	CUMULATIVE TRANSLATION ADJUSTMENTS	FINANCIAL INSTRUMENTS DESIGNATED AS CASH FLOW HEDGES	UNREALIZED GAIN (LOSS) ON INVESTMENTS	ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS)
Balance at December 31, 2001........	$(1,133)	$ 466	$ 13	$ (654)
Foreign currency translation adjustment, net of taxes of $0....	4,126	--	--	4,126
Changes in value of financial instruments designated as cash flow hedges, net of taxes of $0...	--	(745)	--	(745)
Change in unrealized gain (loss) on investments, net of tax of $0.....	--	--	52	52
Balance at December 31, 2002.......	2,993	(279)	65	2,779
Foreign currency translation adjustment, net of taxes of $0....	7,050	--	--	

				7,050
Changes in value of financial instruments designated as cash flow hedges, net of taxes of $0...	--	(1,671)	--	(1,671)
Change in unrealized gain (loss) on investments, net of tax of $0.....	--	--	(109)	(109)
Balance at December 31, 2003........	$10,043	$(1,950)	$ (44)	$ 8,049

9) INCOME TAXES

A reconciliation of the Company's 2003, 2002 and 2001 effective tax rate to the U.S. federal statutory rate follows:

	2003	2002	2001
U.S. Federal income tax statutory rate.....................	(35.0)%	(35.0)%	(35.0)%
Nondeductible goodwill, merger expenses, and in-process Technology..	--	7.1	7.6
State income taxes, net of federal benefit..................	2.3	(1.9)	(3.2)
Effect of foreign operations taxed at various rates.........	(11.1)	(4.6)	(0.6)
Foreign sales corporation tax benefit......................	(0.6)	(0.2)	(1.1)
Deferred tax asset valuation allowance.....................	67.3	32.2	--
Other..	(3.6)	(2.4)	(0.3)
	19.3%	(4.8)%	(32.6)%

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

The components of income before income taxes and the related provision (benefit) for income taxes consist of the following:

	YEAR ENDED DECEMBER 31,		
	2003	2002	2001
Income (loss) before income taxes:			
United States	$(23,737)	$(47,045)	$(52,571)
Foreign	10,003	5,527	6,515
	(13,734)	(41,518)	(46,056)
Current taxes:			
United States Federal	--	(3,806)	(5,892)
State	477	237	337
Foreign	1,458	1,338	1,994
	1,935	(2,231)	(3,561)
Deferred taxes:			
United States Federal	--	(150)	(8,842)
State and Foreign	716	400	(2,610)
	716	250	(11,452)
Provision (benefit) for income taxes	$ 2,651	$ (1,981)	$(15,013)

At December 31, 2003 and 2002 the components of the deferred tax asset and deferred tax liability were as follows:

	2003	2002
Deferred tax assets:		
Net operating losses and credits	$ 22,072	$ 13,685
Inventory and warranty reserves	10,986	13,700
Accounts receivable and other reserves	4,666	5,235
Depreciation and amortization	3,740	3,966
Other	363	326
Total deferred tax assets	41,827	36,912
Deferred tax liabilities:		
Acquired intangible assets	(18,726)	(23,182)
Other	(1,405)	(1,661)
Total deferred tax liabilities	(20,131)	(24,843)
Valuation allowance	(22,933)	(12,590)
Net deferred tax liability	$ (1,237)	$ (521)

During 2002 the Company recorded a valuation allowance of $12,590,000 against all of its United States and foreign net deferred tax assets. This valuation allowance was recorded against deferred tax assets because the Company determined that it is more likely than not that all of the deferred tax assets may not be realized.

In 2003, the Company increased the valuation allowance by $10,343,000 to $22,933,000 primarily as a result of additional net operating losses and tax credits.

The Company incurred significant operating losses in 2003, 2002 and 2001. At December 31, 2003 and 2002, these cumulative factors resulted in the Company's decision that it is more likely than not that all of its deferred tax assets may not be realized. If the Company generates sustained future taxable income against which these tax attributes may be applied, some portion or all of the valuation allowance would be reversed. If the valuation allowance were reversed, approximately $4,000,000 would be recorded as a reduction of goodwill, approximately $1,800,000 would be recorded as an increase to additional paid in capital, and the remainder would be recorded as a reduction to income tax expense.

At December 31, 2003, the Company had approximately $49,294,000 of federal net operating losses including approximately $6,800,000 the utilization of which may be limited by the change in ownership rules under Section 382 of the Internal Revenue Code. The remaining $42,494,000 of net operating losses may be further limited should a change in ownership occur as defined by section 382. In addition, at December 31, 2003, the Company also had approximately $57,276,000 of state net operating losses. The federal and state net operating losses begin to expire in 2009 and 2006, respectively.

The Company does not provide for a U.S. income tax liability on undistributed earnings of its foreign subsidiaries. The earnings of non-U.S. subsidiaries, which reflect full provision for non-U.S. incomes taxes, are indefinitely reinvested in non-U.S. operations or will be remitted substantially free of additional tax. As of December 31, 2003, the unrecognized deferred tax liability associated with these unremitted earnings was approximately $3,300,000.

10) EMPLOYEE BENEFIT PLANS

The Company has a 401(k) profit-sharing plan for U.S. employees meeting certain requirements in which eligible employees may contribute between 1% and 20% of their annual compensation to this plan, limited by an annual maximum amount determined by the Internal Revenue Service. The Company, at its discretion, may provide a matching contribution which will generally match up to the first 2% of each participant's compensation, plus 25% of the next 4% of compensation. At the discretion of the board of directors, the Company may also make additional contributions for the benefit of all eligible employees. The Company's contributions were $1,503,000, $1,938,000 and $1,419,000 for 2003, 2002 and 2001, respectively.

The Company maintains a bonus plan which provides cash awards to key employees, at the discretion of the compensation committee of the board of directors, based upon operating results and employee performance. The bonus expense in 2003 was immaterial and there was no bonus expense in 2002 and 2001.

11) SEGMENT AND GEOGRAPHICAL INFORMATION AND SIGNIFICANT CUSTOMER

The Company operates in one segment for the development, manufacturing, sales and servicing of products that measure, control, power and monitor critical parameters of advanced manufacturing processes. The Company's chief decision-maker reviews operating results to make decisions about allocating resources and assessing performance for the entire Company.

Information about the Company's operations in different geographic regions is presented in the tables below. Net sales to unaffiliated customers are based on the location in which the sale originated. Transfers between geographic areas are at negotiated transfer prices and have been eliminated from consolidated net sales.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

YEAR ENDED DECEMBER 31,	2003	2002	2001
Geographic net sales			
United States	$199,118	$200,181	$196,768
Japan	59,664	43,335	34,816
Europe	43,339	38,767	40,076
Asia	35,170	32,490	15,148
	$337,291	$314,773	$286,808

DECEMBER 31,	2003	2002
Long-lived assets		
United States	$65,977	$75,401
Japan	5,978	5,450
Europe	5,541	5,577
Asia	3,349	2,162
	$80,845	$88,590

The Company had one customer comprising 18%, 23% and 18% of net sales for the years ended December 31, 2003, 2002 and 2001, respectively. During the years ended December 31, 2003, 2002 and 2001, the Company estimates that approximately 69%, 70% and 64% of its net sales, respectively, were to semiconductor capital equipment manufacturers and semiconductor device manufacturers.

12) ACQUISITIONS

On September 30, 2003, the Company acquired Wenzel Instruments, a privately held developer of solid state MicroElectroMechanical System (MEMS) based vacuum sensor technology for advanced manufacturing processes. This acquisition expands our vacuum gauge product line offering to help meet current demand for process control sensors with higher accuracy and a faster response in a smaller footprint. The purchase price was $2,150,000 and was accounted for under the purchase method of accounting. The purchase price was primarily allocated to the assets acquired based upon their estimated fair values, with the full purchase price being allocated to intangible assets as completed technology. This intangible asset is being amortized over its estimated useful life of 5 years. The results of operations are included in the Company's consolidated statement of income as of and since the date of the purchase.

On January 31, 2002, MKS completed its acquisition of the ENI Business ("ENI") of Emerson Electric Co., a supplier of solid-state RF and DC plasma power supplies, matching networks and instrumentation to the semiconductor and thin-film processing industries. The reasons for the acquisition of ENI were based upon the ability to offer higher value and more integrated application solutions by combining ENI's solid-state power conversion technology with the Company's core competency in plasma and reactive gas solutions. The acquisition has been accounted for under the purchase method of accounting. The purchase price was approximately $266,530,000 and consisted of approximately 12,000,000 shares of MKS common stock valued at approximately $261,264,000 and transaction expenses of approximately $5,266,000. The value of MKS common stock was approximately $21.7720 per share based on the average closing price of MKS' common stock for the five-day period including the date of the announcement of the signing of the merger agreement and the two days preceding and succeeding such date.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

The purchase price was allocated to the assets acquired based upon their estimated fair values and resulted in an allocation of approximately $197,123,000 to goodwill. The results of operations are included in the Company's consolidated statement of income as of and since the date of the purchase. The allocation of the purchase price is as follows:

Current assets	$ 31,038
Other assets	2,123
Fixed assets	18,882
Completed technology	39,600
Patents	6,500
Customer relationships	2,600
In-process research and development	7,500
Goodwill	197,123
Other current liabilities	(13,883)
Deferred tax liabilities	(19,480)
Other long term liabilities	(5,473)
	$266,530

The amounts allocated to acquired intangible assets are being amortized using the straight-line method over their respective estimated useful lives: six years for completed technology, eight years for patents, and eight years for customer relationships. The total weighted average amortizable life of the acquired intangible assets is six years. Approximately $9,700,000 of the goodwill is tax deductible.

In connection with the acquisition of ENI, the Company obtained an appraisal from an independent appraiser of the fair value of its intangible assets. This appraisal valued purchased in-process research and development ("IPR&D") of various projects for the development of new products and technologies at approximately $7,500,000. Because the technological feasibility of products under development had not been established and no future alternative uses existed, the purchased IPR&D was expensed during the six months ended June 30, 2002. The value of the purchased IPR&D was determined using the income approach, which discounts expected future cash flows from projects under development to their net present value. Each project was analyzed to determine the technological innovations included; the utilization of core technology; the complexity, cost and time to complete development; any alternative future use or current technological feasibility; and the stage of completion. The cash flows derived from the IPR&D projects were discounted at rates ranging from 25% to 30%. The Company believes these rates were appropriate given the risks associated with the technologies for which commercial feasibility had not been established. The percentage of completion for each in-process project was determined by identifying the cost incurred to date of the project as a ratio of the total estimated cost required to bring the project to technical and commercial feasibility. The percentage of completion for in-process projects acquired ranged from 65% to 80%, based on management's estimates of tasks completed and the tasks to be completed to bring the projects to technological and commercial feasibility. The projects were generally expected to have durations of up to 12 months.

On March 13, 2002, MKS acquired Tenta Technology, Ltd. ("Tenta"), a company that designs and supplies modular, computer-based process control systems for 300mm semiconductor process tool applications. The reasons for the acquisition were based upon the ability to offer higher value and more integrated application solutions by integrating Tenta's process controllers with MKS digital network products to provide a more complete process control solution. The acquisition has been accounted for under the purchase method of accounting. The purchase price was approximately $26,400,000 and consisted of 700,000 shares of MKS common stock valued at approximately $21,100,000, cash of $5,000,000 and transaction expenses of approximately $300,000. The value of MKS common stock was based on the average closing price of MKS' common stock for the five-day period including the date of the announcement of the signing of the merger agreement and the two days preceding and succeeding such date. The purchase price was allocated to the assets acquired based upon their estimated fair values. The results of operations are included in the Company's consolidated statement of income as of and since the date of the purchase. The allocation of the purchase price was as follows:

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

Current assets	$ 5,051
Completed technology	10,400
Other acquired intangibles	540
In-process research and development	180
Goodwill	18,899
Other net liabilities assumed	(8,670)
	$26,400

Completed technology and other acquired intangibles are being amortized on a straight-line basis over 6 to 8 years. None of the goodwill is tax deductible.

In 2002, the Company acquired two other businesses for a total purchase price of $12,200,000, including IPC Fab Automation GmbH, a developer and provider of web-based hardware and software that enable e-diagnostics and advanced process control for advanced manufacturing applications. There were no shares of MKS common stock issued for these acquisitions. Goodwill recognized in these transactions was approximately $11,000,000 and acquired intangible assets were approximately $2,800,000.

On April 27, 2001, MKS completed its acquisition of On-Line Technologies, Inc. ("On-Line"), a company that designs and manufactures products used for gas analysis, wafer metrology and complementary analysis and control software. The reasons for the acquisition of On-Line were to expand our range of products for monitoring the composition of process gases and thin-films, and to provide our customers with integrated products that help them to increase their manufacturing yield. The acquisition has been accounted for under the purchase method of accounting. The purchase price was approximately $23,829,000 and consisted of approximately 660,000 shares of MKS common stock valued at approximately $12,110,000, cash payments of $6,295,000, assumption of On-Line debt of approximately $4,728,000 and transaction expenses of approximately $696,000. The value of MKS common stock was based on the average closing price of MKS' common stock for the five-day period including the date of the announcement of the signing of the merger agreement and the two days preceding and succeeding such date. The purchase price was allocated to the assets acquired based upon their estimated fair values and resulted in an allocation of approximately $16,050,000 to goodwill. The results of operations are included in the Company's consolidated statement of income (loss) as of and since the effective date of the purchase. The allocation of the purchase price was as follows:

Net tangible assets acquired	$ (971)
In-process research and development	2,340
Completed technology	4,710
Other acquired intangibles	1,700
Goodwill	16,050
	$23,829

The completed technology and other intangibles are being amortized on a straight-line basis over 5 to 7 years. None of the goodwill is tax deductible.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

In connection with the acquisition of On-Line, the Company obtained an appraisal from an independent appraiser of the fair value of its intangible assets. This appraisal valued purchased IPR&D of various projects for the development of new products and technologies at approximately $2,340,000. The projects were generally expected to have durations of 24 to 48 months. Because the technological feasibility of products under development had not been established and no future alternative uses existed, the purchased IPR&D was expensed during the quarter ended June 30, 2001. The value of the purchased IPR&D was determined using the income approach, which discounts expected future cash flows from projects under development to their net present value.

Each project was analyzed to determine the technological innovations included; the utilization of core technology; the complexity, cost and time to complete development; any alternative future use or current technological feasibility; and the stage of completion. The cash flows derived from the in-process technology projects were discounted at a rate of 25%. The Company believes this rate was appropriate given the risks associated with the technologies for which commercial feasibility had not been established. The percentage of completion for each in-process project was determined by identifying the elapsed time invested in the project as a ratio of the total time required to bring the project to technical and commercial feasibility. The percentage of completion for in-process projects acquired ranged from 55% to 65%, based on management's estimates of tasks completed and the tasks to be completed to bring the projects to technological and commercial feasibility.

The following unaudited pro forma results of operations of the Company for 2002 and 2001 give effect to the acquisitions made in 2002 and 2001 as if the acquisitions had occurred at the beginning of 2001.

	YEAR ENDED DECEMBER 31,	
	2002	2001
Net sales	$318,913	$379,601
Net income (loss)	(34,067)	(39,751)
Net income (loss) per share: Basic and diluted	$ (0.67)	$ (0.79)

These unaudited pro forma results have been prepared for comparative purposes only and do not purport to be indicative of the results of operations which actually would have resulted had the acquisitions occurred at the beginning of the period, or which may result in the future. Additionally, the charges for purchased IPR&D were not included in the unaudited pro forma results, because they were non-recurring and directly related to the transactions.

POOLING OF INTEREST COMBINATIONS

On January 26, 2001, the Company acquired ASTeX. Each outstanding share of ASTeX common stock was exchanged for 0.7669 newly issued shares of common stock of the Company, resulting in the issuance of approximately 11,200,000 shares of common stock. The acquisition was accounted for under the pooling of interests method of accounting, and accordingly, the consolidated financial statements reflect the combined financial position and results of operations and cash flows of MKS Instruments, Inc. and ASTeX, for all periods presented.

13) SALE OF ASSETS

During 2002, the Company sold an investment in a company for approximately $2,500,000. The gain on the transaction was not material.

In August 2001, the Company sold certain assets for proceeds of approximately $9,000,000, consisting of approximately $4,700,000 in cash, $3,900,000 in a note receivable, and $200,000 of warrants. The note receivable matures August 7, 2004, and bears an annual interest rate of 9.0%. The loss on the transaction was $1,246,000 before taxes. During 2002, due to the downturn in the semiconductor industry and its result on the acquirer's operations, and the acquirer's inability to raise financing, the Company considered the value of the note and warrants to be impaired. Accordingly, during 2002, MKS recorded a charge of $4,121,000 to other expense for the Company's estimate of the impairment on the note receivable and warrants.

In December 2001, the Company sold an investment in a company for approximately $367,000. The loss on the transaction was $1,133,000 before taxes.

14) RESTRUCTURING AND ASSET IMPAIRMENT CHARGES

During 2003, the Company continued its consolidation of recent acquisitions that it initiated in 2002, and recorded restructuring, asset impairment and other charges of $1,593,000. The charges in 2003 consisted of $356,000 of severance costs related to workforce reductions, $1,145,000 of lease cost, professional fees and other costs related to facility consolidations and an asset impairment charge of $92,000. The workforce reduction was across all functional groups.

During 2002 the Company implemented a consolidation of recent acquisitions to accelerate product development, rationalize manufacturing operations, and reduce operating costs. As a result of these actions, the Company recorded restructuring and asset impairment charges of $2,726,000 in 2002. The charges consisted of $631,000 of severance costs related to a workforce reduction, $1,228,000 related to consolidation of leased facilities, and an asset impairment charge of $867,000 primarily related to the impairment of an intangible asset from the discontinuance of certain product development activities. The fair value of the impaired intangible asset was determined using the expected present value of future cash flows. The workforce reduction was across all functional groups and consisted of 225 employees.

The following table sets forth the components of the restructuring activities initiated during 2003 and 2002, and the related accruals remaining at December 31, 2003:

	WORKFORCE REDUCTIONS	ASSET IMPAIRMENT	FACILITY CONSOLIDATIONS	TOTAL
	(IN THOUSANDS)			
Restructuring provision in 2002	$ 631	$ 867	$1,228	$ 2,726
Charges utilized in 2002	(305)	(867)	(64)	(1,236)
Reserve balance as of December 31, 2002	326	--	1,164	1,490
Restructuring provision in 2003	356	92	1,145	1,593
Charges utilized in 2003	(483)	(92)	(478)	(1,053)
Reserve balance as of December 31, 2003	$ 199	$ --	$1,831	$ 2,030

The remaining accruals for workforce reductions are expected to be paid by the second quarter of 2004. The facilities consolidation charges will be paid over the respective lease terms, the latest of which ends in 2007. The accrual for severance costs and lease payments is recorded in Other accrued expenses and Other liabilities.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

Inventory Reserves

During the second quarter and fourth quarter of 2001, the Company recorded significant charges to reserve for excess and obsolete inventory. The following is a summary of the changes in these inventory reserves during 2001, 2002 and 2003:

	BALANCE
Initial charge in 2001	$16,608
Inventory scrapped and charged against the reserve during 2001	(978)
Balance at December 31, 2001	15,630
Inventory scrapped and charged against the reserve during 2002	(4,868)
Inventory sold during 2002, benefiting cost of sales	(1,413)
	(6,281)
Balance at December 31, 2002	9,349
Inventory scrapped and charged against the reserve during 2003	(1,994)
Inventory sold during 2003, benefiting cost of sales	(181)
	(2,175)
Balance at December 31, 2003	$ 7,174

When the Company acquired the Shamrock product line, it was expected that sales of the existing system design and development of new system designs would generate future revenues. Since the acquisition, the Company had provided potential customers with purchase quotations for Shamrock systems, including a significant quotation to a potential customer in January 2001 for the sale of several systems. The potential customer did not purchase the systems, and the quotation expired in March 2001. The Company had been unsuccessful in selling any systems of the product line since the acquisition and, with the expiration of the significant quote in March 2001, the Company evaluated the recoverability of the long-lived assets, primarily goodwill. As a result, based on discounted cash flow analysis, the Company recorded an impairment charge for the carrying value of the related goodwill of approximately $3,720,000 in the quarter ended March 31, 2001.

15) GOODWILL AND INTANGIBLE ASSETS

The Company adopted the provisions of SFAS 142 on January 1, 2002. Accordingly, the Company ceased the ratable amortization of goodwill on that date. In addition, the Company reassessed the classification of its goodwill and intangible assets. This analysis, which was completed during the quarter ended March 31, 2002, resulted in the reclassification of workforce related intangible assets of $2,023,000 to goodwill. Also, in accordance with this statement, the Company reassessed the useful lives of its amortizable intangible assets and determined that the lives were appropriate.

The Company is required to perform an annual impairment test of its goodwill under the provisions of FAS 142. The Company compares the fair value of each reporting unit to its recorded book value. An excess of book value over fair value indicates that an impairment of goodwill exists. Fair value is based on a discounted cash flow analysis of expectations of future earnings for each of the reporting units with goodwill. The Company completed its annual impairment for 2003 in the fourth quarter. No adjustment to goodwill was necessary.

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

The changes in the carrying amount of goodwill during the years ended December 31, 2003 and 2002 were as follows:

	YEAR ENDED	
	DECEMBER 31, 2003	DECEMBER 31, 2002
Balance, beginning of year	$259,781	$ 31,113
Workforce reclassification	--	2,023
Goodwill acquired during the year	--	227,022
Finalization of purchase price allocation and foreign currency translation	143	(377)
Balance, end of year	$259,924	$259,781

The following is the pro forma effect on net income and net income per share had SFAS 142 been in effect for the year ended December 31, 2001:

	DECEMBER 31, 2001
Reported net loss	$(31,043)
Add back: impact of goodwill amortization, net of taxes	5,145
Adjusted net loss	$(25,898)
Reported basic net loss per share	$ (0.83)
Add back: impact of goodwill amortization, net of taxes	$ 0.14
Adjusted basic net loss per share	$ (0.69)
Reported diluted net loss per share	$ (0.83)
Add back: impact of goodwill amortization, net of taxes	$ 0.14
Adjusted diluted net loss per share	$ (0.69)

Components of the Company's acquired intangible assets are comprised of the following:

	DECEMBER 31, 2003		DECEMBER 31, 2002	
	GROSS CARRYING AMOUNT	ACCUMULATED AMORTIZATION	GROSS CARRYING AMOUNT	ACCUMULATED AMORTIZATION
Completed technology	$72,563	$(27,654)	$69,394	$(15,629)
Customer relationships	6,640	(2,663)	6,640	(1,743)
Patents, trademarks, tradenames and other	12,394	(5,088)	12,394	(3,336)
	$91,597	$(35,405)	$88,428	$(20,708)

(TABLES IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)

Aggregate amortization expense related to acquired intangibles for the years ended December 31, 2003, 2002 and 2001 were $14,692,000, $13,897,000 and $5,200,000, respectively. Estimated amortization expense related to acquired intangibles for each of the five succeeding years is as follows:

YEAR	AMOUNT
2004	$14,837
2005	13,936
2006	11,835
2007	11,201
2008	2,831

16) PRODUCT WARRANTIES

The Company provides for the estimated costs to fulfill customer warranty obligations upon the recognition of the related revenue. While the Company engages in extensive product quality programs and processes, including actively monitoring and evaluating the quality of its component suppliers, the Company's warranty obligation is affected by product failure rates, utilization levels, material usage, and supplier warranties on parts delivered to the Company. Should actual product failure rates, utilization levels, material usage, or supplier warranties on parts differ from the Company's estimates, revisions to the estimated warranty liability would be required.

Product warranty activity for the years ended December 31, were as follows:

	2003	2002
Balance at beginning of year	$ 6,921	$ 3,630
Fair value of warranty liabilities acquired	--	3,813
Provisions for product warranties	3,133	2,974
Direct charges to the warranty liability	(4,250)	(3,496)
Balance at end of year	$ 5,804	$ 6,921

17) OTHER ACCRUED EXPENSES

Other accrued expenses consist of:

	DECEMBER 31, 2003	DECEMBER 31, 2002
Product warranties	$ 5,804	$ 6,921
Accrued restructuring costs	881	1,490
Other	11,914	13,243
	$18,599	$21,654

18) RELATED PARTY TRANSACTIONS

In December 2003, the Company recorded a gain of $927,000 from the early repayment of premiums related to a split dollar life insurance policy covering the Chairman and CEO of the Company. This gain was recorded in Other expense (income) in the consolidated statement of operations.

19) SUBSEQUENT EVENTS

Litigation

On January 12, 2004, Gas Research Institute ("GRI") brought suit in federal district court in Illinois against the Company, On-Line Technologies, Inc., which was acquired by the Company in April 2001, and another defendant for breach of contract, misappropriation of trade secrets and related claims relating to certain infra-red gas analysis technology allegedly developed under a January 1995 Contract for Research and incorporated into certain of the Company's products. GRI has made claims for unspecified damages, attorney's fees and injunctive relief. The Company is currently evaluating the merits of the claims. The Company cannot be certain of the outcome of this litigation, but plans to oppose the claims against it vigorously.

Issuance of Common Stock

On January 21, 2004, the Company issued 1,142,857 shares of its common stock at $26.25 per share through a public offering. Estimated proceeds of the offering, net of underwriters discount and estimated offering expenses, were approximately $28,500,000. On January 23, 2004, the underwriters exercised their over-allotment option and therefore, the Company issued an additional 171,429 shares of its common stock, which generated net proceeds of approximately $4,298,000.

MKS INSTRUMENTS, INC.

SUPPLEMENTAL FINANCIAL DATA

	QUARTER ENDED			
	MAR 31	JUN 30	SEP 30	DEC 31
	(UNAUDITED)			
2003 STATEMENT OF INCOME (LOSS) DATA				
Net sales	$ 72,777	$81,168	$81,568	$101,778
Gross profit	25,406	27,445	27,722	37,536
Income (loss) from operations(1)	(7,423)	(5,388)	(5,344)	2,438
Net income (loss)(2)	(7,430)	(5,470)	(5,621)	2,136
Net income (loss) per share Basic and diluted	$ (0.14)	$ (0.11)	$ (0.11)	$ 0.04
2002 STATEMENT OF INCOME (LOSS) DATA				
Net sales	$ 59,067	$85,932	$92,216	$ 77,558
Gross profit	19,220	29,715	31,825	25,035
Income (loss) from operations(3)	(15,275)	(9,486)	(7,466)	(10,820)
Net income (loss)(4)	(11,787)	(4,694)	(3,825)	(19,231)
Net income (loss) per share Basic and diluted	$ (0.25)	$ (0.09)	$ (0.07)	$ (0.37)

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(1) Income (loss) from operations for the quarter ended December 31, 2003 includes restructuring charges of $1.0 million and an adjustment of $0.8 million to reduce depreciation expense.

(2) Net income (loss) for the quarter ended December 31, 2003 includes a gain of $0.9 million from the early repayment of premiums related to a split dollar life insurance policy covering the Chairman and CEO of the Company.

(3) Income (loss) from operations for the quarter ended September 30, 2002 includes restructuring and asset impairment charges of $2.4 million.

(4) Net income (loss) for the quarter ended December 31, 2002 includes a deferred tax charge of $13.4 million to establish a valuation allowance for the Company's net deferred tax assets. These assets remain available for use as deductions against future taxable income.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

The Company's management, with the participation of the Company's chief executive officer and chief financial officer, evaluated the effectiveness of the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of December 31, 2003. Based on this evaluation, the Company's chief executive officer and chief financial officer concluded that, as of December 31, 2003, the Company's disclosure controls and procedures were (1) designed to ensure that material information relating to the Company, including its consolidated subsidiaries, is made known to the Company's chief executive officer and chief financial officer by others within those entities, particularly during the period in which this report was being prepared and (2) effective, in that they provide reasonable assurance that information required to be disclosed by the Company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms.

The Company's management, including the chief executive officer and chief financial officer, recognizes that our disclosure controls and our internal controls cannot prevent all error or all attempts at fraud. Any controls system, no matter how well crafted and operated, can only provide reasonable, and not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints that affect the operation of any such system and that the benefits of controls must be considered relative to their costs. Because of the inherent limitations in any control system, no evaluation or implementation of a control system can provide complete assurance that all control issues and all possible instances of fraud have been or will be detected. These inherent limitations include the realities that judgments in decision-making can be faulty and that breakdowns can occur because of simple error or mistake.

As a result of acquisitions, the Company has added several different decentralized accounting systems, resulting in a complex reporting environment. The Company expects that it will need to continue to modify its accounting policies, internal controls, procedures and compliance programs to provide consistency across all its operations.

PART III

ITEM 10. DIRECTORS AND EXECUTIVE OFFICERS OF THE REGISTRANT

The information required by this item is set forth under the captions "Election of Directors", "Executive Officers", "Code of Ethics" and "Audit Committee Financial Expert" in our definitive proxy statement for the 2004 Annual Meeting of Stockholders, is incorporated herein by reference.

We are also required under Item 405 of Regulation S-K to provide information concerning delinquent filers of reports under Section 16 of the Securities and Exchange Act of 1934, as amended. This information is listed under the caption "Section 16(a) Beneficial Ownership Reporting Compliance" in our definitive proxy statement for the 2004 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission no later than 120 days after the end of our fiscal year. This information is incorporated herein by reference.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is set forth under the caption "Executive Compensation" in our definitive proxy statement for the 2004 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission not later than 120 days after the end of our fiscal year. This information is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by Item 403 of Regulation S-K is set forth under the caption "Security Ownership of Certain Beneficial Owners and Management" in our definitive proxy statement for the 2004 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission not later than 120 days after the end of our fiscal year. This information is incorporated herein by reference.

The information required by Item 201(d) of Regulation S-K is set forth under the caption "Equity Compensation Plan Information" in our definitive proxy statement for the 2004 Annual Meeting of Stockholders, to be filed with the Securities and Exchange Commission not later than 120 days after the end of our fiscal year. This information is incorporated herein by reference.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

The information required by this item is set forth under the caption "Certain Relationships and Related Transactions" in our definitive proxy statement for the 2004 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission not later than 120 days after the end of our fiscal year. This information is incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this item is set forth under the caption "Report of the Audit Committee of the Board of Directors" in our definitive proxy statement for the 2004 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission not later than 120 days after the end of our fiscal year. This information is incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS, FINANCIAL SCHEDULES AND REPORTS ON FORM 8-K

(a) The following documents are filed as a part of this Report:

1. Financial Statements. The following Consolidated Financial Statements are included under Item 8 on this Annual Report on Form 10-K.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

FINANCIAL STATEMENTS:

2. Financial Statement Schedules

The following consolidated financial statement schedule is included in this Annual Report on Form 10-K of Item 15(d):

Schedule II -- Valuation and Qualifying Accounts

Schedules other than those listed above have been omitted since they are either not required or information is otherwise included.

3. Exhibits. The following exhibits are filed as part of this Annual Report on Form 10-K pursuant to Item 15(c).

EXHIBIT NO. TITLE - ---- ------- ---- - +3.2(1) Restated Articles of Organization +3.3(2) Articles of Amendment, as filed with the Secretary of State of Massachusetts on May 18, 2001 +3.4(3) Articles of Amendment, as filed with the Secretary of State of Massachusetts on May 16, 2002 +3.5(4) Amended and Restated By-Laws +4.1(4)

Specimen certificate representing the common stock

+10.1(5)* Applied Science and Technology, Inc. 1993 Stock Option Plan, as amended

+10.2(6)* Applied Science and Technology, Inc. 1994 Formula Stock Option Plan, as amended

+10.3(4)* 1996 Amended and Restated Director Stock Option Plan

+10.4(7)* Amended and Restated 1997 Director Stock Option Plan

+10.5(8)* Second Restated 1995 Stock Incentive Plan

EXHIBIT NO. TITLE - - ---------- ----- +10.6(3)* Second Restated 1999 Employee Stock Purchase Plan +10.7(3)* Restated International Employee Stock Purchase Plan 10.8(4)* Amended and Restated Employment Agreement dated as of December 15, 1995 between Leo Berlinghieri and the Registrant +10.9(4)* Amended and Restated Employment Agreement dated as of December 15, 1995 between Ronald C. Weigner and the Registrant +10.10(4)* Amended and Restated Employment Agreement dated as of December 15, 1995 between William D. Stewart and the Registrant +10.11(9)* Employment Agreement dated as of December 6, 1999 between Robert Klimm and the Registrant +10.12* Employment Agreement dated as of March 10, 2000 between the Registrant and Donald Smith, as amended by an Amendment to Employment Agreement between the Registrant and Donald Smith, dated February 21, 2004 +10.13(10)* Employment Agreement dated as of September 14, 1992 between John Smith and the Registrant +10.14 Employment Agreement dated as of December 15, 1995 between Gerald Colella and the Registrant +10.15(4) Lease Agreement dated as of October 12, 1989, as extended November 1, 1998, by and between Aspen Industrial Park Partnership, LLLP and the Registrant +10.16(1) Lease dated as of August 9, 2000 between Aspen Industrial Park Partnership, LLLP and the Registrant +10.17(3) First Amended and Restated Credit Agreement dated as of July 31, 2002 between Fleet National Bank as Agent and Lender, JP

Morgan Chase Bank as Lender, and Registrant as Borrower +10.18(11) Loan Agreement between ASTeX Realty Corp. and Citizens Bank of Massachusetts, dated March 6, 2000 (the "Citizens Loan Agreement") +10.19(11) Exhibit A to the Citizens Loan Agreement +10.20(12) Agreement and Plan of Merger with respect to the Acquisition of the ENI Business dated October 30, 2001 between the Registrant and Emerson Electric Co. +10.21(13) Shareholder Agreement dated as of January 31, 2002 among the Registrant and Emerson Electric Co. 21.1 Subsidiaries of the Registrant 23.1 Consent of PricewaterhouseCoopers LLP 31.1 Certification of Principal Executive Officer pursuant to Rule 13a-14(a)/Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended 31.2 Certification of Principal Financial Officer pursuant to Rule 13a-14(a)/Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended 32.1 Certification of Chief Executive Officer pursuant to 18 U.S.C. section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 32.2 Certification of Chief Financial Officer pursuant to 18 U.S.C. section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

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+ Previously filed

* Management contract or compensatory plan arrangement filed as an Exhibit to this Form 10-K pursuant to Item 15(c) of this report.

(1) Incorporated by reference to the Registration Statement on Form S-4 (File No. 333-49738) filed with the Securities and Exchange Commission on November 13, 2000.

(2) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q (File No. 000-23621) for the quarter ended June 30, 2001.

(3) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q (File No. 000-23621) for the quarter ended June 30, 2002.

(4) Incorporated by reference to the Registration Statement on Form S-1 (File No. 333-71363) filed with the Securities and Exchange Commission on January 28, 1999, as amended.

(5) Incorporated by reference to the Registration Statement on Form S-8 (File No. 333-54486) filed with the Securities and Exchange Commission on January 29, 2001.

(6) Incorporated by reference to the Registration Statement on Form S-8 (File No. 333-54488) filed with the Securities and Exchange Commission on January 29, 2001.

(7) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q (File No. 000-23621) for the quarter ended June 30, 2003.

(8) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q (File No. 000-23621) for the quarter ended September 30, 2002.

(9) Incorporated by reference to the Registrant's Annual Report on Form 10-K (File No. 000-23621) for the fiscal year ended December 31, 1999.

(10) Incorporated by reference to the Registrant's Annual Report on Form 10-K (File No. 000-23621) for the fiscal year ended December 31, 2002.

(11) Incorporated by reference to Applied Science and Technology, Inc.'s Quarterly Report on Form 10-Q (File No. 333-71467) for the quarter ended March 25, 2000.

(12) Incorporated by reference to the Registrant's Definitive Proxy Statement on Schedule 14A (Commission File No. 000-23621) filed with the Securities and Exchange Commission on December 4, 2001.

(13) Incorporated by reference to the Registrant's Report on Form 8-K (File No. 000-23621) filed with the Securities and Exchange Commission on February 12, 2002.

(b) Reports on Form 8-K.

On October 21, 2003, the Company furnished a Current Report on Form 8-K dated October 21, 2003 under Item 12 (Results of Operations and Financial Condition) containing a copy of its earnings release for the quarter ended September 30, 2003.

On October 16, 2003, the Company filed a Current Report on Form 8-K for the purpose of filing under Item 7 (Financial Statements, Pro Forma Financial Information and Exhibits) as an exhibit thereto, certain pro forma financial data related to the acquisition on January 31, 2002 by the Company of the ENI business of Emerson Electric Co.

(c) Exhibits.

The Company hereby files as exhibits to our Annual Report on Form 10-K those exhibits listed in Item 15 above.

(d) Financial Statement Schedules.

MKS INSTRUMENTS, INC.

SCHEDULE II -- VALUATION AND QUALIFYING ACCOUNTS

DESCRIPTION	BALANCE AT BEGINNING OF YEAR	ADDITIONS: CHARGED TO COSTS AND EXPENSES	ADDITIONS: CHARGED TO OTHER ACCOUNTS	DEDUCTIONS & WRITE-OFFS	BALANCE AT END OF YEAR
(DOLLARS IN THOUSANDS)					
Accounts receivable allowance					
Year ended December 31,					
2003	$3,264	$ 460	$--	$1,880	$1,844
2002	$3,282	$2,064	$--	$2,082	$3,264
2001	$1,954	$1,711	$--	$ 383	$3,282

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

MKS INSTRUMENTS, INC.

By: /s/ JOHN R. BERTUCCI

John R. Bertucci
President, Chairman of the Board of Directors
and Chief Executive Officer
(Principal Executive Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the date indicated.

SIGNATURES
TITLE DATE

----- ----
/s/ JOHN
R.
BERTUCCI
President,
Chairman
of the
Board
March 11,
2004 - ---

----- of
Directors
and Chief
Executive
John R.
Bertucci
Officer
(Principal
Executive
Officer)
/s/ RONALD
C. WEIGNER
Vice
President
and Chief
Financial
March 11,
2004 - ---

Officer
(Principal
Financial
and Ronald
C. Weigner
Accounting
Officer)
/s/ ROBERT
R.
ANDERSON
Director
March 11,
2004 - ---

Robert R. Anderson /s/ JAMES G. BERGES Director March 11, 2004 - ---
James G. Berges /s/ RICHARD S. CHUTE Director March 11, 2004 - ---
Richard S. Chute /s/ HANS-JOCHEN KAHL Director March 11, 2004 - ---
Hans-Jochen Kahl /s/ OWEN W. ROBBINS Director March 11, 2004 - --- Owen W. Robbins /s/ LOUIS P. VALENTE Director March 11, 2004 - ---
Louis P. Valente

Exhibit 10.12

EMPLOYMENT AGREEMENT

EMPLOYMENT AGREEMENT dated March 10, 2000 ("Employment Agreement") by and between MKS Instruments, Inc., a Massachusetts corporation (the "Corporation"), and Donald Smith of Belmont, MA (the "Employee").

WHEREAS, the Corporation and the Employee desire to provide for the employment of the Employee by the Corporation:

NOW, THEREFORE, in consideration of the premises and the mutual promises contained herein, the Corporation and the Employee hereby agree as follows:

(1) TERM OF EMPLOYMENT: The Corporation hereby employs the Employee, and the Employee hereby accepts employment with the Corporation, for a period commencing as of March 10, 2000 and continuing from month to month thereafter until terminated as provided in this Section (1). The Corporation may terminate the employment of the Employee under this Employment Agreement at any time after September 10, 2000 by giving written notice to the Employee stating its election to terminate the employment of the Employee under this Employment Agreement. The employment of the Employee under this Employment Agreement shall terminate six (6) months after the date of receipt by the Employee of such notice; provided, however, that the employment of the Employee under this Employment Agreement is subject to prior termination as hereinafter provided in Section (5). The Employee may terminate his employment with the Corporation under this Employment Agreement at any time after September 10, 2000 by giving written notice to the Corporation stating his election to terminate his employment under this Employment Agreement, provided, however, that the employment of the Employee under this Employment Agreement is subject to prior termination as hereinafter provided in Section (5).

The employment of the employee under this Employment Agreement shall terminate between twelve (12) and six (6) months after the date of receipt by the Corporation of such notice as set forth below:

IF NOTICE IS RECEIVED BY THE CORPORATION:	DATE OF TERMINATION OF EMPLOYMENT OF EMPLOYEE:
Between September 10, 2000 and October 9, 2000	Twelve (12) months after date of receipt of written notice by Corporation

Between October 10, 2000 and November 9, 2000	Eleven (11) months after date of receipt of written notice by Corporation.
Between November 10, 2000 and December 9, 2000	Ten (10) months after date of receipt of written notice by Corporation
Between December 10, 2000 and January 9, 2001	Nine (9) months after date of receipt of written notice by Corporation
Between January 10, 2001 and February 9, 2001	Eight (8) months after date of receipt of written notice by Corporation
Between February 10, 2001 and March 9, 2001	Seven (7) months after date of receipt of written notice by Corporation
Anytime on or after March 10, 2001	Six (6) months after date of receipt of written notice by Corporation

(2) CAPACITY: The Employee shall be employed by the Corporation in the position of Vice President and Chief Technical Officer and shall perform such duties as shall be assigned to Employee by the President and Chief Operating Officer of the Corporation, or his designee.

(3) EXTENT OF SERVICES: During the term of employment of the Employee under this Employment Agreement, the Employee shall devote his full time to, and use his best efforts in the furtherance of, the business of the Corporation and shall not engage in any other business activity which interferes in any way with the Employee's performance of his duties to the Corporation, whether or not such business activity is pursued for gain or any other pecuniary advantage, without the prior written consent of the Corporation.

(4) COMPENSATION: In consideration of the services to be rendered by the Employee under this Employment Agreement, the Corporation agrees to pay, and the Employee agrees to accept, the following compensation:

(a) BASE SALARY: A base salary at the rate of $150,000 per year for the term of employment of the Employee under this Employment Agreement. The base salary shall be payable in equal biweekly installments subject to usual withholding requirements. This salary will be reviewed annually according to the established practices of the company. No overtime pay will be paid to the Employee by the Corporation.

(b) INCENTIVE: For each calendar year of the corporation during the term of employment of the Employee under this Employment Agreement, the Employee shall be entitled to participate in a Management Incentive Program pursuant to the terms of which the Employee may receive compensation in addition to his base salary if the Corporation attains its consolidated financial goals during such calendar year of the Corporation. The "targeted" additional compensation goal for the Employee shall be 40% of his earnings. The Management Incentive Program, including the consolidated financial goals established by the Corporation for the calendar year and the formula to be used to determine the payment of amounts under the Management Incentive Program, will be communicated to the Employee in writing prior to the beginning of each calendar year of the Corporation.

If there shall be any disagreement between the Corporation and the Employee as to the calculation of the Management Incentive Bonus in any calendar year of the Corporation during the term of employment of the Employee under this Employment Agreement, the decision of the independent Public Accounting firm of the corporation as to the amount of the Management Incentive Bonus of the Corporation shall be conclusive and binding on the corporation and the Employee. The Employee shall be entitled to inspect any certificate of such independent public accounting firm as to the calculation of the Management Incentive Bonus of the Corporation in any calendar year of the Corporation during the term of employment of the Employee under this Employment Agreement.

Incentive payments shall be payable to the Employee on or before March 31 after the end of each calendar year of the Corporation during the term of employment of the Employee under this Employment Agreement.

The Employee will not receive any payment under the Management Incentive Program for any calendar year in which the Employee is not actively employed on the last day of that calendar year, but the Employee need not be actively employed at the time the payment is actually made.

(c) MKS INSTRUMENTS PROFIT SHARING AND RETIREMENT SAVINGS PLAN: The Employee shall be eligible to become a participant under the profit sharing plan of the Corporation on fulfilling the conditions set forth in the MKS Instruments Profit Sharing and Retirement Savings Plan of the Corporation.

(d) VACATION: The Employee shall be entitled to an annual vacation leave of 20 days at full pay during each year of this Employment Agreement, subject to the Employee arranging such vacation so as not to affect adversely the ability of the Corporation to transact its necessary business. Vacation shall accrue at the rate of 13.33 hours per month.

(e) LIFE INSURANCE: The Corporation shall provide, and pay all of the premiums for, term life insurance in the amount of $250,000 for the Employee during the term of employment of the Employee under this Employment Agreement in accordance with the term life insurance plan of the Corporation.

(f) MEDICAL/DENTAL INSURANCE: The Corporation shall provide group medical/dental insurance for the Employee and his eligible family members under the Plans of the Corporation applicable to the Employee during the term of employment of the Employee under this Employment Agreement. In addition, the Corporation shall provide to the Employee a supplemental medical/dental plan that will reimburse the Employee for the cost of any medically necessary services not paid under the primary medical/dental insurance plans, subject to an annual limit of $2,500.

(g) OTHER BENEFITS: The Corporation shall provide other benefits for the employee under the Plans of the Corporation applicable to the Employee during the term of employment of the Employee under this Employment Agreement.

(5) TERMINATION: The employment of the Employee under this Employment Agreement shall terminate:

(a) On the expiration of the period of employment as provided in Section (1).

(b) Upon the death of the Employee.

(c) At the election of the Corporation (i) if the Employee shall fail, or refuse, to perform the services required of him under this Employment Agreement, or (ii) if the Employee shall fail, or refuse, to perform the other covenants and agreements required of him under this Employment Agreement, or (iii) "for cause", which term shall mean acts or actions detrimental to the best interests of the Corporation.

(6) PAYMENT UPON TERMINATION:

(a) If the employment of the Employee is terminated on the expiration of the period of employment as provided in Section (1), the Employee shall not be entitled to any compensation, and the Corporation shall have no obligation to pay the employee any compensation, except as is provided in this Employment Agreement.

(b) If the employment of the Employee is terminated by death, the Corporation shall pay to the estate of the Employee the compensation which would otherwise be payable to the Employee at the end of the month in which his death occurs.

(c) In the event the employment of the Employee is terminated at the election of the Corporation pursuant to Section (5) (c) hereof, the Employee shall only be entitled to his base salary through the last day of actual employment or the date of termination, whichever is earlier..

(7) TRADE SECRETS: The Employee covenants and agrees that he will communicate to the Corporation, and will not divulge or communicate to any other person, partnership, corporation or other entity without the prior written consent of the Corporation, any trade secrets of the Corporation or confidential information relating to the business of the Corporation or any one connected with the Corporation, and that such trade secrets and confidential information shall not be used by the Employee either on his own behalf or for the benefit of others or disclosed by the Employee to any one, except to the Corporation, during or after the term of employment of the Employee under this Employment Agreement.

(8) INVENTIONS AND PATENTS:

(a) The Employee shall make prompt full disclosure in writing to the Corporation of all inventions, improvements and discoveries, whether or not patentable, which the Employee conceives, devises, makes, discovers, develops, perfects or first reduces to practice, either alone or jointly with others, during the term of employment of the Employee under this Employment Agreement, which relate in any way to the fields, products or business of the Corporation, including development and research, whether during or out of the usual hours of work or on or off the premises of the Corporation or by use of the facilities of the Corporation or otherwise and whether at the request or suggestion of the Corporation or otherwise (all such inventions, improvements and discoveries being hereinafter called the "Inventions"), including any Inventions, whether or not patentable, conceived, devised, made, discovered, developed, perfected or first reduced to practice by the Employee after the employment of the Employee under this Employment Agreement is terminated if the Inventions were conceived by the Employee during the term of employment of the Employee under this Employment Agreement. Any Inventions, whether or not patentable which relate in any way to the fields, products or business of the Corporation, conceived, devised, made, discovered, developed, perfected or first reduced to practice by the Employee within six (6) months of the date termination of the employment of the Employee under this Employment Agreement shall be conclusively presumed to have been conceived during the term of employment of the Employee under this Employment Agreement.

(b) The Employee agrees that the Inventions shall be the sole and exclusive property of the Corporation.

(c) The Employee agrees to assist the Corporation and its nominees in every reasonable way (entirely at its or their expense) to obtain for the benefit of the Corporation letters patent for the Inventions and trademarks, trade names and copyrights relating to the Inventions, and any renewals, extensions or reissues thereof, in any and all countries, and agrees to make, execute, acknowledge and deliver, at the request of the Corporation, all written applications for letters patent, trademarks, trade names and copyrights relating to the Inventions and any renewals, extensions or reissues thereof, in any and all countries, and all documents with respect thereto, and all powers of attorney relating thereto and, without further compensation, to assign to the Corporation or its nominee all the right, title and interest of the Employee in and to such applications and to any patents, trademarks, trade names or copyrights which shall thereafter issue on any such applications, and to execute, acknowledge and deliver all other documents deemed necessary by the Corporation to transfer to or vest in the Corporation all of the right, title and interest of the Employee in and to the Inventions, and to such trademarks, trade names, patents and copyrights together with exclusive rights to make, use, license and sell them throughout the world.

(d) The Employee agrees that even though his employment is terminated under this Employment Agreement he will, at any time after such termination of employment, carry out and perform all of the agreements of Subsections (8) (a) and (8) (c) above, and will at any time and at all times cooperate with the Corporation in the prosecution and/or defense of any litigation which may arise in connection with the Inventions, provided, however, that should such services be rendered after termination of employment of the Employee under this Employment Agreement, the Employee shall be paid reasonable compensation on a per diem basis.

(e) The Employee agrees to make and maintain adequate and current written records of all Inventions in the form of notes, sketches, drawings, or reports relating thereto, which records shall be and remain the property of, and available to, the Corporation at all times.

(f) The Employee agrees that he will, upon leaving the employment of the Corporation, promptly deliver to the Corporation all originals and copies of disclosures, drawings, prints, letters, notes, and reports either typed, handwritten or otherwise memorialized, belonging to the Corporation which are in his possession or under his control and the Employee agrees that he will not retain or give away or make copies of the originals or copies of any such disclosures, drawings, prints, letters, notes or reports.

(9) PROPERTY OF CORPORATION: All files, records, reports, documents, drawings, specifications, equipment, and similar items relating to the business of the Corporation, whether prepared by the Employee or otherwise coming into his possession, shall remain the exclusive property of the Corporation and shall not be removed by the Employee from the premises of the Corporation under any circumstances whatsoever without the prior written consent of the Corporation. Provided, however, the Employee may remove such files and other items from the premises of the Corporation if required to do so during the course of his duties or if required to work at home.

(10) NON-COMPETITION:

(a) During the term of employment of the Employee under this Employment Agreement, and during a period of one (1) year after termination of employment of the Employee under this Employment Agreement without regard to the cause of termination of employment and whether or not such termination of employment was caused by the Employee or by the Corporation, (i) the Employee shall not engage, either directly or indirectly, in any manner or capacity, in any business or activity which is competitive with any business or activity conducted by the Corporation; (ii) the Employee shall not work for or employ, directly or indirectly, or cause to be employed by another, any person who was an employee, officer or agent of the Corporation or of any of its subsidiaries at any time during a period of twelve (12) months prior to the termination of the employment of the Employee under this Employment Agreement nor shall the Employee form any partnership with, or establish any business venture in cooperation with, any such person which is competitive with any business or activity of the Corporation; (iii) the Employee shall not give, sell or lease any goods or services competitive with the goods or services of the Corporation or its subsidiaries to any person, partnership, corporation or other entity who purchased goods or services from the Corporation or its subsidiaries within one (1) year before the termination of the employment of the Employee under this Employment Agreement; (iv) the Employee shall not have any financial interest, or participate as a director, officer, stockholder, partner, employee, consultant or otherwise, in any corporation, partnership or other entity which is competitive with any business or activity conducted by the Corporation.

(b) The Corporation and the Employee agree that the services of the Employee are of a personal, special, unique and extraordinary character, and cannot be replaced by the Corporation without great difficulty, and that the violation by the Employee of any of his agreements under this Section (10) would damage the goodwill of the Corporation and cause the Corporation irreparable harm which could not reasonably or adequately be compensated in damages in an action at law, and that the agreements of the Employee under this Section (10) may be enforced by the Corporation in equity by an injunction or restraining order in addition to being enforced by the Corporation at law.

(c) In the event that this Section (10) shall be determined by any court of competent jurisdiction to be unenforceable by reason of its extending for too long a period of time or over too great a range of activities, it shall be interpreted to extend only over the maximum period of time or range of activities as to which it may be enforceable.

(11) NOTICE: Any and all notices under this Employment Agreement shall be in writing and, if to the Corporation, shall be duly given if sent to the Corporation by registered or certified mail, postage prepaid, return receipt requested, at the address of the Corporation set forth under its name below or at such other address as the Corporation may hereafter designate to the Employee in writing for the purpose, and if to the Employee, shall be duly given if delivered to the Employee by hand or if sent to the Employee by registered or certified mail, postage prepaid, return receipt requested, at the address of the Employee set forth under his name below or at such other address as the Employee may hereafter designate to the Corporation in writing for the purpose.

(12) ASSIGNMENT: The rights and obligations of the Corporation under this Employment Agreement shall inure to the benefit of, and shall be binding upon, the successors and assigns of the Corporation. The rights and obligations of the Employee under this Employment Agreement shall inure to the benefit of, and shall be binding upon, the heirs, executors and legal representatives of the Employee.

(13) ENTIRE AGREEMENT AND SEVERABILITY

(a) This Employment Agreement and the MKS offer of employment letter dated

March 10, 2000 (and the documents referenced herein) supersede any and all other agreements, either oral or in writing, between the parties hereto with respect to the employment of the Employee by the Corporation and contain all of the covenants and agreements between the parties with respect to such employment. Each party to this Employment Agreement acknowledges that no representations, inducements, promises or agreements, oral or otherwise, have been made by any party, or any one acting on behalf of any party, which are not embodied herein, and that no other agreement, statement or promise not contained in this Employment Agreement or referenced herein, or as amended, shall be valid and binding. Any modification of this Employment Agreement will be effective only if it is in writing signed by both parties to this Employment Agreement.

(b) If any provision in this Employment Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions shall nevertheless continue in full force and effect without being impaired or invalidated in any way.

(c) All pronouns used herein shall include the masculine, feminine, and neuter gender as the context requires.

(14) GOVERNING LAW: This Employment Agreement shall be governed by, and construed and enforced in accordance with, the internal laws of The Commonwealth of Massachusetts without reference to conflict of laws principles.

IN WITNESS WHEREOF, the parties hereto have executed, in the Commonwealth of Massachusetts, this Employment Agreement as a sealed instrument, all as of the day, month and year first written above.

MKS INSTRUMENTS, INC.

By: /s/ Peter Younger

Peter Younger
President and Chief Operating Officer
6 Shattuck Road, Andover, MA 01810

/s/ Donald Smith

Donald Smith

Address: 10 Village Hill Road

Belmont, MA 02478

AMENDMENT TO EMPLOYMENT AGREEMENT

This Amendment (the "Amendment") to Employment Agreement is made this 21st day of February, 2004 by and between MKS Instruments, Inc., a Massachusetts corporation ("MKS") and Donald Smith of Belmont, Massachusetts (the "Employee").

RECITALS

WHEREAS, MKS and the Employee have previously entered into an Employment Agreement dated March 10, 2000 (the "Employment Agreement");

WHEREAS, MKS and the Employee desire to provide for the Employee's continuing services while the Employee establishes a business unrelated to the business activities carried on or currently under development by MKS; and

WHEREAS, MKS and the Employee wish to modify certain limited provisions of the Employment Agreement;

NOW THEREFORE, for good and valuable consideration, the sufficiency and receipt whereof are hereby acknowledged, the parties hereby agree as follows:

1. Ratification of Employment Agreement. Except as specifically set forth in this Amendment, the parties hereby ratify and confirm in all respects all of the provisions of the Employment Agreement.

2. Employment and Extent of Services. Notwithstanding the provisions of Section 3 of the Employment Agreement, the parties acknowledge that beginning the date of this Amendment, the Employee may devote up to 20 hours per week in connection with the establishment of the New Business (as defined below) and the development of technologies, business opportunities, and other development plans associated with the New Business. For the purposes of this Amendment, the term "New Business" shall mean the development of lithography technologies for use in the semiconductor industry and any other businesses that do not compete with the MKS Current Business (as defined below). For purposes of this Amendment, the "MKS Current Business" shall mean the business of MKS relating to products and technologies now or previously sold, demonstrably under development by MKS as of the date of this Amendment or included on the latest respective versions of the MKS Technology Roadmaps for each of the MKS product groups and the Advanced Technology group prior to the date of this Amendment. The Employee may terminate his employment with MKS by providing MKS with thirty (30) days notice, which notice may be provided at any time on or after March 31, 2004, and MKS may terminate the Employee's employment at any time with thirty (30) days notice, provided that such employment may be terminated with less notice upon the mutual agreement of the parties. During his employment in accordance with the Employment Agreement as amended hereby (including any termination notice period), (1) the Employee shall be eligible for all benefits then provided to full-time MKS employees and all options held by the Employee shall continue to vest in the normal

course as if the Employee were employed on a full-time basis by MKS and (2) the Employee will be paid a rate of one-half of his current base salary.

3. Access following termination. Following termination of employment, the Employee agrees to be available (1) without charge to MKS for a maximum of eight hours per month for a period of six months to allow for the continuity of MKS' business, and (2) with reasonable compensation and reimbursement of expenses for any services provided by the Employee to MKS pursuant to Section 8(d) of the Employment Agreement.

4. Trade Secrets and Inventions. The provisions of Sections 7 and 8 of the Employment Agreement shall continue to apply solely as they relate to the MKS Current Business.

5. Non-Competition. The provisions of Section 10(a) of the Employment Agreement are hereby modified as follows:

(a) The restrictions set forth in Section 10(a)(i) as they relate to the MKS Current Business are hereby extended from one (1) year to two (2) years after termination of employment;

(b) The restrictions set forth in Section 10(a)(ii) are hereby extended from one (1) year to three (3) years after termination of employment, provided that MKS may, at its sole discretion, waive such restrictions on a case-by-case basis with its prior written consent.

(c) The restrictions set forth in Section 10(a)(iii) and (iv) continue to apply as they relate to the MKS Current Business.

In witness whereof, the parties have executed this Amendment as of the date first mentioned above.

MKS INSTRUMENTS, INC.

/s/ John R. Bertucci
- --------------------
By: John R. Bertucci
President

EMPLOYEE

/s/ Donald K. Smith

Donald Smith

Exhibit 10.14

AMENDED & RESTATED EMPLOYMENT AGREEMENT

EMPLOYMENT AGREEMENT dated December 15, 1995 (the "Employment Agreement") by and between MKS Instruments, Inc., a Massachusetts Corporation (the "Corporation"), and Gerald Colella of Lowell, MA (the "Employee").

WHEREAS, the Corporation and the Employee entered into an Employment Agreement dated February 28, 1994 (the "Original Employment Agreement"); and

WHEREAS, the Corporation has adopted a new Management Incentive Program and the Employee desires to be eligible to participate in such Management Incentive Program; and

WHEREAS, the Corporation and the Employee desire to make certain other amendments to the Original employment Agreement as more particularly set forth herein; and

WHEREAS, for convenience of reference, the Corporation and the Employee desire to amend and restate the Original Employment Agreement in its entirety:

NOW, THEREFORE, in consideration of the premises and the mutual promises contained herein, and for other good and valuable considerations, the receipt and sufficiency of which are hereby acknowledged, The Corporation and the Employee hereby agree that the Original Employment Agreement is hereby amended and restated to read in its entirety as follows:

(1) Term of Employment: The Corporation hereby employs the Employee, and the Employee hereby accepts employment with the Corporation, for a period commencing as of December 15, 1995 and continuing from month to month thereafter until terminated as provided in this Section (1). Either the Corporation or the Employee may terminate the employment of the Employee under this Employment Agreement at any time after December 15, 1995 by giving written notice to the other party stating its or his election to terminate the employment of the Employee under this Employment Agreement. The employment of the Employee under this Employment Agreement shall terminate thirty (30) days after the date of receipt by the other party of such notice; provided, however, that the employment of the Employee under this Employment Agreement is subject to prior termination as hereinafter provided in Section (5).

(2) Capacity: The Employee shall serve in such capacity as may be assigned to him consistent with his training and experience for the term of employment under this Employment Agreement and shall have such authority as is delegated to him by the President of the Corporation, or his designee.

(3) Extent of Services: During the term of employment of the Employee under this

Employment Agreement, the Employee shall devote his full time to, and use his best efforts in the furtherance of, the business of the Corporation and shall not engage in any other business activity, whether or not such business activity is pursued for gain or any other pecuniary advantage, without the prior written consent of the Corporation.

(4) Compensation: In consideration of the services to be rendered by the Employee under this Employment Agreement, the Corporation agrees to pay, and the Employee agrees to accept, the following compensation:

(a) Base Salary: A base salary at the rate of $110,000 per year for the term of employment of the Employee under this Employment Agreement. The base salary shall be payable in equal weekly, biweekly, or bimonthly installments subject to usual withholding requirements. Base salary will be reviewed according to the established practices of the corporation. No overtime pay will be paid to the Employee by the Corporation.

(b) Incentive: For each calendar year of the Corporation during the term of employment of the Employee under this Employment Agreement, the Employee shall be entitled to participate in a Management Incentive Program pursuant to the terms of which the Employee may receive compensation in addition to his base salary in an amount equal to a specified percentage of his base salary if the Corporation attains its consolidated financial goals during such calendar year of the Corporation. The Management Incentive Program, including the consolidated financial goals established by the Corporation for the calendar year and the formula to be used to determine the payment of amounts under the Management Incentive Program, will be communicated to the Employee in writing prior to the beginning of each calendar year of the Corporation. The first calendar year of the Corporation for purposes of the Management Incentive Program will commence on January 1, 1996 and end on December 31, 1996. If the term of employment of the Employee under this Employment Agreement shall include a portion of a calendar year of the Corporation commencing after January 1, 1996, the Corporation shall not pay the Employee, and the Employee shall not be entitled to receive, any amount under the Management Incentive Program.

If there shall be any disagreement between the Corporation and the Employee as to the calculation of the Management Incentive Bonus in any calendar year of the Corporation during the term of employment of the Employee under this Employ- ment Agreement, the decision of the independent Public Accounting firm of the Cor-poration as to the amount of the Management Incentive Bonus of the Corporation shall be conclusive and binding on the Corporation and the Employee. The Employee shall have no right to inspect any of the books, papers or records of the Corporation, except that the Employee shall be entitled to inspect any certificate of such independent public of the Corporation in any calendar year of the Corporation during the term of employment of the Employee under this Employment Agreement.

Incentive payments shall be payable to the Employee on or before March 31 after the end of each calendar year of the Corporation during the term of employment of the Employee under this Employment Agreement.

(c) MKS Instruments, Inc. Profit Sharing and Retirement Savings Plan: The Employee shall be eligible to participate in the the MKS Instruments, Inc. Profit Sharing and Retirement Savings Plan upon satisfaction of the conditions set forth therein.

(d) Vacation: The Employee shall be entitled to an annual vacation leave of 18 days at full pay during each calendar year during the term of employment of the Employee under this Employment Agreement, subject to the Employee arranging such vacation so as not to affect adversely the ability of the Corporation to transact its necessary business.

(e) Life Insurance: The Corporation shall provide, and pay all of the premiums for, term life insurance for the Employee during the term of employment of the Employee under this Employment Agreement in accordance with the term life insurance plan of the Corporation.

(f) Medical/Dental Insurance: The Corporation shall provide group medical/dental insurance for the Employee under the Plans of the Corporation applicable to the Employee during the term of employment of the Employee under this Employment Agreement.

(g) Other Benefits: The Corporation shall provide other benefits for the employee under the Plans of the Corporation applicable to the Employee during the term of employment of the Employee under this Employment Agreement.

(5) Termination: The employment of the Employee under this Employment Agreement shall terminate:

(a) On the expiration of the period of employment as provided in Section (1).

(b) Upon the death of the Employee.

(c) At the election of the Corporation (i) if the Employee shall fail, or refuse, to perform the services required of him under this Employment Agreement, or (ii) if the Employee shall fail, or refuse, to perform the other covenants and agreements required of him under this Employment Agreement, or (iii) for "cause", which term shall mean acts or actions detrimental to the best interests of the Corporation.

(6) Payment Upon Termination:

(a) If the employment of the Employee is terminated on the expiration of the period of employment as provided in Section (1), the Employee shall not be entitled to any compensation, and the Corporation shall have no obligation to pay the Employee any compensation, except as is provided in this Employment Agreement.

(b) If the employment of the Employee is terminated by death, the Corporation shall pay to the estate of the Employee the compensation which would otherwise be payable to the Employee at the end of the month in which his death occurs.

(c) In the event the employment of the Employee is terminated at the election of the Corporation pursuant to Section (5) (c) hereof, the Employee shall only be entitled to his base salary through the last day of actual employment or the date of termination, whichever is earlier.

(7) Trade Secrets: The Employee covenants and agrees that he will communicate to the Corporation, and will not divulge or communicate to any other person, partnership, corporation or other entity without the prior written consent of the Corporation, any trade secrets of the Corporation or confidential information relating to the business of the Corporation or any one connected with the Corporation, and that such trade secrets and confidential information shall not be used by the Employee either on his own behalf or for the benefit of others or disclosed by the Employee to any one, except to the Corporation, during or after the term of employment of the Employee under this Employment Agreement. "Trade secrets of the Corporation" shall include, but not be limited to, Inventions, trade secrets, files, records, drawings, specifications, processes, lists of material, lists of customers, sales and marketing strategies, product development plans, financial information, and information on research and development.

(8) Inventions and Patents:

(a) The Employee shall make prompt full disclosure in writing to the Corporation of all inventions, improvements and discoveries, whether or not patentable, which the Employee conceives, devises, makes, discovers, develops, perfects or first reduces to practice, either alone or jointly with others, during the term of employment of the Employee under this Employment Agreement, which relate in any way to the fields, products or business of the Corporation, including development and research, whether during or out of the usual hours of work or on or off the premises of the Corporation or by use of the facilities of the Corporation or otherwise and whether at the request or suggestion of the Corporation or otherwise (all such inventions, improvements and discoveries being hereinafter called the "Inventions"), including any Inventions, whether or not patentable, conceived, devised, made, discovered, developed, perfected or first reduced to practice by the Employee after the employment of the Employee under this Employment Agreement is terminated if the Inventions were conceived by the Employee during the term of employment of the Employee under this Employment Agreement. Any Inventions, whether or not patentable, conceived, devised, made, discovered, developed, perfected or first reduced to practice by the Employee within six (6) months of the date of termination of the employment of the Employee under this Employment Agreement shall be conclusively presumed to have been conceived during the term of employment of the Employee under this Employment Agreement.

(b) The Employee agrees that the Inventions shall be the sole and exclusive property of the Corporation.

(c) The Employee agrees to assist the Corporation and its nominees in every reasonable way (entirely at its or their expense) to obtain for the benefit of the Corporation letters patent for the Inventions and trademarks, trade names and copyrights relating to the Inventions, and any renewals, extensions or reissues thereof, in any and all countries, and agrees to make, execute, acknowledge and deliver, at the request of the Corporation, all written applications for letters patent, trademarks, trade names and copyrights relating to the Inventions and any renewals, extensions or reissues thereof, in any and all countries, and all documents with respect thereto, and all powers of attorney relating thereto and, without further compensation, to assign to the Corporation or its nominees all the right, title and interest of the Employee in and to such applications and to any patents, trademarks, trade names or copyrights which shall thereafter issue on any such applications, and to execute, acknowledge and deliver all other documents deemed necessary by the Corporation to transfer to or vest in the Corporation all of the right, title and interest of the Employee in and to the Inventions, and to such trademarks, trade names, patents and copyrights together with exclusive rights to make, use, license and sell them throughout the world.

(d) The Employee agrees that even though his employment is terminated under this Employment Agreement he will, at any time after such termination of employment, carry out and perform all of the agreements of Subsections (8) (a) and (8) (c) above, and will at any time and at all times cooperate with the Corporation in the prosecution and/or defense of any litigation which may arise in connection with the Inventions, provided, however, that should such services be rendered after termination of employment of the Employee under this Employment Agreement, the Employee shall be paid reasonable compensation on a per diem basis.

(e) The Employee agrees to make and maintain adequate and current written records of all Inventions in the form of notes, sketches, drawings, or reports relating thereto, which records shall be and remain the property of, and available to, the Corporation at all times.

(f) The Employee agrees that he will, upon leaving the employment of the Corporation, promptly deliver to the Corporation all originals and copies of disclosures, drawings, prints, letters, notes, and reports either typed, handwritten or otherwise memorialized, belonging to the Corporation which are in his possession or under his control and the Employee agrees that he will not retain or give away or make copies of the originals or copies of any such disclosures, drawings, prints, letters, notes or reports.

(9) Property of Corporation: All files, records, reports, documents, drawings, specifications, equipment, and similar items relating to the business of the Corporation, whether prepared by the Employee or otherwise coming into his possession, shall remain the exclusive property of the Corporation and shall not be removed by the Employee from the premises of the Corporation under any circumstances whatsoever without the prior written consent of the Corporation.

(10) Non-Competition:

(a) In order to protect the good will of the Corporation and in order to protect the trade secrets of the Corporation referred to in Section (7) of this Employment Agreement, the Employee hereby agrees that during the term of employment of the Employee under this Employment Agreement, and during a period of one (1) year after termination of employment of the Employee under this Employment Agreement without regard to the cause of termination of employment and whether or not such termination of employment was caused by the Employee or by the Corporation, (i) the Employee shall not engage, either directly or indirectly, in any manner or capacity, in any business or activity which is competitive with any business or activity conducted by the Corporation; (ii) the Employee shall not work for or employ, directly or indirectly, or cause to be employed by another, any person who was an employee, officer or agent of the Corporation or of any of its subsidiaries at any time during a period of twelve (12) months prior to the termination of the employment of the Employee under this Employment Agreement, provided such employment is competitive with any business or activity of the Corporation, nor shall the Employee form any partnership with, or establish any business venture in cooperation with, any such person which is competitive with any business or activity of the Corporation; (iii) the Employee shall not give, sell or lease any goods or services competitive with the goods or services of the Corporation or its subsidiaries to any person, partnership, corporation or other entity who purchased goods or services from the Corporation or its subsidiaries within one (1) year before the termination of the employment of the Employee under this Employment Agreement; (iv) the Employee shall not participate as a director, officer, partner, employee, consultant or otherwise, in any corporation, partnership or other entity which is competitive with any business or activity conducted by the Corporation.

(b) The Corporation and the Employee agree that the services of the Employee are of a personal, special, unique and extraordinary character, and cannot be replaced by the Corporation without great difficulty, and that the violation by the Employee of any of his agreements under this Section (10) would damage the goodwill of the Corporation and cause the Corporation irreparable harm which could not reasonably or adequately be compensated in damages in an action at law, and that the agreements of the Employee under this Section (10) may be enforced by the Corporation in equity by an injunction or restraining order in addition to being enforced by the Corporation at law.

(c) In the event that this Section (10) shall be determined by any court of competent jurisdiction to be unenforceable by reason of its extending for too long a period of time or over too great a range of activities, it shall be interpreted to extend only over the maximum period of time or range of activities as to which it may be enforceable.

(11) Notice: Any and all notices under this Employment Agreement shall be in writing and, if to the Corporation, shall be duly given if sent to the Corporation by registered or certified mail, postage prepaid, return receipt requested, at the address of the Corporation set forth under its name below or at such other address as the Corporation may hereafter designate to the Employee in writing for the purpose, and if to the Employee, shall be duly given if delivered to the Employee by hand or if sent to the Employee by registered or certified mail, postage prepaid, return receipt requested, at the address of the Employee set forth under his name below or at such other address as the Employee may hereafter designate to the Corporation in writing for the purpose.

(12) Assignment: The rights and obligations of the Corporation under this Employment Agreement shall inure to the benefit of, and shall be binding upon, the successors and assigns of the Corporation. The rights and obligations of the Employee under this Employment Agreement shall inure to the benefit of, and shall be binding upon, the heirs, executors and legal representatives of the Employee.

(13) Entire Agreement and Severability:

(a) This Employment Agreement supersedes any and all other agreements, either oral or in writing, between the parties hereto with respect to the employment of the Employee by the Corporation and contains all of the covenants and agreements between the parties with respect to such employment. Each party to this Employment Agreement acknowledges that no representations, inducements, promises or agreements, oral or otherwise, have been made by any party, or any one acting on behalf of any party, which are not embodied herein, and that no other agreement, statement or promise not contained in this Employment Agreement shall be valid and binding. Any modification of this Employment Agreement will be effective only if it is in writing signed by both parties to this Employment Agreement.

(b) If any provision in this Employment Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions shall nevertheless continue in full force and effect without being impaired or invalidated in any way.

(c) All pronouns used herein shall include the masculine, feminine, and neuter gender as the context requires.

(14) Governing Law and Jurisdictions: This Employment Agreement shall be governed by, and construed in accordance with, the laws of The Commonwealth of Massachusetts applicable to contracts made and to be performed entirely within The

Commonwealth of Massachusetts (without reference to conflict of laws principles). Any action or proceeding arising from or in connection with this Employment Agreement may be brought against the Employee in a court of record of The Commonwealth of Massachusetts, Middlesex County, or in the United States District Court for the District of Massachusetts, the Employee hereby consenting to the jurisdiction thereof over its person; and service of process may be made upon the Employee by mailing a copy of the summons and any complaint to the Employee by registered or certified mail, postage prepaid, return receipt requested, at the address to be used for the giving of notice to the Employee as provided in this Employment Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Employment Agreement as a sealed instrument in the Commonwealth of Massachusetts, all as of the day, month and year first written above.

MKS INSTRUMENTS, INC.

By: /s/ John R. Bertucci

John R. Bertucci, President

Six Shattuck Road
Andover, MA 01810

/s/ Gerald Colella

Employee Signature

Gerald Colella

Employee Name

Address:
61 Heritage Drive

Lowell, MA 01852

EXHIBIT 21.1

SUBSIDIARIES OF THE REGISTRANT

SUBSIDIARY	JURISDICTION OF INCORPORATION
MKS International, Inc.	Massachusetts
MKS Instruments France S.A.	France
MKS Instruments Canada Ltd.	Canada
MKS Instruments, U.K. Limited	United Kingdom
MKS East, Inc.	Massachusetts
MKS Japan, Inc.	Japan
MKS Korea Co., Ltd.	Korea
MKS FSC, Inc.	Barbados
Telvac Engineering Limited	United Kingdom
Spectra Sensortech, Ltd.	United Kingdom
Applied Science and Technology, Inc.	Delaware
MKS MSC, Inc.	Massachusetts
ASTeX Realty Corporation	Massachusetts
MKS (Bermuda) Ltd.	Bermuda
MKS Luxembourg S.A.R.L.	Luxembourg
MKS Germany Holding GmbH	Germany
MKS Instruments Deutschland GmbH	Germany
ASTeX GmbH	Germany
ENI Technology, Inc.	Delaware
MKS (Asia) Ltd.	Bermuda
MKS Hong Kong	Hong Kong
MKS China	China
MKS Taiwan Ltd.	Taiwan
M.K.S. Tenta Products Ltd.	Israel
Wenzel Instruments APS	Denmark
ETO Export Corporation FSC	US Virgin Islands
MKS Shanghai Ltd	China
ASTex Sorbios GmbH	Germany

EXHIBIT 23.1

CONSENT OF INDEPENDENT ACCOUNTANTS

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (No. 333-78069, 333-78071, 333-78073, 333-31224, 333-54486, 333-54488, 333-54490, 333-90498, 333-90500 and 333-90502) and Form S-3 (No. 333-34450 and 333-109753) of MKS Instruments, Inc. of our report dated January 30, 2004 relating to the financial statements and the financial statement schedule, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
March 9, 2004

EXHIBIT 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO RULE 13A-14(A)/RULE 15D-14(A) OF THE
SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

I, John R. Bertucci, certify that:

1. I have reviewed this report on Form 10-K of MKS Instruments, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15(d)-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any changes in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal controls over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control and financial reporting.

Dated: March 8, 2004

/s/ JOHN R. BERTUCCI

John R. Bertucci
Chairman, Chief Executive Officer and President
(Principal Executive Officer)

EXHIBIT 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO RULE 13A-14(A)/RULE 15D-14(A) OF THE
SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

I, Ronald C. Weigner, certify that:

1. I have reviewed this report on Form 10-K of MKS Instruments, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15(d)-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any changes in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal controls over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control and financial reporting.

Dated: March 8, 2004

/s/ RONALD C. WEIGNER

Ronald C. Weigner
Vice President and Chief Financial Officer
(Principal Financial Officer)

EXHIBIT 32.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER

PURSUANT TO 18 U.S.C. SECTION 1350,

AS ADOPTED PURSUANT TO

SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of MKS Instruments, Inc. (the "Company") for the period ended December 31, 2003 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, John R. Bertucci, Chairman, Chief Executive Officer and President of the Company, hereby certifies, pursuant to 18 U.S.C. Section 1350, that:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: March 8, 2004

/s/ John R. Bertucci

John R. Bertucci
Chairman, Chief Executive Officer and President

EXHIBIT 32.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER

PURSUANT TO 18 U.S.C. SECTION 1350,

AS ADOPTED PURSUANT TO

SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of MKS Instruments, Inc. (the "Company") for the period ended December 31, 2003 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Ronald C. Weigner, Vice President and Chief Financial Officer of the Company, hereby certifies, pursuant to 18 U.S.C. Section 1350, that:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: March 8, 2004

/s/ Ronald C. Weigner

Ronald C. Weigner
Vice President and Chief Financial Officer