ENTEGRIS INC
Form 10-K
February 20, 2014
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2013

or

o 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: 001-32598

Entegris, Inc.
(Exact name of registrant as specified in its charter)

Delaware	41-1941551
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)

129 Concord Road, Billerica, Massachusetts 01821
(Address of principal executive offices and zip code)
(978) 436-6500
(Registrant's telephone number, including area code)

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

Title of Class	Name of Exchange on which Registered
Common Stock, $0.01 Par Value	The Nasdaq Global Select Market

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of Form 10-K or any amendment to this Form 10-K. o

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. (Check one):

Large Accelerated Filer	x	Accelerated Filer	o
Non-Accelerated Filer	o (Do not check if a smaller reporting company)	Smaller reporting company	o

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

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The aggregate market value of voting stock held by non-affiliates of the registrant, based on the last sale price of the Common Stock on June 29, 2013, the last business day of registrant's most recently completed second fiscal quarter, was $1,170,000,000. Shares held by each officer and director of the registrant and by each person who owned 10 percent or more of the outstanding Common Stock have been excluded from this computation in that such persons may be deemed to be affiliates of the registrant. This determination of affiliate status for this purpose is not necessarily a conclusive determination for other purposes.

As of February 12, 2014, 138,735,596 shares of the registrant's Common Stock were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Definitive Proxy Statement for its 2014 Annual Meeting of Stockholders scheduled to be held on May 7, 2014, or the 2014 Proxy Statement, which will be filed with the Securities and Exchange Commission, or SEC, not later than 120 days after December 31, 2013, are incorporated by reference into Part III of this Annual Report on Form 10-K. With the exception of the portions of the 2014 Proxy Statement expressly incorporated into this Annual Report on Form 10-K by reference, such document shall not be deemed filed as part of this Annual Report on Form 10-K.

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PART I

Item 1. Business.

THE COMPANY

Entegris, Inc., referred in this report as Entegris or the Company, is a worldwide developer, manufacturer and supplier of products and materials used in processing and manufacturing in the microelectronics and other high-technology industries. For the semiconductor industry, a subset of the microelectronics industry that constitutes the majority of our sales, our products maintain the purity and integrity of critical materials used in the semiconductor manufacturing process. For other high-technology applications, our products and materials are used to manufacture flat panel displays, light emitting diodes or "LEDs", high-purity chemicals, such as photoresists, solar cells, gas lasers, optical and magnetic storage devices, and critical components for aerospace, glass manufacturing and biomedical applications. We sell our products worldwide through a direct sales force and through selected distributors.

The Company was incorporated in Delaware in March 2005 in connection with a strategic merger of equals transaction between Entegris, Inc., a Minnesota corporation (Entegris Minnesota), and Mykrolis Corporation, a Delaware corporation (Mykrolis). See OUR HISTORY below.

We offer a diverse product portfolio that includes approximately 17,000 standard and customized products that we believe provide the most comprehensive offering of products and services to maintain the purity and integrity of critical materials used by the semiconductor and other high-technology industries. Our products include both unit driven and capital expense driven products. Unit-driven and consumable products are consumed or exhausted during the customer's manufacturing process and rely on the level of semiconductor and other manufacturing activity to drive growth. Capital expense driven products rely on the expansion of manufacturing capacity to drive growth. Our unit-driven and consumable product class includes membrane-based liquid filters and housings, metal-based gas filters, resin-based gas purifiers, wafer shippers, disk-shipping containers and test assembly and packaging products and consumable graphite and silicon carbide components used in plasma etch, ion implant and chemical vapor deposition (CVD) processes in semiconductor manufacturing. Our capital expense-driven products include our components, systems and subsystems that use electro-mechanical, pressure differential and related technologies, to permit semiconductor and other electronics manufacturers to monitor and control the flow and condition of process liquids used in these manufacturing processes, and our process carriers that protect the integrity of in-process wafers. Unit-driven and consumable products, including service revenue, accounted for approximately 66%, 66%, and 63% of our net sales for fiscal years 2013, 2012 and 2011, respectively, while capital expense-driven products accounted for approximately 34%, 34% and 37% of our net sales for the fiscal years 2013, 2012 and 2011, respectively.

Our Internet address is www.entegris.com. On this web site, under the "Investors—Financial Information—SEC Filings" section, we post the following filings as soon as reasonably practicable after they are electronically filed with, or furnished to, the U.S. Securities and Exchange Commission (SEC): our annual, quarterly, and current reports on Forms 10-K, 10-Q, and 8-K; our proxy statements; and any amendments to those reports or statements. All such filings are available on our web site free of charge. The SEC also maintains a web site (www.sec.gov) that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. The content on our website, and any other website, as referred to in this Form 10-K is not incorporated by reference into this Form 10-K unless expressly noted.

SEMICONDUCTOR INDUSTRY BACKGROUND

Semiconductors, or integrated circuits, are the building blocks of today's electronics and the backbone of the information age. The market for semiconductors has grown significantly over past decades. This trend is expected to continue due to increased usage of and reliance on the Internet through expanding channels, and the continuing demand for applications in data processing, wireless communications, broadband infrastructure, personal computers, handheld electronic devices and other consumer electronics.

The manufacture of semiconductors is a highly complex process that consists of two principal segments: front-end processes and back-end processes. The front-end process begins with the delivery of raw silicon wafers from wafer manufacturers to semiconductor manufacturers and requires hundreds of highly complex and sensitive manufacturing steps, during which a variety of materials, including chemicals, gases and metals are repeatedly applied to the silicon wafer to build the integrated circuits on the wafer surface. We offer products, such as liquid and gas filters and

purifiers, fluid and gas handling components and wafer shippers and process carriers, to purify these materials and to support each of the primary front-end process steps, which are listed below, as well as products to transport in-process wafers between each of these steps.

Deposition. Deposition refers to placing layers of insulating or conductive materials on a wafer surface in thin films that make up the circuit elements of semiconductor devices. The two main deposition processes are physical vapor deposition, where a

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thin film is deposited on a wafer surface in a low-pressure gas environment, and chemical vapor deposition, where a thin film is deposited on a wafer surface using a gas medium and a chemical bonding process. In addition, electro-plating technology is utilized for the deposition of low resistance conductive materials such as copper. The control of uniformity and thickness of these films through our filtration and purification products, which purify the fluids and materials used during the process, is critical to the performance of the semiconductor circuit and, consequently, the manufacturing yield. In addition, our graphite chamber liners and shower heads are critical expendable components used in the CVD chamber.

Chemical Mechanical Planarization (CMP). CMP flattens, or planarizes, the topography of the surface of the wafer after deposition by use of CMP polishing pads and slurries containing abrasive particles in a chemical mixture. The purpose of CMP is to permit the patterning of small features on the resulting smooth surface by the photolithography process. Semiconductor manufacturers need our filtration and purification systems to filter the liquid slurries and to remove oversized particles and contaminants that can cause defects on a wafer's surface, while not affecting the functioning of the abrasive particles in the liquid slurries. Our filtration and purification systems thus enable semiconductor manufacturers to maintain acceptable manufacturing yields through the CMP process. In addition, manufacturers use our consumable polyvinyl alcohol (PVA) roller brushes to clean the wafer after completion of the CMP process to prepare the wafer for subsequent operations and our pad conditioners to prepare the surface of the CMP polishing pad.

Photolithography. Photolithography is the process step that defines the patterns of the circuits to be built on the chip. Before photolithography, a wafer is pre-coated with photoresist, a light-sensitive film composed of ultra-high purity chemicals in liquid form. The photoresist is exposed to specific forms of radiation, such as ultraviolet light, electrons or x-rays, to form patterns that eventually become the circuitry on the chip. This process is repeated many times, using different patterns and interconnects between layers to form the complex, multi-layer circuitry on a semiconductor chip. As device geometries decrease and wafer sizes increase, it is even more critical that these photoresists are dispensed onto the chip with accurate thickness and uniformity, as well as with low levels of contamination, and that the process gases are free of micro-contamination so that manufacturers can achieve acceptable yields in the manufacturing process. Our liquid filtration and liquid dispense systems play a critical role in assuring the pure, accurate and uniform dispense of photoresists onto the wafer. In addition, our gas micro-contamination systems eliminate airborne amine contaminants that can disrupt effective photolithography processes.

Etch and Resist Strip. Etch is the process of selectively removing precise areas of thin films that have been deposited on the surface of a wafer. The hardened photoresist protects the remaining material that makes up the circuits. During etch, specific areas of the film not covered by photoresist are removed to leave a desired circuit pattern. Similarly, resist strip is a process of removing the photoresist material from the wafer after the desired pattern has been etched on the wafer. Emerging advanced etch and resist strip applications require precisely controlled gas chemistries and flow rates in order to achieve precise etch and resist strip characteristics. Our gas filters and purifiers help assure the purity of these process gas streams, and our consumable graphite components deliver, baffle and confine these process gases during the etch process.

Ion Implant. Ion implantation provides a means for introducing impurities into the silicon crystal, typically into selected areas defined by the photolithographic process. This selective implanting of ions into defined areas creates electrically conductive areas that form the transistors of the integrated circuits. Ion implanters have the ability to implant selected elements into the silicon wafers at precise locations and depths by bombarding the silicon surface with a precisely controlled beam of electrically charged ions of specific atomic mass and energy. These ions are embedded into the silicon crystal structure, changing the electrical properties of the silicon. The precision of ion implantation techniques permits customers to achieve the necessary control of this doping process to construct up to 500 billion transistors of uniform characteristics on a 300mm wafer. Since these transistors are the starting point of all subsequent process steps, repeatability, uniformity and yield are extremely important. Our consumable graphite components as well as our proprietary low temperature plasma coating process for core components are critical elements of ion implantation equipment.

Wet Cleaning. Ultra-high purity chemicals and photoresists of precise composition are used to clean the wafers, to pattern circuit images and to remove photoresists after etch. Before processes such as photoresist coating, thin film

deposition, ion implantation, diffusion and oxidation, and after processes such as ion implantation and etch, the photoresists must be stripped off, and the wafer cleaned in multiple steps of chemical processes. To maintain manufacturing yields and avoid defective products, these chemicals must be maintained at very high purity levels without the presence of foreign material such as particles, ions or organic contaminants. Our liquid filters and purifiers are used to assure the purity of these chemicals.

Our wafer and reticle carriers are high-purity “micro-environments” which carry wafers between each of the above process steps, protecting them from damage and contamination during these transport operations. Our fluid handling components assure the delivery of pure liquid chemicals to each of these process steps. Front-end wafer processing can involve hundreds of steps and take several weeks. As a result, a batch of 25 fully processed wafers, the standard number of wafers that can be transported in one of our 200 mm and 300 mm products, can be worth several million dollars. Since significant value is added to the wafer

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during each successive manufacturing step, it is essential that the wafer be handled carefully and precisely to minimize damage. Thus, in the case of wafer carriers, precise wafer positioning, highly reliable and predictable cassette interface dimensions and advanced materials are crucial. The failure to prevent damage to wafers can severely impact integrated circuit performance, render an integrated circuit inoperable or disrupt manufacturing operations. Our products enable semiconductor manufacturers to: minimize contamination (semiconductor processing is now so sensitive that ionic contamination in certain processing chemicals is measured in parts per trillion); protect semiconductor devices from electrostatic discharge and shock; avoid process interruptions; prevent damage or abrasion to wafers and materials during automated processing caused by contact with other materials or equipment; prevent damage due to abrasion or vibration of work-in-process and finished goods during transportation to and from customer and supplier facilities; and eliminate the dangers associated with handling toxic chemicals.

Once the front-end manufacturing process is completed, finished wafers are transferred to back-end manufacturers or assemblers. The back-end semiconductor manufacturing process consists of test, assembly and packaging of finished wafers into integrated circuits. Our wafer shippers, wafer and reticle carriers and integrated circuit trays facilitate the storage, transport, processing and protection of wafers through these front-end and back-end manufacturing steps.

Semiconductor manufacturing has become increasingly complex in recent years as new technologies have been introduced to enhance device performance and as larger wafer sizes have been introduced to increase production efficiencies. This increasing complexity of semiconductor devices has substantially increased the cost of semiconductor fab infrastructure and equipment and has made achieving target yields more difficult for semiconductor manufacturers adopting advanced processes. This has resulted in a number of challenges including the need for more complex, higher-precision liquid and gas delivery, measurement, control and purification systems and subsystems in the front-end manufacturing processes in order to improve time-to-market and manufacturing yields, reduce manufacturing costs, improve production quality and enhance product reliability. To address these challenges, semiconductor equipment companies and device manufacturers are outsourcing the design and manufacture of liquid delivery, measurement, control and purification systems, subsystems, components, and consumables to us and to other well-established subsystem and component companies that have worldwide presence and leading technologies. The design and performance of those liquid delivery systems, subsystems, components and consumables are critical to the front-end semiconductor manufacturing process because they directly affect cost of ownership and manufacturing yields. We continually seek opportunities to work with our customers to address these challenges.

Also in response to these challenges and to achieve continued productivity gains, semiconductor manufacturers have become increasingly focused on materials management solutions that enable them to safely store, handle, process and transport critical materials throughout the manufacturing process to minimize the potential for damage or degradation to their materials and to protect their investment in processed wafers. The need for efficient and reliable materials management is particularly important as new materials are introduced. Further processing wafers in higher manufacturing technology nodes, larger wafers and finer line widths is more costly and more complex than for smaller wafer sizes and larger line widths. In addition, new materials and circuit shrinkage create new contamination and material compatibility risks, rendering larger wafers more vulnerable to damage or contamination. We believe that these challenges provide opportunities for our advanced purification, dispense, shipping, transport, process and storage products and systems. We also seek to bring our advanced polymer engineering expertise and advanced tool design capabilities to bear on these challenges to provide our customers with innovative materials-based solutions.

Many of the processes used to manufacture semiconductors are also used to manufacture photovoltaic cells, LEDs, flat panel displays and magnetic storage devices resulting in the need for similar filtration, purification, control and measurement capabilities. We seek to leverage our products and expertise in serving semiconductor applications to address these important market opportunities.

OUR BUSINESS STRATEGY

Our objective is to be a leading global provider of innovative products and solutions for purifying, protecting and transporting critical materials used in processing and manufacturing in the semiconductor and other high-technology industries. We intend to build upon our position as a worldwide developer, manufacturer and supplier of liquid delivery systems, components and consumables used by semiconductor and other electronic device manufacturers and upon our expertise in advanced specialty materials to grow our business in these and other high value-added

manufacturing process markets. Our strategy includes the following key elements:

Comprehensive and Diverse Product Offerings. The semiconductor manufacturing industry is driven by rapid technological changes and intense competition. We believe that semiconductor manufacturers are seeking process control suppliers who can provide a broad range of reliable, flexible and cost-effective products, as well as the technological and application design expertise necessary to deliver effective solutions. Our comprehensive product offering enables us to meet a broad range of customer needs and provide a single source of flexible product offerings for semiconductor device and capital equipment

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manufacturers as they seek to consolidate their supplier relationships to a smaller select group. In addition, we believe manufacturers of semiconductor tools are looking to their suppliers for subsystems that provide more integrated functionality and that seamlessly communicate with other equipment. We believe our offering of consumables and equipment, as well as our ability to integrate them, allows us to provide advanced subsystems. We believe our offering of consumables and equipment, as well as our ability to integrate them, responds to these needs.

Diversified Revenue Stream. We target a diversified revenue stream by balancing our sales of wafer transport and process carriers as well as component and subsystem equipment products with sales of our unit-driven and consumable products. Our unit-driven and consumable products provide a relatively more stable and recurring source of revenue in this cyclical industry. Our capital expense-driven products, which are generally dependent upon such factors as the construction and expansion of semiconductor manufacturing facilities and the retrofitting and renovation of existing semiconductor facilities, position us to benefit from increases in capital spending that are typically more subject to the volatility of industry cycles. In addition, we are applying our products and technologies to ancillary markets as described below.

Technology Leadership. With the emergence of smaller and more powerful semiconductor devices, and the deployment of new materials and processes to produce them, we believe there is a need for greater materials management within the semiconductor fabrication process. We seek to extend our technology by developing advanced products that address more stringent requirements for greater purification, protection and transport of high value-added materials and for contamination control, fluid delivery and monitoring, and system integration. We have continuously improved our products as our customers' needs have evolved. For example, we have developed proprietary materials blends for use in our wafer handling product family that address the contamination concerns of advanced semiconductor processing for below 32 nanometers; we have also developed advanced 300 mm wafer handling products utilizing advanced materials and have been actively developing products for handling 450 mm wafers, the next generation of semiconductor wafers. We have also expanded upon our proprietary two-stage dispense technology with integrated filtration for photoresist delivery, where the photoresist is filtered through one pump and precisely dispensed through a second pump at a different flow rate to reduce defects on wafers.

Strong Customer Base. We have established ongoing relationships with many leading original equipment manufacturers (OEMs) and materials suppliers in our key markets. These industry relationships have provided us with the opportunity for significant collaboration with our customers at the product design stage, which has facilitated our ability to introduce new products and applications that meet our customers' needs. For example, we work with our key customers at the pre-design and design stages to identify and respond to their requests for current and future generations of products. We target opportunities to offer new technologies in emerging applications, such as copper plating, chemical mechanical planarization, wet-dry cleaning systems, and extreme ultra-violet, or EUV, photolithography. We believe that our large customer base will continue to be an important source of new product development opportunities.

Global Presence. We have established a global infrastructure of design, manufacturing, distribution, service and support facilities to meet the needs of our customers. As semiconductor and other electronic device manufacturers have become increasingly global, they have required that suppliers offer comprehensive local repair and customer support services. In response to this trend, we have, for example, expanded our operations in Taiwan to provide manufacturing capabilities to support our important customers in the region, we have established sales and service offices in China in anticipation of a growing semiconductor manufacturing base in that region and we have transferred customer support and logistics activities to local regions, including our expanded presence in Singapore, to enhance our global and regional management of supply chain and manufacturing processes. We maintain our customer relationships through a combination of direct sales and support personnel and selected independent sales representatives and distributors in Asia, Europe and the Middle East.

Ancillary Markets. We leverage our accumulated expertise in the semiconductor industry by developing products for applications that employ similar production processes that utilize materials integrity management, high-purity fluids and integrated dispense system technologies. Our products are used in manufacturing processes outside of the semiconductor industry, including the manufacturing of flat panel displays, fuel cell components, high-purity chemicals, photoresists, solar cells, gas lasers, optical and magnetic storage devices and fiberoptic cables. We plan to

continue to identify and develop products that address materials management and advanced materials processing applications where fluid management plays a critical role. We believe that by utilizing our technology to provide manufacturing solutions across multiple industries, we are able to increase the total available market for our products and reduce, to an extent, our exposure to the cyclicality of any particular market.

Strategic Acquisitions, Partnerships and Related Transactions. We plan to pursue strategic acquisitions and business partnerships that enable us to address gaps in our product offerings, secure new customers, diversify into complementary product markets and broaden our technological capabilities and product offerings. Our acquisition of Jetalon Solutions, Inc. in April 2013 is an example of this strategy. Jetalon Solutions reinforces our presence in the semiconductor industry by providing a group of new sensing and control products critical to front-end manufacturing processes based on technology that we did not

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previously have in our portfolio. Further, as the dynamics of the markets that we serve shift, we will reevaluate the ability of our existing businesses to provide value-added solutions to those markets in a manner that contributes to achieving our objectives; in the event that we conclude that a business is not able to do this, we expect to restructure or replace that business. The sale of our cleaning equipment business in 2008 is an example of this strategy. Finally, we are continuously evaluating opportunities for strategic alliances and joint development efforts with key customers and other industry leaders.

OUR SEGMENTS

We design, manufacture and market our products through three business segments: (i) our contamination control solutions segment, which offers a wide range of products that purify, monitor and deliver critical liquids and gases to the semiconductor manufacturing process and similar manufacturing processes, (ii) our microenvironments segment, which offers products to preserve the integrity of wafers, reticles and electronic components at various stages of transport, processing and storage and (iii) our specialty materials segment, which offers materials, components and services to a wide range of customers in the semiconductor industry and in adjacent and unrelated industries. Each segment has dedicated manufacturing resources, and is composed of product-focused business units. Each business segment has its own dedicated marketing and engineering, research and development resources. There follows a detailed description of our three segments:

CONTAMINATION CONTROL SOLUTIONS

Liquid Filtration Products. Liquid processing occurs during multiple manufacturing steps including photolithography, deposition, planarization and surface etching and cleaning. The fluids that are used include various mixtures of acids, bases, solvents, slurries and photochemicals, which in turn are used over a broad range of operating conditions, including temperatures from 5 degrees Celsius up to 180 degrees Celsius. The design and performance of our liquid filtration and purification products are critical to the semiconductor manufacturing process because they directly affect the manufacturing yield. Specially designed proprietary filters remove sub-micron sized particles and bubbles from the different fluid streams that are used in the manufacturing process. Some of our filters are constructed with ultra-high molecular weight polyethylene flat sheet membranes that offer improved bubble clearance and gel removal to prevent defects in the wafers that occur if these elements are not removed. Our low hold-up volume disposable filters, with flat sheet membranes, use our Connectology technology to allow filter changes in less than a minute, significantly faster than conventional filters, to reduce the amount of expensive chemicals lost each time a filter is changed and to minimize operator exposure to hazardous solvents and vapors during changeout. In addition to the filtration of particles from fluids, we have also expanded our offerings for chemical purification, which targets the removal of specific molecules from a process chemical, to improve yield in processes such as wet cleaning.

Components and Systems. Chemicals spend most of their time in contact with fluid storage and management distribution systems, so it is critical for fluid storage and handling components to resist these chemicals and avoid contributing contaminants to the fluid stream. We offer chemical delivery products that allow the consistent and safe delivery of sophisticated chemicals from the chemical manufacturer to the point-of-use in the semiconductor fab. Most of these products are made from perfluoroalkoxy or PFA, a fluoropolymer resin widely used in the semiconductor industry because of its high purity and inertness to chemicals. The innovative design and reliable performance of our products under the most stringent of process conditions has made us a leader in high-purity fluid transfer products. Both semiconductor manufacturers and semiconductor OEMs use our chemical delivery products. Our comprehensive product line provides our customers with a single-source provider for their chemical storage and management needs throughout the manufacturing process. Our chemical delivery products include valves, fittings, tubing, pipe, chemical containers, custom fabricated products and associated connection systems for high-purity chemical applications.

Our proprietary photochemical filtration and dispense systems integrate our patented two-stage, filter device and valve control technologies. Our two-stage technology permits the filtering and dispense functions to operate independently so that filtering and dispensing of photochemicals can occur at different rates, reducing the differential pressure across the filter, conserving expensive photochemicals and resulting in reduced defects in wafers. As described above, we offer a line of proprietary filters specifically designed to efficiently connect with these systems. Our patented digital valve control technology improves chemical uniformity on wafers and improves ease of optimized system operation.

In addition, our integrated high-precision liquid dispense systems enable uniform application of photoresists for the spin-coating process, where uniformity is measured in units of Angstroms, a tiny fraction of the thickness of a human hair.

We offer a wide variety of measurement and control products for high-purity and corrosive applications. For electronic measurement and control of liquids, we provide a complete line of pressure and flow measurement and control products as well as all-plastic capacitance sensors for leak detection, valve position, chemical level and other measurements. We also offer mechanical gauge pressure measurement products. The acquisition of Jetalon Solutions added metrology and sensor products that use refractive index technology to achieve greater precision in real-time chemical blending, which is increasingly critical in

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applications where minute variations of process fluid concentration levels can adversely impact manufacturing yields. In semiconductor manufacturing, Jetalon Solutions products monitor and control liquid concentrations in all wet processing areas including wafer surface preparation and cleaning, photolithography, CMP, post-CMP cleaning, and copper electroplating. In the biopharmaceutical market, these solutions are used in both upstream and downstream processing in applications such as real-time in-line concentration monitoring of media and buffer preparations. This is an area of increasing interest for biopharmaceutical applications given the growing trend from batch manufacturing to real-time or continuous manufacturing processes.

CMP Products. In addition to filters for the purification of liquid chemical slurries, we offer a line of consumable PVA roller brush products to clean the wafer following the chemical mechanical planarization process. Our unique Planarcore PVA roller brush is molded on the core to allow easy installation that reduces tool downtime and a dimensionally stable product that provides consistent wafer-to-wafer cleaning performance. In addition, our CMP pad conditioners, based on our silicon carbide capabilities, offer unique preparation solutions for each distinct CMP pad application.

Gas Filtration Products. Our Wafergard®, Chambergard® and Waferpure® particle and molecular filtration products purify the gas entering the process chamber in order to eliminate system and wafer problems due to particulate, atmospheric and chemical contaminants. These filters are able to retain all particles 0.003 microns and larger. Our metal filters, such as stainless steel and nickel filters, reduce outgassing and improve corrosion resistance. Our Waferpure ® and Aeronex Gatekeeper® purifiers chemically react with and absorb contaminants, such as oxygen and water, to prevent contamination, and our ChamberGard vent diffusers reduce particle contamination and processing cycle times. We offer a wide variety of gas purification products to meet the stringent requirements of semiconductor processing. Our Aeronex Gas Purification Systems contain dual-resin beds, providing a continuous supply of purified gas without process interruption. These gas purification systems are capable of handling higher flow rates and longer duty cycles than cartridge purifiers. Our product line also includes filter housings and hybrid media chemical air filters which purify air entering tool enclosures and remove airborne molecular contaminants.

MICROENVIRONMENTS

Our microenvironment products fall into three sub-categories, wafer and reticle handling products, wafer shipping products and data storage products.

Wafer and Reticle Handling Products. We are a global producer of wafer and reticle handling products. We offer a wide variety of products that hold and position wafers as they travel between each piece of equipment used in the automated semiconductor manufacturing process. These specialized carriers provide precise wafer positioning, wafer protection and highly reliable and predictable cassette interfaces in automated fabs. Semiconductor manufacturers rely on our products to improve yields by protecting wafers from abrasion, degradation and contamination during the manufacturing process. We provide standard and customized products that meet a spectrum of industry standards and customers' wafer handling needs including front opening unified pods or "FOUPs", wafer transport and process carriers, standard mechanical interface or "SMIF" pods and work-in-process boxes. To meet our customers' varying wafer processing and transport needs, we offer wafer process carriers in a variety of materials, including advanced polymeric materials, and in sizes ranging from 100 mm through 300 mm. In addition, we offer FOUPs for experimental 450 mm wafers.

We are also a global provider of mask and reticle handling products, including reticle SMIF pods for the protection of extremely valuable and contamination-sensitive lithography reticles. Through our Clarilite—branded product offerings, we are providing our customers with leading edge contamination control solutions.

Wafer Shipping Products. We are a global provider of critical shipping products that preserve the integrity of raw silicon wafers as they are transported from wafer manufacturers to semiconductor manufacturers or finished wafers shipped to back end processors. We lead the market with our extensive, high-volume line of Ultrapak ® and Crystalpak ® products which are supplied to wafer manufacturers in a full range of sizes covering 100, 125, 150 and 200 mm wafers. We also offer a full-pitch, front-opening shipping box, or FOSB, for the transportation and automated interface of 300 mm wafers. We offer a complete shipping system, including both wafer shipping containers as well as secondary packaging that provides another level of protection for wafers. For experimental 450 mm wafers, we offer a Single Wafer Shipper, a Multi-Application Carrier, or MAC, and a front-opening unified pod, or FOUP.

We currently offer outsourcing programs for wafer and device transportation and protection for both wafer manufacturing and wafer handling products. Our services include product cleaning, certified re-use services for shipping products, on-site and off-site product maintenance and optimization, and end-of-life recycling for our wafer, device and disk-handling products. Re-use services can be customized depending on the customer’s needs to provide product cleaning, logistics, recovery, certification and supply solutions for our products.

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Data Storage Products. We provide products and solutions to manage two critical sectors in the data storage market: magnetic disks and the read/write heads used to read and write today's higher density disks. Because both of these hard disk drive components are instrumental in the transition to more powerful storage solutions, we offer products that protect and maintain the integrity of these components during their processing, storage and shipment. Our product offerings for magnetic hard disk drives include process carriers, boxes, packages, tools and shippers for aluminum and other disk substrates. Our optical hard disk drive products include stamper cases, process carriers, boxes and glass master carriers. Our read/write head products include transport trays, carriers, handles, boxes, individual disk substrate packages and accessories.

Rapidly changing packaging strategies for semiconductor applications are creating new materials management challenges for back-end manufacturers. We offer chip and matrix trays as well as carriers for bare die handling and integrated circuits. Our materials management products are compatible with industry standards and available in a wide range of sizes with various feature sets. Our standard trays offer dimensional stability and permanent electrostatic discharge protection. Our trays also offer a number of features including custom designs to minimize die movement and contact; shelves and pedestals to minimize direct die contact, special pocket features to handle various surface finishes to eliminate die sticking; and other features for automated or manual die placement and removal. In addition, we support our product line with a full range of accessories to address specific needs such as static control, cleaning, chip washing and other related requirements.

SPECIALTY MATERIALS

Our specialty materials products fall into two sub-categories, Poco Graphite Products and Specialty Coating Products. These products all provide high-value materials science enabling solutions in the form of materials, components or services that provide corrosion, high temperature, wear and chemical resistance, electrical and thermal conductivity and biocompatibility to a wide range of customers both within the semiconductor industry and in adjacent and unrelated industries.

Poco Graphite Products. These products are made from specialized graphite or silicon carbide. Our Poco Graphite products sold to the semiconductor industry are used for critical components for semiconductor manufacturing equipment at various stages of the semiconductor manufacturing process including CVD, where our expendable graphite chamber liners and shower heads are critical components used in the CVD chamber; dry or plasma etch, where our consumable graphite components deliver, baffle and confine the process gases during the etch process; and ion implant, where our consumable graphite components are critical elements of ion implantation equipment. In addition, our POCO® high-quality graphite is used to make precision consumable electrodes for electrical discharge machining, a non-contact precision thermoelectric machining process for hard and exotic metals and other materials. Poco Graphite also manufactures a number of graphite hot glass contact materials for use in the manufacture of glass containers. Finally, Poco Graphite manufactures a number of graphite consumable products for various industrial applications including bushings and thrust washers for aerospace applications, substrates for industrial print heads, components for scan heads in industrial optical applications, cathodes for fuel cells and materials to manufacturers of artificial heart valves for human implantation.

Specialty Coating Products. We offer a variety of high-performance specialty coatings for critical components used in semiconductor and other high-technology manufacturing operations. These components, often in highly complex geometries, are coated by means of a proprietary low-temperature, plasma-assisted CVD process to provide corrosion and abrasion resistance and desired conductivity and hydrophobicity properties. We also provide complex assemblies such as electrostatic chucks for ion implant equipment, where our coatings prevent contamination of the process. Our coatings are also used in other high-technology applications such as aerospace optical components.

WORLDWIDE APPLICATIONS DEVELOPMENT AND FIELD SUPPORT CAPABILITIES

We provide strong technical support to our customers through local service groups and engineers consisting of field applications engineers, technical service groups, applications development groups and training capabilities. Our field applications engineers, located in the United States and approximately ten other countries, work directly with our customers on product qualification and process improvements in their facilities. In addition, in response to customer needs for local technical service and fast turnaround time, we maintain regional applications laboratories. Our applications laboratories maintain process equipment that simulate customers' applications and industry test standards

and provide product evaluation, technical support and complaint resolution for our customers.

OUR CUSTOMERS AND MARKETS

Within the semiconductor market, our major customer groups include integrated circuit device manufacturers, OEMs that provide equipment to integrated circuit device manufacturers, gas and chemical manufacturing companies and manufacturers of high-precision electronics.

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Our most significant customers based on sales in 2013 include leading device makers such as Micron Technology, Inc., Samsung Electronics Co., Ltd., Taiwan Semiconductor Manufacturing Co. Ltd. and United Microelectronics Corporation (UMC), leading OEM companies such as Applied Materials, Inc., ASML Holding N.V. Dainippon Screen Mfg. Co., Ltd. (DNS), Lam Research Corporation and Tokyo Electron Ltd. and leading wafer grower companies such as MEMC Electronic Materials, Inc., Shin-Etsu Chemical Co. Ltd., Siltronic AG and SUMCO Oregon Corp. We also sell our products to flat panel display OEMs, materials suppliers and end users. The major manufacturers for flat panel displays and flat panel display equipment are concentrated in Japan, Korea and other parts of Asia.

In our other high-technology markets, our customers include manufacturers and suppliers in the solar and life science industries and, for our Poco Graphite products, electrical discharge machining customers, glass container manufacturers, aerospace manufacturers and manufacturers of biomedical implantation devices.

In 2013, 2012 and 2011, net sales to our top ten customers accounted for approximately 34%, 36% and 29%, respectively, of our net sales. During those same periods no single customer accounted for more than 10% of our net sales and international net sales represented 71%, 69% and 71%, respectively, of our net sales in 2013, 2012 and 2011. Over 2,400 customers purchased products from us during 2013.

We may enter into supply agreements with our customers to govern the conduct of our business with our customers, including the manufacture of our products. These agreements generally have a term of one to three years, but do not contain any long-term purchase commitments. Instead, we work closely with our customers to develop non-binding forecasts of the future volume of orders. However, customers may cancel their orders, change production quantities from forecasted volumes or delay production for a number of reasons beyond our control.

SALES AND MARKETING

We sell our products worldwide, primarily through our direct sales force and strategic distributors located in offices in all major semiconductor markets, as well as through independent distributors elsewhere. As of December 31, 2013, our sales and marketing force consisted of approximately 435 employees worldwide. Our direct sales force is also supplemented by independent distributors, sales representatives and agents.

Our semiconductor marketing efforts focus on our “push/pull” marketing strategy in order to maximize our selling opportunities. We work with OEMs to persuade them to design tools that require our products and we create end-user “pull” demand by persuading semiconductor manufacturers to specify our products. Our industry relationships have provided us with the opportunity for significant collaboration with our customers at the product design stage, which has facilitated our ability to introduce new products and applications that meet our customers’ needs. In addition, we are constantly identifying for our customers the variety of analytical, purification and process control challenges that may be addressed by our products. Further, we adapt our products and technologies to resolve process control issues identified by our customers. Our sales representatives provide our customers with worldwide support and information about our products.

We believe that our technical support services are important to our marketing efforts. These services include assisting in defining a customer’s needs, evaluating alternative products, designing a specific system to perform the desired separation, training users and assisting customers in compliance with relevant government regulations. In addition, we maintain a network of service centers located in the United States and in key international markets to support our products.

COMPETITION

The market for our products is highly competitive. While price is an important factor, we compete primarily on the basis of the following factors:

- historical customer relationships;
- technical expertise;
- product quality and performance;
- total cost of ownership;
- customer service and support;
- breadth of product line;
- breadth of geographic presence;
- advanced manufacturing capabilities; and
- after-sales service.

We believe that we compete favorably with respect to all of the factors listed above, but we cannot assure you that we will continue to do so. We believe that our key competitive strengths include our broad product line, the low total cost

of ownership of our products, our ability to provide our customers with quick order fulfillment and our technical expertise. However, our competitive position varies depending on the market segment and specific product areas within these segments. While we have

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longstanding relationships with a number of semiconductor and other electronic device manufacturers, we also face significant competition from companies that also have longstanding relationships with other semiconductor and electronic device manufacturers and, as a result, have been able to have their products specified by those customers for use in manufacturers' fabrication facilities. In the markets for our consumable products, we believe that our differentiated membrane and materials management technologies, our strong supply chain capabilities that allow us to provide our customers with quick order fulfillment, and our technical expertise, which enables us to develop membranes to meet specific customer needs and assist our customers in improving the functionality of our membranes for particular applications, allow us to compete favorably. In these markets our competitors compete against us on the basis of price, as well as alternative membrane technology having different functionality, manufacturing capabilities and breadth of geographic presence.

The market for our products is highly fragmented, and we compete with a number of different companies. Our liquid filtration and other contamination control products compete with product offerings from a wide range of companies including both large companies, such as Pall Corporation, as well as small Asian filter manufacturers. Our contamination control components and systems also face worldwide competition from companies such as Saint-Gobain, Parker Hannifin Corp., Gemu Valves, Inc., Integrated Automation, Inc. (CKD) and Tokyo Keiso Co., Ltd. Our gas filtration products compete with companies such as SAES Pure Gas, Inc., Donaldson Company, Inc. and Mott Corporation. Our microenvironment product lines face competition largely on a product-by-product basis. We face competition from companies such as Miraial Co. Ltd. (formerly Kakizaki), Dainichi Shoji Co., Inc., Gudeng Precision Industrial Co., Ltd. and Shin-Etsu Polymer Co., Ltd. and from regional suppliers such as e.PAK Resources Pte. Ltd. These companies compete with us primarily in 200 mm and 300 mm applications. Our data storage and finished electronic components products compete with companies such as Illinois Tool Works Inc. (ITW/Camtex), Peak International and 3M Company and from regional suppliers. Our Poco Graphite products compete with products manufactured by companies such as Mersen (France), Tokai Carbon Co., Ltd. (Japan) and Toyo Tanso Co., Ltd. (Japan). Some of our competitors are larger and have greater resources than we do. In some cases, our competitors are smaller than us, but well-established in specific product niches. We believe that none of our competitors competes with us across all of our product offerings and that, within the markets that we serve, we offer a broader line of products, make use of a wider range of process control technologies and address a broader range of applications than any single competitor.

ENGINEERING, RESEARCH AND DEVELOPMENT

Our aggregate engineering, research and development expenses in 2013, 2012 and 2011 were $55.3 million, $50.9 million and $48.0 million, respectively. As of December 31, 2013, we had approximately 270 employees in engineering, research and development. In addition, we have followed a practice of supplementing our internal research and development efforts by licensing technology from unaffiliated third parties and/or acquiring distribution rights with respect to products incorporating externally owned technologies when we believe it is in our long-term interests to do so.

To meet the global needs of our customers, we have engineering, research and development capabilities in California, Minnesota, Massachusetts, Colorado, Texas, Japan, Korea, Taiwan, France and Malaysia. Our engineering, research and development efforts are directed toward developing and improving our technology platforms for semiconductor and advanced processing applications and identifying and developing products for new applications for which fluid management plays a critical role.

We use sophisticated methodologies to research, develop and characterize our materials and products. Our materials technology laboratories are equipped to analyze the physical, rheological, thermal, chemical and compositional nature of the polymers we use. Our materials lab includes standard and advanced polymer analysis equipment such as inductively coupled plasma mass spectrometry (ICP/MS), inductively coupled plasma atomic emission spectrometry (ICP/AES), fourier transform infrared spectroscopy (FTIR) and automated thermal desorption gas chromatography/mass spectrometry (ATD-GC/MS). This advanced analysis equipment allows us to detect contaminants in materials that could harm the semiconductor manufacturing process to levels as low as parts per billion, and in many cases parts per trillion.

Our capabilities to test and characterize our materials and products are focused on continuously reducing risks and threats to the integrity of the critical materials that our customers use in their manufacturing processes. We expect that technology and product engineering, research and development will continue to represent an important element in our ability to develop and characterize our materials and products.

Key elements of our engineering, research and development expenditures over the past three years have included the development of new product platforms to meet the manufacturing needs for 45, 32, 28 and 20 nanometer and smaller semiconductor devices. Driven by the proliferation of new materials and chemicals in the manufacturing processes and more demanding platforms for contamination control for 300 mm wafers, investments were made for new contamination control products in the area of copper interconnects, deep ultra-violet (DUV) and EUV photolithography, and chemical and gas management technologies for advanced wafer cleans, deposition and etch equipment. Additional investments were made in the

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area of advanced process control, monitoring and diagnostics capabilities for future generations of semiconductor manufacturing processes, including the development of a manufacturing capability for the production of Single Wafer Carriers, Multi Application Carriers and FOUPs for the next generation 450 mm wafers. Our employees also work closely with our customers' development personnel. These relationships help us identify and define future technical needs on which to focus our engineering, research and development efforts. In addition, we participate in Semiconductor Equipment and Materials International (SEMI), an association of semiconductor equipment suppliers, and leading industry consortia, such as the Interuniversity Microelectronics Centre (IMEC) and Semiconductor Manufacturing Technology (SEMATECH), including its Global 450 Consortium (G450C). For example, we have participated with SEMI to develop specifications and with a major customer to develop wafer handling products for 450 mm wafers. We also support research at academic and other institutions targeted at advances in materials science and semiconductor process development.

MANUFACTURING

Our customers rely on our products to assure the integrity of the critical materials used in their manufacturing processes by providing dimensional precision and stability, purity, cleanliness and consistent performance. Our ability to meet our customers' expectations, combined with our substantial investments in worldwide manufacturing capacity, position us to respond to the increasing materials integrity management demands of the microelectronics industry and other industries that require similar levels of materials integrity.

To meet our customer needs worldwide, we have established an extensive global manufacturing network with manufacturing and coating facilities in the United States, Japan, Taiwan, France, Malaysia and South Korea. Because we work in an industry where contamination control is paramount, we maintain Class 100 to Class 10,000 cleanrooms for manufacturing and assembly. We believe that our worldwide manufacturing operations and our advanced manufacturing capabilities are important competitive advantages. Our advanced manufacturing capabilities include:

- Injection Molding. Our manufacturing expertise is based on our long experience with injection molding. Using molds produced from computer-aided processes, our manufacturing technicians utilize specialized injection molding equipment and operate within specific protocols and procedures established to consistently produce precision products.
- Extrusion. Extrusion is accomplished through the use of heat and force from a screw to melt solid polymer pellets in a cylinder and then forcing the resulting melt through a die to produce tubing and pipe. We have established contamination-free on-line laser marking and measurement techniques to properly identify products during the extrusion process and ensure consistency in overall dimension and wall thickness. In addition, we use extrusion technology to extrude a polymer mix into flat sheet and hollow fiber membranes.
- Blow Molding. Blow molding consists of the use of heat and force from a screw to melt solid polymer pellets in a cylinder and then forcing the resulting melt through a die to create a hollow tube. The molten tube is clamped in a mold and expanded with pressurized gas until it takes the shape of the mold. We utilize advanced three-layer processing to manufacture premium grade 55 gallon drums, leading to cost savings while simultaneously assuring durability, strength and purity.
- Rotational Molding. Rotational molding is accomplished by the placing of a solid polymer powder in a mold, placing the mold in an oven and rotating the mold on two axes so that the melting polymer coats the entire surface of the mold. This forms a part in the shape of the mold upon cooling. We use rotational molding in manufacturing containers up to 5,000 liters.
- Compression Molding. In compression molding, thermoset polymers are processed. Today, we use this manufacturing process primarily for manufacturing integrated flow controllers and valves market. We use the same expertise as in injection molding to assure a consistently produced precision product.
- Membrane Casting. We cast membrane by extruding a polymer into flat sheet or hollow fiber format that is passed through a chamber with controlled atmospheric conditions to control the development of voids or pores in the membrane. Once cast, the membrane is subjected to solvent extraction and annealing steps. The various properties of the membranes that we offer are developed during subsequent process steps.
- Cartridge Manufacturing. We fabricate the membrane we manufacture as well as membranes manufactured by others into finished filtration cartridges in a variety of configurations. The fabrication process involves membrane processing

into pleated and other configurations around a central core and enclosing it in a framework of end caps and protective screening for use in fabricated cartridge housings. We also manufacture filter cartridges that are integrated into their own housings and incorporate our patented Connectology quick connect technology.

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- Specialty Coating Capabilities. We fabricate high performance electrostatic chucks by using highly engineered materials and advance vacuum coatings. We have proprietary low-temperature, plasma-assisted CVD and physical vapor deposition (PVD) processes that deposit coatings on a variety of vacuum compatible materials, including metals, alloys, ceramics, semiconductors and polymers, with superior density, purity and uniformity.
- Graphite Synthesis. We have a differentiated proprietary graphite synthesis process that produces premium graphite with superior strength, uniformity and performance. This synthesis process consists of blending and forming petroleum cokes into “green” billets, baking over an extended period between 800 to 1,100°C, followed by a graphitization process at temperatures between 2,000 to 3,000°C. The graphite produced by this process is sold in bulk, machined into specific components or converted into silicon carbide through controlled exposure to silicon monoxide gas.
- Machining. Machining consists of the use of computer-controlled equipment to create shapes, such as valve bodies and other specific components, out of solid polymer blocks or rods, premium graphite and silicon carbide. Our computerized machining capabilities enable speed and repeatability in volume manufacturing of our machined products, particularly products utilized in chemical delivery applications.
- Assembly. We have established protocols, flow charts, work instructions and quality assurance procedures to assure proper assembly of component parts. The extensive use of robotics throughout our facilities reduces labor costs, diminishes the possibility of contamination and assures process consistency.
- Tool Making. We employ tool development staff in the United States and Malaysia and have tool-making capabilities in Malaysia. Our toolmakers produce the majority of the tools we use throughout the world.

We have made significant investments in systems and equipment to create innovative products and tool designs. Our computer-aided design (CAD) equipment allows us to develop three-dimensional electronic models of desired customer products to guide design and tool-making activities. Our CAD equipment also aids in the rapid prototyping of products.

We also use computer-automated engineering in the context of mold flow analysis. Beginning with a three-dimensional CAD model, mold flow analysis is used to visualize and simulate how our molds will fill. The mold flow analysis techniques cut the time needed to bring a new product to market because of the reduced need for sampling and development. Also, our CAD equipment can create a virtual part with specific geometries, which drives subsequent tool design, tool manufacturing, mold flow analysis and performance simulation.

In conjunction with our three-dimensional product designs, we use finite element analysis software to simulate the application of a variety of forces or pressures to observe what will happen during product use. This analysis helps us anticipate forces that affect our products under various conditions. The program also assists our product designers by measuring anticipated stresses against known material strengths and establishing proper margins of safety.

PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

We rely on a combination of patent, copyright, trademark and trade secret laws and license agreements to establish and protect our proprietary rights. As of February 18, 2014 our patent portfolio included 280 current U.S. patents, 805 current foreign patents, including counterparts to U.S. filings, 119 pending U.S. patent applications, 23 pending filings under the Patent Cooperation Treaty not yet nationalized and 320 pending foreign patent applications. While we believe that patents may be important for aspects of our business, we believe that our success also depends upon close customer contact, innovation, technological expertise, responsiveness and worldwide distribution. Additionally, while our patented technology may delay or deter a competitor in offering a competing product, we do not believe that our patent portfolio functions as a barrier to entry for any of our competitors. In addition, while we license and will continue to license technology used in the manufacture and distribution of products from third parties, we do not consider any particular license to be material to our business. We also license our technology to third parties from time to time and, in particular, as required for our patented technology to be designated as the standard by SEMI or other standard setting organizations within the semiconductor industry.

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

The patent position of any manufacturer, including us, is subject to uncertainties and may involve complex legal and factual issues. Litigation has in the past and may in the future be necessary to enforce our patents and other intellectual property rights or to defend ourselves against claims of infringement or invalidity. The steps that we have taken in seeking patents and other intellectual property protections may prove inadequate to deter misappropriation of our technology and information. In

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addition, our competitors may independently develop technologies that are substantially equivalent or superior to our technology.

GOVERNMENTAL REGULATION

Our operations are subject to federal, state and local regulatory requirements relating to environmental, waste management and health and safety matters, including measures relating to the release, use, storage, treatment, transportation, discharge, disposal and remediation of contaminants, hazardous substances and wastes, as well as practices and procedures applicable to the construction and operation of our plants. There can be no assurance that we will not incur material costs and liabilities or that our past or future operations will not result in exposure to injury or claims of injury by employees or the public. Although some risk of costs and liabilities related to these matters is inherent in our business, as with many similar businesses, we believe that our business is operated in substantial compliance with applicable regulations. However, new, modified or more stringent requirements or enforcement policies could be adopted, which could adversely affect us. While we expect that capital expenditures will be necessary to assure that any new manufacturing facility is in compliance with environmental and health and safety laws, we do not expect these expenditures to be material. Otherwise, we are not presently aware of any facts or circumstances that would cause us to incur significant liabilities in the future related to environmental, health and safety law compliance.

EMPLOYEES

As of December 31, 2013, we had approximately 2,800, full-time employees, as well as approximately 400 temporary and part-time employees. Approximately 270 of our full-time employees work in engineering, research and development and approximately 435 work in sales and marketing. Given the variability of business cycles in the semiconductor industry and the quick response time required by our customers, it is critical that we be able to quickly adjust the size of our production staff to maximize efficiency. Therefore, we use skilled temporary labor as required. None of our employees are represented by a labor union or covered by a collective bargaining agreement other than statutorily mandated programs in certain European countries.

INFORMATION ABOUT OUR OPERATING SEGMENTS

Our financial reporting segments are Contamination Control Solutions (CCS), Microenvironments (ME), and Specialty Materials (SMD). See Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations - Segment Analysis below for a discussion of revenue and segment profitability with respect to each of these reporting segments, which discussion is incorporated herein by reference. Further, in 2013, 2012 and 2011 approximately 71%, 69% and 71%, respectively, of our net sales were made to customers outside North America. Industry and geographic segment information is also discussed in Note 16 to the Entegris, Inc. Consolidated Financial Statements (the “Financial Statements”) included in response to Item 8 below, which Note is incorporated herein by reference.

OTHER INFORMATION

On July 27, 2005, our Board of Directors adopted a shareholder rights plan (the “Rights Plan”) pursuant to which Entegris declared a dividend on August 8, 2005 to its shareholders of record on that date of one preferred share purchase right (a “Right”) for each share of Entegris common stock owned on August 8, 2005 and authorized the issuance of Rights in connection with future issuances of Entegris common stock. Each Right entitles the holder to purchase one-hundredth of a share of a series of preferred stock at an exercise price of $50, subject to adjustment as provided in the Rights Plan. The Rights Plan is designed to protect Entegris’ shareholders from attempts by others to acquire Entegris on terms or by using tactics that could deny all shareholders the opportunity to realize the full value of their investment. The Rights are attached to the shares of our common stock until certain triggering events specified in the Rights Agreement occur, including, unless approved by our board of directors, an acquisition by a person or group of specified levels of beneficial ownership of our common stock or a tender offer for our common stock. Upon the occurrence of any of these triggering events, the Rights authorize the holders to purchase at the then-current exercise price for the Rights that number of shares of our common stock having a market value equal to twice the exercise price. The Rights are redeemable by us for $0.01 and will expire on August 8, 2015. One of the events that would trigger the Rights is the acquisition, or commencement of a tender offer, by a person (an Acquiring Person, as defined in the shareholder rights plan), other than Entegris or any of our subsidiaries or employee benefit plans, of

15% or more of the outstanding shares of our common stock. An Acquiring Person may not exercise a Right.

Entegris' products are made from a wide variety of raw materials that are generally available in quantity from alternate sources of supply. However, certain materials included in the Company's products, such as certain filtration membranes used by our Contamination Control Solutions segment, polymer resins used by our Microenvironments segment and petroleum coke used by our Specialty Materials segment are obtained from a single source or a limited group of suppliers. Although the Company

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seeks to reduce dependence on these sole and limited source suppliers, the partial or complete loss of these sources could interrupt our manufacturing operations and result in an adverse effect on the Company's results of operations. Furthermore, a significant increase in the price of one or more of these components could also adversely affect the Company's results of operations.

OUR HISTORY

Effective August 6, 2005 Entegris, Inc., a Minnesota corporation, and Mykrolis Corporation, a Delaware corporation, completed a strategic merger of equals transaction, pursuant to which they were each merged into the Company to carry on the combined businesses. We were incorporated in Delaware in March 2005 under the name Eagle DE, Inc. as a wholly owned subsidiary of Entegris Minnesota. Effective August 6, 2005 Entegris Minnesota merged into us in a reincorporation merger of which we were the surviving corporation. Immediately following that merger, Mykrolis merged into us and our name was changed to Entegris, Inc. Our stock is traded on the NASDAQ National Market System under the symbol "ENTG".

Entegris Minnesota was incorporated in June 1999 to effect the business combination of Fluoroware, Inc., which began operating in 1966, and EMPAK, Inc., which began operating in 1980. On July 10, 2000, Entegris Minnesota completed an initial public offering of approximately 19% of the total shares of the Company's common stock outstanding.

Mykrolis was organized as a Delaware corporation on October 16, 2000 under the name Millipore MicroElectronics, Inc. in connection with the spin-off by Millipore Corporation of its microelectronics business unit. On March 31, 2001, Millipore effected the separation of the Mykrolis business from Millipore's business by transferring to Mykrolis substantially all of the assets and liabilities associated with its microelectronics business. On August 9, 2001, Mykrolis completed an initial public offering of approximately 18% of the total shares of the Company's common stock outstanding. On February 27, 2002, Millipore completed the spin-off of Mykrolis by distributing to its stockholders the 82% of the Mykrolis common stock that it held following the Mykrolis initial public offering.

On August 11, 2008, we acquired Poco Graphite, Inc. (Poco Graphite), a privately held company based in Decatur, Texas, which augmented our base of business in the semiconductor industry and expanded our materials science capabilities to include graphite and silicon carbide. On April 1, 2013, we acquired the business and assets of Jetalon Solutions, Inc., a privately held California corporation, to add metrology and refractive index concentration sensing technology to our technology portfolio.

EXECUTIVE OFFICERS OF THE REGISTRANT

The following is a list, as of December 31, 2013, of our Executive Officers. All of the Corporate Officers listed below were elected to serve until the first Directors Meeting following the 2014 Annual Stockholders Meeting. All of the Other Executive Officers Listed below were appointed to their current positions by Corporate Officers.

Name	Age	Office	First Appointed To Office*
CORPORATE OFFICERS			
Bertrand Loy	48	President & Chief Executive Officer	2001
Gregory B. Graves	53	Executive Vice President, Chief Financial Officer & Treasurer	2002
Peter W. Walcott	67	Senior Vice President, Secretary & General Counsel	2001
John J. Murphy	61	Senior Vice President, Human Resources	2005
OTHER EXECUTIVE OFFICERS			
Todd Edlund	51	Vice President, General Manager, Contamination Control Solutions Division	2007
Gregory C. Morris	57	Chief Commercial Officer	2008
Michael D. Sauer	48	Vice President, Controller & Chief Accounting Officer	2011
William Shaner	46	Vice President, General Manager, Microenvironments Division	2007

* With either the Company or a predecessor company

Bertrand Loy has served as our President and Chief Executive Officer since November 2012. Prior to that, he served as the Executive Vice President and Chief Operating Officer since July 2008. Mr. Loy served as the Executive Vice President and Chief Administrative Officer from the effectiveness of the merger with Mykrolis until July 2008. He served as the Vice

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President and Chief Financial Officer of Mykrolis from January 2001 until the Merger. Prior to that, Mr. Loy served as the Chief Information Officer of Millipore Corporation from April 1999 until December 2000. From 1995 until 1999, he served as the Division Controller for Millipore's Laboratory Water Division. From 1989 until 1995, Mr. Loy served Sandoz Pharmaceuticals (now Novartis) in a variety of financial, audit and controller positions located in Europe, Central America and Japan. Mr. Loy serves on the board of BTU International, Inc., a publicly held supplier of advanced thermal processing equipment.

Gregory B. Graves has served as our Executive Vice President and Chief Financial Officer since July 2008. Prior to that he served as Senior Vice President and Chief Financial Officer since April 2007. Prior to April 2007, he served as Senior Vice President, Strategic Planning & Business Development since the effectiveness of the merger with Mykrolis. Mr. Graves served as the Chief Business Development Officer of Entegris Minnesota since September 2002 and from September 2003 until August 2004 he also served as Senior Vice President of Finance. Prior to joining Entegris Minnesota, Mr. Graves held positions in investment banking and corporate development, including at U.S. Bancorp Piper Jaffray from June 1998 to August 2002 and at Dain Rauscher from October 1996 to May 1998.

Peter W. Walcott has been our Senior Vice President, Secretary and General Counsel since the effectiveness of the merger with Mykrolis. He served as the Vice President, Secretary and General Counsel of Mykrolis since October 2000. Mr. Walcott served as the Assistant General Counsel of Millipore Corporation from 1981 until March 2001.

John J. Murphy joined us as our Senior Vice President, Human Resources in October 2005. He served as the Senior Vice President Human Resources of HNTB, an engineering and architectural services firm, from February 2004 until October 2005 and as Corporate Vice President, Human Resources of Cadence Design Systems, Inc. from May 2000 through October 2003. Prior to that Mr. Murphy held senior human resources positions with Williams Companies L.M. Ericsson Telephone Company and General Electric Company.

Todd Edlund has been Vice President and General Manager of our Contamination Control Solutions Division since December 2007. He served as the Vice President and General Manager of our Liquid Systems Business Unit from 2005 to 2007, and prior to that as Entegris Minnesota's Vice President of Sales for semiconductor markets from 2003 to 2005. Prior to 2003, Mr. Edlund held a variety of positions with our predecessor companies since 1995.

Gregory C. Morris has been our Chief Commercial Officer since of 2012; prior to that he served as Vice President, General Manager, Global Field Operations since 2008. Mr. Morris was our North American Regional Sales Director from 2007 until 2008, and the head of our Finished Electronics Products group from 2005 until 2007. Mr. Morris was President of the Entegris Minnesota Data Storage Business Unit from 2003-2005. From 2000 to 2003 Mr. Morris acted as General Manager of a wholly-owned subsidiary of Entegris Minnesota. Prior to 2000, Mr. Morris held a variety of positions with our predecessor companies since 1992.

Michael D. Sauer has been our Vice President, Controller and Chief Accounting Officer since June 2012. Prior to that time, he served as the Corporate Controller since 2008. From the effectiveness of the merger with Mykrolis until April 2008, Mr. Sauer served as Director of Treasury and Risk Management. Mr. Sauer joined Fluoroware, Inc., a predecessor to Entegris Minnesota in 1988 and held a variety of finance and accounting positions until 2001 when he became the Director of Business Development for Entegris Minnesota, the successor to Fluoroware, serving in that position until the merger with Mykrolis.

William Shaner has been our Vice President and General Manager, Microenvironments Division since 2007. He has served in a variety of sales, marketing, business development and engineering roles since joining Entegris in 1995.

Item 1A. Risk Factors.

Risks Relating to our Business and Industry

The semiconductor industry has historically been highly cyclical, and industry downturns reduce net sales and profits. Our business depends on the purchasing patterns of semiconductor manufacturers, which, in turn, depend on the current and anticipated demand for semiconductors and products utilizing semiconductors. The semiconductor industry has historically been highly cyclical with periodic significant downturns, which often have resulted in significantly decreased expenditures by semiconductor manufacturers. Even moderate cyclicality can cause our operating results to fluctuate significantly from one period to the next. We experienced significant revenue deterioration and incurred significant operating losses due to a severe downturn in both the capital and unit-driven segments of the semiconductor industry that began during the second half of 2008. We are unable to predict the

ultimate duration and severity of future downturns for the semiconductor industry.

Furthermore, in periods of reduced demand, we must continue to maintain a satisfactory level of engineering, research and development expenditures and continue to invest in our infrastructure. At the same time, we have to manage our operations to

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be able to respond to any significant increases in demand, if they occur. In addition, because we typically do not have significant backlog, changes in order patterns have a more immediate impact on our revenues. We expect the semiconductor industry to continue to be cyclical. During downturns our revenue is reduced, and there is likely to be an increase in pricing pressure and shifts in product and customer mix, all of which may affect gross margin and net income. Such fluctuations in our results could cause our stock price to decline significantly. We believe that period-to-period comparisons of our results of operations may not be meaningful, and you should not rely upon them as indicators of our future performance.

The semiconductor industry is subject to rapid demand shifts, which are difficult to predict. As a result, our inability to meet demand in response to these rapid shifts may cause a reduction in our market share.

Our ability to increase sales of our products, particularly our capital equipment products, depends in part upon our ability to ramp up the use of our manufacturing capacity for such products in a timely manner and to quickly mobilize our supply chain. In order to meet the demands of our customers, we may be required to ramp up our manufacturing capacity in as little as a few months. If we are unable to expand our manufacturing capacity on a timely basis or manage such expansion effectively, our customers could seek such products from other suppliers, and our market share could be reduced. Because demand shifts in the semiconductor industry are rapid and difficult to foresee, we may not be able to increase capacity quickly enough to respond to any such increase in demand.

We may not be able to accurately forecast demand for our products.

We typically operate our business on a just-in-time shipment basis with a modest level of backlog and we order supplies and plan production based on internal forecasts of demand. Due to these factors, we have, in the past, and may again in the future, fail to accurately forecast demand for our products, in terms of both volume and specific products for which there will be demand. This has led to, and may in the future lead to, delays in product shipments, disappointment of customer expectations, or, alternatively, an increased risk of excess inventory and of inventory obsolescence. If we fail to accurately forecast demand for our products, our business, financial condition and operating results could be materially and adversely affected.

Semiconductor industry up-cycles may not reach historic levels and instead may reflect a lower rate of long-term growth.

There may not be new high-opportunity applications to drive growth in the semiconductor industry, as was the case in earlier market cycles. Accordingly, the semiconductor industry may experience lower growth rates during any recovery cycle than has historically been the case and its longer-term performance may reflect this lower growth rate. We are unable to predict the duration or ultimate severity of any downturn or the growth rate of any recovery cycle that may follow.

If we are unable to maintain our technological expertise in design and manufacturing processes, we will not be able to successfully compete.

The microelectronics industry is subject to rapid technological change, changing customer requirements and frequent new product introductions. Because of this, the life cycle of our products is difficult to determine. We believe that our future success will depend upon our ability to develop and provide products that meet the changing needs of our customers, including the shrinking of integrated circuit line-widths and the use of new classes of materials, such as copper, titanium nitride and organic and inorganic dielectric materials, which are materials that have either a low or high resistance to the flow of electricity. This requires that we successfully anticipate and respond to technological changes in manufacturing processes in a cost-effective and timely manner. Any inability to develop the technical specifications for any of our new products or enhancements to our existing products or to manufacture and ship these products or enhancements in volume in a timely manner could harm our business prospects and significantly reduce our sales. In addition, if new products have reliability or quality problems, we may experience reduced orders, higher manufacturing costs, delays in acceptance and payment, additional service and warranty expense, and damage to our reputation.

Our sales are somewhat concentrated on a small number of key customers and, therefore, our net sales and profitability may materially decline if one or more of our key customers does not continue to purchase our existing and new products in significant quantities.

We depend and expect to continue to depend on a limited number of customers for a large portion of our business, and changes in several customers' orders could have a significant impact on our operating results. Our top ten customers accounted for 34%, 36% and 29%, of our net sales in 2013, 2012 and 2011, respectively. If any one of our key customers decides to purchase significantly less from us or to terminate its relationship with us, our net sales and profitability may decline significantly. We could also lose our key customers or significant sales to our key customers because of factors beyond our control, such as a significant disruption in our customers' businesses generally or in a specific product line. These customers may stop incorporating our products into their products with limited notice to us and suffer little or no penalty for doing so. The

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semiconductor industry is currently undergoing consolidation with a number of major firms merging or being acquired. If any of our customers merge or are acquired, we may experience lower overall sales from the merged or surviving companies. Because one of our strategies has been to develop long-term relationships with key customers in the product areas in which we focus, and because we have a long product design and development cycle for most of our products and prospective customers typically require lengthy product qualification periods prior to placing volume orders, we may be unable to replace these customers quickly or at all.

We are subject to order and shipment uncertainties and many of our costs are fixed, and, therefore, any significant changes, cancellations or deferrals of orders or shipments could cause our net sales and profitability to decline or fluctuate.

We do not usually obtain long-term purchase orders or commitments from our customers. Instead, we work closely with our customers to develop non-binding forecasts of the future volume of orders. Customers may cancel their orders, change production quantities from forecasted volumes or delay production for reasons beyond our control. Order cancellations or deferrals could cause us to hold inventory for longer than anticipated, which could reduce our profitability, restrict our ability to fund our operations and cause us to incur unanticipated reductions or delays in our revenue. Our customers often change their orders multiple times between initial order and delivery. Such changes usually relate to quantities or delivery dates, but sometimes relate to the specifications of the products we are supplying. If a customer does not pay for these products, we could incur significant charges against our income. In addition, our profitability may be affected by the generally fixed nature of our costs. Because a substantial portion of our costs is fixed, we may experience deterioration in gross margins when volumes decline.

Competition from existing or new companies in the microelectronics industry could cause us to experience downward pressure on prices, fewer customer orders, reduced margins, the inability to take advantage of new business opportunities and the loss of market share.

We operate in a highly competitive industry. We compete against many domestic and foreign companies that have substantially greater manufacturing, financial, research and development and marketing resources than we do. In addition, some of our competitors may have more developed relationships with our existing customers than we do, which may enable them to have their products specified for use more frequently by these customers. We also face competition from the manufacturing operations of our current and potential customers, who continually evaluate the benefits of internal manufacturing versus outsourcing. As more OEMs dispose of their manufacturing operations and increase the outsourcing of their products to liquid and gas delivery system and other component companies, we may face increasing competitive pressures to grow our business in order to maintain our market share. If we are unable to maintain our competitive position, we could experience downward pressure on prices, fewer customer orders, reduced margins, the inability to take advantage of new business opportunities and a loss of market share. Further, we expect that existing and new competitors will improve the design of their existing products and will introduce new products with enhanced performance characteristics. The introduction of new products or more efficient production of existing products by our competitors could diminish our market share and increase pricing pressure on our products. Further, customers continue to demand lower prices, shorter delivery times and enhanced product capability. If we do not respond adequately to such pressures, we could lose customers or orders. If we are unable to compete successfully, we could experience pricing pressures, reduced gross margins and order cancellation, which could have a material adverse effect on our results of operations.

The limited market acceptance of our 300 mm shipper products as well as our other products could continue to harm our operating results.

The broad adoption of 300 mm wafers has contributed to the increasing complexity of the semiconductor manufacturing process. The greater diameter of these wafers requires higher tooling costs and presents more complex handling, storage and transportation challenges. We have made and expect to make in the future substantial investments in our 300 mm wafer shipping products, but there is no guarantee that our customers will adopt our 300 mm wafer shipping product lines. Sales of our shipping products for these applications has to date been and could continue in the future to be modest, and we might not recover our development costs.

Semiconductor and other electronic device manufacturers may direct semiconductor capital equipment manufacturers to use a specified supplier’s product in their equipment. Accordingly, our success depends in part on our ability to have

semiconductor and other electronic device manufacturers specify that our products be used at their fabrication facilities. Some of our competitors may have more developed relationships with semiconductor and other electronic device manufacturers, which enable them to have their products specified for use in manufacturers' fabrication facilities.

From time to time, we make capital investments in anticipation of future business opportunities; if we are unable to obtain the anticipated business, our revenue and profitability may decline.

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In the semiconductor market, the first company to introduce an innovative product meeting an identified customer need often will have a significant advantage over offerings of competitive products. For this reason we may make significant capital investments in technology and manufacturing capacity in advance of future business developing and without any commitment from our customers to purchase products manufactured as a result of these investments. For example, we have made significant capital investments to develop the capability to manufacture shippers and FOUPs for 450 mm wafers, however, the size and timing of the development of the market for 450 mm wafer shippers and FOUPs remains uncertain. Major semiconductor manufacturers have delayed the implementation of 450 mm manufacturing while others have announced that they would not initiate 450 mm manufacturing until after 2020, so we cannot assure you that we will be able to successfully sell significant quantities of our 450 mm shipper and FOUP products or realize a return on our investment in the near term or ever. If we are unable to achieve broad market acceptance for these products or if a competitive product is preferred by our customers, we may not be able to recoup our investment, we may lose market share and our revenue and profitability may decline.

We may acquire other businesses, form joint ventures or divest businesses that could negatively affect our profitability, require us to incur debt and dilute your ownership of our company.

As part of our business strategy, we have, and we expect to continue to address gaps in our product offerings, diversify into complementary product markets or pursue additional technology and customers through acquisitions, joint ventures or other types of collaborations. We also expect to adjust our portfolio of businesses to meet our ongoing strategic objectives. As a result, we may enter markets in which we have no or limited prior experience and may encounter difficulties in divesting businesses that no longer meet our objectives. Competition for acquiring attractive businesses in our industry is substantial. In executing this part of our business strategy, we may experience difficulty in identifying suitable acquisition candidates or in completing selected transactions at appropriate valuations. Alternatively, we may be required to undertake multiple transactions at the same time in order to take advantage of acquisition opportunities that do arise; this could strain our ability to effectively execute and integrate these transactions. We would consider a variety of financing alternatives for each acquisition which could include borrowing funds, reducing our cash balances or issuing additional shares of our common stock to complete an acquisition. This could impair our liquidity and dilute your ownership of our Company. Further, we may not be able to successfully integrate any acquisitions that we do make into our existing business operations, and we could assume unknown or contingent liabilities or experience negative effects on our reported results of operations from dilutive results from operations and/or from future potential impairment of acquired assets, including goodwill, related to future acquisitions. We may experience difficulties in operating in foreign countries or over significant geographical distances and in retaining key employees or customers of an acquired business, and our management’s attention could be diverted from other business issues. We may not identify or complete these transactions in a timely manner, on a cost-effective basis or at all, and we may not realize the benefits of any acquisition or joint venture.

We may not effectively penetrate new markets.

Part of our business strategy is to leverage our expertise in our core competencies for growth in new and adjacent markets, such as photovoltaic cells, LEDs, flat panel displays, lithium ion batteries and magnetic storage devices. Our ability to grow our business could be limited if we are unable to execute on this strategy.

Manufacturing Risks

Our dependence on single and limited source suppliers could affect our ability to manufacture our products.

We rely on single or limited source suppliers for some plastic polymers, filtration membranes and petroleum coke that are critical to the manufacturing of our products. At times, we have experienced a limited supply of certain polymers as well as the need to substitute polymers, resulting in delays, increased costs and the risks associated with qualifying new polymers with our customers. An industry-wide increase in demand for these polymers could affect the ability of our suppliers to provide sufficient quantities to us. If we are unable to obtain an adequate quantity of such supplies, our manufacturing operations may be interrupted.

In addition, suppliers may discontinue production of polymers specified in certain of our products, requiring us in some instances to certify an alternative source with our customers. If we are unable to obtain an adequate quantity of such supplies for any reason, our manufacturing operations may be adversely affected. Obtaining alternative sources would likely result in increased costs and shipping delays, which could decrease profitability and damage our

relationships with current and potential customers.

Prices for polymers can vary widely. In a volatile oil price environment, some suppliers have added and may in the future add surcharges to the prices of the polymers we purchase. While we have long-term arrangements with certain key suppliers of polymers that fix our price for purchases up to specified quantities, if our polymer requirements exceed the quantities specified,

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we could be exposed to higher material costs. If the cost of polymers increases and we are unable to correspondingly increase the sales price of our products, our profit margins will decline.

Our filtration products incorporate a wide variety of filter membranes designed to meet specific customer filtration needs, not all of which are produced internally. In the event that a manufacturer of outsourced membrane discontinues supply or production, we may be required to identify and qualify an alternative filter membrane for that application to incorporate into our products. This could require extensive lead times and increased costs which may cause us to lose sales and cause our profit margins to decline.

Our graphite synthesis process requires petroleum coke that meets specified criteria. While there are multiple suppliers for this petroleum coke, the sources are limited and our required criteria may cause the price of this petroleum coke to increase.

Our production processes are becoming increasingly complex, and our production could be disrupted if we are unable to avoid manufacturing difficulties.

Our manufacturing processes are complex and require the use of expensive and technologically sophisticated equipment and materials. These processes are frequently modified to improve manufacturing yields and product quality. We have, on occasion, experienced manufacturing difficulties, such as temporary shortages of raw materials and occasional critical equipment breakdowns that have delayed deliveries to customers. A number of our product lines are manufactured at only one or two facilities, and any disruption could impact our sales until another facility could commence or expand production of such products.

Our manufacturing operations are subject to numerous risks, including the introduction of impurities in the manufacturing process and other manufacturing difficulties that may not be well understood for an extended period of time and that could lower manufacturing yields and make our products unmarketable; the costs and demands of managing and coordinating geographically diverse manufacturing facilities; and the disruption of production in one or more facilities as a result of a slowdown or shutdown in another facility. We could experience these or other manufacturing difficulties, which might result in a loss of customers and exposure to warranty and product liability claims.

Third-party membrane suppliers may disrupt our ability to manufacture products to meet our customer needs.

Certain of our membrane products rely on membranes manufactured by third parties. In the event that these membranes are no longer available or cost-effective and we are unable to acquire an alternative source, our ability to manufacture these products may be disrupted and our profits may decline.

Our membrane manufacturing operations may be disrupted if we are unable to successfully transition manufacturing to our own facility.

The Membrane Manufacturing and Supply Transition Agreement (the “Membrane Agreement”) between us and EMD Millipore Corporation, dated November 22, 2013, provides that our lease of space in Millipore’s Bedford, Massachusetts facility and our right to use certain manufacturing equipment owned by Millipore expires on June 30, 2015. While we have purchased a building in Bedford, MA to house these membrane manufacturing operations, outfitting of this new building to become a functioning membrane manufacturing plant will require significant lead time and capital investment. In addition, the transition of membrane manufacturing operations to this new facility, which will also consolidate certain other existing operations in Massachusetts, will be complex and time consuming. In addition, our current membrane manufacturing is operating at capacity. Consequently, delays in completion of our new membrane manufacturing facility, construction or installation of the equipment to be used therein or obtaining necessary utilities or a failure to execute the transition of our membrane manufacturing operations effectively and expeditiously might disrupt our manufacture of membrane, exacerbate our capacity constraints and result in a loss of customers or exposure to warranty, product liability claims and breach of contract claims.

We may lose sales if we are unable to timely procure, repair or replace capital equipment necessary to manufacture many of our products.

If our existing equipment fails, or we are unable to obtain new equipment quickly enough to satisfy any increased demand for our products, we may lose sales to competitors. In particular, we do not maintain duplicate tools or equipment for most of our important products. Fixing or replacing complex tools is time consuming, and we may not be able to replace a damaged tool in time to meet customer requirements. In addition, from time to time we may

upgrade or add new manufacturing equipment that may require substantial lead times to build and qualify. Delays in building and qualifying new equipment could result in a disruption of our manufacturing processes and prevent us from meeting our customers' requirements so that they would seek other suppliers.

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We incur significant cash outlays over long-term periods in order to research, develop, manufacture and market new products that may never reach market or may have limited market acceptance.

We make significant cash expenditures to engineer, research, develop and market new products. For example, we incurred $55.3 million, $50.9 million and $48.0 million of engineering, research and development expense in 2013, 2012 and 2011, respectively. The development period for a product can be very long. Following development, it may take a number of years for sales of that product to reach a substantial level, if ever. We cannot be certain of the success of a new product. A product concept may never progress beyond the development stage or may only achieve limited acceptance in the marketplace. If this occurs, we do not receive a direct return on our expenditures and may not even realize any indirect benefits. Additionally, capacity expansion may be necessary in order to manufacture a new product. If sales levels do not increase to offset the additional fixed operating expenses associated with any such expansion, our profitability could decline and our prospects could be harmed. For example, as noted above, while we have made significant capital investments to develop the capability to manufacture shippers and FOUPs for 450 mm wafers, the size and timing of the development of the market for 450 mm wafer shippers and FOUPs remains uncertain. Major semiconductor manufacturers have delayed the implementation of 450 mm manufacturing while others have announced that they would not initiate 450 mm manufacturing until after 2020, so we cannot assure you that we will be able to successfully sell significant quantities of our 450 mm shipper and FOUP products or realize a return on our investment in the near term or ever.

We are subject to a variety of environmental laws that could cause us to incur significant expenses.

In addition to other regulatory requirements affecting our business, we are subject to a variety of federal, state, local and non-U.S. regulatory requirements relating to the use, disposal, clean-up of, and human exposure to, hazardous chemicals. We generate and handle materials that are considered hazardous waste under applicable law. Certain of our manufacturing operations require the discharge of substantial quantities of wastewater into publicly owned waste treatment works which require us to assure that our wastewater complies with volume and content limitations. If we fail to comply with any present or future regulations, we could be subject to future liabilities or the suspension of production. In addition, compliance with these or future laws could restrict our ability to expand our facilities or to build or acquire new facilities or may require us to acquire costly equipment, incur other significant expenses, such as remediation of contamination found on any site that we may acquire, or modify our manufacturing processes.

We are continually evaluating our manufacturing operations within our plants in order to achieve efficiencies and gross margin improvements. If we are unable to successfully manage transfers or realignments of our manufacturing operations, our ability to deliver products to our customers could be disrupted and our business, financial condition and results of operations could be adversely affected.

In order to enhance the efficiency and cost effectiveness of our manufacturing operations, we have in the past and may in the future move several product lines from one of our plants to another and to consolidate manufacturing operations in certain of our plants. Our product lines involve technically complex manufacturing processes that require considerable expertise to operate. If we are unable to establish stable processes to efficiently and effectively produce high quality products in relocated manufacturing processes in the destination plant, production may be disrupted and we may not be able to deliver these products to meet customer orders in a timely manner, which may cause us to lose credibility with our customers and harm our business. There can be no assurance that these complex manufacturing processes can be stabilized and that the cost savings that we anticipate will be achieved.

Loss of our key personnel could harm our business because of their experience in the microelectronics industry and their technological expertise. Similarly, our inability to attract and retain new qualified personnel could inhibit our ability to operate and grow our business successfully.

We depend on the services of our key senior executives and technological experts because of their experience in the microelectronics industry and their technical expertise. The loss of the services of one or several of our key employees or an inability to attract, train and retain qualified and skilled employees, specifically research and development and engineering personnel, could result in the loss of customers or otherwise inhibit our ability to operate and grow our business successfully. In the past and currently, during downturns in the semiconductor industry our predecessor companies have, and we have, had to impose salary reductions on senior employees and freeze or eliminate merit increases in an effort to maintain our financial position. These actions may have an adverse effect on employee loyalty

and may make it more difficult for us to attract and retain key personnel.

We face the risk of product liability claims.

The manufacture and sale of our products involve the risk of product liability claims. In addition, a failure of one of our products at a customer site could interrupt the business operations of the customer. Our existing insurance coverage limits may

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not be adequate to protect us from all liabilities that we might incur in connection with the manufacture and sale of our products if a successful product liability claim or series of product liability claims were brought against us.

If we are unable to protect our intellectual property rights, our business and prospects could be harmed.

Our future success and competitive position depend in part upon our ability to obtain and maintain proprietary technology used in our principal product families. We rely, in part, on patent, trade secret and trademark law to protect that technology. We routinely enter into confidentiality agreements with our employees and with third parties.. However, there can be no assurance that these agreements will not be breached, that we will have adequate remedies for any breach or that our confidential and proprietary information and technology will not be independently developed by or become otherwise known to third parties. We have obtained a number of patents relating to our products and have filed applications for additional patents. We cannot assure you that any of our pending patent applications will be approved, that we will develop additional proprietary technology that is patentable, that any patents owned by or issued to us will provide us with competitive advantages or that these patents will not be challenged by third parties. Patent filings by third parties, whether made before or after the date of our filings, could render our intellectual property less valuable. Competitors may misappropriate our intellectual property, and disputes as to ownership of intellectual property may arise. In addition, if we do not obtain sufficient international protection for our intellectual property, our competitiveness in international markets could be significantly impaired, which would limit our growth and future revenue. Furthermore, there can be no assurance that third parties will not design around our patents.

Protection of our intellectual property rights has in the past resulted and may continue to result in costly litigation.

We may from time to time be required to institute litigation in order to enforce our patents, copyrights or other intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others or to defend against claims of infringement. Such litigation could result in substantial costs and diversion of resources and could negatively affect our sales, profitability and prospects regardless of whether we are able to successfully enforce our rights. For example, in January 2011 we settled multiple patent litigations with Pall Corporation. We prosecuted and defended these cases vigorously and incurred substantial costs in pursuing them. It may become necessary for us to initiate other costly patent litigation against this or other competitors in order to protect and/or perfect our intellectual property rights. We cannot predict how any existing or future litigation will be resolved or what their impact will be on us.

If we infringe on the proprietary technology of others, our business and prospects could be harmed.

Our commercial success will depend, in part, on our ability to avoid infringing or misappropriating any patents or other proprietary rights owned by third parties. If we are found to infringe or misappropriate a third party’s patent or other proprietary rights, we could be required to pay damages to such third party, alter our products or processes, obtain a license from the third party or cease activities utilizing such proprietary rights, including making or selling products utilizing such proprietary rights. If we are required to obtain a license from a third party, there can be no assurance that we will be able to do so on commercially favorable terms, if at all.

International Risks

We conduct a significant amount of our sales activity and manufacturing efforts outside the United States, which subjects us to additional business risks and may cause our profitability to decline due to increased costs.

Sales to customers outside the United States accounted for approximately 71%, 69% and 71%, respectively, of our net sales in 2013, 2012 and 2011. We anticipate that international sales will continue to account for a majority of our net sales. In addition, a number of our key domestic customers derive a significant portion of their revenues from sales in international markets. We also manufacture a significant portion of our products outside the United States and are dependent on international suppliers for many of our parts. We intend to continue to pursue opportunities in both sales and manufacturing internationally. Our international operations are subject to a number of risks and potential costs that could adversely affect our revenue and profitability, including:

- unexpected changes in regulatory requirements that could impose additional costs on our operations or limit our ability to operate our business;
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- greater difficulty in collecting our accounts receivable and longer payment cycles than are typical in domestic operations;
- changes in labor conditions and difficulties in staffing and managing foreign operations;
- expense and complexity of complying with U.S. and foreign import and export regulations;
- liability for foreign taxes assessed at rates higher than those applicable to our domestic operations; and
- political and economic instability.

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In the past, we have incurred costs or experienced disruptions due to the factors described above and expect to do so in the future. For example, our operations in Asia, and particularly South Korea, Taiwan and Japan, have been negatively impacted in the past as a result of regional economic instability. In addition, Taiwan and South Korea account for a growing portion of the world's semiconductor manufacturing. There have historically been strained relations between China and Taiwan and there are continuing tensions between North Korea and South Korea and the United States. Any adverse developments in those relations could significantly disrupt the worldwide production of semiconductors, which may lead to reduced sales of our products. Furthermore, we incur additional legal compliance costs associated with our international operations and could become subject to legal penalties in foreign countries if we do not comply with local laws and regulations, which may be substantially different from those in the United States. In a number of foreign countries, some companies engage in business practices that are prohibited by U.S. law applicable to us such as the Foreign Corrupt Practices Act. Although we implement policies and procedures designed to ensure compliance with these laws, there can be no assurance that all of our employees, contractors and agents, as well as those companies to which we outsource certain of our business operations, including those based in countries where practices that violate such U.S. laws may be customary or common, will not take actions in violation of our policies. Any such violation, even if prohibited by our policies, could have an adverse effect on our business and results of operations.

We will lose sales if we are unable to obtain government authorization to export certain of our products or to import certain of our products into foreign markets, and we would be subject to legal and regulatory consequences if we do not comply with applicable export and import control laws and regulations.

Exports of certain of our products are subject to export controls imposed by the U.S. Government and administered by the U.S. Departments of State and Commerce. In certain instances, these regulations may require pre-shipment authorization from the administering department. For products subject to the Export Administration Regulations (EAR) administered by the Department of Commerce's Bureau of Industry and Security, the requirement for a license is dependent on the type and end use of the product, the final destination, the identity of the end user and whether a license exception might apply. Virtually all exports of products subject to the International Traffic in Arms Regulations (ITAR) administered by the Department of State's Directorate of Defense Trade Controls, require a license. Certain of our products are subject to EAR and ITAR. Products developed and manufactured in our foreign locations are subject to export controls of the applicable foreign nation.

Given the current global political climate, obtaining export licenses can be difficult and time-consuming. Failure to obtain export licenses for these shipments could significantly reduce our revenue and materially and adversely affect our business, financial condition and results of operations. Compliance with U.S. Government regulations may also subject us to additional fees and costs. The absence of comparable restrictions on competitors in other countries may adversely affect our competitive position.

In addition, certain countries require import and other special licenses in order for certain of our products to be imported into or sold in that country. Our inability to satisfy these requirements in a timely manner has in the past, and may continue to, prevent us from meeting our customers' expectations in these countries and to lose sales.

Our results of operations could be adversely affected by changes in taxation.

We have facilities in foreign countries and, as a result, are subject to taxation and audit by a number of taxing authorities. Tax rates vary among the jurisdictions in which we operate. Our results of operations could be affected by market opportunities or decisions we make that cause us to increase or decrease operations in one or more countries, or by changes in applicable tax rates or audits by the taxing authorities in countries in which we operate. In addition, we are subject to laws and regulations in various locations that govern the determination of which is the appropriate jurisdiction to decide when and how much profit has been earned and is subject to taxation in that jurisdiction. Changes in these laws and regulations could affect the locations where we are deemed to earn income, which could in turn affect our results of operations. We have deferred tax assets on our balance sheet. Changes in applicable tax laws and regulations could affect our ability to realize those deferred tax assets, which could also affect our results of operations. Each quarter we forecast our tax liability based on our forecast of our performance for the year. If that performance forecast changes, our forecasted tax liability may change.

From time to time we may undertake internal reorganizations of our foreign subsidiaries in order to rationalize and streamline our foreign operations, focus our management efforts on certain local opportunities and to take advantage of favorable business conditions in certain localities. While we exercise diligence in undertaking these internal reorganizations, there can be no assurance that these reorganizations will not result in adverse tax consequences in certain foreign countries in which we have operations. This could adversely impact our profitability from foreign operations and result in a material reduction in our results of operations.

Fluctuations in the value of the U.S. dollar in relation to other currencies may lead to lower net income and shareholders' equity or may cause us to raise prices, which could result in reduced net sales.

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Foreign currency exchange rate fluctuations could have an adverse effect on our net sales, results of operations and shareholders' equity. Foreign currency fluctuations against the U.S. dollar could require us to increase prices to foreign customers, which could result in lower net sales by us to such customers. Alternatively, if we do not adjust the prices for our products in response to foreign currency fluctuations, our profitability could decline. In addition, sales made by our foreign subsidiaries are generally denominated in the currency of the country in which these products are sold, and the currency we receive in payment for such sales could be less valuable at the time of receipt versus the time of sale as a result of foreign currency exchange rate fluctuations.

We may be subject to increased import duties as we seek to source more of the materials from which our products are made from foreign countries.

In an effort to reduce the cost of our products or to obtain the highest quality materials, we expect that our purchases of raw materials and components from foreign countries will increase. Those of our products manufactured in the United States or other countries from these materials and components may consequently be burdened by import duties imposed by the United States or those other countries, and these additional costs may be substantial and may put our products at a competitive disadvantage.

Volatility in the global economy could adversely affect our results.

Financial markets in the United States, Europe and Asia have been experiencing extreme disruption in recent years, including, among other things, volatility in securities prices, severely diminished liquidity and credit availability, rating downgrades of sovereign debt and declining valuation of certain investments, declines in consumer confidence, declines in economic growth, volatility in unemployment rates, and uncertainty about economic stability. During 2008 and 2009, these conditions had a significant adverse impact on our industry and financial condition and results of operations. There may be further changes in the global economy, which could lead to further challenges in our business and negatively impact our financial results. Tightness of credit in financial markets could adversely affect the ability of our customers and suppliers to obtain financing for significant purchases and operations and could result in a decrease in orders and spending for our products and services. We are unable to predict the likely duration and severity of any disruption in European or global financial markets and adverse economic conditions and the effects they may have on our business and financial condition. If uncertain economic conditions return or deteriorate, our business and results of operations could be further materially and adversely affected.

An increased concentration of wafer manufacturing in Japan could result in lower sales of our wafer shipper products.

A large percentage of the world's 300 mm raw silicon wafer manufacturing currently takes place in Japan. Our market share in Japan is currently lower than in other regions we serve. Further, we expect that a large percentage of 450 mm raw silicon wafer manufacturing will, in the future, take place in Japan. If we are unable to persuade these wafer suppliers to use our new 450 mm shippers, we may not be able to achieve a significant market share and may not be able to benefit from our investment in 450 mm shipper manufacturing capacity.

Terrorist attacks, such as the attacks that occurred in New York and Washington, D.C. on September 11, 2001, and other acts of violence or war or natural catastrophes such as the March 2011 earthquake and tsunami in Japan and the June 2012 wildfires in Colorado Springs, Colorado, may affect the markets in which we operate or our operations and hurt our ability to manufacture products and our profitability.

Terrorist attacks may negatively affect our operations and any security we issue. There can be no assurance that there will not be future terrorist attacks against the United States or U.S. businesses. These attacks or other armed conflicts may directly impact our physical facilities or those of our suppliers or customers. Our primary facilities include headquarters, research and development and manufacturing facilities in the United States; sales, research and development and manufacturing facilities in Japan, South Korea, Taiwan and Malaysia; and sales and service facilities in Europe and Asia. Attacks may also disrupt the global insurance and reinsurance industries with the result that we may not be able to obtain insurance at historical terms and levels for our facilities. Furthermore, such attacks may make travel and the transportation of our supplies and products more difficult and more expensive and may ultimately affect the sales of our products in the United States and overseas. As a result of terrorism, the United States may enter into additional armed conflicts, which could have a further impact on our domestic and international sales, our supply chain, our production capacity and our ability to deliver products to our customers. The consequences of these armed conflicts and the associated instability are unpredictable, and we may not be able to foresee events that could have an

adverse effect on our business and any security we issue.

While the March 2011 earthquake and tsunami in Japan did not materially impair manufacturing operations at our Yonezawa, Japan plant and while the June 2012 wildfires in Colorado Springs, CO did not materially impair manufacturing operations at our Colorado Springs plant, there can be no assurance that future such catastrophes will not impact our manufacturing

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operations or those of our supply chain partners by disrupting our ability to manufacture and deliver products to our customers, resulting in an adverse impact on our business and results of operations.

Risks Related to Owning our Securities

The price of our common stock has been volatile in the past and may be volatile in the future.

The price of our common stock has been volatile in the past and may be volatile in the future. While in 2013 the closing price of our stock on The NASDAQ Global Select Market ("NASDAQ") ranged from a low of $8.98 to a high of $11.59, in 2012 and 2011 the price of our common stock showed greater volatility: in 2012 the closing price of our stock on NASDAQ ranged from a low of $7.48 to a high of $9.90 and in 2011 the closing price of our stock on NASDAQ ranged from a low of $6.11 to a high of $10.44.

The trading price of our common stock is subject to significant volatility in response to various factors, some of which are beyond our control, including the following: the failure to meet the published expectations of securities analysts; changes in financial estimates by securities analysts; press releases or announcements by, or changes in market values of, comparable companies; volatility in the markets for high-technology stocks, general stock market price and volume fluctuations, which are particularly common among securities of high-technology companies; stock market price and volume fluctuations attributable to inconsistent trading volume levels; the cyclicality of the semiconductor industry and current industry downturn; our performance; our ability to repay when due any debt obligations we may incur in the future; our ability to respond to rapid shifts in demand; our ability to compete effectively; loss of key customers or decline in order volumes for new and existing products; our high fixed costs; manufacturing difficulties; risks associated with our significant foreign operations; additions or departures of key personnel; involvement in or adverse results from litigation; and perceived dilution from stock issuances.

Furthermore, stock prices for many companies fluctuate widely for reasons that may be unrelated to their operating results. Those fluctuations and general economic, political and market conditions, such as recessions, terrorist or other military actions, or international currency fluctuations, as well as public perception of equity values of publicly traded companies may adversely affect the market price of our common stock. These market fluctuations may cause the trading price of our common stock to decrease. Future decreases in our stock price may adversely impact our ability to raise sufficient additional capital in the future, if needed.

If our common stock trades below book value or our business outlook worsens, we could be required to record material impairment losses for our long-lived assets, including property, plant and equipment and our identifiable intangibles.

In accordance with U.S. generally accepted accounting principles, we review our long-lived assets whenever events or changes in circumstances indicate that the carrying amount of such assets may not be recoverable. If the carrying amount of an asset or group of assets exceeds its undiscounted cash flows, the asset will be written down to its fair value.

The evaluation of the recoverability of long-lived assets requires us to make significant estimates and assumptions. These estimates and assumptions primarily include, but are not limited to, the identification of the asset group at the lowest level of independent cash flows and the primary asset of the group; and long-range forecasts of revenue, reflecting management's assessment of general economic and industry conditions, operating income, depreciation and amortization and working capital requirements.

Due to the inherent uncertainty involved in making these estimates, which are made in a particular economic environment, actual results could differ from those estimates. In addition, changes in the underlying assumptions would have a significant impact on the conclusion that an asset group's carrying value is recoverable, or the determination of any impairment charge if it was determined that the asset values were indeed impaired.

Due to the uncertain economic environment within the semiconductor industry, we continually monitor circumstances and events to determine whether asset impairment testing is warranted.

It is possible that in the future we may no longer be able to conclude that there is no impairment of our long-lived assets, nor can we provide assurance that material impairment charges of long-lived assets will not occur in future periods.

Our annual and quarterly operating results are subject to fluctuations as a result of rapid demand shifts and our modest level of backlog, and if we fail to meet the expectations of securities analysts or investors, the market price of our

common stock may decrease significantly.

Our sales and profitability can vary significantly from quarter to quarter and year to year. Because our expense levels are relatively fixed in the short-term, an unanticipated decline in revenue in a particular quarter could significantly reduce our net income, or lead to a net loss, in that quarter. In addition, we make a substantial portion of our shipments shortly after we receive

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the order, and therefore we operate with a relatively modest level of backlog. As a consequence of the just-in-time nature of shipments and the modest level of backlog, our results of operations may decline quickly and significantly in response to changes in order patterns or rapid decreases in demand for our products. We anticipate that fluctuations in operating results will continue in the future. Such fluctuations in our results could cause us to fail to meet the expectations of securities analysts or investors, which could cause the market price of our common stock to decline substantially. We believe that period-to-period comparisons of our results of operations may not be meaningful, and you should not rely upon them as indicators of our future performance.

If we fail to maintain an effective system of internal controls, we may not be able to accurately report our financial results. As a result, current and potential stockholders could lose confidence in our financial reporting, which would harm our business and the trading price of our stock.

Effective internal controls are necessary for us to provide reliable financial reports. If we cannot provide reliable financial reports, our business and operating results could be harmed. We have in the past discovered, and may in the future, identify material weaknesses in internal control over financial reporting. Each of these past material weaknesses represented a reasonable possibility that a material misstatement of our annual or interim financial statements would not have been prevented or detected.

Any failure to implement and maintain the improvements that we have made to our controls over our financial reporting, or difficulties encountered in the implementation of these improvements in our controls, could cause us to fail to meet our reporting obligations. Any failure in our internal controls that leads to a material weakness could also cause investors to lose confidence in our reported financial information, which could have a negative impact on the trading price of our stock.

Changes effected by the Sarbanes-Oxley Act of 2002 and the Dodd-Frank Wall Street Reform and Consumer Protection Act and related SEC regulations have in the past and are likely to continue to increase our costs.

The Sarbanes-Oxley Act of 2002 and the Dodd-Frank Act required changes in some of our corporate governance, securities disclosure and compliance practices. In response to the requirements of those Acts, the Securities and Exchange Commission and the NASDAQ have promulgated new rules and listing standards covering a variety of subjects. Compliance with these rules and listing standards has increased our legal and financial and accounting costs, and we expect these increased costs to continue indefinitely. We also expect these developments may make it more difficult and more expensive for us to obtain director and officer liability insurance in the future, and we may be forced to accept reduced coverage or incur substantially higher costs to obtain coverage. Likewise, these developments may make it more difficult for us to attract and retain qualified members of our board of directors, particularly independent directors, or qualified executive officers.

Provisions in our charter documents, Delaware law and our shareholder rights plan may delay or prevent an acquisition of us, which could decrease the value of your shares.

Our certificate of incorporation and by-laws, Delaware law and our shareholder rights plan contain provisions that could make it harder for a third party to acquire us without the consent of our board of directors. These provisions include limitations on actions by our stockholders by written consent. In addition, our board of directors has the right to issue preferred stock without stockholder approval, which could be used to dilute the stock ownership of a potential hostile acquirer.

Our restated certificate of incorporation makes us subject to the anti-takeover provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits publicly held Delaware corporations to which it applies from engaging in a “business combination” with an “interested stockholder” for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner. This provision could discourage others from bidding for our shares of common stock and could, as a result, reduce the likelihood of an increase in the price of our common stock that would otherwise occur if a bidder sought to buy our common stock.

Our shareholder rights plan will permit our stockholders to purchase shares of our common stock at a 50% discount upon the occurrence of specified events, including the acquisition by anyone of 15% or more of our common stock, unless such event is approved by our board of directors. Delaware law also imposes restrictions on mergers and other business combinations between us and any holder of 15% or more of our outstanding common stock. Although we

believe these provisions provide for an opportunity to receive a higher bid by requiring potential acquirers to negotiate with our board of directors, these provisions apply even if the offer may be considered beneficial by stockholders. If a change of control or change in management is delayed or prevented, the market price of our common stock could decline.

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Our certificate of incorporation authorizes the issuance of shares of blank check preferred stock.

Our certificate of incorporation provides that our board of directors is authorized to issue from time to time, without further stockholder approval, up to 5,000,000 shares of preferred stock in one or more series and to fix and designate the rights, preferences, privileges and restrictions of the preferred stock, including dividend rights, conversion rights, voting rights, redemption rights and terms of redemption and liquidation preferences. Such shares of preferred stock could have preferences over our common stock with respect to dividends and liquidation rights. Our issuance of preferred stock may have the effect of delaying or preventing a change in control. Our issuance of preferred stock could decrease the amount of earnings and assets available for distribution to the holders of common stock or could adversely affect the rights and powers, including voting rights, of the holders of common stock. The issuance of preferred stock could have the effect of decreasing the market price of our common stock.

Your percentage ownership in us may be diluted by future issuances of capital stock, which could reduce your influence over matters on which stockholders vote.

Subject to applicable NASDAQ standards, our board of directors has the authority, without action or vote of our stockholders, to issue all or any part of our authorized but unissued shares. Issuances of common stock or the exercise of employee and director stock options would dilute your percentage ownership interest, which will have the effect of reducing your influence over matters on which our stockholders vote. In addition, we may issue substantial quantities of our common stock in order to affect acquisitions which would also dilute your ownership interest. If the issuances are made at prices that reflect a discount from the then current trading price of our common stock, your interest in the book value of our common stock might be diluted.

Risks Related to the Pending Merger with ATMI, Inc.

Failure to complete our pending merger with ATMI, Inc. (ATMI) could have a materially adverse effect on our financial condition and results and could negatively impact our stock price.

On February 4, 2014, we entered into an agreement and plan of merger pursuant to which we agreed to acquire ATMI. We will incur significant transaction costs relating to the merger, including legal, accounting, financial advisory, regulatory and other expenses. In general, these expenses are payable by us whether or not the merger is completed. If the merger is not completed under specific circumstances provided in the agreement and plan of merger, we may be required to pay ATMI a termination fee of $100 million. The payment of such transaction costs or termination fees could have an adverse effect on our financial condition, results of operations or cash flows. In addition, we could be subject to litigation in the event the merger is not consummated, which could subject us to significant liability for damages and result in the incurrence of substantial legal fees. The current market price of our stock may reflect an assumption that the pending merger will occur and failure to complete the merger could result in a decline in our stock price.

A putative class action lawsuit has been filed on behalf of ATMI's stockholders relating to the pending merger which names us and our subsidiary, Atomic Merger Corporation, as defendants. If these actions or similar actions that may be brought are successful, the merger with ATMI could be delayed or prevented.

In order to close the merger with ATMI we will need to incur a significant level of debt that could have important consequences for our business and any investment in our securities.

On February 4, 2014, we also entered into a debt commitment letter with Goldman Sachs Bank USA (“Goldman Sachs”), pursuant to which, Goldman Sachs has agreed to provide the financing necessary to consummate the merger and provide ongoing liquidity for the Company. This financing is comprised of the following elements: a senior secured term loan facility in the aggregate principal amount of $460 million; senior unsecured notes in the aggregate principal amount of $360 million intended to be issued in an underwritten offering; and a senior secured asset-backed revolving credit facility in the aggregate principal amount of $85 million. This indebtedness could have important consequences for our business and any investment in our securities, including:

- increasing our vulnerability to adverse economic, industry or competitive developments;
- requiring a substantial portion of our cash flow from operations to be dedicated to the payment of principal and interest on our indebtedness, therefore reducing our ability to use our cash flow to fund our operations, capital expenditures and future business opportunities;
- restricting us from making strategic acquisitions or causing us to make non-strategic divestitures;

- exposing us to the risk of increased interest rates if the closing of the merger or the underwritten offering of the senior unsecured notes is delayed;

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- limiting our ability to obtain additional financing for working capital, capital expenditures, product development, debt service requirements, acquisitions and general corporate or other purposes; and
- limiting our flexibility in planning for, or reacting to, changes in our business or market conditions and placing us at a competitive disadvantage compared to our competitors who are less highly leveraged and who therefore, may be able to take advantage of opportunities that our leverage prevents us from exploiting.

Item 1B. Unresolved Staff Comments.

Not Applicable.

Item 2. Properties.

Our principal executive offices are located in Billerica, Massachusetts. We also have manufacturing, design and equipment cleaning facilities in the United States, Japan, France, Taiwan, South Korea and Malaysia. Information about our principal facilities is set forth below:

Location	Principal Function	Approximate Square Feet	Leased/ Owned
Bedford, Massachusetts	Research &Manufacturing[1] [4]	80,000	Owned
Billerica, Massachusetts	Executive Offices, Research & Manufacturing[1]	175,000	Leased [2]
Chaska, Minnesota	Executive Offices, Research & Manufacturing [1] [3]	192,000	Owned
Colorado Springs, Colorado	Manufacturing[3]	82,000	Owned
Colorado Springs, Colorado	Manufacturing[3]	40,000	Leased
Decatur, Texas	Manufacturing[4]	359,000	Owned
Montpellier, France	Cleaning Services[3]	53,000	Owned
Yonezawa, Japan	Manufacturing[1] [3]	196,000	Owned
Kulim, Malaysia	Manufacturing[1] [3]	195,000	Owned
Wonju City, South Korea	Manufacturing[1]	35,000	Owned

1. Facility used by our Contamination Control Solutions Division.
2. This lease has been extended through March 31, 2019 and is subject to one five-year renewal option.
3. Facility used by our Microenvironments Division.
4. Facility used by our Specialty Materials Division.

We lease approximately 4,200 square feet of manufacturing space in a facility located at 80 Ashby Road, Bedford, Massachusetts owned by EMD Millipore Corporation pursuant to a Membrane Manufacturing and Supply Transition Agreement that expires June 30, 2015. We also lease approximately 13,000 square feet of research and development and manufacturing office space located in San Diego, California, approximately 12,000 square feet of office, research and development and manufacturing space located in Fridley, Minnesota and approximately 31,000 square feet of office, research and development and manufacturing space located in Franklin, Massachusetts.

In addition, we lease an aggregate of approximately 16,000 square feet of office, research and development and manufacturing space in three buildings located in Burlington, Massachusetts which currently houses our specialty coatings business. These leases are for extended terms expiring March 31, 2014. In 2012, we purchased real property in Bedford, Massachusetts, and we are in the process of building infrastructure upgrades and facilities at that property. When this facility is complete, our specialty coatings business will relocate to that facility. During 2011, we opened a new manufacturing facility in 20,000 square feet of leased space in Hsinchu, Taiwan for use by our Contamination Control Solutions Division.

We maintain a worldwide network of sales, service, repair or cleaning centers in the United States, Germany, France, Israel, Japan, Malaysia, Taiwan, Singapore, China and South Korea. Leases for our facilities expire through December 2018. We currently expect to be able to extend the terms of expiring leases or to find suitable replacement facilities on

reasonable terms.

We believe that our facilities are well-maintained and suitable for their respective operations. All of our facilities are generally utilized within a normal range of production volume.

Item 3. Legal Proceedings.

During fiscal 2013 we were not involved in any legal proceedings that we believe will have a material impact on our consolidated financial position, results of operations or cash flows, from time to time the Company may be a party to litigation involving claims against the Company arising in the ordinary course of our business. We are not aware of any material potential litigation or claims against us which would have a material adverse effect upon our financial statements.

Item 4. Mine Safety Disclosures.

Not applicable.

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PART II

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

Market Information and Holders:

Entegris' Common Stock, $0.01 par value, trades on the NASDAQ Global Select Market under the symbol "ENTG". The following table sets forth the high and low sales prices of the Company shares for each full quarterly period during 2013 and 2012. As of February 12, 2014 there were 1,293 shareholders of record. On February 12, 2014, the last sale price reported on the Nasdaq Global Select Market for our common stock was $11.74 per share.

	2013		2012	
	Low	High	Low	High
First quarter	$8.96	$10.18	$8.56	$10.18
Second quarter	$8.89	$10.52	$7.45	$9.52
Third quarter	$8.97	$10.64	$7.62	$9.35
Fourth quarter	$9.87	$11.65	$7.50	$9.35

Dividend Policy:

The Company has never declared or paid any cash dividends on its capital stock. The Company currently intends to retain all available earnings for use in its business operations and does not anticipate paying any cash dividends in the foreseeable future. Furthermore, our Restated Credit Agreement contains restrictions that limit our ability to pay dividends. On July 27, 2005 the Entegris Board of Directors declared a dividend of one common stock purchase right for each share of Entegris Common Stock outstanding to shareholders of record on August 8, 2005, payable on August 8, 2005. For a description of the Common Stock Rights Plan see "Other Information" in Item 1 above. Each right generally entitles the holder to purchase one one-hundredth of a share of a series of preferred stock of Entegris at a price of $50.

Issuer Sales of Unregistered Securities During the Past Three Years:

None

Comparative Stock Performance

The following graph compares the cumulative total shareholder return on the common stock of Entegris, Inc. from December 31, 2008 through December 31, 2013 with cumulative total return of (1) The NASDAQ Composite Index (NASDAQ), and (2) The Philadelphia Semiconductor Index, assuming $100 was invested at the close of trading December 31, 2008 in Entegris, Inc. common stock, the NASDAQ Composite Index and the Philadelphia Semiconductor Index and that all dividends are reinvested.

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	December 31, 2008	December 31, 2009	December 31, 2010	December 31, 2011	December 31, 2012	December 31, 2013
Entegris, Inc.	$100.00	$241.10	$341.10	$398.63	$419.18	$529.22
NASDAQ Composite	$100.00	$145.34	$171.70	$170.34	$200.57	$281.14
Philadelphia Semiconductor Index	$100.00	$172.51	$244.56	$219.19	$235.12	$333.50

Issuer Purchases of Equity Securities:

On December 12, 2012, the Board of Directors authorized a repurchase program covering up to an aggregate of $50.0 million of the Company's common stock in open market transactions and in accordance with one or more pre-arranged stock trading plans established in accordance with Rule 10b5-1 under the Securities Exchange Act of 1934, as amended. The repurchase program will expire in February 2014 unless it is terminated or extended. The current pre-arranged stock trading plan was established on August 14, 2013 and expired February 7, 2014 and covered the repurchase of up to $36.2 million of the registrant's common stock.

The following table provides information concerning shares of the Company's Common Stock $0.01 par value per share, purchased during the three months ended December 31, 2013:

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Period	(a) Total Number of Shares Purchased	(b) Average Price Paid per Share	(c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	(d) Maximum Number (or Approximate Dollar Value) of Shares that May Yet Be Purchased Under the Plans or Programs
October	67,015	$9.98	67,015	$ 39,379,692
November	—	—	—	$ 39,379,692
December	—	—	—	$ 39,379,692
Total	67,015	$9.98	67,015	$ 39,379,692

Item 6. Selected Financial Data.

The table that follows presents selected financial data for each of the last five fiscal years from the Company's consolidated financial statements and should be read in conjunction with the Company's Consolidated Financial Statements and the related Notes and with "Management's Discussion and Analysis of Financial Condition and Results of Operations" included elsewhere in this Annual Report on Form 10-K. The selected financial data set forth below as of December 31, 2013 and 2012 and for the fiscal years ended December 31, 2013, 2012 and 2011 are derived from our audited financial statements included in this Annual Report on Form 10-K. All other selected financial data set forth below is derived from our audited financial statements not included in this Annual Report on Form 10-K. Our historical results are not necessarily indicative of our results of operations to be expected in the future.

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(In thousands, except per share amounts)	Year ended December 31, 2013	Year ended December 31, 2012	Year ended December 31, 2011	Year ended December 31, 2010	Year ended December 31, 2009
Operating Results					
Net sales	$693,459	$715,903	$749,259	$688,416	$398,644
Gross profit	294,214	307,383	325,930	310,643	137,812
Selling, general and administrative expenses	137,123	147,405	140,847	147,051	117,001
Engineering, research and development expenses	55,320	50,940	47,980	43,934	35,039
Amortization of intangible assets	9,347	9,594	10,225	13,231	19,237
Contingent consideration fair value adjustment	(1,813)	—	—	—	—
Restructuring charges	—	—	—	—	15,463
Operating profit (loss)	94,237	99,444	126,878	106,427	(48,928)
Income (loss) before income taxes and equity in affiliate net income (loss)	96,195	99,703	127,964	101,481	(59,888)
Income tax expense (benefit)	21,669	30,881	4,217	15,006	(2,996)
Net income (loss)	74,526	68,825	124,246	85,122	(57,759)
Net income (loss) attributable to Entegris, Inc.	74,526	68,825	123,846	84,356	(57,721)
Earnings Per Share Data					
Diluted earnings (loss) per share – continuing operations	$0.53	$0.50	$0.91	$0.63	$(0.49)
Weighted average shares outstanding – diluted	139,618	138,412	136,223	133,174	117,321
Operating Ratios – % of net sales					
Gross profit	42.4%	42.9%	43.5%	45.1%	34.6%
Selling, general and administrative expenses	19.8	20.6	18.8	21.4	29.3
Engineering, research and development expenses	8.0	7.1	6.4	6.4	8.8
Amortization of intangible assets	1.3	1.3	1.4	1.9	4.8
Contingent consideration fair value adjustment	(0.3)	—	—	—	—
Restructuring charges	—	—	—	—	3.9
Operating profit (loss)	13.6	13.9	16.9	15.5	(12.3)
Income (loss) before income taxes and equity in affiliate net income (loss)	13.9	13.9	17.1	14.7	(15.0)
Effective tax rate	22.5	31.0	3.3	14.8	5.0
Net income (loss) attributable to Entegris, Inc.	10.7	9.6	16.5	12.3	(14.5)
Cash Flow Statement Data					
Depreciation and amortization	$38,815	$37,607	$37,064	$41,198	$50,127
Capital expenditures	60,360	49,929	30,267	16,794	13,162
Net cash provided by operating activities	109,402	115,162	157,286	140,898	4,193

Net cash used in investing activities	(47,029)	(72,467)	(28,431)	(11,985)	(9,843)
Net cash (used in) provided by financing activities	(3,895)	10,890	10,864	(65,709)	(40,690)
Balance Sheet and Other Data					
Current assets	$612,305	$579,324	$502,999	$387,091	$267,458
Current liabilities	97,585	93,263	92,594	107,634	73,910
Working capital	514,720	486,061	410,405	279,457	193,548
Current ratio	6.27	6.21	5.43	3.60	3.62
Long-term debt	—	—	—	—	52,492
Shareholders' equity	756,843	694,799	608,238	459,619	346,192
Total assets	875,294	811,544	724,663	601,385	504,672
Return on average shareholders' equity – %	10.3%	10.6%	23.2%	20.9%	(16.9)%
Shares outstanding at end of period	138,734	138,458	135,821	132,901	130,043

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

The following discussion and analysis of the Company's consolidated financial condition and results of operations should be read along with the consolidated financial statements and the accompanying notes to the consolidated financial information included elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements that involve numerous risks and uncertainties, including, but not limited to, those described in the "Cautionary Statements" sections of this Item 7 below. The Company's actual results may differ materially from those contained in any forward-looking statements. You

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should review the section entitled “Risk Factors” of this Annual Report on Form 10-K for a discussion of important factors that could cause actual results to differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Cautionary Statements

This Annual Report on Form 10-K and the documents incorporated by reference in this Annual Report on Form 10-K contain “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. The information in this Management’s Discussion and Analysis of Financial Condition and Results of Operations, except for the historical information, contains forward-looking statements. These forward-looking statements reflect the Company’s current views with respect to future events and financial performance. The words “believe,” “expect,” “anticipate,” “intend,” “estimate,” “forecast,” “project,” “may,” will,” “would,” “could,” “should” and similar expressions are i identify these “forward-looking statements.” You should read statements that contain these words carefully because they discuss future expectations, contain projections of future results of operations or of financial position or state other “forward-looking” information. All forecasts and projections in this report are “forward-looking statements,” and are based on management’s current expectations of the Company’s near-term results, based on current information available pertaining to the Company. The important factors listed below, as well as any cautionary language elsewhere in this Annual Report on Form 10-K, provide examples of risks, uncertainties and events that may cause our actual results to differ materially from the expectations described in these forward-looking statements. The risks which could cause actual results to differ from those contained in such “forward looking statements” include, without limitation, the risks described under Item 1A of this Annual Report on Form 10-K for the year ended December 31, 2013 under the headings “Risks Relating to our Business and Industry,” “Manufacturing Risks,” “International Risks” and “Risks Related to Owning Our Securities” as well as in the Company’s quarterly reports on Form 10-Q and current reports on Form 8-K as filed with the Securities and Exchange Commission. Any forward-looking statements in this Annual Report on Form 10-K are not guarantees of future performance, and actual results, developments and business decisions may differ from those envisaged by such forward-looking statements, possibly materially. We disclaim any duty to update any forward-looking statements.

Overview

This overview is not a complete discussion of the Company’s financial condition, changes in financial condition and results of operations; it is intended merely to facilitate an understanding of the most salient aspects of its financial condition and operating performance and to provide a context for the detailed discussion and analysis that follows and must be read in its entirety in order to fully understand the Company’s financial condition and results of operations. Entegris, Inc. is a leading provider of a wide range of products and services for purifying, protecting and transporting the critical materials used in processing and manufacturing in the microelectronics and other high-technology industries. Entegris derives most of its revenue from the sale of products and services to the semiconductor and related industries. The Company’s customers consist primarily of semiconductor manufacturers, semiconductor equipment and materials suppliers as well as thin film transistor-liquid crystal display (TFT-LCD) and hard disk manufacturers, which are served through direct sales efforts, as well as sales and distribution relationships, in the United States, Asia, Europe and the Middle East.

The Company offers a diverse product portfolio which includes more than 17,000 standard and customized products that it believes provide the most comprehensive offering of contamination control solutions and microenvironment products and services to maintain the purity and integrity of critical materials used by the semiconductor and other high-technology industries. Certain of these products are unit-driven and consumable products that rely on the level of semiconductor manufacturing activity to drive growth, while others are capital-expenditure driven and rely on expansion of manufacturing capacity to drive growth. The Company’s unit-driven and consumable products includes membrane-based liquid filters and housings, metal-based gas filters, resin-based gas purifiers, wafer shippers, disk-shipping containers and test assembly and packaging products and consumable graphite and silicon carbide components used in plasma etch, ion implant and chemical vapor deposition processes in semiconductor manufacturing. The Company’s capital expense-driven products include components, systems and subsystems that use electro-mechanical, pressure differential and related technologies to permit semiconductor and other electronics manufacturers to monitor and control the flow and condition of process liquids used in these manufacturing processes,

and process carriers that protect the integrity of in-process wafers.

Key operating factors Key factors, which management believes have the largest impact on the overall results of operations of Entegris, Inc., include:

- Level of sales Since a significant portion of the Company's product costs (except for raw materials, purchased components and direct labor) are largely fixed in the short-to-medium term, an increase or decrease in sales affects gross profits and overall profitability significantly. Also, increases or decreases in sales and operating profitability affect certain costs such as incentive compensation and commissions, which are highly variable in nature. The

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Company’s sales are subject to the effects of industry cyclicality, technological change, substantial competition, pricing pressures and foreign currency fluctuation.

- Variable margin on sales The Company’s variable margin on sales is determined by selling prices and the costs of manufacturing and raw materials. This is affected by a number of factors, which include the Company’s sales mix, purchase prices of raw material (especially polymers, stainless steel and purchased components), competition, both domestic and international, direct labor costs, and the efficiency of the Company’s production operations, among others.
- Fixed cost structure. The Company’s operations include a number of large fixed or semi-fixed cost components, which include salaries, indirect labor and benefits, facility costs, lease expense, and depreciation and amortization. It is not possible to vary these costs easily in the short-term as volumes fluctuate. Accordingly, increases or decreases in sales volume can have a large effect on the usage and productivity of these cost components, resulting in a large impact on the Company’s profitability.

Overall Summary of Financial Results for the Year Ended December 31, 2013

The Company’s financial results for 2013 reflected continued softness in semiconductor industry spending, though the Company experienced growth and signs of stabilization in the fourth quarter. In line with industry data, overall demand from the Company's semiconductor industry customers reflected lower demand from leading edge fabs, aggregate fab utilization rates remained well below peak levels and semiconductor industry capital spending remained restrained. Total net sales for the year ended December 31, 2013 were $693.5 million, down $22.4 million, or 3%, from sales of $715.9 million for the year ended December 31, 2012.

The sales decrease in 2013 included unfavorable foreign currency translation effects of $18.6 million related to the year-over-year weakening of most international currencies versus the U.S. dollar, most notably the Japanese yen. Excluding this factor, net sales fell approximately 1% in 2013 when compared to 2012.

The year-over-year sales decrease, along with a slightly unfavorable sales mix, accounted for lower gross profits in 2013. These factors, along with lower levels of factory utilization, underlie the gross margin rate for 2013 of 42.4% compared to 42.9% a year ago.

Operating costs, consisting of selling, general and administrative (SG&A) and engineering, research and development (ER&D) costs, decreased 3% for the year ended December 31, 2013 when compared to the year-ago period. Included in SG&A for the year ended December 31, 2012 was a $3.9 million charge associated with a CEO succession and transition plan.

The Company’s effective tax rate was 22.5% in 2013 compared to 31.0% in 2012. The lower rate in 2013 reflects changes in the Company's geographic composition of income toward jurisdictions with lower tax rates and also included a $1.7 million benefit associated with the reinstatement of the U.S. federal credit for increasing research expenditures, as retroactively signed into law and recorded by the Company in the first quarter of 2013.

The Company’s reporting segments experienced varied net sales and operating results as described in greater detail below.

As a result of the aforementioned factors, net income for 2013 was $74.5 million, or $0.53 per diluted share, compared to net income of $68.8 million, or $0.50 per diluted share, in 2012.

During 2013, the Company’s operating activities provided cash flow of $109.4 million. Capital expenditures were $60.4 million for 2013. Cash, cash equivalents and short-term investments were $384.4 million at December 31, 2013 compared with $350.4 million at December 31, 2012. The Company had no outstanding short-term bank borrowings or long-term debt at December 31, 2013.

Subsequent Event

On February 4, 2014, the Company announced that it will acquire ATMI, Inc., a Delaware corporation (ATMI), for approximately $1.2 billion in cash pursuant to an Agreement and Plan of Merger with ATMI. ATMI is a leading supplier of high-performance materials, materials packaging and materials delivery systems used worldwide in the manufacture of microelectronics devices. Excluding ATMI's Life Sciences business, which ATMI agreed to sell to a third party on December 22, 2013, ATMI’s sales for the year ended December 31, 2013 were approximately $361 million. The transaction is expected to close in the second quarter of 2014. See note 18 to the consolidated financial

statements for more information concerning the merger.

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On February 4, 2014, the Company entered into a debt commitment letter with Goldman Sachs Bank USA to provide the Company with the financing necessary to complete the merger and provide ongoing liquidity for the Company. See note 18 to the consolidated financial statements for more information concerning this debt commitment letter.

Critical Accounting Policies

Management's discussion and analysis of financial condition and results of operations are based upon the Company's consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these consolidated financial statements requires the Company to make estimates, assumptions and judgments that affect the reported amounts of assets, liabilities, revenues and expenses and related disclosure of contingent assets and liabilities. At each balance sheet date, management evaluates its estimates, including, but not limited to, those related to accounts receivable, sales return obligations, inventories, long-lived assets, income taxes and shared-based compensation. The Company bases its estimates on historical experience and various other assumptions that are believed to be reasonable under the circumstances. If management made different judgments or utilized different estimates, this could result in material differences in the amount and timing of the Company's results of operations for any period. In addition, actual results could be different from the Company's current estimates, possibly resulting in increased future charges to earnings.

The critical accounting policies affected most significantly by estimates, assumptions and judgments used in the preparation of the Company's consolidated financial statements are discussed below.

Accounts Receivable-Related Valuation Accounts The Company maintains allowances for doubtful accounts and for sales returns and allowances. Significant management judgments and estimates must be made and used in connection with establishing these valuation accounts.

The Company provides an allowance for doubtful accounts for all individual receivables judged to be unlikely for collection. In addition, for all other accounts receivable, the Company records an allowance for doubtful accounts based on a combination of factors. Specifically, management considers the age of receivable balances, historical bad debt write-off experience and current economic circumstances. The Company's allowance for doubtful accounts was $1.8 million and $2.3 million at December 31, 2013 and 2012, respectively. The decrease in 2013 primarily reflects the reversal of the recording of allowances for specific individual receivables.

An allowance for sales returns and allowances is established based on historical and current trends in both sales and product returns. At December 31, 2013 and 2012, the Company's reserve for sales returns and allowances was $0.7 million and $1.2 million, respectively. The decrease in 2013 primarily reflects changes in the underlying variables of the Company's determination of its sales return allowances.

Inventory Valuation The Company uses certain estimates and judgments to properly value its inventory. The Company's inventories are recorded at the lower of cost or market. The Company evaluates its ending inventories for obsolescence and excess quantities each quarter. This evaluation includes analyses of inventory levels, historical write-off trends, expected product lives, and historical and projected sales levels by product. Inventories that are considered obsolete are written off or a full allowance is recorded. In addition, allowances are established for inventory quantities in excess of forecasted demand. Inventory allowances were $6.6 million and $5.7 million at December 31, 2013 and 2012, respectively.

The Company's inventories include materials and products subject to technological obsolescence, which are sold in highly competitive industries. If future demand or market conditions are less favorable than current conditions or the Company's projected outlook for sales, inventory write-downs or additional allowances may be required and would be reflected in cost of sales in the period the revision is made.

Impairment of Long-Lived Assets As of December 31, 2013, the Company had $186.4 million of net property, plant and equipment and $43.5 million of net intangible assets. The Company routinely considers whether indicators of impairment of the value of its long-lived assets, particularly its manufacturing equipment, and its intangible assets, are present. A long-lived asset (asset group) shall be tested for recoverability whenever events or changes in circumstances (triggering events) indicate that its carrying amount may not be recoverable. The following are examples of such events or changes in circumstances:

a. A significant decrease in the market price of a long-lived asset (asset group)

b. A significant adverse change in the extent or manner in which a long-lived asset (asset group) is being used or in its physical condition

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c. A significant adverse change in legal factors or in the business climate that could affect the value of a long-lived asset (asset group), including an adverse action or assessment by a regulator

d. An accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of a long-lived asset (asset group)

e. A current-period operating or cash flow loss combined with a history of operating or cash flow losses or a projection or forecast that demonstrates continuing losses associated with the use of a long-lived asset (asset group)

f. A current expectation that, more likely than not, a long-lived asset (asset group) will be sold or otherwise disposed of significantly before the end of its previously estimated useful life.

If such indicators are present, it is determined whether the sum of the estimated undiscounted cash flows attributable to the asset group in question is less than its carrying value. If less, an impairment loss is recognized based on the excess of the carrying amount of the assets in the group over its respective fair value. Fair value is determined by discounting estimated future cash flows, appraisals or other methods deemed appropriate. If the asset groups determined to be impaired are to be held and used, the Company recognizes an impairment charge to the extent the fair value attributable to the asset group is less than the assets' carrying value. The fair value of the assets then becomes the assets' new carrying value, which is depreciated or amortized over the remaining estimated useful life of the assets.

The Company's long-lived assets are grouped with other assets and liabilities at the lowest level (asset groups) for which the identifiable cash flows are largely independent of the cash flows of other assets and liabilities. The Company has four significant asset groups, identified by assessing the Company's identifiable cash flows and the interdependence of such cash flows: Contamination Control Solutions (CCS), Microenvironments (ME), Poco Graphite (POCO) and Entegris Specialty Coatings (ESC).

As described above, the evaluation of the recoverability of long-lived assets requires the Company to make significant estimates and assumptions. These estimates and assumptions primarily include, but are not limited to, the identification of the asset group at the lowest level of independent cash flows, the primary asset of the group and long-range forecasts of revenue and costs, reflecting management's assessment of general economic and industry conditions, operating income, depreciation and amortization and working capital requirements.

Due to the inherent uncertainty involved in making these estimates, actual results could differ from those estimates. In addition, changes in the underlying assumptions would have a significant impact on the conclusion that an asset group's carrying value is recoverable, or the determination of any impairment charge if it was determined that the asset values were indeed impaired.

Based on current general economic conditions and trends within the semiconductor industry and the absence of any other triggering events, the Company has not been required to perform impairment testing for any of its asset groups. The Company will continue to monitor circumstances and events to determine whether asset impairment testing is warranted. It is possible that in the future the Company may no longer be able to conclude that there is no impairment of its long-lived assets, nor can the Company provide assurance that material impairment charges of long-lived assets will not occur in future periods.

Income Taxes In the preparation of the Company's financial statements, the income tax expense, deferred tax assets and liabilities, and reserves for unrecognized tax benefits reflect management's best assessment of estimated current and future taxes to be paid. The Company is subject to income taxes in both the United States and numerous foreign jurisdictions. Significant judgments and estimates are required in determining consolidated income tax expense. Deferred income taxes arise from temporary differences between the tax basis of assets and liabilities and their reported amounts in the financial statements, which will result in taxable or deductible amounts in the future. In evaluating the Company's ability to recover its deferred tax assets within the jurisdiction from which they arise, management considers all available positive and negative evidence, including scheduled reversals of deferred tax liabilities, projected future taxable income, tax-planning strategies, and results of recent operations. In projecting future taxable income, the Company begins with historical results adjusted for the results of discontinued operations and incorporates assumptions about the amount of future state, federal and foreign pretax operating income adjusted for items that do not have tax consequences. The assumptions about future taxable income require significant judgment and are consistent with the plans and estimates management is using to manage the underlying business. In

evaluating the objective evidence that historical results provide, the Company considers three years of cumulative operating income.

The Company has deferred tax assets related to certain federal and state credit carryforwards, and certain state and foreign net operating loss carryforwards of $6.8 million and $5.8 million as of December 31, 2013 and December, 31 2012, respectively. Management believes it is more likely than not that the benefit from a portion of these carryforwards will not be realized. In

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recognition of this risk, the Company provided a valuation allowance of $5.4 million and $5.0 million as of December 31, 2013 and December 31, 2012, respectively, relating to these carryforwards. If the Company's assumptions change and it determines it will be able to realize these carryforwards, the tax benefits relating to any reversal of the valuation allowance on the deferred tax assets will be recognized as a reduction of income tax expense.

The calculation of tax liabilities involves dealing with uncertainties in the application of complex tax laws and regulations in a multitude of jurisdictions across our global operations. A tax benefit from an uncertain tax position may be recognized when it is more likely than not that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, on the basis of the technical merits. Resolution of these uncertainties in a manner inconsistent with management's expectations could have a material impact on the Company's financial condition and operating results.

Share-Based Compensation U.S generally accepted accounting principles require the measurement and recognition of compensation expense for all share-based payment awards made to employees and directors based on estimated fair values. The Company estimates the value of stock option and restricted stock awards on the date of grant.

The fair value of restricted stock and restricted stock unit awards is valued based on the Company's stock price on the date of grant. The fair value of stock option awards is estimated on the date of grant using an option-pricing model affected by the Company's stock price as well as assumptions regarding a number of complex and subjective variables. These variables include the expected stock price volatility over the expected term of the awards, risk-free interest rate and dividend yield assumptions, and actual and projected employee stock option exercise behaviors and forfeitures.

Because share-based compensation expense recognized in the consolidated statement of operations is based on awards ultimately expected to vest, it is recorded net of estimated forfeitures. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. Forfeitures are estimated based on historical experience and current expectations.

If the above factors change, and the Company uses different assumptions in future periods, the share-based compensation expense recorded may differ significantly from what was recorded in the current period.

Results of Operations

Year ended December 31, 2013 compared to year ended December 31, 2012

The following table sets forth the results of operations and the relationship between various components of operations, stated as a percent of net sales, for the years ended December 31, 2013 and 2012. The Company's historical financial data was derived from its consolidated financial statements and related notes included elsewhere in this annual report.

(Dollars in thousands)	2013		2012	
		% of net sales		% of net sales
Net sales	$693,459	100.0 %	$715,903	100.0 %
Cost of sales	399,245	57.6	408,520	57.1
Gross profit	294,214	42.4	307,383	42.9
Selling, general and administrative expenses	137,123	19.8	147,405	20.6
Engineering, research and development expenses	55,320	8.0	50,940	7.1
Amortization of intangible assets	9,347	1.3	9,594	1.3
Contingent consideration fair value adjustment	(1,813)	(0.3)	—	—
Operating income	94,237	13.6	99,444	13.9
Other income, net	(1,958)	(0.3)	(259)	—
Income before income taxes and equity in net loss of affiliates	96,195	13.9	99,703	13.9
Income tax expense	21,669	3.1	30,881	4.3
Equity in net income of affiliates	—	—	(3)	—
Net income	$74,526	10.7	$68,825	9.6

Net sales For the year ended December 31, 2013, net sales were $693.5 million, down $22.4 million, or 3%, from sales for the year ended December 31, 2012. The year-over-year declines in net sales primarily reflected continued softness in semiconductor industry spending, though the Company experienced growth and signs of stabilization in the fourth quarter, and changes in foreign currency rates. In line with industry data, overall demand from the

Company's semiconductor industry customers for 2013 reflected lower demand from leading edge fabs, aggregate fab utilization rates remained well below peak levels and semiconductor industry capital spending remained restrained. The Company’s operating segments experienced mixed sales results. See the “Segment analysis” included below in this section for additional detail.

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The sales decrease in 2013 included unfavorable foreign currency translation effects of $18.6 million related to the year-over-year weakening of most international currencies versus the U.S. dollar, most notably the Japanese yen. Excluding this factor, net sales fell approximately 1% in 2013 when compared to 2012.

On a geographic basis, total sales to North America were 29%, Asia Pacific 43%, Europe 13% and Japan 15% in 2013. Total sales to North America were 31%, Asia Pacific 38%, Europe 12% and Japan 19% in 2012. When comparing 2013 to 2012, North America and Japan experienced year-over-year sales decreases, while Europe and Asia Pacific experience year-over-year sales increases. Net sales to customers in North America and Japan decreased 8% and 23%, respectively, while net sales to customers in Asia Pacific and Europe increased 8% and 5%, respectively, from 2012 to 2013. Net sales for Japan were affected by unfavorable foreign currency translation effects of $22.7 million. Net sales to Europe were favorably affected by foreign currency translation effects of $3.6 million. Net of those effects, sales decreased 5% for Japan and increased 1% for Europe.

Demand drivers for the Company's business primarily consist of semiconductor fab utilization and production (unit-driven) as well as capital spending for new or upgraded semiconductor fabrication equipment and facilities (capital-driven). The Company analyzes sales of its products by these two key drivers. Sales of unit-driven products represented 66% of total sales and sales of capital-driven products represented 34% of total sales in 2013. This compares to a unit-driven to capital-driven ratio of 66%:34% for 2012.

Sales of unit-driven products decreased 3% in 2013. Unit-driven products generally have average lives of less than 18 months or need to be replaced based on usage levels. These products include liquid filters used in the photolithography, CMP and wet etch and clean processes, specialized graphite components, and wafer shippers used to ship raw wafers, particularly at wafer sizes of 200mm and below.

Year-over-year sales of capital-driven products decreased 3% in 2013. Capital-driven products include wafer process carriers, gas microcontamination control systems used in the deployment of advanced photolithography processes, fluid handling systems, including dispense pumps used in the photolithography process, and integrated liquid flow controllers used in various processes around the fab.

The Company believes the sales decreases noted above are primarily volume driven. Based on the information available, the Company believes it improved or maintained market share for its products and that the effect of selling price erosion was nominal. Additionally, given that no single customer accounts for more than 10% of the Company's annual revenue, the decrease in sales has not been driven by any one particular customer or group of customers, but rather by the decline in semiconductor and other high-technology sectors as a whole.

Gross profit Gross profit for 2013 decreased by $13.2 million, to $294.2 million, a decrease of 4% from $307.4 million for 2012. The gross margin rate for 2013 was 42.4% versus 42.9% for 2012.

The year-over-year sales decrease, including a $3.7 million reduction in royalty revenue, primarily accounted for the Company's lower gross profit and gross margin in 2013.

Selling, general and administrative expenses Selling, general and administrative (SG&A) expenses for 2013 decreased $10.3 million, or 7%, to $137.1 million from $147.4 million in 2012. SG&A expenses, as a percent of net sales, decreased to 19.8% from 20.6% a year earlier, reflecting a decrease in SG&A expenditure levels.

Employee costs, which make up approximately two-thirds of SG&A expenses, decreased by $2.4 million for 2013. The decrease also reflected a decline in consulting and professional fees of $1.9 million as well as the $3.9 million reduction in SG&A expense related to the 2012 CEO succession and transition plan noted above. Also included in the decrease in SG&A expenses for 2013 compared to the year-ago period is a $0.7 million reduction in SG&A expense during the second quarter of 2013 related to the sale of a building classified as an asset held for sale, consisting of the gain on sale thereof and an adjustment to the real estate tax accrual for the building and the favorable settlement of value-added tax matters in Europe ($1.2 million). In addition, the decrease in SG&A costs reflected favorable foreign currency translation effects of $2.9 million.

Engineering, research and development expenses Engineering, research and development (ER&D) expenses related to the support of current product lines and the development of new products and manufacturing technologies increased by $4.4 million, or 9%, to $55.3 million in 2013 compared to $50.9 million in 2012. ER&D expenses as a percent of net sales were 8.0% compared to 7.1% a year ago, reflecting both the increase in ER&D expenditure levels and decrease in net sales.

The increase in ER&D expense mainly reflects higher employee costs of $1.8 million and a general increase in overall ER&D expense levels related to the support of current product lines and the development of new products and manufacturing technologies to support the Company's customers' next-generation processes.

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In 2014, the Company intends to continue to invest in its core membrane and coatings technologies to continue to create differentiated and high-value, unit-driven products for the most advanced and demanding semiconductor applications. In addition, the Company is committed to ER&D spending and capital investment needed to sustain its initiative in 450 mm wafer handling as that technology is adopted over the next several years.

Contingent consideration fair value adjustment In the year ended December 31, 2013, the Company recognized an acquisition-related contingent consideration adjustment of $1.8 million reflecting changes in the fair value of contingent consideration associated with the Jetalon acquisition described in note 2 in the Company's consolidated financial statements. This adjustment reflects changes in the revenue and gross profit forecasts for the three years ending December 31, 2015 and the estimated probability of achieving those projections.

Amortization of intangible assets Amortization of intangible assets was $9.3 million in 2013 compared to $9.6 million for 2012.

Other income, net Other income was $2.0 million in 2013 compared to other income of $0.3 million in 2012. In 2013, other income includes foreign currency transaction gains of $2.3 million, partially offset by charges of $0.8 million associated with the realization of translation losses recorded upon the liquidation of certain of the Company's subsidiaries.

In 2012, other income includes a $1.5 million gain recorded in the second quarter related to the remeasurement of the previously held 50% equity investment in a Taiwan joint venture entity in which the Company acquired a 100% interest in April 2012. The other income was partially offset by $1.4 million of foreign currency transaction losses related to the remeasurement of yen-denominated assets and liabilities held by the Company.

Income tax expense The Company recorded income tax expense of $21.7 million in 2013 compared to an income tax expense of $30.9 million in 2012. The Company's effective tax rate was 22.5% in 2013, compared to 31.0% in 2012. The lower rate in 2013 reflects changes in the Company's geographic composition of income toward jurisdictions with lower tax rates. The effective tax rate in 2013 also included a $1.7 million benefit associated with the reinstatement of the U.S. federal credit for increasing research expenditures, as retroactively signed into law in 2013 and recorded by the Company in the first quarter of 2013.

In 2012, the Company's effective tax rate was lower than the U.S. statutory rate of 35% primarily due to lower rates in various foreign jurisdictions compared to the U.S. statutory rate.

Net income Net income was $74.5 million, or $0.53 per diluted share, in 2013 compared to net income of $68.8 million, or $0.50 per diluted share, in 2012. The increase reflects the Company's aforementioned operating results described in greater detail above.

Non-GAAP Measures Information The Company's consolidated financial statements are prepared in conformity with accounting principles generally accepted in the United States (GAAP). The Company also utilizes certain non-GAAP financial measures as a complement to financial measures provided in accordance with GAAP in order to better assess and reflect trends affecting the Company's business and results of operations. See "Non-GAAP Information" included below in this section for additional detail, including the reconciliation of GAAP measures to the Company's non-GAAP measures.

The Company's non-GAAP financial measures are Adjusted EBITDA and Adjusted Operating Income, together with related measures thereof, and non-GAAP Earnings Per Share (EPS).

Adjusted EBITDA decreased 7% to $131.2 million in 2013, compared to $141.0 million in 2012. Adjusted EBITDA, as a percent of net sales, decreased to 18.9% from 19.7% a year earlier. Adjusted Operating Income decreased 10% to $101.8 million in 2013, compared to $113.0 million in 2012. Adjusted Operating Income, as a percent of net sales, decreased to 14.7% from 15.8% a year earlier. Non-GAAP Earnings Per Share increased 4% to $0.57 in 2013, compared to $0.55 in 2012. The decline in the Adjusted EBITDA and Adjusted Operating Income measures reflect the reduction in net sales and related decrease in gross profit. In addition, Non-GAAP Earnings Per Share was positively affected by a lower effective tax rate.

Segment Analysis

The following table and discussion concern the results of operations of the Company's three business segments for the years ended December 31, 2013 and 2012. See Note 16 "Segment Reporting" to the consolidated financial statements

for additional information on the Company’s three segments.

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(In thousands)	2013	2012
Contamination Control Solutions:		
Net sales	$447,410	$461,838
Segment profit	106,120	116,356
Microenvironments:		
Net sales	$178,201	$182,375
Segment profit	35,737	37,223
Specialty Materials:		
Net sales	$67,848	$71,690
Segment profit	7,087	12,230

Contamination Control Solutions (CCS)

For the year ended December 31, 2013, CCS net sales decreased 3%, to $447.4 million, from $461.8 million in the comparable period last year. Net of unfavorable foreign currency effects of $16.6 million, primarily related to weakness in the Japanese yen, CCS net sales were flat. CCS sales decrease primarily reflected lower sales of liquid filtration products and fluid components and systems. Gas filtration products were flat.

CCS reported a segment profit of $106.1 million for the year ended December 31, 2013 compared to $116.4 million in the comparable period last year, a decrease of $10.2 million, or 9%. The decrease in sales volume and a slightly unfavorable sales mix combined to reduce gross profit by $8.9 million, which along with a 1% increase in operating expenses accounted for the decline in segment profit.

Microenvironments (ME)

For the year ended December 31, 2013, ME net sales decreased 2%, to $178.2 million, versus $182.4 million in the comparable period last year. Net of unfavorable foreign currency effects of $2.4 million, ME net sales decreased 1%. Net sales reflected lower sales of 300mm wafer process and lower royalty revenue, offset by higher sales of data storage products.

ME reported a segment profit of $35.7 million for the year ended December 31, 2013 compared to $37.2 million in the comparable period last year, a decrease of 4%. The decrease in the segment's gross profit associated with lower sales levels, particularly the decrease in royalty revenue, and a 2% increase of operating expenses, accounted for the decrease in segment profit.

Specialty Materials (SMD)

For the year ended December 31, 2013, SMD net sales decreased 5%, to $67.8 million, down from $71.7 million in the year ended December 31, 2012. The sales decrease mainly reflected slightly lower demand for SMD’s high-margin specialty-coated products.

SMD reported a segment profit of $7.1 million in 2013 compared to $12.2 million in 2012, a decrease of 42%. The change in segment profit primarily reflected the decrease in gross profit associated with the lower sales in 2013 and the related reduction in factory utilization, particularly for SMD’s specialized graphite manufacturing operation. The segment’s operating expenses increased 12% compared with a year ago, mainly representing increased R&D spending.

Unallocated general and administrative expenses

Unallocated general and administrative expenses totaled $47.2 million for the year ended December 31, 2013 compared to $56.8 million for the year ended December 31, 2012. The decrease primarily reflected lower employee costs ($4.4 million) and professional fees ($1.4 million). Included in the employee cost decline is a $3.9 million charge recorded in 2012 associated with compensation to which the Company’s current chief executive officer was entitled in connection with the succession and transition plan noted above. Figures for 2013 included reductions in unallocated general and administrative expenses related to the sale of a building classified as assets held for sale, consisting of the gain on sale thereof, and an adjustment to the real estate tax accrual for the building ($0.7 million) and the favorable settlement of value-added tax matters in Europe ($1.2 million).

Year ended December 31, 2012 compared to year ended December 31, 2011

The following table sets forth the results of operations and the relationship between various components of operations, stated as a percent of net sales, for the years ended December 31, 2012 and 2011. The Company’s historical financial data was derived from its consolidated financial statements and related notes included elsewhere in this annual report.

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(Dollars in thousands)	2012	% of net sales	2011	% of net sales
Net sales	$715,903	100.0 %	$749,259	100.0 %
Cost of sales	408,520	57.1	423,329	56.5
Gross profit	307,383	42.9	325,930	43.5
Selling, general and administrative expenses	147,405	20.6	140,847	18.8
Engineering, research and development expenses	50,940	7.1	47,980	6.4
Amortization of intangible assets	9,594	1.3	10,225	1.4
Operating income	99,444	13.9	126,878	16.9
Interest (income) expense, net	(10)	—	659	0.1
Other income, net	(249)	—	(1,745)	(0.2)
Income before income taxes and equity in net loss of affiliates	99,703	13.9	127,964	17.0
Income tax expense	30,881	4.3	4,217	0.6
Equity in net income of affiliates	(3)	—	(499)	(0.1)
Net income	$68,825	9.6	$124,246	16.5

Net sales For the year ended December 31, 2012, net sales were $715.9 million, down $33.4 million, or 4%, from sales for the year ended December 31, 2011. The Company's net sales for 2012 reflected the lower capital spending levels and sluggish production rates in the semiconductor industry that began in the latter half of 2011. Sales in 2012 showed modest quarterly growth from late 2011 levels before declining in the third and fourth quarters. The Company's operating segments experienced mixed sales results. See the "Segment analysis" included below in this section for additional detail.

The sales decrease in 2012 included unfavorable foreign currency translation effects of $8.5 million related to the year-over-year weakening of most international currencies versus the U.S. dollar, most notably the Euro. Excluding this factor, net sales fell approximately 3% in 2012 when compared to 2011.

On a geographic basis, total sales to North America were 31%, Asia Pacific 38%, Europe 12% and Japan 19% in 2012. Total sales to North America were 29%, Asia Pacific 38%, Europe 14% and Japan 19% in 2011. When comparing 2012 to 2011, all regions experienced year-over-year sales decreases except North America. Net sales to customers in Asia, Europe, and Japan decreased 3%, 19%, and 6%, respectively, and North America increased 2% from 2011 to 2012. Net sales for Asia and Europe were affected by unfavorable foreign currency translation effects of $7.0 million and $1.5 million, respectively. Net of those effects, sales decreased 3% and 12% for Asia and Europe, respectively.

Demand drivers for the Company's business primarily consist of semiconductor fab utilization and production (unit-driven) as well as capital spending for new or upgraded semiconductor fabrication equipment and facilities (capital-driven). The Company analyzes sales of its products by these two key drivers. Sales of unit-driven products represented 66% of total sales and sales of capital-driven products represented 34% of total sales in 2012. This compares to a unit-driven to capital-driven ratio of 63:37 for 2011. This shift in relative demand for capital-driven products reflects lower capital spending since mid-2011 by semiconductor customers for capacity-related products. Sales of unit-driven products increased 1% in 2012. Unit-driven products generally have average lives of less than 18 months or need to be replaced based on usage levels. These products include liquid filters used in the photolithography, CMP and wet etch and clean processes, specialized graphite components, and wafer shippers used to ship raw wafers, particularly at wafer sizes of 200mm and below.

Year-over-year sales of capital-driven products decreased 14% in 2012. Capital-driven products include wafer process carriers, gas microcontamination control systems used in the deployment of advanced photolithography processes, fluid handling systems, including dispense pumps used in the photolithography process, and integrated liquid flow controllers used in various processes around the fab.

The Company believes the sales decreases noted above are primarily volume driven. Based on the information available, the Company believes it improved or maintained market share for its products and that the effect of selling price erosion was nominal. Additionally, given that no single customer accounts for more than 10% of the Company's

annual revenue, the decrease in sales has not been driven by any one particular customer or group of customers, but rather by the decline in semiconductor and other high-technology sectors as a whole.

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Gross profit Gross profit for 2012 decreased by $18.5 million, to $307.4 million, a decrease of 6% from $325.9 million for 2011. The gross margin rate for 2012 was 42.9% versus 43.5% for 2011.

The year-over-year sales decrease accounted for the Company's lower gross profit in 2012. The reduction in gross profit related to a slightly unfavorable sales mix was offset by improved levels of factory utilization, primarily at the Company's Microenvironments segment, and higher royalty revenue.

Selling, general and administrative expenses Selling, general and administrative (SG&A) expenses for 2012 increased $6.6 million, or 5%, to $147.4 million from $140.8 million in 2011. SG&A expenses, as a percent of net sales, increased to 20.6% from 18.8% a year earlier, reflecting both the decrease in net sales and increase in SG&A expenditure levels.

The increase in SG&A expenses includes a $3.9 million charge associated with compensation to which the Company's former chief executive officer was entitled in connection with a succession and transition plan, a $1.4 million increase in consultants' fees, and a $1.3 million increase in the provision for bad debts. Other employee costs, which make up about two-thirds of SG&A expenses, were flat as lower accruals for incentive compensation were offset by increases in other employee cost categories, most notably benefit costs. The increase in SG&A costs was partially offset by favorable foreign currency translation effects of $1.4 million.

Included in the twelve-month period ended December 31, 2011 was a $0.7 million gain associated with the pension curtailment of the Company's Japan defined benefit pension plan. Refer to Note 13 to the Company's consolidated financial statements for further discussion.

Engineering, research and development expenses Engineering, research and development (ER&D) expenses related to the support of current product lines and the development of new products and manufacturing technologies increased by $3.0 million, or 6%, to $50.9 million in 2012 compared to $48.0 million in 2011. ER&D expenses as a percent of net sales were 7.1% compared to 6.4% a year ago, reflecting both the increase in ER&D expenditure levels and decrease in net sales.

The increase in ER&D expense mainly reflects higher employee costs ($0.6 million) and a general increase in overall ER&D expense levels related to the support of current product lines and the development of new products and manufacturing technologies.

Moving into 2013, the Company intends to invest in its core membrane and coatings technologies to continue to create differentiated and high-value, unit-driven products for the most advanced and demanding semiconductor applications. In addition, the Company is committed to the ER&D spending and capital investment needed to sustain its initiative in 450 mm wafer handling as that technology is adopted over the next several years.

Amortization of intangible assets Amortization of intangible assets was $9.6 million in 2012 compared to $10.2 million for 2011. The decline reflects the absence of amortization expense for certain acquired developed technology and trade name assets that became fully amortized in 2011 or 2012.

Other income, net Other income was $0.2 million in 2012 compared to other income of $1.7 million in 2011. In 2012, other income includes a $1.5 million gain recorded in the second quarter related to the remeasurement of the previously held 50% equity investment in a Taiwan joint venture entity in which the Company acquired a 100% interest in April 2012. The other income was partially offset by $1.4 million of foreign currency transaction losses related to the remeasurement of yen-denominated assets and liabilities held by the Company. In 2011, other income primarily relates to a $1.5 million gain recorded in connection with the sale of an equity investment.

Income tax expense The Company recorded income tax expense of $30.9 million in 2012 compared to an income tax expense of $4.2 million in 2011. The Company's effective tax rate was 31.0% in 2012, compared to 3.3% in 2011.

In 2012, the Company's effective tax rate was lower than the U.S. statutory rate of 35% primarily due to lower rates in various foreign jurisdictions compared to the U.S. statutory rate.

In 2011, the Company's effective tax rate was lower than the U.S. statutory rate of 35% due mainly to the $41.0 million reduction of tax expense related to the decrease in the Company's deferred tax asset valuation allowance. Management concluded it is more likely than not that the Company would realize the U.S. net deferred tax assets and thereby released the valuation allowance on most of its U.S. deferred tax assets. The $41.0 million of benefit to tax expense comprises $19.8 million from the U.S. utilization of deferred tax assets during the year, $0.2 million from the utilization of foreign deferred tax assets and $21.0 million attributed to the release of the valuation allowance at

December 31, 2011.

Equity in net income of affiliates The Company recorded equity in the net income of affiliates of $3 thousand in 2012 compared to equity in the net income of affiliates of $0.5 million in 2011. During 2012, the Company acquired the remaining

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50% of Entegris Precision Technologies Corporation (EPT) in Taiwan, an entity in which it had previously owned a 50% equity interest accounted for under the equity method.

Net income attributable to Entegris, Inc. Net income attributable to the Company was $68.8 million, or $0.50 per diluted share, in 2012 compared to net income attributable to the Company of $123.8 million, or $0.91 per diluted share, in 2011. The decrease mainly reflects the Company's lower net sales and related gross profit decrease, slightly increased operating expenses and higher income tax expense, each described in greater detail above.

Non-GAAP Measures Information The Company's consolidated financial statements are prepared in conformity with accounting principles generally accepted in the United States (GAAP). The Company also utilizes certain non-GAAP financial measures as a complement to financial measures provided in accordance with GAAP in order to better assess and reflect trends affecting the Company's business and results of operations. See "Non-GAAP Information" included below in this section for additional detail, including the reconciliation of GAAP measures to the Company's non-GAAP measures.

The Company's non-GAAP financial measures are Adjusted EBITDA and Adjusted Operating Income, together with related measures thereof, and non-GAAP Earnings Per Share (EPS).

Adjusted EBITDA decreased 14% to $141.0 million in 2012, compared to $163.2 million in 2011. Adjusted EBITDA, as a percent of net sales, decreased to 19.7% from 21.8% a year earlier. Adjusted Operating Income decreased 17% to $113.0 million in 2012, compared to $136.4 million in 2011. Adjusted Operating Income, as a percent of net sales, decreased to 15.8% from 18.2% a year earlier. Non-GAAP Earnings Per Share decreased 30% to $0.55 in 2012, compared to $0.79 in 2011. The decline in the Adjusted EBITDA and Adjusted Operating Income measures reflect the reduction in net sales and related decrease in gross profit. In addition, Non-GAAP Earnings Per Share was adversely affected by a higher effective tax rate.

Segment Analysis

The following table and discussion concern the results of operations of the Company's three business segments for the years ended December 31, 2012 and 2011. See Note 16 "Segment Reporting" to the consolidated financial statements for additional information on the Company's three segments.

(In thousands)	2012	2011
Contamination Control Solutions:		
Net sales	$461,838	$483,958
Segment profit	116,356	140,313
Microenvironments:		
Net sales	$182,375	$182,150
Segment profit	37,223	29,959
Specialty Materials:		
Net sales	$71,690	$83,151
Segment profit	12,230	18,255

Contamination Control Solutions (CCS)

For the year ended December 31, 2012, CCS net sales decreased 5%, to $461.8 million, from $484.0 million in the comparable period last year. Net of unfavorable foreign currency effects of $4.6 million, CCS net sales fell 4%. CCS sales decreased due to lower sales of products tied to semiconductor industry capital spending, which experienced a sharp drop in the second half of 2012. Sales of both fluid components and systems products, and gas filtration products fell in 2012. Sales of liquid filtration products, which are less affected by capital spending levels, improved due to strong initial acceptance and demand for new products supporting advanced semiconductor manufacturing processes.

CCS reported a segment profit of $116.4 million for the year ended December 31, 2012 compared to $140.3 million in the comparable period last year, a decrease of $24.0 million, or 17%. The decrease in sales volume directly led to the decline in gross profit of $18.2 million. Operating expenses increased 7%, with selling and marketing expenses, and engineering, research and development costs related to the support of current product lines and the development of new and high-value, unit-driven products for the most advanced and demanding semiconductor applications

increasing by $3.6 million and $3.2 million, respectively. Those factors account for the year-over-year change in the CCS's profitability.

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Microenvironments (ME)

For the year ended December 31, 2012, ME net sales remained flat at $182.4 million, versus $182.2 million in the comparable period last year. Net of unfavorable foreign currency effects of $3.0 million, ME net sales increased 2%. Net sales reflected higher sales of 300mm process products related to the industry's migration to smaller advanced node processes and a $3.3 million increase in royalty revenue, offset by lower sales of 200mm process and wafer shipper products.

ME reported a segment profit of $37.2 million for the year ended December 31, 2012 compared to $30.0 million in the comparable period last year, an increase of 24%. An increase in gross profit accounts for three-quarters of the improvement in segment profit, reflecting the $3.3 million increase in royalty revenue and improved factory utilization. In addition, ME sales and marketing expenses fell by $1.9 million in 2012.

Specialty Materials (SMD)

For the year ended December 31, 2012, SMD net sales decreased 14%, to $71.7 million, down from $83.2 million in the year ended December 31, 2011. The decrease reflected lower sales for both SMD's graphite-based components and specialty coated products, due to a weak semiconductor equipment market for SMD products as well as continued weakness in the solar market.

SMD reported a segment profit of $12.2 million in 2012 compared to $18.3 million in 2011, a decrease of 33%. The change in segment profit primarily reflected the decrease in gross profit associated with the lower sales in 2012 and the related reduction in factory utilization, particularly for SMD's specialized graphite manufacturing operation. The segment's operating expenses were essentially flat with a year ago.

Unallocated general and administrative expenses

Unallocated general and administrative expenses totaled $56.8 million for the year ended December 31, 2012 compared to $51.4 million for the year ended December 31, 2011. For the year ended December 31, 2012, unallocated general and administrative expenses included a $3.9 million charge associated with compensation to which the Company's former chief executive officer was entitled in connection with the succession and transition plan as noted above. In addition, information technology expenses increased by $1.2 million in 2012.

Quarterly Results of Operations

The following table presents selected data from the Company's consolidated statements of operations for the eight quarters ended December 31, 2013. This unaudited information has been prepared on the same basis as the audited consolidated financial statements appearing elsewhere in this annual report. All adjustments that management considers necessary for the fair presentation of the unaudited information have been included in the quarters presented.

QUARTERLY STATEMENTS OF OPERATIONS DATA (UNAUDITED)

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	2012				2013			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
(In thousands)								
Net sales	$175,403	$188,233	$184,449	$167,818	$165,070	$177,544	$164,585	$186,260
Gross profit	76,244	82,746	81,932	66,461	67,128	77,570	70,132	79,384
Selling, general and administrative expenses	35,048	35,989	39,095	37,273	32,421	35,397	31,746	37,559
Engineering, research and development expenses	11,989	12,726	13,314	12,911	12,173	13,427	13,947	15,773
Amortization of intangible assets	2,450	2,420	2,389	2,335	2,287	2,359	2,343	2,358
Contingent consideration fair value adjustment	—	—	—	—	—	—	(1,813)	—
Operating income	26,757	31,611	27,134	13,942	20,247	26,387	23,909	23,694
Net income	17,859	21,673	18,037	11,256	16,397	19,781	17,807	20,541
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
(Percent of net sales)								
Net sales	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gross profit	43.5	44.0	44.4	39.6	40.7	43.7	42.6	42.6
Selling, general and administrative expenses	20.0	19.1	21.2	22.2	19.6	19.9	19.3	20.2
Engineering, research and development expenses	6.8	6.8	7.2	7.7	7.4	7.6	8.5	8.5
Amortization of intangibles	1.5	1.3	1.3	1.4	1.4	1.3	1.4	1.3
Contingent consideration fair value adjustment	—	—	—	—	—	—	(1.1)	—
Operating income	15.3	16.8	14.7	8.3	12.3	14.9	14.5	12.7
Net income	10.2	11.5	9.8	6.7	9.9	11.1	10.8	11.0

The Company’s quarterly results of operations have been, and will likely continue to be, subject to significant fluctuations due to a myriad of factors, many of which are beyond the Company’s control. The variability in sales, and its corresponding effect on gross profit, is the single most important factor underlying the changes in the Company’s operating income and net income over the past eight quarters.

Liquidity and Capital Resources

The Company has historically financed its operations and capital requirements through cash flow from its operating activities, long-term loans, lease financing and borrowings under domestic and international short-term lines of credit. In fiscal 2000 and 2009, the Company raised capital via public offerings of its common stock.

Operating activities

Net cash flow provided by operating activities totaled $109.4 million for the year ended December 31, 2013. Cash generated by the Company’s operations included net income of $74.5 million, as adjusted for the impact of various non-cash charges, primarily depreciation and amortization of $38.8 million and share-based compensation expense of $7.9 million. The net impact on cash flow from operations from changes in operating assets reduced cash otherwise generated by the Company’s operations.

Working capital was $514.7 million at December 31, 2013, which included $384.4 million in cash and cash equivalents, an increase from $486.1 million as of December 31, 2012, which included $350.4 million in cash and cash equivalents and short-term investments.

Accounts receivable increased by $7.9 million during 2013, or $13.4 million net of foreign currency translation adjustments. This increase reflects the year-over-year improvement in fourth quarter sales of the Company’s products. The Company’s days sales outstanding measure (DSO) stood at 50 days at December 31, 2013 compared to 51 days at the beginning of the year.

Inventories at December 31, 2013 decreased by $5.1 million from a year earlier, or $0.4 million after taking into account the impact of foreign currency translation adjustments and the provision for excess and obsolete inventory. The decrease reflects the Company's improved management of its finished goods inventories.

Accounts payable and accrued expenses were $0.4 million lower than a year ago, or $4.4 million net of foreign currency translation adjustments. The Company made income tax payments, net of refunds, of 10.2 million in 2013.

Investing activities Cash flow used in investing activities totaled $47.0 million in 2013. Acquisition of property and equipment totaled $60.4 million, which primarily reflected significant investments in equipment and tooling to manufacture 450mm wafer

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handling products and to establish an advanced membrane manufacturing and development center for critical filtration applications.

As of December 31, 2013, the Company expects its capital expenditures in 2014 to be approximately $25 million to $30 million, as the Company capital expenditure plans will generally reflect more normalized capital spending levels. Under the terms of its revolving credit facility, the Company is restricted from making capital expenditures in excess of $85 million during any fiscal year. The Company does not anticipate that this limit on capital expenditures will have an adverse effect on the Company's operations.

As noted above, the Company announced that it will acquire ATMI, Inc., a Delaware corporation (ATMI), for approximately $1.2 billion in cash pursuant to an Agreement and Plan of Merger with ATMI. The transaction is expected to close in the second quarter of 2014. See note 18 to the Company's consolidated financial statements for more information concerning the prospective acquisition.

Financing activities Cash flow used in financing activities totaled $3.9 million during 2013. The Company purchased shares of the Company's common stock at a total cost of $15.5 million under the stock repurchase program authorized by the Company's Board of Directors in 2011, partially offset by proceeds of $7.7 million in connection with common shares issued under the Company's stock plans. Cash flow used in financing activities also was partially offset by $3.9 million related to excess tax benefits associated with employee stock plan activity.

The Company has a revolving credit facility maturing June 9, 2014, with a revolving credit commitment of $30.0 million. As of December 31, 2013, the Company had no outstanding borrowings and $0.2 million undrawn on outstanding letters of credit under the revolving credit facility. Through December 31, 2013, the Company was in compliance with all applicable financial covenants included in the terms of the revolving credit facility. The Company expects that the revolving credit facility will be terminated upon consummation of the prospective acquisition described in note 18 to the consolidated financial statements.

The Company also has a line of credit with two banks that provide for borrowings of Japanese yen for the Company's Japanese subsidiary equivalent to an aggregate of approximately $11.4 million. There were no outstanding borrowings under these lines of credit at December 31, 2013.

At December 31, 2013, the Company's shareholders' equity stood at $756.8 million, up 9% from $694.8 million at the beginning of the year. The increase reflected net income of $74.5 million, additional paid-in capital of $7.9 million associated with the Company's share-based compensation expense, $7.7 million received in connection with common shares issued under the Company's stock option and employee stock purchase plans, and a tax benefit associated with employee stock plan activity of $3.9 million, partially offset by the repurchase and retirement of its common stock of $15.5 million and foreign currency translation effects of $17.5 million, which primarily reflects the effect of the weakening Japanese yen in 2013.

As of December 31, 2013, the Company's sources of available funds were its cash and cash equivalents of $384.4 million, funds available under its revolving credit facility and international credit facilities and cash flow generated from operations.

The Company believes that its cash and cash equivalents, funds available under its revolving credit facility and international credit facilities and cash flow generated from operations, as well as the debt commitment financing described in note 18 to the Company's consolidated financial statements, will be sufficient to consummate the acquisition of ATMI as well as meet its working capital and investment requirements for at least the next twelve months. If available liquidity is not sufficient to meet the Company's operating and debt service obligations as they come due, management would need to pursue alternative arrangements through additional equity or debt financing in order to meet the Company's cash requirements. There can be no assurance that any such financing would be available on commercially acceptable terms.

The Company considers the undistributed earnings of its foreign subsidiaries as of December 31, 2013 to be indefinitely reinvested. As of December 31, 2013, the amount of cash and cash equivalents associated with indefinitely reinvested foreign earnings was $131.1 million. Amounts held by foreign subsidiaries are generally subject to U.S. income taxation on repatriation to the United States. The Company does not anticipate the need to

repatriate funds to the United States to satisfy domestic liquidity needs arising in the ordinary course of business and believes its existing balances of domestic cash and cash equivalents, and operating cash flows will be sufficient to meet the Company's domestic cash needs for the next twelve months.

New Accounting Pronouncements

The Company does not anticipate that recently issued accounting guidance that has not yet been adopted will have a material impact on its consolidated financial statements. Refer to Note 1 to the Company's consolidated financial statements for a discussion of accounting pronouncements implemented in 2013.

Contractual Obligations

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The following table summarizes the maturities of the Company's significant financial obligations as of December 31, 2013:

(In thousands)	Total	2014	2015	2016	2017	2018	Thereafter
Pension obligations	$9,471	$242	$123	$195	$265	$293	$8,353
Capital purchase obligations[1]	14,877	14,877	—	—	—	—	—
Operating leases	24,639	7,014	6,264	4,051	3,430	3,211	669
Total	$48,987	$22,133	$6,387	$4,246	$3,695	$3,504	$9,022
Unrecognized tax benefits[2]							

1. Capital purchase obligations represent commitments for the construction or purchase of property, plant and equipment. They were not recorded as liabilities on the Company's consolidated balance sheet as of December 31, 2013, as the Company had not yet received the related goods or taken title to the property.

2. The Company had $4.3 million of total gross unrecognized tax benefits at December 31, 2013. The timing of any payments associated with these unrecognized tax benefits will depend on a number of factors. Accordingly, the Company cannot make reasonably reliable estimates of the amount and period of potential cash settlements, if any, with taxing authorities and are not included in the table above.

Non-GAAP Information The Company's consolidated financial statements are prepared in conformity with accounting principles generally accepted in the United States (GAAP).

The Company also provides certain non-GAAP financial measures as a complement to financial measures provided in accordance with GAAP in order to better assess and reflect trends affecting the Company's business and results of operations. Regulation G, "Conditions for Use of Non-GAAP Financial Measures," and other regulations under the Securities Exchange Act of 1934, as amended, define and prescribe the conditions for use of certain non-GAAP financial information. The Company provides non-GAAP financial measures of Adjusted EBITDA and Adjusted Operating Income together with related measures thereof, and non-GAAP Earnings Per Share (EPS).

Adjusted EBITDA, a non-GAAP term, is defined by the Company as net income before (1) net income attributable to noncontrolling interest, (2) equity in net income of affiliates, (3) income tax expense (4) other income, net, (5) contingent consideration fair value adjustment, (6) charge associated with CEO succession and transition plan, (7) amortization of intangible assets and (8) depreciation. Adjusted Operating Income, another non-GAAP term, is defined by the Company as its Adjusted EBITDA less depreciation. The Company also utilizes non-GAAP measures whereby Adjusted EBITDA and Adjusted Operating Income are each divided by the Company's net sales to derive Adjusted EBITDA Margin and Adjusted Operating Margin, respectively.

Non-GAAP EPS, a non-GAAP term, is defined by the Company as net income before (1) amortization of intangible assets, (2) contingent consideration fair value adjustment, (3) reclassification of cumulative translation adjustments associated with liquidated subsidiaries, (4) charge associated with CEO succession and transition plan, (5) gain on sale of equity investment, and (6) the tax effect of the aforementioned adjustments to net income divided by weighted common shares outstanding.

The Company provides supplemental non-GAAP financial measures to better understand and manage its business and believes these measures provide investors and analysts additional and meaningful information for the assessment of the Company's ongoing results. Management also uses these non-GAAP measures to assist in the evaluation of the performance of its business segments and to make operating decisions.

Management believes the Company's non-GAAP measures help indicate the Company's baseline performance before certain gains, losses or other charges that may not be indicative of the Company's business or future outlook and offer a useful view of business performance in that the measures provide a more consistent means of comparing performance. The Company believes the non-GAAP measures aid investors' overall understanding of the Company's results by providing a higher degree of transparency for such items and providing a level of disclosure that will help investors understand how management plans, measures and evaluates the Company's business performance.

Management believes that the inclusion of non-GAAP measures provides consistency in its financial reporting and facilitates investors' understanding of the Company's historical operating trends by providing an additional basis for

comparisons to prior periods.

Management uses Adjusted EBITDA and Adjusted Operating Income to assist it in evaluations of the Company's operating performance by excluding items that management does not consider as relevant in the results of its ongoing operations. Internally, these non-GAAP measures are used by management for planning and forecasting purposes, including the preparation

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of internal budgets; for allocating resources to enhance financial performance; for evaluating the effectiveness of operational strategies; and for evaluating the Company's capacity to fund capital expenditures, secure financing and expand its business.

In addition, and as a consequence of the importance of these non-GAAP financial measures in managing its business, the Company's Board of Directors uses non-GAAP financial measures in the evaluation process to determine management compensation.

The Company believes that certain analysts and investors use Adjusted EBITDA, Adjusted Operating Income and non-GAAP EPS as supplemental measures to evaluate the overall operating performance of firms in the Company's industry. Additionally, lenders or potential lenders use Adjusted EBITDA measures to evaluate the Company's creditworthiness.

The presentation of non-GAAP financial measures is not meant to be considered in isolation, as a substitute for, or superior to, financial measures or information provided in accordance with GAAP. Management strongly encourages investors to review the Company's consolidated financial statements in their entirety and to not rely on any single financial measure.

Management notes that the use of non-GAAP measures has limitations:

First, non-GAAP financial measures are not standardized. Accordingly, the methodology used to produce the Company's non-GAAP financial measures is not computed under GAAP and may differ notably from the methodology used by other companies. For example, the Company's non-GAAP measure of Adjusted EBITDA may not be directly comparable to EBITDA or an adjusted EBITDA measure reported by other companies.

Second, the Company's non-GAAP financial measures exclude items such as amortization and depreciation that are recurring. Amortization of intangibles and depreciation have been, and will continue to be for the foreseeable future, a significant recurring expense with an impact upon the Company's results of operations, notwithstanding the lack of immediate impact upon cash flows.

Third, there is no assurance the Company will not have future restructuring activities, gains or losses on sale of equity investments, contingent consideration fair value adjustments or similar items and, therefore, may need to record additional charges (or credits) associated with such items, including the tax effects thereon. The exclusion of these items from the Company's non-GAAP measures should not be construed as an implication that these costs are unusual, infrequent or non-recurring.

Management considers these limitations by providing specific information regarding the GAAP amounts excluded from these non-GAAP financial measures and evaluating these non-GAAP financial measures together with their most directly comparable financial measures calculated in accordance with GAAP. The calculations of Adjusted EBITDA, Adjusted operating income, and non-GAAP EPS, and reconciliations between these financial measures and their most directly comparable GAAP equivalents are presented below in the accompanying tables.

The reconciliation of GAAP measures to Adjusted Operating Income and Adjusted EBITDA for the years ended December 31, 2013, 2012 and 2011 are presented below:

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(Dollars in thousands)	2013	2012	2011
Net sales	$693,459	$715,903	$749,259
Net income attributable to Entegris, Inc.	$74,526	$68,825	$123,846
Adjustments to net income attributable to Entegris, Inc.			
Net income attributable to noncontrolling interest	—	—	400
Equity in net income of affiliates	—	(3)	(499)
Income tax expense	21,669	30,881	4,217
Other income, net	(1,958)	(259)	(1,086)
GAAP – Operating income	94,237	99,444	126,878
Gain associated with pension curtailment	—	—	(726)
Contingent consideration fair value adjustment	(1,813)	—	—
Charge associated with CEO succession and transition plan	—	3,928	—
Amortization of intangible assets	9,347	9,594	10,225
Adjusted operating income	101,771	112,966	136,377
Depreciation	29,468	28,013	26,839
Adjusted EBITDA	$131,239	$140,979	$163,216
Adjusted operating margin	14.7%	15.8%	18.2%
Adjusted EBITDA – as a % of net sales	18.9%	19.7%	21.8%

The reconciliation of GAAP measures to Non-GAAP Earnings per Share for the years ended December 31, 2013, 2012 and 2011 are presented below:

(Dollars in thousands)	2013	2012	2011
GAAP net income attributable to Entegris, Inc.	$74,526	$68,825	$123,846
Adjustments to net income:			
Amortization of intangible assets	9,347	9,594	10,225
Accelerated write-off of debt issuance costs	—	—	282
Gain associated with pension curtailment	—	—	(726)
Contingent consideration fair value adjustment	(1,813)	—	—
Reclassification of cumulative translation adjustments adjustments associated with liquidated subsidiaries	787	—	—
Charge associated with CEO succession and transition plan	—	3,928	—
Gain on sale of equity investment	—	(1,522)	(1,523)
Tax effect of adjustments to net income attributable to Entegris, Inc.	(2,714)	(4,643)	(3,355)
Reversal of deferred tax valuation allowance			$(20,999)
Non-GAAP net income attributable to Entegris, Inc.	$80,133	$76,182	$107,750
Diluted earnings per common share attributable to Entegris, Inc.	$0.53	$0.50	$0.91
Effect of adjustments to net income attributable to Entegris, Inc.	$0.04	$0.05	$(0.12)
Diluted non-GAAP earnings per common share attributable to Entegris, Inc.	$0.57	$0.55	$0.79

Quantitative and Qualitative Disclosure About Market Risks

Entegris' principal financial market risks are sensitivities to interest rates and foreign currency exchange rates. The Company's interest-bearing cash equivalents and short-term investments are subject to interest rate fluctuations. The Company's cash equivalents are instruments with maturities of three months or less. A 100 basis point change in interest rates would potentially increase or decrease annual net income by approximately $2.4 million annually.

The cash flows and results of operations of the Company's foreign-based operations are subject to fluctuations in foreign exchange rates. The Company occasionally uses derivative financial instruments to manage the foreign currency exchange rate risks associated with its foreign-based operations. At December 31, 2013, the Company had no net exposure to any foreign currency forward contracts.

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

The information required by this item can be found under the subcaption “Quantitative and Qualitative Disclosure About Market Risks” of “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in Item 7.

Item 8. Financial Statements and Supplementary Data.

The information called for by this item is set forth in the Consolidated Financial Statements covered by the Report of Independent Registered Public Accounting Firm at the end of this report.

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

This item is not applicable.

Item 9A. Controls and Procedures.

DISCLOSURE CONTROLS AND PROCEDURES

Management evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, (the Exchange Act)), as of December 31, 2013, the end of the fiscal period covered by this report on Form 10-K. The Securities and Exchange Commission, or SEC, rules define the term “disclosure controls and procedures” to mean a company’s controls and other procedures that are designed to ensure that information required to be disclosed in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time period specified in the SEC’s rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in its reports filed under the Exchange Act is accumulated and communicated to the company’s management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure.

Based on the evaluation of the effectiveness of our disclosure controls and procedures by our management team with the participation of the Chief Executive Officer and the Chief Financial Officer, our Chief Executive Officer and our Chief Financial Officer have concluded that, as of the end of the period covered by this report, our disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC rules and forms and is accumulated and communicated to management, including the principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure.

(a) MANAGEMENT’S ANNUAL REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management is responsible for establishing and maintaining an adequate system of internal control over financial reporting of the Company. This system of internal financial reporting controls is designed to provide reasonable assurance that assets are safeguarded and transactions are properly recorded and executed in accordance with management’s authorization. The design, monitoring and revision of the system of internal financial reporting controls involves, among other things, management’s judgments with respect to the relative cost and expected benefits of specific control measures. The effectiveness of the control system is supported by the selection, retention and training of qualified personnel and an organizational structure that provides an appropriate division of responsibility and formalized procedures. The system of internal accounting controls is periodically reviewed and modified in response to changing conditions. Designated Company employees regularly monitor the adequacy and effectiveness of internal accounting controls.

Because of its inherent limitations, a system of internal control over financial reporting can provide only reasonable assurance and may not prevent or detect misstatements. Further, because of changes in conditions, the effectiveness of internal controls over financial reporting may vary over time. Our system contains control-monitoring mechanisms, and actions are taken to correct deficiencies as they are identified.

Management conducted an evaluation of the effectiveness of the system of internal control over financial reporting based on the framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO 1992”). Based on this evaluation, management concluded that the Company’s system of internal control over financial reporting was effective as of December 31, 2013.

KPMG LLP, the independent registered public accounting firm which audited the financial statements included in this annual report, has issued an attestation report on our internal control over financial reporting.

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(b) CHANGES IN INTERNAL CONTROL OVER FINANCIAL REPORTING

There was no change in the Company's internal control over financial reporting during the most recently completed fiscal quarter that has materially affected, or is reasonably likely to materially affect, internal controls over financial reporting.

Item 9B. Other Information.

None.

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PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Except as set forth below, the Information required by this Item 10 has been omitted from this report, and is incorporated by reference to the sections “Section 16(a) Beneficial Ownership Reporting Compliance,” “Election of Directors,” “Corporate Governance” in our definitive Proxy Statement for the Entegris, Inc. Annual Meeting of Stockholders to be held on May 7, 2014, and to be filed with the Securities and Exchange Commission pursuant to Regulation 14A within 120 days after the end of our 2013 fiscal year.

Information called for by this item with respect to registrant’s executive officers is set forth under “Executive Officers of the Registrant” in Item 1 of this report.

At their first meeting following the August 10, 2005 merger described under "Our History" in Part I above, our Board of Directors adopted a code of business ethics, The Entegris, Inc. Code of Business Ethics, applicable to all of our executives, directors and employees as well as a set of corporate governance guidelines. The Entegris, Inc. Code of Business Ethics, the Corporate Governance Guidelines and the charters for our Audit & Finance Committee, Governance & Nominating Committee and our Management Development & Compensation Committee all appear on our website at http://www.Entegris.com under “Investors – Corporate Governance”. The Entegris Code of Business Ethics, Corporate Governance Guidelines and committee charters are also available in print to any shareholder that requests a copy. Copies may be obtained by contacting Peter W. Walcott, our Senior Vice President, Secretary and General Counsel through our corporate headquarters. The Company intends to comply with the requirements of Item 5.05 of Form 8-K with respect to any amendment to or waiver of the provisions of the Entegris, Inc. Code of Business Ethics applicable to the registrant’s Chief Executive Officer, Chief Financial Officer or Chief Accounting Officer by posting notice of any such amendment or waiver at the same location on our website.

Item 11. Executive Compensation.

The information required by this Item 11 has been omitted from this report, and is incorporated by reference to the sections entitled "Compensation of Executive Officers" and “Management Development & Compensation Committee Report”, respectively, in our definitive Proxy Statement for the Entegris, Inc. Annual Meeting of Stockholders to be held on May 7, 2014, and to be filed with the Securities and Exchange Commission pursuant to Regulation 14A within 120 days after the end of our 2013 fiscal year.

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

Securities Authorized for Issuance Under Equity Compensation Plans:

As of December 31, 2013, our equity compensation plan information is as follows:

Equity Compensation Plan Information

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (1) (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (2) (c)
Equity compensation plans approved by security holders	3,531,101	$ 8.20	6,849,087
Equity compensation plans not approved by security holders	—	—	—
Total	3,531,101	$ 8.20	6,849,087

(1) The weighted average exercise price does not take into account the shares issuable upon outstanding restricted stock unit vesting, which have no exercise price.

(2) These shares are available under the 2010 Stock Plan for future issuance for stock options, restricted stock units, performance shares and stock awards in accordance with the terms of the 2010 Stock Plan.

The other information called for by this Item 12 has been omitted from this report, and is incorporated by reference to the section entitled “Ownership of Entegris Common Stock” in our definitive Proxy Statement for the Entegris, Inc. Annual Meeting

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of Stockholders to be held on May 7, 2014, and to be filed with the Securities and Exchange Commission pursuant to Regulation 14A within 120 days after the end of our 2013 fiscal year.

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

The information required by this Item 13 has been omitted from this report, and is incorporated by reference to the section entitled "Corporate Governance" in our definitive Proxy Statement for the Entegris, Inc. Annual Meeting of Stockholders to be held on May 7, 2014, and to be filed with the Securities and Exchange Commission pursuant to Regulation 14A within 120 days after the end of our 2013 fiscal year.

Item 14. Principal Accountant Fees and Services.

The information required by this Item 14 has been omitted from this report, and is incorporated by reference to the section entitled "Proposal 2 - Ratification of Selection of Independent Registered Public Accounting Firm for 2014" in our definitive Proxy Statement for the Entegris, Inc. Annual Meeting of Stockholders to be held on May 7, 2014, and to be filed with the Securities and Exchange Commission pursuant to Regulation 14A within 120 days after the end of our 2013 fiscal year..

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PART IV

Item 15. Exhibits and Financial Statement Schedules.

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

1. Financial Statements. The Consolidated Financial Statements listed under Item 8 of this report and in the Index to Consolidated Financial Statements on page F-1 of this report are incorporated by reference herein.

2. Exhibits.

A. The following exhibits are incorporated by reference:

Reg. S-K Item 601(b) Reference	Document Incorporated	Referenced Document on file with the Commission
(2)	Agreement and Plan of Merger, dated as of March 21, 2005, by and among Entegris, Inc., Mykrolis Corporation and Eagle DE, Inc.	Included as Annex B in the joint proxy statement/prospectus included in S-4 Registration Statement of Entegris, Inc. and Eagle DE, Inc. (No. 333-124719)
(2)	Agreement and Plan of Merger, dated as of March 21, 2005, by and between Entegris, Inc., and Eagle DE, Inc.	Included as Annex B in the joint proxy statement/prospectus included in S-4 Registration Statement of Entegris, Inc. and Eagle DE, Inc. (No. 333-124719)
(3)	By-Laws of Entegris, Inc., as amended December 17, 2008	Exhibit 3 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended December 31, 2008
(3)	Amended and Restated Certificate of Incorporation of Entegris, Inc., as amended	Exhibit 3.1 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended December 31, 2011
(4)	Form of certificate representing shares of Common Stock, $.01 par value per share	Exhibit 4.1 to Form S-4 Registration Statement of Entegris, Inc. and Eagle DE, Inc. (No. 333-124719)
(4)	Rights Agreement dated July 26, 2005 between Entegris and Wells Fargo Bank, N.A as rights agent	Exhibit 4.1 to Entegris, Inc. (Entegris Minnesota) Current Report on Form 8-K filed with the Securities and Exchange Commission on July 29, 2005
(10)	Entegris, Inc. – 2010 Stock Plan, as amended*	Exhibit 10.1 to Entegris, Inc. Quarterly Report on Form 10-Q for the period ended July 3, 2010
(10)	Entegris, Inc. Outside Directors' Stock Option Plan*	Exhibit 10.2 to Entegris, Inc. Registration Statement on Form S-1 (No. 333-33668)
(10)	Entegris, Inc. 2000 Employee Stock Purchase Plan*	Exhibit 10.3 to Entegris, Inc. Registration Statement on Form S-1 (No. 333-33668)
(10)	Amended and Restated Entegris Incentive Plan*	Exhibit 10.1 to Entegris, Inc. Quarterly Report on Form 10-Q for the period ended June 28, 2008
(10)	Lease Agreement, dated April 1, 2002 between Nortel Networks HPOCS Inc. and Mykrolis Corporation, relating to Executive	Exhibit 10.1.3 to Mykrolis Corporation's Quarterly Report on

	office, R&D and manufacturing facility located at 129 Concord Road Billerica, MA	Form 10-Q for the quarter ended March 31, 2002
(10)	Amendment of Lease between Entegris, Inc. and KBS Rivertech, LLC dated April 1, 2012	Exhibit 10.1 to Entegris, Inc. Quarterly Report on Form 10-Q for the period ended June 30, 2012
(10)	Amended and Restated Employment Agreement, dated as of May 4, 2005, by and between Mykrolis Corporation and Gideon Argov*	Exhibit 10.13 to Mykrolis Corporation's Quarterly Report on Form 10-Q for the quarter ended April 2, 2005

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(10)	Fluoropolymer Purchase and Sale Agreement, by and between E.I. Du Pont De Nemours and Company and the Registrant, dated January 1, 2011, as amended	Exhibit 10.2 to Entegris, Inc. Quarterly Report on Form 10-Q for the quarter ended April 2, 2011
(10)	Credit Agreement, dated June 9, 2011, among Entegris, Inc., Poco Graphite, Inc., the Lenders (as defined therein) and Wells Fargo Bank, NA, as Administrative Agent.	Exhibit 10.1 to Entegris, Inc. Quarterly Report on Form 10-Q for the period ended July 2, 2011
(10)	First Amendment to Credit Agreement, dated August 1, 2012, among the Registrant, Poco Graphite, Inc., the Lenders as defined in the Credit Agreement and Wells Fargo Bank National Association	Exhibit 99.1 to Entegris, Inc. Current Report on Form 8-K filed on August 3, 2012
(10)	Form of Indemnification Agreement between Entegris, Inc. and each of its executive officers and Directors	Exhibit 10.30 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended August 27, 2005
(10)	Form of Executive Change of Control Termination Agreement between Entegris, Inc. and certain of its executive officers*	Exhibit 10.31 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended August 27, 2005
(10)	Severance Protection Agreement, dated July 26, 2011 between Entegris, Inc. and Gregory B. Graves*	Exhibit 10.2 to Entegris, Inc. Quarterly Report on Form 10-Q for the period ended July 2, 2011
(10)	Trust Agreement between Entegris, Inc. Fidelity Management Trust Company and Entegris Inc. 401(k) Savings and Profit Sharing Plan Trust, dated December 29, 2007.	Exhibit 10.3 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended December 31, 2007
(10)	Entegris, Inc. 2007 Deferred Compensation Plan*	Exhibit 10.2 to Entegris, Inc. Quarterly Report on Form10-Q for the fiscal period ended June 30, 2007
(10)	Entegris, Inc. – Form of 2010 RSU Unit Award Agreement*	Exhibit 10.1 to Entegris, Inc. Quarterly Report on Form 10-Q for the fiscal period ended April 3, 2010