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, 2024

☐ **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	**34-1818596**
(State or other jurisdiction of incorporation or organization)	(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	Trading symbol	Name of each exchange on which registered
Common Stock, $.001 par value	ACLS	Nasdaq Global Select Market

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

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

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 every Interactive Data File required to be submitted 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 such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company” and “emerging growth company” in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management’s assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements.

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant’s executive officers during the relevant recovery period pursuant to §240.10D-1(b).

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, 2024: $4,617,739,619

Number of shares outstanding of the registrant’s Common Stock, $0.001 par value, as of February 24, 2025: 32,154,139

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, 2025 are incorporated by reference into Part III of this Form 10-K.

PART I

Item 1. Business.

Overview of Our Business

Axcelis Technologies, Inc. ("Axcelis," the "Company," "we," "us," or "our") designs, manufactures and services ion implantation and other processing equipment used in the fabrication of semiconductor chips. We believe that our Purion family of products offers the most innovative implanters available on the market today. We sell to leading semiconductor chip manufacturers worldwide. The ion implantation business represented 98.3% of our revenue in 2024, with the remaining 1.7% of revenue derived from aftermarket sales associated with other legacy processing systems. In addition to equipment, we provide extensive aftermarket lifecycle products and services, including used tools, spare parts, equipment upgrades, maintenance services and customer training.

Axcelis' business commenced in 1978 and its current corporate entity was incorporated in Delaware in 1995. We are headquartered in Beverly, Massachusetts and maintain an internet site at www.axcelis.com. On or through our website, investors may access, free of charge, 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 Annual Report on Form 10-K.

Revenue for 2024 was $1,017.9 million, compared to $1,130.6 million in 2023. Systems revenue for 2024 was $782.6 million, compared to $883.6 million in 2023. Gross margin percent for 2024 was 44.7% compared to 43.5% in 2023. Operating profit for 2024 was $210.8 million, compared to $265.8 million in 2023. Net income for 2024 was $201.0 million, compared to $246.3 million in 2023.

The Company is in a strong competitive position. A focused strategy on ion implant, combined with the hard work and dedication of our employees and the support of our customers and suppliers, enabled us to achieve critical milestones in our drive to market leadership. Important accomplishments in 2024 included:

- We delivered revenue of $1,017.9 million in 2024 and earnings per share of $6.15.
- We remained a technology leader and supplier of choice in the implant-intensive power device segment, which accounted for 56% of the value of our 2024 system shipments.
- We continued working to expand our footprint with existing and new customers and currently have two Purion evaluation systems in the field at strategic customer sites in key market segments.
- We continued our investment in our Customer Solutions & Innovation ("CS&I") aftermarket business to drive financial growth and increased customer satisfaction levels, including the "Digital Tool Box," an innovative service offering with online training, remote diagnosis and install, and automated troubleshooting guide.
- We received 22 customer satisfaction awards in 2024. In addition, Axcelis was named to both the 2023 and 2024 editions of Forbes' List of America's Best Mid-Cap Companies and to both the Fortune Magazine's 2023 and 2024 lists of the Top 100 Fastest Growing Companies.

We continue to work diligently to ensure that manufacturing and operating expense levels remain well aligned to business conditions. We believe that the most fundamental interest of our stockholders is consistent, profitable financial performance, which we expect to continue to deliver in 2025. Our performance is subject to the risks and uncertainties discussed below under Item 1A, Risk Factors.

Industry Overview

Semiconductor chips, also known as integrated circuits, are used in a continuously evolving range of consumer and industrial products, including for example, personal computers, mobile devices, automobiles, sensors and controllers for the "internet of things" and data storage servers. Types of semiconductor chips include dynamic random-access memory

("DRAM") and "Not AND" ("NAND") Flash memory; logic devices to process information; and "system on chip" devices (which have both logic and memory features). The demand for chips continues to increase, as a result of the electrification of vehicles, the evolution of digital communications (including the introduction of 5G mobile networks), artificial intelligence, large language models e.g. (ChatGPT), data analytics and visualization, and the growth in the Internet of Things, and the increasing complexity of device features. These chips are used in power management, data input, such as image sensors, which are often manufactured using mature processing technologies, as well as for memory to support the storage of data, internet streaming and "cloud computing" data analytics.

Most semiconductor chips are built on silicon or silicon carbide ("SiC") wafers of 150mm (6 inches), 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 wafer by introducing various precisely placed dopants into the silicon or SiC in specific patterns.

Semiconductor chip manufacturers own or manage wafer fabrication facilities (often referred to as "fabs"), which utilize many different types of equipment in the making of integrated circuits. Over 300 process steps utilizing over 50 different types of process tools are required to make a single device like a microprocessor. Semiconductor chip manufacturers seek device performance benefits through new products and technology enhancements and productivity 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.

We have different types of customers, which impacts the timing of purchases and technology requirements. Some customers are integrated electronics manufacturers, making semiconductor chips for their own devices. These same companies may also act as foundries, manufacturing semiconductor chips for other electronic manufacturers or chip design companies. Some customers only function as foundries. A few companies design and manufacture branded chips that are sold to device manufacturers. In addition, some customers have partnerships or joint ventures with two or more semiconductor chip manufacturers to share the technology development and capital investment. The timing of purchases by foundry customers will depend on their success in securing manufacturing contracts. Also, foundry customers will look for equipment that can deliver the broadest capabilities to be prepared to manufacture all chip types, while integrated electronics manufacturers may invest in processing equipment dedicated to a specific application they require for their products.

The semiconductor capital equipment industry has historically been cyclical as global chip production capacities successively exceed, then lag behind, global chip demand. When chip demand is high, and inventories are 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. Device manufacturers react with muted capital spending, lowering the demand for capital equipment. Changes in consumer and business demand for products in which chips are used also affect the industry. A successful semiconductor capital equipment manufacturer must not only provide some of the most technically complex products manufactured in the world but also must manage its business to thrive during downturns in the cycle.

Axcelis' Strategy

Axcelis' 2025 strategic goals are to:

- Continue to build the foundation on our long-term implant-only business model
  - Win new customers with Purion products and aftermarket offerings that solve high value customer challenges with differentiated, valuable, and sustainable ("DVS") solutions
  - Improve customer satisfaction to drive repeat business
  - Execute on identified growth opportunities in Japan and advanced logic
  - Deliver CS&I target business model revenues of approximately 25% of total revenues, in line with expectations
- Drive profitable growth by focusing on key customers and targeted market/geographic segments

    - Achieve market share leadership across all served markets
    - Deliver attractive earnings per share and cash generation as defined in targeted business models
    - Monitor spending in line with growth initiatives and industry trends
    - Execute capital strategy that allows for appropriate business investments while returning value to shareholders
- Increase gross margins by deriving maximum value from enabling upgrades, system specials and product extensions while lowering cost through use of "Design for X" ("DFx") principles, right sourcing, and providing the industry's best products and services
- Expand beyond ion implant by launching identified corporate development growth initiatives

We continue to invest in research and development to ensure our products meet the needs of our customers. We take pride in our scientists and engineers who are adding to our portfolio of patents and proprietary technology to ensure that our investment in technology leadership translates into unique product advantages. We strive for operational excellence by focusing on ways to lower our product, manufacturing, and design costs and to improve our delivery times to our customers. Global customer teams and a focused account management structure maintain and strengthen our customer relationships and increase customer satisfaction. Finally, we endeavor to generate strong cash flows from operations and maintain a sufficient cash balance to ensure we continue to have the necessary capital to fund business growth.

Ion Implantation Systems

Ion implantation is a principal step in the transistor formation cycle of the semiconductor chip manufacturing process. Ion implantation is also used to change the material characteristics of the silicon or silicon carbide for reasons other than electrical doping, a process known as "material modification." An ion implanter is a large, technically advanced system that injects dopants such as arsenic, boron or phosphorus into a wafer. These dopants are ionized and therefore have an electrical charge state. This electric charge state allows the dopants to be accelerated, focused and filtered with electric and magnetic fields. Ion implanters use these fields to create a beam of ions with a precisely defined energy level (ranging between several hundred and eight million electron-volts) and with a precisely defined beam current level (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. Typical process flows require twenty implant steps, with the most advanced processes requiring substantially more steps. Each implant step is characterized by four key parameters: dopant type, dose (amount of dopant), energy (depth into the silicon) and tilt/twist (angle of wafer relative to the ion beam).

To efficiently cover the wide range of implant steps, three different broad categories of implanters have been developed, each targeted at a specific range of applications, primarily defined by dose and energy. The three traditional implanter categories are referred to as high current, high energy and medium current:

- High current implanters were the second type of implanter to emerge, having low energy capability and high dose range.
- High energy implanters emerged to address the need for deeper implants with a high energy range and low dose.
- Medium current implanters are the original model of ion implanter, with mid to low-range energy and dose capability.

Axcelis Ion Implanters

Axcelis offers a complete line of high energy, high current, and medium current implanters for all application requirements. Our Purion flagship systems are all based on a common platform which enables a unique combination of implant purity, precision, and productivity. Combining a state-of-the-art single wafer end station, with advanced spot beam architectures (that ensures all points across the wafer see the same beam condition at the same beam angle), Purion products enable exceptional process control to optimize device performance and yield, at high productivity.

In addition to the Purion family of ion implanters, the Company offers the Ovation™ family of multi-wafer, or "batch" implanters. These systems extend Axcelis' industry benchmark GSD platform into the future, delivering the highest reliability, serviceability, and lowest cost of operations. The Ovation configuration is designed to seamlessly integrate with the existing fleet of Axcelis batch implanters, while providing incremental performance improvements with updated components for long-term sustainability.

Beyond the traditional categories of implanters, Axcelis has developed systems designed for specific applications. For example, the Axcelis *Purion Power Series*, which provides full recipe coverage for power device applications critical to electric vehicles and industrial applications. The Purion Power Series is comprised of a group of high current, medium current and high energy implanters that optimize semiconductor devices created on SiC wafers, which is advantageous for certain power devices.

An overview of specific Axcelis ion implantation products is below:

- **High Current Ion Implant.** Our Purion H, Purion Dragon, Purion H200, and GSD/E2 Ovation spot beam, high current systems cover all traditional high current requirements as well as those associated with emerging and future devices. Our Purion high current capabilities extend beyond traditional high current energy and dose ranges, to cover new device fabrication requirements as well as to maximize capital utilization and flexibility. In addition, Axcelis' Purion systems provide advantages for material modification applications, including those requiring hot and cold implant capabilities.

- **High Energy Ion Implant**. Axcelis has been a market leader in high energy ion implanters for many years, and offers a range of new Purion systems which have differentiated capabilities for specialty applications as well as legacy high energy systems. Our Purion XE, EXE, and other Purion high energy systems combine Axcelis' production-proven RF Linac high energy, spot beam technology with the Purion platform wafer handling system. The Purion XE Power Series implanters include Purion XE and EXE models for high volume power devices aluminum implantation, available with 150mm SiC wafer handling or 200mm thin Si wafer handling. Our batch high energy systems include the GSD/HE Ovation implanter, a 10 stage Linac with energies up to 3 MeV and the GSD/VHE Ovation system, a 14 stage Linac with energies up to 4.9 MeV.

- **Medium Current Ion Implant.** Our Purion M Si and SiC medium current systems offer higher productivity and lower electrical energy consumption compared to competitive offerings, in addition to other advantages. With high energy capability far beyond competitive implanters, the Purion M is ideal for fabs at higher elevations or those dealing with heavy mass species. The Purion M is 20% more energy efficient than competing platforms, and is among the industry's lowest cost of ownership.

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

Aftermarket Support and Services

Through our CS&I business, we offer our customers extensive aftermarket service and support throughout the lifecycle of the equipment we manufacture. Approximately 3,300 of our products are in use in 28 countries worldwide. The service and support that we provide includes used tools, spare parts, equipment upgrades, and maintenance services. We offer varying levels of sales, service and application support out of our field offices. Revenue generated through our CS&I business of $235.3 million, $247.0 million, and $227.9 million represents 23.1%, 21.8% and 24.8% of total revenue in 2024, 2023 and 2022, respectively.

To support our aftermarket business, we have 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, and 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 several Business-to-Business options to support our customers' parts management requirements. Our Axcelis Managed Inventory service offering provides the customer with full spare parts support through a parts consignment arrangement in which Axcelis retains responsibility for the complete supply chain. These services provide ease of use alternatives that reduce order fulfillment costs and improve cycle time, resulting in an expanded customer base for this service offering.

Sales and Marketing

We primarily sell our equipment and services through our direct sales force. We conduct sales and marketing activities from our sales offices located in the United States, Taiwan, South Korea, China, Singapore, Japan, Germany and Italy.

International revenue, including export sales from our U.S. manufacturing facilities to foreign customers and sales by foreign subsidiaries and branches, accounted for 85.8%, 84.1% and 84.4% of total revenue in 2024, 2023 and 2022, respectively. In 2024, approximately 93.8% of our sales were denominated in U.S. dollars. See Note 17 to our Consolidated Financial Statements contained in Item 15 of this Annual Report on Form 10-K for a breakdown of our revenue and long-lived assets in the United States, Europe and Asia. See also Item 1A, "Risk Factors," for information about risks attendant to our foreign operations.

Customers

In 2024, according to Gartner Inc., the top 20 semiconductor chip manufacturers accounted for approximately 87.6% of total semiconductor capital equipment spending, which decreased from 92.0% in 2023. These manufacturers are from the largest semiconductor chip manufacturing regions in the world: the United States, Asia Pacific (Taiwan, South Korea, Singapore, Japan and China) and Europe.

Information on net sales to unaffiliated customers is included in Note 2 of Notes to Consolidated Financial Statements. For the year ended December 31, 2024, no customer represented 10% or more of our consolidated revenues.

U.S. export controls impact our ability to sell to certain customers in China, a country that has represented a significant portion of our sales in recent years. One of our major Chinese customers, Semiconductor Manufacturing International Corporation ("SMIC"), is on the U.S. Entity List, but is subject to a 2020 licensing policy that allows shipments to certain mature process SMIC fabs, which to date, we have been able to obtain. Other Chinese chipmakers are on the U.S. Entity List, without a similar policy allowing licensed shipments. In October 2022 (with modifications in 2023), the U.S. Commerce Department established an export controls regulatory framework for U.S. exports of semiconductor equipment to China. This framework limits all semiconductor equipment shipments to Chinese customers who are producing or developing logic, DRAM and NAND chips that meet specific advanced parameters. The U.S. Commerce Department implemented further regulatory changes in December 2024, creating a new Export Controls Classification Number for certain 300mm ion implanters and adding certain Chinese customers to the U.S. Entity List, some of which have a licensing policy that should allow us to continue to support them. While these regulations have further excluded exports to certain Chinese customers, we currently are able to continue to ship to substantially all of our Chinese customers. In general, however, sales to Chinese customers represent a higher risk than sales to customers in other international locations because of trade tensions between the U.S. government and the Chinese government, and other challenges reflecting China's stage of development and rapid growth. For example, the U.S. government has imposed tariffs on certain foreign products, including most recently from Canada, Mexico and China, that in the past have resulted in and may result in future retaliatory tariffs on U.S. goods and products. We cannot predict whether these policies will continue, or if new policies will be enacted, or the impact, if any, that any policy changes could have on our business.

Research and Development

Our industry continues to experience rapid technological change, requiring us to frequently introduce new products and enhancements. Our Beverly, Massachusetts Advanced Technology Center houses a process development laboratory with a 13,500 square feet class 10/100/1000 clean room for product demonstrations and process development and a 17,500 square feet customer training center. The Advanced Technology Center provides infrastructure and process capabilities that allow customers to test their unique process steps on our systems under conditions that substantially replicate the customers' production environments. This facility also provides significant capability for our research and development efforts.

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 use 3D, computer-aided design, finite element analysis and other computer-based modeling methods to test new designs and accelerate the technology innovation process.

Our expenses for research and development were $105.5 million, $96.9 million and $78.4 million in 2024, 2023 and 2022, respectively, or 10.4%, 8.6% and 8.5% of revenue, respectively.

Manufacturing

We manufacture products at our 417,000 square feet ISO 9001:2015, ISO 4001:2015 and ISO 45001:2018 certified plant in Beverly, Massachusetts as well as our 38,000 square feet ISO 4001:2015 and ISO 45001:2018 certified Axcelis Asia Operations Center in South Korea and our 101,800 square feet state-of-the-art logistics and flex manufacturing Axcelis Logistics Center in Beverly, Massachusetts. Our facilities employ 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 1,000/10,000 space to facilitate most of our manufacturing requirements.

Our core competency in manufacturing and supply chain management is built around system assembly and testing, 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 global partners and includes items such as vacuum systems, wafer handling and commodity-level components. We continuously pursue outsourcing opportunities where the economics are justified, with a goal of enabling quality and margin improvement. Our supply chain team is globally focused and is located in Beverly, South Korea and Singapore. Customized and commercially available software solutions drive our planning, purchasing and inventory tracking process.

The companies supplying Axcelis play a critical part in our success. We want to ensure these companies share our values and have adopted a Supplier Code of Conduct, which contains our expectation that our suppliers will comply with our Environmental Policy, our Corporate Social Responsibility Policy, and other industry standards and policies. Our Supplier Code of Conduct provides that if a supplier fails to comply with these policies, our business relationship with that company will be permanently severed, although a compliance remediation period of up to 90 days may be allowed.

Our 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 the "ship-from-cell" process 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 because of shorter factory cycle times and increased labor productivity.

Installation of our equipment is provided by factory and field teams. The process includes assembling the equipment at our installation site, and after it has been connected, recalibrating it to factory specifications.

Competition

The semiconductor equipment industry is highly competitive and is characterized by a small number of participants ranging in size. Significant competitive factors in the semiconductor capital equipment market include price, cost of ownership, equipment performance, customer support, capabilities, and breadth of product line.

In the market for ion implantation systems, we mainly compete against Applied Materials, Inc. ("Applied Materials"). Axcelis and Applied Materials are the only ion implant system manufacturers with a full range of implant products. Other implantation equipment manufacturers we compete with include Sumitomo Heavy Industries Ion Technology Co. Ltd. and Nissin Ion Equipment Co., Ltd in Japan, Advanced Ion Beam Technology, Inc. in Taiwan, as well as Kingstone Semiconductor and CETC Electronics Equipment Group Co., Ltd. in the People's Republic of China. Non-U.S. suppliers may have an advantage over U.S. suppliers under recently established U.S. export controls regulation for shipments to China. We also provide aftermarket service and parts to service our customers globally. In this market, there are many competitors, often based in the customer's location, offering alternatives to Axcelis services and certified products.

Intellectual Property

We rely on patent, copyright, trademark and trade secret protection in the United States and in other countries, as well as contractual restrictions, to protect our proprietary rights in our products and our business. As of December 31, 2024, we had 185 active patents issued in the United States and 349 active patents granted in other countries, as well as 160 patent applications (58 in the United States and 102 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. Trademark registrations generally remain in effect as long as the trademarks are in use. From time to time, we enter into license agreements with third parties under which we obtain or grant rights to patented or proprietary technology. We do not believe that any of our licenses are currently material to us.

Backlog

Systems backlog, including deferred systems revenue, was $645.8 million and $1,061.2 million as of December 31, 2024 and 2023, respectively. The systems backlog amount at December 2023 reflects a correction reported in our Form 8-K filed on November 6, 2024. 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 or customer prepayments. Our policy is to include in backlog only those system orders for which we have accepted purchase orders. All orders are subject to cancellations or rescheduling by customers with limited or no penalties.

Backlog does not include orders received and fulfilled within a quarter. Our backlog at the beginning of a quarter typically does not include all orders required to achieve our sales objectives for that quarter. Backlog is not necessarily an indicator of future business trends because orders for services or parts received during the quarter are generally performed or shipped within the same quarter.

Bookings in the quarter ended December 31, 2024 were $84.5 million compared to $235.5 million in the quarter ended December 31, 2023.

Human Capital

As of December 31, 2024, we had 1,524 employees and 39 agency temporary staff worldwide. During 2024, our total employee and temporary staff headcount decreased by approximately 8%. While the majority of our headcount is based in the U.S. at our main manufacturing facility in Beverly, Massachusetts, our business requires our presence where our customers are located around the world, resulting in Axcelis employees working in 28 different countries. Of our total year end 2024 employees and agency temporary staff, 1,081 work in North America, 396 in Asia and 86 in Europe.

Our future success largely depends upon our continued ability to attract and retain highly skilled employees. We provide competitive compensation and benefits programs. In addition to salaries, all Axcelis employees are eligible for cash incentive programs with annual payouts tied to annual financial metrics, as described in our proxy statements, with two exceptions: (i) certain sales staff receive commission and other sales compensation, and (ii) in order to provide greater certainty of compensation to lower level U.S. employees, we pay quarterly bonuses to those employees in amounts communicated at the start of the year. Beyond these basic forms of cash compensation, we offer recognition bonuses, equity awards, an Employee Stock Purchase Plan, a 401(k) plan with a competitive employer match, healthcare and insurance benefits, health savings and flexible spending accounts, paid time off, family leave, family care resources, flexible work schedules, employee assistance programs, and tuition assistance. These programs all contribute to both attracting and retaining a highly skilled employee base, including those with critical leadership and industry skills and experience.

During 2024, our voluntary turnover rate for employees was 9.1%, or 6.5% without retirements, below the worldwide technology industry (all reported) voluntary turnover average of 11.4% reported in the Aon 2024 Salary Increase and Turnover Study -- December 2024.

We also recognize that training is an important aspect of both employee retention and talent development. Axcelis conducts an annual talent review process and establishes individualized development programs agreed upon by employees and their managers. Human Resources provides training on personal development planning and leadership skills. All Axcelis employees have access to LinkedIn Learning to pursue independent training on business subjects. Our manufacturing staff each receives 35 hours of training upon commencement of employment, and our field service and other technical employees receive training on various ion implanter systems to develop product support, applications and service skills on all of our products. Finally, all staff are required to complete monthly, annual or biennial training on cybersecurity, various health and safety topics, and legal matters, such as the Foreign Corrupt Practices Act, export controls compliance, ethical business practices, and confidentiality. At a minimum, all Axcelis employees are required to complete at least 15 hours of training per year, and they can access additional voluntary training at the Company's expense.

The success of our business is fundamentally connected to the well-being of our people. Accordingly, we are committed to the health, safety, and wellness of our employees. We provide our employees and their families with access to health and wellness insurance and programs that offer choice where possible so they can customize their benefits to meet their needs and the needs of their families. Following the COVID-19 pandemic, we have maintained flexible working opportunities for those employees who can, and wish to, work remotely. This flexibility allows us to access workers who do not live near our facilities and provides a desired quality of life benefit to those who wish to work remotely for personal reasons.

Axcelis is dedicated to accessing a workforce that has the skills and qualities required for our jobs, fostering a culture built on the principle of inclusion, and maintaining a workplace free from discrimination. We strongly believe that a the experiences, perspectives and backgrounds of our entire workforce will lead to a better environment for our employees and better products for our customers. Axcelis' commitment extends to our Board of Directors, our leadership team and all teams and functions across our global locations.

We encourage you to review our 2024 ESG Report (located in the "ESG Hub" under the "Investors" section of our Axcelis.com website). Nothing on our website, including our ESG Report or sections thereof, shall be deemed incorporated by reference into this Annual Report on Form 10-K.

Environmental

Axcelis is deeply committed to our role as a responsible corporate citizen and dedicated to our Environmental, Social, Governance ("ESG") and Net Zero commitments. In 2022, Axcelis became a founding member of the Semiconductor Climate Consortium ("SCC") of Semiconductor Equipment and Materials International ("SEMI"), our industry organization serving the manufacturing supply chain for the micro- and nano-electronics industries. In doing so, we expect to bolster our own sustainability work with the power of the semiconductor ecosystem. By collaborating with

SCC member companies' joint knowledge and innovative technologies, Axcelis hopes to promote progressive action towards climate change.

We are proud that our Power Series ion implantation systems have become enabling technology for the production of power management devices, which are critical to the electrification of vehicles, an important component of our society's actions to address climate change.

Additional disclosures regarding our environmental initiatives and goals can be found in our 2024 ESG Report located in the "ESG Hub" under the "Investors" section of our Axcelis.com website.

We are proud of our commitment to improving our environment. Axcelis is 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 that our operations are in 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 9001:2015, ISO 14001:2015, and ISO 45001:2018 certified at our Beverly, Massachusetts facility and ISO 14001:2015 and ISO 45001:2018 at our Asia Axcelis Operations Center.

Information about our Executive Officers

Russell J. Low, Ph.D., 54, became Axcelis' CEO in May 2023, also joining the Company's Board of Directors at that time. Dr. Low joined Axcelis in October 2016, first serving as Executive Vice President, Engineering and then as Executive Vice President, Global Customer and Engineering Operations effective January 2021. Prior to joining the Company, Dr. Low held the position of Vice President of Engineering, MOCVD Business Unit at Veeco Instruments since 2013, prior to which he was Veeco's Senior Director of Engineering, Molecular Beam Epitaxy Business Unit beginning in 2012. From 2003 to 2012, Dr. Low held a number of positions at Varian Semiconductor Equipment Associates, most recently as Director of Technology. Prior to that, Dr. Low held engineering positions in the thermal processing and ion implant divisions of Applied Materials, Inc. Dr. Low joined the North American Advisory Board (NAAB) of SEMI International in 2023. He is also a member of the Massachusetts High Tech Council.

James G. Coogan, 44, joined Axcelis as Executive Vice President and CFO in September 2023. Mr. Coogan brings more than 20 years of finance, accounting, and investor relations experience across multiple industries, most recently in aerospace and defense. Mr. Coogan joins Axcelis after serving as Senior Vice President, Chief Financial Officer at Kaman Corporation, a leading provider of aerospace and defense products. During his 15 years with Kaman, he held various management positions including Vice President, Investor Relations and Corporate Development, Assistant Vice President, External Reporting and SEC Compliance, and Director, External Reporting and SEC Compliance. After starting his career at PwC, he held several financial management roles at Ann Taylor Stores Corporation and Mohegan Tribal Gaming Authority before joining Kaman.

Gerald M. Blumenstock, 56, became Axcelis' Executive Vice President, Research, Development and Engineering in June 2023 leading product development, engineering and R&D. With over 30 years of experience in technology, primarily in the semiconductor capital equipment industry, Mr. Blumenstock brings a unique blend of leadership, technical and business skills gained over a distinguished career. Immediately before joining Axcelis, Mr. Blumenstock was self-employed as a management consultant from 2022 to 2023. Prior to that, Mr. Blumenstock led multiple product business groups as Senior Vice President and General Manager at Veeco Instruments and Vice President and General Manager at Advanced Energy from 2020 to 2022 and as Senior Vice President and General Manager at Veeco Instruments from 2011 to 2020. Additionally, Mr. Blumenstock held the role of Chief Marketing Officer at Veeco directing a corporate rebrand. Prior to that, Mr. Blumenstock held Senior Director level business roles at KLA, Cymer (ASML) and FormFactor, bringing several new products to market. Mr. Blumenstock began his career as an Optics & Materials Engineer at SVGL (ASML) and NASA.

Eileen J. Evans, Esq., 57, joined Axcelis as Executive Vice President and General Counsel in December 2024. Ms. Evans brings more than 25 years of legal and technology business experience to Axcelis, including commercial transactions, merger and acquisition integration, intellectual property, compliance, and corporate matters. Before joining Axcelis, from October 2022 to December 2024, she served as Chief Legal Officer at SunPower, a solar and energy services provider in North America, whose key assets were acquired by Complete Solaria, Inc. From July 2021 to October 2022, Ms. Evans held the top legal job at Redaptive, a tech-enabled sustainability-as-a-service company. Prior to that, from September 2017 to July 2021, she served as Deputy General Counsel at Micro Focus International, a British multinational software and information technology business and before that, as Vice President and Deputy General Counsel at Hewlett Packard Enterprise and Hewlett-Packard Company and Associate General Counsel at Oracle Corporation and Sun Microsystems, Inc. Ms. Evans earned her Juris Doctor from the University of California, Davis and her Bachelor of Arts in Political Science from the University of California, Berkeley. She currently serves on the Board of Directors for the Linux Foundation.

Gregory F. Redinbo, Ph.D., *60*, is our Executive Vice President, Marketing and Applications, a position he assumed in September 2022. He joined Axcelis in 2021 as Senior Vice President of Strategic Marketing and Business Development. Dr. Redinbo has over 25 years of experience in the semiconductor capital equipment industry. Prior to joining Axcelis, he held the position of Vice President, Global Strategic Accounts at ASML from 2017 to 2020, where his focus was on business and relationship growth with a leading logic manufacturer and prior to that was Global Vice President of Sales, Service and Applications at FEI, a microscopy solutions company, where he worked from 2012 to 2017. Dr. Redinbo's past positions also include Director of Sales, US and Europe, and Director of Product Marketing, High Current Products at Varian Semiconductor and Product Management in the Thermal Processing Division at Applied Materials.

Christopher J. Tatnall, Ph.D., 52, became Axcelis' Executive Vice President, Global Customer Operations in September 2023. In this capacity, Dr. Tatnall is responsible for Worldwide System Sales and Sales Operations, Global Service, Support and Training and the Axcelis Customer Solutions organization. Dr. Tatnall joined Axcelis in March 2022 as Senior Vice President of Sales. Prior to joining Axcelis, he was Vice President and General Manager at MKS Instruments, Plasma and Reactive Gas Division from May 2018 to March 2022, where he led a cross functional team of over 200 members with multiple product lines with both semiconductor and industrial applications. Prior to that, Dr. Tatnall was Senior Director of Customer Operations at Brooks Automation, Semiconductor Sales Manager at Alcatel Vacuum Technology, and Development Engineer at Edwards Vacuum.

Item 1A. Risk Factors.

Risks Related to Our Business and Industry

Set forth below and elsewhere in this Annual Report on Form 10-K and in other documents we file with the SEC are risks and uncertainties that could cause actual results to differ materially from the results contemplated by the forward-looking statements contained in this Annual Report on Form 10-K. It is not possible to predict or identify all such risk factors. Consequently, the following is not a complete discussion of all potential risks or uncertainties.

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

New systems orders and used tool sales depend upon demand from semiconductor chip 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. In addition, all or a portion of the demand for increased capacity may be satisfied by a semiconductor chip manufacturer's ability to reconfigure and re-use equipment they already own. Revenue decline also hurts our profitability because our established 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.

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

Rapid technological changes in semiconductor chip 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. This will depend upon a variety of factors, including new product selection, timely and efficient completion of product design and development as well as manufacturing and assembly processes, product performance in the field and effective sales and marketing. In particular:

- We must continue to develop competitive technical specifications for 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 higher manufacturing costs, delays in acceptance and payment and additional service and warranty expenses, and ultimately, a lack of repeat orders.
- 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.

Axcelis is subject to the risks of operating internationally: 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, accounted for 85.8% of total revenue in 2024. Customers based in Asia dominate our international sales. Ion implanter system shipments to customers in Asia represented 81.0% of total system revenue in 2024. We anticipate that international sales will continue to account for a significant portion of our revenue. In particular, we expect that sales to Chinese customers (both global and domestic Chinese chip manufacturers) will continue to represent a significant portion of our total sales, creating both risk and opportunity.

U.S. export controls on shipments to Chinese customers have been notably increasing since 2020. Since the placement of SMIC on the U.S. Entity List in 2020, we are required to obtain export control licenses to ship to mature process SMIC fabs, which to date, we have been able to obtain. Other chipmakers have been placed on the Entity List, some with, and some without, a similar policy allowing licensed shipments on specified conditions. A new export controls regulatory framework issued by the U.S. in October 2022 and supplemented in 2023, prohibits all semiconductor equipment shipments to Chinese customers (other than certain multi-nationals) who are producing or developing logic, DRAM and NAND chips meeting specific advanced parameters. While these regulations have further excluded exports to certain Chinese customers, we currently are able to continue to ship to the majority of our Chinese customers. In general, however, continuing revenue from Chinese customers is at higher risk than continuing revenue form customers in other international locations because of trade tensions between the United States government and the Chinese government, and other challenges reflecting China's stage of development and rapid growth.

Increased U.S. export controls and other political and trade tensions exacerbate the risk that Chinese customers will change suppliers to non-U.S. vendors, such as Advanced Ion Beam Technology, Inc., Nissin Ion Equipment Co., Ltd. and Sumitomo Heavy Industries Ion Technology Co., Ltd. In addition, two Chinese entities, known as Kingstone Semiconductor and CETC Electronics Equipment Group Co., Ltd., are developing ion implanters for the Chinese domestic market. The loss of a significant customer or any reduction or delays in our ability to ship to any significant customer will adversely affect us.

We source a substantial portion of our materials from outside of the United States. Because of our dependence upon international sales and our global supply chain, our results and prospects may be adversely affected by a number of factors, including:

- changes in laws or regulations resulting in more burdensome governmental controls, tariffs, restrictions, embargoes or export license requirements;
- volatility in currency exchange rates;
- political and economic instability;
- global health emergencies, such as pandemics have the potential to disrupt our manufacturing operations and those of our supply chain, as well as cause our customers to delay or cancel shipments;
- difficulties in accounts receivable collections;
- extended payment terms beyond those customarily offered in the United States;
- difficulties in managing suppliers, service providers or representatives outside of the United States;
- difficulties in staffing and managing foreign subsidiary operations; and
- potential adverse tax consequences.

The U.S. government has proposed or enacted tariffs and substantial changes to trade policies, which could adversely affect our business. For example, the U.S. government has imposed tariffs on certain foreign products, including most recently from Canada, Mexico and China, that in the past have resulted in and may result in future retaliatory tariffs on U.S. goods and products. We cannot predict whether these policies will continue, or if new policies will be enacted, or the impact, if any, that any policy changes could have on our business.

Our dependence upon 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 a limited group of suppliers. Accordingly, based on situations outside of our control, 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, negatively impacting our gross margin.

The manufacture of some of these components and sub-assemblies is an extremely complex process and requires long lead times. As a result, we could 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.

Moreover, if actual demand for Axcelis' products is different than expected, Axcelis may purchase more or fewer parts than necessary or incur costs for canceling, postponing, or expediting delivery of parts. If Axcelis purchases inventory in anticipation of customer demand that does not materialize, or if customers reduce or delay orders, Axcelis may incur excess inventory charges.

A significant portion of our revenue depends on customers electing to buy aftermarket products and services from Axcelis.

Historically, a significant portion of our product revenue and all of our service revenue relates to our sale of "aftermarket" products and services, which include parts, consumables, upgrades, service contracts, and time and materials billings. Some of our customers purchase fewer aftermarket products and services, often training their own staff to maintain and service semiconductor capital equipment rather than relying on the equipment manufacturer for these services. In addition, we compete against third-party parts suppliers for the sale of parts and consumables that are not protected by patents or otherwise proprietary. To the extent our customers purchase parts and services from other vendors or provide their own system maintenance labor, our revenue and profitability will be reduced.

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

The ion implant segment is highly competitive and includes one company with substantially greater financial, engineering, manufacturing, marketing and customer service and support resources that may better position it to compete successfully than we can, as well as several smaller companies that could provide innovative systems with technology that may have performance advantages. 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. Finally, if we must lower prices to remain competitive without commensurate cost of goods savings, our gross margin and profitability will be adversely affected.

We are dependent on sales to a limited number of large customers; the loss of a significant customer 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 semiconductor chip manufacturers. In 2024, our top ten customers accounted for 45.9% of our net sales, in comparison to 51.7% and 59.4% in 2023 and 2022, respectively. None of our customers have entered into a long-term agreement requiring it to purchase our products. Our customers located in China represent a significant portion of our revenue, and are subject to U.S. export controls restrictions, as discussed above. 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 will adversely affect us. Consolidation of semiconductor chip manufacturers may result in the loss of a customer.

Our international operations involve currency risk.

Substantially all of our system sales are billed in U.S. dollars. We also pay almost all non-U.S. vendors providing materials, components, and subassemblies to our U.S. factory in U.S. dollars. Aftermarket revenues of our non-U.S.

subsidiaries are denominated in both local currency and U.S. dollars. The majority of operating expenses of these non-U.S. subsidiaries, are received and incurred in local currencies. The establishment of the Axcelis Asia Operations Center in South Korea has increased the volume of our transactions in non-U.S. dollar currencies and increased the impact of foreign exchange gain / loss on the Company's financial results. The Company experiences translation adjustments when local currency accounts payable on non-U.S. subsidiary books are re-measured for consolidated financial reporting. Similarly, the translation of long-term asset and liability values to U.S. dollars are recorded in stockholders' equity as an element of accumulated other comprehensive income (loss). The value of the asset or liability in U.S. dollars will increase or decrease relative to the local currency based on changes in the exchange rate between the two currencies over the period. As a result, any unplanned non-cash gains or losses are recorded in the Company's consolidated financial statements. Accordingly, fluctuations in exchange rates can impact reported revenues, expense, and profitability and asset values in our Consolidated Financial Statements. During the year ended December 31, 2024, approximately 6.2% of our revenue was derived in local currencies from foreign operations with this inherent risk. In addition, at December 31, 2024, our operations outside of the United States accounted for approximately 9.2% of our total assets, the majority of which was denominated in currencies other than the U.S. dollar.

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, both in the Boston metropolitan area and 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 experience insufficient levels of staffing to fully 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 financial results may fluctuate significantly.

We derive our new systems revenue from the sale of a small number of expensive products to a relatively small number of customers. The selling prices on our ion implant systems range from approximately $2.6 million to $12.0 million. We also sell used equipment in our aftermarket business. Each sale, or failure to make a sale, may have a significant 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, warranty costs and the impact of changes to inventory reserves. New product introductions may also affect our gross margin. Fluctuations in our financial results may have an adverse effect on the price of our common stock.

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

Management may from time to time provide financial forecasts to investors. These forecasts are based on assumptions, which are believed to be reasonable when made, of the timing of system orders, system shipments, system acceptance and aftermarket revenue. Any of these assumptions can prove erroneous and 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 revenue 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 systems on previous orders as scheduled during that quarter, receiving customer acceptance of previously shipped products, and obtaining new orders for products and services to be provided within that same quarter. Any delay in, or cancellation of, scheduled shipments and customer acceptances or in revenue from new orders, including aftermarket revenue, could materially affect our financial results.

Accounting rules addressing revenue recognition add more complexity in forecasting quarterly revenue and profitability. Orders for our products usually contain multiple performance obligations 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 forecasted financial performance may have an adverse effect on the price of our common stock.

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

The semiconductor industry is 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 device industry produce an oversupply of semiconductors. This can cause a reduced demand for capital equipment such as our products, negatively impacting our sales and level of profitability. 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 do not fluctuate with changes in volume. Significant decreases in revenue can therefore have a disproportionate effect on profitability. In addition, reduced demand for our products and services may require Axcelis to implement cost reduction efforts, including restructuring activities, which may adversely affect Axcelis' ability to capitalize on opportunities that arise in the future.

Axcelis is exposed to risks related to cybersecurity threats and incidents.

In the conduct of our business, Axcelis collects, uses, transmits, and stores data on information technology systems. This data includes confidential information belonging to Axcelis, our employees or our customers or other business partners, some of which is personally-identifiable information of individuals. As reported in the 2024 Verizon Data Breach Investigation Report, cyber-attacks in the manufacturing industries are almost entirely financially motivated. Axcelis has been and expects to continue to be subject to cybersecurity threats and incidents, including through employee error or misuse; individual attempts to gain unauthorized access to information systems; and sophisticated and targeted measures known as advanced persistent threats, none of which have had a material impact on the Company to date.

Axcelis implements a "Layered Security Strategy" that aligns with National Institute of Standards and Technology Cybersecurity Framework. To do so, we devote resources to network security, data encryption, employee training and other measures to protect our systems and data from unauthorized access or misuse. This includes continuously monitoring and reacting to the cybersecurity environment, by implementing best-in-class solutions from several vendors. On an on-going basis, we engage a cybersecurity consultant to validate and advise on the Company's cyber landscape and to drive employee vigilance through employee cyber training and messaging. We continually replace less secure legacy systems to improve internal and external cyber defenses and maintain a cyber incident response plan including reporting and recovery processes. See Item IC "Cybersecurity" below. In addition, as discussed in our proxy statement, the Audit Committee and the full Board of Directors receive quarterly reports on cybersecurity risks and annual reports on management initiatives to promote cybersecurity.

However, depending on their nature and scope, cybersecurity incidents could result in business disruption; the misappropriation, corruption or loss of confidential information and critical data (Axcelis' and that of third parties); reputational damage; unnecessary expense; litigation with third parties; diminution in the value of Axcelis' investment in research, development, and engineering; data privacy issues; and increased cybersecurity protection and remediation costs. These adverse outcomes could negatively impact our revenues, expenses, profitability, and asset values.

Axcelis is subject to risks associated with compliance with environmental, health and safety regulations.

Axcelis is subject to environmental, health and safety regulations in connection with its global business operations, including but not limited to: regulations related to the development, manufacture, shipping, and use of its products; handling, discharge, recycling and disposal of hazardous materials used in its products or in producing its products; the operation of its facilities; and the use of its real property. The failure or inability to comply with existing or future environmental and safety regulations could result in: significant remediation or other legal liabilities; the imposition of penalties and fines; restrictions on the development, manufacture, sale, shipment or use of certain of its products; limitations on the operation of its facilities or ability to use its real property; and a decrease in the value of its real property. Axcelis could be required to alter its manufacturing and operations and incur substantial expense in order to comply with environmental, health and safety regulations. Any failure to comply with these regulations could subject Axcelis to significant costs and liabilities that could adversely affect Axcelis' business, financial condition, and results of operations.

Our financial condition and results of operations could be adversely affected by global pandemics.

Global pandemics have in the past and may again in the future cause disruptions and restrictions on our operations and ability to travel, and similar disruptions and restrictions impacting our suppliers or customers could adversely affect our sales and operating results. Axcelis' products rely on an extensive global supply chain, and shortages of certain parts could impact our ability to meet customers' shipment expectations, negatively affecting our revenues. Such pandemics may drive changes in the demand for certain of our customers' products, resulting in their delay or cancelation of purchases from us. The extent to which pandemics may impact our results will depend on future developments, which are highly uncertain and cannot be predicted.

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 challenge, design around or legitimately use the proprietary technology embedded in our systems or other technology or information used in our business. If this occurs, the value of our proprietary technology will be diminished. Our means of protecting our proprietary rights may not be adequate and our patents may not be sufficient to prevent others from using technology that is similar to or the same as our technology. Patents issued to us may 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 invalidation or 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 or claims of infringement with respect to such technology 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 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 may 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 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 remove certain features from our products or seek costly licenses from third parties or 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 to be disrupted at Axcelis' manufacturing facilities, it would have a negative impact on our business.

Our primary manufacturing facility is located in Massachusetts, with a smaller facility located in South Korea. Our operations could be subject to disruption for a variety of reasons, including, but not limited to severe weather events, other effects of climate change, 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.

If we do not have access to capital on favorable terms, on the timeline we anticipate, or at all, our financial condition and results of operations could be materially adversely affected.

We require a substantial amount of capital to meet our operating requirements and remain competitive. We routinely incur significant costs to purchase inventory to meet expected system sales, to develop and introduce new products, and to place evaluation systems at new customer sites. There can be no assurance that we will realize a return on the capital expended. Although our current cash levels and borrowing capacity are expected to be adequate for our foreseeable cash requirements, if our operating results falter, or our cash flow or capital resources prove inadequate, we may incur debt to fund these requirements. Significant volatility or disruption in the global financial markets may result in us not being able to obtain additional financing on favorable terms, on the timeline we anticipate, or at all, and we may not be able to refinance, if necessary, any outstanding debt when due, all of which could have a material adverse effect on our financial condition. Any inability to obtain financing on favorable terms, on the timeline we anticipate, or at all, may cause us to curtail our operations significantly, reduce planned capital expenditures and research and development, or obtain funds through arrangements that management does not currently anticipate, including disposing of our assets and relinquishing rights to certain technologies, the occurrence of any of which may significantly impair our ability to remain competitive, and materially and adversely affect our results of operations and financial condition.

The market price of our common stock may be volatile, which could result in substantial losses for investors.

The stock markets in general, and the markets for semiconductor equipment stocks in particular, have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. These broad market fluctuations may adversely affect the trading price of our common stock. The market price of the common stock may also fluctuate significantly in response to the following factors, among others, some of which are beyond our control:

- variations in our quarterly results;
- the issuance or repurchase of shares of our common stock;
- changes in securities analysts' estimates of our financial performance;
- changes in market valuations of similar companies;
- announcements by us or our competitors of significant contracts, acquisitions, strategic partnerships, joint ventures, capital commitments, new products or product enhancements;
- loss of a major customer or failure to complete significant transactions;
- additions or departures of key personnel; and
- new positions adopted by investor stewardship groups and proxy advisory firms regarding desired environmental, social and governance disclosures, policies, ranking systems, and other initiatives.

The trading price of our common stock in the past has been significantly volatile, and we cannot accurately predict every potential risk that may materially and adversely affect our stock price.

We operate in jurisdictions with complex and changing tax laws.

We are also subject to laws and regulations in various jurisdictions that determine how much profit has been earned and when it is subject to taxation in that jurisdiction. In the United States, for example, the Inflation Reduction Act (IRA) imposes a 15% book minimum tax on corporations with three-year average annual adjusted financial statement income exceeding $1 billion. To date, the IRA has not materially impacted our effective tax rate.

Corporate tax reform, anti-base-erosion rules and tax transparency continue to be high legislative or regulatory priorities in many jurisdictions. Changes in laws and regulations regarding these matters could impact the jurisdictions where we are deemed to earn income, which could in turn adversely affect our tax liability and results of operations. As of December 31, 2024, 54 countries have enacted various aspects of the Organization for Economic Co-operation and Development's Base Erosion and Profit Shifting 2.0 Pillar Two global minimum tax (GMT). In 35 of those countries, the GMT is effective beginning in 2024. Based on currently enacted law and countries we operate in, the impact of GMT on our 2024 results did not have an impact on our business.

Item 1B. Unresolved Staff Comments.

None.

Item 1C. Cybersecurity.

Axcelis implements an enterprise risk management ("ERM") process in which management annually identifies and reviews the principal risks to which the Company's business is subject, rating each risk in terms of likelihood of occurrence and severity of impact. Risks that have either a high likelihood or a high potential impact on our business are assessed quarterly with respect to the trend (an increasing or decreasing risk) and whether additional mitigation actions are needed. These quarterly risk assessments are shared with our Board of Directors, with the Audit Committee reviewing any changes in risk identification or ranking on an annual basis.

Cybersecurity risks are integrated into our overall ERM, and our Chief Information Officer assesses the trends and need for additional mitigations on a quarterly basis. Our main concerns are (i) the unauthorized exfiltration of personal information pertaining to Axcelis employees, (ii) the unauthorized exfiltration of confidential business or technical information, and (iii) an inability to use our business systems for a period of time following a cybersecurity event.

Management has adopted a Cybersecurity Incident Response plan which lays out the roles of IT personnel, senior leadership, and legal resources in responding to a cybersecurity incident. This plan is shared with our Board of Directors and reviewed annually. These risks could materially impact the business of the Company. To date, the Company has not experienced a material cybersecurity incident.

To implement risk management and protective strategies, management implements a "Layered Security Strategy" that aligns with National Institute of Standards and Technology Cybersecurity Framework. We consider the various factors that can play a role in the occurrence of a cybersecurity incident, such as:

- Unauthorized system access
- User errors
- Undetected system vulnerabilities
- Mobile device risks
- Vulnerabilities in software applications and specific hardware
- Third party cybersecurity risks
- Insider threats

Management has implemented specific mitigation strategies for each of these factors, such as (i) user training to avoid fraud and other scams, (ii) utilizing multi-factor authentication processes for system access, (iii) engaging in vulnerability scanning applications, (iv) upgrading software and hardware to those with the greatest security protections, and (v) ensuring third parties to whom sensitive information is provided have appropriate security. Management has also developed a vendor assessment form to evaluate potential "Software as a Service" providers, which is incorporated in the Company's RFP processes. The Company routinely obtains and reviews SOC 2 reports from third parties who have access to the Company's information, some of which are part of management's internal controls over financial reporting. The

Company accesses cybersecurity consultants and legal counsel to assist in the identification of vulnerabilities and advise on appropriate mitigation and preparedness actions.

Overall, we devote resources to network security, data encryption, employee training and other measures to protect our systems and data from unauthorized access or misuse. This includes the emerging need to protect our data from the unauthorized incorporation in large language models or other artificial intelligence systems. The Audit Committee and full Board of Directors receive quarterly reports on cybersecurity risks and annual reports on management initiatives to promote cybersecurity.

Item 2. Properties.

We lease our principal facility in Beverly, Massachusetts, which comprises 417,000 square feet. The facility is used for manufacturing, research and development, sales/marketing, customer support, advanced process development, product demonstration, customer-training center and corporate headquarters. We also lease our Axcelis Asia Operations Center in South Korea, which comprises 38,000 square feet and is principally used for manufacturing, and the Axcelis Logistics Center, a state-of-the-art logistics and flex manufacturing center with 101,800 square feet built to our specifications, in Beverly, Massachusetts.

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.

We own 23 acres of undeveloped property in Beverly, Massachusetts, adjacent to our headquarters.

As of December 31, 2024, we also leased 47 other properties, of which 10 are located in the United States and the remainder are located in Asia and Europe, including offices in Taiwan, Singapore, South Korea, China, Japan, Italy and Germany. These properties are used for sales, service and warehousing.

Our Beverly, Massachusetts facility is ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018 certified, our European office is ISO 9001:2015 certified, and our Asia Axcelis Operations Center is ISO 14001:2015 and ISO 45001:2018.

Item 3. Legal Proceedings.

We are not presently a party to any litigation that we believe might have a material adverse effect on our business operations. We are, from time to time, a party to litigation that arises in the normal course of our business operations.

Item 4. Mine Safety Disclosures.

Not applicable.

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. As of February 23, 2025, we had approximately 668 stockholders of record.

The following table summarizes the stock repurchase activity for the 12 months ended December 31, 2024 pursuant to our stock repurchase program:

	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Program	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Program
	(in thousands except per share amounts)			
January 1 through January 31	60	$124.72	60	$ 182,523
February 1 through February 29	62	$121.31	62	175,007
March 1 through March 31	—		—	175,007
April 1 through April 30	78	$103.33	78	166,999
May 1 through May 31	63	$110.03	63	160,011
June 1 through June 30	—		—	160,011
July 1 through July 31	70	$137.48	70	150,387
August 1 through August 31	48	$111.33	48	145,011
September 1 through September 30	—		—	145,011
October 1 through October 31	104	$96.23	104	135,003
November 1 through November 30	59	$85.37	59	130,012
December 1 through December 31	—		—	$ 130,012
Total	544		544	

We currently maintain one equity compensation plan, the 2012 Equity Incentive Plan (the "2012 Equity Plan"). The number of shares issuable upon vesting of outstanding restricted stock units granted to employees and non-employee directors, as well as the number of shares remaining available for future issuance, under the 2012 Equity Plan and our 2020 Employee Stock Purchase Plan as of December 31, 2024 are summarized in the following table:

Plan category	**(A)** **Number of shares to be issued upon exercise of outstanding options, warrants and rights (1)**	**(B)** **Weighted-average exercise price of outstanding options, warrants and rights (2)**	**(C)** **Number of shares remaining available for future issuance under equity compensation plans (excluding shares reflected in column (A)) (3)**
Equity compensation plans approved by stockholders	464,904	$ -	1,299,342
Equity compensation plans not approved by stockholders	—	N/A	N/A
Total	464,904		1,299,342

(1) Represents 464,904 shares issuable on vesting of outstanding RSUs under the 2012 Equity Plan (some of which will be withheld in respect of tax withholding obligations).
(2) For the purposes of this table, the weighted-average exercise price of outstanding options, warrants and rights includes RSUs as if they had a $0.00 exercise price.
(3) Represents the total shares available for issuance under our 2012 Equity Plan and our 2020 Employee Stock Purchase Plan, as of December 31, 2024, as follows:

(A) 419,955 shares were available for future issuance under the 2012 Equity Plan. Such amount represents the total number of shares reserved for issuance under the 2012 Equity Plan ((7,762,500 shares approved by the shareholders, plus 1,777,029 shares added in accordance with the terms of the 2012 Equity Plan as a result of the expiration or forfeiture of awards granted under our prior equity grant plan that were outstanding at the time of the adoption of the 2012 Equity Plan), less the shares issuable on options and restricted stock units (counted at 1.5 shares each) outstanding under the 2012 Equity Plan included in column (A)) and the shares issued prior to such date on exercise of options and vesting of restricted stock units granted under the 2012 Equity Plan. This plan is generally used for grants to employees and directors and was initially approved by our stockholders at our 2012 annual meeting.

(B) 879,387 shares were available under our 2020 Employee Stock Purchase Plan, which represents the total number of shares reserved for issuance under the plan (1,000,000) less the shares purchased through December 31, 2024.

Item 6. [RESERVED]

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 Annual Report on 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 cyclical swings in capital spending by semiconductor chip manufacturers. Capital spending is influenced by demand for semiconductors and the products using them, the utilization rate and capacity of existing semiconductor chip manufacturing facilities and changes in semiconductor technology, all of which are outside of our control. As a result, our revenue may fluctuate from year to year and period to period. Our established cost structure does not vary significantly with changes in volume. We may also experience fluctuations in operating results and cash flows depending on our revenue level.

Revenue for 2024 was $1,017.9 million, compared to $1,130.6 million in 2023. Systems revenue for 2024 was $782.6 million, compared to $883.6 million in 2023. Gross margin percent for the year was 44.7% compared to 43.5% in 2023. Operating profit was $210.8 million in 2024, compared to $265.8 million in 2023. Net income for the year was $201.0 million, compared to $246.3 million in 2023.

The Company is in a strong competitive position. A focused strategy on ion implant, combined with the hard work and dedication of our employees and the encouragement and support of our customers and suppliers, enabled us to achieve numerous critical milestones in our drive to market leadership. Important accomplishments in 2024 included:

- We delivered revenue of $1,017.9 million in 2024 and earnings per share of $6.15.
- We remained a technology leader and supplier of choice in the implant-intensive power device segment, which accounted for 56% of the value of our 2024 system shipments.
- We continued working to expand our footprint with existing and new customers and currently have two Purion evaluation systems in the field at strategic customer sites in key market segments.
- We continued our investment in our Customer Solutions & Innovation ("CS&I") aftermarket business to drive financial growth and increased customer satisfaction levels, including the "Digital Tool Box," an innovative service offering with online training, remote diagnosis and install, and automated troubleshooting guide.
- We received 22 customer satisfaction awards in 2024. In addition, Axcelis was named to both the 2023 and 2024 editions of Forbes' List of America's Best Mid-Cap Companies and to both the Fortune Magazine's 2023 and 2024 lists of the Top 100 Fastest Growing Companies.

We continue to work diligently to ensure that manufacturing and operating expense levels remain well aligned to business conditions.

The market for our systems and aftermarket products and services is represented by a relatively small number of companies. In 2024, the top 20 semiconductor chip manufacturers accounted for approximately 87.6% of total semiconductor capital equipment spending, down from 92.0% in 2023. Our net revenue from our ten largest customers accounted for 45.9% of total revenue for the year ended December 31, 2024 compared to 51.7% and 59.4% of revenue for the years ended December 31, 2023 and 2022, respectively. For the year ended December 31, 2024, no customers represented ten percent or more of total revenue.

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 and assumptions. 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. For additional accounting policies, see Note 2 to the consolidated financial statements for the year ended December 31, 2024 included in this Annual Report on Form 10-K.

Revenue Recognition

Our accounting policies relating to the recognition of revenue require management to make estimates, determinations and judgments based on historical experience and on various other assumptions, which include (i) the existence of a contract with the customer, (ii) the identification of the performance obligations in the contract, (iii) the value of any variable consideration in the contract, (iv) the standalone selling price of multiple obligations in the contract, for the purpose of allocating the consideration in the contract, and (v) determining when a performance obligation has been met. Our revenue recognition policies are set forth in section (j) of Note 2, Summary of Significant Accounting Policies, to the consolidated financial statements for the year ended December 31, 2024 included in this Annual Report on Form 10-K. Recognition of revenue based on incorrect judgments, including an erroneous allocation of the estimated sales price between the units of accounting, could result in inappropriate recognition of revenue, or incorrect timing of revenue recognition, which could have a material effect on our financial condition and results of operations.

Inventory—Provision for Excess and Obsolescence and Lower of Cost or Net Realizable Value

We record a provision for estimated excess and obsolete inventory and lower of cost or net realizable value. The provision is determined using management's assumptions of materials usage, based on estimates of forecasted and historical demand and market conditions. Specifically, our assumptions of forecasted system sales and the size and utilization of the installed base of systems may have a significant effect on estimated materials usage. 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 determine that inventory needs to be written down, we will recognize such costs in our cost of revenue at the time of such determination. If we subsequently sell product that has previously been written down, our gross margin in that period will be favorably impacted.

Product Warranty

We generally offer a one-year warranty for all of our systems, 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 relative 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.

Income Taxes

We record 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 basis, and net operating loss and tax credit carryforwards.

We establish a valuation allowance when it is more likely than not that some portion or all of the deferred tax assets will not be realized. Significant management judgment is required in determining our provision for income taxes, the deferred tax assets and liabilities and any valuation allowance recorded against those net deferred tax assets.

We evaluate the weight of all available evidence such as historical losses, the expected timing of the reversals of existing temporary differences and projected future taxable income 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.

Our income tax expense includes 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. We recognize accrued interest related to unrecognized tax benefits as interest expense and penalties as operating expense.

Results of Operations

The following year-to-year comparative statements include the 2024 and 2023 year periods. For comparative statements for the 2023 and 2022 periods, please refer to our 2023 Annual Report on Form 10-K, filed with the Securities and Exchange Commission on February 23, 2024, as amended by Amendment No. 1 thereto, filed with the Securities and Exchange Commission on February 28, 2024.

The following table sets forth our results of operations as a percentage of total revenue:

	Year ended December 31,	
	2024	2023
Revenue:		
Product	96.0 %	96.9 %
Services	4.0	3.1
Total revenue	100.0	100.0
Cost of revenue:		
Product	51.5	53.8
Services	3.8	2.7
Total cost of revenue	55.3	56.5
Gross profit	44.7	43.5
Operating expenses:		
Research and development	10.4	8.6
Sales and marketing	6.7	5.6
General and administrative	6.9	5.8
Total operating expenses	24.0	20.0
Income from operations	20.7	23.5
Other income (expense):		
Interest income	2.4	1.6
Interest expense	(0.5)	(0.5)
Other, net	0.1	(0.0)
Total other income	2.0	1.1
Income before income taxes	22.7	24.6
Income tax provision	2.9	2.9
Net income	19.8 %	21.7 %

Revenue

The following table sets forth our revenue:

	Year ended December 31,		Period-to-Period Change	
	2024	2023	$	%
	(dollars in thousands)			
Revenue:				
Product	$ 976,881	$ 1,095,650	$ (118,769)	*(10.8)%*
Percentage of revenue	*96.0 %*	*96.9 %*		
Services	40,984	34,954	6,030	*17.3 %*
Percentage of revenue	*4.0 %*	*3.1 %*		
Total revenue	$ 1,017,865	$ 1,130,604	$ (112,739)	*(10.0)%*

Product

Product revenue, which includes new system sales, sales of spare parts, product upgrades and used system sales was $976.9 million or 96.0% of revenue in 2024, compared with $1,095.7 million or 96.9% of revenue in 2023. The decrease in product revenue in 2024 was primarily driven by a decrease in the number of Purion systems sold.

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, 2024 and 2023 was $138.2 million and $210.9 million, respectively. The decrease was primarily due to a decrease in system prepayments.

Services

Services revenue, which includes the labor component of maintenance and service contracts and fees for service hours provided by on-site service personnel, was $41.0 million, or 4.0% of revenue for 2024, compared with $35.0 million, or 3.1% of revenue for 2023. Although services revenue typically increases 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 equipment service.

Revenue Categories used by Management

In addition to the line-item revenue categories discussed above, management also uses revenue categorizations which break down revenue into other groupings. Management regularly disaggregates revenue in the following categories, which it finds relevant and useful:

- Systems and Customer Solutions and Innovation ("CS&I", or "aftermarket") revenue is

    A. The portion of Product revenue relating to spare parts, product upgrades and used systems combined with;
    B. Service revenue, which is the labor component of aftermarket revenues

    Aftermarket revenue reflects current fab utilization as opposed to System revenue, which reflects capital investment decisions by our customers, which have differing economic drivers;

- Revenue by geographic regions, since economic factors impacting customer purchasing decisions may vary by geographic region; and

- Revenue by our customers' end markets, since they tend to be subject to different economic environments at different periods of time, impacting a customer's likelihood of purchasing capital equipment during any particular period; currently, management uses three end market categories: Memory, mature process technology and leading edge foundry and logic.

The CS&I/aftermarket revenue categories for the twelve month periods ended December 31, 2024 and 2023 are discussed below.

CS&I/Aftermarket

Revenue from our aftermarket business was $235.3 million in 2024, compared to $247.0 million for 2023. Aftermarket revenue generally increases with the 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.

Gross Profit / Gross Margin

The following table sets forth our gross profit (dollars in thousands):

	Year ended December 31, 2024	Year ended December 31, 2023	Period-to-Period Change $	Period-to-Period Change %
	(dollars in thousands)			
Gross Profit:				
Product	$ 452,430	$ 487,538	$ (35,108)	*(7.2)*%
Product gross margin	*46.3 %*	*44.5 %*		
Services	2,224	3,763	(1,539)	*(40.9)*%
Services gross margin	*5.4 %*	*10.7 %*		
Total gross profit	$ 454,654	$ 491,301	$ (36,647)	*(7.5)*%
Gross margin	*44.7 %*	*43.5 %*		

Product

Gross margin from product revenue was 46.3% for the twelve months ended December 31, 2024, compared to 44.5% for the twelve months ended December 31, 2023. The increase in gross margin resulted from a favorable mix of system shipments and improved margins on Purion systems.

Services

Gross margin from services revenue was 5.4% for the twelve months ended December 31, 2024, compared to 10.7% for the twelve months ended December 31, 2023. The decrease in gross margin is attributable to changes in the mix of service contracts.

Operating Expenses

The following table sets forth our operating expenses:

	Year ended December 31, 2024	Year ended December 31, 2023	Period-to-Period Change $	Period-to-Period Change %
	(dollars in thousands)			
Research and development	$ 105,497	$ 96,907	$ 8,590	*8.9 %*
Percentage of revenue	*10.4 %*	*8.6 %*		
Sales and marketing	68,046	62,805	5,241	*8.3 %*
Percentage of revenue	*6.7 %*	*5.6 %*		
General and administrative	70,317	65,794	4,523	*6.9 %*
Percentage of revenue	*6.9 %*	*5.8 %*		
Total operating expenses	$ 243,860	$ 225,506	$ 18,354	*8.1 %*
Percentage of revenue	*24.0 %*	*20.0 %*		

Our operating expenses consist primarily of personnel costs, including salaries, commissions, bonuses, stock-based compensation and related benefits and taxes; project material costs related to the design and development of new products and enhancement of existing products; and professional fees, facilities and amortization and depreciation expenses. Personnel costs are our largest expense, representing $144.2 million, or 59.1% of our total operating expenses, for the year ended December 31, 2024; and $135.1 million, or 59.9% of our total operating expenses for the year ended December 31, 2023.

Research and Development

	Year ended December 31,		Period-to-Period Change	
	2024	2023	$	%
	(dollars in thousands)			
Research and development	$ 105,497	$ 96,907	$ 8,590	*8.9 %*
Percentage of revenue	*10.4 %*	*8.6 %*		

Our ability to remain competitive depends largely on continuously developing innovative technology, with new and enhanced features and systems and introducing them at competitive prices on a timely basis. Accordingly, based on our strategic plan, we establish annual research and development budgets to fund programs that we expect will drive competitive advantages.

Research and development (“R&D”) expense was $105.5 million in 2024, an increase of $8.6 million, or 8.9%, compared with $96.9 million in 2023. The increase was primarily due to increased outside services, materials and supplies expense to support ongoing R&D projects as well as higher personnel expenses associated with an increase in wages and benefits partially offset by a decrease in variable compensation expense and temporary employee expenses.

Sales and Marketing

	Year ended December 31,		Period-to-Period Change	
	2024	2023	$	%
	(dollars in thousands)			
Sales and marketing	$ 68,046	$ 62,805	$ 5,241	*8.3 %*
Percentage of revenue	*6.7 %*	*5.6 %*		

Our sales and marketing expenses result primarily from the sale of our equipment and services through our direct sales force.

Sales and marketing expense was $68.0 million in 2024, an increase of $5.2 million, or 8.3%, compared with $62.8 million in 2023. The increase was primarily due to higher personnel expenses associated with an increase in wages and stock compensation partially offset by a decrease in variable compensation expense.

General and Administrative

	Year ended December 31,		Period-to-Period Change	
	2024	2023	$	%
	(dollars in thousands)			
General and administrative	$ 70,317	$ 65,794	$ 4,523	*6.9 %*
Percentage of revenue	*6.9 %*	*5.8 %*		

Our general and administrative expenses result primarily from the costs associated with our executive, finance, information technology, legal and human resource functions.

General and administrative expense was $70.3 million in 2024, an increase of $4.5 million, or 6.9%, compared with $65.8 million in 2023. The increase was primarily due to higher bad debt expense and higher personnel expenses associated with an increase in wages and benefits partially offset by a decrease in variable compensation expense.

Other Income (Expense)

Other income (expense) consists of interest earned and accretion on our invested cash balances, interest expense relating to the finance lease obligation we incurred in connection with the 2015 sale of our headquarters facility (“sale leaseback") as well as foreign exchange gains and losses attributable to both fluctuations of the U.S. dollar against the local currencies of certain of the countries in which we operate and forward currency exchange contracts.

	Year ended December 31,		Period-to-period change	
	2024	2023	$	%
	(dollars in thousands)			
Other income (expense):	$ 19,480	$ 12,804	$ 6,676	*52.1* %
Percentage of revenue	*2.0 %*	*1.1 %*		

Other income for the year ended December 31, 2024 was $19.5 million, which includes $24.4 million of interest income on our investments, partially offset by $5.5 million of interest expense related to our sale leaseback obligation and $9.1 million of foreign exchange losses, offset by $9.1 million of foreign exchange gains from forward exchange contracts. Other expense for the year ended December 31, 2023 was $12.8 million, which includes $18.2 million of interest income on our investments, partially offset by $5.3 million of interest expense related to our sale leaseback obligation.

Income Taxes

	Year ended December 31,		Period-to-period change	
	2024	2023	$	%
	(dollars in thousands)			
Income tax provision	$ 29,282	$ 32,336	$ (3,054)	*(9.4)*%
Percentage of revenue	2.9 *%*	2.9 *%*		

Income tax expense was $29.3 million for the year ended December 31, 2024, compared to $32.3 million in 2023. The effective tax rate for the year ended December 31, 2024 was 12.7% compared to 11.6% for year the ended December 31, 2023. The increase in the effective tax rate in 2024 is primarily due to a decrease in the benefit associated with stock-based compensation.

Liquidity and Capital Resources

Our liquidity is affected by many factors. Some of these relate specifically to the operations of our business. For example, our sales and other factors are influenced by the uncertainties of global economies, including the availability of credit and the condition of the overall semiconductor capital equipment industry. Our industry requires ongoing investments in operations and research and development that are not easily adjusted to reflect changes in revenue. As a result, profitability and cash flows can fluctuate more widely than revenue.

In 2024, $140.8 million of cash was provided by operating activities. This compares to $156.9 million of cash provided by operations in 2023. Cash and cash equivalents at December 31, 2024 was $123.5 million, compared to $167.3 million at December 31, 2023. Approximately $41.8 million of cash was located in foreign jurisdictions as of December 31, 2024. In addition to the cash and cash equivalent balance at December 31, 2024, we had $7.6 million in restricted cash which relates to a $5.9 million cash collateral relating to our lease for our headquarters in Beverly, Massachusetts, a $0.9 million letter of credit for customs purposes, a $0.7 million letter of credit relating to workers' compensation insurance and a $0.1 million deposit relating to customs activity. Working capital at December 31, 2024 was $916.1 million. At December 31, 2024, we had no bank debt.

In 2024, $108.7 million of cash was used in investing activities, $12.2 million of which was used for capital expenditures. We used $539.1 million of cash for purchases of short-term investments in 2024, partially offset by maturities of short-term investment of $442.6 million. We held $447.8 million of short-term investments at December 31, 2024. These short-term investments consist of U.S. Government securities and agency investments. In 2023, $100.9 million of cash was used in investing activities, $20.7 million of which was used for capital expenditures. We used $388.8 million of cash for purchases of short-term investments in 2023, partially offset by maturities of short-term investments of $308.6 million. Total capital expenditures for 2025 are projected to be approximately $20 million. Future capital expenditures beyond 2025 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.

Cash used in financing activities for the year ended December 31, 2024 was $71.2 million, which consisted of $60.5 million related to our stock repurchase program, $11.6 million related to net settlement of restricted stock issuances and $1.5 million related to principal reduction on our finance lease. These amounts were partially offset by $2.4 million in proceeds from our employee stock purchase plan. Cash used in financing activities was $68.3 million for the year ended December 31, 2023, which consisted of $52.5 million related to our stock repurchase program, $16.6 million related to net settlement of restricted stock issuances, and $1.2 million of principal reduction on our finance lease. These amounts were partially offset by $2.1 million in proceeds from our employee stock purchase plan.

We have outstanding letters of credit, surety bonds and deposits in the amount of $17.5 million to cover the security deposit under the lease of our headquarters, our workers' compensation insurance program, customs and bank deposits and certain value added tax claims in Europe.

The following represents our commercial commitments as of December 31, 2024 (in thousands):

		Amount of Commitment Expiration by Period		
Other Commercial Commitments	**Total**	**2025**	**2026**	**2027**
Surety bonds	$ 9,927	$ 7,183	$ 2,110	$ 634
Standby letters of credit and deposits	7,536	7,536	—	—
Total	$ 17,463	$ 14,719	$ 2,110	$ 634

The following represents our contractual obligations as of December 31, 2024 (in thousands):

		Payments Due by Period			
Contractual Obligations	**Total**	**2025**	**2026-2027**	**2028-2029**	**2030-Beyond**
Sale leaseback obligation	$ 79,653	$ 5,930	$ 12,136	$ 12,627	$ 48,960
Purchase order commitments	187,450	178,644	8,315	469	22
Operating leases	42,119	6,663	8,422	4,650	22,384
Total	$ 309,222	$ 191,237	$ 28,873	$ 17,746	$ 71,366

We have no off-balance sheet arrangements as of December 31, 2024. See Note 18 – Income Taxes in the Notes to the Consolidated Financial Statements for information related to our unrecognized tax benefits.

We consider the undistributed earnings of our foreign subsidiaries as of December 31, 2024 to be indefinitely reinvested and, accordingly, no U.S. income taxes have been provided thereon. As of December 31, 2024, there was no cash associated with indefinitely reinvested foreign earnings. We have not, nor do we anticipate the need to, repatriate funds to the United States to satisfy domestic liquidity needs arising in the ordinary course of business. Upon repatriation of those earnings, in the form of dividends or otherwise, we could be subject to withholding taxes payable to the various foreign tax jurisdictions.

Under the rules of the U.S. Securities and Exchange Commission (the "SEC"), we qualify as a "well-known seasoned issuer," which allows us to file shelf registration statements to register an unspecified amount of securities that are effective upon filing. On August 3, 2023, we filed such a shelf registration statement with the SEC for the issuance of an unspecified amount of common stock, preferred stock, various series of debt securities and/or warrants to purchase any of such securities, either individually or in units, from time to time at prices and on terms to be determined at the time of any such offering. This registration statement was effective upon filing and will expire in August 2026. We may file another shelf registration statement to maintain the availability of this financing option.

We have a cash collateralized letter of credit of $5.9 million, which is classified as long-term restricted cash on our balance sheet at December 31, 2024.

We believe that based on our current market, revenue, expense and cash flow forecasts, our existing cash, cash equivalents and short-term investments will be sufficient to satisfy our anticipated cash requirements for the short and long-term.

Related-Party Transactions

There are no significant related-party transactions that require disclosure in the consolidated financial statements for the year ended December 31, 2024, or in this Annual Report on Form 10-K.

Recent Accounting Pronouncements

A discussion of recent accounting pronouncements, the impact of some of which may be material, is included in Note 2 to the consolidated financial statements for the year ended December 31, 2024 included in this Annual Report on Form 10-K.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

Interest Rate Sensitivity

Our exposure to market risk for changes in interest rates relates primarily to our investment portfolio, which consists of cash equivalents and short-term investments at December 31, 2024. The primary objective of our investment activities is to preserve principal. This is accomplished by investing in marketable investment grade securities. We do not use derivative financial instruments in managing our investment portfolio. 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. We are exposed to certain risks relating to our ongoing business operations, including market risks relating to fluctuations in foreign currency exchange rates. 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 currency. We have entered forward exchange contracts in order to mitigate risks associated with fluctuations in exchange rates on forecasted transactions denominated in foreign currencies and to minimize the impact of foreign currency fluctuations on our earnings and cash flows. These contracts have month-to-month settlement dates. During the years ended December 31, 2024 and 2023, approximately 6.2% and 5.8% of our revenue, respectively, were derived in local currencies from foreign operations with this inherent risk. In addition, at December 31, 2024 and 2023, our operations outside the United States accounted for approximately 9.2% and 9.4% 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 on Form 10-K (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.

Internal Control over Financial Reporting

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, 2024. In making this assessment, management used the criteria set forth in the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”) Internal Control—2013 Integrated Framework.

Based on this assessment, management has concluded that, as of December 31, 2024, 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

To the Stockholders and the Board of Directors of Axcelis Technologies, Inc.

Opinion on Internal Control Over Financial Reporting

We have audited Axcelis Technologies, Inc.'s internal control over financial reporting as of December 31, 2024, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Axcelis Technologies, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2024, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the 2024 consolidated financial statements of the Company and our report dated February 27, 2025 expressed an unqualified opinion thereon.

Basis for Opinion

The Company'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 are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. 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.

Definition and Limitations of Internal Control Over Financial Reporting

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.

/s/ Ernst & Young LLP

Boston, Massachusetts
February 27, 2025

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.

During the quarter ended December 31, 2024, no director or officer adopted or terminated any contract, instrument or written plan for the purchase or sale of Axcelis securities intended to satisfy the affirmative defense conditions of Rule 10b5-1(c) under the Exchange Act or any non-Rule 10b5-1 trading arrangement as defined in Item 408(c) of Regulation S-K.

Item 9C. Disclosure regarding Foreign Jurisdictions that Prevent Inspections.

None.

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 the Axcelis Proxy Statement for the Annual Meeting of Stockholders to be held May 7, 2025 (the “Proxy Statement”) captioned:

- “Proposal 1: Election of Directors,”
- “Board of Directors,”
- “Board Committees,” and
- “Corporate Governance.”

The remainder of such information is set forth under the heading “Information about Our Executive Officers” at the end of Item 1 in Part I of this report and is incorporated herein by reference.

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
- “Board Committees—Compensation Committee Interlocks and Insider Participation.”

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

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.”

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,”
- “Board of Directors,” and
- “Corporate Governance—Certain Relationships and Related Transactions.”

Item 14. Principal Accountant 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.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

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

1) Financial Statements:

Report of Independent Registered Public Accounting Firm (PCAOB ID: 42)	38
Consolidated Statements of Operations — For the years ended December 31, 2024, 2023 and 2022	40
Consolidated Statements of Comprehensive Income — For the years ended December 31, 2024, 2023 and 2022	41
Consolidated Balance Sheets — December 31, 2024 and 2023	42
Consolidated Statements of Stockholders' Equity — For the years ended December 31, 2024, 2023 and 2022	43
Consolidated Statements of Cash Flows — For the years ended December 31, 2024, 2023 and 2022	44
Notes to Consolidated Financial Statements	45

2) Financial Statement Schedules:

Schedule II—Valuation and Qualifying Accounts for the years ended December 31, 2024, 2023 and 2022.

3) Exhibits

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

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.

Item 16. Form 10-K Summary.

Not applicable.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Axcelis Technologies, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Axcelis Technologies, Inc. (the Company) as of December 31, 2024 and 2023, the related consolidated statements of operations, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2024, and the related notes and financial statement schedule listed in the Index at Item 15(a) (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2024 and 2023, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2024, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2024, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), and our report dated February 27, 2025 expressed an unqualified opinion thereon.

Adoption of ASU 2023-07 Segment Reporting (Topic 280)

As discussed in Note 2 to the consolidated financial statements, the Company changed its segment disclosures in 2024 and 2023 due to the adoption of ASU No. 2023-07, Segment Reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

	Systems Revenue recognition
Description of the Matter	As discussed in Note 2 and Note 3 to the consolidated financial statements, the Company generates revenue from the sale of ion implantation and other processing equipment used in the manufacture of semiconductor chips ("systems revenue"). The Company's revenue contracts for systems have multiple performance obligations, including the systems themselves and obligations that are not delivered simultaneously with the systems. Systems revenue accounted for $782.6 million of the Company's total revenue of $1.0 billion in 2024.

Auditing management's recognition of revenue was challenging because of the higher extent of audit effort and because the amounts are material to the consolidated financial statements and related disclosures. During our risk assessment process, we identified a higher inherent risk related to revenue primarily due to the size of the account, as well as the focus on revenue from readers of the financial statements.

How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design and tested the operating effectiveness of controls over the Company's systems revenue recognition process, including controls designed to mitigate the risk of override of controls. This included testing controls over management's review of manual journal entries and revenue related account reconciliations. To test systems revenue recognition, we reconciled revenue recognized to the Company's general ledger to test completeness and performed substantive test of details over significant transactions deemed to be key items and a representative sample of the remaining transactions. For example, we selected and read a sample of arrangements to evaluate the completeness of the promised products and services and the related revenue recognized. We also confirmed directly with certain of the Company's customers the terms of the selected system revenue arrangements.
	Estimate of Excess Inventory
Description of the Matter	The Company's inventories totaled $282.2 million, net, as of December 31, 2024. As described in Note 2 and Note 6 to the consolidated financial statements, the Company records a provision for estimated excess inventory. Management determines the provision using its assumptions of future materials usage, based on estimates of demand and market conditions. Auditing the Company's provision for excess inventory is complex due to the highly judgmental nature of the factors used to estimate demand and market conditions. Specifically, the Company's estimated materials usage may be significantly affected by management's assumptions of forecasted system sales and the size and utilization of the installed base of systems. Management's identification and measurement of these factors are forward looking and could be affected by future economic and market conditions that could have a significant effect on the excess inventory reserve.
How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design, and tested the operating effectiveness of internal controls, including management review controls, over the Company's excess inventory reserve estimation process. This included management's assessment of the assumptions and data underlying the excess inventory provision. For example, we tested controls over management's review of its systems sales forecasts, as well as management's review of the assumptions relating to the market size and utilization of installed systems. We also tested management's controls over the completeness and accuracy of the data used in the estimation model. Our substantive audit procedures included, among others, evaluating the significant assumptions stated above and testing the accuracy and completeness of the underlying data used by management to compute the value of excess inventory. For example, we compared the quantities of on-hand inventories to historical and forecasted materials usage and evaluated adjustments to forecasts for specific product considerations, such as technological changes or alternative uses. We also assessed the historical accuracy of management's estimates and performed sensitivity analyses over the significant assumptions to evaluate the changes in the excess inventory estimates that would result from changes in the underlying assumptions.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 1999.

Boston, Massachusetts
February 27, 2025

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

	Twelve months ended December 31, 2024	2023	2022
Revenue:			
Product	$ 976,881	$ 1,095,650	$ 890,582
Services	40,984	34,954	29,416
Total revenue	1,017,865	1,130,604	919,998
Cost of revenue:			
Product	524,451	608,112	492,104
Services	38,760	31,191	26,104
Total cost of revenue	563,211	639,303	518,208
Gross profit	454,654	491,301	401,790
Operating expenses:			
Research and development	105,497	96,907	78,356
Sales and marketing	68,046	62,805	53,599
General and administrative	70,317	65,794	57,474
Total operating expenses	243,860	225,506	189,429
Income from operations	210,794	265,795	212,361
Other income (expense):			
Interest income	24,403	18,199	4,551
Interest expense	(5,462)	(5,347)	(5,576)
Other, net	539	(48)	(6,451)
Total other income (expense)	19,480	12,804	(7,476)
Income before income taxes	230,274	278,599	204,885
Income tax provision	29,282	32,336	21,806
Net income	$ 200,992	$ 246,263	$ 183,079
Net income per share:			
Basic	$ 6.17	$ 7.52	$ 5.54
Diluted	$ 6.15	$ 7.43	$ 5.46
Shares used in computing net income per share:			
Basic weighted average shares of common stock	32,552	32,758	33,043
Diluted weighted average shares of common stock	32,704	33,165	33,542

See accompanying Notes to these Consolidated Financial Statements

Axcelis Technologies, Inc.
Consolidated Statements of Comprehensive Income
(In thousands)

	Twelve months ended December 31,		
	2024	**2023**	**2022**
Net income	$ 200,992	$ 246,263	$ 183,079
Other comprehensive (loss) income:			
Foreign currency translation adjustments	(4,297)	38	(4,058)
Amortization of actuarial net gain and other adjustments from pension plan, net of tax	(71)	84	325
Total other comprehensive (loss) income	(4,368)	122	(3,733)
Comprehensive income	$ 196,624	$ 246,385	$ 179,346

See accompanying Notes to these Consolidated Financial Statements

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

	December 31, 2024	December 31, 2023
ASSETS		
Current assets:		
Cash and cash equivalents	$ 123,512	$ 167,297
Short-term investments	447,831	338,851
Accounts receivable, net	203,149	217,964
Inventories, net	282,225	306,482
Prepaid income taxes	6,420	—
Prepaid expenses and other current assets	60,471	49,397
Total current assets	1,123,608	1,079,991
Property, plant and equipment, net	53,784	53,971
Operating lease assets	29,621	30,716
Finance lease assets, net	15,346	16,632
Long-term restricted cash	7,552	6,654
Deferred income taxes	68,277	53,428
Other assets	50,593	40,575
Total assets	$ 1,348,781	$ 1,281,967
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 46,928	$ 54,400
Accrued compensation	25,536	31,445
Warranty	13,022	14,098
Income taxes	—	6,164
Deferred revenue	94,673	164,677
Current portion of finance lease obligation	1,345	1,511
Other current liabilities	26,018	12,834
Total current liabilities	207,522	285,129
Long-term finance lease obligation	42,329	43,674
Long-term deferred revenue	43,501	46,208
Other long-term liabilities	42,639	42,074
Total liabilities	335,991	417,085
Commitments and contingencies (Note 16)		
Stockholders' equity:		
Common stock, $0.001 par value, 75,000 shares authorized; 32,365 shares issued and outstanding at December 31, 2024; 32,685 shares issued and outstanding at December 31, 2023	32	33
Additional paid-in capital	548,654	547,189
Retained earnings	470,318	319,506
Accumulated other comprehensive loss	(6,214)	(1,846)
Total stockholders' equity	1,012,790	864,882
Total liabilities and stockholders' equity	$ 1,348,781	$ 1,281,967

See accompanying Notes to these Consolidated Financial Statements

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

	Common Stock		Additional Paid-in	Accumulated Deficit / Retained	Accumulated Other Comprehensive	Total Stockholders'
	Shares	Amount	Capital	Earnings	Income (Loss)	Equity
Balance at December 31, 2021	33,240	33	559,883	(22,722)	1,765	$ 538,959
Net income	—	—	—	183,079	—	183,079
Foreign currency translation adjustments	—	—	—	—	(4,058)	(4,058)
Change in pension obligation, net of tax	—	—	—	—	325	325
Exercise of stock options	103	—	1,247	—	—	1,247
Issuance of stock under Employee Stock Purchase Plan	29	—	1,662	—	—	1,662
Issuance of restricted shares of common stock	291	—	(9,907)	—	—	(9,907)
Stock-based compensation expense	—	—	13,444	—	—	13,444
Repurchase of common stock	(888)	—	(16,030)	(41,465)	—	(57,495)
Balance at December 31, 2022	32,775	33	550,299	118,892	(1,968)	667,256
Net income	—	—	—	246,263	—	246,263
Foreign currency translation adjustments	—	—	—	—	38	38
Change in pension obligation, net of tax	—	—	—	—	84	84
Exercise of stock options	3	—	25	—	—	25
Issuance of stock under Employee Stock Purchase Plan	16	—	2,057	—	—	2,057
Issuance of restricted shares of common stock	271	—	(16,611)	—	—	(16,611)
Stock-based compensation expense	—	—	18,269	—	—	18,269
Repurchase of common stock	(380)	—	(6,850)	(45,649)	—	(52,499)
Balance at December 31, 2023	32,685	33	547,189	319,506	(1,846)	864,882
Net income	—	—	—	200,992	—	200,992
Foreign currency translation adjustments	—	—	—	—	(4,297)	(4,297)
Change in pension obligation, net of tax	—	—	—	—	(71)	(71)
Issuance of stock under Employee Stock Purchase Plan	30	—	2,385	—	—	2,385
Issuance of restricted shares of common stock	194	—	(11,563)	—	—	(11,563)
Stock-based compensation expense	—	—	20,951	—	—	20,951
Repurchase of common stock	(544)	(1)	(10,308)	(50,180)	—	(60,489)
Balance at December 31, 2024	32,365	$ 32	$ 548,654	$ 470,318	$ (6,214)	$ 1,012,790

See accompanying Notes to these Consolidated Financial Statements

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

	Twelve months ended December 31,		
	2024	**2023**	**2022**
Cash flows from operating activities			
Net income	$ 200,992	$ 246,263	$ 183,079
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	15,809	13,069	11,607
Deferred income taxes	(15,594)	(20,018)	8,536
Stock-based compensation expense	20,951	18,269	13,444
Provision for doubtful accounts	2,987	1,129	—
Provision for excess and obsolete inventory	5,966	5,211	4,565
Accretion of discounts and premiums on marketable securities	(12,435)	(12,077)	—
Unrealized currency loss on foreign denominated transactions	7,811	2,252	5,986
Mark-to-market adjustment on forward exchange contracts	(267)	—	—
Changes in operating assets and liabilities:			
Accounts receivable	6,909	(50,755)	(67,270)
Inventories	5,917	(69,957)	(58,433)
Prepaid expenses and other current assets	(11,703)	(16,046)	(6,533)
Accounts payable and other current liabilities	(413)	(8,103)	31,392
Deferred revenue	(71,097)	56,183	86,366
Income taxes	(9,034)	3,786	3,493
Other assets and liabilities	(5,981)	(12,337)	(625)
Net cash provided by operating activities	140,818	156,869	215,607
Cash flows from investing activities			
Expenditures for property, plant and equipment and capitalized software	(12,181)	(20,656)	(10,683)
Purchase of short-term investments	(539,120)	(388,809)	(246,571)
Maturities of short-term investments	442,575	308,607	—
Net cash used in investing activities	(108,726)	(100,858)	(257,254)
Cash flows from financing activities			
Net settlement on restricted stock grants	(11,563)	(16,611)	(9,907)
Repurchase of common stock	(60,489)	(52,499)	(57,495)
Proceeds from Employee Stock Purchase Plan purchases	2,385	2,057	1,662
Principal payments on finance lease obligation	(1,525)	(1,240)	(987)
Proceeds from exercise of stock options	—	25	1,247
Net cash used in financing activities	(71,192)	(68,268)	(65,480)
Effect of exchange rate changes on cash and cash equivalents	(3,787)	(139)	(2,206)
Net decrease in cash, cash equivalents and restricted cash	(42,887)	(12,396)	(109,333)
Cash, cash equivalents and restricted cash at beginning of period	173,951	186,347	295,680
Cash, cash equivalents and restricted cash at end of period	$ 131,064	$ 173,951	$ 186,347
Supplemental disclosure of cash flow information			
Cash paid for:			
Income taxes	$ 61,133	$ 54,217	$ 10,763
Interest	$ 4,727	$ 4,874	$ 4,992

See accompanying Notes to these Consolidated Financial Statements

Axcelis Technologies, Inc.
Notes to Consolidated Financial Statements

Note 1. Nature of Business

Axcelis Technologies, Inc. (“Axcelis” “We” or the “Company”) was incorporated in Delaware in 1995, and is a worldwide producer of ion implantation and other processing equipment used in the fabrication of semiconductor chips in the United States, Europe and Asia. In addition to equipment, we provide extensive aftermarket lifecycle products and services, including spare parts, equipment upgrades, maintenance services and customer training.

Note 2. Summary of Significant Accounting Policies

The accompanying consolidated financial statements reflect the application of certain significant accounting policies as described in this note and elsewhere in the footnotes.

(a) Basis of Presentation

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

Events occurring subsequent to December 31, 2024 have been evaluated for potential recognition or disclosure in the consolidated financial statements.

(b) Use of Estimates

The preparation of these consolidated financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the dates of the financial statements and the reported amounts of revenue and expenses during the reporting periods. On an ongoing basis, we evaluate our estimates and judgments, including those related to revenue recognition, the realizable value of accounts receivable and inventories, warranty reserves, valuing stock-based compensation instruments and reserves relating to tax assets and liabilities. Actual amounts could differ from these estimates. Changes in estimates are recorded in the period in which they become known.

(c) 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 other comprehensive income (loss). Foreign currency transaction gains and losses are included in other income (expense) in the Consolidated Statements of Operations.

For the years ended December 31, 2024, 2023, and 2022 we had foreign exchange losses of $9.1 million, $0.5 million, and $6.6 million, respectively.

(d) Derivative Instruments

We are exposed to certain risks relating to our ongoing business operations, including market risks relating to fluctuations in foreign currency exchange rates. We have entered into forward exchange contracts in order to mitigate risks associated with fluctuations in exchange rates on forecasted transactions denominated in foreign currencies and to minimize the impact of foreign currency fluctuations on our earnings and cash flows. These contracts have month-to-month settlement dates. As of December 31, 2024, we had open contracts with a notional value of $112.0 million. We measure these instruments at fair value and recognize assets or liabilities associated with the fair value on these open contracts on the Consolidated Balance Sheets at the end of each reporting period. At December 31, 2024, the recognized unrealized gain on these forward exchange contracts was approximately $0.3 million. Unrealized gains and losses are shown in our cash flows from operating activities within our Consolidated Statement of Cash Flows. We have not designated these forward exchange contracts as hedging instruments and we record changes in the fair values at each measurement date in Other, net on the Consolidated Statements of Operations. For the year ended December 31, 2024, we recorded $9.1 million of gain on forward currency exchange contracts.

We do not offset fair value amounts of derivative instruments. We do not use derivative instruments for speculative purposes.

(e) Cash, Cash Equivalents and Short-term Investments

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 funds, U.S. Government and Agency Securities and deposit accounts. Cash equivalents are carried on the balance sheet at fair market value. Short-term investments are highly liquid investments with original maturities of greater than 90 days but less than one year from date of purchase and are carried on the balance sheet at amortized cost. Our short-term investments consist primarily of U.S. Government and Agency securities and are classified as held-to-maturity based on our positive intent and ability to hold the securities to maturity. Income related to these securities is recorded in interest income in the Consolidated Statements of Operations.

(f) Inventories

Inventories are carried at the lower of cost or net realizable value, determined using the first-in, first-out (“FIFO”) method. We periodically review our inventories and make provisions as necessary for estimated obsolescence or damaged goods to ensure values approximate lower of cost or net realizable value. 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.

We record a provision for estimated excess inventory. The provision is determined using management’s assumptions of materials usage, based on estimates of demand, market conditions, and the size and utilization of our installed base. If actual market conditions become less favorable than those projected by management, additional inventory write-downs may be required.

(g) Property, Plant and Equipment and Leased Assets

Property, plant and equipment are stated at cost, less accumulated depreciation and amortization.

On January 30, 2015, we sold our corporate headquarters facility. As part of this sale, we also entered into a 22-year lease agreement. We accounted for the sale leaseback transaction as a financing arrangement for financial reporting purposes. We retained the historical costs of the property and the related accumulated depreciation on our financial books within property, plant and equipment and will continue to depreciate the property for financial reporting purposes over the lesser of its remaining useful life or its initial lease term of 22 years.

Depreciation and amortization are recorded using the straight-line method over the estimated useful lives of the related assets as follows:

Asset Classification	Estimated Useful Life
Land, buildings and equipment (under lease)	Lesser of the lease term or estimated useful life of the asset
Machinery and equipment	3 to 10 years

Repairs and maintenance costs are expensed as incurred. Expenditures greater than $2.5 thousand for renewals and betterments are capitalized and depreciated over their useful lives.

(h) Impairment of Long-Lived Assets

We record impairment losses on long-lived assets when events and circumstances indicate that these assets might not be recoverable. Recoverability is assessed 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.

We did not have any indicators of impairment during the period ending December 31, 2024. We did not record an impairment charge in the years ended December 31, 2024, 2023, or 2022.

Actual performance could be materially different from our current forecasts, which could impact 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.

(i) Concentration of Risk and Off-Balance Sheet Risk

Financial instruments that potentially subject us to concentrations of credit risk are principally cash equivalents, short-term investments and accounts receivable. Our cash equivalents and short-term investments are principally maintained in investment grade money-market funds, U.S. Government and Agency Securities and deposit accounts.

Other than our currency exchange contracts, we have no significant off-balance sheet risk relating to option contracts or other hedging arrangements.

Our exposure to market risk for changes in interest rates relates primarily to cash equivalents and short-term investments. The primary objective of our investment activities is to preserve principal without significantly increasing risk. This is accomplished by investing in marketable investment grade securities. We do not use derivative financial instruments to manage our investment portfolio and do not expect operating results or cash flows to be affected to any significant degree by any change in market interest rates.

We perform ongoing credit evaluations of our customers' financial condition and generally require no collateral to secure accounts receivable. For selected overseas sales, we require customers to obtain letters of credit before product is shipped. We maintain an allowance for doubtful accounts based on our assessment of the collectability of accounts receivable. We review the allowance for doubtful accounts quarterly. We do not have any off-balance sheet credit exposure related to our customers.

Our customers consist of semiconductor chip manufacturers located throughout the world and net sales to our ten largest customers accounted for 45.9%, 51.7% and 59.4% of revenue in 2024, 2023 and 2022, respectively.

For the years ended December 31, 2024 and December 31, 2023, we had no customers representing 10% or greater of total revenue. For the year ended December 31, 2022, we had two customers representing 13.1% and 11.5% of total revenue, respectively.

As of December 31, 2024, we had one customer account for 10.0% of consolidated accounts receivable. As of December 31, 2023, we had one customer account for 12.2% of consolidated accounts receivable.

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

(j) Revenue Recognition

We recognize revenue in accordance with Accounting Standards Codification ("ASC") Topic 606, *Revenue from Contracts with Customers* or ("ASC 606"). Under ASC 606, revenue is recognized when a customer obtains control of promised goods or services in an amount that reflects the consideration we expect to receive in exchange for those goods or services. We measure revenue based on the consideration specified in the customer arrangement, and revenue is recognized when the performance obligations in the customer arrangement are satisfied. A performance obligation is a promise in a contract to transfer a distinct product or service to the customer. The transaction price of a contract is allocated to each distinct performance obligation based upon the relative standalone selling price for each performance obligation and recognized as revenue when, or as, the customer receives the benefit of the performance obligation. To account for and measure revenue, we apply the following five steps:

1) Identify the contract with the customer

A contract with a customer exists when (i) we enter into an enforceable contract with a customer that defines each party's rights regarding the goods or services to be transferred and identifies the related payment terms, (ii) the contract has commercial substance, and (iii) we determine that collection of substantially all consideration for goods and services that are transferred is probable based on the customer's intent and ability to pay the promised consideration.

2) Identify the performance obligations in the contract

Performance obligations promised in a contract are identified based on the goods and services that will be transferred to the customer that are both capable of being distinct, whereby the customer can benefit from the good or service either on its own or together with other available resources, and are distinct in the context of the contract, whereby the transfer of the good or service is separately identifiable from other promises in the contract. To the extent a contract includes multiple promised goods and services, we must apply judgment to determine whether promised goods and services are capable of being distinct and distinct in the context of the contract. If these criteria are not met, the promised goods and services are accounted for as a combined performance obligation.

Systems sales consist of multiple performance obligations, including the system itself and obligations that are not delivered simultaneously with the system. These undelivered obligations might include a combination of installation services, extended warranty and support and spare parts, all of which are generally covered by a single sales price.

The Aftermarket business includes both products and services type arrangements. Performance obligations in these contracts consist of used tools, spare parts, equipment upgrades, maintenance services and customer training.

Customers who purchase new systems are provided an assurance-type warranty for one year after acceptance of the tool. For aftermarket transactions, we provide customers an assurance-type warranty for 90 days. Customers can choose to purchase extended warranty terms with enhanced support similar to a service-type warranty ranging from one to three years. In accordance with ASC 606, assurance-type warranties are not considered a performance obligation, whereas service-type warranties are.

3) Determine the transaction price

The transaction price is determined based on the consideration to which we will be entitled in exchange for transferring goods and services to the customer. To the extent the transaction price includes variable consideration, we estimate the amount of variable consideration that should be included in the transaction price utilizing either the expected value method or the most likely amount method depending on the nature of the variable consideration. Variable consideration is included in the transaction price if, in our judgment, it is probable that a significant future reversal of cumulative revenue under the contract will not occur. Any estimates, including the effect of the constraint on variable consideration, are evaluated at each reporting period for any changes. In applying this guidance, Companies must also consider whether any significant financing components exist.

The transaction price for all transactions is based on the price reflected in the individual customer's purchase order. Variable consideration has not been identified as a significant component of the transaction price for any of our transactions.

For those transactions where all performance obligations will be satisfied within one year or less, we apply the practical expedient outlined in ASC 606-10-32-18. This practical expedient allows us not to adjust promised consideration for the effects of a significant financing component if we expect at contract inception that the period between when we transfer the promised good or service to a customer and when the customer pays for that good or service will be one year or less. For those transactions that are expected to be completed after one year, we have assessed that there are no significant financing components because any difference between the promised consideration and the cash selling price of the good or service is for reasons other than the provision of financing.

4) Allocate the transaction price to performance obligations in the contract

If the contract contains a single performance obligation, the entire transaction price is allocated to the single performance obligation. Contracts that contain multiple performance obligations require an allocation of the transaction price to each performance obligation on a relative standalone selling price basis unless the transaction price is variable and meets the criteria to be allocated entirely to a performance obligation or to a distinct service that forms part of a single performance obligation.

Where required, we determine standalone selling price (“SSP”) for each obligation based on consideration of both market and Company specific factors, including the selling price and profit margin for similar products, the cost to produce, and the anticipated margin.

For those contracts that contain multiple performance obligations (primarily systems sales, as well as some aftermarket contracts requiring both time and material inputs), we must determine the SSP. We use a cost plus margin approach in determining the SSP for any materials related performance obligations (such as upgrades, spare parts, systems). To determine the SSP for labor related performance obligations (such as the labor component of installation), we use directly observable inputs based on the standalone sale prices for these services.

5) Recognize revenue when or as we have satisfied a performance obligation

We satisfy performance obligations either over time or at a point in time. Revenue is recognized over time if either 1) the customer simultaneously receives and consumes the benefits provided by the entity’s performance, 2) the entity’s performance creates or enhances an asset that the customer controls as the asset is created or enhanced, or 3) the entity’s performance does not create an asset with an alternative use to the entity and the entity has an enforceable right to payment for performance completed to date. If the entity does not satisfy a performance obligation over time, the related performance obligation is satisfied at a point in time by transferring the control of a promised good or service to a customer. Examples of control are using the asset to produce goods or services, enhance the value of other assets or settle liabilities, and holding or selling the asset. For over time recognition, ASC 606 requires us to select a single revenue recognition method for the performance obligation that faithfully depicts our performance in transferring control of the goods and services. The guidance allows entities to choose between two methods to measure progress toward complete satisfaction of a performance obligation:

Output methods - recognize revenue on the basis of direct measurements of the value to the customer of the goods or services transferred to date relative to the remaining goods or services promised under the contract (e.g., surveys of performance completed to date, appraisals of results achieved, milestones reached, time elapsed, and units produced or units delivered); and

Input methods - recognize revenue on the basis of the entity’s efforts or inputs to the satisfaction of a performance obligation (e.g., resources consumed, labor hours expended, costs incurred, or time elapsed) relative to the total expected inputs to the satisfaction of that performance obligation.

We have the right to consideration from a customer in an amount that corresponds directly with the value to the customer of the entity’s performance completed to date (i.e., certain aftermarket contracts), as such we have elected a practical expedient to recognize revenue in the amount to which the entity has a right to invoice for such services.

Product related revenues (whether for systems or aftermarket business) are recognized at a point in time, when they are shipped or delivered, depending on shipping terms.

For installation services, revenue is recognized at a point in time, once the installation of the tool is complete. The nature of the installation services is such that the customer does not simultaneously receive and consume the benefits provided by the entity's performance, nor does performance of installation services create or enhance an asset that the customer controls. Installation services do not create an asset with an alternative use to the entity, and the entity does not have an enforceable right to payment for performance completed to date.

Contract liabilities are reflected as deferred revenue on the consolidated balance sheet. Contract liabilities relate to payments invoiced or received in advance of completion of performance obligations under a contract. Contract liabilities are recognized as revenue upon the fulfillment of performance obligations.

Service-type warranties for any product are recognized over time, as these represent a stand ready obligation to service the product during the warranty period. Progress in the satisfaction of these performance obligations is measured using an input method of time elapsed.

Maintenance and service contracts are recognized over time. Progress in the satisfaction of these performance obligations is measured using an input method of either time elapsed in the case of fixed period contracts, or labor hours expended, in the case of project-based contracts.

(k) Recognizing Assets related to Recoverable Customer Contract Costs

We recognize an asset related to incremental costs incurred by us to obtain a contract with a customer if we expect to recover those costs. We will recognize an asset from costs incurred to fulfill a contract only if such costs relate directly to a contract with an entity that we can specifically identify, the costs incurred will generate or enhance resources that will be used in satisfying performance obligations in the future, and the costs are expected to be recovered. Any assets recognized related to costs to obtain or fulfill a contract are amortized on a systematic basis that is consistent with the transfer to the customer of the goods or services to which the asset relates.

In substantially all of our business transactions, we incur incremental costs to obtain contracts with customers, in the form of sales commissions. We maintain a commission program which awards our employees for System sales, aftermarket activity and other individual goals. Under ASC 606, an asset is amortized on a systematic basis that is consistent with the transfer to the customer of the goods or services to which the asset relates. However, ASC 606 provides a practical expedient to allow for the recognition of commission expense when incurred if the amortization period of the asset that the entity otherwise would have recognized is one year or less. Based on the nature of our commission agreements, all commissions are expensed as incurred based upon the expectation that the amortization period would be one year or less.

(l) Shipping and Handling Costs

Shipping and handling costs are included in cost of revenue.

(m) Stock-Based Compensation

We generally recognize compensation expense for all stock-based payments to employees and directors, including grants of stock options and restricted stock units, based on the grant-date fair value of those stock-based payments. For stock option awards, we use the Black-Scholes option pricing model, adjusted for expected forfeitures. Other valuation models may be utilized in the limited circumstances where awards with market-based vesting considerations, such as the price of our common stock, or performance-based awards, are granted. Stock-based compensation expense is recognized ratably over the requisite service period. For each stock option or restricted stock unit grant with vesting based on a combination of time, market or performance conditions, where vesting will occur if either condition is met, the related compensation costs are recognized over the shorter of the explicit service period or the derived service period.

See Note 13 for additional information relating to stock-based compensation.

(n) Income Taxes

We record 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 basis, and operating loss and tax credit carryforwards.

We establish 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 our provision for income taxes, our deferred tax assets and liabilities and any valuation allowance recorded against those net deferred tax assets. We evaluate 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. We recognize accrued interest related to unrecognized tax benefits as interest expense and penalties within operating expense in the consolidated statements of operations.

See Note 18 for additional information relating to income taxes.

(o) Computation of Net Income per Share

Basic earnings per share is computed by dividing income available to common stockholders (the numerator) by the weighted-average number of shares of common stock 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 shares of common stock that would have been outstanding if the potentially dilutive shares of common stock had been issued, calculated using the treasury stock method.

The components of net income per share are as follows:

	Year ended December 31,		
	2024	2023	2022
	(in thousands, except per share data)		
Net income available to common stockholders	$ 200,992	$ 246,263	$ 183,079
Weighted average shares of common stock outstanding used in computing basic income per share	32,552	32,758	33,043
Incremental options and RSUs	152	407	499
Weighted average shares of common stock used in computing diluted net income per share	32,704	33,165	33,542
Net income per share			
Basic	$ 6.17	$ 7.52	$ 5.54
Diluted	$ 6.15	$ 7.43	$ 5.46

Diluted weighted average shares of common stock outstanding does not include restricted stock units outstanding to purchase 122,294, 6,025 and 4,929 common equivalent shares for the periods ended December 31, 2024, 2023 and 2022, respectively, as their effect would have been anti-dilutive.

(p) Accumulated Other Comprehensive Loss

The following table presents the changes in accumulated other comprehensive loss, net of tax, by component, for the year ended December 31, 2024:

	Foreign currency	Defined benefit pension plan	Total
		(in thousands)	
Balance at December 31, 2023	$ (1,956)	$ 110	$ (1,846)
Other comprehensive loss and pension reclassification	(4,297)	(71)	(4,368)
Balance at December 31, 2024	$ (6,253)	$ 39	$ (6,214)

(q) Recent Accounting Guidance

In November 2023 the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update 2023-07, *Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures* ("ASU 2023-07"). ASU 2023-07 is intended to enhance disclosures for significant segment expenses for all public entities required to report segment information in accordance with ASC Topic 280, *Segment Reporting* ("ASC 280"). ASC 280 requires a public entity to report for each reportable segment a measure of segment profit or loss that its chief operating decision maker (“CODM”) uses to assess segment performance and to make decisions about resource allocations. ASU 2023-07 is intended to improve financial reporting by requiring disclosure of incremental segment information on an annual and interim basis for all public entities to enable investors to develop more useful financial analyses. ASU 2023-07 is effective for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024. We adopted ASU 2023-07 within this Annual Report on Form 10-K and we applied the update retrospectively for all prior periods presented in the consolidated financial statements. See Note 17 for related disclosures.

In December 2023 the FASB issued Accounting Standards Update 2023-09, *Income Taxes (Topic 740): Improvements to Income Tax Disclosures* ("ASU 2023-09"). ASU 2023-09 is intended to enhance the transparency and decision usefulness of income tax disclosures. ASU 2023-09 addresses investor requests for enhanced income tax information primarily through changes to the rate reconciliation and income taxes paid information. Early adoption is permitted. A public entity should apply ASU 2023-09 prospectively to all annual periods beginning after December 15, 2024. The Company is currently evaluating the impact of ASU 2023-09 on its future consolidated financial statements and related disclosures.

In November 2024 the FASB issued Accounting Standards Update 2024-03, *Income Statement—Reporting Comprehensive Income—Expense Disaggregation Disclosures (Subtopic 220-40): Disaggregation of Income Statement Expenses* (“ASU 2024-03”). ASU 2024-03 is intended to enhance the disclosures for expenses for all public entities in accordance with ASC Topic 220, *Income Statement-Reporting Comprehensive Income*. ASU 2024-03 addresses investor requests for more detailed information about expenses, specifically cost of sales and selling, general, and administrative expenses (“SG&A”). ASU 2024-03 requires a public entity to disclose the amounts of (a) purchases of inventory, (b) employee compensation, (c) depreciation, (d) intangible asset amortization, and (e) depreciation, depletion, and amortization recognized as part of oil- and gas-producing activities (or other amounts of depletion expense) included in each relevant expense caption presented on the face of the income statement as well as a qualitative description of the amounts remaining in the relevant expense captions that are not separately disaggregated quantitatively. ASU 2024-03 also requires a public entity to disclose the total amount of selling expenses and the entity’s definition of selling expenses. ASU 2024-03 is effective for fiscal years beginning after December 15, 2026, and interim periods within fiscal years beginning after December 15, 2027. Early adoption is permitted. A public entity should apply ASU 2024-03 either prospectively to financial statements issued for reporting periods after the effective date of this ASU or retrospectively to all prior periods presented in the financial statements. The Company is currently evaluating the impact of ASU 2024-03 on its future consolidated financial statements and related disclosures.

Note 3. Revenue

We design, manufacture and service ion implantation and other processing equipment used in the fabrication of semiconductor chips and sell our products to leading semiconductor chip manufacturers worldwide. We offer a complete line of high energy, high current and medium current implanters for all application requirements. In addition, we provide extensive aftermarket lifecycle products and services, including used tools, spare parts, equipment upgrades, maintenance service and customer training. Our revenue recognition policies are set forth in Section (j) of Note 2, Summary of Significant Accounting Policies.

(a) Alternative Operational Revenue Categories used by Management

To reflect the organization of our business operations, management reviews revenue in two categories: revenue from sales of new systems and revenue arising from the sale of used systems, parts and labor to customers who own systems, which we refer to as Customer Solutions & Innovation ("CS&I") or "aftermarket."

Below are the revenues by categories used by management for the periods covered in this report:

	Year ended December 31,		
	2024	2023	2022
		(in thousands)	
Systems	$ 782,559	$ 883,604	$ 692,061
Aftermarket	235,306	247,000	227,937
Total Revenue	$ 1,017,865	$ 1,130,604	$ 919,998

(b) Economic Factors Affecting our Revenue: Geographic Breakdown of Revenue

Global economic conditions have a direct impact on our revenue. We are substantially dependent on sales of our products and services to customers outside of the United States. Adverse economic conditions, political instability, potential adverse tax consequences, regulatory changes and volatility in exchange rates pose a risk that our clients may reduce, postpone or cancel spending for our products and services, which would impact our revenue.

Revenue by geographic markets is determined based upon the location to which our products are shipped and where our services are performed. Revenue in our principal geographic markets is as follows:

	Year ended December 31,		
	2024	2023	2022
		(in thousands)	
North America	$ 144,066	$ 174,810	$ 143,701
Asia Pacific	781,039	811,308	673,752
Europe	92,760	144,486	102,545
Total Revenue	$ 1,017,865	$ 1,130,604	$ 919,998

(c) Recognition of Deferred Revenue from Contract Liabilities

Contract liabilities are as follows:

	Year ended December 31,		
	2024	2023	2022
		(in thousands)	
Balance, beginning of the period	$ 210,885	$ 154,777	$ 68,436
Deferral of revenue*	65,708	185,688	146,674
Recognition of deferred revenue	(138,419)	(129,580)	(60,333)
Balance, end of the period	$ 138,174	$ 210,885	$ 154,777

* Amount is net of a reclassification of $12.7 million from deferred revenue to refund liability for the year ended December 31, 2024.

Contract liabilities are reflected as deferred revenue on the consolidated balance sheet. Contract liabilities relate to payments received or amounts invoiced in advance of completion of performance obligations under a contract. Contract liabilities are recognized as revenue upon the fulfillment of performance obligations.

As of December 31, 2024, we had deferred revenue of $138.2 million. This represents the portion of the transaction price for contracts with customers allocated to the performance obligations that remain unsatisfied or partially unsatisfied. Short-term deferred revenue of $94.7 million as of December 31, 2024 represents performance obligations that are expected to be satisfied within the next 12 months. This amount relates primarily to prepayments made prior to system delivery as well as to installation and non-standard warranty performance obligations for system sales. Long-term deferred revenue of $43.5 million as of December 31, 2024 relates to prepayments made prior to system delivery as well as to extended warranty performance obligations that we expect to be completed in excess of the next 12 months but within the next 24 months.

The majority of our system transactions have either (1) payment terms that are 90% due upon shipment of the system and 10% due upon acceptance or (2) a pre-shipment deposit ranging from 20% to 60%, with the remainder due upon shipment, less 10% due at acceptance. Aftermarket transaction payment terms are such that payment is due either within 30 or 60 days of service provided or parts delivered.

Note 4. Cash, cash equivalents and restricted cash

	December 31, 2024	December 31, 2023
	(in thousands)	
Cash and cash equivalents	$ 123,512	$ 167,297
Long-term restricted cash	7,552	6,654
Total cash, cash equivalents and restricted cash	$ 131,064	$ 173,951

As of December 31, 2024, we had $7.6 million in restricted cash which relates to a $5.9 million cash collateral relating to our lease for our headquarters in Beverly, Massachusetts, a $0.9 million letter of credit for customs purposes, a $0.7 million letter of credit relating to workers' compensation insurance and a $0.1 million deposit relating to customs activity.

Note 5. Accounts Receivable and Allowance for Credit Losses

All trade receivables are reported on the Consolidated Balance Sheets at their amortized cost adjusted for any write-offs and net of allowances for credit losses.

Axcelis maintains an allowance for credit losses, which represents an estimate of expected losses over the remaining contractual life of its receivables considering current market conditions and estimates for supportable forecasts when appropriate. The estimate is a result of the Company's ongoing assessments and evaluations of collectability, historical loss experience, and future expectations in estimating credit losses in its receivable portfolio. Axcelis uses historical loss experience rates and applies them to a related aging analysis while also considering customer and/or economic risk where appropriate. Determination of the proper amount of allowances requires management to exercise judgment about the timing, frequency and severity of credit losses that could materially affect the provision for credit losses and, as a result, net earnings. The allowance takes into consideration numerous quantitative and qualitative factors that include receivable type, historical loss experience, delinquency trends, collection experience, current economic conditions, estimates for supportable forecasts, when appropriate, and credit risk characteristics.

Axcelis evaluates the credit risk of the customer when extending credit based on a combination of various financial and qualitative factors that may affect its customers' ability to pay. These factors may include the customer's financial condition, past payment experience, and credit ratings from credit bureaus, as well as the value of the underlying collateral.

Management performs detailed reviews of its receivables on a quarterly basis to assess the adequacy of the allowances and to determine if any impairment has occurred. Amounts determined to be uncollectable are charged directly against the allowance, while amounts recovered on previously written-off accounts increase the allowance. Changes to the allowance for credit losses are maintained through adjustments to the provision for credit losses, which are charged to current period earnings.

The following table shows changes of the allowances for credit losses related to trade receivables for the twelve months ended December 31, 2024 and 2023, respectively:

	Year ended December 31,	
	2024	2023
	(in thousands)	
Balance, beginning of period	$ 460	$ —
Provision for credit losses	3,446	1,117
Charge-offs	(3,446)	(657)
Recoveries	(460)	—
Balance, end of period	$ —	$ 460

The components of accounts receivable are as follows:

	December 31,	
	2024	2023
	(in thousands)	
Trade receivables	$ 203,149	$ 218,424
Allowance for doubtful accounts	—	(460)
Trade receivables, net	$ 203,149	$ 217,964

Note 6. Inventories, net

The components of inventories are as follows:

	December 31, 2024	December 31, 2023
	(in thousands)	
Raw materials	$ 227,141	$ 231,200
Work in process	34,490	45,373
Finished goods (completed systems)	20,594	29,909
Inventories, net	$ 282,225	$ 306,482

When recorded, inventory reserves are intended to reduce the carrying value of inventories to their net realizable value. We establish 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 our products or market conditions. We regularly evaluate our ability to realize the value of inventories based on a combination of factors including the following: forecasted sales and the size and utilization of our installed base, 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. In 2024, we recorded an increase of $0.6 million in inventory reserves. At December 31, 2024 and 2023, inventories are stated net of inventory reserves of $5.8 million and $5.2 million, respectively.

During the years ended December 31, 2024, 2023 and 2022, we recorded charges to cost of sales of $6.0 million, $5.2 million and $4.6 million, respectively, to adjust inventories to their lower of cost or net realizable value.

We have inventory on consignment at customer locations at December 31, 2024 and 2023, of $5.6 million and $6.5 million, respectively.

Note 7. Property, Plant and Equipment, net

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

	December 31,	
	2024	2023
	(in thousands)	
Land and buildings	$ 25,813	$ 21,802
Machinery and equipment	45,482	41,547
Construction in process	13,598	17,055
Total cost	84,893	80,404
Accumulated depreciation	(31,109)	(26,433)
Property, plant and equipment, net	$ 53,784	$ 53,971

Depreciation expense was $7.7 million, $6.2 million and $5.1 million for the years ended December 31, 2024, 2023 and 2022, respectively.

Note 8. Assets Manufactured for Internal Use, net

Assets manufactured for internal use, included in other assets, are depreciated using the straight-line method over their 10 year estimated useful life. Their components are as follows:

	December 31,	
	2024	2023
	(in thousands)	
Internal use assets	$ 90,252	$ 76,273
Construction in process	964	236
Total cost	91,216	76,509
Accumulated depreciation	(46,045)	(39,588)
Assets manufactured for internal use, net	$ 45,171	$ 36,921

These products are used for research and development, training, and customer demonstration purposes.

Depreciation expense was $6.8 million, $5.6 million and $5.2 million for the years ended December 31, 2024, 2023 and 2022, respectively.

Note 9. Leases

We have operating leases for manufacturing, office space, warehouse space, computer and office equipment and vehicles used in our business operations. We have a finance lease in relation to the 2015 sale-leaseback of our corporate headquarters in Beverly, Massachusetts. We review all agreements to determine if the agreement contains a lease component. An agreement contains a lease component if it provides the use of a specific physical space or a specific physical item.

We recognize operating lease obligations under Accounting Standards Codification - *Leases* (Topic 842). The guidance in Topic 842 requires recognition of lease assets and related liabilities on a discounted basis using the explicit or implicit discount rate stated within the agreement. We recognize a corresponding right-of-use asset, which is initially determined based upon the net present value of the associated liability and is adjusted for deferred costs and possible impairment, if any. For those lease agreements that do not indicate the applicable discount rate, we use our incremental borrowing rate. The value of the right-of-use asset is initially determined based on the net present value of the associated liability, and is adjusted for deferred costs and possible impairments, if any. We have made the following policy elections: (i) operating leases with an initial term of 12 months or less are not recorded on the consolidated balance sheet; (ii) we recognize lease expense for operating leases on a straight-line basis over the lease term; and (iii) we account for lease components and non-lease components that are fixed payments as one component. Some of our operating leases include one or more options to renew, with renewal terms that can extend the respective lease term 1 to 3 years. The exercise of lease renewal options is at our sole discretion. For lease extensions that are reasonably certain to occur, we have included the renewal periods in our calculation of the net present value of the lease obligation and related right-of-use asset. Certain leases also include options to purchase the leased property. The depreciable life of certain assets and leasehold improvements are limited by the expected lease term, unless there is a transfer of title or purchase option reasonably certain of exercise. Our lease agreements do not contain any material residual value guarantees or material restrictive covenants. The amounts of operating and finance lease right-of-use assets and related lease obligations recorded within our consolidated balance sheets are as follows:

Leases	Classification	December 31, 2024	December 31, 2023
Assets		**(in thousands)**	
Operating leases	Operating lease assets	$ 29,621	$ 30,716
Finance lease	Finance lease assets*	15,346	16,632
Total leased assets		$ 44,967	$ 47,348
Liabilities			
Current			
Operating	Other current liabilities	$ 4,470	$ 4,978
Finance	Current portion of finance lease obligation	1,345	1,511
Non-current			
Operating	Other long-term liabilities	25,321	25,724
Finance	Finance lease obligation	42,329	43,674
Total lease liabilities		$ 73,465	$ 75,887

*Finance lease assets are recorded net of accumulated depreciation of $47.4 million and include $0.5 million of prepaid financing costs as of December 31, 2024. Finance lease assets are recorded net of accumulated depreciation of $46.4 million and include $0.6 million of prepaid financing costs as of December 31, 2023.

Our operating lease office locations support local selling and servicing functions. Our Axcelis Asia Operations Center facility in South Korea is used to manufacture our products for Asia-based customers. We lease a logistics and flex manufacturing center in Beverly, Massachusetts to support our principal product manufacturing operations at our corporate headquarters. Lease expense, depreciation expense relating to finance leased assets and interest expense relating to our finance lease obligation recognized within our consolidated statement of operations for the twelve-month periods ended

December 31, 2024, 2023 and 2022 are as follows:

Lease cost	Classification	Year ended December 31, 2024	2023	2022
Operating lease cost		(in thousands)		
Product / services*	Cost of revenue	$ 6,898	$ 7,297	$ 5,427
Research and development	Operating expenses	622	587	322
Sales and marketing*	Operating expenses	1,817	1,674	1,526
General and administrative*	Operating expenses	991	1,111	1,065
Total operating lease cost		$ 10,328	$ 10,669	$ 8,340
Finance lease cost				
Depreciation of leased assets	Cost of revenue, Research and development, Sales and marketing and General and administrative	$ 1,285	$ 1,310	$ 1,296
Interest on lease liabilities	Interest expense	4,727	4,874	4,992
Total finance lease cost		$ 6,012	$ 6,184	$ 6,288
Total lease cost		$ 16,340	$ 16,853	$ 14,628

* Product / services, sales and marketing and general and administrative expense also includes short-term lease and variable lease costs of approximately $2.1 million, $2.1 million and $1.8 million for the years ended December 31, 2024, 2023 and 2022, respectively.

Our corporate headquarters, shown below under finance leases, has an original lease term of 22 years. All other locations are treated as operating leases, with lease terms ranging from 1 to 16 years. The tables below reflect the minimum cash outflow regarding our current lease obligations as well as the weighted-average remaining lease term and weighted-average discount rates used in our calculation of our lease obligations and right-of-use assets:

Maturity of Lease Liabilities	Finance Leases	Operating Leases	Total Leases
		(in thousands)	
2025	$ 5,930	$ 6,663	$ 12,593
2026	6,008	5,083	11,091
2027	6,128	3,339	9,467
2028	6,251	2,381	8,632
2029	6,376	2,269	8,645
Thereafter	48,960	22,384	71,344
Total lease payments	$ 79,653	$ 42,119	$ 121,772
Less interest portion*	(35,979)	(12,328)	(48,307)
Finance lease and operating lease obligations	$ 43,674	$ 29,791	$ 73,465

* Finance lease interest calculated using the implied interest rate; operating lease interest calculated using estimated corporate borrowing rate.

The table above does not include options to renew lease terms that are not reasonably certain of being exercised as of December 31, 2024.

Lease term and discount rate	December 31, 2024
Weighted-average remaining lease term (years):	
Operating leases	11.0
Finance leases	12.1
Weighted-average discount rate:	
Operating leases	5.5%
Finance leases	10.5%

Our cash outflows from our operating leases include rent expense and other charges associated with these leases. These cash flows are included within the operating section of our statement of cash flows. Our cash flows from our finance lease include an interest and payment of principal component. The table below shows our cash outflows, by lease type and related section of our statement of cash flows, as well as the non-cash amount capitalized on our balance sheet in relation to our operating lease right-of-use assets:

Cash paid for amounts included in the measurement of lease liabilities	Year ended December 31, 2024	2023	2022
		(in thousands)	
Operating cash outflows from operating leases	$ 10,328	$ 10,669	$ 8,340
Operating cash outflows from finance leases	4,727	4,874	4,992
Financing cash outflows from finance leases	1,525	1,240	987
Operating lease assets obtained in exchange for operating lease liabilities	5,324	26,890	6,173
Finance lease assets obtained in exchange for new finance lease liabilities	—	—	—

Note 10. Product Warranty

We generally offer a one-year warranty for all of our systems, 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.

The changes in our product warranty liability are as follows:

	Year ended December 31, 2024	2023	2022
		(in thousands)	
Balance at January 1 (beginning of year)	$ 16,757	$ 10,487	$ 6,924
Warranties issued during the period	11,263	12,893	10,597
Settlements made during the period	(12,160)	(10,230)	(6,798)
Changes in estimate of liability for pre-existing warranties during the period	(677)	3,607	(236)
Balance at December 31 (end of period)	$ 15,183	$ 16,757	$ 10,487
Amount classified as current	$ 13,022	$ 14,098	$ 8,299
Amount classified as long-term (within other long-term liabilities)	2,161	2,659	2,188
Total warranty liability	$ 15,183	$ 16,757	$ 10,487

Note 11. Financing Arrangements

On January 30, 2015, we sold our corporate headquarters facility for the sale price of $48.9 million. As part of the sale, we also entered into a 22-year lease agreement with the buyer. The sale leaseback is accounted for as a financing arrangement for financial reporting purposes and, as such, we recorded a financing obligation of $43.7 million as of December 31, 2024, $1.3 million of which is classified within current liabilities. The associated lease payments include both an interest component and payment of principal, with the underlying liability being extinguished at the end of the original lease term. As of December 31, 2024, we had a security deposit of $5.9 million related to this lease in the form of a cash collateralized letter of credit issued with UBS Bank USA, which is classified as long-term restricted cash on our balance sheet at December 31, 2024.

Note 12. Employee Benefit Plans

(a) Defined Contribution Plan

We maintain the Axcelis Long-Term Investment Plan, a defined contribution plan. Eligible employees may contribute up to 35% of their compensation on a before-tax basis subject to Internal Revenue Service (“IRS”) limitations. Highly compensated employees may contribute up to 16% of their compensation on a before-tax basis subject to IRS limitations. In 2024, 2023 and 2022, we provided an employer match of 50% of employees’ pre-tax contributions on the first 6% of eligible compensation. Total related matching contribution expense was $3.4 million, $3.4 million and $2.7 million, for 2024, 2023 and 2022, respectively.

(b) Other Compensation Plans

We operate in foreign jurisdictions that require lump sum benefits, payable based on statutory regulations, for voluntary or involuntary termination. Where required, an annual actuarial valuation of the benefit plans is obtained.

We have recorded an unfunded liability of $3.1 million and $3.2 million at December 31, 2024 and 2023, respectively, for costs associated with these compensation plans in foreign jurisdictions. The following table presents the classification of these liabilities in the Consolidated Balance Sheets:

	Year ended December 31,	
	2024	2023
	(in thousands)	
Long-term:		
Other long-term liabilities	3,117	3,160
Total liabilities	$ 3,117	$ 3,160

The expense recorded in connection with these plans was $1.7 million, $1.7 million and $1.5 million during the years ended December 31, 2024, 2023 and 2022, respectively.

Note 13. Stock Award Plans and Stock-Based Compensation

(a) Equity Incentive Plans

We maintain the Axcelis Technologies, Inc. 2012 Equity Incentive Plan (the “2012 Equity Plan” or the “Plan”), which became effective on May 2, 2012.

The 2012 Equity Plan, as amended, reserves 9.5 million shares of common stock, $0.001 par value, for grant and permits the issuance of options, stock appreciation rights, restricted stock, restricted stock units, stock equivalents and awards of shares of common stock that are not subject to restrictions or forfeiture to selected employees, directors, and consultants of the Company. The total number of shares reserved for issuance under the Plan is the sum of 7.76 million shares approved by the shareholders, and 1.78 million shares added in accordance with the terms of the Plan as a result of the expiration or forfeiture of awards granted under our prior equity plan. Shares that are not issued under an award (because such award expires, is terminated unexercised or is forfeited) revert back to the Plan.

The term of stock options granted under the Plan is specified in the award agreements. Unless a lesser term is otherwise specified by the Compensation Committee of the Company's Board of Directors, option awards under the 2012 Equity Plan will expire seven years from the date of grant. Under the terms of the Plan, the exercise price of a stock option may not be less than the fair market value of a share of the Company's common stock on the date of grant. Under the 2012 Equity Plan, fair market value is defined as the last reported sale price of a share of the Company's common stock on a national securities exchange as of any applicable date, as long as the Company's shares are traded on such exchange.

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 six months and, once vested, are not affected by the director's termination of service to the Company. In limited circumstances, the Company may grant stock option awards with market-based vesting conditions, such as the Company's common stock price, or other performance conditions. Termination of service by an employee will cause options to cease vesting as of the date of termination, and in most cases, employees will have 90 days after termination to exercise options that were vested as of the termination of employment. In general, retiring employees will have one year after termination of employment to exercise vested options. The Company settles stock option exercises with newly issued shares of common stock.

Restricted stock units granted to employees during 2024 had both service-based vesting provisions and performance-based vesting provisions. Restricted stock units granted to employees generally vest over a service period of four years, while restricted stock units granted to non-employee members of the Company's Board of Directors in 2024 vest over a service period of one year. We have granted restricted stock units to executive officers and other senior employees with performance vesting conditions, which may be subject to further service-based vesting terms. Unvested restricted stock unit awards expire upon termination of service to the Company. We settle restricted stock units upon vesting with newly issued shares of common stock. No restricted stock was granted during the three year period ended December 31, 2024.

As of December 31, 2024, there were 0.5 million shares available for grant under the 2012 Equity Plan.

As of December 31, 2024, there were no options outstanding and 0.5 million unvested restricted stock units outstanding under the 2012 Stock Plan.

(b) Employee Stock Purchase Plan

The 2020 Employee Stock Purchase Plan (the "2020 ESPP") provides our employees an 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 as elected by the participant, subject to certain caps set forth in the 2020 ESPP. Employees may purchase the Company's common stock at 85% of its market price on the day the stock is purchased.

The 2020 ESPP is considered compensatory and as such, compensation expense has been recognized based on the benefit of the discounted stock price, amortized to compensation expense over each offering period of six months. Compensation expense relating to the 2020 ESPP was approximately $0.4 million, $0.4 million, and $0.3 million for the years ended December 31, 2024, 2023 and 2022, respectively.

As of December 31, 2024, there were approximately 0.9 million shares reserved for issuance and available for purchase under the 2020 ESPP, with 19,268 shares purchased on that date to be issued pending settlement. 0.1 million shares were purchased under the 2020 ESPP for the year ended December 31, 2024. Less than 0.1 million shares were purchased under the 2020 ESPP for both of the years ended December 31, 2023 and 2022.

(c) Valuation of Restricted Stock Units

The fair value of the Company's restricted stock units is calculated based upon the fair market value of the Company's stock at the date of grant.

(d) Summary of Stock-based Compensation Expense

We use 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. We estimate forfeitures at the time of grant and revise 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. Based on a historical analysis, a forfeiture rate of 5% per year was applied to stock-based awards, including executive officer awards, for the years ended December 31, 2024, 2023 and 2022.

For the years ended December 31, 2024, 2023 and 2022, we recognized stock-based compensation expense of $21.0 million, $18.3 million and $13.4 million, respectively. We present the expenses related to stock-based compensation in the same expense line items as cash compensation paid to our employees. For the years ended December 31, 2024, 2023 and 2022, we used restricted stock units in our annual equity compensation program.

The benefit of tax deductions in excess of recognized compensation cost is reported in the consolidated statements of cash flows as part of cash flows from operating activities. For the year ended December 31, 2024, the tax deductions in excess of recognized compensation cost had no material impact.

(e) Restricted Stock Units and Restricted Stock

Restricted stock units 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 Award Agreement issued under the 2012 Equity Incentive Plan. Restricted stock unit awards granted in 2024 included time vested share awards and awards with performance vesting conditions. Restricted stock awards are issued shares of common stock that are subject to forfeiture on terms described in the Award Agreement, and may be granted under the 2012 Equity Incentive Plan. No restricted stock awards were granted, or vested, during the years ended December 31, 2024, 2023 and 2022. The fair value of a restricted stock unit and restricted stock award is charged to expense ratably over the applicable service period. 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.

Changes in the Company's non-vested restricted stock units for the year ended December 31, 2024 is as follows:

	Shares/units (in thousands)	Weighted-Average Grant Date Fair Value per Share
Outstanding at December 31, 2023	538	$ 77.22
Granted	249	112.45
Vested	(296)	112.92
Forfeited	(26)	81.32
Outstanding at December 31, 2024	465	$ 103.09

The weighted average grant-date fair value of restricted stock units granted for the years ended December 31, 2024, 2023 and 2022 was $112.45, $125.11 and $55.47, respectively. Most restricted stock units provide for net share settlement to cover the employee's personal income tax withholding obligations on vesting of the employee's restricted stock units. Vesting activity above reflects shares vested before net share settlement. As of December 31, 2024, there was $37.0 million of total forfeiture-adjusted unrecognized compensation cost related to non-vested restricted stock units granted under the 2012 Equity Incentive Plan. That cost is expected to be recognized over a weighted-average period of 2.6 years.

Note 14. Stockholders' Equity

We may issue up to 75 million shares of common stock without additional shareholder approval. At December 31, 2024 and 2023, there were 32.4 million and 32.7 million outstanding shares of common stock, respectively.

Note 15. Fair Value Measurements

Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date.

(a) Fair Value Hierarchy

The accounting guidance for fair value measurement requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The standard establishes a fair value hierarchy based on the level of independent, objective evidence surrounding the inputs used to measure fair value. A financial instrument's categorization within the fair value hierarchy is based upon the lowest level of input that is significant to the fair value measurement. The fair value hierarchy is as follows:

Level 1—applies to assets or liabilities for which there are quoted prices in active markets for identical assets or liabilities.

Level 2—applies to assets or liabilities for which there are inputs other than quoted prices that are observable for the asset or liability, such as quoted prices for similar assets or liabilities in active markets; quoted prices for identical assets or liabilities in markets with insufficient volume or infrequent transactions (less active markets); or model-derived valuations in which significant inputs are observable or can be derived principally from, or corroborated by, observable market data.

Level 3—applies to assets or liabilities for which there are unobservable inputs to the valuation methodology that are significant to the measurement of the fair value of the assets or liabilities.

(b) Assets and Liabilities Measured at Fair Value

Our money market funds and short-term investments with maturities of 90 days or less at time of purchase are included in cash and cash equivalents in the consolidated balance sheets. Short-term investments with maturities greater than 90 days but not greater than 365 days are included in short-term investments in the consolidated balance sheets.

The following table sets forth Company's assets which are measured at fair value by level within the fair value hierarchy.

	December 31, 2024 Fair Value Measurements			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Assets				
Cash equivalents and other short-term investments:				
Cash equivalents (money market funds, U.S. Government Securities and Agency Investments)	$ 81,320	$ —	$ —	$ 81,320
Short-term investments (U.S. Government Securities and Agency Investments)	448,296	—	—	448,296
Mark-to-market adjustment on forward exchange contracts	—	267	—	267
Total	$ 529,616	$ 267	$ —	$ 529,883

	December 31, 2023 Fair Value Measurements			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Assets				
Cash equivalents and other short-term investments:				
Cash equivalents (money market funds, U.S. Government Securities and Agency Investments)	$ 118,278	$ —	$ —	$ 118,278
Short-term investments (U.S. Government Securities and Agency Investments)	339,240	—	—	339,240
Total	$ 457,518	$ —	$ —	$ 457,518

(c) Other Financial Instruments

The carrying amounts reflected in the consolidated balance sheets for accounts receivable, prepaid expenses and other current and non-current assets, restricted cash, accounts payable and accrued expenses approximate fair value due to their short-term maturities.

Note 16. Commitments and Contingencies

In addition to the finance and operating leases discussed in Note 9, we have purchase commitments and other contingency considerations.

(a) Purchase Commitments

We have contracts and purchase orders for inventory and other expenditures of $187.5 million at December 31, 2024, approximately $178.6 million of which are expected to occur in 2025.

(b) Litigation

We are not presently a party to any litigation that we believe might have a material adverse effect on our business operations. We are, from time to time, a party to litigation that arises in the normal course of our business operations.

(c) Indemnifications

Our system sales agreements typically include provisions under which we agree to take certain actions, provide certain remedies and defend our 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. We have not incurred any material costs as a result of such indemnifications and have not accrued any liabilities related to such obligations in the accompanying consolidated financial statements.

Note 17. Business Segment and Geographic Region Information

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

The Company’s chief operating decision maker (“CODM”) is our chief executive officer. The CODM assesses financial performance for the company and decides how to allocate resources based on consolidated net income, such as determining the amount of resources to allocate to research and development projects, stock repurchases, or other growth opportunities. Segment asset information is provided to the CODM but it is not used to allocate resources.

The following table presents selected financial information with respect to the Company's single operating segment for the years ended December 2024, 2023, and 2022:

	Year ended December 31,		
	2024	2023	2022
		(in thousands)	
Revenue:	$ 1,017,865	$ 1,130,604	$ 919,998
Less:			
Cost of revenue	563,211	639,303	518,208
Research and development	105,497	96,907	78,356
Sales and marketing	68,046	62,805	53,599
General and administrative	70,317	65,794	57,474
Total other income (expense)	19,480	12,804	(7,476)
Income tax provision	29,282	32,336	21,806
Segment Net Income	$ 200,992	$ 246,263	$ 183,079
Reconciliation of profit or loss Adjustments and reconciling items	-	-	-
Net income	$ 200,992	$ 246,263	$ 183,079

The above table includes depreciation expense and amortization expense of $15.8 million, $13.1 million and $11.6 million, for the years ended December 31, 2024, 2023, and 2022, respectively.

Our ion implantation systems product line includes high current, medium current and high energy implanters. Other legacy processing products include curing and thermal processing systems. In addition to new equipment, we provide post-sales equipment service and support, including spare parts, equipment upgrades, used equipment, maintenance services and customer training.

Revenue by product lines is as follows:

	Year ended December 31,		
	2024	2023	2022
		(in thousands)	
Ion implantation systems and services	$ 1,001,045	$ 1,111,278	$ 898,132
Other systems and services	16,820	19,326	21,866
Total revenue	$ 1,017,865	$ 1,130,604	$ 919,998

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)	
2024		
United States	$ 632,028	$ 94,132
Europe	38,089	311
Asia Pacific	347,748	4,512
	$ 1,017,865	$ 98,955
2023		
United States	$ 749,288	$ 86,482
Europe	45,583	382
Asia Pacific	335,733	4,040
	$ 1,130,604	$ 90,904
2022		
United States	$ 634,081	$ 66,227
Europe	38,963	212
Asia Pacific	246,954	3,464
	$ 919,998	$ 69,903

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

International revenue, which includes export sales from U.S. manufacturing facilities to foreign customers and sales by foreign subsidiaries and branches, was $873.8 million (85.8% of total revenue), $950.4 million (84.1% of total revenue) and $776.3 million (84.4% of total revenue) in 2024, 2023 and 2022, respectively.

Note 18. Income Taxes

Income before income taxes is as follows:

	Year ended December 31, 2024	2023 (in thousands)	2022
United States	$ 222,160	$ 270,842	$ 198,028
Foreign	8,114	7,757	6,857
Income before income taxes	$ 230,274	$ 278,599	$ 204,885

Provision for income taxes is as follows:

	Year ended December 31, 2024	2023 (in thousands)	2022
Current:			
United States			
Federal	$ 38,963	$ 46,871	$ 8,430
State	2,026	1,985	1,716
Foreign	3,887	3,498	3,124
Total current	44,876	52,354	13,270
Deferred:			
Federal	(13,758)	(18,526)	9,097
State	205	(440)	(102)
Foreign	(2,041)	(1,052)	(459)
Total deferred	(15,594)	(20,018)	8,536
Income tax provision	$ 29,282	$ 32,336	$ 21,806

Reconciliation of income taxes at the United States Federal statutory rate to the effective income tax rate of 12.7% is as follows:

	Year ended December 31, 2024	2023 (in thousands)	2022
Income taxes at the United States statutory rate	$ 48,358	$ 58,506	$ 43,026
State income taxes	1,136	1,062	1,075
Foreign-derived intangible income	(20,439)	(24,052)	(20,526)
Research and other tax credits	(6,037)	(5,955)	(5,469)
Stock-based compensation	(2,765)	(6,718)	(3,818)
Nondeductible compensation	2,834	4,488	2,692
Effect of change in valuation allowance	3,169	1,978	680
Unrecognized tax benefits	761	1,053	705
Other, net	2,265	1,974	3,441
Income tax provision	$ 29,282	$ 32,336	$ 21,806

Deferred income taxes reflect the effect of temporary differences between the carrying amounts of assets and liabilities recognized for financial reporting purposes and the amounts recognized for tax purposes. The tax effects of the temporary differences were as follows:

	Year ended December 31,	
	2024	2023
	(in thousands)	
Deferred tax assets:		
State net operating loss carryforwards	$ 52	$ 96
Foreign net operating loss carryforwards	122	182
Federal tax credit carryforwards	3,378	1,999
State tax credit carryforwards	11,357	9,560
Property, plant and equipment	4,896	6,979
Operating lease liability	5,504	5,564
Accrued compensation	313	242
Inventories	552	804
Stock compensation	2,399	1,790
Warranty	2,666	3,108
Deferred revenue	6,562	6,389
Capitalized research and development costs	54,673	38,036
Gross deferred tax assets	92,474	74,749
Valuation allowance	(14,736)	(10,963)
Net deferred tax assets	77,738	63,786
Deferred tax liabilities:		
Intangible assets	—	—
Right-of-use asset	(8,750)	(9,155)
Other	(711)	(1,203)
Gross deferred tax liabilities	(9,461)	(10,358)
Deferred taxes, net	$ 68,277	$ 53,428

Changes in tax rates and tax laws are accounted for in the period of enactment. Our deferred tax assets and liabilities are measured at the enacted tax rate expected to apply when these temporary differences are expected to be realized or settled.

At December 31, 2024, we maintained a $14.7 million valuation allowance in the U.S. against certain tax credits and state net operating losses due to the uncertainty of their realization based on long-term Company forecasts and the expiration dates on these attributes. This represents an increase of $3.8 million from the prior year.

At December 31, 2024, we had research and development and other tax credit carryforwards of $17.4 million. These carry forwards are subject to an uncertain tax position reserve of $6.0 million. These credits can be used to reduce future federal and state income tax liabilities and expire principally between 2025 and 2036.

We consider the undistributed earnings of our foreign subsidiaries as of December 31, 2024 to be indefinitely reinvested and, accordingly, no U.S. income taxes have been provided thereon. As of December 31, 2024, there is no cash associated with indefinitely reinvested foreign earnings. We did not, nor do we anticipate the need to, repatriate funds to the United States to satisfy domestic liquidity needs arising in the ordinary course of business.

We and our subsidiaries file income tax returns in the U.S. federal jurisdiction and various states and foreign jurisdictions. We and most foreign subsidiaries are subject to income tax examinations by tax authorities for all years dating back to 2021. Our policy is to recognize interest related to unrecognized tax benefits as interest expense and penalties as operating expenses. We believe that we have appropriate support for the income tax positions taken and to be taken on our tax returns and that our 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, 2024, we had unrecognized tax benefits related to uncertain tax positions of $12.5 million, $9.0 million of which is recorded as a long-term liability, and the remainder of which reduced the Company’s state deferred tax assets and the offsetting valuation allowance. We recognized $0.7 million in interest and penalty expenses for the year ended December 31, 2024 relating to these uncertain tax positions. These unrecognized tax benefits, if recognized, would reduce the effective tax rate and also reverse associated accrued interest and penalty expenses.

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

	Year ended December 31,		
	2024	**2023**	**2022**
		(in thousands)	
Balance at beginning of year	$ 11,926	$ 10,443	$ 9,961
Decrease in unrecognized tax benefits as a result of tax positions taken during a prior period	(330)	(271)	(122)
Decreases in unrecognized tax benefits related to settlements with tax authorities	—	—	(708)
Increases in unrecognized tax benefits as a result of tax positions taken during the current period	947	1,754	1,312
Balance at end of year	$ 12,543	$ 11,926	$ 10,443
Recorded as other long-term liability	$ 9,049	$ 8,344	$ 7,190
Recorded as a decrease in deferred tax assets	3,494	3,582	3,253
Balance at end of year	$ 12,543	$ 11,926	$ 10,443

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

	Balance at Beginning of Period	Charged to Costs and Expenses	Deductions	Balance at End of Period
Year ended December 31, 2024				
Allowance for doubtful accounts and returns	$ 460	$ 3,446	$ 3,906	$ —
Deferred tax valuation allowance	10,963	3,773	—	14,736
Year ended December 31, 2023				
Allowance for doubtful accounts and returns	$ —	$ 1,117	$ 657	$ 460
Deferred tax valuation allowance	8,370	3,196	603	10,963
Year ended December 31, 2022				
Allowance for doubtful accounts and returns	$ —	$ —	—	$ —
Deferred tax valuation allowance	7,689	1,529	848	8,370

Exhibit Index

Exhibit No.	Description
3.1	Restated Certificate of Incorporation of the Company, filed November 2, 2017. Incorporated by reference to Exhibit 3.1 of the Company's Form 10-Q filed with the Commission on November 3, 2017.
3.2	Bylaws of the Company, as amended and restated as of May 11, 2022. Incorporated by reference to Exhibit 3.1 of the Company's Form 8-K filed with the Commission on May 11, 2022.
3.3	Certificate of Amendment to the Restated Certificate of Incorporation of the Company filed May 9, 2024. Incorporated by reference to Exhibit 3.1 of the Company's Form 8-K filed with the Commission on May 9, 2024.
4.4	Description of Securities Registered under Section 12 of the Securities Exchange Act of 1934. Incorporated by reference to Exhibit 4.4 of the Company's Form 10-K for the year ended December 31, 2019 filed with the Commission on March 2, 2020.
10.1*	Axcelis Technologies, Inc. 2012 Equity Incentive Plan, as amended by the Board of Directors on November 13, 2024. Filed herewith.
10.2*	Axcelis Management Incentive Plan, as amended and restated by the Compensation Committee of the Board of Directors on February 11, 2010. Incorporated by reference to Exhibit 10.2 of the Company's report on Form 10-K for the year ended December 31, 2009 filed with the Commission on March 15, 2010.
10.3*	Form of Indemnification Agreement approved by the Board of Directors of the Company on February 9, 2012 for use with each of its directors and officers. Incorporated by reference to Exhibit 10.4 of the Company's report on Form 10-K for the year ended December 31, 2011 filed with the Commission on February 29, 2012.
10.4*	Form of Change in Control Agreement, as amended, as approved by the Compensation Committee of the Board of Directors on November 11, 2016, between the Company and each of its executive officers. Incorporated by reference to Exhibit 10.6 of the Company's Form 10-K for the year ended December 31, 2016 filed with the Commission on March 14, 2017.
10.5*	Form of Employee Non-Qualified Stock Option Certificate under the 2012 Equity Incentive Plan, adopted June 18, 2012. Incorporated by reference to Exhibit 10.2 of the Company's report on Form 10-Q for the quarter ended June 30, 2012 filed with the Commission on August 7, 2012.
10.6*	Form of Non-Employee Director Non-Qualified Stock Option Certificate under the 2012 Equity Incentive Plan, adopted June 18, 2012. Incorporated by reference to Exhibit 10.3 of the Company's report on Form 10-Q for the quarter ended June 30, 2012 filed with the Commission on August 7, 2012.
10.7*	Form of Restricted Stock Unit Award Agreement under the 2012 Equity Incentive Plan, adopted June 18, 2012. Incorporated by reference to Exhibit 10.4 of the Company's report on Form 10-Q for the quarter ended June 30, 2012 filed with the Commission on August 7, 2012.
10.8*	Named Executive Officer Base Compensation at February 15, 2025. Filed herewith.
10.9*	Non-Employee Director Cash Compensation at February 15, 2025. Filed herewith.
10.10*	Employment Agreement between the Company and Russell J. Low dated May 11, 2023. Incorporated by reference to Exhibit 10.1 of the Company's report on Form 8-K filed with the Commission on May 12, 2023.
10.11*	2023 Amended and Restated Employment Agreement between the Company and Mary G. Puma dated February 24, 2023. Incorporated by reference to Exhibit 10.1 of the Company's report on Form 8-K filed with the Commission on April 18, 2023.

Exhibit No.	Description
10.12*	Form of Executive Separation Pay Agreement between the Company and each of its executive officers other than Russell J. Low, including Gregory F. Redinbo, Gerald M. Blumenstock, Christopher J. Tatnall, James G. Coogan and Eileen J. Evans, having dates from September 6, 2022 to December 12, 2024. Incorporated by reference to Exhibit 10.2 of the Company's Form 10-Q for the quarter ended June 30, 2019 filed with the Commission on August 7, 2019.
10.13	Lease Agreement between the Company and Beverly Property Owner LLC, effective January 30, 2015. Incorporated by reference to Exhibit 10.24 of the Company's Form 10-K for the year ended December 31, 2014 filed with the Commission on March 11, 2015.
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.
19.1	2023 Insider Trading Policy, as adopted by the Board of Directors on August 10, 2023. Incorporated by reference to Exhibit 19.1 of the Company's report on Form 10-K filed with the Commission on February 23, 2024.
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 February 27, 2025. 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 February 27, 2025. 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 February 27, 2025. 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 February 27, 2025. Filed herewith.
97*	Executive Compensation Clawback Policy, as adopted by the Board of Directors on August 10, 2023. Incorporated by reference to Exhibit 10.14 of the Company's Form 10-K filed with the Commission on February 23, 2024.
101	The following materials from the Company's Form 10-K for the year ended December 31, 2024, formatted in eXtensible Business Reporting Language (XBRL): (i) Consolidated Statements of Operations, (ii) Consolidated Statement of Comprehensive Income (iii) Consolidated Balance Sheets, (iv) Consolidated Statements of Equity, (v) Consolidated Statements of Cash Flows, and (vi) Notes to Consolidated Financial Statements.
104	Cover Page Interactive Data File (formatted as iXBRL and contained in Exhibit 101).

* Indicates a management contract or compensatory plan.

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.

By: /s/ RUSSELL J. LOW
Russell J. Low,
President and Chief Executive Officer

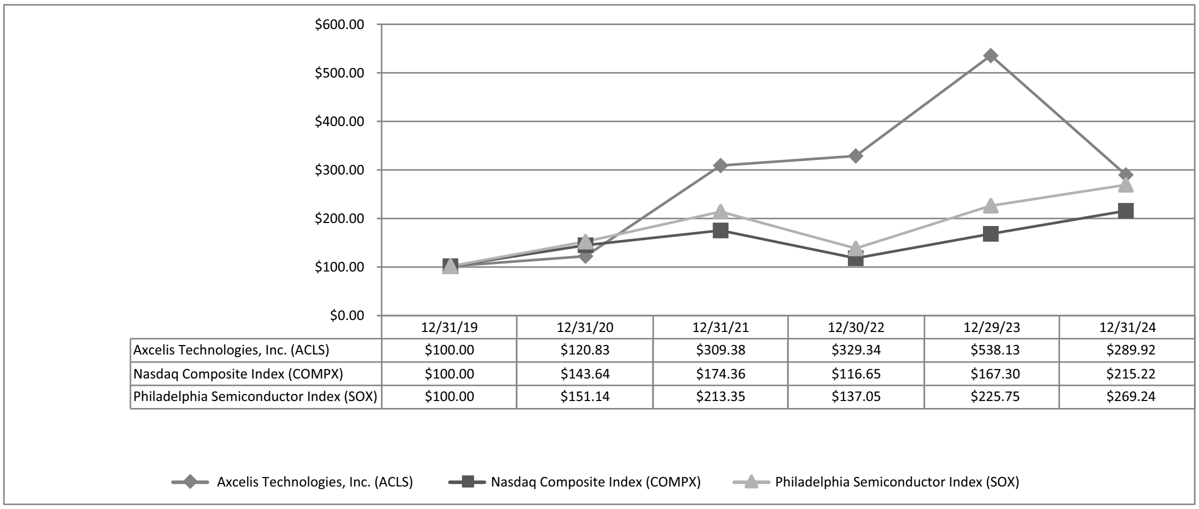
Dated: February 27, 2025

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

Signature	Title	Date
/s/ RUSSELL J. LOW Russell J. Low	Director and Principal Executive Officer	February 27, 2025
/s/ JAMES G. COOGAN James G. Coogan	Principal Accounting and Financial Officer	February 27, 2025
Tzu-Yin Chiu	Director	February 27, 2025
/s/ GREGORY B. GRAVES Gregory B. Graves	Director	February 27, 2025
/s/ JOHN T. KURTZWEIL John T. Kurtzweil	Director	February 27, 2025
/s/ JEANNE QUIRK Jeanne Quirk	Director	February 27, 2025
/s/ NECIP SAYINER Necip Sayiner	Director	February 27, 2025
/s/ THOMAS ST. DENNIS Thomas St. Dennis	Director	February 27, 2025
/s/ JORGE TITINGER Jorge Titinger	Director	February 27, 2025
/s/ Dipti VACHANI Dipti Vachani	Director	February 27, 2025

STOCK PERFORMANCE GRAPH

This graph compares the five-year cumulative total stockholder returns for our common stock to that of the Philadelphia Semiconductor Index and the Nasdaq Composite Index at each of the last five fiscal year ends. The cumulative returns are based on a $100 investment on December 31, 2019, with all dividends, if any, being reinvested. The stock performance shown on the graph below is not necessarily indicative of future price performance.



	12/31/19	12/31/20	12/31/21	12/30/22	12/29/23	12/31/24
Axcelis Technologies, Inc. (ACLS)	$100.00	$120.83	$309.38	$329.34	$538.13	$289.92
Nasdaq Composite Index (COMPX)	$100.00	$143.64	$174.36	$116.65	$167.30	$215.22
Philadelphia Semiconductor Index (SOX)	$100.00	$151.14	$213.35	$137.05	$225.75	$269.24

SAFE HARBOR STATEMENT

This document contains forward-looking statements under the SEC safe harbor provisions. These statements are based on management’s current expectations and should be viewed with caution. They are subject to various risks and uncertainties, many of which are outside the control of the Company, including our ability to implement successfully our profit plans, the continuing demand for semiconductor equipment, relative market growth, continuity of business relationships with and purchases by major customers, competitive pressure on sales and pricing, increases in material and other production costs that cannot be recouped in product pricing and global economic and financial conditions. These risks and uncertainties are discussed in more detail in our Form 10-K and other SEC filings, which may be obtained as described on the next page under “Investor Information/SEC Form 10-K”.

BOARD OF DIRECTORS

Tzu-Yin Chiu, Ph.D.
President, National
Silicon Industry Group

Gregory B. Graves
Former Chief Financial Officer,
Entegris, Inc.

John T. Kurtzweil
Independent Consultant

Russell J. Low, Ph.D.
President and Chief Executive Officer,
Axcelis Technologies, Inc.

Jeanne Quirk
SVP, Mergers and Acquisitions,
TE Connectivity

Necip Sayiner, Ph.D.
Former President of Renesas
Electronics America

Thomas St. Dennis
Non-Executive Chairperson,
FormFactor, Inc.

Jorge Titinger
Non-Executive Chairperson,
Axcelis Technologies, Inc.
Principal, Titinger Consulting

Dipti Vachani
SVP, General Manager,
Automotive and Embedded
Line of Business, Arm Limited

AUDIT COMMITTEE

John T. Kurtzweil, Chairperson
Gregory B. Graves
Jeanne Quirk

COMPENSATION COMMITTEE

Jorge Titinger, Chairperson
Gregory B. Graves
Necip Sayiner
Dipti Vachani

NOMINATING AND GOVERNANCE COMMITTEE

Jeanne Quirk, Chairperson
Thomas St. Dennis
John T. Kurtzweil

TECHNOLOGY AND NEW PRODUCT DEVELOPMENT COMMITTEE
Thomas St. Dennis, Chairperson
Tzu-Yin Chiu
Necip Sayiner
Dipti Vachani

EXECUTIVE OFFICERS

Russell J. Low, Ph.D.
President and Chief Executive Officer

James G. Coogan
Executive Vice President and
Chief Financial Officer

Gerald M. Blumenstock
Executive Vice President, Research,
Development & Engineering

Eileen J. Evans
Executive Vice President and General
Counsel

Gregory F. Redinbo, Ph.D.
Executive Vice President,
Marketing and Applications

Christopher Tatnall, Ph.D.
Executive Vice President,
Global Customer Operations

ANNUAL MEETING DATE & LOCATION
The annual meeting of stockholders will be held at 11:00 a.m. ET on Wednesday, May 7, 2025 at the Company's corporate headquarters.

CORPORATE HEADQUARTERS
108 Cherry Hill Drive
Beverly, MA 01915-1053
978-787-4000

INDEPENDENT AUDITORS
Ernst & Young LLP
200 Clarendon Street
Boston, MA 02116-5072

INVESTOR INFORMATION/SEC FORM 10-K
Information on the Company, as well as the Company's 2024 Annual Report on SEC Form 10-K and other SEC filings, can be obtained 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. You can also e-mail investor relations at investor.relations@axcelis.com.

LEGAL COUNSEL
Covington & Burling LLP
One International Place
Boston, MA 02110-2627

STOCK LISTING
The Company's common stock is traded on the NASDAQ Global Select market under the symbol ACLS.

TRANSFER AGENT & REGISTRAR
For questions regarding misplaced stock certificates, changes of address, or the consolidation of accounts, please contact Computershare Trust Company, N.A., the company's transfer agent:

Telephone: 1-781-575-2725
Toll Free: 1-877-373-6374
Hearing Impaired
TDD#: 1-800-952-9245

Website:
http://www.computershare.com/investor

Mailing Address:
Computershare Trust Company, N.A.
P.O. Box 505000
Louisville, KY 40233-5000

Overnight Correspondence:
Computershare Trust Company, N.A.
462 South 4th Street, Suite 1600
Louisville, KY 40202

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