MKS INSTRUMENTS INC
Form 10-K
February 24, 2012
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UNITED STATES SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

Form 10-K

(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, 2011

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	**04-2277512**
(State or other Jurisdiction of Incorporation or Organization)	*(IRS Employer Identification No.)*
2 Tech Drive, Suite 201, Andover, Massachusetts	**01810**
(Address of Principal Executive Offices)	*(Zip Code)*

Registrant s Telephone Number, including area code

(978) 645-5500

Securities registered pursuant to Section 12(b) of the Act:

Title of class	Name of exchange on which registered
Common Stock, no par value	NASDAQ Global Select Market

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ¨ No x

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ¨ No x

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 whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes x No ¨

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant s knowledge, in definitive proxy or information statements 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 a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer x	Accelerated filer ¨	Non-accelerated filer ¨ (Do not check if a smaller reporting company)	Smaller reporting company ¨

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ¨ No x

Aggregate market value of the voting and non-voting common equity held by nonaffiliates of the registrant as of June 30, 2011 based on the closing price of the registrant s Common Stock on such date as reported by the NASDAQ Global Market: $1,385,444,483.

Number of shares outstanding of the issuer s Common Stock, no par value, as of February 17, 2012: 52,510,320

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive Proxy Statement for MKS Annual Meeting of Stockholders to be held on May 7, 2012 are incorporated by reference into Part III of this Form 10-K.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act and Section 21E of the Securities Exchange Act. When used herein, the words believe, anticipate, plan, expect, estimate, intend, may, see, will, would and similar expressions are intended to identify forward-looking statements altho forward looking statements contain these identifying words. 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 Risk Factors of this annual report on Form 10-K.

PART I

Item 1. ***Business***

MKS Instruments, Inc. (the Company or MKS) was founded in 1961 as a Massachusetts corporation. We are a global provider of instruments, subsystems and process control solutions that measure, control, power, monitor and analyze critical parameters of advanced manufacturing processes to improve process performance and productivity. We also provide services relating to the maintenance and repair of our products, software maintenance, installation services and training.

Our products are used in diverse markets, applications and processes and are derived from our core competencies in pressure measurement and control, materials delivery, gas composition analysis, control and information technology, power and reactive gas generation and vacuum technology. The primary markets we serve are manufacturers of semiconductor capital equipment and semiconductor devices and for other thin film applications including flat panel displays, solar cells, light emitting diodes (LEDs), data storage media and other advanced manufactured products. We also leverage our technology into other markets with advanced manufacturing applications including medical equipment, pharmaceutical manufacturing, energy generation and environmental monitoring.

We are managed as one operating segment. We group our products into three product groups, based upon the similarity of the product function, type of product and manufacturing processes. These three groups of products are: 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 composition analysis, control and information technology, power and reactive gas generation and vacuum technology.

For 50 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 includes manufacturers of semiconductor capital equipment and semiconductor devices, thin film capital equipment used in the manufacture of flat panel displays, LEDs, solar cells, data storage media and other coating applications; and other industrial, medical, pharmaceutical manufacturing, energy generation, environmental monitoring and other advanced manufacturing companies, as well as university, government and industrial research laboratories.

We file reports, proxy statements and other documents with the Securities and Exchange Commission (SEC). You may read and copy any document we file at the SEC Headquarters at the Office of Investor Education and Assistance, 100 F Street, NE, 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.

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Our internet address is http://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 internet 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 (the Exchange Act), as soon as reasonably practicable after we electronically file such materials with, or furnish it to, the SEC.

Markets and Applications

We are focused on improving process performance and productivity by measuring, controlling, powering, monitoring and analyzing advanced manufacturing processes in semiconductor, thin film and certain other advanced market sectors. Approximately 61%, 64% and 52% of our net sales for the years 2011, 2010 and 2009, respectively, were to semiconductor capital equipment manufacturers and semiconductor device manufacturers. Approximately 39%, 36% and 48% of our net sales in the years 2011, 2010 and 2009, respectively, were for other advanced manufacturing applications. These include, but are not limited to, thin film processing equipment applications such as flat panel displays, LEDs, solar cells, data storage media and other thin film coatings as well as medical equipment; pharmaceutical manufacturing, energy generation and environmental monitoring processes; other industrial manufacturing; and university, government and industrial research laboratories.

During the years 2011, 2010 and 2009, international net sales accounted for approximately 52%, 43% and 46% of our net sales, respectively. Net sales by our Japanese subsidiary were 13%, 14% and 12% for the years 2011, 2010 and 2009, respectively. Long-lived assets located in the U.S. were $56.8 million, $54.8 million and $52.1 million as of December 31, 2011, 2010 and 2009, respectively. Long-lived assets located outside the U.S. were $17.7 million, $17.8 million and $17.4 million as of December 31, 2011, 2010 and 2009, respectively.

Semiconductor Manufacturing Applications

The majority of our sales are derived from products sold to semiconductor capital equipment manufacturers and semiconductor device manufacturers. Our products are used in the major semiconductor processing steps such as depositing thin films of material onto silicon wafer substrates and etching and cleaning circuit patterns. In addition, we provide specialized instruments and software to monitor and analyze process performance.

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 Japan and the United States.

Other Advanced Manufacturing Applications

Our products are used in the manufacture of flat panel displays, LEDs, data storage media, solar cells and other coatings including architectural glass that require the same or similar thin film deposition processes as semiconductor manufacturing.

Flat Panel Display Manufacturing

Flat panel displays are used in electronic hand-held devices, laptop computers, desktop computer monitors and television sets. We sell products to flat panel display equipment manufacturers and to end-users in the flat panel display market. Major manufacturers of flat panel displays are concentrated in Japan, Korea and Taiwan, and major manufacturers of flat panel display equipment are concentrated in Japan and the United States. The transition to larger panel sizes and higher display resolution is driving the need for improved process control to reduce defects.

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Light Emitting Diodes (LEDs)

LEDs are made using vacuum processes similar to semiconductor chip manufacturing. Because of their high brightness and long life, as well as environmentally friendly benefits such as lower power consumption, LEDs are expected to experience rapid acceptance in back side lighting of flat screen television displays and are emerging in general lighting applications.

Solar Cells

Our products are used in crystalline silicon and emerging thin film processes to manufacture photovoltaic cells. Crystalline silicon technology requires wafer based deposition systems and is currently the dominant manufacturing technology. Thin film deposition on a non-silicon substrate, such as glass, is the emerging technology.

Data Storage Media

Our products are used to manufacture storage media that store and read data magnetically; optical storage media that store and read data using laser technology; hard disks; data storage devices; and digital video discs.

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

Other Advanced Coatings

Thin film coatings for diverse applications such as architectural glass and packaging are deposited using processes similar to those used in semiconductor manufacturing. Thin film processing manufacturers are concentrated in Europe, Japan and the United States.

Other Advanced Applications

Our products are used in other energy generation and environmental monitoring processes such as nuclear fuel processing, fuel cell research, greenhouse gas monitoring, and chemical agent detection; medical instrument sterilization; consumable medical supply manufacturing and pharmaceutical applications. Our power delivery products are also incorporated into other end-market products such as medical imaging equipment. 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. Major equipment and process providers and research laboratories are concentrated in Europe, Japan and the United States.

Product Groups

We group our products into three product groups, based upon the similarity of the product function, type of product and manufacturing processes. These three groups of products are: Instruments and Control Systems, Power and Reactive Gas Products and Vacuum Products.

Instruments and Control Systems

This product group includes pressure measurement and control, materials delivery, gas composition analysis and control and information technology products.

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.

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Baratron® Pressure Measurement Products. These products are typically used to measure the pressure of the gases being distributed upstream of the process chambers, process chamber pressures and pressures between process chambers, vacuum pumps and exhaust lines. 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. 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.

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 combines MKS flow, pressure measurement and control technologies to provide customers with integrated subsystems and precise control capabilities that are optimized for a given application.

Flow Measurement and Control Products. Flow measurement products include gas and vapor 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. These products measure and automatically control the mass flow rate of gases and vapors into the process chamber.

Gas Composition Analysis Products. Gas 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 quadrupole 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 Composition Analysis Products. FTIR-based products provide information about the composition of gases 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.

Control and Information Technology Products. We design and manufacture a suite of products that allow semiconductor and other manufacturing customers to better control their processes through computer-controlled automation. These products include digital control network products, process chamber and system controllers, connectivity products and data analysis/information products.

Control 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 as well as conventional discrete digital and analog signals. Chamber and system control computers process these signals in real time and allow customers to precisely manage the process conditions.

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Connecting sensors, chambers and tools to the factory network is essential for improving quality and productivity. Our 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, we believe that we help customers optimize their processes through Advanced Process Control, and diagnose equipment problems from a remote location, which is referred to as e-diagnostics.

Information Technology Products. We design on-line and off-line software products to analyze data to improve the quality and yield of semiconductor, thin film, pharmaceutical, injection molding and other manufacturing processes.

Power and Reactive Gas Products

This group of products includes power delivery and reactive gas generation products used in semiconductor and other thin film applications, including solar and in medical imaging equipment applications.

Power Delivery Products. We design and manufacture microwave, direct current and radio frequency power delivery systems as well as radio frequency matching networks and metrology products. In the semiconductor, thin film and other market sectors, our power supplies are used to provide energy to various etching, stripping and deposition processes. Our power amplifiers are also used in medical imaging equipment.

Reactive Gas Generation Products. We design and manufacture reactive gas generation products, which create reactive species. A reactive species is an atom or molecule in an unstable state, which is used to facilitate various chemical reactions in processing of thin films (deposition of films, etching and cleaning of films and surface modifications). A number of different technologies are used to create reactive gas including different plasma technologies and barrier discharge technologies.

Processing Thin Films. Our reactive gas products include ozone generators and subsystems used for deposition of insulators onto semiconductor devices, ozonated water delivery systems for advanced semiconductor wafer and flat panel display cleaning, microwave plasma based products for photo resist removal and a line of remote plasma generators which provide reactive gases for a wide range of semiconductor, flat panel and other thin film process applications.

Equipment Cleaning. As materials are deposited on wafers, films, or solar cells, the deposited material also accumulates on the walls of the vacuum process chamber. Our atomic fluorine generators are used to clean the process chambers between deposition steps to reduce particulates and contamination caused by accumulated build up on the chamber walls.

Vacuum Products

This group of products consists of vacuum technology products, including vacuum containment components, vacuum gauges, vacuum valves, effluent management subsystems and custom stainless steel chambers, vessels, pharmaceutical process equipment (BPE) hardware and housings.

Vacuum Gauging Products. We offer a wide range of vacuum instruments consisting of vacuum measurement sensors and associated power supply and readout units as well as transducers where the sensor and electronics are integrated within a single package. These gauges complement our Baratron capacitance manometers for medium and high vacuum ranges. Our indirect gauges use thermal conductivity and ionization gauge technologies to measure pressure and vacuum levels, and our direct gauges use the pressure measurement technology of a MEMS-based piezo sensor.

Vacuum Valves, Stainless Steel Components, Process Solutions and Custom Stainless Steel Hardware. Our vacuum valves are used for vacuum isolation of vacuum lines, load locks, vacuum chambers and pumps for chamber isolation and vacuum containment. Our vacuum process solutions consist of vacuum fittings, traps and heated lines that are used downstream from the semiconductor process chamber to control process effluent gasses by preventing condensable materials from depositing particles near or back into the process chamber.

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Custom Manufactured Components. Our design and manufacturing facilities build high purity chambers for material and thin film coating, atomic layer deposition, lithography and all semiconductor and solar processes. We design and build custom panels, weldments, ASME (American Society of Manufacturing Engineers) vessels and housings, as well as a line of BPE certified components for biopharmaceutical processes.

Customers

Our largest customers include leading semiconductor capital equipment manufacturers such as Applied Materials, Lam Research, Novellus Systems and Tokyo Electron. Sales to our top ten customers accounted for approximately 41%, 45% and 37% of net sales for the years 2011, 2010 and 2009, respectively. Applied Materials accounted for approximately 14%, 16% and 13% of our net sales for the years 2011, 2010 and 2009, respectively.

Sales, Marketing, Service and Support

Our worldwide sales, marketing, service and support organization is critical to our strategy of maintaining close relationships with semiconductor capital equipment and device manufacturers and manufacturers of other advanced applications. We sell our products primarily through our direct sales force. As of December 31, 2011, we had 152 sales employees worldwide, located in China, France, Germany, Japan, Korea, the Netherlands, Singapore, Sweden, Taiwan, the United Kingdom and the United States. We also maintain sales representatives and agents in a number of countries, who supplement our direct sales force. We maintain a marketing staff that identifies customer requirements, assists in product planning and specifications, and focuses on future trends in 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 internal worldwide sales and support organizations in nine countries and external third party worldwide sales and support organizations in six countries. Technical support is provided from offices in China, France, Germany, Japan, Korea, Singapore, Taiwan, the United Kingdom and the United States. Repair and calibration services are provided at twenty internal and four third party service depots located worldwide. We typically 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 and other advanced manufacturing processes, thereby enhancing uptime, yield and throughput for our customers. Our products have continuously advanced as we strive to meet our customers evolving needs. We have developed, and continue to develop, new products to address industry trends, such as the shrinking of integrated circuit critical dimensions to 22 nanometers and below and, in the flat panel display and solar markets, the transition to larger substrate sizes, which require more advanced process control technology. In addition, we have developed, and continue to develop, products that support the migration to new classes of materials and ultra-thin layers, 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 development of new products in order to reduce the time to market for new products. Our employees also work closely with our customers development personnel helping us to 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.

As of December 31, 2011, we had 339 research and development employees, primarily located in the United States. Our research and development expenses were $61.0 million, $62.7 million and $50.2 million for the years 2011, 2010 and 2009, respectively. Our research and development efforts include numerous projects, none of

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which are individually material, and generally have a duration of 3 to 30 months depending upon whether the product is an enhancement of existing technology or a new product. Our current initiatives include projects to enhance the performance characteristics of older products, to develop new products and to integrate various technologies into subsystems.

Manufacturing

Our primary manufacturing facilities are located in China, Germany, Israel, Mexico, the United Kingdom and the United States. Manufacturing activities include the assembly and testing of components and subassemblies, which are integrated into our 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 lean manufacturing techniques and responsiveness to customers significantly fluctuating product demands to be a competitive advantage. As of December 31, 2011, we had 1,618 manufacturing related employees located mostly in China and the United States.

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 single 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 are well established in specific product niches. Hitachi and Horiba offer materials delivery products that compete with our product line of mass flow controllers. Nor-Cal Products and VAT offer products that compete with our vacuum components. Inficon offers products that compete with our vacuum measurement and gas analysis products. Brooks Automation and Inficon offer products that compete with our vacuum gauging products. Advanced Energy offers products that compete with our power delivery and reactive gas generator 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, 2011, we owned 360 U.S. patents, 382 foreign patents and had 118 pending U.S. patent applications that expire at various dates through 2030. Foreign counterparts of certain of these applications have been filed or may be filed at the appropriate time.

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.

Employees

As of December 31, 2011, we employed 2,429 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.

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Discontinued Operations

During 2010, we executed a plan to divest two product lines, as their growth potential no longer met our long-term strategic objectives. We completed the sale of Ion Systems, Inc. (Ion) during the second quarter of 2010 and the sale of the assets of the Yield Dynamics, LLC (YDI) business during the third quarter of 2010. The results of operations of the two product lines have been classified as discontinued operations in the consolidated statements of operations for all periods presented. The assets and liabilities of these discontinued product lines have not been reclassified and segregated in the consolidated balance sheets or consolidated statements of cash flows due to their immaterial amounts.

Item 1A. ***Risk Factors***

The following factors could materially affect MKS business, financial condition or results of operations and should be carefully considered in evaluating the Company and its business, in addition to other information presented elsewhere in this report.

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.

Approximately 61%, 64% and 52% of our net sales for the years 2011, 2010 and 2009, 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 portion of our sales. Our business depends upon the capital expenditures of semiconductor device manufacturers, which in turn depend upon the demand for semiconductors.

Historically, the semiconductor market has been highly cyclical and has experienced periods of overcapacity, resulting in significantly reduced demand for capital equipment which may result in lower gross margins due to reduced absorption of manufacturing overhead. In addition, many semiconductor manufacturers have operations and customers in Asia, a region that in past years has experienced serious economic problems including currency devaluations, debt defaults, lack of liquidity and recessions. For example, reductions in demand for the products manufactured by semiconductor capital equipment manufacturers and semiconductor device manufacturers in 2008 and early 2009 adversely affected our business. The global economic uncertainty prolonged a steep downturn in semiconductor capital equipment spending and adversely affected our business, financial condition and results of operations. Our net revenues during 2009 for our semiconductor and capital equipment manufacturers and semiconductor device manufacturers decreased by 43%. However, in 2010, sales to semiconductor capital equipment manufacturers and semiconductor device manufacturers increased by 167%. In 2011, our sales to semiconductor capital equipment manufacturers and semiconductor device manufacturers decreased by 8%. We cannot be certain of the timing or magnitude of future semiconductor industry downturns or recoveries. A decline in the level of orders as a result of any downturn or slowdown in the semiconductor capital equipment industry could have a material adverse effect on our business, financial condition and results of operations.

We are exposed to risks associated with instability in the financial markets and any weakness in the global economy.

The markets for semiconductors and flat panel displays in particular depend largely on consumer spending. Economic uncertainty exacerbates negative trends in consumer spending and may cause certain of our customers to push out, cancel, or refrain from placing equipment or service orders, which may affect our ability to convert backlog to sales and may reduce our net sales. Difficulties in obtaining capital and deteriorating market conditions may also lead to the inability of some customers to obtain affordable financing, resulting in lower sales for us. Customers with liquidity issues may lead to additional bad debt expense for us. These conditions may also similarly affect key suppliers, which could affect their ability to deliver parts and result in delays for our products. Further, these conditions and uncertainty about future economic conditions make it challenging for

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us to forecast our operating results, make business decisions, and identify the risks that may affect our business, financial condition and results of operations. If we are not able to timely and appropriately adapt to changes resulting from a difficult macroeconomic environment, our business, financial condition or results of operations may be materially and adversely affected.

International sales accounted for approximately 52%, 43% and 46%, of net sales for the years 2011, 2010 and 2009, respectively, a substantial portion of which were sales to China, Japan and other Asian countries and 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 affecting the global economy generally, as well as economic slow downs in particular regions, such as Asia or Europe, or specific countries such as Japan.

Our quarterly operating results have fluctuated, and are likely to continue to vary significantly, which may result in volatility in the market price of our common stock.

A substantial portion of our shipments occurs 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 is 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 in capital spending by customers;
- production capacity constraints; and
- specific features requested by customers.

In addition, our quarterly operating results may be adversely affected due to charges incurred in a particular quarter, for example, relating to inventory obsolescence, warranty or asset impairments.

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 fluctuate or 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 41%, 45% and 37% of our net sales for the years 2011, 2010 and 2009, respectively. During the years 2011, 2010 and 2009, one customer, Applied Materials, accounted for approximately 14%, 16% and 13%, respectively, of our net sales. 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. 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.

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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 and satisfy any required qualification periods;

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

the successes of our customers in creating demand for their capital equipment products that 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 and costly to integrate, may be disruptive to our business, may dilute stockholder value or may divert management attention.

In past years, we made numerous acquisitions and, 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, technology and personnel of the acquired companies, the potential disruption of our ongoing business and distraction of management, possible internal control weaknesses of the acquired companies, expenses related to the acquisition and potential unknown liabilities associated with acquired businesses. 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 may 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 without achieving the desired accretion to our business. Further, our prior acquisitions and any future acquisitions may not ultimately help us achieve our strategic goals and may pose other risks to us.

As a result of our previous acquisitions, we now have several different decentralized operating and accounting systems, resulting in a complex reporting environment. We will need to continue to modify our accounting policies, internal controls, procedures and compliance programs to provide consistency across all of our operations. In order to increase efficiency and operating effectiveness and improve corporate visibility into our decentralized operations, we are currently implementing a worldwide Enterprise Resource Planning (ERP) system. We expect to continue to implement the ERP system in phases over the next few years. Any future implementations may risk potential disruption of our operations during the conversion periods and the implementations could require significantly more management time and higher implementation costs than currently estimated.

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.

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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 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. We must develop products that are technologically advanced so that they are positioned to be chosen for use in each successive generation of capital equipment. If customers do not choose our products, 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. 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.

A material amount of our assets represents goodwill and intangible assets, and our net income will be reduced if our goodwill or intangible assets become impaired.

As of December 31, 2011, our goodwill and intangible assets, net, represented approximately $141.1 million, or 13% of our total assets. Goodwill is generated in our acquisitions when the cost of an acquisition exceeds the fair value of the net tangible and identifiable intangible assets we acquire. Goodwill is subject to an impairment analysis at least annually based on the fair value of the reporting unit. Intangible assets, which relate primarily to the customer technologies, relationships, patents and trademarks and in-process research and development acquired by us as part of our acquisitions of other companies, are subject to an impairment analysis whenever events or changes in circumstances exist that indicate that the carrying value of the intangible asset might not be recoverable. During 2009, we recorded non-cash impairment charges of $205.0 million related to goodwill and intangible assets. We will continue to monitor and evaluate the carrying value of goodwill and intangible assets. If market and economic conditions or business performance deteriorate, the likelihood of the Company recording an impairment charge would increase, which could materially and adversely affect our results of operations.

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.

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Although we believe that we compete favorably with respect to these factors, we may not be able to 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. Competitors may develop products that offer price or performance features superior to those of our products. If our competitors develop superior products, we may lose existing customers and market share.

We have significant foreign operations, and outsource certain operations offshore, which pose significant risks.

We have significant international sales, service, engineering and manufacturing operations in Europe, Israel and Asia, and have outsourced a portion of our manufacturing to Mexico. In the future, we may expand the level of manufacturing and certain other operations that we perform offshore in order to take advantage of cost efficiencies available to us in those countries. However, we may not achieve the significant cost savings or other benefits that we would anticipate from moving manufacturing and other operations to a lower cost region. These foreign operations expose us to operational and political risks that may harm our business, including:

political and economic instability;

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, the formation of labor unions;

reduced or less certain protection for intellectual property rights;

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;

costs associated with compliance programs for import and export regulations;

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 operating 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, most 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 foreign exchange contracts and may enter into 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.

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Changes in tax rates or tax regulation could affect results of operations.

As a global company, we are subject to taxation in the United States and various other countries. Significant judgment is required to determine and estimate worldwide tax liabilities. Our future annual and quarterly effective tax rates could be affected by numerous factors, including changes in the: applicable tax laws; composition of pre-tax income in countries with differing tax rates; and/or valuation of our deferred tax assets and liabilities. In addition, we are subject to regular examination by the Internal Revenue Service and foreign tax authorities. We regularly assess the likelihood of favorable or unfavorable outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. Although we believe our tax estimates are reasonable, there can be no assurance that any final determination will not be materially different from the treatment reflected in our historical income tax provisions and accruals, which could materially and adversely affect our financial condition and results of operations.

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 sales 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, 2011, we owned 360 U.S. patents, 382 foreign patents and had 118 pending U.S. patent applications that expire at various dates through 2030. 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;
- domestic and international 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 are, from time to time, involved in lawsuits enforcing or defending our intellectual property rights. Such litigation could result in substantial costs and diversion of resources and could have a material adverse effect on our business, financial condition, results of operations, or cash flows.

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, pay royalties, 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. Historically, the

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market price of shares of our common stock has fluctuated greatly 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.

We may not pay dividends on our common stock.

Holders of our common stock are only entitled to receive such dividends when and if they are declared by our Board of Directors. Although we have declared cash dividends on our common stock for the last year, we are not required to do so and may reduce or eliminate our cash dividend in the future. This could adversely affect the market price of our common stock.

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 we could obtain and qualify alternative sources for most sole, limited source and international supplier parts however, the transition time may be long. Seeking alternative sources for these 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 products. We must ensure that the affected products meet a variety of 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. In addition, the European Union has issued directives relating to regulation of recycling and hazardous substances, which may be applicable to our products, or to which some customers may voluntarily elect to adhere to. China has adopted, and certain other Asian countries have indicated, an intention to adopt similar regulations. We must comply with any applicable regulation adopted in connection with these types of directives in order to ship affected products into countries that adopt these types of regulations. 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, or customer demands beyond such requirements, 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.

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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.

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 the Company.

Changes in financial accounting standards may adversely affect our reported results of operations.

A change in accounting standards or practices could have a significant effect on our reported results and may even affect our reporting of transactions completed before the change was effective. New accounting pronouncements and varying interpretations of existing accounting pronouncements have occurred and may occur in the future. Such changes may adversely affect our reported financial results or may impact our related business practice.

Item 1B. ***Unresolved Staff Comments***

None.

Item 2. ***Properties***

The following table provides information concerning MKS principal and certain other owned and leased facilities as of December 31, 2011:

Location	Sq. Ft.	Activity	Products Manufactured	Lease Expires
Akishima, Japan	26,300	Manufacturing, Customer Support and Service	Materials and Power Delivery Products	September 11, 2018
Andover, Massachusetts	118,000	Manufacturing, Research & Development and Corporate Headquarters	Pressure Measurement and Control Products	(1)
Austin, Texas	20,880	Manufacturing, Sales, Customer Support, Service and Research & Development	Control & Information Management Products	June 30, 2015
Berlin, Germany	20,750	Manufacturing, Customer Support, Service and Research & Development	Reactive Gas Generation Products	December 13, 2013
Boulder, Colorado	124,000	Manufacturing, Customer Support, Service and Research & Development	Vacuum Products	(2)
Carmiel, Israel	11,800	Manufacturing and Research & Development	Control & Information Management Products	December 31, 2012
Cheshire, United Kingdom	16,000	Manufacturing, Sales, Customer Support and Service	Materials Delivery Products	November 6, 2018
Colorado Springs, Colorado	24,000	Research & Development	Not applicable	(3)
Filderstadt, Germany	9,300	Sales and Service	Not applicable	July 31, 2014
Fukuoka, Japan	9,300	Customer Support and Service	Not applicable	October 19, 2012
Hellebaek, Denmark	6,400	Manufacturing and Research & Development	Vacuum Products	December 31, 2012

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Location	Sq. Ft.	Activity	Products Manufactured	Lease Expires	
Kyunggi, Korea	45,600	Sales, Customer Support and Service	Not applicable		(4)
Lawrence, Massachusetts	40,000	Manufacturing	Pressure Measurement and Control Products		(3)
Lod, Israel	7,600	Customer Support and Research & Development	Not applicable	December 31, 2012	
Methuen, Massachusetts	85,000	Manufacturing, Customer Support, Service and Research & Development	Pressure Measurement and Control Products and Materials Delivery Products		(3)
Munich, Germany	20,100	Manufacturing, Sales, Customer Support, Service and Research & Development	Pressure Measurement and Control Products and Materials Delivery Products		(5)
Nogales, Mexico	67,700	Manufacturing	Pressure Measurement and Control Products and Reactive Gas Generation Products	March 31, 2014	
Richardson, Texas	8,800	Sales, Customer Support and Service	Not applicable	November 30, 2012	
Rochester, New York	156,000	Manufacturing, Sales, Customer Support, Service and Research & Development	Power Delivery Products		(3)
San Jose, California	20,400	Sales, Customer Support and Service	Not applicable	January 31, 2018	
Shanghai, China	18,700	Sales, Customer Support and Service	Not applicable	February 28, 2014	
Shenzhen, China	242,000	Manufacturing	Power Delivery Products	May 31, 2017	
Shropshire, United Kingdom	25,000	Manufacturing	Control & Information Management Products	June 23, 2022	
Singapore	12,000	Sales, Customer Support and Service	Not applicable	July 31, 2012	
Taiwan	21,400	Sales, Customer Support and Service	Not applicable	August 31, 2012	
Tokyo, Japan	6,000	Sales and Customer Support	Not applicable	December 31, 2012	
Umea, Sweden	7,000	Sales, Customer Support and Research & Development	Not applicable	August 31, 2013	
Wilmington, Massachusetts	118,000	Manufacturing, Sales, Customer Support, Service and Research & Development	Reactive Gas Generation Products and Power Delivery Products		(3)

(1) MKS owns one facility with 82,000 square feet of space used for manufacturing and research and development and leases 36,000 square feet of space used for its corporate headquarters with a lease term that expires on January 1, 2018.

(2) MKS leases two facilities, of which one has 39,000 square feet of space and the other has 38,000 square feet of space. Both leases expire on May 31, 2015. MKS also owns a third and fourth facility with 27,000 and 20,000 square feet of space, respectively.

(3) This facility is owned by MKS.

(4) MKS leases floors 4 and 6 totaling 36,500 square feet with a lease expiration date of May 2, 2020. MKS leases floor 5 totaling 9,100 square feet with a lease expiration date of January 31, 2013.

(5) MKS owns 14,800 square feet and leases 1,600 square feet with an expiration date of August 31, 2012 and 3,700 square feet with an expiration date of December 31, 2012.

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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, Service and Support.

Item 3. ***Legal Proceedings***

We are subject to various 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. ***Mine Safety Disclosures***

Not applicable.

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PART II

Item 5. ***Market for the Registrant s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities***

Price Range of Common Stock

Our common stock is traded on the NASDAQ Global Select Market under the symbol MKSI. On February 17, 2012, the closing price of our common stock, as reported on the NASDAQ Global Select Market, was $31.68 per share. The following table sets forth for the periods indicated the high and low sales prices per share of our common stock as reported by the NASDAQ Global Select Market.

	2011		2010	
	High	Low	High	Low
First Quarter	$ 33.68	$ 23.09	$ 20.00	$ 15.94
Second Quarter	33.85	23.37	24.88	17.45
Third Quarter	27.75	20.96	22.26	16.50
Fourth Quarter	28.89	20.01	24.87	17.31

On February 17, 2012, we had approximately 147 stockholders of record.

Dividend Policy and Cash Dividends

Holders of our common stock are entitled to receive dividends when and if they are declared by our Board of Directors. During 2011, our Board of Directors declared four quarterly dividends of $0.15 per share, which totaled $31.4 million or $0.60 per share. Future dividend declarations, if any, as well as the record and payment dates for such dividends, are subject to the final determination of our Board of Directors. No dividends were declared or paid in 2010. The Board of Directors intends to declare and pay cash dividends on our common stock based on the financial conditions and results of operations of the Company, although it has no obligation to do so.

On February 13, 2012, our Board of Directors declared a quarterly cash dividend of $0.15 per share to be paid on March 16, 2012 to shareholders of record as of March 1, 2012.

Purchase of Equity Shares

On July 25, 2011, our Board of Directors approved and on July 27, 2011, we publicly announced, a share repurchase program for the repurchase of up to an aggregate of $200 million of our outstanding common stock from time to time in open market purchases, privately negotiated transactions or through other appropriate means (the Program). The timing and quantity of any shares repurchased will depend upon a variety of factors, including business conditions, stock market conditions and business development activities, including but not limited to merger and acquisition opportunities. These repurchases may be commenced, suspended or discontinued at any time without prior notice.

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The following table sets forth certain information with respect to repurchases of our common stock during the three months ended December 31, 2011.

ISSUER PURCHASES OF EQUITY SECURITIES

Period	(a) Total Number of Shares Purchased	(b) Average Price Paid per Share	(c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs[1]	(d) Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs[1]
October 1 October 31, 2011	20,000	$ 21.48	20,000	$ 199,096,000
November 1 November 30, 2011	20,000	$ 23.71	20,000	$ 198,622,000
December 1 December 31, 2011	24,000	$ 26.20	24,000	$ 197,993,000
Total			**64,000**	

(1) We have repurchased approximately 86,000 shares of our common stock pursuant to the Program since its adoption. During the three months ended December 31, 2011, we repurchased a total of 64,000 shares of our common stock pursuant to the Program.

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Comparative Stock Performance

The following graph compares the cumulative total shareholder return (assuming reinvestment of dividends) from investing $100 on December 31, 2006, and plotted at the last trading day of each of the fiscal years ended December 31, 2007, 2008, 2009, 2010 and 2011, in each of MKS common stock; an industry group index of semiconductor equipment/material manufacturers (the Morningstar Semiconductor Equipment & Materials Industry Group), compiled by Morningstar, Inc.; and the NASDAQ Market Index of companies. The stock price performance on the graph below is not necessarily indicative of future price performance. The Company s common stock is listed on the NASDAQ Global Select Market under the ticker symbol MKSI.

Performance Graph

	2006	2007	2008	2009	2010	2011
MKS Instruments, Inc.	$ 100.00	$ 84.76	$ 65.49	$ 77.06	$ 108.48	$ 126.04
NASDAQ Market Index	$ 100.00	$ 110.65	$ 66.42	$ 96.54	$ 114.06	$ 113.16
Morningstar Semiconductor Equipment & Materials Industry Group	$ 100.00	$ 107.28	$ 46.89	$ 78.72	$ 88.43	$ 79.02

The information included under the heading Comparative Stock Performance in Item 5 of this Annual Report on Form 10-K is furnished and not filed and shall not be deemed to be soliciting material or subject to Regulation 14A, shall not be deemed filed for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities of that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act.

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Item 6. ***Selected Financial Data***

Selected Consolidated Financial Data

	Years Ended December 31,				
	2011	**2010**	**2009**	**2008**	**2007**
	(in thousands, except per share data)				
Statement of Operations Data					
Net sales (1)	$ 822,517	$ 853,114	$ 392,693	$ 621,380	$ 751,445
Gross profit (1)	374,988	378,638	130,216	248,238	316,194
Income (loss) from operations (1)	184,925	195,507	(171,661)	50,874	109,946
Income (loss) from continuing operations	129,731	132,919	(149,361)	40,010	88,569
Income (loss) from discontinued operations, net of taxes (2)		9,668	(63,298)	(9,893)	(2,209)
Net income (loss) (3)	$ 129,731	$ 142,587	$ (212,659)	$ 30,117	$ 86,360
Basic income (loss) per share:					
Continuing operations	$ 2.49	$ 2.66	$ (3.03)	$ 0.81	$ 1.57
Net income (loss)	$ 2.49	$ 2.85	$ (4.31)	$ 0.61	$ 1.53
Diluted income (loss) per share:					
Continuing operations	$ 2.45	$ 2.61	$ (3.03)	$ 0.79	$ 1.55
Net income (loss)	$ 2.45	$ 2.80	$ (4.31)	$ 0.59	$ 1.51
Cash dividends paid per common share	$ 0.60	$	$	$	$
Balance Sheet Data					
Cash and cash equivalents	$ 312,916	$ 162,476	$ 111,009	$ 119,261	$ 223,968
Short-term investments	252,603	269,457	160,786	159,608	99,797
Working capital	788,470	643,209	461,581	452,793	514,235
Long-term investments	7,873		4,853		
Total assets	1,118,654	982,413	774,069	984,939	1,076,260
Short-term obligations	1,932		12,885	18,678	20,203
Long-term obligations, less current portion				396	5,871
Stockholders equity	$ 990,012	$ 847,039	$ 684,933	$ 886,698	$ 954,009

(1) For the years 2007 through 2009, shown in the table above, the amounts have been revised to exclude the results of two product lines that have been classified as discontinued operations. Loss from operations for 2009 includes an impairment charge of $143.0 million related to the write-down of goodwill, intangible and long-lived assets and $5.5 million of restructuring charges.

(2) Income from discontinued operations, net of taxes for 2010 includes a $4.4 million gain on the sale of the two discontinued product lines. Loss from discontinued operations, net of taxes for 2009 includes charges related to the discontinued product lines of $53.8 million for the goodwill impairment and $7.3 million for the intangible assets impairment.

(3) Net loss for 2009 includes charges, net of tax, of $202.7 million related to the write-down of goodwill, intangible and long-lived assets and $3.6 million of restructuring charges. Net income for 2008 includes an impairment charge of $3.8 million, net of tax, related to the write-down of intangible assets.

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Item 7. ***Management s Discussion and Analysis of Financial Condition and Results of Operations***

Overview

We are a global provider of instruments, subsystems and process control solutions that measure, control, power, monitor and analyze critical parameters of advanced manufacturing processes to improve process performance and productivity.

We are managed as one operating segment. We report revenues and group our products into three product groups, based upon the similarity of the product function, type of product and manufacturing processes. These three groups of products are: 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 composition analysis, control and information technology, power and reactive gas generation and vacuum technology. Our products are used in diverse markets, applications and processes. Our primary served markets are manufacturers of capital equipment for semiconductor devices, and for other thin film applications including flat panel displays, solar cells, light emitting diodes (LEDs), data storage media and other advanced manufactured products. We also leverage our technology in other markets with advanced manufacturing applications including medical equipment, pharmaceutical manufacturing, energy generation and environmental monitoring.

We have a diverse base of customers that includes manufacturers of semiconductor capital equipment and semiconductor devices, thin film capital equipment used in the manufacture of flat panel displays, LEDs, solar cells, data storage media and other coating applications; and other industrial, medical, energy generation, environmental monitoring and manufacturing companies, and university, government and industrial research laboratories. During the years 2011, 2010 and 2009, approximately 61%, 64% and 52% of our net sales, respectively, were to semiconductor capital equipment manufacturers and semiconductor device manufacturers. We expect that sales to semiconductor capital equipment manufacturers and semiconductor device manufacturers will continue to account for a substantial portion of our sales.

In the first half of 2011, we delivered our two strongest revenue quarters on record, with net sales of $456.3 million for the six months ended June 30, 2011. However, late in the second quarter of 2011, we started to see a weakening in our orders and sales, mainly in the semiconductor markets. Worldwide economic uncertainty and slowing consumer spending have resulted in lower electronics demand, rising chip inventories and a slowing of investments in semiconductor production capacity for the second half of 2011. Our capital equipment customers have seen their order rates decline significantly, and they have therefore slowed the rate at which they are ordering from us. As a result, sales to our semiconductor customers decreased by 8% in 2011 compared to 2010, after growing by 167% in 2010 compared to 2009. The semiconductor capital equipment industry is subject to rapid demand shifts, which are difficult to predict, and we are uncertain as to the timing or extent of future demand or any future weakness in the semiconductor capital equipment industry.

Our net revenues sold to other advanced markets, which exclude semiconductor capital equipment and semiconductor device product applications, increased 4% in 2011 compared to the prior year. These advanced and growing markets include LED, medical, pharmaceutical, environmental, thin films, solar and other markets. Approximately 39% of our net sales for 2011 were to other advanced markets and we anticipate that these markets will continue to grow and will represent a larger portion of our revenue.

A significant portion of our net sales is to operations in international markets. During the years 2011, 2010 and 2009, international net sales accounted for approximately 52%, 43% and 46% of our net sales, respectively. A significant portion of our international net sales were sales in Japan. We expect that international net sales will continue to represent a significant percentage of our total net sales.

During 2010, we executed a plan to divest two product lines, as their growth potential no longer met our long-term strategic objectives. We completed the sale of Ion Systems, Inc. (Ion) during the second quarter of

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2010 and the sale of the assets of the Yield Dynamics, LLC (YDI) business during the third quarter of 2010 and received total net proceeds of $15.6 million. The results of operations of the two product lines have been classified as discontinued operations in the consolidated statements of operations for all periods presented. The assets and liabilities of these discontinued product lines have not been reclassified and segregated in the consolidated balance sheets or consolidated statements of cash flows due to their immaterial amounts.

Critical Accounting Policies and Estimates

This section, 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 and allowance for doubtful accounts, inventory, warranty costs, stock- based compensation expense, 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 the most significant judgments, assumptions and estimates we use in preparing our consolidated financial statements:

Revenue Recognition and Accounts Receivable Allowances. 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, training, support and services to customers after the product has been shipped. We defer the fair value of any undelivered elements until the undelivered element is delivered. 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 its

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estimated net realizable value, if less than cost, based primarily on our estimated forecast of product demand. Once our inventory value is written-down and a new cost basis has been established, the inventory value is not increased due to demand increases. Demand for our products can fluctuate significantly. A significant increase in the demand for our products could result in a short-term increase in the cost of inventory purchases as a result of 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. For 2011, 2010 and 2009, our total charges for excess and obsolete inventory totaled $14.9 million, $13.2 million and $20.3 million, respectively.

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.

Stock-Based Compensation Expense. We record compensation expense for all share-based payment awards to employees and directors based upon the estimated fair market value of the underlying instrument. Accordingly, share-based compensation cost is measured at the grant date, based upon the fair value of the award.

For the past four years, we have been issuing restricted stock units (RSUs) as stock-based compensation. For one year we issued restricted stock awards (RSAs) and prior to that, we issued share-based options. We also provide employees the opportunity to purchase shares through an Employee Stock Purchase Program (ESPP). For restricted stock units, the fair value is the stock price on the date of grant. For share-based options and shares issued under our ESPP, we have estimated the fair value on the date of grant using the Black Scholes pricing model, which is affected by our stock price as well as assumptions regarding a number of complex and subjective variables. These variables include our expected stock price volatility over the term of the awards, expected life, risk free interest rate and expected dividends. We are also required to estimate forfeitures at the time of grant and revise those estimates in subsequent periods if actual forfeitures differ from those estimates. Management determined that blended volatility, a combination of historical and implied volatility, is more reflective of market conditions and a better indicator of expected volatility than historical or implied volatility alone.

Certain RSUs involve stock to be issued upon the achievement of performance conditions (performance shares) under our stock incentive plans. Such performance shares become available subject to time-based vesting conditions if, and to the extent that, financial or operational performance criteria for the applicable period are achieved. Accordingly, the number of performance shares earned will vary based on the level of achievement of financial or operational performance objectives for the applicable period. Until such time that our performance can ultimately be determined, each quarter we estimate the number of performance shares more likely than not to be earned based on an evaluation of the probability of achieving the performance objectives. Such estimates are revised, if necessary, in subsequent periods when the underlying factors change our evaluation of the probability of achieving the performance objectives. Accordingly, share-based compensation expense associated with performance shares may differ significantly from the amount recorded in the current period.

The assumptions used in calculating the fair value of share-based payment awards represents management s best estimates, but these estimates involve inherent uncertainties and the application of management s judgment. As a result, if factors change and we use different assumptions, our stock-based compensation expense could be materially different in the future.

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Intangible assets, goodwill and other long-lived assets. As a result of our acquisitions, we have identified intangible assets and generated significant goodwill. Definite-lived intangible assets are valued based on estimates of future cash flows and amortized over their estimated useful life. Goodwill and indefinite-lived intangible assets are subject to annual impairment testing as well as testing upon the occurrence of any event that indicates a potential impairment. Intangible assets and other long-lived assets are also subject to an impairment test if there is an indicator of impairment. The carrying value and ultimate realization of these assets is dependent upon estimates of future earnings and benefits that we expect to generate from their use. If our expectations of future results and cash flows are significantly diminished, intangible assets and goodwill may be impaired and the resulting charge to operations may be material. When we determine that the carrying value of intangibles or other long-lived assets may not be recoverable based upon the existence of one or more indicators of impairment, we use the projected undiscounted cash flow method to determine whether an impairment exists, and then measure the impairment using discounted cash flows. To measure impairment for goodwill, we compare the fair value of our reporting units by measuring discounted cash flows to the book value of the reporting units. Goodwill would be impaired if the resulting implied fair value of goodwill was less than the recorded book value of the goodwill.

The estimation of useful lives and expected cash flows require us to make significant judgments regarding future periods that are subject to some factors outside of our control. Changes in these estimates can result in significant revisions to the carrying value of these assets and may result in material charges to the results of operations.

We have elected to perform our annual goodwill impairment test as of October 31 of each year, or more often if events or circumstances indicate that there may be impairment. Reporting units are defined as operating segments or one level below an operating segment, referred to as a component. We have determined that our reporting units are components of our one operating segment. We allocate goodwill to reporting units at the time of acquisition and when there is a change in the reporting unit structure and base that allocation on which reporting units will benefit from the acquired assets and liabilities. The estimated fair values of our reporting units were based on discounted cash flow models (DCF) derived from internal earnings and internal and external market forecasts. Determining fair value requires the exercise of significant judgment, including judgments about appropriate discount rates, perpetual growth rates, and the amount and timing of expected future cash flows. Discount rates are based on a weighted average cost of capital (WACC), which represents the average rate a business must pay its providers of debt and equity. The WACC used to test goodwill is derived from a group of comparable companies. Assumptions in estimating future cash flows are subject to a high degree of judgment and complexity. We make every effort to forecast these future cash flows as accurately as possible with the information available at the time the forecast is developed.

In 2011, we adopted authoritative guidance that allows entities to use a qualitative approach to test goodwill for impairment. This authoritative guidance permits an entity to first perform a qualitative assessment to determine whether it is more likely than not the fair value of a reporting unit is less than its carrying value. For the reporting units that did not experience any significant adverse changes in their business or reporting structures or any other adverse changes, and the reporting unit s fair value substantially exceeded its amount from the prior year assessment, we performed the qualitative Step 0 assessment. In performing the qualitative Step 0 assessment, we considered certain events and circumstances specific to the reporting unit and to the entity as a whole, such as macroeconomic conditions, industry and market considerations, overall financial performance and cost factors when evaluating whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. For the remaining reporting units that did not meet the criteria, we performed the two-step goodwill impairment test. Under the two-step goodwill impairment test, we compared the fair value of each reporting unit to its respective carrying amount, including goodwill. If the fair value of the reporting unit exceeds its carrying amount, goodwill of the reporting unit is not considered impaired. If the reporting unit s carrying amount exceeds the fair value, the second step of the goodwill impairment test must be completed to measure the amount of the impairment loss, if any. The second step compares the implied fair value of goodwill with the carrying value of goodwill. The implied fair value is determined by allocating the fair value

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of the reporting unit to all of the assets and liabilities of that unit, the excess of the fair value over amounts assigned to its assets and liabilities is the implied fair value of goodwill. The implied fair value of goodwill determined in this step is compared to the carrying value of goodwill. If the implied fair value of goodwill is less than the carrying value of goodwill, an impairment loss is recognized equal to the difference.

Due to various factors, including market and economic conditions that contributed to a decline in our forecasted business levels, and the excess of our consolidated net assets over market capitalization for a sustained period of time, we concluded an interim assessment for impairment should be conducted for our goodwill and intangible assets as of April 30, 2009, the date of the triggering event. In the interim assessment, we determined that for certain reporting units, the carrying amount of their net assets exceeded their respective fair values, indicating that a potential impairment existed. After completing the second step of the goodwill impairment test, we recorded a goodwill impairment charge in the second quarter of 2009 of $193.3 million. We tested the long-lived assets in question for recoverability by comparing the sum of the undiscounted cash flows attributable to each respective asset group to their carrying amounts, and determined that the carrying amounts were not recoverable. We then evaluated the fair values of each long-lived asset of the potentially impaired long-lived asset group to determine the amount of the impairment, if any. The fair value of each intangible asset was based primarily on an income approach, which is a present value technique used to measure the fair value of future cash flows produced by the asset. We estimated future cash flows over the remaining useful life of each intangible asset. As a result of this analysis, we determined that certain of our intangible assets related to completed technology, customer relationships, and patents and trademarks, had carrying values that exceeded their estimated fair values. As a result, an impairment charge of $11.7 million was recorded in the second quarter of 2009. In 2010, we reclassified $53.8 million and $11.7 million of the goodwill and intangible asset impairment charges, respectively, to discontinued operations for 2009, as the charges related to the two discontinued product lines.

As of October 31, 2011, the Company performed its annual impairment assessment of goodwill and determined that it is more likely than not that the fair values of the reporting units exceed their carrying amount. We will continue to monitor and evaluate the carrying value of goodwill. If market and economic conditions or business performance deteriorate, this could increase the likelihood of us recording an impairment charge, however, management believes it is not reasonably likely that an impairment will occur at any of its reporting units over the next twelve months.

As a result of a facility consolidation in Asia, we recorded an asset impairment charge of $3.5 million in the second quarter of 2009 resulting from the write-down of the value of a building to its estimated fair 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 capitalize IPR&D as an intangible asset. If the projects are completed, the intangible asset will be amortized to earnings over the expected life of the completed product. If the R&D projects are abandoned, we will write-off the related intangible asset.

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 in the utilization of core technology, the complexity, cost, time to complete development, any alternative future use or current technological feasibility and the stage of completion.

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

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realized. To the extent we established a valuation allowance, an expense is recorded within the provision for income taxes line in the consolidated statements of operations. In future periods, if we were to determine that it was more likely than not 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.

Accounting for income taxes requires a two-step approach to recognize and measure uncertain tax positions. The first step is to evaluate the tax position for recognition by determining if, based on the technical merits, it is more likely than not that the position will be sustained upon audit, including resolutions of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount that is more than 50% likely of being realized upon ultimate settlement. We re-evaluate these uncertain tax positions on a quarterly basis. This evaluation is based on factors including, but not limited to, changes in facts or circumstances, changes in tax law, effectively settled issues under audit and new audit activity. Any change in these factors could result in the recognition of a tax benefit or an additional charge to the tax provision.

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 statements of operations data:

	Years Ended December 31,		
	2011	**2010**	**2009**
Net revenues:			
Product	87.4%	89.5%	82.7%
Service	12.6	10.5	17.3
Total net revenues	100.0%	100.0%	100.0%
Cost of revenues:			
Product	47.1	49.4	55.9
Service	7.3	6.2	10.9
Total cost of revenues	54.4%	55.6%	66.8%
Gross profit	45.6%	44.4%	33.2%
Research and development	7.4	7.3	12.8
Selling, general and administrative	15.6	14.1	25.6
Amortization of acquired intangible assets	0.1	0.2	0.7
Goodwill and asset impairment			36.4
Gain on sale of asset		(0.1)	
Restructuring			1.4
Income (loss) from operations	22.5%	22.9%	(43.7)%
Interest income, net	0.1	0.1	0.4
Income (loss) from continuing operations before income taxes	22.6%	23.0%	(43.3)%
Provision (benefit) for income taxes	6.8	7.4	(5.3)
Income (loss) from continuing operations	15.8%	15.6%	(38.0)%
Income (loss) from discontinued operations, net of taxes		1.1	(16.1)
Net income (loss)	15.8%	16.7%	(54.1)%

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Year Ended 2011 Compared to 2010 and 2009

Net Revenues

	Years Ended December 31,			% Change in 2011	% Change in 2010
	2011	2010	2009		
	(Dollars in millions)				
Product	$ 719.0	$ 763.4	$ 325.0	(5.8)%	134.9%
Service	103.5	89.7	67.7	15.4	32.4
Total net revenues	$ 822.5	$ 853.1	$ 392.7	(3.6)%	117.2%

Product revenues decreased $44.4 million during 2011 compared to 2010. Product revenues related to our semiconductor capital equipment manufacturer and semiconductor device manufacturer customers decreased by $51.6 million or 10.6%, as we believe that slowing consumer spending has resulted in lower electronics demand, rising chip inventories and a slowing of investment in semiconductor production capacity. Our product revenues for other advanced markets, which exclude semiconductor capital equipment and semiconductor device product applications, increased by $7.2 million or 2.6%. We saw an increase in our solar and general industrial markets, offset by decreases in film, LED, medical and other markets. Our domestic product revenues decreased by $93.2 million or 20.7%, mainly due to a high concentration of sales to the semiconductor markets. Our international markets increased by $48.8 million or 15.6%, mainly due to sales in China, which increased by $36.7 million. This increase was mainly due to product revenues from a thin film solar customer in China.

Product revenues increased $438.4 million during 2010 compared to 2009. During 2010, we believe a recovery in the global economy contributed to an increase in demand for our products in all of the markets we serve. Our increase in overall product revenues was primarily due to the increase in worldwide demand from our semiconductor capital equipment manufacturer and semiconductor device manufacturer customers. Product revenues related to these customers increased $305.5 million or 175.2% compared to the same period for the prior year. Revenues related to other advanced markets increased $133.0 million or 88.3% compared to the same period for the prior year. The increase in demand in our other advanced markets included the LED, medical, pharmaceutical, environmental, thin films, solar and other markets. Our domestic product revenues increased by $262.5 million or 139.2% mainly due to a high concentration of sales to the semiconductor capital equipment and device manufacturer customers. Our international product revenues increased $176.0 million or 129.1% during 2010. This increase consists of a $107.7 million increase in product revenues from our semiconductor customers and an increase in product revenues of $68.3 million related to other advanced markets.

Service revenues consisted mainly of fees for services related to the maintenance and repair of our products, software maintenance, installation services and training. Service revenues increased $13.8 million during 2011 compared to 2010 as a result of a larger installed base of products and due to our continued investment in 2011 to grow our worldwide service business. Service revenues increased $22.0 million during 2010 compared to 2009 as a result of the improvement in the global economy in 2010 compared to 2009.

Total international net revenues, including product and service, were $431.4 million for 2011 or 52.5% of net sales compared to $369.0 million for 2010 or 43.2% of net sales and $180.1 million or 45.8% of net sales for 2009.

Gross Profit

	Years Ended December 31,			% Points Change in 2011	% Points Change in 2010
	2011	2010	2009		
	(As a percentage of net revenues)				
Product	46.1%	44.8%	32.4%	1.3%	12.4%
Service	42.0	41.2	37.0	0.8	4.2
Total gross profit percentage	45.6%	44.4%	33.2%	1.2%	11.2%

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Gross profit on product revenues increased by 1.3 percentage points during 2011 compared to the prior year. The increase was mainly due to favorable product mix, which accounted for 4.6 percentage points of the overall increase. In addition, 0.9 percentage points of the overall increase is due to favorable foreign exchange rate fluctuations and 0.4 percentage points was due to a duties refund received in late 2011 on duties that were paid in prior years. These increases were partially offset by 2.4 percentage points due to higher overhead, 1.1 percentage points due to higher excess and obsolete inventory net charges and 1.1 percentage points due to unfavorable product revenue volume.

Gross profit on product revenues increased by 12.4 percentage points during 2010 compared to the prior year. The increase was mainly due to an increase in product revenue volumes, which accounted for 8.2 percentage points of the overall increase, and an increase of 1.6 percentage points due to favorable product mix. In addition, our gross profit increased by 2.4 percentage points due to lower excess and obsolete inventory-related net charges. The higher excess and obsolete inventory related charges in 2009 were primarily a result of a lower inventory consumption plan in the first quarter of 2009 that we implemented in response to the weakness in the markets we served during that period.

Cost of service revenues consists primarily of costs of providing services for repair and training which includes salaries and related expenses and other fixed costs. Service gross profit for 2011 increased 0.8 percentage points compared to the same period for the prior year. Of this increase, 1.8 percentage points was due to favorable volume and 1.4 percentage points was due to favorable foreign exchange rate fluctuations. These increases were offset by 2.5 percentage points related to unfavorable mix. Service gross profit for 2010 increased 4.2 percentage points compared to the same period for the prior year. The increase was mainly a result of higher service revenue since a portion of overhead costs are fixed.

Research and Development

	Years Ended December 31,			% Change	% Change
	2011	2010	2009	in 2011	in 2010
	(Dollars in millions)				
Research and development expenses	$ 61.0	$ 62.7	$ 50.2	(2.6)%	24.8%

Research and development expenses decreased $1.7 million during 2011 compared to the prior year. The decrease consists mainly of a $1.1 million decrease in spending on project materials and a $0.6 million decrease in consulting costs, both of which were a result of cost control measures taken primarily in the second half of 2011.

Research and development expenses increased $12.5 million during 2010 compared to the prior year. The increase includes a $5.9 million increase in compensation expense, a $2.4 million increase in spending on project materials, a $3.0 million increase in consulting and other costs and a $1.1 million increase in patent and other legal related costs. The increase in compensation expense is primarily due to the Company s restoration of both the incentive compensation plan and certain employee benefits that were suspended as part of cost control measures in 2009. Our favorable operating profit levels in 2010 resulted in an increase in incentive compensation expense compared to 2009, since our incentive compensation plan is based on achieving certain operating profit levels.

Our research and development is primarily focused on developing and improving our instruments, components, subsystems and process control solutions to improve process performance and productivity.

We have thousands of products and our research and development efforts primarily consist of a large number of projects related to these products and new product development, none of which is individually material to us. Current projects typically have durations of 3 to 30 months depending upon whether the product is an enhancement of existing technology or a new product. Our current initiatives include projects to enhance the

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performance characteristics of older products, to develop new products and to integrate various technologies into subsystems. These projects support in large part the transition in the semiconductor industry to smaller integrated circuit geometries and in the flat panel display and solar markets to larger substrate sizes, which require more advanced process control technology. Research and development expenses consist primarily of salaries and related expenses for personnel engaged in research and development, fees paid to consultants, material costs for prototypes and other expenses related to the design, development, testing and enhancement of our products as well as legal costs associated with maintaining and defending our intellectual property.

We believe that the continued investment in research and development and ongoing development of new products are essential to the expansion of our markets, and expect to continue to make significant investment in research and development activities. We are subject to risks if products are not developed in a timely manner, due to rapidly changing customer requirements and competitive threats from other companies and technologies. Our success primarily depends on our products being designed into new generations of equipment for the semiconductor industry. We develop products that are technologically advanced so that they are positioned to be chosen for use in each successive generation of semiconductor capital equipment. If our products are not chosen to be designed into our customers products, our net sales may be reduced during the lifespan of those products.

Selling, General and Administrative

	Years Ended December 31,			% Change	% Change
	2011	2010	2009	in 2011	in 2010
	(Dollars in millions)				
Selling, general and administrative expenses	$ 128.0	$ 119.8	$ 100.4	6.8%	19.3%

Selling, general and administrative expenses increased $8.2 million during 2011 compared to 2010. The increase consists primarily of a $4.6 million unfavorable impact from foreign exchange fluctuations, mainly related to changes in the Japanese Yen, and a $4.0 million increase in professional fees, primarily related to information technology projects.

Selling, general and administrative expenses increased $19.4 million during 2010 compared to 2009. The increase includes a $17.9 million increase in compensation expense, a $3.1 million increase in consulting, professional and other fees and a $1.6 million increase in travel related expenses. The increase was partially offset by a $1.4 million decrease in the provision of uncollectable accounts receivable, a $1.1 million decrease in depreciation and facility related costs and a $1.1 million favorable impact from foreign exchange fluctuations. The increase in compensation expense is primarily due to the Company s restoration of both the incentive compensation plan and certain employee benefits that were suspended as part of cost control measures in 2009. Our favorable operating profit levels in 2010 resulted in an increase in incentive compensation expense compared to 2009, since our incentive compensation plan is based on achieving certain operating profit levels.

Amortization of Acquired Intangible Assets

	Years Ended December 31,			% Change	% Change
	2011	2010	2009	in 2011	in 2010
	(Dollars in millions)				
Amortization of acquired intangible assets	$ 1.0	$ 1.3	$ 2.8	(20.9)%	(53.5)%

Amortization expense decreased by $0.3 million and $1.5 million for 2011 and 2010, respectively, as certain acquired intangible assets became fully amortized during each year.

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Goodwill and Asset Impairment Charges

	Years Ended December 31,		
	2011	2010	2009
	(Dollars in millions)		
Goodwill and asset impairment charges	$	$	$ 143.0

During 2009, we reviewed our goodwill and long-lived assets for potential impairment as a result of market and economic conditions that contributed to a decline in our forecasted business levels, and the excess of our consolidated net assets over our market capitalization for a sustained period of time. As a result of this impairment assessment, we recorded non-cash goodwill and intangible asset impairment charges of $193.3 million and $11.7 million, respectively. In addition, as a result of a facility consolidation in Asia in the second quarter of 2009, we recorded a non-cash impairment charge of $3.5 million to continuing operations resulting from the write-down of the value of a building to its estimated fair value. In 2010, we reclassified $53.8 million and $11.7 million of the goodwill and intangible asset impairment charges, respectively, to discontinued operations for 2009, as the charges related to the two discontinued product lines.

Gain on sale of asset

	Years Ended December 31,		
	2011	2010	2009
	(Dollars in millions)		
Gain on sale of asset	$	$ 0.7	$

During the first quarter of 2010, we sold two vacated facilities for proceeds of $2.1 million and recorded a $0.7 million net gain on the sale.

Restructuring

	Years Ended December 31,		
	2011	2010	2009
	(Dollars in millions)		
Restructuring	$	$	$ 5.5

In light of the 2008 and 2009 global financial crisis and its impact on our semiconductor equipment OEM customers and the other markets we serve, we initiated a restructuring plan in the first quarter of 2009. The plan included a reduction in our worldwide headcount of approximately 630 people, which represented approximately 24% of our global workforce. The restructuring charges of $5.5 million in 2009 were primarily for severance and other charges associated with the reductions in workforce. The restructuring plan was completed in the first quarter of 2010.

Interest Income, Net

	Years Ended December 31,				
	2011	2010	2009	% Change in 2011	% Change in 2010
	(Dollars in millions)				
Interest income, net	$ 1.1	$ 0.9	$ 1.6	22.9%	(44.1)%

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Net interest income increased $0.2 million during 2011 compared to the prior year due to an increase in investment balances and a change in the mix of the overall investment portfolio. Net interest income decreased $0.7 million during 2010 compared to the prior year mainly due to a general decrease in market rates and the investment mix of our portfolio during this period.

Provision (Benefit) for Income Taxes

	Years Ended December 31,		
	2011	2010	2009
	(Dollars in millions)		
Provision (benefit) for income taxes	$ 56.3	$ 63.5	$ (20.7)

The provision (benefit) for income taxes in 2011, 2010 and 2009 are comprised of U.S. federal, state and foreign income taxes.

Our effective tax rate for the years 2011, 2010 and 2009 was 30.3%, 32.3% and (12.2)%, respectively. The effective tax rate in 2011 and related tax provision is lower than the U.S. statutory tax rate primarily due to geographic mix of income and profits earned by our international subsidiaries being taxed at rates lower than the U.S. statutory tax rate.

The effective tax rate in 2010 and related tax provision is lower than the U.S. statutory tax rate primarily due to geographic mix of income and profits earned by our international subsidiaries being taxed at rates lower than the U.S. statutory tax rate.

The effective tax rate in 2009 and related tax benefit was lower than the U.S. statutory tax rate primarily due to non-deductible goodwill impairment charges of $139.4 million during the second quarter of 2009, partially offset by discrete reserve releases.

At December 31, 2011, our total amount of gross unrecognized tax benefits, which excludes interest and penalties, was approximately $35.2 million. At December 31, 2010, our total amount of gross unrecognized tax benefits, which excludes interest and penalties, was approximately $21.3 million. The net increase from December 31, 2010 was primarily attributable to a current year increase in reserves for uncertain tax positions, partially offset by a reduction due to the effective settlement of a foreign tax audit. As of December 31, 2011, if these benefits were recognized in a future period, the timing of which is not estimable, the net unrecognized tax benefit of $15.4 million, excluding interest and penalties, would impact our effective tax rate. We accrue interest expense and, if applicable, penalties, for any uncertain tax positions. Interest and penalties are classified as a component of income tax expense. At December 31, 2011, 2010 and 2009 we had accrued interest on unrecognized tax benefits of approximately $1.0 million, $1.0 million and $0.7 million, respectively.

Over the next 12 months it is reasonably possible that we may recognize $2.8 million to $3.4 million of previously unrecognized tax benefits related to various U.S. federal, state and foreign tax positions as a result of the conclusion of various audits and the expiration of statutes of limitations. We are subject to examination by federal, state and foreign tax authorities. Our U.S. federal tax filings are open for examination for tax years 2007 through present. The statute of limitations in our other tax jurisdictions remains open between fiscal years 2004 through present.

On a quarterly basis, we evaluate both positive and negative evidence that affect the realizability of net deferred tax assets and assess the need for a valuation allowance. 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. During 2011, we increased our valuation allowance by $1.2 million primarily related to capital losses incurred from our foreign affiliates because we determined it is more likely than not that the deferred tax assets related to these attributes will not be realized. In 2010, we increased our valuation allowance by $20.1 million primarily

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related to capital losses incurred from our discontinued business operations. In 2011, we recorded a net benefit to income tax expense of $2.1 million, excluding interest and penalties, due to discrete reserve releases primarily related to the effective settlement of a German tax audit for years 2001 through 2005. In 2010, we did not record a net benefit to income tax expense. In 2009, we recorded a net benefit to income tax expense of $5.7 million, excluding interest and penalties, due to discrete reserve releases primarily related to the close of the 2005 and 2006 U.S. federal tax audits.

During 2006, we received a notification letter from the Israeli Ministry of Industry Trade and Labor (MITL) indicating that our Israeli operations were in compliance with requirements relating to the tax holiday granted to our manufacturing operations in Israel in 2001. This tax holiday expired at December 31, 2011 and was subject to meeting continued investment, employment and other requirements under the guidelines of the MITL. This tax holiday resulted in income tax savings of approximately $1.0 million, $2.7 million and $0.3 million for the years 2011, 2010 and 2009, respectively.

Our future effective income tax rate depends on various factors, such as tax legislation and the geographic composition of our pre-tax income. We monitor these factors and timely adjust our effective tax rate accordingly. Additionally, the effective tax rate could be adversely affected by changes in the valuation of deferred tax assets and liabilities. In particular, the carrying value of deferred tax assets, which are predominantly in the United States, is dependent on our ability to generate sufficient future taxable income in the United States. While we believe we have adequately provided for all tax positions, amounts asserted by taxing authorities could materially differ from our accrued positions as a result of uncertain and complex application of tax regulations. Additionally, the recognition and measurement of certain tax benefits include estimates and judgment by management and inherently includes subjectivity. Accordingly, we could record additional provisions due to U.S. federal, state, and foreign tax-related matters in the future as we revise estimates or settle or otherwise resolve the underlying matters.

Discontinued Operations

	Years Ended December 31,		
	2011	2010	2009
	(Dollars in millions)		
Income (loss) from discontinued operations, net of taxes	$	$ 9.7	$ (63.3)

During 2010, we divested two product lines as their growth potential no longer met our long-term strategic objectives. We completed the sale of Ion on May 17, 2010 and the sale of the assets of our YDI business on August 11, 2010 for a total of $15.6 million of net cash proceeds, after expenses, and recorded a $4.4 million pre-tax gain on the combined sales. For the year ended December 31, 2009, the loss from discontinued operations includes $65.5 million of goodwill and intangible asset impairment charges. These charges were a result of the interim impairment assessment performed on April 30, 2009.

The two product lines have been accounted for as discontinued operations. Accordingly, their results of operations have been reclassified to discontinued operations in the consolidated statements of operations for all periods presented. The assets and liabilities of these discontinued product lines have not been reclassified or segregated in the consolidated balance sheets or consolidated statements of cash flows due to their immaterial amounts.

Liquidity and Capital Resources

Cash, cash equivalents and short-term marketable investments totaled $565.5 million at December 31, 2011, an increase of $133.6 million compared to $431.9 million at December 31, 2010. This increase was mainly due to the net cash provided by operating activities as a result of our net income and net proceeds related to employee stock option awards, partially offset by dividend payments to our common stockholders and capital expenditures.

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The primary driver in our current and anticipated future cash flows is and will continue to be cash generated from operations, consisting mainly of our net income and changes in operating assets and liabilities. In periods when our sales are growing, higher sales to customers will result in increased trade receivables, and inventories will generally increase as we build products for future sales. This may result in lower cash generated from operations. Conversely, in periods when our sales are declining, our trade accounts receivable and inventory balances will generally decrease, resulting in increased cash from operations.

Net cash provided by operating activities was $156.0 million for 2011 and resulted mainly from net income of $129.7 million, which included non-cash net charges of $39.1 million, partially offset by an increase in working capital of $15.5 million. The increase in working capital consisted primarily of an increase in inventory of $11.7 million, a decrease in accounts payable of $11.6 million, an increase in other operating assets of $7.7 million and an increase in income taxes of $5.3 million. These increases were offset by a decrease in accounts receivable of $17.9 million, and an increase in accrued expenses and other operating liabilities of $2.9 million. The increase in inventory relates to specific solar projects where shipment has been delayed by our customers. The decrease in accounts payable and accounts receivable is caused by a slowdown in our business in the fourth quarter of 2011 compared to the fourth quarter of 2010.

Net cash provided by operating activities was $163.5 million for 2010 and resulted mainly from net income of $142.6 million, which included non-cash net charges of $37.7 million, partially offset by an increase in working capital of $19.8 million. The increase in working capital consisted primarily of a $52.5 million increase in inventory and a $42.5 million increase in accounts receivable. These increases were partially offset by a $40.9 million increase in accrued expenses and other liabilities, a $22.8 million decrease in income taxes receivable and a $11.2 million increase in accounts payable. The increases in working capital are primarily related to our increase in business levels in 2010. The increase in accrued expenses includes an increase of $20.6 million in accrued compensation related to increases in incentive compensation and accrued salaries and benefits. The decrease in income taxes receivable was primarily due to the collection of an income tax refund of $24.7 million.

Net cash used in investing activities was $6.1 million for 2011 and resulted primarily from the purchase of property and equipment of $15.6 million, partially offset by net maturities and sales of investments of $9.9 million. The $15.6 million increase in plant and equipment was primarily for the purchase of calibration and test equipment. Net cash used in investing activities was $105.6 million for 2010 and resulted primarily from the net purchases of $104.1 million of available-for-sale investments and purchases of plant and equipment of $15.8 million, partially offset by $15.6 million in net proceeds from the sale of the discontinued product lines. The $15.8 million increase in plant and equipment was primarily for the purchase of calibration and test equipment.

Net cash provided by financing activities was $2.4 million for 2011 and consisted primarily of $28.5 million received in net proceeds related to employee stock awards, $5.3 million related to excess tax benefit from stock-based compensation and $1.9 million in net proceeds from short-term borrowings. These increases were partially offset by $31.4 million of dividend payments made to common stockholders and $2.0 million related to the repurchase of common stock. Net cash used in financing activities was $5.0 million for 2010 and consisted primarily of $13.7 million in net repayment of short-term borrowings, partially offset by $6.5 million in net proceeds related to stock-based compensation.

Our Japanese subsidiary has lines of credit and short-term borrowing arrangements with two financial institutions which provide for aggregate borrowings as of December 31, 2011 of up to an equivalent of $32.2 million U.S. dollars, which generally expire and are renewed at three month intervals. Total borrowings outstanding under these arrangements at December 31, 2011 were $1.9 million at an average interest rate of 0.65%. There were no borrowings outstanding under these arrangements at December 31, 2010.

We have provided financial guarantees for certain unsecured borrowings and have standby letters of credit, some of which do not have fixed expiration dates. At December 31, 2011, our maximum exposure as a result of these standby letters of credit and performance bonds was approximately $1.0 million.

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On July 25, 2011, our Board of Directors approved, and on July 27, 2011 we publicly announced, a share repurchase program for the repurchase of up to an aggregate of $200 million of our common stock from time to time in open market purchases, privately negotiated transactions or through other appropriate means. The timing and quantity of any shares repurchased will depend upon a variety of factors, including business conditions, stock market conditions and business development activities, including but not limited to merger and acquisition opportunities. These repurchases may be commenced, suspended or discontinued at any time without prior notice. During 2011, we repurchased approximately 86,000 shares of our common stock for $2.0 million at an average price of $23.40 per share.

Holders of our common stock are entitled to receive dividends when they are declared by our Board of Directors. For the year ended December 31, 2011, we paid cash dividends of $31.4 million in aggregate, or $0.60 per share. Future dividend declarations, if any, as well as the record and payment dates for such dividends, are subject to the final determination of our Board of Directors.

On February 13, 2012, our Board of Directors declared a quarterly cash dividend of $0.15 per share to be paid on March 16, 2012 to shareholders of record as of March 1, 2012.

Future payments due under debt, lease and purchase commitment obligations as of December 31, 2011 are as follows:

		Payment Due By Period				
Contractual Obligations (In thousands)	**Total**	**Less than 1 Year**	**1-3 years**	**3-5 years**	**After 5 years**	**Other (3)**
Operating lease obligations	$ 28,723	$ 7,619	$ 10,558	$ 6,557	$ 3,989	$
Purchase obligations(1)	141,490	126,776	11,002	3,712		
Other long-term liabilities reflected on the Balance Sheet under U.S. GAAP(2)	32,211	201	99	60	15,767	16,084
Total	$ 202,424	$ 134,596	$ 21,659	$ 10,329	$ 19,756	$ 16,084

(1) As of December 31, 2011, we have entered into purchase commitments for certain inventory components and other equipment and services used in our normal operations. The majority of these purchase commitments covered by these arrangements are for periods of less than one year and aggregate to approximately $141.5 million.

(2) The majority of this balance relates to income taxes payable and accrued compensation for certain executives related to supplemental retirement benefits.

(3) The majority of this balance relates to our reserve for uncertain tax positions.

We believe that our current cash position and available borrowing capacity, together with the cash anticipated to be generated from operations, will be sufficient to satisfy our estimated working capital, planned capital expenditure requirements, and any future cash dividends declared by our Board of Directors or share repurchases through at least the next 12 months and the foreseeable future.

Derivatives

We enter into derivative instruments for risk management purposes only, including derivatives designated as hedging instruments and those utilized as economic hedges. We operate internationally, and in the normal course of business, are exposed to fluctuations in interest rates and foreign exchange rates. These fluctuations can increase the costs of financing, investing and operating the business. We have used derivative instruments, such as forward contracts, to manage certain foreign currency exposure.

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By nature, all financial instruments involve market and credit risks. We enter into derivative instruments with major investment grade financial institutions and no collateral is required. We have policies to monitor the credit risk of these counterparties. While there can be no assurance, we do not anticipate any material non-performance by any of these counterparties.

We hedge a portion of our forecasted foreign currency denominated intercompany sales of inventory, over a maximum period of eighteen months, using forward foreign exchange contracts accounted for as cash-flow hedges related to Japanese, South Korean, British and European currencies. To the extent these derivatives are effective in offsetting the variability of the hedged cash flows, and otherwise meet the hedge accounting criteria, changes in the derivatives fair value are not included in current earnings but are included in accumulated other comprehensive income in stockholders equity. These changes in fair value will subsequently be reclassified into earnings, as applicable, when the forecasted transaction occurs. To the extent that a previously designated hedging transaction is no longer an effective hedge, any ineffectiveness measured in the hedging relationship is recorded currently in earnings in the period it occurs. The cash flows resulting from forward exchange contracts are classified in the consolidated statements of cash flows as part of cash flows from operating activities. We do not enter into derivative instruments for trading or speculative purposes.

To the extent that hedge accounting criteria is not met, the foreign currency forward contracts are considered economic hedges and changes in the fair value of these contracts are recorded immediately in earnings in the period in which they occur. These include hedges that are used to reduce exchange rate risks arising from the change in fair value of certain foreign currency denominated assets and liabilities (i.e., payables, receivables) and other economic hedges where the hedge accounting criteria were not met.

We had forward exchange contracts with notional amounts totaling $36.1 million outstanding at December 31, 2011 of which $18.7 million were outstanding to exchange Japanese yen to U.S. dollars. We had forward exchange contracts with notional amounts totaling $87.7 million outstanding at December 31, 2010 of which $50.1 million were outstanding to exchange Japanese yen for U.S. dollars.

As of December 31, 2011, the unrealized loss that will be reclassified from accumulated other comprehensive income to earnings over the next twelve months is $523 thousand. The ineffective portions of the derivatives are recorded in selling, general and administrative costs and were immaterial in 2011, 2010 and 2009, respectively.

We sometimes hedge certain intercompany and other payables with forward exchange contracts. Typically, as 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 2011, 2010 and 2009.

Realized and unrealized gains and losses on forward exchange contracts that do not qualify for hedge accounting are recognized currently in earnings. The cash flows resulting from forward exchange contracts are classified in our consolidated statements of cash flows as part of cash flows from operating activities. We do not hold or issue derivative financial instruments for trading purposes.

Gains and losses on forward exchange contracts that qualify for hedge accounting are classified in selling, general and administrative expenses in 2011 and totaled a loss of $4.0 million. In 2010 and 2009, these gains and losses were classified in cost of products and totaled a gain of $1.0 million and loss of $1.1 million, respectively.

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

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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 September 2011, the Financial Accounting Standards Board (FASB) issued an Accounting Standards Update (ASU) which simplifies how companies test goodwill for impairment. Under the amendments, an entity has the option to first assess qualitative factors to determine whether the existence of events or circumstances leads to a determination that it is more likely than not that the fair value of a reporting unit is less than its carrying amount. If, after assessing the totality of events or circumstances, an entity determines it is not more likely than not that the fair value of a reporting unit is less than its carrying amount, then performing the two-step impairment test is unnecessary. However, if an entity concludes otherwise, then it is required to perform the first step of the two-step impairment test by calculating the fair value of the reporting unit and comparing the fair value with the carrying amount of the reporting unit, as described in the goodwill accounting standard. The amendments are effective for annual and interim goodwill impairment tests performed for fiscal years beginning after December 15, 2011. Early adoption is permitted. We adopted this new ASU in the fourth quarter of 2011. The new ASU did not have a material effect on our consolidated financial statements.

In June 2011, the FASB issued an ASU which eliminates the option to present the components of other comprehensive income as part of the statement of equity and requires an entity to present the total of comprehensive income, the components of net income, and the components of other comprehensive income either in a single continuous statement of comprehensive income or in two separate but consecutive statements. The amendments are effective retrospectively for fiscal years, and interim periods within those years, beginning after December 15, 2011. The ASU requires changes in presentation only and we do not expect it will have a material effect on our consolidated financial statements.

In May 2011, the FASB issued an ASU which applies to all reporting entities that are required or permitted to measure or disclose the fair value of an asset, a liability, or an instrument classified in a reporting entity s shareholders equity in the financial statements. The amendments do not extend the use of fair value accounting, but provide guidance on how it should be applied where its use is already required or permitted by other standards within U.S. Generally Accepted Accounting Principles (U.S. GAAP). The amendments change the wording used to describe many requirements in U.S. GAAP for measuring fair value and for disclosing information about fair value measurements. Additionally, the ASU clarifies the FASB s intent about the application of existing fair value measurements. The amendments in this ASU are to be applied prospectively. For public entities, the amendments are effective during interim and annual periods beginning after December 15, 2011. Early application by public entities is not permitted. We do not expect the new ASU to have a material effect on our consolidated financial statements.

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-term debt as well as fluctuations in foreign currency exchange rates.

Foreign Exchange Rate Risk

We mainly enter into forward exchange contracts to reduce currency exposure arising from intercompany sales of inventory. We sometimes also enter into forward exchange contracts to reduce foreign exchange risks arising from the change in fair value of certain foreign currency denominated assets and liabilities.

There were forward exchange contracts with notional amounts totaling $36.1 million and $87.7 million outstanding at December 31, 2011 and 2010, respectively. Of such forward exchange contracts, $18.7 million

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and $50.1 million, respectively, were outstanding to exchange Japanese yen for U.S. dollars with the remaining amounts relating to contracts to exchange the British pound, South Korean won and Euro for U.S. dollars. The potential fair value loss for a hypothetical 10% adverse change in the currency exchange rate on our forward exchange contracts at December 31, 2011 and 2010 would be $4.0 million and $9.7 million, respectively. The potential losses in 2011 and 2010 were estimated by calculating the fair value of the forward exchange contracts at December 31, 2011 and 2010 and comparing that with those calculated using hypothetical forward currency exchange rates.

Interest Rate Risk

Due to its short-term duration, the fair value of our cash and investment portfolio at December 31, 2011 and 2010 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.

From time to time, we have outstanding lines of credit and short-term borrowings with variable interest rates, primarily denominated in Japanese yen. At December 31, 2011, we had $1.9 million outstanding related to these short-term borrowings at an average interest rate of 0.65%. There were no outstanding borrowings at December 31, 2010. 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.

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Item 8. ***Financial Statements and Supplementary Data***

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To Board of Directors and Shareholders 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, 2011 and December 31, 2010, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2011 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. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2011, based on criteria established in *Internal Control Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The Company s management is responsible for these financial statements and financial statement schedule, for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in Management s Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on these financial statements, on the financial statement schedule, and on the Company s internal control over financial reporting based on our integrated audits. We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the financial statements included 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. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

A company s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts

February 24, 2012

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MKS Instruments, Inc.

Consolidated Balance Sheets

	December 31, 2011	2010
	(in thousands, except share data)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 312,916	$ 162,476
Short-term investments	252,603	269,457
Trade accounts receivable, net of allowances of $2,516 and $2,557 at December 31, 2011 and 2010, respectively	120,894	138,181
Inventories	153,632	156,429
Deferred income taxes	10,618	13,775
Other current assets	34,238	12,577
Total current assets	884,901	752,895
Property, plant and equipment, net	72,487	68,976
Long-term investments	7,873	
Goodwill	140,084	140,020
Intangible assets, net	1,043	1,743
Other assets	12,266	18,779
Total assets	$ 1,118,654	$ 982,413
LIABILITIES AND STOCKHOLDERS EQUITY		
Current liabilities:		
Short-term borrowings	$ 1,932	$
Accounts payable	24,853	36,427
Accrued compensation	21,774	29,944
Income taxes payable	7,548	5,347
Other current liabilities	40,324	37,968
Total current liabilities	96,431	109,686
Other liabilities	32,211	25,688
Commitments and contingencies (Note 23)		
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; 52,491,948 and 50,648,601 shares issued and outstanding at December 31, 2011 and 2010, respectively	113	113
Additional paid-in capital	707,419	663,792
Retained earnings	268,870	171,356
Accumulated other comprehensive income	13,610	11,778
Total stockholders equity	990,012	847,039
Total liabilities and stockholders equity	$ 1,118,654	$ 982,413

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

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MKS Instruments, Inc.

Consolidated Statements of Operations

	Years Ended December 31,		
	2011	2010	2009
	(in thousands, except per share data)		
Net Revenues:			
Products	$ 719,002	$ 763,452	$ 324,951
Services	103,515	89,662	67,742
Total net revenues	822,517	853,114	392,693
Cost of revenues:			
Cost of products	387,445	421,777	219,776
Cost of service	60,084	52,699	42,701
Total cost of revenues	447,529	474,476	262,477
Gross profit	374,988	378,638	130,216
Research and development	61,033	62,689	50,212
Selling, general and administrative	128,015	119,841	100,429
Amortization of acquired intangible assets	1,015	1,283	2,762
Goodwill and asset impairment charges			142,958
Gain on sale of asset		(682)	
Restructuring			5,516