

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2009

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 000-30941

AXCELIS TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction
of incorporation or organization)

34-1818596

(IRS Employer Identification No.)

108 Cherry Hill Drive

Beverly, Massachusetts 01915

(Address of principal executive offices) (zip code)

(978) 787-4000

(Registrant's telephone number, including area code)

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

Title of each class	Name of each exchange on which registered
Common Stock, \$.001 par value	The Nasdaq Stock Market LLC
Preferred Share Purchase Rights	

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

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

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 No

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of 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.

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

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

Aggregate market value of the voting stock held by non-affiliates of the registrant as of June 30, 2009: \$47,081,992

Number of shares outstanding of the registrant's Common Stock, \$0.001 par value, as of March 15, 2010: 104,135,179.

Documents incorporated by reference:

Portions of the definitive Proxy Statement for Axcelis Technologies, Inc.'s Annual Meeting of Stockholders to be held on May 7, 2010 are incorporated by reference into Part III of this Form 10-K.

Item 1. Business.

Overview of Our Business

Axcelis Technologies, Inc. ("Axcelis," the Company, "we," "us," or "our") designs, manufactures and services ion implantation, dry strip and other processing equipment used in the fabrication of semiconductor chips. We sell to leading semiconductor chip manufacturers worldwide. The ion implantation business comprised approximately 83.4% of our revenue in 2009 with the remaining 16.6% of revenue derived from our dry strip and other processing systems. In addition to equipment, we provide extensive aftermarket service and support, including spare parts, equipment upgrades, maintenance services and customer training. Through March 30, 2009, we also owned 50% of the equity of SEN Corporation, an SHI and Axcelis Company, or "SEN," a leading producer of ion implantation equipment in Japan. In February 2009, we entered into an agreement to sell our shares in SEN, which closed on March 30, 2009. We have a non-exclusive cross license of patented and unpatented technology with SEN. See "Sale of Investment in SEN" below.

Axcelis, which was incorporated in Delaware in 1995, is headquartered in Beverly, Massachusetts. We maintain an Internet site at <http://www.axcelis.com>. We make available free of charge on and through this website our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after we electronically file such material with, or furnish it to, the Securities and Exchange Commission. Our website and the information contained therein or connected thereto shall not be deemed to be incorporated into this Form 10-K.

Industry Overview

Semiconductor chips, also known as integrated circuits, are used in personal computers, telecommunication equipment, digital consumer electronics, wireless communication products and other applications. Types of semiconductor chips include memory chips (which store and retrieve information), microprocessors (logic devices which process information) and "system on chip" devices (which have both logic and memory features). Most semiconductor chips are built on a wafer of silicon of either 200mm (8 inches) or 300mm (12 inches) in diameter. Each semiconductor chip is made up of millions of tiny transistors or "switches" to control the functions of the device. Transistors are created in the silicon wafer by introducing various precisely placed impurities into the silicon in specific patterns. The process steps in the formation of transistors are traditionally referred to as "front-end-of-line." The "back-end-of-line" process steps connect the transistors and other components together through several overlapping layers of metal wires, known as interconnect, creating a complete circuit. Each layer of metal interconnect must be separated by a non-conductive or insulating material called inter-level dielectric. Each layer that is added is selectively patterned to all previous layers through a process called photolithography.

Semiconductor chip manufacturers utilize many different types of equipment in the making of integrated circuits. There are over 300 process steps utilizing over 50 different types of process tools required in the making of a single device like a microprocessor. Semiconductor chip manufacturers seek efficiency improvements through increased throughput, equipment utilization and higher manufacturing yields. Capacity is added by increasing the amount of manufacturing equipment in existing fabrication facilities and by constructing new fabrication facilities. Periodically the semiconductor industry adopts a larger silicon wafer size to achieve lower manufacturing costs. Semiconductor manufacturers can produce more chips on a larger wafer, thus reducing the overall manufacturing cost per chip. For example, the use of 200mm wafers in production began at the end of the 1980s. The migration from 200mm to 300mm began at the end of the 1990s. The majority of wafer

fabrication facilities today are using wafers with a diameter of 300mm. In 2009, Axcelis derived 75.0% of total systems revenue (a component of product revenue) from sales of 300mm equipment.

The customer base is also changing. Given the magnitude of the investment needed to build a new wafer fabrication facility (often referred to as a "fab"), which can be over \$3 billion for a new 300mm fab, many customers are entering into partnerships to offset the cost of technology development and manufacturing. In addition, many chip developers outsource all or part of their chip manufacturing requirements to contract manufacturers, known as foundries. Foundries are significant purchasers of semiconductor manufacturing equipment.

Historically, the semiconductor industry has grown on an annual basis. However, the industry has also been highly cyclical, as global chip production capacities successively exceed, then lag behind, global chip demand. When chip demand is high, and inventories low, chip manufacturers add capacity through capital equipment purchases. Given the difficulties of forecasting and calibrating chip demand and production capacity, the industry periodically experiences excess chip inventories and softening chip prices. Our customers react with muted capital spending, lowering the demand for our equipment. Changes in consumer and business demand for products in which chips are used also affect the industry. Current economic conditions have resulted in greatly reduced demand, and this situation will continue until the global economy shows a significant rebound. Therefore, a successful semiconductor equipment manufacturer must not only provide some of the most technically complex products manufactured in the world but also must design its business to thrive during the inevitable low points in the cycle.

Axcelis' Strategy

Our mission and vision is to:

- Ensure our customers' success by providing enabling semiconductor manufacturing and support solutions that deliver the best performance at the lowest total cost of ownership.
- Achieve and maintain market share leadership in ion implantation and dry strip.
- Deliver profitability and positive cash flow through the industry cycles to maximize shareholder and employee value.

Operationally, we manage our business based on three main tenets:

- technology leadership,
- operational excellence, and
- customer partnerships.

We have continued to invest in research and development through the industry cycles to assure our products meet the needs of our customers. We continue to add to our portfolio of patents and unpatented proprietary technology to ensure that our investment in technology leadership is translated into unique product advantages. We take pride in our scientists and engineers who comprise over one-third of our workforce. We strive for operational excellence by focusing on ways to lower our manufacturing and design costs and to improve our delivery times to our customers. Finally, we have grown and improved our customer support infrastructure and have established Global Customer Teams and a focused account management structure to strengthen our customer relationships and increase customer satisfaction.

Ion Implantation Systems

Ion implantation is a principal step in the transistor formation cycle of the semiconductor manufacturing process. An ion implanter is a large, technically advanced machine that injects dopants

such as arsenic, boron or phosphorus into a silicon wafer. These dopants are ionized and therefore have electric charges. With an electric charge they can be manipulated, moved and accelerated with electric and magnetic fields. Ion implanters use these fields to create a beam of ions with a precisely defined amount of energy (ranging between several hundred and three million electron-volts) and with a precisely defined amount of beam current (ranging from microamps to milliamps). Certain areas of the silicon wafer are blocked off by a polymer material known as photoresist, which acts as a "stencil" to pattern devices so that the dopants will only enter the wafer where needed. The dopants change the electrical properties of the silicon wafer to create the active components of a chip, called the transistors. Typical process flows require twenty implant steps, with the most advanced processes requiring thirty or more. Each implant step is characterized by four key parameters: dopant type, dose (amount of dopant), energy (depth into the silicon) and tilt (angle of wafer relative to the ion beam).

In order to cover the wide range of implant steps, three different types of implanters have been developed, each designed to cover a specific range of applications, primarily defined by dose and energy. The three traditional implanter types are referred to as medium current, high current and high energy:

- Medium current (mid dose) implanters are the original model of ion implanter, with mid-range energy and dose capability. These implanters are single wafer systems in which only one wafer at a time is slowly moved in front of the ion beam.
- High current (high dose) implanters were the second type of implanter to emerge, having low energy capability and high dose range. High current implanters were initially designed as "multi wafer" or "batch" tools for maximum productivity, processing multiple wafers at the same time. To address smaller device geometries and provide high tilt, single wafer high current implanters now dominate the sector.
- High energy implanters emerged to address the need for deeper implants with a high energy range and low dose. High energy implanters are available in both multi wafer and single wafer architectures.

Axcelis offers a complete line of high energy, high current and medium current implanters for all application requirements.

- **High Energy Implant.** Axcelis is a market leader in high energy ion implanters. Our single wafer tool for high energy applications, the Optima XE, was released in the fourth quarter of 2007 and upgraded to the Optima XEx in 2009. The Optima XEx combines Axcelis' production-proven RF Linac high energy, spot beam technology with a high-speed, state-of-the-art single wafer endstation, enabling unmatched throughput. Axcelis' advanced spot beam ensures that all points across the wafer see the same beam at the same beam angle, resulting in exceptional process control and maximum yield. We expect to maintain our leadership in the high energy segment through sales of our multi wafer high energy systems and the Optima XEx.
- **High Current Implant.** We introduced our single wafer Optima HD product (for high current applications) in 2006, which was upgraded to the Optima HDx in 2009. We use the term "high dose" or "HD" in connection with this product because the Optima HD fulfills all traditional high current requirements while extending beyond traditional high current energy and dose ranges. In order to maximize utilization and flexibility, the Optima HD can process some traditional mid current implants. In addition, the Optima HD is extendable into ultra-low energy applications to satisfy future process requirements. The Optima HD also supports molecular and hydrogen implants for emerging dual poly gate and silicon-on-insulator applications to improve device speed and performance. With the Optima HDx, Axcelis is regaining market share in high current lost when customers shifted from multi wafer to single wafer tools.

- **Medium Current Implant.** With the introduction of the Optima MD in 2005, Axcelis re-entered the medium current market segment, which we had not participated in since 2001. We refer to this product as "mid dose" or "MD" because it has energy and dose capabilities which extend beyond the traditional medium current space into traditional high current and high energy spaces.

We believe the Optima products will continue to meet customer demand for advantages in productivity, simplicity, process performance and technical extendibility.

Dry Strip

Of our total 2009 revenue, 13.5% was derived from our dry strip products. In the process steps prior to ion implantation, a light sensitive, polymer-based liquid called photoresist is spread in a uniformly thin film on the wafer. Through a process known as photolithography, the photoresist is developed into a pattern like a stencil. Once the subsequent implant processes and etch steps (in which the top layer of the surface of the wafer not covered by photoresist is removed) are completed, the photoresist is no longer necessary and must be removed. The primary means of removing photoresist and residue is a process called "dry strip" or "ashing." Our dry strip machines, also called "ashers," use microwave and radio frequency energy to turn process gases into plasma, which then acts to "clean" the surface of the wafer by removing the photoresist and unwanted residue.

Axcelis offers a full line of dry strip tools that cover the entire range of customer applications. Our newest product, the Integra RS, was introduced in 2009 and brings significantly higher productivity and flexibility to Axcelis' already proven advanced dry strip process capabilities. The Integra RS's unique multi-chamber design includes paired-chamber process modules that can run production recipes with the highest throughputs available for leading edge memory and logic devices. Each of the chamber pairs can operate independently, giving users the choice of running different cleaning recipes simultaneously or performing maintenance on one module while the others continue to operate. This flexibility makes the system ideal for a variety of advanced cleaning applications in a high volume manufacturing environment. The platform also includes technology required to address cleaning challenges at emerging transistor device nodes, such as those associated with advanced source/drain formation and high-k/metal-gate structures.

We believe our dry strip products and technology will continue to meet customer demand for advantages in productivity, process performance and technical extendibility.

Other Processing Systems

Axcelis also provides aftermarket support for the installed base of thermal processing and photostabilization/curing systems manufactured by Axcelis. In 2007 Axcelis ceased further development of these product lines. These systems and related services contributed 4.1% of our 2009 revenue.

Photostabilization/Curing Systems In some manufacturing processes, the photoresist stencil material spread on the wafer must be hardened or "cured." Axcelis' curing (also known as photostabilization) systems use proprietary ultraviolet light sources to cure the photoresist so the material maintains the desired pattern during the subsequent implant processes and etch steps.

The photostabilization and curing market has remained a small segment. In past years, Axcelis has explored growth opportunities for this product line in curing and drying new low-k dielectric materials. To date, broad adoption of such materials has not occurred. In the fourth quarter of 2007, Axcelis determined that the current and near term market opportunity for the curing product line did not justify continuing investment in these products. As a result, Axcelis decided to cease future product development in curing to focus on profitable growth within the company's core ion implant and dry strip businesses.

Thermal Processing Systems At a number of points during the manufacturing process, silicon wafers need to be heated rapidly, often to 900 degrees centigrade or higher, in order to complete chemical or electronic reactions. This heating process is referred to as rapid thermal processing, or RTP. Our thermal processing systems employ a patented design to process a single wafer in a hot wall vertical reactor. This technology differs from most other thermal processing equipment, which regulate temperature through a lamp-based system. The RTP market is dominated by a single major competitor and, while the Axcelis RTP systems have technological advantages for certain applications, our penetration into the market remains low. In the third quarter of 2007, Axcelis determined that the current and near term market opportunity for the RTP product line did not justify continuing investment in these products. As a result, Axcelis decided to cease future product development in RTP to focus on profitable growth within the company's core ion implant and dry strip businesses.

Aftermarket Support and Services

We offer our customers extensive aftermarket service and support throughout the lifecycle of the equipment we manufacture. We believe that approximately 4,000 of our products are in use in 50 countries worldwide. The service and support that we provide include spare parts, equipment upgrades, and maintenance services. We provide service out of 47 field offices to customers located in 29 countries. Revenue generated through our service and support business represented about 73.8%, 57.1%, and 42.2% of revenue in 2009, 2008, and 2007, respectively.

Our customer support network consists of over 393 staff, including sales and marketing personnel, field service engineers, and spare parts and applications engineers, as well as employees located at our manufacturing facilities who work with our customers to provide customer training and documentation, product, process and applications support.

Most of our customers maintain spare parts inventories for our machines. In addition to our web-based spare parts management and replenishment tracking program, we offer a number of Business-to-Business options to support our customers' parts management requirements. AMI (Axcelis Managed Inventory) provides the customer with full spares support through which Axcelis takes responsibility for the complete supply chain. The expansion of these services provides ease of use alternatives that help us reduce order fulfillment costs and improve cycle time, resulting in an expanded customer base for this service offering. See Note 2 to our Consolidated Financial Statements contained in Item 15 of this Form 10-K for a discussion of revenue classifications from our aftermarket business.

Sales and Marketing

We primarily sell our equipment and services through our direct sales force. We have 16 sales offices in ten countries. Aftermarket service and support is also offered at all of these offices. In the United States, we conduct sales and marketing activities from seven locations. Outside of the United States, our sales offices are located in Taiwan, South Korea, China, Japan, Germany, Singapore, Netherlands, France and Italy. In addition, isolated sales are made in smaller markets through distributors and manufacturing representatives.

In Japan, SEN Corporation has a non-exclusive license to use certain patented and unpatented technology owned by the Company. This license does not restrict our ability to sell any of our products in Japan. See "Sale of Investment in SEN" below. We support our products in Japan through a representative agreement with Applied Materials, Inc., which provides aftermarket services and support services for our products.

International revenue, including export sales from our U.S. manufacturing facilities to foreign customers, sales by foreign subsidiaries and branches, and royalties, accounted for 62.8% of total revenue in 2009, 64.7% in 2008, and 67.0% in 2007. Substantially all of our sales are denominated in U.S. dollars. See Note 17 to our Consolidated Financial Statements contained in Item 15 of this

Customers

In 2009, the top 20 semiconductor manufacturers accounted for approximately 96.0% of total semiconductor industry capital spending, up from 75.8% in 2008. These manufacturers are from the four largest semiconductor manufacturing regions in the world: the United States, Asia Pacific (Taiwan, South Korea, Singapore, and China), Japan and Europe. The Company serves all leading semiconductor manufacturers. We believe that more than 4,000 of our products, including products shipped by our former Japanese joint venture prior to our divestiture of that company in 2009, are in use worldwide.

Revenue from our ten largest customers accounted for 56.6%, 51.5%, and 57.8% of revenue in 2009, 2008, and 2007, respectively. We expect that sales of our products to relatively few customers will continue to account for a high percentage of revenue for the foreseeable future. In 2009, no customer accounted for more than 10% of revenue. In 2008 one customer accounted for 11.7% of revenue.

Sale of Investment in SEN

Until March 30, 2009, we owned 50% of the equity of SEN, a joint venture with Sumitomo Heavy Industries, Ltd. ("SHI") in Japan. This joint venture licensed technology from us relating to the manufacture of specified ion implantation products and had exclusive rights to manufacture and sell these products in the territory of Japan. On March 30, 2009, pursuant to a Share Purchase Agreement dated February 26, 2009, we sold to SHI all of our common shares in SEN in exchange for a cash payment of 13 billion Yen, which resulted in proceeds of approximately \$132.8 million before advisor fees and other expenses of \$10.6 million. The sales price was determined through an arm's length negotiation. This transaction terminated all prior agreements among the three parties relating to the SEN joint venture. In addition, an arbitration we had initiated against SEN in Tokyo was dismissed.

In connection with the sale of our investment in SEN, on March 30, 2009, the Company and SEN entered into a License Agreement pursuant to which the parties have cross licensed each other to use certain ion implant patents and technical information on a non-exclusive, perpetual, royalty-free, worldwide basis, provided that both received sole exclusive licenses for 4 years in the U.S. and Japan, respectively. The licenses to technical information cover only technical information shared by the parties prior to the date of the license, so the license to SEN does not cover technical information relating to the Optima HD and Optima XE. The license also excludes patents relating to our work in molecular implant and certain patents developed for the Optima HD and Optima XE. The parties provided each other with limited warranties regarding their right to grant these licenses, and indemnity with respect thereto, but disclaim any warranty regarding the validity or freedom from infringement of the licensed intellectual property. Neither party will provide any support for the other party's use of the licensed intellectual property.

The sale of our investment in SEN on March 30, 2009, resulted in a gain of approximately \$1.1 million. This gain includes net proceeds of \$122.2 million (after payment of advisor fees and other costs of \$10.6 million) and cumulative foreign translation gain of \$23.5 million, previously recorded in other comprehensive income, reduced by the carrying value of the investment on the date of sale of \$144.6 million. The gain from the sale of our investment in SEN is recorded in other income.

A portion of the proceeds of the sale was used to pay off, in full, the amounts due to the holder of our 4.25% Convertible Senior Subordinated Notes.

Research and Development

Our industry continues to experience rapid technological change, requiring us to frequently introduce new products and enhancements. Our ability to remain competitive in this market will depend in part upon our ability to develop new and enhanced systems and to introduce these systems at competitive prices on a timely and cost effective basis.

We devote a significant portion of our personnel and financial resources to research and development programs and seek to maintain close relationships with our customers to remain responsive to their product needs. We have also sought to reduce the development cycle for new products through a collaborative process whereby our engineering, manufacturing and marketing personnel work closely together with one another and with our customers at an earlier stage in the process. We also use 3D, computer-aided design, finite element analysis and other computer-based modeling methods to test new designs.

Our expenditures for research and development were \$32.7 million, \$63.3 million and \$72.0 million in 2009, 2008, and 2007, respectively, or 24.6%, 25.3% and 17.8% of revenue, respectively. We expect that research and development expenditures will continue to represent a substantial investment in future years.

Manufacturing

We manufacture products at our 417,000 sq. ft. ISO 9000:2008, ISO 14001:2004 certified plant in Beverly, Massachusetts. Our facility employs best in class manufacturing techniques including lean manufacturing, six sigma controls and advanced inventory management, purchasing and quality systems. Our clean manufacturing process uses class 1000/10,000 space to facilitate most of our manufacturing requirements.

Products are designed to be assembled and tested in a modular fashion which facilitates our industry recognized ship-from-cell process. Specially developed test stands, software and tooling provide the framework for this accelerated delivery process. Customers that choose ship-from-cell substantially improve their delivery times while receiving the same high level of quality provided by more traditional longer cycle integration techniques. Product margins and inventory turns also improve as a result of shorter factory cycle times and increased labor productivity.

Installation of our equipment is provided by factory and field teams. The process includes placing and leveling the equipment at its installation site, connecting it to sources of gas, water and electricity and recalibrating it to specifications that had previously been met during factory testing.

Our supply chain team is globally focused and is located in Beverly and Singapore. Customized and commercially available software solutions drive our planning, purchasing and inventory tracking process. Material is supplied from a number of sources that provide OEM or product built to our detailed specifications.

Core manufacturing competency is built around system assembly and test which remains an in house capability due to the high degree of expertise and intellectual property associated with the process and design. Non-core work is sourced to one of several global partners and includes items such as power distribution, vacuum systems, wafer handling and commodity level components. We continuously pursue outsourcing opportunities where the economics are justified, with a goal of enabling factory capacity, quality and margin improvement.

Beverly, Massachusetts is also the location of our Advanced Technology Center. This center houses a process development laboratory with 12,500 sq. ft. of class 10/100/1000 clean room for product demonstrations and process development and a 34,000 sq. ft. customer training center. The Advanced Technology Center provides infrastructure and process capabilities that allow customers to test their unique process steps on our product under conditions that substantially replicate the customers' production environment. This facility also provides significant capability for our research and development efforts.

Competition

The semiconductor wafer fabrication equipment market is highly competitive and is characterized by a small number of medium to large size participants. We compete in two principal product markets in both the front-end and back-end of the semiconductor wafer fabrication process: ion implantation and dry strip. We believe that preexisting relationships have a significant influence on a customer's choice of equipment supplier. Other significant competitive factors in the semiconductor equipment market include price, cost of ownership, equipment performance, customer support, breadth of product line, distribution and financial viability.

Ion Implantation. In ion implantation, we compete against Varian Semiconductor Equipment Associates, Inc., SEN Corporation, Nissin Electric Co., Ltd. and AIBT.

Dry Strip. Our principal competitors in the dry strip product market are PSK, Inc., Mattson Technology Inc. and Novellus Systems, Inc.

Intellectual Property

We rely on patent, copyright, trademark and trade secret protection, as well as contractual restrictions, in the United States and in other countries to protect our proprietary rights in our products and our business. As of January 1, 2010, we had 306 patents issued in the United States and 375 patents granted in other countries, as well as 754 patent applications (87 in the United States and 667 in other countries) on file with various patent agencies worldwide. Patents are generally in effect for up to 20 years from the filing of the application.

We intend to file additional patent applications and grow our intellectual property portfolio as appropriate. Although patents are important to our business, we do not believe that we are substantially dependent on any single patent or any group of patents.

We have trademarks, both registered and unregistered, that are maintained to provide customer recognition for our products in the marketplace.

From time to time, we enter into license agreements with third parties under which we obtain or grant rights to patented or proprietary technology. Except for our license agreement with SEN (described above under "Sale of Investment"), we do not believe that any of our licenses are currently material to us.

We can give no assurance that we, our licensors, licensees, customers or suppliers will not be subject to claims of patent infringement or claims to invalidate our patents, or that any such claims will not be successful, requiring us to pay substantial damages or delete certain features from our products or both.

Backlog

As of December 31, 2009, our systems backlog (excluding deferred systems revenue) was \$10.8 million, as compared to \$6.3 million as of December 31, 2008. Systems backlog including deferred systems revenue was \$16.5 million and \$20.7 million as of December 31, 2009 and 2008, respectively.

The low level of backlog is representative of the overall downturn in the semiconductor equipment market. We believe it is meaningful to investors to include deferred systems revenue as part of our backlog. Deferred systems revenue represents revenue that will be recognized in future periods based on prior shipments. Our policy is to include in backlog only those system orders for which we have accepted purchase orders and typically are due to ship within six months. Backlog does not include orders received for our service business (spare parts, consumables and service contracts) due to the turn rate associated with that business. Generally, orders for services or parts received during the quarter are performed or shipped within the same quarter. All orders are subject to cancellations or rescheduling by customers with limited or no penalties. Due to possible changes in system delivery schedules, cancellations of orders, and delays in systems shipments, our backlog at any particular date is not necessarily indicative of our actual sales for any succeeding period. In addition, our backlog at the beginning of a quarter typically does not include all orders required to achieve our sales objectives for that quarter and is not a reliable indicator of our future sales.

Employees

As of December 31, 2009, we had 858 employees and 6 temporary staff worldwide, of which 611 work in North America, 185 in Asia and 68 in Europe. We consider our relationship with our employees to be good. Our employees are not represented by a labor union and are not subject to a collective bargaining agreement. Some of our European locations have formed work councils, which have certain information and discussion rights under applicable law.

Environmental

We are subject to environmental laws and regulations in the countries in which we operate that regulate, among other things: air emissions; water discharges; and the generation, use, storage, transportation, handling and disposal of solid and hazardous wastes produced by our manufacturing, research and development and sales activities. As with other companies engaged in like businesses, the nature of our operations exposes us to the risk of environmental liabilities, claims, penalties and orders. We believe, however, that our operations are in substantial compliance with applicable environmental laws and regulations and that there are no pending environmental matters that would have a material impact on our business. We are ISO-14001 certified at our Beverly, MA facility.

Executive Officers of the Registrant

Mary G. Puma, 52, has been our President and Chief Executive Officer since January 2002 and Chairman since 2005. From May 2000 until January 2002, Ms. Puma was our President and Chief Operating Officer, prior to which she served as a Vice President of Axcelis from February 1999. In 1998, she became General Manager and Vice President of the Implant Systems Division of Eaton Corporation, a global diversified industrial manufacturer. In May 1996, she joined Eaton as General Manager of the Commercial Controls Division. Prior to joining Eaton, Ms. Puma spent 15 years in various marketing and general management positions for General Electric Company. Ms. Puma is a director of Nordson Corporation, North Shore Medical Center and Semiconductor Equipment and Materials International (SEMI).

Stephen G. Bassett, 62, has been our Chief Financial Officer since April 2004 and Executive Vice President, Finance since May 2005, prior to which he was Senior Vice President, Finance since 2004. Prior to that, Mr. Bassett had served as interim Chief Financial Officer for Axcelis beginning in June 2003. From 1999 to 2002, Mr. Bassett served as Chief Financial Officer of Ezenia! Inc., a provider of real-time voice, video and data collaboration solutions for corporate networks and the Internet. From 1996 to 1999, Mr. Bassett worked as an independent financial consultant. From 1981 until 1996, Mr. Bassett served as an audit partner at Ernst & Young LLP, where he managed auditing services for a variety of organizations, ranging from multinational Fortune 500 companies to emerging businesses.

Kevin J. Brewer, 51, is our Executive Vice President, Manufacturing Operations, a position he has held since November 2008, prior to which he had been Vice President of Manufacturing Operations since October 2002 and Director of Operations from 1999 to 2002. Prior to joining Axcelis in 1999, Mr. Brewer was Director of Operations, Business Jets at Raytheon Aircraft Company, a leading manufacturer of business and special mission aircraft owned by Raytheon Company, a manufacturer of defense, government and commercial electronics, as well as aircraft. Prior to that, Mr. Brewer held various management positions in operations and strategic planning in Raytheon Company's Electronic Systems and Missile Systems groups.

Lynnette C. Fallon, 50, has been our General Counsel and corporate Secretary since 2001 and Executive Vice President, Human Resources/Legal since May 2005. Prior to that, Ms. Fallon was Senior Vice President HR/Legal since 2002, and Senior Vice President since 2001. Before joining Axcelis, Ms. Fallon was a partner in the Boston law firm of Palmer & Dodge LLP since 1992, where she was head of the Business Law Department from 1997 to 2001.

Matthew P. Flynn, 53, is our Executive Vice President, Global Customer Operations, a position he has held since May 2005, prior to which he was Vice President Global Customer Operations since October 2002. Before then, Mr. Flynn was Director of Sales, Ion Implant and RTP systems. Prior to joining Axcelis in 1996, Mr. Flynn held executive and management roles at Cherry Semiconductor, an integrated circuit manufacturer, and at Teledyne Inc., in its microelectronics business.

William Bintz, 53, has been our Senior Vice President, Marketing since September 2007. Mr. Bintz joined Axcelis in early 2006 as Director of Marketing for curing and cleaning products and shortly thereafter became Vice President of Product Marketing where he expanded his responsibilities to include implant products as well. Prior to joining Axcelis, from 2002 Mr. Bintz was Product Director for Medium Current and High Energy Ion Implant System at Varian Semiconductor Equipment Associates, Inc. Before that, he was General Manager of the Materials Delivery Products Group at MKS Instruments, beginning in 1999, and General Manager of the Thermal Processing Systems Division at Eaton Corporation (now Axcelis) beginning in 1995.

Item 1A. Risk Factors.

Some of the matters discussed in this filing contain forward-looking statements regarding future events that are subject to risks and uncertainties. From time to time, we may also make other forward-looking public statements, such as statements concerning our expected future revenue or earnings or concerning the prospects for our markets or our product development, projected plans, performance, order procurement as well as other estimates relating to future operations. Forward-looking statements may be in reports filed under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), in registration statements filed under the Securities Act of 1933, as amended (the "Securities Act"), in press releases or in informal statements made with the approval of an authorized executive officer. The words or phrases "will likely result," "are expected to," "will continue," "is anticipated," "estimate," "project," or similar expressions are intended to identify "forward-looking statements" within the meaning of Section 21E of the Exchange Act and Section 27A of the Securities Act, as enacted by the Private Securities Litigation Reform Act of 1995.

We wish to caution you not to place undue reliance on these forward-looking statements. These statements speak only as of the date on which they are made and represent management's expectations based on information available to them at that time. The factors listed below, as well as other factors that we may or may not have currently identified, could affect our financial or other performance and could cause our actual results for future periods to differ materially from opinions or statements expressed with respect to future periods or events in any current statement.

We will not undertake, and specifically decline, any obligation to publicly release revisions to these forward-looking statements to reflect either circumstances after the date of the statements or the

occurrence of events that may cause us to re-evaluate our forward-looking statements, except as may be required by law.

Important factors that could cause our actual results to differ materially from those projected in any forward-looking statements or that may otherwise be made by us or on our behalf and that make an investment in our securities risky include, but are not limited to: our ability to maintain our Nasdaq listing, the cyclical nature of the semiconductor industry, whether we can keep pace with rapid technological changes in the semiconductor manufacturing processes, the highly competitive nature of the semiconductor equipment industry, and quarterly fluctuations in operating results attributable to the timing and amount of orders for our products and services, as well as the other risk factors, discussed below. If any of those risk factors actually occurs, our business, financial condition and results of operations could be seriously harmed and the trading price of our common stock could decline.

We may be unable to obtain needed additional capital to finance our operations.

Our capital requirements may vary widely from quarter to quarter, depending on, among other things, capital expenditures, fluctuations in our operating results, financing activities, acquisitions and investments and inventory and receivables management. We believe that our existing cash and cash equivalents will be sufficient to satisfy our anticipated cash requirements through the end of 2010 and beyond, but this, of course, depends on the accuracy of our assumptions about levels of sales and expenses. A number of factors, including those described in these "Risk Factors," could prove our assumption wrong and cause us to require additional capital from external sources. Depending on market conditions, future debt or equity financings may not be possible on attractive terms or at all. In addition, future debt or equity financings could be dilutive to the existing holders of our common stock.

The general economic crisis may further hurt our business.

Factors such as consumer spending, business investment, and the volatility and strength of the capital markets all affect the business and economic environment, and ultimately, the amount of profitability of our business. Continuing poor economic conditions may have an adverse effect on us because we are dependent on customer behavior. Our revenue is likely to continue to decline in such circumstances and our profit margins will continue to erode. In addition, as a result of extreme prolonged events, such as the current global credit crisis, we could incur significant losses

If semiconductor manufacturers do not make sufficient capital expenditures, our sales and profitability will be harmed.

Almost all of our new orders will depend upon demand from semiconductor manufacturers who build or expand fabrication facilities. When the rate of construction or expansion of fabrication facilities declines, demand for our systems will decline, reducing our revenue. Revenue decline also hurts our profitability because our fixed cost structure and our continued investments in engineering, research and development and marketing necessary to develop new products and to maintain extensive customer service and support capabilities limit our ability to reduce expenses in proportion to declining sales.

Our financial results may fluctuate significantly.

We derive most of our revenue from the sale of a relatively small number of expensive products to a small number of customers. The list prices on these products range from \$0.2 million to over \$5.0 million. At our current sales level, each sale, or failure to make a sale, has a material effect on us in a particular quarter. In a given quarter, a number of factors can adversely affect our revenue and results, including changes in our product mix, increased fixed expenses per unit due to reductions in the number of products manufactured, and higher fixed costs due to increased levels of research and development and expansion of our worldwide sales and marketing organization. Our financial results

also fluctuate based on gross profit realized on sales. A variety of factors may cause gross profit as a percentage of revenue to vary, including the mix and average selling prices of products sold, costs to manufacture and customize systems and warranty costs. New product introductions may also affect our gross margins. Fluctuations in our results may have an adverse effect on the price of our common stock.

Our financial results may fall short of anticipated levels; forecasting revenue and profitability is complex and may be inaccurate.

Management may from time to time provide financial forecasts. These forecasts are based on assumptions believed to be reasonable when made of shipment timing and contract terms. However, in some cases, the final customer terms may not have been agreed and documented at the time the forecast is made, so the level of revenue recognizable in a particular quarter may vary from the forecast. Our lengthy sales cycle, coupled with customers' competing capital budget considerations, make the timing of customer orders uneven and difficult to predict. In addition, our backlog at the beginning of a quarter typically does not include all orders required to achieve our sales objectives for that quarter and is not a reliable indicator of our future sales. As a result, our revenue and operating results for a quarter depend on our shipping orders as scheduled during that quarter, receiving customer acceptance of shipped products during the quarter, and obtaining new orders for products to be shipped in that same quarter. Any delay in, or cancellation of, scheduled shipments and customer acceptances or in shipments from new orders could materially and adversely affect our financial results.

Accounting rules addressing revenue recognition have added additional complexity in forecasting quarterly revenue and profitability. Orders for our products usually contain multiple delivery elements that result in revenue deferral under generally accepted accounting principles. Due to the foregoing factors, investors should understand that our actual financial results for a quarter may vary significantly from our forecasts of financial performance for that quarter. Failure to meet forecast financial performance may have an adverse effect on the price of our common stock.

The semiconductor industry is highly cyclical and we expect that demand for our products will regularly increase and decrease, making it difficult to manage the business and potentially causing harm to our sales and profitability.

The semiconductor business is highly cyclical, experiencing upturns when the demand for our products is high and downturns when our customers are not investing in new or expanded fabrication facilities. From time to time, inventory buildups in the semiconductor industry, resulting in part from periodic downturns, produce an oversupply of semiconductors. This will cause semiconductor manufacturers to revise capital spending plans, resulting in reduced demand for capital equipment such as our products. If an oversupply is not reduced by increasing demand from the various electronics industries that use semiconductors, which we cannot accurately predict, our sales and profitability will be harmed. Our revenue can vary significantly from one point in the cycle to another, making it difficult to manage the business, both when revenue is increasing and when it is decreasing. In addition, a substantial portion of our operating expenses are fixed and do not fluctuate with changes in volume. Significant decreases in revenue can therefore have a disproportionate effect on profitability.

If we fail to develop and introduce reliable new or enhanced products and services that meet the needs of semiconductor manufacturers, our results will suffer.

Rapid technological changes in semiconductor manufacturing processes require us to respond quickly to changing customer requirements. Our future success will depend in part upon our ability to develop, manufacture and successfully introduce new systems and product lines with improved capabilities and to continue to enhance existing products, including products that process 300 millimeter wafers using a single wafer platform. This will depend upon a variety of factors, including

new product selection, timely and efficient completion of product design and development and of manufacturing and assembly processes, product performance in the field and effective sales and marketing. In particular:

- We must develop the technical specifications of competitive new systems, or enhancements to our existing systems, and manufacture and ship these systems or enhancements in volume in a timely manner.
- We will need to accurately predict the schedule on which our customers will be ready to transition to new products, in order to accurately forecast demand for new products while managing the transition from older products.
- We will need to effectively manage product reliability or quality problems that often exist with new systems, in order to avoid reduced orders, higher manufacturing costs, delays in acceptance and payment and additional service and warranty expenses.
- Our new products must be accepted in the marketplace.

Our failure to meet any of these requirements will have a material adverse effect on our operating results and profitability.

The success of our high current implant system is very important to our prospects.

The 300 millimeter high current (high dose) market segment of ion implant is a substantial portion of the total market opportunity available to Axcelis. As a result, our future success is particularly dependent on our ability to successfully gain market share with our single wafer ion implant system, the Optima HDx. We were late to market with the Optima HD system, so we are competing against established competitive offerings for the high current 300 millimeter ion implant market. Our ability to gain market share with the Optima HDx is dependent on the factors discussed above. If we are unable to do so, our financial condition and results will suffer.

If we fail to compete successfully in the highly competitive semiconductor equipment industry, our sales and profitability will decline.

The market for semiconductor manufacturing equipment is highly competitive and includes companies with substantially greater financial, engineering, manufacturing, marketing and customer service and support resources than we have that may be better positioned to compete successfully in the industry. In addition, there are smaller, emerging semiconductor equipment companies that provide innovative systems with technology that may have performance advantages over our systems. We expect our competitors to continue to improve the design and performance of their existing products and processes and to introduce new products and processes with improved price and performance characteristics. If we are unable to improve or introduce competing products when demanded by the markets, our business will be harmed. In addition, if competitors enter into strategic relationships with leading semiconductor manufacturers covering products similar to those sold or being developed by us, our ability to sell products to those manufacturers may be adversely affected. Finally, if we must lower prices to remain competitive without commensurate cost of goods savings, our gross margins and profitability will be adversely affected.

We have been dependent on sales to a limited number of large customers; the loss of any of these customers or any reduction in orders from them could materially affect our sales.

Historically, we have sold a significant portion of our products and services to a limited number of fabricators of semiconductor products. For example, in 2009, our top ten customers accounted for 56.6% of our net sales. None of our customers has entered into a long-term agreement requiring it to purchase our products. Although the composition of the group comprising our largest customers has

varied from year to year, the loss of a significant customer or any reduction or delays in orders from any significant customer could adversely affect us. The ongoing consolidation of semiconductor manufacturers may also increase the harmful effect of losing one or more significant customers.

Axcelis is subject to the risks of operating internationally and we derive a substantial portion of our revenue from outside the United States, especially from Asia.

We are substantially dependent on sales of our products and services to customers outside the United States. International sales, including export sales from our U.S. manufacturing facilities to non-U.S. customers and sales by our non-U.S. subsidiaries and branches, accounted for 62.8% of total revenue in 2009, 64.7% in 2008, and 67.0% in 2007. System shipments to Asian customers represented 76% of total shipment dollars in 2009 in comparison to 50% of total shipment dollars in 2008. We anticipate that international sales will continue to account for a significant portion of our revenue. Because of our dependence upon international sales, our results and prospects may be adversely affected by a number of factors, including:

- unexpected changes in laws or regulations resulting in more burdensome governmental controls, tariffs, restrictions, embargoes or export license requirements;
- difficulties in obtaining required export licenses;
- volatility in currency exchange rates;
- political and economic instability, particularly in Asia;
- difficulties in accounts receivable collections;
- extended payment terms beyond those customarily offered in the United States;
- difficulties in managing distributors or representatives outside the United States;
- difficulties in staffing and managing foreign subsidiary and branch operations; and
- potentially adverse tax consequences.

We may not be able to maintain and expand our business if we are not able to hire, retain and integrate qualified personnel.

Our business depends on our ability to attract and retain qualified, experienced employees. There is substantial competition for experienced engineering, technical, financial, sales and marketing personnel in our industry. In particular, we must attract and retain highly skilled design and process engineers. Competition for such personnel is intense, particularly in the Boston metropolitan area, as well as in other locations around the world. If we are unable to retain our existing key personnel, or attract and retain additional qualified personnel, we may from time to time experience levels of staffing inadequate to develop, manufacture and market our products and perform services for our customers. As a result, our growth could be limited or we could fail to meet our delivery commitments or experience deterioration in service levels or decreased customer satisfaction, all of which could adversely affect our financial results.

Our dependence upon a limited number of suppliers for many components and sub-assemblies could result in increased costs or delays in the manufacture and sale of our products.

We rely to a substantial extent on outside vendors to manufacture many of the components and sub-assemblies of our products. We obtain many of these components and sub-assemblies from either a sole source or a limited group of suppliers. Accordingly, we may be unable to obtain an adequate supply of required components on a timely basis, on price and other terms acceptable to us, or at all.

In addition, we often quote prices to our customers and accept customer orders for our products before purchasing components and sub-assemblies from our suppliers. If our suppliers increase the cost of components or sub-assemblies, we may not have alternative sources of supply and may not be able to raise the price of our products to cover all or part of the increased cost of components.

The manufacture of some of these components and sub-assemblies is an extremely complex process and requires long lead times. As a result, we have in the past and may in the future experience delays or shortages. If we are unable to obtain adequate and timely deliveries of our required components or sub-assemblies, we may have to seek alternative sources of supply or manufacture these components internally. This could delay our ability to manufacture or to ship our systems on a timely basis, causing us to lose sales, incur additional costs, delay new product introductions and suffer harm to our reputation.

Our international operations involve currency risk.

Substantially all of our sales are billed in U.S. dollars, thereby reducing the impact of fluctuations in foreign exchange rates on our results. Operating margins of certain foreign operations can fluctuate with changes in foreign exchange rates to the extent revenue is billed in U.S. dollars and operating expenses are incurred in the local functional currency. During the year ended December 31, 2009, approximately 37% of our revenue was derived from foreign operations with this inherent risk. In addition, at December 31, 2009, our operations outside of the United States accounted for approximately 39% of our total assets, the majority of which was denominated in currencies other than the U.S. dollar.

Our stock price has been volatile and you could lose the value of your investment.

Our stock price has been volatile and has fluctuated significantly to date. The trading price of our stock is likely to continue to be highly volatile and subject to wide fluctuations. Your investment in our stock could lose value. Some of the factors that could significantly affect the market price of our stock include:

- actual or anticipated variations in results;
- analyst reports or recommendations;
- changes in interest rates; and
- other events and factors, many of which are beyond our control.

The stock market in general has experienced extreme price fluctuations.

Our proprietary technology may be vulnerable to efforts by competitors to challenge or design around, potentially reducing our market share.

We rely on a combination of patents, copyrights, trademark and trade secret laws, non-disclosure agreements and other intellectual property protection methods to protect our proprietary technology. Despite our efforts to protect our intellectual property, our competitors may be able to legitimately ascertain the non-patented proprietary technology embedded in our systems. If this occurs, we may not be able to prevent their use of this technology. Our means of protecting our proprietary rights may not be adequate and our patents may not be sufficiently broad to prevent others from using technology that is similar to or the same as our technology. In addition, patents issued to us have been, or might be challenged, and might be invalidated or circumvented and any rights granted under our patents may not provide adequate protection to us. Our competitors may independently develop similar technology, duplicate features of our products or design around patents that may be issued to us. As a result of these threats to our proprietary technology, we may have to resort to costly litigation to enforce or

defend our intellectual property rights. Finally, all patents expire after a period of time (in the U.S., patents expire 20 years from the date of filing of the patent application). Our market share could be negatively impacted by the expiration of a patent which had created a barrier for our competitors.

Axcelis also has agreements with third parties for licensing of patented or proprietary technology with Axcelis as the licensor or the licensee. Termination of license agreements could have an adverse impact on our financial performance or ability to ship products with existing configurations.

We (or customers that we indemnify) might face intellectual property infringement claims or patent disputes that may be costly to resolve and, if resolved against us, could be very costly to us and prevent us from making and selling our systems.

From time to time, claims and proceedings have been or may be asserted against us relative to patent validity or infringement matters. We typically agree to indemnify our customers from liability to third parties for intellectual property infringement arising from the use of our products in their intended manner. Therefore, we occasionally receive notification from customers who believe that we owe them indemnification or other obligations related to infringement claims made against the customers by third parties. Our involvement in any patent dispute or other intellectual property dispute or action to protect trade secrets, even if the claims are without merit, could be very expensive to defend and could divert the attention of our management. Adverse determinations in any litigation could subject us to significant liabilities to third parties, require us to seek costly licenses from third parties and prevent us from manufacturing and selling our systems. In addition, infringement indemnification clauses in system sale agreements may require us to take other actions or require us to provide certain remedies to customers who are exposed to indemnified liabilities. Any of these situations could have a material adverse effect on our business results.

If operations were disrupted at Axcelis' primary manufacturing facility it would have a negative impact on our business.

We have one primary manufacturing facility, located in Massachusetts. Its operations could be subject to disruption for a variety of reasons, including, but not limited to natural disasters, work stoppages, operational facility constraints and terrorism. Such disruption could cause delays in shipments of products to our customers and could result in cancellation of orders or loss of customers, which could seriously harm our business.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

We own one property and lease 44 properties, of which 14 are located in the United States and the remainder are located in Asia and Europe, including offices in Taiwan, Singapore, South Korea, China, Malaysia, Italy, and Germany.

Our principal facilities are listed below:

Facility Location	Principal Use	Square Footage (Owned Leased)
Beverly, Massachusetts	Manufacturing, research and development, sales/marketing, customer support, advanced process development, product demonstration, customer-training center and corporate headquarters.	417,000 (owned)
Rockville, Maryland	Research and development, marketing and customer support	22,000 (leased)

Although we are currently operating significantly below normal capacity as a result of the continuing downturn in the industry, we believe that there is no material long-term, excess capacity in our manufacturing facilities, although utilization is subject to change based on customer demand. We believe that our manufacturing facilities and equipment generally are well maintained, in good operating condition, suitable for our purposes, and adequate for our present operations. Our Beverly, Massachusetts facility is ISO 9001 and ISO 14001 certified and all other locations are ISO 9001 certified.

Item 3. Legal Proceedings.

The Company is not presently a party to any litigation that it believes might have a material adverse effect on its business operations. The Company is, from time to time, a party to litigation that arises in the normal course of its business operations.

Item 4. Submission of Matters to a Vote of Security Holders.

None.

PART II

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

Our common stock trades on the Nasdaq Global Select Market under the symbol ACLS. The following table sets forth the high and low sale prices as reported on the Nasdaq Global Select Market during each of the quarters for the two most recent years. As of March 15, 2010, we had approximately 5,485 stockholders of record. We have not paid any cash dividends in the past five years and do not anticipate paying cash dividends in the future.

	Common Stock Price	
	High	Low
<u>2008</u>		
First Quarter	\$ 5.79	\$ 3.70
Second Quarter	\$ 6.04	\$ 4.63
Third Quarter	\$ 5.35	\$ 1.25
Fourth Quarter	\$ 1.73	\$ 0.36
<u>2009</u>		
First Quarter	\$ 0.70	\$ 0.17
Second Quarter	\$ 0.66	\$ 0.32
Third Quarter	\$ 1.29	\$ 0.32
Fourth Quarter	\$ 1.78	\$ 0.75

Item 6. Selected Financial Data.

The following selected consolidated statements of operations data for each of the three years ended December 31, 2009, 2008, and 2007 and the consolidated balance sheet data as of December 31, 2009 and 2008 have been derived from the audited consolidated financial statements contained in Item 15 of Part IV of this Form 10-K. The selected consolidated balance sheet data as of December 31, 2007 and 2006, and the statement of operations data for the years ended December 31, 2006 and 2005, has been derived from the audited financial statements contained in our Form 10-K filed on March 17, 2008. The consolidated balance sheet data as of December 31, 2005 has been derived from the audited financial statements contained in our Form 10-K filed on March 14, 2006.

The historical financial information set forth below may not be indicative of our future performance and should be read together with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our historical consolidated financial statements and notes to those statements included in Item 7 of Part II and Item 15 of Part IV, respectively, of this Form 10-K.

	Years ended December 31,				
	2009	2008	2007	2006	2005
	(In thousands, except per share amounts)				
Consolidated statements of operations data:					
Revenue	\$ 133,022	\$ 250,214	\$ 404,800	\$ 461,717	\$ 372,540
Gross profit	28,064	62,615	152,861	191,514	154,431
Equity income (loss) of SEN	(3,238)	(3,667)	10,416	19,266	15,751
Income (loss) before Income taxes	(76,603)	(195,803)	(11,808)	42,783	(1,982)
Net income (loss)	(77,468)	(196,664)	(11,398)	40,770	(3,855)
Net income (loss) per share:					
Basic	\$ (0.75)	\$ (1.91)	\$ (0.11)	\$ 0.40	\$ (0.04)
Diluted	\$ (0.75)	\$ (1.91)	\$ (0.11)	\$ 0.40	\$ (0.04)
Shares used in computing basic and diluted per share amounts:					
Basic	103,586	102,739	101,891	101,058	100,301
Diluted	103,586	102,739	101,891	101,361	100,301
Consolidated balance sheet data:					
Cash and cash equivalents	\$ 45,020	\$ 37,694	\$ 83,877	\$ 140,451	\$ 71,417
Working capital	163,849	111,182	284,679	284,910	301,143
Total assets	250,603	455,181	669,929	753,993	661,443
Long-term liabilities	4,447	5,808	89,920	86,290	141,176
Stockholders' equity	216,399	319,377	486,006	447,562	426,041

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

Certain statements in "Management's Discussion and Analysis of Financial Condition and Results of Operations" are forward-looking statements that involve risks and uncertainties. Words such as may, will, should, would, anticipates, expects, intends, plans, believes, seeks, estimates and similar expressions identify such forward-looking statements. The forward-looking statements contained herein are based on current expectations and entail various risks and uncertainties that could cause actual results to differ materially from those expressed in such forward-looking statements. Factors that might cause such a difference include, among other things, those set forth under "Liquidity and Capital Resources" and "Risk Factors" and others discussed elsewhere in this Form 10-K. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect management's analysis only as of the date hereof. We assume no obligation to update these forward-looking statements to reflect actual results or changes in factors or assumptions affecting forward-looking statements, except as may be required by law.

Overview

The semiconductor capital equipment industry is subject to significant cyclical swings in capital spending by semiconductor manufacturers. Capital spending is influenced by demand for semiconductors and the products using them, the utilization rate and capacity of existing semiconductor manufacturing facilities and changes in semiconductor technology, all of which are outside of our control. As a result, our revenue and gross margins, to the extent affected by increases or decreases in volume, could fluctuate from year to year and period to period. The industry experienced a downturn beginning in the second half of 2007 which extended through 2009, although signs of improvement began during the fourth quarter of 2009. Our gross margins are also affected by the introduction of new products. We typically become more efficient in manufacturing products as they mature. Our expense base is largely fixed and does not vary significantly with changes in volume. Therefore, we could experience fluctuations in operating results and cash flows depending on our revenue as driven by the level of capital expenditures by semiconductor manufacturers.

The sizable expense of building, upgrading or expanding a semiconductor fabrication facility is increasingly causing semiconductor companies to contract with foundries to manufacture their semiconductors. In addition, consolidation and partnering within the semiconductor manufacturing industry is increasing. We expect these trends to continue to reduce the number of our potential customers. This growing concentration of Axcelis' customers may increase competitive pricing as higher percentages of our total revenue are tied to the buying decisions of a particular customer or a small number of customers.

In 2009, 2008, and 2007, we incurred net losses. Beginning in 2004, most customers shifted from multi wafer tools to single wafer tools for high current ion implant applications. Because we were late to market with a single wafer high current product, we experienced a significant loss of market share. We introduced our single wafer Optima HD (for high current applications) product in 2006 and have gained traction with this tool at a number of customers.

Although we believe that we have competitive products, challenging market conditions have severely limited our ability to increase sales and market share. Additionally, in concert with the market uncertainty resulting from the recent credit crisis, we believe that the economic downturn which is characterized by higher unemployment, lower corporate earnings, lower business investment and lower consumer spending, has severely impacted many technology manufacturers and has significantly lowered the demand for our products. The Company believes that a combination of these factors accounts for the difference between our stock trading price and our book value.

As described in "Business—Sale of Investment in SEN," on March 30, 2009, the Company sold all of the Company's common shares in SEN to SHI, in exchange for a cash payment of 13 billion Yen,

which resulted in proceeds of approximately \$132.8 million before advisor fees and other expenses of \$10.6 million. The sale price was determined through an arm's length negotiation. This transaction terminated all prior agreements among the three parties relating to the SEN joint venture. In addition, the arbitration with SEN initiated by Axcelis in Tokyo, Japan was dismissed.

In connection with the sale of its investment in SEN, on March 30, 2009, the Company and SEN entered into a cross License Agreement pursuant to which the parties may use certain technical information on a non-exclusive, perpetual, royalty-free, worldwide basis, provided that the Company and SEN received sole exclusive licenses for 4 years in the U.S. and Japan, respectively. The sale of the Company's investment in SEN resulted in a gain of approximately \$1.1 million. This gain includes net proceeds of \$122.2 million (after payment of advisor fees and other costs of \$10.6 million) and cumulative foreign translation gain of \$23.5 million, previously recorded in other comprehensive income, reduced by the carrying value of the investment on the date of sale of \$144.6 million. The gain from sale of the Company's investment in SEN is recorded in other income. A portion of the proceeds of the sale were used to pay off, in full, the amounts due to the holder of the Company's 4.25% Convertible Senior Subordinated Notes.

Axcelis' liquidity is affected by many factors. Some of these factors are based on normal operations of the business, including sale of Optima products in inventory, and others relate to the uncertainties of global economies, including the availability of credit, and the state of the semiconductor equipment industry. Although our cash requirements fluctuate based on the timing and extent of these factors, based on our current market, revenue and expense forecast we believe that our existing cash and cash equivalents will be sufficient to satisfy our anticipated cash requirements in the short and long-term.

Operating results for the years presented are not necessarily indicative of the results that may be expected for future interim periods or years as a whole.

Critical Accounting Estimates

Management's discussion and analysis of our financial condition and results of operations are based upon Axcelis' 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 judgments that affect the reported amounts of assets, liabilities, revenue and expenses, and related disclosure of contingent assets and liabilities. On an on-going basis, we evaluate our estimates, including those related to revenue recognition, income taxes, accounts receivable, inventory and warranty obligations. Management's estimates are based on historical experience and on various other assumptions 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 accounting policies are critical in the portrayal of our financial condition and results of operations and require management's most significant judgments and estimates in the preparation of our consolidated financial statements.

Revenue Recognition

Our revenue recognition policy involves significant judgment by management. As described below, we consider a broad array of facts and circumstances in determining when to recognize revenue, including contractual obligations to the customer, the complexity of the customer's post delivery acceptance provisions, payment history, customer creditworthiness and the installation process. In the future, if the post delivery acceptance provisions and installation process become more complex or result in a materially lower rate of acceptance, we may have to revise our revenue recognition policy, which could delay the timing of revenue recognition.

Axcelis' revenue transactions include sales of products under multiple element arrangements. Revenue under these arrangements is allocated to each element, except systems, based upon its estimated fair market value. The amount of revenue allocated to systems is calculated on a residual method. Under this method, the total value of the arrangement is allocated first to the undelivered elements, with the residual amount being allocated to product revenue.

The value of the undelivered elements includes (a) the greater of (i) the fair value of the installation or (ii) the portion of the sales price that will not be received until the installation is completed (the "retention") plus (b) the fair value of all other undelivered elements. The amount allocated to installation is based upon the fair value of the service performed, including labor, which is based upon the estimated time to complete the installation at hourly rates, and material components. The fair value of all other undelivered elements is based upon the price charged when these elements are sold separately. Product revenue for products which have demonstrated market acceptance (legacy products), is generally recognized upon shipment provided title and risk of loss has passed to the customer, evidence of an arrangement exists, prices are contractually fixed or determinable, collection is reasonably assured through historical collection results and regular credit evaluations, and there are no uncertainties regarding customer acceptance. Revenue from installation services is recognized at the time formal acceptance is received from the customer or, for certain customers, when both the formal acceptance and retention payment have been received. Revenue for other elements is recognized at the time products are shipped or the related services are performed.

We generally recognize systems revenue for products which have demonstrated market acceptance (legacy products), at the time of shipment because the customer's post-delivery acceptance provisions and installation process have been established to be routine, commercially inconsequential and perfunctory. The majority of Axcelis' systems are designed and tailored to meet the customer's specifications, as outlined in the contract between the customer and Axcelis, which may be the Axcelis standard specification. To ensure that the customer's specifications are satisfied, many customers request that new systems be tested at Axcelis' facilities prior to shipment, normally with the customer present, under conditions that substantially replicate the customer's production environment and the customer's criteria are confirmed to have been met. Customers of mature products generally do not require pre-shipment testing. We believe the risk of failure to complete a system installation is remote. Should an installation not be completed successfully, the contractual provisions do not provide for forfeiture, refund or other purchase price concession beyond those prescribed by the provisions of the Uniform Commercial Code applicable generally to such transactions.

For initial shipments of systems with new technologies or in the small number of instances where Axcelis is unsure of meeting the customer's specifications or obtaining customer acceptance upon shipment of the system, Axcelis will defer the recognition of systems revenue and related costs until written customer acceptance of the system is obtained. This deferral period is generally within twelve months of shipment.

Revenue related to maintenance and service contracts is recognized ratably over the duration of the contracts, or based on parts usage, where appropriate. Revenue related to service hours is recognized when the services are performed.

Royalty revenue is primarily earned under the terms of our license agreement with SEN. Royalty revenue is recorded at the time SEN notifies the Company that royalties have been earned.

Impairment of Long-Lived Assets

We record impairment losses on long-lived assets when events and circumstances indicate that long-lived assets might not be recoverable. Recoverability is measured by a comparison of the assets' carrying amount to their expected future undiscounted net cash flows. If such assets are considered to

be impaired, the impairment is measured based on the amount by which the carrying value exceeds its fair value.

During the fourth quarter of 2008, we experienced a sustained market capitalization below book value, as well as a significant decline in our business that led us to revise our short-term financial forecasts. As a result, we recorded a total intangible and long-lived asset impairment charge at December 31, 2008 of \$46.9 million. This charge consisted of intangibles of \$8.3 million, certain other assets of \$21.1 million and property, plant and equipment of \$17.5 million. During 2009, we continued to experience events and circumstances which indicated that a further impairment of long-lived assets may have occurred. The significant decline in our stock price continued through most of 2009, and we continued to maintain a market capitalization significantly below book value. In addition, the estimated future total market for our products, which was significantly revised downward in the fourth quarter of 2008, showed only modest signs of recovery as of December 31, 2009. However, recent industry market forecasts anticipate greater recovery in 2010.

Accordingly, as of December 31, 2009, we performed an analysis comparing undiscounted cash flows estimated to be generated by the long-lived assets to the carrying amounts of those assets. The estimates of future operating results and cash flows are derived from our updated long-term financial forecast. This updated long-term forecast represents the best estimate that we have at this time and we believe that its underlying assumptions are reasonable, based primarily on current product performance and customer acceptance. This forecast relies primarily on market assumptions and market share we expect to achieve. As of December 31, 2009, our analysis indicated that the carrying amounts for long-lived assets are expected to be recovered. As such, we did not record an impairment charge for the year ended December 31, 2009. However, actual performance could be materially different from our current forecasts, which could impact future estimates of undiscounted cash flows and may result in the impairment of the carrying amount of the long-lived assets in the future. This could be caused by strategic decisions made in response to economic and competitive conditions, the impact of the economic environment on our customer base, or a material adverse change in our relationships with significant customers. Accordingly we will continue to perform this analysis no less than quarterly for the foreseeable future.

Accounts Receivable—Allowance for Doubtful Accounts

We record an allowance for doubtful accounts for estimated losses resulting from the inability of our customers to make required payments. If the financial condition of our customers were to deteriorate, resulting in an impairment of their ability to make payments, additional allowances may be necessary.

Inventory—Allowance for Excess and Obsolescence

We record an allowance for estimated excess and obsolete inventory. The allowance is determined using management's assumptions of materials usage, based on estimates of forecasted and historical demand and market conditions. If actual market conditions become less favorable than those projected by management, additional inventory write-downs may be required.

Although we make every effort to ensure the accuracy of our forecasts or product demand and pricing assumptions, any significant unanticipated changes in demand, pricing, or technical developments would significantly impact the value of our inventory and our reported operating results. In the future, if we find that estimates are too optimistic and determine that inventory needs to be written down, the Company will recognize such costs in our cost of revenue at the time of such determination. Conversely, if we find our estimates are too pessimistic and we subsequently sell product that has previously been written down, our gross margin in that period will be favorably impacted.

Product Warranty

We offer a one to three year product warranty, the terms and conditions of which vary depending upon the product sold. For all systems sold, we accrue a liability for the estimated cost of standard warranty at the time of system shipment and defer the portion of systems revenue attributable to the fair value of non-standard warranty. Costs for non-standard warranty are expensed as incurred. Factors that affect our warranty liability include the number of installed units, historical and anticipated product failure rates, material usage and service labor costs. We periodically assess the adequacy of our recorded liability and adjust the amount as necessary.

Results of Operations

The following table sets forth our results of operations as a percentage of total revenue for the periods indicated:

	Years Ended December 31,		
	2009	2008	2007
Revenue:			
Product	74.2%	77.6%	84.9%
Service	25.5	20.7	13.6
Royalties, primarily from SEN	0.3	1.7	1.5
Total revenue	100.0	100.0	100.0
Cost of revenue:			
Product	63.3	64.5	53.6
Services	15.6	10.5	8.6
Total cost of revenue	78.9	75.0	62.2
Gross profit	21.1	25.0	37.8
Operating expenses:			
Research and development	24.6	25.3	17.8
Sales and marketing	19.0	17.8	12.3
General and administrative	25.6	17.2	10.3
Impairment of goodwill	—	16.8	1.2
Impairment of intangibles and long lived assets	—	18.8	—
Amortization of intangible assets	—	1.1	0.7
Restructuring charges	4.2	2.7	0.6
Total operating expenses	73.4	99.7	42.9
Loss from operations:	(52.3)	(74.7)	(5.1)
Other income (expense):			
Gain on sale of SEN	0.8	—	—
Equity income (loss) of SEN	(2.4)	(1.5)	2.6
Interest income	0.1	0.6	1.2
Interest expense	(1.3)	(2.6)	(1.6)
Other, net	(2.6)	(0.1)	—
Total other income (expense)	(5.4)	(3.6)	2.2
Loss before income taxes	(57.7)	(78.3)	(2.9)
Provision for/(benefit) from income taxes	0.7	0.3	(0.1)
Net loss	(58.4)%	(78.6)%	(2.8)%

Revenue

Revenue declined significantly in 2009 compared to 2008 due to the continuing depressed semiconductor equipment market. Based on current industry projections we expect revenue, from both system sales and our aftermarket business, to improve in 2010.

Product

Product revenue, which includes systems sales, sales of spare parts and product upgrades, was \$98.7 million or 74.2% of revenue in 2009, compared with \$194.3 million, or 77.6% of revenue in 2008. The decline in product revenue in 2008 and 2009 was attributable to a weakening semiconductor market and a related decrease in capital spending by semiconductor manufacturers. In addition, a decrease in 200mm manufacturing capacity (a portion of which relates to the overall decline in the semiconductor capital equipment market) decreased revenue from system sales by \$95.6 million for 2009.

Approximately 25.0% of systems revenue in 2009 was from sales of 200mm products and 75.0% was from sales of 300mm products, compared with 41.0% and 59.0% for sales of 200mm products and 300mm products in 2008, respectively.

A portion of our revenue from system sales is deferred until installation and other services related to future deliverables are performed. The total amount of deferred revenue at December 31, 2009 and 2008 was \$5.7 million and \$14.4 million, respectively. The decline was mainly due to the decrease in overall systems revenue in 2009.

Service

Service revenue, which includes the labor component of maintenance and service contracts and fees for service hours provided by on-site service personnel, was \$33.9 million, or 25.5% of revenue for 2009, compared with \$51.9 million, or 20.7% of revenue, for 2008. The decline was due to a continuing decline in overall market conditions and low capacity utilization at customers' manufacturing facilities. Although service revenue should increase with the expansion of the installed base of systems, it can fluctuate from period to period based on capacity utilization at customers' manufacturing facilities, which affects the need for our services.

Royalties

Royalty revenue was \$0.4 million or 0.3% of revenue for 2009, compared with \$4.1 million, or 1.7% of revenue for 2008. Royalties were earned primarily under our prior license agreement with SEN. As a result of the sale of our investment in SEN, SEN has had no further obligation to pay royalties to us since March 30, 2009.

Ion Implant

Included in total revenue of \$133.0 million in 2009 is revenue from sales of ion implantation products and service of \$110.9 million, or 83.4% of total revenue, compared with \$204.9 million, or 81.9%, of total revenue in 2008. The decline was due to the factors discussed above. Annual revenue from the sale of ion implantation products and service typically averages from 70% to 80% of total revenue.

Aftermarket

The Company's product revenue includes sales of spare parts and product upgrades as well as complete systems. We refer to the business of selling spare parts and product upgrades, combined with the sale of maintenance labor and service contracts and service hours, as the "aftermarket" business. Included in total revenue of \$133.0 million in 2009 is revenue from our aftermarket business of \$98.2 million, compared to \$143.0 million for 2008. Aftermarket revenue generally increases with expansion of the installed base of systems but can fluctuate from period to period based on capacity utilization at customers' manufacturing facilities which affects the sale of spare parts and demand for equipment service. After hitting bottom in the first quarter of 2009, industry utilization has increased every quarter since then. This has resulted in successive improvements in aftermarket revenue each quarter, a trend that is expected to continue into 2010.

Gross Profit

Product

Gross profit from product revenue was 14.7% for the twelve months ended December 31, 2009, compared to 17.0% for the twelve months ended December 31, 2008. The decrease resulted from significantly lower systems sales volume during the twelve months ended December 31, 2009, and the related under absorption of manufacturing overhead which reduced gross margins by 30.7%. This was offset by a 12.2% increase in gross margin resulting from the favorable impact of an increased mix of parts and upgrade revenue at higher margins and 16.2% attributable to a lower provision for excess inventory.

Service

Gross profit from service revenue was 38.8% for the twelve months ended December 31, 2009, compared to 49.2% for the twelve months ended December 31, 2008. The decrease in gross profit is attributable to significantly lower revenue.

Operating Expenses

In response to continuing weak market conditions in 2009 the Company took several actions, including reduction in headcount, to reduce operating expenses. The aggregate of research and development, sales and marketing, and general and administrative expense reduction in 2009 compared to 2008 was \$58.9 million.

Research and Development

Research and development expense was \$32.7 million in 2009, a decrease of \$30.6 million, or 48.3%, compared with \$63.3 million in 2008. The decrease was primarily due to substantial completion of Optima and Integra platform development in 2008, which resulted in decreased payroll costs (\$12.4 million), decreased professional fee expenses (\$3.2 million), decreased project material costs (\$3.9 million), decreased development asset amortization and depreciation costs (\$8.9 million) and decreased other miscellaneous expenses (\$2.2 million).

Research and development expense was attributable to the following activities for 2009: 49% for new product development, 35% for improvement of existing products, and 16% for product testing.

Sales and Marketing

Sales and marketing expense was \$25.2 million in 2009, a decrease of \$19.4 million, or 43.5%, compared with \$44.6 million in 2008. The decrease was driven primarily by decreased payroll costs (\$9.5 million), decreased professional services (\$4.0 million), decreased supplies and marketing costs

(\$1.7 million), decreased travel costs (\$2.3 million), decreased freight costs (\$1.1 million) and decreased other miscellaneous costs (\$0.8 million).

General and Administrative

General and administrative expense was \$34.1 million in 2009, a decrease of \$9.0 million, or 20.8% compared with \$43.1 million in 2008. The decrease was driven primarily by decreased payroll costs of (\$4.5 million), decreased professional fee expenses (\$2.2 million) decreased amortization costs (\$1.1 million), and a decrease in other miscellaneous costs (\$1.2 million).

Impairment of Intangibles and Long-Lived Assets

During the fourth quarter of 2008, the significant decline in our stock price experienced at the end of the third quarter continued through the end of the fourth quarter and beyond, resulting in a sustained market capitalization well below book value.

During 2009 we continued to experience events and circumstances which indicated that a further impairment of long-lived assets may have occurred. The significant decline in our stock price continued through 2009, and we continued to maintain a market capitalization significantly below book value. In addition, the estimated future total market for our products, which was significantly revised downward in the fourth quarter of 2008, while showing signs of modest recovery which is expected to continue into 2010 is still less than historical levels.

Accordingly, as of December 31, 2009, we performed an analysis comparing undiscounted cash flows estimated to be generated by the long-lived assets to the carrying amounts of those assets. The estimates of future operating results and cash flows are derived from our updated long-term financial forecast. This updated long-term forecast represents the best estimate that we have at this time and we believe that its underlying assumptions are reasonable, based primarily on current product performance and customer acceptance. This forecast relies primarily on market assumptions and market share we expect to achieve. As of December 31, 2009, our analysis indicated that the carrying amounts for long-lived assets are expected to be recovered. As such we did not record an impairment charge for the year ended December 31, 2009. However, actual performance could be materially different from our current forecasts, which could impact future estimates of undiscounted cash flows and may result in the impairment of the carrying amount of the long-lived assets in the future. This could be caused by strategic decisions made in response to economic and competitive conditions, the impact of the economic environment on our customer base, or a material adverse change in our relationships with significant customers. Accordingly we will continue to perform this analysis no less than quarterly for the foreseeable future. As a result of our review of the recoverability of intangibles and long-lived assets, at December 31, 2008, we recorded an impairment charge of \$46.9 million consisting of the entire net book value of intangible assets of \$8.3 million, certain other assets of \$21.1 million, and property, plant and equipment of \$17.5 million.

Restructuring

During the year ended December 31, 2009, we implemented a reduction in force to further reduce costs to mitigate deteriorating industry fundamentals. This reduction in force resulted in a total charge to expense of approximately \$6.1 million related to separation and outplacement costs for the year ended December 31, 2009, offset by a reversal of \$0.6 million of accrued compensation expense related to terminated employees. A charge to expense of \$5.5 million was recorded in the year ended December 31, 2009. See Note 10 to our Consolidated Financial Statements contained in Item 15 of this Annual Report on Form 10-K for further information regarding our 2009 restructuring.

Changes in our restructuring liability, included in amounts reported as other current liabilities, are as follows:

	<u>Severance</u> <u>(in thousands)</u>
Balance at December 31, 2008	\$ 746
Severance and related costs	6,084
Cash payments	(6,533)
Balance at December 31, 2009	<u>\$ 297</u>

Other Income (Expense)

Equity loss attributable to SEN was \$3.2 million for the year ended December 31, 2009. This is compared to equity loss attributable to SEN of \$3.7 million for the year ended December 31, 2008. As a result of the sale of our investment in SEN, subsequent to March 30, 2009, the Company no longer records equity income or loss from SEN.

Interest income of \$0.2 million for the year ended December 31, 2009, primarily relates to interest earned on cash and cash equivalents. Interest income decreased by \$1.4 million from the year ended December 31, 2008, due primarily to lower average cash balances.

Interest expense decreased by \$5.1 million for the year ended December 31, 2009 compared to the year ended December 31, 2008. The decrease is due to the payment in full of the convertible senior subordinated notes on March 30, 2009.

Income Taxes

We incur income tax expense relating principally to operating results of foreign entities in jurisdictions, principally in Asia, where we earn taxable income. We have significant net operating loss carryforwards in the United States and certain foreign jurisdictions, principally Europe, and, as a result, we do not currently pay significant income taxes in those jurisdictions and we do not recognize the tax benefit for such losses as discussed in Note 18 to the consolidated financial statements. Accordingly, our effective income tax rate is not meaningful.

Year ended December 31, 2008 in comparison to the year ended December 31, 2007

Revenue

Product

Product revenue, which includes systems sales, sales of spare parts and product upgrades, was \$194.3 million or 77.6% of revenue in 2008, compared with \$343.6 million, or 84.9% of revenue in 2007. The decline in product revenue in 2008 was mainly attributable to a weakening semiconductor market and a related decrease in capital spending by semiconductor manufacturers. Product revenue in 2007 and 2008 was also impacted by our loss of high current market share, as discussed above. In addition, a decrease in 200mm manufacturing capacity (a portion of which relates to the overall decline in the semiconductor capital equipment market) decreased revenue from system sales by \$149.3 million for 2008.

Approximately 41% of systems revenue in 2008 was from sales of 200mm products and 59% was from sales of 300mm products, compared with 31.6% and 68.4% for sales of 200mm products and 300mm products in 2007, respectively.

A portion of our revenue from system sales is deferred until installation and other services related to future deliverables are performed. The total amount of deferred revenue at December 31, 2008 and

2007 was \$14.4 million and \$40.5 million, respectively. The decline was mainly due to the decrease in overall systems revenue in 2008 and the recognition of \$13.2 million of revenue deferred in 2007 related to the rollout of the Optima HD product line.

Service

Service revenue, which includes the labor component of maintenance and service contracts and fees for service hours provided by on-site service personnel, was \$51.9 million, or 20.7% of revenue for 2008, compared with \$55.2 million, or 13.6% of revenue, for 2007. Although service revenue should increase with the expansion of the installed base of systems, it can fluctuate period to period based on capacity utilization at customers' manufacturing facilities, which affects the need for equipment service.

Royalties

Royalty revenue was \$4.1 million or 1.7% of revenue for 2008, compared with \$6.1 million, or 1.5% of revenue for 2007. Royalties are earned primarily under the terms of our license agreement with SEN. Changes are mainly attributable to fluctuations in SEN sales volume based on demand for equipment by Japanese semiconductor manufacturers and the timing of shipments in Japan. As a result of the sale of our investment in SEN subsequent to March 31, 2009 SEN has had no further obligation to pay royalties to us.

Ion Implant

Revenue from sales of ion implantation products and service accounted for \$204.9 million, or 81.9% of total revenue in 2008, compared with \$304.5 million, or 75.2%, of total revenue in 2007. The decline was due to the factors discussed above. Annual revenue from the sale of ion implantation products and service typically averages from 70% to 80% of total revenue.

Aftermarket

The Company's product revenue includes sales of spare parts and product upgrades as well as complete systems. We refer to the business of selling spare parts and product upgrades, combined with the sale of maintenance labor and service contracts and service hours as the "aftermarket" business. The revenue from our aftermarket business was \$143.0 million for 2008, compared to \$170.9 million for 2007. Aftermarket revenue generally increases with expansion of the installed base of systems but can fluctuate period to period based on capacity utilization at customers' manufacturing facilities which affects the sale of spare parts and demand for equipment service. The estimated future total available market for our products, as published by independent third party industry analysts, was significantly revised downward in the fourth quarter and we experienced a 26% decline (as compared to aftermarket revenue in the third quarter of 2008), in our aftermarket business, reflecting significant declines in manufacturers' capacity utilization.

Gross Profit

Product

Gross profit from product revenue was 17.0% for 2008, compared to 36.8% for 2007, a decrease of 19.8%. Approximately 12% of the decrease pertains to an additional reserve of \$23.2 million for excess inventory. The remaining 7.8% decrease is attributable to the significantly lower system sales volume (14.9%) during the year. These amounts were offset by the favorable impact of an increased mix of parts and upgrade revenue at higher margins (7.1%).

Service

Gross profit from service revenue was 49.2% for 2008, compared to 36.8% for 2007. The increase in gross profit is attributable to service pricing increases enacted during the first quarter of 2008 driving a higher mix of profitable service support agreements and lower expenses against fixed price support contracts.

Research and Development

Research and development expense was \$63.3 million in 2008, a decrease of \$8.7 million, or 12%, compared with \$72.0 million in 2007. The decrease was primarily due to completion of Optima and Integra platform development, which resulted in decreased professional fee expenses (\$3.4 million), decreased payroll costs (\$4.8 million) and decreased project material costs (\$1.3 million), offset by increased development asset amortization and depreciation costs (\$0.8 million).

Research and development expense was attributable to the following activities for 2008: 49% for new product development, 32% for improvement of existing products, and 19% for product testing.

Sales and Marketing

Sales and marketing expense was \$44.6 million in 2008, a decrease of \$5.4 million, or 10.8%, compared with \$50.0 million in 2007. The decrease was driven primarily by decreased payroll costs (\$3.7 million), decreased professional services (\$0.3 million), decreased commissions expenses (\$0.4 million), decreased travel costs (\$1.2 million), decreased marketing communications costs (\$0.4 million) and decreased training and supplies costs (\$0.5 million), offset by increased costs related to evaluation system support for our Optima platform (\$1.1 million).

General and Administrative

General and administrative expense was \$43.1 million in 2008, an increase of \$1.4 million, compared with \$41.7 million in 2007. The increase was driven primarily by increased variable compensation costs of (\$1.1 million) and increased professional fee expenses (\$2.4 million) offset by lower payroll costs of (\$1.4 million), lower stock compensation costs (\$0.4 million) and lower travel costs (\$0.3 million).

Impairment of Goodwill, Intangibles and Long-Lived Assets

During the three month period ended September 30, 2007, we elected to discontinue future development of the RTP and Curing product lines. Based on that business decision, the forecast of future cash flows was revised and, as such, in September 2007 a goodwill impairment loss of \$4.7 million was recorded. Our 2008 annual test was performed during the fourth quarter of 2008. During this period, the significant decline in our stock price experienced at the end of the third quarter continued through the end of the fourth quarter and beyond, resulting in a sustained market capitalization well below book value. In addition, the estimated future total available market for our products, as published by independent third party industry analysts, was significantly revised downward in the fourth quarter and we experienced a 26% decline (as compared to aftermarket revenue in the third quarter of 2008), in our aftermarket business, reflecting significant declines in manufacturers' capacity utilization. This fourth quarter contraction in the industry led us to revise our short-term and long-term financial forecast

Based on the result of our impairment assessment of goodwill, we determined that the carrying value of our Cleaning and Curing product line exceeded its estimated fair value. Therefore, we performed the second step of the impairment test to determine the implied value of goodwill. Specifically, we allocated the estimated fair value of our Cleaning and Curing product line as

determined in the first step to recognized and unrecognized net assets, including allocations to intangible assets such as developed technologies, in-process research and development, customer relationships and trade names. The result of our analysis indicated that there would be no remaining implied value attributable to goodwill and accordingly, we wrote off the entire book value of goodwill of \$42.1 million as of December 31, 2008.

Based on the same factors, we also reviewed the recoverability of intangibles and long-lived assets, and, at December 31, 2008, we recorded an impairment charge of \$46.9 million consisting of the entire net book value of intangible assets of \$8.3 million, certain other assets of \$21.1 million, and property, plant and equipment of \$17.5 million. There was no impairment charge related to intangibles or long-lived assets in 2007.

Restructuring

In May and October of 2008, we implemented a reduction in force to further reduce costs to mitigate deteriorating industry fundamentals. These reductions in force resulted in restructuring charges to expense of \$3.5 million and \$3.4 million respectively for separation and outplacement costs. See Note 11 to our Consolidated Financial Statements contained in Item 15 of this Annual Report on Form 10-K for further information regarding our 2008 restructuring.

Changes in our restructuring liability, included in amounts reported as other current liabilities, are as follows:

	<u>Severance</u> <u>(in thousands)</u>
Balance at December 31, 2007	\$ 916
Severance and related costs	6,873
Cash payments	(7,043)
Balance at December 31, 2008	<u>\$ 746</u>

Other Income (Expense)

Equity loss attributable to SEN was \$3.7 million for 2008. This is compared to equity income attributable to SEN of \$10.4 million for 2007, and was due to changes in its sales volume and net income resulting from demand changes in the Japanese semiconductor market, and the timing of shipments in Japan.

Interest income of \$1.6 million for 2008, primarily relates to interest earned on cash and cash equivalents. Interest income decreased by \$3.4 million from 2007, due primarily to lower average cash balances.

Interest expense of \$6.7 million in 2008, an increase of \$0.3 million from 2007, relates primarily to the then outstanding convertible senior subordinated notes which had an effective yield to maturity of 8%. The increase in interest expense in 2008 relates to the accretion of the premium due at maturity.

Income Taxes (Credits)

We incur income tax expense relating principally to operating results of foreign entities in jurisdictions, principally in Asia, where we earn taxable income. We have significant net operating loss carryforwards in the United States and certain foreign jurisdictions, principally Europe, and, as a result, we do not currently pay significant income taxes in those jurisdictions and we do not recognize the tax benefit for such losses as discussed in Note 18 to the consolidated financial statements. Accordingly, our effective income tax rate is not meaningful.

Liquidity and Capital Resources

Capital expenditures were \$0.5 million and \$3.4 million for the years ended December 31, 2009 and 2008, respectively. We have no significant capital projects planned for 2010 and total capital expenditures for 2010 are projected to be less than \$2.0 million. Future capital expenditures beyond 2010 will depend on a number of factors, including the timing and rate of expansion of our business and our ability to generate cash to fund them.

We have outstanding standby letters of credit, bank guarantees and surety bonds in the amount of \$13.6 million to support certain operating lease obligations, workers' compensation insurance, and certain value added tax claims in Europe, of which \$7.2 million at December 31, 2009 was supported by cash pledged as collateral. The pledged cash is reflected as restricted cash on the consolidated balance sheet.

The following represents our contractual obligations and commercial commitments as of December 31, 2009 (in thousands):

<u>Contractual Obligations</u>	<u>Total</u>	<u>Payments Due by Period</u>			
		<u>2010</u>	<u>2011-2012</u>	<u>2013-2014</u>	<u>Thereafter</u>
Purchase order commitments	\$ 10,236	\$ 10,236	\$ —	\$ —	\$ —
Operating leases	9,787	4,309	2,560	1,952	966
	<u>\$ 20,023</u>	<u>\$ 14,545</u>	<u>\$ 2,560</u>	<u>\$ 1,952</u>	<u>\$ 966</u>

<u>Other Commercial Commitments</u>	<u>Total</u>	<u>Amount of Commitment Expiration by Period</u>			
		<u>2010</u>	<u>2011-2012</u>	<u>2013-2014</u>	<u>Thereafter</u>
Standby letters of credit	\$ 1,550	\$ 1,550	\$ —	\$ —	\$ —
Bank guarantees	5,612	3,367	2,245	—	—
Surety bonds	6,442	6,442	—	—	—
	<u>\$ 13,604</u>	<u>\$ 11,359</u>	<u>\$ 2,245</u>	<u>\$ —</u>	<u>\$ —</u>

We have no off-balance sheet arrangements at December 31, 2009.

Our liquidity is affected by many factors. Some of these relate specifically to the operations of our business, for example, the rate of sale of Optima inventory, and others relate to the uncertainties of global economies, including the availability of credit, and the condition of the overall semiconductor equipment industry.

On March 30, 2009, pursuant to the Share Purchase Agreement with SHI and SEN, we sold all of our common shares in SEN to SHI for net proceeds of \$122.2 million. We used \$86.4 million of that amount to pay in full our outstanding obligations on our 4.25% Convertible Senior Subordinated Notes.

We have net operating loss and tax credit carryforwards the tax effect of which aggregate \$90.2 million at December 31, 2009. These carryforwards, which expire principally between 2018 and 2028, are available to reduce future income tax liabilities in the United States and certain foreign jurisdictions. The sale of our investment in SEN generated taxable income which we will off-set with existing net operating loss carry forwards.

During 2009, we experienced negative cash flows from operations. Cash used for operations in 2009 was predominately driven by the net loss from operations attributable to the depressed semiconductor equipment market and the resultant decline in revenue, offset by a reduction in working capital. Cash and cash equivalents at December 31, 2009 were \$45.0 million, compared to \$37.7 million at December 31, 2008. The \$7.3 million increase in cash and cash equivalents is mainly attributable to

the net proceeds of the sale of our interest in SEN Corporation, less cash used by operations. Our 2010 plan includes improvement in revenue and cash flow and reduction of working capital as compared to 2009.

On March 12, 2010, we amended our existing revolving credit facility with a bank. The amended agreement provides for borrowings up to the lesser of \$20 million or specified percentages of the amounts of qualifying accounts receivable and inventory. The facility has certain financial covenants requiring us to maintain minimum levels of operating results and liquidity. Based on current forecasts we believe we will be in compliance with the financial covenants throughout 2010. Borrowings made under the facility will bear interest at the greater of 6% or the bank's prime rate plus 2%. The agreement will terminate on March 12, 2011.

We believe that based on our current market, revenue and expense forecasts, our existing cash and cash equivalents will be sufficient to satisfy our anticipated cash requirements. Our 2010 forecast reflects revenue and gross margins consistent with our understanding of customer plans, the improving market conditions currently forecasted by the industry, and increasing capacity utilization at customers' manufacturing facilities which has had a positive impact on our aftermarket business for the past several quarters. Forecasted operating expense levels reflect those in effect at the end of 2009. Should the market recovery in 2010 not proceed in accordance with industry forecasts and our expectations and revenue remain at 2009 levels, we believe we can control spending levels to provide sufficient liquidity to support operations through 2010. However, the absence of a market recovery in 2010 would likely have a material effect on our liquidity entering 2011.

Recent Accounting Pronouncements

In May 2009, the FASB issued guidance on how companies should assess subsequent events. This guidance is intended to establish general standards of accounting for and disclosure of events that occur after the balance sheet date but before financial statements are issued or are available to be issued. This guidance requires the Company to evaluate subsequent events through the date the financial statements are issued. The guidance is effective for interim and annual financial periods after June 15, 2009. No significant events other than the amendment to the credit facility as disclosed in Note 12 have occurred through March 15, 2010 (the date of issuance of this Form 10-K).

In June 2009, the FASB issued the FASB Accounting Standard Codification (the Codification). This statement establishes the codification as the source of authoritative accounting principles recognized by the FASB to be applied by nongovernmental entities in the preparation of financial statements in conformity with Generally Accepted Accounting Principles in the United States. This statement is effective for periods ending September 15, 2009. The adoption of the Codification had no impact on the Company's financial position, results of operations, or liquidity.

In September 2009, the FASB issued a new accounting standard to provide guidance on revenue recognition criteria for multiple-element arrangements. The new accounting standard modifies the criteria used to separate elements in a multiple-element arrangement by introducing the concept of best estimate of selling price, establishing a hierarchy of evidence for determining selling price (fair value), requiring the use of relative selling price method and prohibiting the use of the residual method to allocate arrangement consideration among units of accounting. The new accounting standard also expands the disclosure requirements for all multiple element arrangements and is effective prospectively for revenue arrangements entered into or materially modified in fiscal years beginning on or after June 15, 2010 (January 1, 2011 for a calendar year-end entity). The Company is currently evaluating the impact of adopting this pronouncement.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk.**Interest Rate Sensitivity**

Axcelis' exposure to market risk for changes in interest rates relates primarily to our investment portfolio, which consists entirely of cash-equivalents at December 31, 2009. The primary objective of our investment activities is to preserve principal while maximizing yields without significantly increasing risk. This is accomplished by investing in marketable high investment grade securities and limiting exposure to any one issue or issuer. We do not use derivative financial instruments in managing our investment portfolio and, due to the nature of our investments, we do not expect our operating results or cash flows to be affected to any significant degree by any change in market interest rates.

Foreign Currency Exchange Risk

Substantially all of our sales are billed in U.S. dollars, thereby reducing the impact of fluctuations in foreign exchange rates on our results. Operating margins of certain foreign operations can fluctuate with changes in foreign exchange rates to the extent revenue are billed in U.S. dollars and operating expenses are incurred in the local functional currency. During the years ended December 31, 2009 and 2008, approximately 37% and 30% of our revenue were derived from foreign operations with this inherent risk. In addition, at both December 31, 2009 and 2008, our operations outside of the United States accounted for approximately 39% and 53% of our total assets, respectively, the majority of which was denominated in currencies other than the U.S. dollar.

Item 8. Financial Statements and Supplementary Data.

Response to this Item is submitted as a separate section of this report immediately following Item 15.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.**Evaluation of Disclosure Controls and Procedures.**

Our management, with the participation of our principal executive officer and principal financial officer, has evaluated the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) as of the end of the period covered by this annual report (the "Evaluation Date"). Based on this evaluation, our principal executive officer and principal financial officer concluded that, as of the Evaluation Date, these disclosure controls and procedures are effective.

Management's Annual Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) under the Exchange Act. Because of its inherent limitations, internal control over financial reporting may not prevent or detect all misstatements. A control system, no matter how well designed and operated, can provide only reasonable assurance with respect to financial statement preparation and presentation. 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.

Management assessed the effectiveness of our internal control over financial reporting as of December 31, 2009. In making this assessment, management used the criteria set forth in the Committee of Sponsoring Organizations of the Treadway Commission (COSO) Internal Control-Integrated Framework.

Based on this assessment, management has concluded that, as of December 31, 2009, our internal control over financial reporting is effective based on those criteria.

The independent registered public accounting firm of Ernst & Young LLP, as auditors of our consolidated financial statements, has issued an attestation report on its assessment of our internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of Axcelis Technologies, Inc.

We have audited Axcelis Technologies, Inc.'s internal control over financial reporting as of December 31, 2009, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (the COSO criteria). Axcelis Technologies Inc.'s management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control over financial reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit.

We conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

In our opinion, Axcelis Technologies Inc. maintained, in all material respects, effective internal control over financial reporting as of December 31, 2009, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Axcelis Technologies Inc. as of December 31, 2009 and 2008, and the related consolidated statements of operations, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2009 of Axcelis Technologies, Inc. and our report dated March 15, 2010 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 15, 2010

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) identified in connection with the evaluation of our internal control that occurred during our fourth quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

Entry into a Material Definitive Agreement; Creation of a Direct Financial Obligation

On March 12, 2010, Axcelis and its wholly owned subsidiary, Axcelis Technologies CCS Corporation (collectively, the "Borrower"), agreed to modify the terms of the Borrower's April 23, 2008 Loan and Security Agreement (the "revolving credit facility") with Silicon Valley Bank ("SVB") by entering into an Amended and Restated Loan and Security Agreement (the "Amended Loan Agreement") and an Export-Import Bank Loan and Security Agreement ("EXIM Loan Agreement"). Under the Amended Loan Agreement and the EXIM Loan Agreement, the Borrower has the ability to borrow, combined under both agreements, up to an aggregate of \$20 million. The Amended Loan Agreement extends the maturity date of the Borrower's revolving credit facility to March 12, 2011 and the maturity date under the EXIM Loan Agreement is also March 12, 2011. The Borrower's ability to borrow under the Amended Loan Agreement is limited to 80% of the then current amount of qualified accounts receivable and, under the EXIM Loan Agreement, the Borrower may borrow a certain percentage of export-related accounts receivable and inventory. The Export-Import Bank of the United States guarantees 90% of the amount borrowed under the EXIM Loan Agreement.

The Borrower expects to use this credit facility for working capital and for general corporate purposes. The Borrower did not draw on the credit facility at the effective date.

The obligations under the credit facility are guaranteed by High Temperature Engineering Corporation, Fusion Technology International, Inc., Axcelis Technologies (Israel), Inc. and Fusion Investments, Inc., each a direct or indirect domestic subsidiary of Axcelis, and are secured by (i) substantially all of the personal property of the Borrower and (ii) all of the capital stock of certain of the Borrower's domestic subsidiaries and up to 66% of the capital stock of certain of their foreign subsidiaries.

The principal amount outstanding under the credit facility will bear interest at a rate equal to the greater of (i) 6.00% or (ii) SVB's announced "prime rate" plus 2.00%. Interest is payable monthly. In addition, the Borrower will incur a monthly fee on any unused portion of the credit facility equal to 1.875% per annum.

At maturity all outstanding principal and unpaid interest is immediately due and payable.

The credit facility limits Axcelis and its subsidiaries' ability to, among other things, dispose of assets, engage in a new line of business, have a material change in its executive management, have a change of control, acquire another business, incur additional indebtedness, incur liens, pay dividends and make other distributions, make investments, make payments on subordinated debt and engage in transactions with affiliates other than transactions in the ordinary course of business on terms no less favorable than would be obtained in an arms-length transaction.

In addition, under the credit facility, Axcelis must comply with the following financial covenants:

- (a) Adjusted Quick Ratio. At all times, Axcelis shall maintain, on a consolidated basis, a ratio of (x) certain liquid assets to (y) certain current liabilities minus deferred revenue of at least 1.5 to 1.0.
- (b) Maximum Losses. As of the last day of the respective fiscal quarter, Axcelis shall not suffer any loss on a consolidated basis in excess of:
 - (i) \$13 million for the fiscal quarter ending

March 31, 2010; (ii) \$8.5 million for the fiscal quarter ending June 30, 2010; (iii) \$8.5 million for the fiscal quarter ending September 30, 2010; and (iv) \$5.0 million for the fiscal quarter ending December 31, 2020 and each fiscal quarter thereafter; and

- (c) Liquidity. At all times Axcelis shall maintain unrestricted cash and cash equivalents at SVB plus unused availability under the credit facility of at least \$30 million.

The credit facility provides for events of default customary for credit facilities of this type, including, but not limited to, non-payment, breach of covenants, a material adverse change to the business or impairment of the collateral, insolvency, defaults on other debt, or Export-Import Bank of the United States ceases to provide its full guarantee. Upon an event of default and during its continuance, the interest rate will automatically increase 3.5% above the otherwise applicable interest rate.

In addition, upon an event of default, SVB may elect a number of remedies including, but not limited to, stopping the advance of money to the Borrower and declaring all obligations (including principal, interest and expenses) immediately due and payable, which shall occur automatically if Axcelis becomes insolvent.

Axcelis is subject to a \$200,000 early termination fee if it terminates the Amended Loan Agreement prior to the maturity date or SVB terminates the Amended Loan Agreement due to an event of default.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

A portion of the information required by Item 10 of Form 10-K is incorporated by reference from the information responsive thereto contained in the sections in Axcelis Proxy Statement for the Annual Meeting of Stockholders to be held May 7, 2010 (the "Proxy Statement") captioned:

- "Proposal 1: Election of Directors,"
- "Corporate Governance," and
- "Other Matters—Section 16(a) Beneficial Ownership Reporting Compliance."

The remainder of such information is set forth under the heading "Executive Officers of the Registrant" at the end of Item 1 in Part I of this report.

Item 11. Executive Compensation.

The information required by Item 11 of Form 10-K is incorporated by reference from the information responsive thereto contained in the sections in the Proxy Statement captioned:

- "Executive Compensation," and
- "Other Matters—Compensation Committee Interlocks and Insider Participation."

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

A portion of the information required by Item 12 of Form 10-K is incorporated by reference from the information responsive thereto contained in the sections in the Proxy Statement captioned:

- "Share Ownership of 5% Stockholders," and
- "Share Ownership of Directors and Executive Officers."

The remainder of such information is set forth below:

Equity Plan Reserves Disclosure

We maintain two equity compensation plans, the 2000 Stock Plan and the Employee Stock Purchase Plan. The number of shares issuable upon exercise of outstanding options and unvested restricted stock units granted to employees and non-employee directors, as well as the number of shares remaining available for future issuance, under our equity compensation plans as of December 31, 2009 are summarized in the following table:

<u>Plan category</u>	(A) Number of shares to be issued upon exercise of outstanding options, warrents and rights(1)	(B) Weighted-average exercise price of outstanding options, warrants and rights	(C) Number of shares remaining available for future issuance under equity compensation plans (excluding shares reflected in column (A))(2)
Equity compensation plans approved by stockholders	17,971,756	\$ 6.21	15,532,976
Equity compensation plans not approved by stockholders	—	—	—
Total	17,971,756	\$ 6.21	15,532,976

(1) Represents 17,367,567 shares issuable on exercise of outstanding options as of December 31, 2009, plus 604,189 shares issuable on vesting of outstanding restricted stock units as of December 31, 2009 (some of which will be withheld to compensate for tax withholding).

(2) Represents the total shares available for issuance under our 2000 Stock Plan and our Employee Stock Purchase Plan, as of December 31, 2009, as follows:

(A) 12,509,589 shares were available for future issuance under the 2000 Stock Plan. Such amount represents the total number of shares reserved for issuance under the 2000 Stock Plan (33,173,367), less 418,880 outstanding shares issued under the plan as restricted stock, 1,036,065 shares issued on vesting of outstanding restricted stock units, 1,237,077 shares issued upon option exercises, and the outstanding options and unvested restricted stock units shown in column (A), all as of December 31, 2009. This plan is generally used for grants to employees and directors and was approved by our stockholders at our 2002 annual meeting.

(B) 3,023,387 shares were available under our Employee Stock Purchase Plan, which represents the total number of shares reserved for issuance under the plan (7,500,000) less 4,476,613 shares issued through December 31, 2009.

Item 13. Certain Relationships and Related Transactions and Director Independence.

The information required by Item 13 of Form 10-K is incorporated by reference from the information responsive thereto contained in the sections in the Proxy Statement captioned:

- "Executive Compensation,"
- "Corporate Governance—Board of Directors Independence and Meetings," and
- "Corporate Governance—Certain Relationships and Related Transactions."

Item 14. Principal Accounting Fees and Services

The information required by Item 14 of Form 10-K is incorporated by reference from the information responsive thereto contained in the section captioned "Proposal 2: Ratification of the Appointment of our Independent Registered Public Accounting Firm" in the Proxy Statement.

Item 15. Exhibits, Financial Statement Schedules.

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

1) Financial Statements:

<u>Report of Independent Registered Public Accounting Firm</u>	<u>F-1</u>
<u>Consolidated Statements of Operations—For the years ended December 31, 2009, 2008 and 2007</u>	<u>F-2</u>
<u>Consolidated Balance Sheets—December 31, 2009 and 2008</u>	<u>F-3</u>
<u>Consolidated Statements of Stockholders' Equity—For the years ended December 31, 2009, 2008 and 2007</u>	<u>F-4</u>
<u>Consolidated Statements of Cash Flows—For the years ended December 31, 2009, 2008 and 2007</u>	<u>F-5</u>
<u>Notes to Consolidated Financial Statements</u>	<u>F-6</u>

2) Financial Statement Schedules:

Schedule II—Valuation and Qualifying Accounts for the years ended December 31, 2009, 2008 and 2007

All other schedules for which provision is made in the applicable regulation of the Securities and Exchange Commission are not required under the related instructions or are inapplicable, and therefore have been omitted.

3) Exhibits

The exhibits filed as part of this Form 10-K are listed on the Exhibit Index immediately preceding such Exhibits, which Exhibit Index is incorporated herein by reference.

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of Axcelis Technologies, Inc.

We have audited the accompanying consolidated balance sheets of Axcelis Technologies, Inc. (the "Company") as of December 31, 2009 and 2008, and the related consolidated statements of operations, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2009. Our audits also included the financial statement schedule listed in the index at Item 15(a). These financial statements and schedule are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements and schedule based on our 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 audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Axcelis Technologies, Inc. at December 31, 2009 and 2008, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2009, in conformity with U.S. generally accepted accounting principles. Also, in our opinion, the related financial statement schedule, when considered in relation to the basic financial statements taken as a whole, presents fairly in all material respects the information set forth therein.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), Axcelis Technologies, Inc.'s internal control over financial reporting as of December 31, 2009, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated March 15, 2010 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 15, 2010

Axcelis Technologies, Inc.
Consolidated Statements of Operations
(In thousands, except per share amounts)

	<u>Year Ended December 31,</u>		
	<u>2009</u>	<u>2008</u>	<u>2007</u>
Revenue			
Product	\$ 98,716	\$ 194,275	\$ 343,555
Service	33,917	51,880	55,179
Royalties, primarily from SEN	389	4,059	6,066
	<u>133,022</u>	<u>250,214</u>	<u>404,800</u>
Cost of revenue			
Product	84,185	161,310	217,039
Service	20,773	26,289	34,900
	<u>104,958</u>	<u>187,599</u>	<u>251,939</u>
Gross profit	28,064	62,615	152,861
Operating expenses			
Research and development	32,661	63,262	72,044
Sales and marketing	25,209	44,573	49,974
General and administrative	34,087	43,056	41,718
Impairment of goodwill	—	42,115	4,658
Impairment of intangibles and long-lived assets	—	46,949	—
Amortization of intangible assets	—	2,624	2,624
Restructuring charges	5,541	6,873	2,506
	<u>97,498</u>	<u>249,452</u>	<u>173,524</u>
Loss from operations	(69,434)	(186,837)	(20,663)
Other income (expense)			
Gain on sale of SEN	1,080	—	—
Equity income (loss) of SEN	(3,238)	(3,667)	10,416
Interest income	181	1,614	5,019
Interest expense	(1,676)	(6,744)	(6,427)
Other, net	(3,516)	(169)	(153)
	<u>(7,169)</u>	<u>(8,966)</u>	<u>8,855</u>
Loss before income taxes	(76,603)	(195,803)	(11,808)
Income taxes (credits)	865	861	(410)
Net loss	<u>\$ (77,468)</u>	<u>\$ (196,664)</u>	<u>\$ (11,398)</u>
Net loss per share			
Basic and diluted net loss per share	<u>\$ (0.75)</u>	<u>\$ (1.91)</u>	<u>\$ (0.11)</u>
Shares used in computing basic and diluted net loss per share			
Weighted average common shares outstanding	<u>103,586</u>	<u>102,739</u>	<u>101,891</u>

See accompanying Notes to these Consolidated Financial Statements

Axcelis Technologies, Inc.
Consolidated Balance Sheet
(In thousands, except per share amounts)

	December 31,	
	2009	2008
ASSETS		
Current assets		
Cash and cash equivalents	\$ 45,020	\$ 37,694
Restricted cash	4,918	8,654
Accounts receivable, net	19,094	27,486
Inventories, net	114,558	150,113
Prepaid expenses and other current assets	10,016	17,231
Total current assets	193,606	241,178
Property, plant and equipment, net	40,868	44,432
Investment in SEN	—	156,677
Long-term restricted cash	2,245	—
Other assets	13,884	12,894
	<u>\$ 250,603</u>	<u>\$ 455,181</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities		
Accounts payable	\$ 9,680	\$ 8,066
Accrued compensation	9,267	15,841
Warranty	638	3,137
Income taxes	1,499	337
Deferred revenue	5,127	12,508
Other current liabilities	3,546	6,897
Current portion of convertible subordinated debt	—	83,210
Total current liabilities	29,757	129,996
Long-term deferred revenue	563	1,872
Other long-term liabilities	3,884	3,936
Commitments and contingencies (Note 16)		
Stockholders' equity		
Preferred stock, \$0.001 par value, 30,000 shares authorized; none issued or outstanding	—	—
Common stock, \$0.001 par value, 300,000 shares authorized; 104,212 shares issued and 104,092 shares outstanding at December 31, 2009; 103,400 shares issued and 103,280 shares outstanding at December 31, 2008	104	103
Additional paid-in capital	488,321	483,546
Treasury stock, at cost, 120 shares at December 31, 2009 and 2008	(1,218)	(1,218)
Accumulated deficit	(275,947)	(198,479)
Accumulated other comprehensive income	5,139	35,425
	<u>216,399</u>	<u>319,377</u>
	<u>\$ 250,603</u>	<u>\$ 455,181</u>

See accompanying Notes to these Consolidated Financial Statements

Axcelis Technologies, Inc.
Consolidated Statements of Stockholders' Equity
(In thousands)

	Common Stock		Additional Paid-in Capital	Treasury Stock	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Total Stockholders' Equity
	Shares	Amount					
Balance at December 31, 2006	101,418	\$ 101	\$ 469,967	\$ (1,218)	\$ 9,583	\$ (871)	\$ 477,562
Comprehensive loss							
Net loss	—	—	—	—	(11,398)	—	(11,398)
Foreign currency translation adjustments	—	—	—	—	—	10,819	10,819
Unrealized gain on marketable securities	—	—	—	—	—	4	4
Change in pension	—	—	—	—	—	258	258
Total comprehensive loss							(317)
Exercise of stock options	189	1	1,081	—	—	—	1,082
Issuance of shares under Employee Stock Purchase Plan	586	1	2,984	—	—	—	2,985
Forfeiture of restricted common shares	(16)	—	—	—	—	—	—
Issuance of restricted common shares	388	—	(838)	—	—	—	(838)
Stock-based compensation expense	—	—	5,532	—	—	—	5,532
Balance at December 31, 2007	102,565	103	478,726	(1,218)	(1,815)	10,210	486,006
Comprehensive loss							
Net loss	—	—	—	—	(196,664)	—	(196,664)
Foreign currency translation adjustments	—	—	—	—	—	25,075	25,075
Change in pension	—	—	—	—	—	140	140
Total comprehensive loss							(171,449)
Exercise of stock options	22	—	110	—	—	—	110
Issuance of shares under Employee Stock Purchase Plan	388	—	786	—	—	—	786
Forfeiture of restricted common shares	(12)	—	—	—	—	—	—
Issuance of restricted common shares	437	—	(785)	—	—	—	(785)
Stock-based compensation expense	—	—	4,709	—	—	—	4,709
Balance at December 31, 2008	103,400	103	483,546	(1,218)	(198,479)	35,425	319,377
Comprehensive loss							
Net loss	—	—	—	—	(77,468)	—	(77,468)
Foreign currency translation adjustments	—	—	—	—	—	(30,239)	(30,239)
Change in pension	—	—	—	—	—	(47)	(47)
Total comprehensive loss							(107,754)
Exercise of stock options	66	1	44	—	—	—	45
Issuance of shares under Employee Stock Purchase Plan	302	—	184	—	—	—	184
Issuance of restricted common shares	444	—	(104)	—	—	—	(104)
Stock-based compensation expense	—	—	4,651	—	—	—	4,651
Balance at December 31, 2009	104,212	\$ 104	\$ 488,321	\$ (1,218)	\$ (275,947)	\$ 5,139	\$ 216,399

See accompanying Notes to these Consolidated Financial Statements

Axcelis Technologies, Inc.
Consolidated Statements of Cash Flow
(In thousands)

	<u>Year Ended December 31,</u>		
	<u>2009</u>	<u>2008</u>	<u>2007</u>
Cash flows from operating activities			
Net loss	\$ (77,468)	\$ (196,664)	\$ (11,398)
Adjustments to reconcile net loss to net cash used for operating activities			
Undistributed (income) loss of SEN	3,238	3,667	(10,416)
Depreciation and amortization	7,436	20,947	19,287
Gain on sale of SEN	(1,080)	—	—
Deferred income taxes	(765)	189	(91)
Amortization of intangible assets	—	2,624	2,624
Accretion of premium on convertible debt	133	3,287	3,036
Stock-based compensation expense	4,651	4,709	5,532
Impairment of goodwill	—	42,115	4,658
Impairment of intangibles and long-lived assets	—	46,949	—
Provision for excess inventory	9,818	24,631	5,018
Cash dividend from SEN	—	2,016	12,424
Changes in operating assets & liabilities			
Accounts receivable	8,572	48,644	(1,537)
Inventories	26,445	(6,942)	(10,718)
Prepaid expenses and other current assets	8,131	14,991	(4,690)
Accounts payable & other current liabilities	(11,038)	(23,330)	(24,989)
Deferred revenue	(8,695)	(26,151)	6,666
Income taxes	1,154	(162)	(2,455)
Other assets and liabilities	(4,474)	(10,239)	(24,055)
Net cash used for operating activities	<u>(33,942)</u>	<u>(48,719)</u>	<u>(31,104)</u>
Cash flows from investing activities			
Purchase of marketable securities	—	—	(13,000)
Sales and maturities of marketable securities	—	—	76,200
Expenditures for property, plant, and equipment	(463)	(3,407)	(10,386)
Decrease (increase) in restricted cash	1,491	9,624	(4,862)
Proceeds from sale of SEN	132,847	—	—
Payments related to sale of SEN	(10,590)	—	—
Net cash provided by investing activities	<u>123,285</u>	<u>6,217</u>	<u>47,952</u>
Cash flows from financing activities			
Repayment of convertible debt	(83,344)	—	(74,217)
Proceeds from exercise of stock options	45	110	1,082
Proceeds from Employee Stock Purchase Plan	184	786	1,822
Net cash provided by (used for) financing activities	<u>(83,115)</u>	<u>896</u>	<u>(71,313)</u>
Effect of exchange rate changes on cash	1,098	(4,577)	(2,109)
Net increase (decrease) in cash and cash equivalents	7,326	(46,183)	(56,574)
Cash and cash equivalents at beginning of period	\$ 37,694	\$ 83,877	\$ 140,451
Cash and cash equivalents at end of period	<u>\$ 45,020</u>	<u>\$ 37,694</u>	<u>\$ 83,877</u>
Cash paid for interest	\$ 3,009	\$ 3,188	\$ 4,765
Cash paid for income taxes	\$ 734	\$ 1,064	\$ 2,981

See accompanying Notes to these Consolidated Financial Statements

Note 1. Nature of Business and Basis of Presentation

Axcelis Technologies, Inc. ("Axcelis" or the "Company"), is a worldwide producer of ion implantation, dry strip and other processing equipment used in the fabrication of semiconductor chips in the United States, Europe and Asia. In addition, the Company provides extensive aftermarket service and support, including spare parts, equipment upgrades, and maintenance services to the semiconductor industry.

Until March 30, 2009, the Company owned 50% of equity of a joint venture with Sumitomo Heavy Industries, Ltd. ("SHI") in Japan. This joint venture, which was known as SEN Corporation, an SHI and Axcelis Company ("SEN"), licensed technology from the Company relating to the manufacture of specified ion implantation products and had exclusive rights to manufacture and sell these products in the territory of Japan. On March 30, 2009, the Company sold to SHI all of the Company's common shares in SEN, in exchange for a cash payment of 13 billion Yen, which resulted in proceeds of approximately \$132.8 million before advisor fees and other expenses of \$10.6 million. The sales price was determined through an arm's length negotiation. This transaction terminated all prior agreements among the three parties relating to the SEN joint venture. In addition, the arbitration with SEN initiated by Axcelis in Tokyo was dismissed. Detailed information about the Company's investment in SEN is provided in Note 19.

A portion of the proceeds of the sale were used to pay off, in full, the amounts due to the holder of the Company's 4.25% Convertible Senior Subordinated Notes.

During 2009, the Company experienced negative cash flows from operations. Cash used for operations in 2009 was predominately driven by the net loss from operations attributable to the depressed semiconductor equipment market and the resultant decline in revenue offset by a reduction in working capital. Cash and cash equivalents at December 31, 2009 were \$45.0 million, compared to \$37.7 million at December 31, 2008. The \$7.3 million increase in cash and cash equivalents is mainly attributable to the net proceeds of the sale of the Company's interest in SEN, less cash used by operations (\$33.9 million). The Company's 2010 plan includes improvement in revenue and cash flow and reduction in working capital as compared to 2009. The Company believes that based on its current market, revenue and expense forecasts, its existing cash and cash equivalents will be sufficient to satisfy its anticipated cash requirements. The Company's 2010 forecast reflects revenue and gross margins consistent with its understanding of customer plans, the improving market conditions currently forecasted by the industry, and increasing capacity utilization at customers' manufacturing facilities which has had a positive impact on the Company's aftermarket business for the past several quarters. Forecasted operating expense levels reflect those in effect at the end of 2009. Should the market recovery in 2010 not proceed in accordance with industry forecasts and Company expectations and revenue remain at 2009 levels, the Company believes it can control spending levels to provide sufficient liquidity to support operations through 2010. However, the absence of a market recovery in 2010 would likely have a material effect on the Company's liquidity entering 2011.

Note 2. Significant Accounting Policies

Principles of Consolidation

The consolidated financial statements include the accounts of Axcelis and its wholly-owned, controlled subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of consolidated financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Actual results could differ from those estimates.

Foreign Currency

The functional currency for substantially all operations outside the United States is the local currency. Financial statements for these operations are translated into United States dollars at year-end rates as to assets and liabilities and average exchange rates during the year as to revenue and expenses. The resulting translation adjustments are recorded in stockholders' equity as an element of accumulated comprehensive income (loss). Foreign currency transaction gains and losses recorded in the consolidated statements of operations are not material for all periods presented.

Cash and Cash Equivalents

Cash and cash equivalents consist of cash on hand and highly liquid investments with original maturities of ninety days or less. Cash equivalents consist primarily of money market securities, direct and indirect U.S. government obligations, commercial paper, and obligations of U.S. banks. Cash equivalents are carried on the balance sheet at fair market value.

Inventories

Inventories are carried at lower of cost, determined using the first-in, first-out (FIFO) method, or market. The Company periodically reviews its inventories and makes provisions as necessary for estimated obsolescence or damaged goods to ensure values approximate lower of cost or market. The amount of such markdowns is equal to the difference between cost of inventory and the estimated market value based upon assumptions about future demands, selling prices, and market conditions.

Axcelis records an allowance for estimated excess inventory. The allowance is determined using management's assumptions of materials usage, based on estimates of demand and market conditions. If actual market conditions become less favorable than those projected by management, additional inventory write-downs may be required.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost. Depreciation is computed using the straight-line method. The historical cost of buildings is depreciated over forty years and machinery and equipment principally over three to ten years. Expenditures for maintenance and repairs are expensed as incurred. Expenditures for renewals and betterments are capitalized.

Impairment of Intangibles and Long-Lived Assets

The Company records impairment losses on intangibles and long-lived assets when events and circumstances indicate that long-lived assets might not be recoverable. In 2008, the Company experienced a significant decline in its stock price resulting in a sustained market capitalization well below book value. In addition, the estimated future total available market for the Company's products, as published by independent third party industry analysts, was significantly revised downward in the fourth quarter and the Company experienced a 26% decline (as compared to aftermarket revenue in the third quarter of 2008) in its aftermarket business, reflecting significant declines in manufacturers' capacity utilization. This fourth quarter contraction in the industry led the Company to revise its short-term and long-term financial forecast. As discussed in Note 6, 8 and 9 to the consolidated

financial statements, for the year ended December 31, 2008, the Company recorded a total intangible and long-lived asset impairment charge of \$46.9 million. This charge consisted of writing off the net book value of all its intangibles of \$8.3 million, certain other assets of \$21.1 million and property, plant and equipment of \$17.5 million. As a result of economic conditions, along with its stock price below book value, the Company performed a test for recoverability of its remaining long-lived assets at December 31, 2009, concluding that long-lived assets were not impaired.

The Company's updated long-term financial forecast represents the best estimate that management has at this time and the Company believes that its underlying assumptions are reasonable. Recoverability is measured by a comparison of the assets' carrying amount to their expected future undiscounted net cash flows. If such assets are considered to be impaired, the impairment is measured based on the amount by which the carrying value exceeds its fair value. Fair value was based on a probability weighted cash flow forecast, discounted at a rate commensurate with the risks involved in achieving the forecasted cash flows.

The estimates of future operating results and cash flows are derived from the Company's updated long-term financial forecast. This updated long-term forecast represents the best estimate that the Company has at this time and the Company believes that its underlying assumptions are reasonable based primarily on current product performance and customer acceptance. This forecast relies primarily on market assumptions and market share Axcelis expects to achieve. However, actual performance in the near-term and longer-term could be materially different from these forecasts, which could impact future estimates of undiscounted cash flows and may result in the impairment of the carrying amount of long-lived assets. This could be caused by events such as strategic decisions made in response to economic and competitive conditions, the impact of the economic environment on the Company's customer base, or a material negative change in its relationships with significant customers. Accordingly, the Company will continue to perform this analysis no less than quarterly for the foreseeable future.

Concentration of Risk

Financial instruments, which potentially expose Axcelis to concentrations of credit risk, consist principally of accounts receivable and cash equivalents. Axcelis' customers consist of semiconductor manufacturers located throughout the world. Axcelis' net sales to its ten largest customers accounted for 56.6%, 51.5%, and 57.8% of revenue in 2009, 2008, and 2007, respectively.

Axcelis performs ongoing credit evaluations of its customers' financial condition and generally requires no collateral to secure accounts receivable. For selected overseas sales, Axcelis requires customers to obtain letters of credit before product is shipped. Axcelis maintains an allowance for doubtful accounts based on its assessment of the collectability of accounts receivable. The Company reviews the allowance for doubtful accounts monthly. The Company does not have any off-balance-sheet credit exposure related to its customers.

Axcelis' exposure to market risk for changes in interest rates relates primarily to cash equivalents. The primary objective of the Company's investment activities is to preserve principal while maximizing yields without significantly increasing risk. This is accomplished by investing in marketable high investment grade securities and limiting exposure to any one issue or issuer. The Company does not use derivative financial instruments to manage its investment portfolio and does not expect operating results or cash flows to be affected to any significant degree by any change in market interest rates.

Some of the components and sub-assemblies included in the Company's products are obtained either from a sole source or a limited group of suppliers. Disruption to the Company's supply source, resulting either from depressed economic conditions or other factors, could affect its ability to deliver products to its customers.

Comprehensive Income

Comprehensive income is comprised of two components, net loss and other comprehensive income. Other comprehensive income consists of foreign currency translation adjustments and the effects of the minimum pension liability. The following table shows the cumulative components of other comprehensive income for the years ended December 31, 2009, 2008 and 2007:

	<u>2009</u>	<u>2008</u>	<u>2007</u>
		(in thousands)	
Foreign currency translation adjustments	\$ 4,788	\$ 35,027	\$ 9,952
Pension benefit adjustment	351	398	258
Total accumulated comprehensive income	<u>\$ 5,139</u>	<u>\$ 35,425</u>	<u>\$ 10,210</u>

Fair Value of Financial Instruments

The carrying amounts of certain of the Company's financial instruments, including cash equivalents, accounts receivable, accounts payable and other accrued liabilities approximate fair value due to their short maturities.

Revenue Recognition

The Company's revenue recognition policy involves significant judgment by management. As described below, the Company considers a broad array of facts and circumstances in determining when to recognize revenue, including contractual obligations to the customer, the complexity of the customer's post delivery acceptance provisions, payment history, customer creditworthiness and the installation process. In the future, if the post delivery acceptance provisions and installation process become more complex or result in a materially lower rate of acceptance, the Company may have to revise its revenue recognition policy, which could delay the timing of revenue recognition.

Axcelis' revenue transactions include sales of products under multiple element arrangements. Revenue under these arrangements is allocated to each element, except systems, based upon its estimated fair market value. The amount of revenue allocated to systems is calculated on a residual method. Under this method, the total value of the arrangement is allocated first to the undelivered elements, with the residual amount being allocated to product revenue.

The value of the undelivered elements includes (a) the greater of (i) the fair value of the installation or (ii) the portion of the sales price that will not be received until the installation is completed (the "retention") plus (b) the fair value of all other undelivered elements. The amount allocated to installation is based upon the fair value of the service performed, including labor, which is based upon the estimated time to complete the installation at hourly rates, and material components. The fair value of all other undelivered elements is based upon the price charged when these elements are sold separately. Product revenue for products which have demonstrated market acceptance (legacy products), generally recognized upon shipment provided title and risk of loss has passed to the customer, evidence of an arrangement exists, prices are contractually fixed or determinable, collectibility is reasonably assured through historical collection results and regular credit evaluations, and there are no uncertainties regarding customer acceptance. Revenue from installation services is recognized at the time formal acceptance is received from the customer or, for certain customers, when both the formal acceptance and retention payment have been received. Revenue for other elements is recognized at the time products are shipped or the related services are performed.

The Company generally recognizes revenue for products which have demonstrated market acceptance (legacy products), at the time of shipment because the customer's post-delivery acceptance provisions and installation process have been established to be routine, commercially inconsequential

and perfunctory. The majority of Axcelis' systems are designed and tailored to meet the customer's specifications, as outlined in the contract between the customer and Axcelis, which may be the Axcelis standard specification. To ensure that the customer's specifications are satisfied, many customers request that new systems be tested at Axcelis' facilities prior to shipment, normally with the customer present, under conditions that substantially replicate the customer's production environment and the customer's criteria are confirmed to have been met. Customers of mature products generally do not require pre-shipment testing. The Company believes the risk of failure to complete a system installation is remote. Should an installation not be completed successfully, the contractual provisions do not provide for forfeiture, refund or other purchase price concession beyond those prescribed by the provisions of the Uniform Commercial Code applicable generally to such transactions.

For initial shipments of systems with new technologies or in the small number of instances where Axcelis is unsure of meeting the customer's specifications or obtaining customer acceptance upon shipment of the system, Axcelis will defer the recognition of systems revenue and related costs until written customer acceptance of the system is obtained. This deferral period is generally within twelve months of shipment.

Revenue related to maintenance and service contracts is recognized ratably over the duration of the contracts, or based on parts usage, where appropriate. Revenue related to service hours is recognized when the services are performed.

Product revenue includes revenue from system sales, sales of spare parts, the spare parts component of maintenance and service contracts and product upgrades. Service revenue includes the labor component of maintenance and service contract amounts charged for on-site service personnel.

Shipping and Handling Costs

Shipping and handling costs are included in cost of revenue.

Stock-Based Compensation

The Company recognizes compensation expense for all share-based payments to employees and directors, including grants of employee stock options, based on the grant-date fair value of those share-based payments (with limited exceptions), adjusted for expected forfeitures.

Stock-based compensation expense recognized during the years ended December 31, 2009, 2008 and 2007 includes: (a) stock options, restricted stock and restricted stock units granted prior to, but not yet vested, as of December 31, 2005, based on the grant-date fair value estimated in accordance with the original provisions and (b) shares issued in offerings under the Employee Stock Purchase Plan with offering periods commencing January 1, 2006 and stock options, restricted stock and restricted stock units granted subsequent to December 31, 2005, based on the grant-date fair value estimated using the Black-Scholes valuation model. Expense is recognized ratably over the requisite service period.

See Note 14 for additional information relating to stock-based compensation.

Income Taxes

The Company records income taxes using the asset and liability method. Deferred income tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective income tax bases, and operating loss and tax credit carryforwards. The Company's consolidated financial statements contain certain deferred tax assets which have arisen primarily as a result of operating losses, as well as other temporary differences between financial and tax accounting. The Company establishes a valuation allowance if the likelihood of realization of the deferred tax assets is reduced based on an evaluation of objective verifiable evidence. Significant management judgment is required in determining the

Company's provision for income taxes, the Company's deferred tax assets and liabilities and any valuation allowance recorded against those net deferred tax assets. The Company evaluates the weight of all available evidence to determine whether it is more likely than not that some portion or all of the net deferred income tax assets will not be realized.

Income taxes include the largest amount of tax benefit for an uncertain tax position that is more likely than not to be sustained upon audit based on the technical merits of the tax position. Settlements with tax authorities, the expiration of statutes of limitations for particular tax positions, or obtaining new information on particular tax positions may cause a change to the effective tax rate. The Company recognizes accrued interest related to unrecognized tax benefits as interest expense and penalties as operating expense.

Net Loss per Share

Basic earnings per share is computed by dividing income available to common stockholders (the numerator) by the weighted-average number of common shares outstanding (the denominator) for the period. The computation of diluted earnings per share is similar to basic earnings per share, except that the denominator is increased to include the number of additional common shares that would have been outstanding if the potentially dilutive common shares had been issued, calculated using the treasury stock method.

Because the Company had a net loss for the years ended December 31, 2009, 2008, and 2007, any common shares related to outstanding stock options, restricted stock, restricted stock units and convertible debt have been excluded from the calculation of net loss per share because the effect would be anti-dilutive.

Recent Accounting Pronouncements

In May 2009, the FASB issued guidance on how companies should assess subsequent events. This guidance is intended to establish general standards of accounting for and disclosure of events that occur after the balance sheet date but before financial statements are issued or are available to be issued. This guidance requires the Company to evaluate subsequent events through the date the financial statements are issued. The guidance is effective for interim and annual financial periods after June 15, 2009. No significant events other than the amendment to the credit facility as disclosed in Note 12 have occurred through March 15, 2010 (the date of issuance of this Form 10-K).

In June 2009, the FASB issued the FASB Accounting Standard Codification (the Codification). This statement establishes the codification as the source of authoritative accounting principles recognized by the FASB to be applied by nongovernmental entities in the preparation of financial statements in conformity with Generally Accepted Accounting Principles in the United States. This statement is effective for periods ending September 15, 2009. The adoption of the Codification had no impact on the Company's financial position, results of operations, or liquidity.

In September 2009, the FASB issued a new accounting standard to provide guidance on revenue recognition criteria for multiple-element arrangements. The new accounting standard modifies the criteria used to separate elements in a multiple-element arrangement by introducing the concept of best estimate of selling price, establishing a hierarchy of evidence for determining selling price (fair value), requiring the use of relative selling price method and prohibiting the use of the residual method to allocate arrangement consideration among units of accounting. The new accounting standard also expands the disclosure requirements for all multiple element arrangements and is effective prospectively for revenue arrangements entered into or materially modified in fiscal years beginning on or after June 15, 2010 (January 1, 2011 for a calendar year-end entity). The Company is currently evaluating the impact of adopting this pronouncement.

Note 3. Restricted Cash

The components of restricted cash are as follows:

	December 31,	
	2009	2008
	(in thousands)	
Cash collateralizing standby letters of credit	\$ 1,550	\$ 8,654
Bank guarantees	5,613	—
	<u>\$ 7,163</u>	<u>\$ 8,654</u>

In addition to guarantees that are cash collateralized, the Company has surety bonds related to value added tax claims and refunds in Europe of approximately \$6.4 million at December 31, 2009. Restricted cash is reflected in current or non-current assets based on the expiration of the requirement with the banks.

Note 4. Accounts Receivable, net

The components of accounts receivable are as follows:

	December 31,	
	2009	2008
	(in thousands)	
Trade receivables	\$ 21,484	\$ 30,031
Allowance for doubtful accounts	(2,390)	(2,545)
	<u>\$ 19,094</u>	<u>\$ 27,486</u>

Note 5. Inventories, net

The components of inventories are as follows:

	December 31,	
	2009	2008
	(in thousands)	
Raw materials	\$ 69,661	\$ 93,996
Work in process	27,654	35,977
Finished goods (completed systems)	17,243	20,140
	<u>\$ 114,558</u>	<u>\$ 150,113</u>

When recorded, reserves are intended to reduce the carrying value of inventory to its net realizable value. The Company establishes inventory reserves when conditions exist that indicate inventory may be in excess of anticipated demand or is obsolete based upon assumptions about future demand for the Company's products or market conditions. The Company regularly evaluates the ability to realize the value of inventory based on a combination of factors including the following: forecasted sales or usage, estimated product end of life dates, estimated current and future market value and new product introductions. Purchasing and usage alternatives are also explored to mitigate inventory exposure. As of December 31, 2009 and 2008, inventory is stated net of inventory reserves of \$37.0 million and \$47.7 million respectively.

Note 6. Property, Plant and Equipment, net

The components of property, plant and equipment are as follows:

	December 31,	
	2009	2008
	(in thousands)	
Land and buildings	\$ 79,284	\$ 79,802
Machinery and equipment	5,967	5,820
Construction in process	62	—
	<u>85,313</u>	<u>85,622</u>
Accumulated depreciation	(44,445)	(41,190)
	<u>\$ 40,868</u>	<u>\$ 44,432</u>

Depreciation expense was \$3.8 million, \$8.1 million, and \$8.7 million, for the years ended December 31, 2009, 2008, and 2007, respectively. The Company did not record an impairment charge related to property, plant and equipment in 2009. During the fourth quarter of 2008, the Company recorded an impairment charge related to property, plant and equipment of \$17.5 million. (See Impairment of Intangibles and Long-Lived Assets in Note 2).

Note 7. Goodwill

During the fourth quarter of 2008, the Company determined that the carrying value of the Cleaning and Curing product line exceeded its estimated fair value. Therefore, the Company performed the second step of the impairment test to determine the implied value of goodwill. Specifically the Company allocated the estimated fair value of the Cleaning and Curing product line as determined in the first step to recognized and unrecognized net assets, including allocations to intangible assets such as developed technologies, in-process research and development, customer relationships and trade names. The result of this analysis indicated that there was no remaining implied value attributable to goodwill and accordingly, the Company recorded a goodwill impairment charge of \$42.1 million, the entire book value of its goodwill, in the fourth quarter of 2008.

In 2007, a goodwill impairment charge of \$4.7 million was recorded relating to the RTP and Photostabilization/Curing product lines.

Note 8. Intangible Assets, net

Amortization expense for intangible assets was \$0.0 million, \$2.6 million, and \$2.6 million, for each of the years ended December 31, 2009, 2008, and 2007, respectively. During the fourth quarter of 2008, the Company reviewed the recoverability of intangible assets. In connection with this analysis, management determined that there were no future cash flows associated with these assets and therefore no fair value was ascribed to them. As a result, the Company recorded a non-cash impairment charge of \$8.3 million in the fourth quarter of 2008. (See Note 2.)

	December 31, 2008			
	Cost	Accumulated Amortization	Impairment of long lived assets	Net Book Value
	(in thousands)			
Developed technology	\$ 48,030	\$ 40,550	\$ 7,480	\$ —
Customer list	903	506	397	—
Software licenses	877	453	424	—
	<u>\$ 49,810</u>	<u>\$ 41,509</u>	<u>\$ 8,301</u>	<u>\$ —</u>

Note 9. Assets Manufactured for Internal Use

The components of assets manufactured for internal use, included in amounts reported as other assets, are as follows:

	December 31,	
	2009	2008
	(in thousands)	
Cost	\$ 16,446	\$ 16,959
Accumulated depreciation	(3,820)	(5,308)
	<u>\$ 12,626</u>	<u>\$ 11,651</u>

These products are used in-house for research and development, training, and customer demonstration purposes. Costs are amortized to expense over three to five years. Amortization expense was \$3.8 million, \$11.4 million, and \$9.2 million, for the years ended December 31, 2009, 2008, and 2007, respectively.

In the fourth quarter of 2008, the Company recorded an impairment charge to other assets of \$21.1 million. The sum of the expected undiscounted future cash flows of the long lived asset group that included these assets was less than the carrying amount of the asset group. The measure of impairment for these assets was based upon an analysis of the fair value compared to the carrying value as described in Note 2. The Company established the fair value of the other assets based upon its best alternative use, which would be the sale of these tools as used inventory. The Company has a history of used tool sales that supports a range of fair value for these assets. The timing of the impairment event in the fourth quarter of 2008 primarily related to the industry downturn and an anticipated decrease in future cash flows derived from the long-lived asset group that includes these internal use tools, including significant change in the manner in which other assets were being used resulting in excess and or idle tools. These charges were primarily related to the sustained industry downturn and an anticipated decrease in future cash flows derived from other assets being used in research and development activities.

Note 10. Restructuring Charges

In May of 2009, the Company implemented a reduction in force of approximately 20 percent of the Company's global workforce and continued cost reduction initiatives throughout 2009 related to planned actions taken by management to control costs and improve the focus of its operations in order to sustain future profitability and conserve cash. These reductions in force resulted in a total charge to restructuring expense of approximately \$6.1 million related to severance and related costs, offset by the reversal of \$0.6 million of accrued compensation expenses related to terminated employees. A charge to expense of \$5.5 million was recorded through December 31, 2009. Through December 31, 2009, a total of \$6.5 million was paid, which included \$0.3 million paid in the fourth quarter of 2009.

Changes in the Company's restructuring liability, included in amounts reported as other liabilities, for the year ended December 31, 2009 are as follows:

	<u>Severance</u> <u>(in thousands)</u>
Balance at December 31, 2008	\$ 746
Restructuring expense	6,084
Cash payments	(6,533)
Balance at December 31, 2009	<u>\$ 297</u>

In October of 2008, the Company implemented a reduction in force to further reduce costs to mitigate deteriorating industry fundamentals. This reduction in force resulted in a restructuring charge to expense of approximately \$3.9 million, principally for separation and outplacement costs, of which \$3.4 million was recorded in the fourth quarter of 2008 and the remainder was recorded in the first quarter of 2009. A total of \$2.9 million was paid through December 31, 2008.

In May 2008, the Company implemented a reduction in force in connection with planned actions taken by management to control costs to provide future profitability and conserve cash. This reduction in force resulted in a total charge to expense of approximately \$3.6 million principally for separation and outplacement costs, of which \$3.5 million had been recognized as expense through December 31, 2008. The remaining \$0.1 million was recognized in the first quarter of 2009. A total of \$3.4 million has been paid through December 31, 2008.

Changes in the Company's restructuring liability, included in amounts reported as other liabilities, for the year ended December 31, 2008 are as follows:

	<u>Severance</u> <u>(in thousands)</u>
Balance at December 31, 2007	\$ 916
Restructuring expense	6,873
Cash payments	(7,043)
Balance at December 31, 2008	<u>\$ 746</u>

In October of 2007, the Company implemented a reduction in force to control costs and improve the focus of its operations in order to sustain future profitability and conserve cash. This reduction in force resulted in a total charge to expense of approximately \$3.1 million related to separation and outplacement costs, of which \$2.5 million was recorded in the statement of operations at December 31, 2007. For the years ended December 31, 2008 and 2007, payments made in connection with this plan were \$0.7 million and \$1.6 million, respectively. As of December 31, 2008, there was approximately \$0.1 million in other liabilities related to the October 2007 restructuring.

The 2006 lease restructuring liability relates to the consolidation of the Company's Rockville, Maryland operations into its headquarters and manufacturing facility located in Beverly, Massachusetts during 2005. These leases were paid over the remaining lease term, which ended December 31, 2007.

Changes in the Company's restructuring liability, included in amounts reported as other liabilities, for the year ended December 31, 2007 are as follows:

	<u>Severance</u>	<u>Leases</u>	<u>Total</u>
	(in thousands)		
Balance at December 31, 2006	\$ —	\$ 1,124	\$ 1,124
Restructuring expense	2,506	—	2,506
Cash payments	(1,590)	(1,124)	(2,714)
Balance at December 31, 2007	<u>\$ 916</u>	<u>\$ —</u>	<u>\$ 916</u>

Note 11. Product Warranty

The Company offers a one to three year warranty for all of its products, the terms and conditions of which vary depending upon the product sold. For all systems sold, the Company accrues a liability for the estimated cost of standard warranty at the time of system shipment and defers the portion of systems revenue attributable to the fair value of non-standard warranty. Costs for non-standard warranty are expensed as incurred. Factors that affect the Company's warranty liability include the number of installed units, historical and anticipated product failure rates, material usage and service labor costs. The Company periodically assesses the adequacy of its recorded liability and adjusts the amount as necessary.

Changes in the Company's product warranty liability are as follows:

	<u>Years Ended December 31,</u>		
	<u>2009</u>	<u>2008</u>	<u>2007</u>
	(in thousands)		
Balance at January 1 (beginning of year)	\$ 3,530	\$ 6,245	\$ 6,472
Warranties issued during the period	791	2,564	6,625
Settlements made during the period	(2,363)	(5,419)	(6,306)
Changes in estimate of liability for pre-existing warranties during the period	(1,232)	140	(546)
Balance at December 31 (end of year)	<u>\$ 726</u>	<u>\$ 3,530</u>	<u>\$ 6,245</u>
Amount classified as current	\$ 638	\$ 3,137	\$ 5,011
Amount classified as long-term	88	393	1,234
Total Warranty Liability	<u>\$ 726</u>	<u>\$ 3,530</u>	<u>\$ 6,245</u>

Note 12. Financing Arrangements

Convertible Subordinated Debt

On January 15, 2009, Axcelis failed to make the required payment of approximately \$85 million under an Indenture dated as of May 2, 2006 (the "Indenture") between Axcelis and U.S. Bank National Association, as trustee, relating to the Company's 4.25% Convertible Senior Subordinated Notes (the "Notes"). On March 30, 2009, the Company completed the sale of SEN for proceeds of \$122.2 million net of \$10.6 million in advisor fees and other expenses. A portion of the net proceeds was used for a direct repayment of all amounts due under the Indenture resulting in an extinguishment of the debt in full.

The Notes were issued in May 2, 2006, under an exchange and purchase agreement pursuant to which the holder of an aggregate of approximately \$50.8 million of the Company's \$125 million of 4.25% Convertible Subordinated Notes due January 15, 2007 issued in January 2002 (the "2002 Notes"), agreed to exchange its 2002 Notes for \$50.8 million in aggregate principal amount of the Notes, plus accrued and unpaid interest on the 2002 Notes through the closing date of the exchange. In addition, the Company issued this holder an additional \$24.2 million of Notes, resulting in an aggregate of \$75 million of Notes outstanding. The Company repaid the remaining \$74.2 million of outstanding 2002 Notes in January 2007.

Bank Credit Facility

On March 12, 2010, the Company amended its existing revolving credit facility with a bank. The amended agreement provides for borrowings up to the lesser of \$20 million or specified percentages of the amounts of qualifying accounts receivable and inventory. The facility has certain financial covenants requiring the Company to maintain minimum levels of operating results and liquidity. Based on current forecasts the Company believes it will be in compliance with the financial covenants throughout 2010. Borrowings made under the facility will bear interest at the greater of 6% or the bank's prime rate plus 2%. The agreement will terminate on March 12, 2011.

Note 13. Defined Contribution Plan

The Company maintains the Axcelis Long-Term Investment Plan, a defined contribution plan. All regular employees were eligible to participate and may contribute up to 35% of their compensation on a before-tax basis subject to IRS limitations. Highly compensated employees may contribute up to 16% of their compensation on a before-tax basis subject to IRS limitations. Through 2008, the Company matched employee contributions in an amount equal to the greater of (A) 100% of the employee's pre-tax contributions up to one thousand dollars or (B) 50% of the employee's pre-tax contributions, up to the first 6% of eligible compensation. Under this plan, approximately \$1.6 million and \$2.2 million were recognized as expense for the years ended December 31, 2008 and 2007 respectively. The Company suspended matching contributions for 2009, so no expense was recorded for this plan. The Company has taken no action for contribution in 2010.

Note 14. Stock Award Plans and Stock-Based Compensation

2000 Stock Plan

The Company maintains the Axcelis Technologies, Inc. 2000 Stock Plan (the "2000 Plan"), a stock award and incentive plan which permits the issuance of options, stock appreciation rights, restricted stock, restricted stock units, and performance awards to selected employees, directors and consultants of the Company. The 2000 Plan originally reserved 18.5 million shares of common stock for future grant, which amount was subsequently increased to 33.2 million shares of common stock. The 2000 Plan expires in 2012. At December 31, 2009 there were 12.5 million shares of common stock available for future grant. At December 31, 2009, stock awards outstanding under the 2000 Plan included stock options, restricted stock and restricted stock units.

Expiration of non-qualified stock options or stock appreciation rights is based on award agreements. Non-qualified stock options typically expire ten years from date of grant, but, if approved by the Board of Directors, may have a stated term in excess of ten years. Incentive stock option awards expire ten years from the date of grant. Generally, options granted to employees terminate upon termination of employment. Under the terms of the 2000 Plan, the exercise price, determined by the Board of Directors, may not be less than the fair market value of a share of the Company's common stock on the date of grant. Stock options granted to employees generally vest over a period of four years, while stock options granted to non-employee members of the Company's Board of Directors

generally vest over a period of 6 months and, once vested, are not affected by the director's termination of service to the Company. The Company settles stock option exercises with newly issued common shares.

Generally, unvested restricted stock and restricted stock unit awards expire upon termination of service to the Company. Restricted stock or restricted stock unit awards granted to employees generally vest over a period of four years, while restricted stock or restricted stock units granted to members of the Company's Board of Directors generally vest over a period of six months. The Company plans to settle restricted stock units upon vesting with newly issued common shares.

Under the 2000 Plan, fair market value is defined as the closing price of a share of the common stock on the Nasdaq Global Select Market as of any applicable date, as long as the Company's shares are traded on such exchange.

Grant-Date Fair Value

For the purpose of valuing stock options, the Company uses the Black-Scholes option pricing model to calculate the grant-date fair value of an award. The fair values of options granted were calculated using the following estimated weighted-average assumptions:

	Years ended December 31,		
	2009	2008	2007
Weighted-average expected volatility	76.5%	76.5%	58.4%
Weighted-average expected term (in years)	5.5	5.5	4.2
Risk-free interest rate	2.1-2.6%	1.6-2.4%	3.5-5.1%
Expected dividend yield	0%	0%	0%

Expected volatility—The Company is responsible for estimating volatility and has considered a number of factors when estimating volatility. The Company's method of estimating expected volatility for all stock options granted relies on a combination of historical and implied volatility. The Company believes that this blended volatility results in a more accurate estimate of the grant-date fair value of employee stock options because it more appropriately reflects the market's current expectations of future volatility.

Expected term—Weighted average expected term was calculated using a forward looking lattice model of the Company's stock price incorporating a suboptimal exercise factor and a projected post-vest forfeiture rate.

Risk-free interest rate—The yield on zero-coupon U.S. Treasury securities for a period that is commensurate with the expected term assumption is used as the risk-free interest rate.

Expected dividend yield—Expected dividend yield was not considered in the option pricing formula since the Company does not pay dividends and has no current plans to do so in the future.

Stock-Based Compensation Expense

The Company estimates the fair value of stock options using the Black-Scholes valuation model. The fair value of the Company's restricted stock and restricted stock units is calculated based upon the fair market value of the Company's stock at the date of grant.

The Company uses the straight-line attribution method to recognize expense for stock-based awards such that the expense associated with awards is evenly recognized throughout the period.

The amount of stock-based compensation recognized is based on the value of the portion of the awards that are ultimately expected to vest. The Company estimates forfeitures at the time of grant and revises them, if necessary, in subsequent periods if actual forfeitures differ from those estimates. The

term "forfeitures" is distinct from "cancellations" or "expirations" and represents only the unvested portion of the surrendered stock-based award. The Company currently expects, based on a historical analysis, a forfeiture rate of 5% per year, including executive officer awards.

The Company recognized stock-based compensation expense of \$4.7 million, \$4.7 million and \$5.5 million for the years ended December 31, 2009, 2008 and 2007, respectively. For 2008 and 2009, the Company primarily used stock options in its annual share-based payment program. For 2007, the Company used restricted stock units in its annual share-based payment program for employees, while continuing to use stock options for new hire grants.

The benefits of tax deductions in excess of recognized compensation cost is reported as a financing cash flow, rather than as an operating cash flow. Because the Company does not recognize the benefit of tax deductions in excess of recognized compensation cost due to its cumulative net operating loss position, this had no impact on the Company's consolidated statement of cash flows as of and for the years ended December 31, 2009, 2008 and 2007.

Stock Options

The following table summarizes the stock option activity for the years ended December 31, 2009, 2008 and 2007:

	<u>Options</u> <u>(in thousands)</u>	<u>Weighted</u> <u>Average</u> <u>Exercise</u> <u>Price</u>	<u>Weighted</u> <u>Average</u> <u>Remaining</u> <u>Contractual</u> <u>Term</u> <u>(years)</u>	<u>Aggregate</u> <u>Intrinsic</u> <u>Value</u> <u>(in thousands)</u>
Outstanding at December 31, 2006	12,805	\$ 11.68		
Granted	385	4.93		
Exercised	(191)	5.71		
Canceled	(114)	6.33		
Expired	(1,451)	11.47		
Outstanding at December 31, 2007	<u>11,434</u>	<u>\$ 11.65</u>		
Granted	5,333	0.71		
Exercised	(20)	5.01		
Canceled	(196)	5.42		
Expired	(1,027)	10.75		
Outstanding at December 31, 2008	<u>15,524</u>	<u>\$ 8.05</u>		
Granted	4,555	1.11		
Exercised	(66)	0.68		
Canceled	(887)	1.20		
Expired	(1,758)	9.73		
Outstanding at December 31, 2009	<u>17,368</u>	<u>\$ 6.43</u>	<u>6.10</u>	<u>\$ 4,612</u>
Exercisable at December 31, 2009	<u>9,335</u>	<u>\$ 11.12</u>	<u>3.24</u>	<u>\$ 775</u>
Options Vested or Expected to Vest at December 31, 2009(1)	<u>16,664</u>	<u>\$ 6.67</u>	<u>6.03</u>	<u>\$ 6,338</u>

- (1) In addition to the vested options, the Company expects a portion of the unvested options to vest at some point in the future. Options expected to vest is calculated by applying an estimated forfeiture rate to the unvested options.

Of the options outstanding at December 31, 2009, 2008, and 2007, 9,335, 9,805, and 10,467, respectively, were vested and exercisable with a weighted average exercise price of \$11.12, \$12.13, and \$12.21, respectively. The total intrinsic value of options exercised (i.e. the difference between the market price at exercise and the price paid by the employee to exercise the options) for the years ended December 31, 2009, 2008 and 2007 was \$0.8, \$0.0 and \$0.3 million, respectively.

The total fair value of stock options vested during the year ended December 31, 2009 was \$1.1 million. As of December 31, 2009, there was \$4.2 million of total forfeiture adjusted unrecognized compensation cost related to non-vested stock options granted under the 2000 Plan. That cost is expected to be recognized over a weighted-average period of 3.3 years.

Restricted Stock and Restricted Stock Units

Restricted stock units ("RSUs") represent the Company's unfunded and unsecured promise to issue shares of the common stock at a future date, subject to the terms of the RSU Award Agreement and the 2000 Plan. The purpose of these awards is to assist in attracting and retaining highly competent employees and directors and to act as an incentive in motivating selected employees and directors to achieve long-term corporate objectives. These RSU awards typically vest over four years for employees and executive officers. The restricted stock awards to directors typically vest over six months. The fair value of restricted stock unit and restricted stock awards is charged to expense ratably over the applicable service period.

Changes in the Company's non-vested restricted stock and restricted stock units for the years ended December 31, 2009, 2008, and 2007 are as follow:

	<u>Shares/units</u> <u>(in thousands)</u>	<u>Weighted-Average</u> <u>Grant Date Fair</u> <u>Value per Share</u>
Outstanding at December 31, 2006	1,831	\$ 6.44
Granted	1,178	6.03
Vested	(476)	6.60
Forfeited	(423)	6.24
Outstanding at December 31, 2007	2,110	\$ 6.22
Granted	203	4.60
Vested	(568)	6.43
Forfeited	(133)	6.28
Outstanding at December 31, 2008	1,612	\$ 5.94
Vested	(798)	6.04
Forfeited	(210)	5.63
Outstanding at December 31, 2009	<u>604</u>	<u>\$ 5.90</u>

As of December 31, 2009, there was \$2.1 million of total forfeiture adjusted unrecognized compensation cost related to nonvested restricted stock and restricted stock units, which is expected to be amortized over a weighted average amortization period of 1.33 years.

Employee Stock Purchase Plan

The Employee Stock Purchase Plan (the "Purchase Plan") provides effectively all Axcelis employees the opportunity to purchase common stock of the Company at less than market prices. Purchases are made through payroll deductions of up to 10% of the employee's salary, subject to certain caps set forth in the Purchase Plan. Employees may purchase Axcelis common stock at 85% of the market value of the Company's common stock on the day the stock is purchased.

The Purchase Plan is considered compensatory and as such, compensation expense has been recognized. Compensation expense is computed based on the benefit of the discounted stock price, amortized to compensation expense over each offering period of six months. Compensation expense for the years ended December 31, 2009, 2008, and 2007 was \$0.0 million, \$0.1 million, and \$0.3 million respectively.

As of December 31, 2009, there were a total of 3.0 million shares reserved for issuance and available for purchase under the Purchase Plan. There were 0.3, 0.4, and 0.6 million shares purchased under the Purchase Plan for the years ended December 31, 2009, 2008, and 2007 respectively.

Note 15. Stockholders' Equity

Preferred Stock

The Company may issue up to 30 million shares of preferred stock in one or more series. The Board of Directors is authorized to fix the rights and terms for any series of preferred stock without additional shareholder approval. In June 2000, the Board of Directors authorized and designated 3 million shares of preferred stock as Series A Participating Preferred Stock for issuance pursuant to the Company's Shareholder Rights Plan discussed below. As of December 31, 2009 and 2008, there were no outstanding shares of preferred stock.

Shareholder Rights Plan

In June 2000, the Board of Directors adopted a Shareholder Rights Plan and declared a dividend distribution of one share purchase right (a "Right") for each outstanding share of common stock to stockholders of record at the close of business on June 30, 2000. Each share of common stock newly issued after that date also will carry with it one Right. Each Right will entitle the record holder to purchase from the Company one one-hundredth of a share of Series A Participating Preferred Stock at an exercise price of \$110.00 per Right subject to adjustment. If certain takeover events occur, exercise of the rights would entitle the holders thereof (other than the acquiring person or group) to receive common shares or common stock of a surviving corporation, or cash, property or other securities, with a market value equal to twice the purchase price. These takeover events include a person or group becoming the owner of 20% or more of the Company's outstanding common stock, or the commencement of, or announcement of an intention to make, a tender offer or exchange offer the consummation of which would result in the beneficial ownership by a person or group of 20% or more of the Company's outstanding common shares. The Rights expire in June 2010, and may be redeemed by the Company at the option of its Board of Directors, for \$.001 per Right.

Note 16. Commitments and Contingencies

Lease Commitments

The Company leases manufacturing and office facilities and certain equipment under operating leases that expire through 2016. Rental expense was \$5.7 million, \$6.9 million, and \$6.9 million under operating leases. Future minimum lease commitments on non-cancelable operating leases are as follows:

<u>Year ended December 31,</u>	<u>Operating Leases</u> <u>(in thousands)</u>
2010	\$ 4,309
2011	1,566
2012	994
2013	982
2014	970
Thereafter	966
	<u>\$ 9,787</u>

Purchase Commitments

The Company has non-cancelable contracts and purchase orders for inventory of \$10.2 million at December 31, 2009.

Litigation

The Company is not presently a party to any other litigation that it believes might have a material adverse effect on its business operations. The Company is, from time to time, a party to litigation that arises in the normal course of its business operations.

Indemnifications

The Company's system sales agreements typically include provisions under which the Company agrees to take certain actions, provide certain remedies and defend its customers against third-party claims of intellectual property infringement under specified conditions and to indemnify customers against any damage and costs awarded in connection with such claims. The Company has not incurred any material costs as a result of such indemnifications and has not accrued any liabilities related to such obligations in the accompanying consolidated financial statements.

Note 17. Business Segment, Geographic Region Information, and Significant Customers

Axcelis operates in one business segment, which is the manufacture of capital equipment for the semiconductor manufacturing industry. The principal market for semiconductor manufacturing equipment is semiconductor manufacturers. Substantially all sales are made directly by Axcelis to customers located in the United States, Europe and Asia Pacific.

Axcelis' ion implantation systems product line includes high current, medium current and high energy implanters. Other products include dry strip equipment, curing systems, and thermal processing systems. In addition to equipment, Axcelis provides post-sales equipment service and support, including spare parts, equipment upgrades, maintenance services and customer training.

Revenue by product lines is as follows:

	Years ended December 31,		
	2009	2008	2007
	(in thousands)		
Ion implantation systems, services, and royalties	\$ 110,946	\$ 204,886	\$ 304,529
Other products systems, services, and royalties	22,076	45,328	100,271
	<u>\$ 133,022</u>	<u>\$ 250,214</u>	<u>\$ 404,800</u>

Revenue and long-lived assets by geographic region, based on the physical location of the operation recording the sale or the asset, are as follows:

	Revenue	Long-Lived Assets
	(in thousands)	
2009		
United States	\$ 83,790	\$ 40,868
Europe	23,063	—
Asia Pacific	26,169	—
	<u>\$ 133,022</u>	<u>\$ 40,868</u>
2008		
United States	\$ 175,041	\$ 44,432
Europe	29,605	—
Asia Pacific	45,568	—
	<u>\$ 250,214</u>	<u>\$ 44,432</u>
2007		
United States	\$ 316,467	\$ 66,845
Europe	35,629	518
Asia Pacific	52,704	738
	<u>\$ 404,800</u>	<u>\$ 68,101</u>

Long-lived assets consist of property, plant and equipment, net. Operations in Europe and Asia Pacific consist of sales and service organizations.

International revenue, including export sales from U.S. manufacturing facilities to foreign customers, sales by foreign subsidiaries and branches, and royalties was \$83.5 million (62.8% of total revenue) in 2009, \$161.9 million (64.7% of total revenue) in 2008, and \$271.2 million (67.0% of total revenue) in 2007.

No customer accounted for more than 10% of revenue and no customer accounted for more than 10% of consolidated accounts receivable at December 31, 2009. One customer accounted for 11.7% of revenue and 12.0% of consolidated accounts receivable at December 31, 2008. One customer accounted for 12.2% of revenue and 24.1% of consolidated accounts receivable at December 31, 2007.

Note 18. Income Taxes

Loss before income taxes are as follows:

	Years ended December 31,		
	2009	2008	2007
	(in thousands)		
United States	\$ (78,185)	\$ (193,451)	\$ (28,121)
Foreign	4,820	1,315	5,897
Equity income (loss) of SEN	(3,238)	(3,667)	10,416
Loss before income taxes	<u>\$ (76,603)</u>	<u>\$ (195,803)</u>	<u>\$ (11,808)</u>

Income taxes (credits) are as follows:

	Years ended December 31,		
	2009	2008	2007
	(in thousands)		
Current:			
United States			
Federal	\$ 5	\$ 8	\$ (1,574)
State	99	136	185
Foreign	1,526	528	1,070
Total current	<u>1,630</u>	<u>672</u>	<u>(319)</u>
Deferred:			
Foreign	(765)	189	(91)
Total deferred	<u>(765)</u>	<u>189</u>	<u>(91)</u>
Income taxes (credits)	<u>\$ 865</u>	<u>\$ 861</u>	<u>\$ (410)</u>

Reconciliations of income taxes at the United States Federal statutory rate to the effective income tax rate are as follows:

	Years ended December 31,		
	2009	2008	2007
	(in thousands)		
Income credit at the United States statutory rate	\$ (26,812)	\$ (68,531)	\$ (4,132)
State income taxes, net of federal income tax benefit	99	136	185
Impairment of goodwill	—	14,740	—
Unremitted earnings of foreign subsidiaries	705	5,965	—
Effect of change in valuation allowance	(21,446)	45,586	5,856
Foreign income tax rate differentials	(926)	68	(497)
Equity (income) loss of SEN	1,133	1,283	(2,187)
Taxable gain on sale of investment in SEN	41,973	—	—
Deemed distribution from foreign subsidiaries	3,914	—	—
Reversal of income tax liabilities recorded in prior years	—	—	(1,294)
Other, net	2,225	1,614	1,659
Income taxes (credits)	<u>\$ 865</u>	<u>\$ 861</u>	<u>\$ (410)</u>

Significant components of current and long-term deferred income taxes are as follows:

	As of December 31,			
	2009		2008	
	Current	Long Term	Current	Long Term
	(in thousands)			
Federal net operating loss carryforwards	\$ —	\$ 58,261	\$ —	\$ 80,460
State net operating loss carryforwards	—	2,058	—	1,697
Foreign net operating loss carryforwards	—	3,435	—	4,142
Federal tax credit carryforwards	—	15,954	—	22,630
State tax credit carryforwards	—	10,535	—	9,641
Unremitted earnings of foreign subsidiaries	—	(6,670)	—	(5,965)
Intangible assets	87	1,084	—	1,012
Property, plant and equipment	—	6,752	—	7,393
Accrued compensation	1,549	—	1,312	—
Inventories	34,777	—	28,858	—
Stock compensation	—	3,422	—	3,437
Warranty	238	32	1,140	143
Other	892	3,930	1,711	2,559
Deferred taxes, gross	37,543	98,793	33,021	127,149
Valuation allowance	(35,464)	(98,809)	(31,698)	(127,165)
Deferred taxes, net	\$ 2,079	\$ (16)	\$ 1,323	\$ (16)

At December 31, 2009, the Company had \$136.3 million of deferred tax assets relating to net operating loss carryforwards, tax credit carryforwards and other temporary differences, which are available to reduce income taxes in future years. A valuation allowance must be established when it is "more likely than not" that all or a portion of deferred tax assets will not be realized. A review of all available positive and negative evidence needs to be considered, including a company's performance, the market environment in which the company operates length of carryback and carryforward periods, existing sales backlog, and projections of future operating results. Where there are cumulative losses in recent years there is a strong presumption that a valuation allowance is needed. This presumption can be overcome in very limited circumstances.

The Company is in a three year cumulative loss position in the United States and has uncertainty in future taxable income for its European subsidiaries. As a result, the Company maintains a 100% valuation allowance for entities in those tax jurisdictions to reduce the carrying value of deferred tax assets to zero. The Company will continue to maintain a full valuation allowance for those tax assets until sustainable future levels of profitability are evident.

Changes in the valuation allowance in 2009 and 2008 were attributable principally to changes in the composition of temporary differences and changes in net operating loss carryforwards. In 2009, the decrease in net operating loss carryforwards was attributable to the taxable gain on the sale of the investment in SEN, partially offset by domestic operating losses. In 2008, the increase in net operating loss carryforwards was attributable to domestic operating losses.

At December 31, 2009, the Company has federal and state net operating loss carryforwards of approximately \$168.2 million and foreign net operating loss carryforwards of approximately \$16.4 million expiring principally between 2018 and 2029. The sale of the Company's investment in SEN generated taxable income which will be off-set with existing net operating loss carryforwards.

The Company has research and development and other tax credit carryforwards of approximately \$20.2 million at December 31, 2009 that can be used to reduce future federal income tax liabilities. These tax credit carryforwards expire principally between 2021 and 2029. In addition, the Company has foreign tax credit carryforwards of approximately \$6.3 million at December 31, 2009 that are available to reduce future U.S. income tax liabilities subject to certain limitations. These foreign tax credit carryforwards expire between 2011 and 2018.

The Company and its subsidiaries file income tax returns in the U.S. federal jurisdiction, and various states and foreign jurisdictions. The Company and most foreign subsidiaries are subject to income tax examinations by tax authorities for all years dating back to 2001. The Company's policy is to recognize interest related to unrecognized tax benefits as interest expense and penalties as operating expenses. Accrued interest and penalties are insignificant at December 31, 2009. The Company believes that it has appropriate support for the income tax positions taken and to be taken on its tax returns and that its accruals for tax liabilities are adequate for all open years based on an assessment of many factors including past experience and interpretations of tax law applied to the facts of each matter.

At December 31, 2009, the Company had unrecognized tax benefits of approximately \$5.9 million, of which approximately \$4.6 million reduced the Company's deferred tax assets and the offsetting valuation allowance and \$1.3 million was recorded in other long-term liabilities. The Company does not expect any significant changes in unrecognized tax benefits in 2010.

A reconciliation of the beginning and ending balance of unrecognized tax benefits is as follows:

	<u>2009</u>	<u>2008</u>
	<u>(in thousands)</u>	
Balance at beginning of year	\$ 5,824	\$ 5,708
Increases in unrecognized tax benefits as a result of tax positions taken during a prior period	110	—
Increases in unrecognized tax benefits as a result of tax positions taken during the current period	—	261
Decreases in unrecognized tax benefits as a result of tax positions taken during the current period	—	(145)
Balance at end of year	<u>\$ 5,934</u>	<u>\$ 5,824</u>
Recorded as Other Long Term Liability	\$ 1,302	\$ 1,104
Recorded as a decrease in deferred tax assets and offsetting valuation allowance	4,632	4,720
	<u>\$ 5,934</u>	<u>\$ 5,824</u>

Note 19. SEN Corporation (unaudited)

Until March 30, 2009, the Company owned 50% of the equity of a joint venture with Sumitomo Heavy Industries, Ltd. ("SHI") in Japan. This joint venture, which is known as SEN Corporation, an SHI and Axcelis Company ("SEN"), was established in 1982 and licensed technology from the Company relating to the manufacture of specified ion implantation products and had exclusive rights to manufacture and sell these products in the territory of Japan. On March 30, 2009, pursuant to a Share Purchase Agreement dated February 26, 2009, the Company sold to SHI all of the Company's common shares in SEN in exchange for a cash payment of 13 billion Yen, which resulted in proceeds of approximately \$132.8 million before advisor fees and other expenses of \$10.6 million. The sales price was determined through an arm's length negotiation. This transaction terminated all prior agreements among the three parties relating to the SEN joint venture. In addition, an arbitration the Company had initiated against SEN in Tokyo was dismissed.

In connection with the sale of the Company's investment in SEN, on March 30, 2009, the Company and SEN entered into a License Agreement pursuant to which the parties have cross licensed each other to use certain ion implant patents and technical information on a non-exclusive, perpetual, royalty-free, worldwide basis, provided that both received sole exclusive licenses for 4 years in the U.S. and Japan, respectively. The licenses to technical information cover only technical information shared by the parties prior to the date of the license, so the license to SEN does not cover technical information relating to the Optima HD and Optima XE. The license also excludes patents relating to the Company's work in molecular implant and certain patents developed for the Optima HD and Optima XE. The parties provided each other with limited warranties regarding their right to grant these licenses, and indemnity with respect thereto, but disclaim any warranty regarding the validity or freedom from infringement of the licensed intellectual property. Neither party will provide any support for the other party's use of the licensed intellectual property.

The sale of the Company's investment in SEN on March 30, 2009, resulted in a gain of approximately \$1.1 million. This gain includes net proceeds of \$122.2 million (after payment of advisor fees and other costs of \$10.6 million) and cumulative foreign translation gain of \$23.5 million, previously recorded in other comprehensive income, reduced by the carrying value of the investment on the date of sale of \$144.6 million. The gain from the sale of the Company's investment in SEN is recorded in other income.

Summary financial information regarding SEN is as follows:

	Twelve months ended	
	November 30,	
	2008	2007
	(in thousands)	
Net Sales	\$ 158,574	\$ 235,611
Gross profit	102,768	97,911
Net income	(7,334)	20,832
November 30:		
Current assets	\$ 326,197	\$ 287,990
Noncurrent assets	31,768	25,945
Current liabilities	38,863	47,760
Noncurrent liabilities	752	189

SEN has a March 31 fiscal year end. The consolidated statements of operations for Axcelis include the results of SEN for the twelve-month periods ended November 30, which represents a one-month lag. The information above has been presented as of and for the twelve months ended November 30 to conform to Axcelis' equity accounting for SEN.

A summary of Axcelis' transactions with and balances payable to or receivable from SEN are as follows:

	2008	2007
	(in thousands)	
Net Sales	\$ 1,166	\$ 1,825
Royalty revenue	4,059	6,066
Dividends received	2,016	12,424
Axcelis' equity income (loss) of SEN	(3,667)	10,416
Accounts receivable at December 31	257	442
Accounts payable at December 31	2	284

Axcelis' retained earnings (deficit) included \$94.5 million and \$100.2 million of undistributed earnings of SEN at December 31, 2008 and 2007, respectively.

Changes in investment in SEN are as follows:

	<u>2008</u>	<u>2007</u>
	(in thousands)	
Beginning balance	\$ 132,911	\$ 126,688
Equity income loss of SEN	(3,667)	10,416
Dividends received	(2,016)	(12,424)
Foreign exchange impact	29,449	8,231
Ending balance	<u>\$ 156,677</u>	<u>\$ 132,911</u>

Note 20. Quarterly Results of Operations (unaudited)

	<u>Dec. 31, 2009</u>	<u>Sept. 30, 2009</u>	<u>June 30, 2009</u>	<u>March 31, 2009</u>	<u>Dec. 31, 2008</u>	<u>Sept. 30, 2008</u>	<u>June 30, 2008</u>	<u>March 31, 2008</u>
	(in thousands, except per share data)							
Revenue	\$ 38,737	\$ 35,007	\$ 33,550	\$ 25,728	\$ 41,977	\$ 46,454	\$ 76,889	\$ 84,894
Gross profit	11,351	7,820	5,886	3,007	(10,850)	17,159	27,090	29,216
Net loss	(10,036)	(15,898)	(22,379)	(29,155)	(141,445)	(24,741)	(19,397)	(11,081)
Net loss per share basic and diluted	\$ (0.10)	\$ (0.15)	\$ (0.22)	\$ (0.28)	\$ (1.37)	\$ (0.24)	\$ (0.19)	\$ (0.11)

Results of operations for the quarters ended September 30, 2009, June 30, 2009 and March 31, 2009 included restructuring charges of \$0.4 million, \$4.1 million and \$1.0 million respectively.

Results of operations for the quarters ended December 31, 2008, September 30, 2008, June 30, 2008 and March 31, 2008 included restructuring charges of \$3.4 million, \$0.4 million, \$3.0 million and \$0.1 million respectively.

Results of operations for the quarter ended December 31, 2008 include charges for impairment of intangible and long-lived assets of \$46.9 million, impairment of goodwill of \$42.1 million, and excess inventory of \$23.2 million.

Signatures

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

AXCELIS TECHNOLOGIES, INC.

/s/ MARY G. PUMA

Dated: March 15, 2010

By: Mary G. Puma, *Chief Executive Officer*

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

Signature	Title	Date
/s/ MARY G. PUMA		
Mary G. Puma	Director and Principal Executive Officer	March 15, 2010
/s/ STEPHEN G. BASSETT		
Stephen G. Bassett	Principal Accounting and Financial Officer	March 15, 2010
/s/ R. JOHN FLETCHER		
R. John Fletcher	Director	March 15, 2010
/s/ STEPHEN R. HARDIS		
Stephen R. Hardis	Director	March 15, 2010
/s/ WILLIAM C. JENNINGS		
William C. Jennings	Director	March 15, 2010
/s/ PATRICK H. NETTLES		
Patrick H. Nettles	Director	March 15, 2010
/s/ H. BRIAN THOMPSON		
H. Brian Thompson	Director	March 15, 2010
/s/ GEOFFREY WILD		
Geoffrey Wild	Director	March 15, 2010

Exhibit Index

Exhibit No.	Description
3.1	Amended and Restated Certificate of Incorporation of the registrant, as adopted May 6, 2009. Incorporated by reference to Exhibit 3.1 of the Company's Form 8-K filed with the Commission on May 11, 2009.
3.2	Bylaws of the Company, as amended as of August 8, 2007. Incorporated by reference to Exhibit 3.2 of the Company's Form 10-Q for the quarter ended June 30, 2007, filed with the Commission on August 9, 2007.
4.1	Specimen Stock Certificate. Incorporated by reference to Exhibit 4.1 of the Company's Registration Statement on Form S-1 (Registration No. 333-36330).
4.2	Rights Agreement between the Company and EquiServe Trust Company, N.A. Incorporated by reference to Exhibit 4.1 of the Company's Registration Statement on Form S-1 (Registration No. 333-36330).
10.1*	Axcelis Technologies, Inc. 2000 Stock Plan, as amended through June 23, 2005. Incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed with the Commission on June 28, 2005.
10.2*	Axcelis Management Incentive Plan, as amended and restated by the Compensation Committee of the Board of Directors on February 11, 2010. Filed herewith.
10.3	Form of Indemnification Agreement entered into by the Company with each of its directors and executive officers. Incorporated by reference to Exhibit 10.2 of the Company's Registration Statement on Form S-1 (Registration No. 333-36330).
10.4*	Form of Change in Control Agreement, as approved by the Board of Directors on October 16, 2007 and first effective on November 6, 2007, between the Company and each of its executive officers. Incorporated by reference to Exhibit 10.4 of the Company's report on Form 10-Q for the quarter ended September 30, 2007 filed with the Commission on November 8, 2007.
10.5*	Form of Employee non-qualified stock option grant under the 2000 Stock Plan, updated as of April 5, 2002. Incorporated by reference to Exhibit 10.1 of the Company's report on Form 10-Q filed with the Commission on November 9, 2004.
10.6*	Form of Non-Employee Director stock non-qualified stock option grant under the 2000 Stock Plan, updated as of July 12, 2004. Incorporated by reference to Exhibit 10.2 of the Company's report on Form 10-Q filed with the Commission on November 9, 2004.
10.7*	Form of Restricted Stock Agreement for use under the 2000 Stock Plan. Incorporated by reference to Exhibit 10.4 to the Company's Current Report on Form 8-K filed with the Commission on June 28, 2005.
10.8*	Form of Restricted Stock Unit Award Agreement for use under the 2000 Stock Plan. Incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed with the Commission on June 28, 2005.
10.9*	Named Executive Officer Base Compensation at March 15, 2010. Filed herewith.
10.10*	Non-Employee Director Cash Compensation at March 15, 2010. Filed herewith.
10.11*	Amended and Restated Employment Agreement between the Company and Mary G. Puma dated November 6, 2007. Incorporated by reference to Exhibit 10.3 of the Company's report on Form 10-Q for the quarter ended September 30, 2007 filed with the Commission on November 8, 2007.

<u>Exhibit No.</u>	<u>Description</u>
10.12*	Letter from Mary G. Puma to the Board of Directors dated May 1, 2009, modifying her Amended and Restated Employment Agreement with the Company. Incorporated by reference to Exhibit 10.1 of the Company's report on Form 8-K filed with the Commission on May 11, 2009.
10.13	Loan and Security Agreement dated as of April 23, 2008 between the Company and Silicon Valley Bank. Incorporated by reference to Exhibit 10.1 to the Company's report on Form 10-Q for the quarter ended March 31, 2008 filed with the Commission on May 12, 2008.
10.14	Share Purchase Agreement dated February 26, 2009 among the Company, Sumitomo Heavy Industries, Ltd. And SEN Corporation, and SHI and Axcelis Company. Incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the Commission on February 27, 2009.
10.15	License Agreement dated as of March 30, 2009 between the Company and SEN Corporation. Incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the Commission on April 3, 2009.
14.1	Ethical Business Conduct at Axcelis, revised through January 2003. Incorporated by reference to Exhibit 14.1 of the Company's report on Form 10-K filed with the Commission on March 28, 2003.
21.1	Subsidiaries of the Company. Filed herewith.
23.1	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm. Filed herewith.
31.1	Certification of the Principal Executive Officer under Exchange Act Rule 13a-14(a)/15d-14(a) (Section 302 of the Sarbanes-Oxley Act), dated March 15, 2010. Filed herewith.
31.2	Certification of the Principal Financial Officer under Exchange Act Rule 13a-14(a)/15d-14(a) (Section 302 of the Sarbanes-Oxley Act), dated March 15, 2010. Filed herewith.
32.1	Certification of the Principal Executive Officer pursuant to Section 1350 of Chapter 63 of title 18 of the United States Code (Section 906 of the Sarbanes-Oxley Act), dated March 15, 2010. Filed herewith.
32.2	Certification of the Principal Financial Officer pursuant to Section 1350 of Chapter 63 of title 18 of the United States Code (Section 906 of the Sarbanes-Oxley Act), dated March 15, 2010. Filed herewith.

* Indicates a management contract or compensatory plan.

You may obtain a copy of any of these exhibits free of charge either on our website at <http://www.axcelis.com> or by contacting Investor Relations at Axcelis Technologies, Inc., 108 Cherry Hill Drive, Beverly, MA 01915-1053.

Schedule II-Valuation and Qualifying Accounts
Axcelis Technologies, Inc.
(In thousands)

	<u>Balance at Beginning of Period</u>	<u>Charged to Costs and Expenses</u>	<u>Deductions</u>	<u>Other(*)</u>	<u>Balance at End of Period</u>
Year Ended December 31, 2009					
Allowance for doubtful accounts and returns	\$ 2,545	\$ (88)	\$ —	\$ (67)	\$ 2,390
Reserve for excess and obsolete inventory	47,656	9,818	(20,732)	238	36,980
Year Ended December 31, 2008					
Allowance for doubtful accounts and returns	2,927	308	(691)	1	2,545
Reserve for excess and obsolete inventory	25,071	24,631	(2,596)	550	47,656
Year Ended December 31, 2007					
Allowance for doubtful accounts and returns	2,941	—	(13)	(1)	2,927
Reserve for excess and obsolete inventory	22,092	5,018	(2,091)	52	25,071

(*) Represents foreign currency translation adjustments.

AXCELIS TECHNOLOGIES, INC.
Axcelis Management Incentive Plan
Adopted by the Compensation Committee of the Board of Directors on February 11, 2010,
amending and restating the Axcelis Team Incentive Plan
originally adopted by the Compensation Committee on January 26, 2005

1. Purpose. The Compensation Committee of the Board of Directors of Axcelis Technologies, Inc. (together with its affiliates, the "Company") has adopted this Plan in order to provide incentives in the form of cash bonuses to the Company's executive officers and other managers to make significant contributions to the Company's success and profitability.

2. Administration.

(a) This Plan shall be administered by the Compensation Committee (the "Committee") of the Company's Board of Directors. Subject to the express terms of the Plan, the Committee shall have full power and authority to construe, interpret and administer the Plan. The Committee's decisions hereunder shall be final and binding.

(b) The Committee shall from time to time: (i) determine the executive officers and other managers who will participate in the Plan (each, a "Participant") for any fiscal year or other period (a "Performance Period"); (ii) set a target bonus amount and any additional potential bonus amounts for each Participant for each Performance Period; and (iii) establish Performance Goals in accordance with Section 3 and any other terms and conditions applicable to participants' incentive bonuses for each Performance Period.

(c) A Participant's potential bonus and applicable Performance Goals established under the Plan shall be evidenced by a writing delivered to the Participant and containing such other terms and conditions not inconsistent with the provisions of the Plan as the Committee considers necessary or advisable to achieve the purposes of the Plan or to comply with applicable tax and regulatory laws and accounting principles.

3. Performance Goals.

(a) The Committee shall establish for each Participant and for each Performance Period one or more goals related to the performance (defined by absolute and/or relative measures) of the Company, any of its divisions, business units, subsidiaries, products or lines of business, and/or the Participant personally ("Performance Goals"). Such Goals may be based on any one or more of the following criteria: revenue; revenue growth; sales; expenses; margins; net income; earnings or earnings per share; cash flow; shareholder return; return on investment; return on invested capital, assets, or equity; profit before or after tax; operating profit; return on research and development investment; market capitalization; product development and improvements; market share; cycle time reductions; customer satisfaction measures; strategic positioning or marketing programs; business/information systems improvements; expense management; infrastructure support programs; human resource programs; customer programs; technology development programs; and any other financial metric(s) and/or operational or strategic programs. Personal performance may be a multiplier against other Performance Goals.

(b) The Committee may determine threshold, target(s), or other levels of performance that must be achieved, with corresponding threshold, target, maximum, upside, or other bonus payments contingent upon the attainment of the relevant Performance Goals. In establishing the performance levels, the Committee may specify the measures to be used to evaluate Performance Goal achievement and the weighting of each Performance Goal.

4. Bonus Payments.

(a) Within a reasonable time after the end of any Performance Period (which may at the Committee's discretion be after the Company's receipt of an audit opinion on its financial statements in the case of a fiscal year period) and before payment of any bonus, the Committee shall determine the extent to which the respective Performance Goals and any other material terms of the bonus awards have been satisfied and shall determine the date of payment.

(b) The Committee may in its discretion at any time modify or terminate any Participant's eligibility for any payment hereunder if the Committee determines that the Participant has engaged in activity in competition with, or otherwise harmful to the interests of, the Company. No benefit under the Plan may be assigned or transferred by a Participant during the Participant's lifetime.

(d) To be eligible to receive a bonus under the Plan, the Participant must be actively employed by the Company on the date of payment, except to the extent otherwise provided by the Committee. If a Participant's employment with the Company is terminated for any reason before the payment date, the Participant will not be eligible for a bonus under this Plan and the Participant shall forfeit all rights to such payment, except to the extent otherwise provided by the Committee. Payment of any bonus shall be made in cash or, in the Committee's discretion, in the form of an equity award under any equity compensation plan of the Company. Participants may defer receipt of all or any portion of a bonus under this Plan if and to the extent permitted under any deferred compensation plan of the Company.

(e) A Participant shall pay to the Company, or make provision satisfactory to the Committee for payment of, any taxes required by law to be withheld in respect of payments under the Plan no later than the date of the event creating the tax liability. The Company may, to the extent permitted by law, deduct any such tax obligations from the Participant's respective bonus or from any other payment due to the Participant.

5. Change in Control. In addition to any rights a Participant may have under a Change of Control Agreement with the Company, in order to preserve a Participant's rights hereunder in the event of a change in control of the Company (as defined by the Committee), the Committee in its discretion may, at any time, take one or more of the following actions: (i) provide for the acceleration of any time period relating to any payment hereunder, (ii) provide for payment to the Participant upon the change in control of cash or other property equal to the amount that would otherwise have been paid hereunder, (iii) adjust the criteria applicable to the payment of any amount hereunder in a manner determined by the Committee to reflect the change in control, (iv) cause the Company's obligations under this Plan to be assumed, or new obligations substituted therefor, by another entity, or (v) make such other provision as the Committee may consider equitable to Participants and in the best interests of the Company.

6. Unfunded Plan. The Plan shall be unfunded. The Company shall not be required to segregate any assets for payment under the Plan, nor shall the Plan be construed as providing for such segregation, nor shall the Company, the Board of Directors or the Committee be deemed to be a trustee of any amount payable under the Plan. Any liability of the Company to any Participant under the Plan shall be based solely upon any contractual obligations that may be created pursuant to the Plan, and no such obligation of the Company shall be deemed to be secured by any pledge or other encumbrance on any property of the Company.

7. No Right to Continued Employment. No person shall have any claim or right to participate in the Plan. Participation in any period shall not confer any right to participate in any subsequent period. Neither the adoption, maintenance or operation of the Plan nor any notification of a potential bonus hereunder shall confer upon any person any right with respect to continued employment with the Company nor shall they interfere with the rights of the Company at any time to terminate or otherwise change the terms of his or her employment, including, without limitation, the right to promote, demote or otherwise re-assign any employee from one position to another within the Company.

8. Code Section 409A. The awards payable under this Plan are intended to comply with, or be exempt from, the requirements of Section 409A of the Internal Revenue Code of 1986, as amended,

and, accordingly, to the maximum extent permitted, the terms of the Plan shall be interpreted to be in compliance therewith.

9. Amendment and Termination of Plan. The Committee may amend, suspend or terminate the Plan in order to comply with any legal requirements or for any other purpose permitted by law. The Committee shall determine the effect of such action on any proposed payment(s) under the Plan.

10. Governing Law. The Plan shall be governed by, and construed in accordance with, the internal laws of the Commonwealth of Massachusetts.

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[Exhibit 10.2](#)

Axcelis Technologies, Inc.
Named Executive Officer Base Compensation at March 15, 2010

This Exhibit discloses the current understandings with respect to base compensation between Axcelis Technologies, Inc. (the "Company") and each of:

- the Company's principal executive officer (Mary G. Puma),
- the Company's principal financial officer (Stephen G. Bassett), and
- the three most highly compensated other executive officers serving as executive officers at December 31, 2009.

These executive officers are referred to herein as "named executive officers" or "NEOs."

Other than in the case of Mary G. Puma, the Company has not entered into any written agreements with its named executive officers addressing the amount of base salary due to the executive. The Company's Amended and Restated Employment Agreement with Ms. Puma ("Puma Employment Agreement") is listed as Exhibit 10.11 to this Form 10-K (incorporated by reference to Exhibit 10.3 to the Company's Form 10-Q for the quarter ended September 30, 2007 filed on November 8, 2007). The Puma Employment Agreement was modified in a letter agreement dated as of May 1, 2009 is listed as Exhibit 10.12 to this Form 10-K (incorporated by reference to Exhibit 10.1 of the Company's report on Form 8-K filed with the Commission on May 11, 2009).

The Company maintains that all executive officers, other than Ms. Puma, are employees at will and that the Company has no obligation to continue their employment, other in cases where such obligation arises under the Change of Control Agreements described in our Proxy Statement and filed as an Exhibit to this Form 10-K.

In the course of the employment relationship with each NEO, the Company communicates to the named executive officer the amount of base salary approved by the Compensation Committee of the Board of Directors, which compensation is subject to change in the discretion of the Compensation Committee of the Board of Directors. The following table sets forth the annual base salary as communicated to the named executive officers of the Company as in effect on March 15, 2010:

<u>Named Executive Officer</u>	<u>Title</u>	<u>Base Salary</u>
Mary G. Puma	President and Chief Executive Officer	\$ 400,000*
Stephen G. Bassett	Executive VP and Chief Financial Officer	\$ 300,000
Matthew Flynn	Executive VP, Global Customer Operations	\$ 350,000
Lynnette C. Fallon	Executive VP HR/Legal and General Counsel	\$ 305,000
Kevin Brewer	Senior VP, Manufacturing Operations	\$ 300,000

* Under the terms of the Puma Employment Agreement, as modified for 2010.

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[Exhibit 10.9](#)

Axcelis Technologies, Inc.
Non-Employee Director Cash Compensation at March 15, 2010

This Exhibit discloses the current understandings with respect to cash compensation between Axcelis Technologies, Inc. (the "Company") and each of its non-employee directors. Axcelis provides both cash retainers and meeting fees to its non-employee directors, as follows:

Annual Retainers (paid quarterly in advance)

<u>Board Member Position</u>	<u>Amount</u>
Lead Director	\$ 50,000
Non-Employee Board Member (not Lead Director)	\$ 30,000
Audit Committee Chair*	\$ 15,000
Compensation Committee Chair*	\$ 10,000
Nominating Committee Chair*	\$ 7,500

* Retainers for Committee Chairs are in addition to the retainer payable to all non-employee Board members.

Meeting Fees (payable quarterly in arrears)

<u>Meeting Type</u>	<u>Amount Per Meeting</u>
In Person Board Meetings	\$ 2,000
Telephone Board Meetings	\$ 1,000
In Person or Telephone Committee Meetings**	\$ 1,000

** Committee meeting fees are paid only to committee members, and not to other Board members, attending committee meetings.

Non-employee directors also receive reimbursement of out-of-pocket expenses incurred in attending Board and committee meetings. Non-employee directors do not receive any Company-paid perquisites.

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[Exhibit 10.10](#)

Axcelis Technologies, Inc.
Exhibit 21.1 to Form 10-K for the year ended December 31, 2009
Subsidiaries

The following is a list of all direct and indirect wholly-owned subsidiaries of Axcelis Technologies, Inc. as of the date hereof:

Domestic Subsidiaries

1. Axcelis Technologies CCS Corporation a Delaware corporation
2. Fusion Technology International, Inc., a Delaware corporation
3. Axcelis Technologies (Israel), Inc., a Delaware corporation
4. Fusion Investments, Inc., a Maryland corporation
5. High Temperature Engineering Corporation, a Delaware corporation

European Subsidiaries

6. Axcelis Technologies, GmbH (Germany)
7. Axcelis Technologies, S.r.l (Italy)
8. Axcelis Technologies, Sarl (France)
9. Axcelis Technologies, Ltd. (U.K.)
10. Matrix Europe N.V. (Belgium)

Asian Subsidiaries

11. Axcelis Technologies, KK (Japan)
 12. Axcelis Technologies Limited (Korea)
 13. Axcelis Technologies Ltd. (Taiwan)
 14. Axcelis Technologies Pte. Ltd. (Singapore)
 15. Axcelis Technologies Semiconductor Trading (Shanghai) Co., Ltd. (Peoples Republic of China)
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[Exhibit 21.1](#)

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the following Registration Statements:

- (1) Registration Statement (Form S-8 No. 333-49726) pertaining to the Employee Stock Purchase Plan of Axcelis Technologies, Inc.; and
- (2) Registration Statements (Form S-8 No. 333-49768 and No. 333-120356) pertaining to the 2000 Stock Plan of Axcelis Technologies, Inc.;

of our reports dated March 15, 2010 with respect to the consolidated financial statements and schedule of Axcelis Technologies, Inc. and the effectiveness of internal control over financial reporting of Axcelis Technologies, Inc., included in this Annual Report (Form 10-K) for the year ended December 31, 2009.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 15, 2010

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[Exhibit 23.1](#)

CERTIFICATION
of the Principal Executive Officer
Pursuant to Rule 13a-14(a)/15d-14(a) (implementing Section 302 of the Sarbanes-Oxley Act)

I, Mary G. Puma, certify that:

1. I have reviewed this annual report on Form 10-K of Axcelis Technologies, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the company's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 15, 2010

/s/ MARY G. PUMA

Mary G. Puma, *Chairman, Chief Executive Officer and President*

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[Exhibit 31.1](#)

CERTIFICATION
of the Principal Financial Officer
Pursuant to Rule 13a-14(a)/15d-14(a) (implementing Section 302 of the Sarbanes-Oxley Act)

I, Stephen G. Bassett, certify that:

1. I have reviewed this annual report on Form 10-K of Axcelis Technologies, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the company's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 15, 2010

/s/ STEPHEN G. BASSETT

Stephen G. Bassett, *Executive Vice President and Chief Financial Officer*

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[Exhibit 31.2](#)

AXCELIS TECHNOLOGIES, INC.
Certification of the Chief Executive Officer
Pursuant to Section 1350 of Chapter 63 of title 18 of the United States Code

The undersigned Chief Executive Officer of Axcelis Technologies, Inc., a Delaware corporation, hereby certifies, for the purposes of Section 1350 of Chapter 63 of title 18 of the United States Code (as implemented by Section 906 of the Sarbanes-Oxley Act of 2002) as follows:

This Form 10-K annual report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m or 78o(d)) and the information contained herein fairly presents, in all material respects, the financial condition and results of operations of the Company.

IN WITNESS WHEREOF, the undersigned has executed this Certification as of March 15, 2010.

/s/ MARY G. PUMA

Mary G. Puma
Chairman, Chief Executive Officer and President of Axcelis Technologies, Inc.

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[EXHIBIT 32.1](#)

AXCELIS TECHNOLOGIES, INC.
Certification of the Chief Financial Officer
Pursuant to Section 1350 of Chapter 63 of title 18 of the United States Code

The undersigned Chief Financial Officer of Axcelis Technologies, Inc., a Delaware corporation, hereby certifies, for the purposes of Section 1350 of Chapter 63 of title 18 of the United States Code (as implemented by Section 906 of the Sarbanes-Oxley Act of 2002) as follows:

This Form 10-K annual report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m or 78o(d)) and the information contained herein fairly presents, in all material respects, the financial condition and results of operations of the Company.

IN WITNESS WHEREOF, the undersigned has executed this Certification as of March 15, 2010.

/s/ STEPHEN G. BASSETT

Stephen G. Bassett
*Executive Vice President and Chief Financial Officer of Axcelis
Technologies, Inc.*

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[EXHIBIT 32.2](#)