

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

**FORM 10-K**

(Mark One)

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

**For the fiscal year ended December 31, 2013**

**or**

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

**For the transition period from \_\_\_\_\_ to \_\_\_\_\_**

**Commission file number: 001-32598**

**Entegris, Inc.**

**(Exact name of registrant as specified in its charter)**

**Delaware**

**(State or Other Jurisdiction of  
Incorporation or Organization)**

**41-1941551**

**(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**

**Common Stock, \$0.01 Par Value**

**Name of Exchange on which Registered**

**The Nasdaq Global Select Market**

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

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

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

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

Indicate by 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 ☐ No ☐

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. ☐

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 ☒ Accelerated Filer ☐

Non-Accelerated Filer ☐ (Do not check if a smaller reporting company) Smaller reporting company ☐

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

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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ENTEGRIS, INC.

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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](http://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](http://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

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

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

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 cyclicity 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

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



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.

**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.

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

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

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

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.

- **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



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

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.

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



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 cyclicalities 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

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

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.**

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,

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.

**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



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;
- 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.

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.**



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

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 cyclical nature 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

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.

**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;

- 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 <sup>(1) (4)</sup>	80,000	Owned
Billerica, Massachusetts	Executive Offices, Research & Manufacturing <sup>(1)</sup>	175,000	Leased <sup>(2)</sup>
Chaska, Minnesota	Executive Offices, Research & Manufacturing <sup>(1) (3)</sup>	192,000	Owned
Colorado Springs, Colorado	Manufacturing <sup>(3)</sup>	82,000	Owned
Colorado Springs, Colorado	Manufacturing <sup>(3)</sup>	40,000	Leased
Decatur, Texas	Manufacturing <sup>(4)</sup>	359,000	Owned
Montpellier, France	Cleaning Services <sup>(3)</sup>	53,000	Owned
Yonezawa, Japan	Manufacturing <sup>(1) (3)</sup>	196,000	Owned
Kulim, Malaysia	Manufacturing <sup>(1) (3)</sup>	195,000	Owned
Wonju City, South Korea	Manufacturing <sup>(1)</sup>	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.

**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.

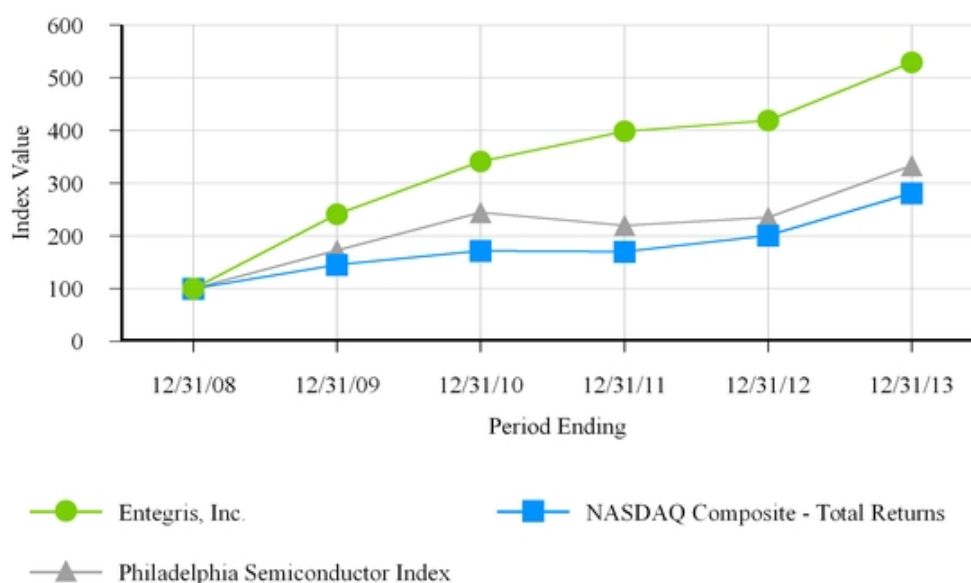
***Issuer Sales of Unregistered Securities During the Past Three Years:***

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.

**of 5 Year Cumulative Total Return  
es Initial Investment of \$100  
Decemeber 2013**



	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:

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

#### 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.



<i>(In thousands, except per share amounts).</i>	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
<b>Operating Results</b>					
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)
<b>Earnings Per Share Data</b>					
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
<b>Operating Ratios – % of net sales</b>					
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)
<b>Cash Flow Statement Data</b>					
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)
<b>Balance Sheet and Other Data</b>					
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*

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 intended to 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

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.

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

- 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

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.

	2013		2012	
		% of net sales		% of net sales
<i>(Dollars in thousands)</i>				
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.



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.

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.



<i>(In thousands)</i>		2013	2012
<b>Contamination Control Solutions:</b>			
Net sales	\$	447,410	\$ 461,838
Segment profit		106,120	116,356
<b>Microenvironments:</b>			
Net sales	\$	178,201	\$ 182,375
Segment profit		35,737	37,223
<b>Specialty Materials:</b>			
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.

	2012		2011	
		% of net sales		% of net sales
<i>(Dollars in thousands)</i>				
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.

**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

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.

<i>(In thousands)</i>	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.

### **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)**

	2012				2013			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>(In thousands)</i>								
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
<i>(Percent of net sales)</i>								
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

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**



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

<i>(In thousands)</i>	Total	2014	2015	2016	2017	2018	Thereafter
Pension obligations	\$ 9,471	\$ 242	\$ 123	\$ 195	\$ 265	\$ 293	\$ 8,353
Capital purchase obligations <sup>1</sup>	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 <sup>2</sup>							

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

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:

(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.

**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.

**(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.

## 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	—	—	—
<b>Total</b>	<b>3,531,101</b>	<b>\$ 8.20</b>	<b>6,849,087</b>

(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

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..



## 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 office, R&D and manufacturing facility located at 129 Concord Road Billerica, MA	Exhibit 10.1.3 to Mykrolis Corporation’s Quarterly Report on 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

(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 Form 10-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
(10)	Entegris, Inc. – Form of 2010 Stock Option Award Agreement*	Exhibit 10.1 to Entegris, Inc. Quarterly Report on Form 10-Q for the fiscal period ended April 3, 2010
(10)	Fourth Amended and Restated Membrane Manufacture and Supply Agreement, dated January 10, 2011, by and between Entegris, Inc. and Millipore Corporation.	Exhibit 10.1 to Entegris, Inc. Quarterly Report on Form 10-Q for the fiscal period ended April 2, 2011
(10)	Amended and Restated Supplemental Executive Retirement Plan for Key Salaried Employees*	Exhibit 10.2 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended December 31, 2008
(10)	Amendment to Amended and Restated SERP*	Exhibit 10.15 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended December 31, 2009.
(10)	Entegris, Inc. 2012 RSU Unit Award Agreement*	Exhibit 10.2 to Entegris, Inc. Quarterly Report on Form 10-Q for the fiscal period ended March 31, 2012
(10)	Entegris, Inc. 2012 Stock Option Grant Agreement*	Exhibit 10.3 to Entegris, Inc. Quarterly Report on Form 10-Q for the fiscal period ended March 31, 2012
(10)	Entegris, Inc. 401(k) Savings and Profit Sharing Plan (2012 Restatement)*	Exhibit 10.2 to Entegris, Inc. Quarterly Report on Form 10-Q for the fiscal period ended March 31, 2012
(10)	Executive Employment Agreement, effective November 28, 2012, between the Registrant and Bertrand Loy*	Exhibit 10.1 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended December 31, 2012
(10)	2011 RSU Unit Award Agreement*	Exhibit 10.2 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended December 31, 2012
(10)	2011 Stock Option Award Agreement*	Exhibit 10.3 to Entegris, Inc. Annual Report on Form 10-K for the fiscal year ended December 31, 2012

(10)	Amendment No. 1, dated April 26, 2013, to Executive Change in Control Termination Agreement, between Entegris, Inc. and Bertrand Loy*	Exhibit 99.1 to Entegris, Inc. Periodic Report on Form 8-K filed with the Securities and Exchange Commission on April 26, 2013
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\* A “management contract or compensatory plan”

*B. The Company hereby files as exhibits to this Annual Report on Form 10-K the following documents:*

## Reg. S-K

### Item 601(b)

Reference	Exhibit No.	Documents Filed Herewith
(10)	10.1	Membrane Manufacture and Supply Transition Agreement, dated as of November 22, 2013, between Entegris, inc. and EMD Millipore Corporation
(21)	21	Subsidiaries of Entegris, Inc.
(23)	23	Consent of Independent Registered Public Accounting Firm
(24)	24	Power of Attorney by the Directors of Entegris, Inc.
(31)	31.1	Certification required by Rule 13a-14(a) in accordance with Section 302 of the Sarbanes—Oxley Act of 2002.
(31)	31.2	Certification required by Rule 13a-14(a) in accordance with Section 302 of the Sarbanes—Oxley Act of 2002.
(32)	32.1	Certification required by Rule 13a-14(b) and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
(32)	32.2	Certification required by Rule 13a-14(b) and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
(101)	101.INS	XBRL Instance Document
(101)	101.SCH	XBRL Taxonomy Extension Schema Document
(101)	101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
(101)	101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
(101)	101.LAB	XBRL Taxonomy Extension Label Linkbase Document
(101)	101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

\* A “management contract or compensatory plan”

\*\* In accordance with Rule 406T of Regulation S-T, the XBRL related information in Exhibit 101 to this Annual Report on Form 10-K is deemed not filed or part of a registration statement or prospectus for purposes of Section 11 or 12 of the Securities Act of 1933, as amended, is deemed not filed for purposes of Section 18 of the Securities and Exchange Act of 1934, as amended, and otherwise is not subject to liability under those sections.

## SIGNATURES

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

### ENTEGRIS, INC.

Dated: February 20, 2014

By           /s/ BERTRAND LOY          

Bertrand Loy  
President & Chief Executive Officer

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

SIGNATURE	TITLE	DATE
/s/ BERTRAND LOY Bertrand Loy	President, Chief Executive Officer and Director (Principal executive officer)	February 20, 2014
/s/ GREGORY B. GRAVES Gregory B. Graves	Executive Vice President, Chief Financial Officer & Treasurer (Principal financial officer)	February 20, 2014
/s/ MICHAEL D. SAUER Michael D. Sauer	Vice President, Controller & Chief Accounting Officer (Principal accounting officer)	February 20, 2014
PAUL L.H. OLSON* Paul L.H. Olson	Director, Chairman of the Board	February 20, 2014
MICHAEL A. BRADLEY* Michael A. Bradley	Director	February 20, 2014
MARVIN D. BURKETT* Marvin D. Burkett	Director	February 20, 2014
R. NICHOLAS BURNS* R. Nicholas Burns	Director	February 20, 2014
DANIEL W. CHRISTMAN* Daniel W. Christman	Director	February 20, 2014
JAMES F. GENTILCORE* James F. Gentilcore	Director	February 20, 2014
ROGER D. MCDANIEL * Roger D. McDaniel	Director	February 20, 2014
BRIAN F. SULLIVAN* Brian F. Sullivan	Director	February 20, 2014

\*By           /s/ BERTRAND LOY          

BERTRAND LOY, ATTORNEY-IN-FACT

## EXHIBIT INDEX

### Reg. S-K Item 601(b)

Reference	Exhibit No.	Documents Filed Herewith
(10)	10.1	Membrane Manufacture and Supply Transition Agreement, dated as of November 22, 2013, between Entegris, inc. and EMD Millipore Corporation
(21)	21	Subsidiaries of Entegris, Inc.
(23)	23	Consent of Independent Registered Public Accounting Firm
(24)	24	Power of Attorney by the Directors of Entegris, Inc.
(31)	31.1	Certification required by Rule 13a-14(a) in accordance with Section 302 of the Sarbanes—Oxley Act of 2002.
(31)	31.2	Certification required by Rule 13a-14(a) in accordance with Section 302 of the Sarbanes—Oxley Act of 2002.
(32)	32.1	Certification required by Rule 13a-14(b) and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
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(101)	101.INS	XBRL Instance Document
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(101)	101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
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(101)	101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

\* A “management contract or compensatory plan”

\*\* In accordance with Rule 406T of Regulation S-T, the XBRL related information in Exhibit 101 to this Annual Report on Form 10-K is deemed not filed or part of a registration statement or prospectus for purposes of Section 11 or 12 of the Securities Act of 1933, as amended, is deemed not filed for purposes of Section 18 of the Securities and Exchange Act of 1934, as amended, and otherwise is not subject to liability under those sections.

**ENTEGRIS, INC.**  
**INDEX TO FINANCIAL STATEMENTS**

<a href="#">Report of Independent Registered Public Accounting Firm</a>	F-2
<a href="#">Consolidated Balance Sheets at December 31, 2013 and 2012</a>	F-3
<a href="#">Consolidated Statements of Operations for the years ended December 31, 2013, 2012 and 2011</a>	F-4
<a href="#">Consolidated Statements of Comprehensive Income for the years ended December 31, 2013, 2012 and 2011</a>	F-5
<a href="#">Consolidated Statements of Equity for the years ended December 31, 2013, 2012 and 2011</a>	F-6
<a href="#">Consolidated Statements of Cash Flows for the years ended December 31, 2013, 2012 and 2011</a>	F-7
<a href="#">Notes to Consolidated Financial Statements</a>	F-8

## Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders  
Entegris, Inc.:

We have audited the accompanying consolidated balance sheets of Entegris, Inc. and subsidiaries as of December 31, 2013 and 2012, and the related consolidated statements of operations, comprehensive income, equity, and cash flows for each of the years in the three-year period ended December 31, 2013. We also have audited Entegris, Inc.'s internal control over financial reporting as of December 31, 2013, based on criteria established in *Internal Control - Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO 1992). Entegris, Inc.'s management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Item 9A.(b) *Management's Annual Report on Internal Control Over Financial Reporting*. Our responsibility is to express an opinion on these consolidated financial statements and an opinion on the Company's internal control over financial reporting based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement and whether effective internal control over financial reporting was maintained in all material respects. Our audits of the consolidated financial statements included examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Entegris, Inc. and subsidiaries as of December 31, 2013 and 2012, and the results of their operations and their cash flows for each of the years in the three-year period ended December 31, 2013, in conformity with U.S. generally accepted accounting principles. Also in our opinion, Entegris, Inc. maintained, in all material respects, effective internal control over financial reporting as of December 31, 2013, based on criteria established in *Internal Control - Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO 1992).

/s/ KPMG LLP

Minneapolis, Minnesota  
February 20, 2014



**ENTEGRIS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED BALANCE SHEETS**

<i>(In thousands, except share and per share data)</i>	December 31, 2013	December 31, 2012
<b>ASSETS</b>		
<b>Current assets:</b>		
Cash and cash equivalents	\$ 384,426	\$ 330,419
Short-term investments	—	19,995
Trade accounts and notes receivable, net	101,873	94,016
Inventories, net	94,074	99,144
Deferred tax assets, deferred tax charges and refundable income taxes	20,844	20,201
Assets held for sale	—	5,998
Other current assets	11,088	9,551
<b>Total current assets</b>	<b>612,305</b>	<b>579,324</b>
Property, plant and equipment, net	186,440	157,021
Other assets:		
Intangible assets, net	43,509	47,207
Deferred tax assets and other noncurrent tax assets	12,039	17,167
Other	21,001	10,825
<b>Total assets</b>	<b>\$ 875,294</b>	<b>\$ 811,544</b>
<b>LIABILITIES AND EQUITY</b>		
<b>Current liabilities:</b>		
Accounts payable	\$ 38,396	\$ 36,341
Accrued payroll and related benefits	30,116	29,376
Other accrued liabilities	18,700	21,887
Deferred tax liabilities and income taxes payable	10,373	5,659
<b>Total current liabilities</b>	<b>97,585</b>	<b>93,263</b>
Pension benefit obligations and other liabilities	15,411	17,066
Deferred tax liabilities and other noncurrent tax liabilities	5,455	6,416
Commitments and contingent liabilities	—	—
<b>Equity:</b>		
Preferred stock, par value \$.01; 5,000,000 shares authorized; none issued and outstanding as of December 31, 2013 and 2012	—	—
Common stock, par value \$.01; 400,000,000 shares authorized; issued and outstanding shares: 138,734,442 and 138,457,769	1,387	1,385
Additional paid-in capital	819,632	809,514
Retained deficit	(88,599)	(157,038)
Accumulated other comprehensive income	24,423	40,938
<b>Total equity</b>	<b>756,843</b>	<b>694,799</b>
<b>Total liabilities and equity</b>	<b>\$ 875,294</b>	<b>\$ 811,544</b>

See the accompanying notes to consolidated financial statements.

**ENTEGRIS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED STATEMENTS OF OPERATIONS**

<i>(In thousands, except per share data)</i>	Year ended December 31, 2013	Year ended December 31, 2012	Year ended December 31, 2011
Net sales	\$ 693,459	\$ 715,903	\$ 749,259
Cost of sales	399,245	408,520	423,329
<b>Gross profit</b>	294,214	307,383	325,930
Selling, general and administrative expenses	137,123	147,405	140,847
Engineering, research and development expenses	55,320	50,940	47,980
Amortization of intangible assets	9,347	9,594	10,225
Contingent consideration fair value adjustment	(1,813)	—	—
<b>Operating income</b>	94,237	99,444	126,878
Other income, net	(1,958)	(259)	(1,086)
<b>Income before income taxes and equity in net income of affiliates</b>	96,195	99,703	127,964
Income tax expense	21,669	30,881	4,217
Equity in net income of affiliates	—	(3)	(499)
<b>Net income</b>	74,526	68,825	124,246
Less net income attributable to the noncontrolling interest	—	—	400
<b>Net income attributable to Entegris, Inc.</b>	<u>\$ 74,526</u>	<u>\$ 68,825</u>	<u>\$ 123,846</u>
Amounts attributable to Entegris, Inc.:			
Basic net income per common share	\$ 0.54	\$ 0.50	\$ 0.92
Diluted net income per common share	\$ 0.53	\$ 0.50	\$ 0.91
Weighted shares outstanding			
Basic	138,950	137,306	134,685
Diluted	139,618	138,412	136,223

See the accompanying notes to consolidated financial statements.

**ENTEGRIS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME**

<b>(In thousands)</b>	<b>Year ended December 31, 2013</b>	<b>Year ended December 31, 2012</b>	<b>Year ended December 31, 2011</b>
Net income	\$ 74,526	\$ 68,825	\$ 124,246
Other comprehensive (loss) income, net of tax			
Foreign currency translation adjustments	(17,504)	(2,524)	925
Reclassification of cumulative translation adjustment associated with sale and liquidation	787	—	(1,715)
Reclassification of cumulative translation adjustment associated with acquisition of business	—	(216)	—
Pension liability adjustments, net of income tax (benefit) expense of \$(37), \$74, and \$(1,631) for year ended December 31, 2013, 2012, and 2011	202	(295)	2,386
Other comprehensive (loss) income	(16,515)	(3,035)	1,596
Comprehensive income	58,011	65,790	125,842
Less comprehensive income attributable to the noncontrolling interest	—	—	620
Comprehensive income attributable to Entegris, Inc.	\$ 58,011	\$ 65,790	\$ 125,222

See the accompanying notes to consolidated financial statements

**ENTEGRIS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED STATEMENTS OF EQUITY**

<i>(In thousands)</i>	<b>Common shares outstanding</b>	<b>Common stock</b>	<b>Additional paid-in capital</b>	<b>Retained earnings (deficit)</b>	<b>Foreign currency translation adjustments</b>	<b>Defined benefit pension adjustments</b>	<b>Noncontrolling interest</b>	<b>Total</b>
<b>Balance at December 31, 2010</b>	132,901	\$ 1,329	\$ 765,867	\$ (349,612)	\$ 45,185	\$ (3,150)	\$ 4,394	\$ 464,013
Shares issued under stock plans	2,920	29	11,661	—	—	—	—	11,690
Share-based compensation expense	—	—	7,519	—	—	—	—	7,519
Tax benefit associated with stock plans	—	—	657	—	—	—	—	657
Purchase of noncontrolling interest	—	—	2,969	—	562	—	(5,014)	(1,483)
Pension liability adjustment	—	—	—	—	—	2,386	—	2,386
Reclassification of cumulative translation adjustment associated with sale of equity method investee	—	—	—	—	(1,715)	—	—	(1,715)
Foreign currency translation	—	—	—	—	705	—	220	925
Net income	—	—	—	123,846	—	—	400	124,246
<b>Balance at December 31, 2011</b>	135,821	1,358	788,673	(225,766)	44,737	(764)	—	608,238
Shares issued under stock plans	2,694	28	7,403	—	—	—	—	7,431
Share-based compensation expense	—	—	9,881	—	—	—	—	9,881
Repurchase and retirement of common stock	(57)	(1)	(329)	(97)	—	—	—	(427)
Tax benefit associated with stock plans	—	—	3,886	—	—	—	—	3,886
Pension liability adjustment	—	—	—	—	—	(295)	—	(295)
Reclassification of cumulative translation adjustment associated with acquisition of business	—	—	—	—	(216)	—	—	(216)
Foreign currency translation	—	—	—	—	(2,524)	—	—	(2,524)
Net income	—	—	—	68,825	—	—	—	68,825
<b>Balance at December 31, 2012</b>	138,458	1,385	809,514	(157,038)	41,997	(1,059)	—	694,799
Shares issued under stock plans	1,882	18	7,667	—	—	—	—	7,685
Share-based compensation expense	—	—	7,928	—	—	—	—	7,928
Repurchase and retirement of common stock	(1,606)	(16)	(9,391)	(6,087)	—	—	—	(15,494)
Tax benefit associated with stock plans	—	—	3,914	—	—	—	—	3,914
Pension liability adjustment	—	—	—	—	—	202	—	202
Reclassification of cumulative translation adjustment associated with liquidated subsidiaries	—	—	—	—	787	—	—	787
Foreign currency translation	—	—	—	—	(17,504)	—	—	(17,504)
Net income	—	—	—	74,526	—	—	—	74,526
<b>Balance at December 31, 2013</b>	<u>138,734</u>	<u>\$ 1,387</u>	<u>\$ 819,632</u>	<u>\$ (88,599)</u>	<u>\$ 25,280</u>	<u>\$ (857)</u>	<u>\$ —</u>	<u>\$ 756,843</u>

**ENTEGRIS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED STATEMENTS OF CASH FLOWS**

<i>(In thousands)</i>	Year ended December 31, 2013	Year ended December 31, 2012	Year ended December 31, 2011
<b>Operating activities:</b>			
Net income	\$ 74,526	\$ 68,825	\$ 124,246
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation	29,468	28,013	26,839
Amortization	9,347	9,594	10,225
Share-based compensation expense	7,928	9,881	7,519
Deferred tax valuation allowance	445	358	(41,038)
Provision for deferred income taxes	7,787	11,582	21,671
Charge for excess and obsolete inventory	3,963	4,007	3,167
Excess tax benefit from share-based compensation plans	(3,914)	(3,805)	(657)
Amortization of debt issuance costs	—	—	676
Net income attributable to noncontrolling interest	—	—	(400)
Other	(765)	1,701	(2,245)
Changes in operating assets and liabilities, net of effects of acquisitions:			
Trade accounts receivable and notes receivable	(13,363)	10,626	19,336
Inventories	(441)	(6,118)	3,632
Accounts payable and accrued liabilities	(4,408)	6,265	(15,127)
Other current assets	(414)	(2,985)	1,253
Income taxes payable and refundable income taxes	2,731	(11,015)	(433)
Other	(3,488)	(11,767)	(1,378)
<b>Net cash provided by operating activities</b>	<b>109,402</b>	<b>115,162</b>	<b>157,286</b>
<b>Investing activities:</b>			
Acquisition of property and equipment	(60,360)	(49,929)	(30,267)
Acquisition of business, net of cash acquired	(13,358)	(2,961)	—
Purchase of short-term investments	—	(27,990)	(2,047)
Proceeds from sale or maturities of short-term investments	20,000	8,000	2,000
Proceeds from sale of assets held for sale	6,500	—	—
Other	189	413	1,883
<b>Net cash used in investing activities</b>	<b>(47,029)</b>	<b>(72,467)</b>	<b>(28,431)</b>
<b>Financing activities:</b>			
Issuance of common stock from employee stock plans	7,685	7,431	11,690
Repurchase and retirement of common stock	(15,494)	(427)	—
Other	3,914	3,886	(826)
<b>Net cash (used in) provided by financing activities</b>	<b>(3,895)</b>	<b>10,890</b>	<b>10,864</b>
Effect of exchange rate changes on cash and cash equivalents	(4,471)	3,241	(80)
<b>Increase in cash and cash equivalents</b>	<b>54,007</b>	<b>56,826</b>	<b>139,639</b>
<b>Cash and cash equivalents at beginning of year</b>	<b>330,419</b>	<b>273,593</b>	<b>133,954</b>
<b>Cash and cash equivalents at end of year</b>	<b>\$ 384,426</b>	<b>\$ 330,419</b>	<b>\$ 273,593</b>

## Supplemental Cash Flow Information

<i>(In thousands)</i>	Year ended December 31, 2013	Year ended December 31, 2012	Year ended December 31, 2011
Non-cash transactions:			
Equipment purchases in accounts payable	\$ 6,950	\$ 3,429	\$ 1,372
Intangible assets received as partial consideration in sale of equity interest	—	—	1,712
Schedule of interest and income taxes paid:			
Interest paid	\$ 72	\$ 271	\$ 210
Income taxes, net of refunds received	10,208	29,697	22,034

See accompanying notes to consolidated financial statements.

**ENTEGRIS, INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS****(1) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

**Nature of Operations** Entegris, Inc. (Entegris or the Company) is a leading provider of products and services that purify, protect and transport the critical materials used in key technology-driven industries, primarily the semiconductor and related industries.

**Principles of Consolidation** The consolidated financial statements include the accounts of the Company and its majority-owned subsidiaries. Intercompany profits, transactions and balances have been eliminated in consolidation.

**Use of Estimates and Basis of Presentation** The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States requires management to make judgments, estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. On an ongoing basis, Entegris evaluates its estimates, including those related to receivables, inventories, property, plant and equipment, intangible assets, accrued expenses, income taxes and share-based compensation, among others. Actual results could differ from those estimates.

In the fourth quarter and year ended December 31, 2013, the Company recorded the correction of an error resulting from the company's Japan manufacturing subsidiary inventory being overvalued due to applying an incorrect exchange rate in calculating the inventory value. The error originated in the fourth quarter of 2012 and the first three quarters of 2013. The impact of correcting the error in the fourth quarter 2013 increased cost of goods sold by \$2.2 million with a corresponding decrease to inventory. Neither the origination nor the correction of the error was material to the Company's consolidated financial statements.

**Concentrations of Suppliers** Certain materials included in the Company's products are obtained from a single source or a limited group of suppliers. Although the Company seeks to reduce dependence on those sole and limited source suppliers, the partial or complete loss of these sources could have at least a temporary adverse effect on the Company's results of operations. Furthermore, a significant increase in the price of one or more of these components could adversely affect the Company's results of operations.

**Cash and Cash Equivalents** Cash and cash equivalents include cash on hand and highly liquid debt securities with original maturities of three months or less, which are valued at cost which approximates fair value.

**Allowance for Doubtful Accounts** An allowance for uncollectible trade receivables is estimated based on a combination of write-off history, aging analysis and any specific, known troubled accounts. The Company maintains an allowance for doubtful accounts that management believes is adequate to cover expected losses on trade receivables.

**Inventories** Inventories are stated at the lower of cost or market. Cost is determined by the first-in, first-out (FIFO) method.

**Property, Plant, and Equipment** Property, plant and equipment are carried at cost and are depreciated on the straight-line method over the estimated useful lives of the assets. When assets are retired or disposed of, the cost and related accumulated depreciation are removed from the accounts, and gains or losses are recognized in the same period. Maintenance and repairs are expensed as incurred; significant additions and improvements are capitalized. Long-lived assets, including property, plant and equipment, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset or group of asset(s) may not be recoverable based on estimated future undiscounted cash flows. The amount of impairment, if any, is measured as the difference between the net book value and the estimated fair value of the asset(s).

**Investments** The Company's nonmarketable investments are accounted for under either the cost or equity method of accounting, as appropriate. All nonmarketable investments are periodically reviewed to determine whether declines, if any, in fair value below cost basis are other-than-temporary. If the decline in fair value is determined to be other-than-temporary, an impairment loss is recorded and the investment written down to a new cost basis.

**Fair Value of Financial Instruments** The carrying value of cash equivalents, accounts receivable and accounts payable approximates fair value due to the short maturity of those instruments.

**Intangible Assets** Amortizable intangible assets include, among other items, patents, unpatented and other developed technology and customer-based intangibles, and are amortized using the straight-line method over their respective estimated useful lives of 3 to 15 years. The Company reviews intangible assets, along with other long-lived assets, for impairment if changes in circumstances or the occurrence of events suggest the remaining value may not be recoverable.



**Derivative Financial Instruments** The Company records derivatives as assets or liabilities on the balance sheet and measures such instruments at fair value. Changes in fair value of derivatives are recorded each period in the Company's consolidated statements of operations.

The Company periodically enters into forward foreign currency contracts to reduce exposures relating to rate changes in certain foreign currencies. Certain exposures to credit losses related to counterparty nonperformance exist. However, the Company does not anticipate nonperformance by the counterparties since they are large, well-established financial institutions. None of these derivatives is accounted for as a hedge transaction. Accordingly, changes in the fair value of forward foreign currency contracts are recorded as other income, net, in the Company's consolidated statements of operations. The fair values of the Company's derivative financial instruments are based on prices quoted by financial institutions for these instruments.

**Foreign Currency Translation** Assets and liabilities of foreign subsidiaries are generally translated from foreign currencies into U.S. dollars at period-end exchange rates, and the resulting gains and losses arising from translation of net assets located outside the U.S. are recorded as a cumulative translation adjustment, a component of accumulated other comprehensive income in the consolidated balance sheets. Income statement amounts are translated at the weighted average exchange rates for the year. Translation adjustments are not adjusted for income taxes, as substantially all translation adjustments relate to permanent investments in non-U.S. subsidiaries. Gains and losses resulting from foreign currency transactions are included in other income, net, in the Company's consolidated statements of operations.

**Revenue Recognition** Revenue and the related cost of sales are generally recognized upon shipment of the products. Revenue for product sales is recognized upon delivery, when persuasive evidence of an arrangement exists, when title and risk of loss have been transferred to the customer, collectability is reasonably assured, and pricing is fixed or determinable. Shipping and handling fees related to sales transactions are billed to customers and are recorded as sales revenue.

The Company sells its products throughout the world primarily to companies in the microelectronics industry. The Company performs continuing credit evaluations of its customers and generally does not require collateral. Letters of credit may be required from its customers in certain circumstances. The Company provides for estimated returns when the revenue is recorded based on historical and current trends in both sales and product returns.

The Company collects various sales and value-added taxes on certain product and service sales that are accounted for on a net basis.

**Shipping and handling costs** Shipping and handling costs incurred are recorded in cost of sales in the Company's consolidated statements of operations.

**Engineering, research and development expenses** Engineering, research and development costs are expensed as incurred.

**Share-based Compensation** The Company measures the cost of employee services received in exchange for the award of equity instruments based on the fair value of the award at the date of grant. The cost is recognized over the period during which an employee is required to provide services in exchange for the award. Compensation expense is based on the grant date fair value. Because share-based compensation expense recognized in the Company's consolidated statements of operations is based on awards ultimately expected to vest, it has been reduced for expected forfeitures which are estimated at the time of grant with such estimates revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates.

**Income Taxes** The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined on the basis of the differences between the financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income tax expense in the period that includes the enactment date.

The Company recognizes deferred tax assets to the extent that it believes these assets are more likely than not to be realized. A valuation allowance is recorded to reduce deferred tax assets when it is more likely than not that the Company would not be able to realize all or part of its deferred tax assets. In making such a determination, the Company considers all available positive and negative evidence, including future reversals of existing temporary differences, projected future taxable income, tax-planning strategies, and results of recent operations. If the Company determines that it would be able to realize its deferred tax assets in the future in excess of their net recorded amount, the Company would make an adjustment to the deferred tax asset valuation allowance, which would reduce the provision for income taxes.

The Company's policy for recording interest and penalties associated with audits and unrecognized tax benefits is to record such items as a component of income before taxes. Penalties and interest to be paid or received are recorded in other income, net, in the statement of operations.

**Comprehensive Income** Comprehensive income represents the change in equity resulting from items other than shareholder investments and distributions. The Company's foreign currency translation adjustments and minimum pension liability adjustments are included in accumulated other comprehensive income. Comprehensive income and the components of accumulated other comprehensive income are presented in the accompanying consolidated statements of equity and comprehensive income.

#### **Recent Accounting Pronouncements**

In December 2011, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2011-11, Amendments to Disclosures about Offsetting Assets and Liabilities. The objective of ASU No. 2011-11 is to provide enhanced disclosures that will enable users of its financial statements to evaluate the effect or potential effect of netting arrangements on an entity's financial position. In January 2013, the FASB issued ASU No. 2013-01, Clarifying the Scope of Disclosures about Offsetting Assets and Liabilities, which clarifies what instruments and transactions are subject to the offsetting disclosure requirements established by ASU No. 2011-11. Derivative instruments accounted for in accordance with Accounting Standards Codification (ASC) 815, are subject to ASU No. 2011-11 disclosure requirements. These amendments are disclosure related and do not have an impact on the Company's financial position, results of operations, comprehensive income or cash flows. ASU Nos. 2011-11 and 2013-01 are effective for reporting periods beginning after December 15, 2012. Accordingly, the Company adopted ASU Nos. 2011-11 and 2013-01 in the first quarter of fiscal 2013. The disclosures associated with ASU Nos. 2011-11 and 2013-01 are included in note 14 to the Company's consolidated financial statements.

In February 2013, the FASB issued ASU No. 2013-02, Comprehensive Income (Topic 220): Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income that amended ASU No. 2011-12 and ASU No. 2011-05. ASU No. 2013-02 requires an entity to provide information about the amounts reclassified out of accumulated other comprehensive income by component. In addition, an entity is required to present, either in the consolidated statements of operations or in the notes, significant amounts reclassified out of accumulated other comprehensive income by the respective line items of net income. These amendments are disclosure related and do not have an impact on the Company's financial position, results of operations, comprehensive income or cash flows. ASU 2013-02 is effective for reporting periods beginning after December 15, 2012. Accordingly, the Company adopted ASU 2013-02 in the first quarter of fiscal 2013. The disclosures associated with ASU No. 2013-02 are included in the Company's consolidated statements of equity.

## **(2) ACQUISITIONS**

### **Jetalon**

On April 1, 2013, the Company acquired substantially all the operating assets and liabilities of Jetalon Solutions, Inc. (Jetalon), a California-based supplier of fluid metrology products. The acquired net assets became part of the Company's Contamination Control Solutions segment. The transaction was accounted for under the acquisition method of accounting and the results of operations of the entity are included in the Company's consolidated financial statements as of and since April 1, 2013. The acquisition of Jetalon's assets and liabilities does not constitute a material business combination.

The purchase price for Jetalon includes cash consideration of \$13.4 million, funded from the Company's existing cash on hand, and earnout-based contingent consideration of up to a maximum of \$14.5 million based on the operating performance of Jetalon in 2013, 2014 and 2015. Costs associated with the acquisition of Jetalon were not significant and were expensed as incurred.

Upon acquisition, the Company recorded a contingent consideration obligation of \$3.1 million representing the fair value of the earnout-based contingent consideration. This amount was estimated through a valuation model that incorporates probability-adjusted assumptions relating to the achievement of possible operating results and the likelihood of the Company making payments.

Subsequent changes in the fair value of this obligation will be recognized as adjustments to the contingent consideration obligation and reflected within the Company's consolidated statements of operations. During the third quarter of 2013, the Company assessed the contingent consideration based on the valuation methodology described above and recorded a \$1.8 million gain that is reflected in the Company's consolidated statements of operations.

The purchase price of Jetalon consists of the following:

<i>(In thousands):</i>	Amount
Cash paid at closing	\$13,358
Contingent consideration obligation	3,094
Total purchase price	<u>\$16,452</u>

The purchase price of Jetalon, including the Company's valuation of contingent consideration, exceeds the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed by \$10.1 million. Cash flows used to determine the purchase price included strategic and synergistic benefits (investment value) specific to the Company, which resulted in a purchase price in excess of the fair value of identifiable net assets. The purchase price also includes the fair values of other assets that were not identifiable, not separately recognizable under accounting rules (e.g., assembled workforce) or of immaterial value in addition to a going-concern element that represents the Company's ability to earn a higher rate of return on the group of assets than would be expected on the separate assets as determined during the valuation process. This additional investment value resulted in goodwill, which is included in other non-current assets in the Company's consolidated balance sheets and is expected to be deductible for income tax purposes.

The following table summarizes the allocation of the purchase price to the fair values assigned to the assets acquired and liabilities assumed at the date of acquisition:

<i>(In thousands):</i>	Amount
Accounts receivable, inventory and other assets	\$944
Identifiable intangible assets	5,634
Current liabilities	(216)
Net assets acquired	6,362
Goodwill	10,090
Total purchase price	<u>\$16,452</u>

As of December 31, 2013, the Company has completed its fair value determinations for all elements of the Jetalon acquisition. Intangible assets, consisting mostly of technology-related intellectual property, will be amortized on a straight-line basis over an estimated useful life of approximately 10 years.

#### **Entegris Precision Technologies Corporation (EPT)**

On April 2, 2012, the Company acquired the remaining 50% of its EPT joint venture in Taiwan, an equity method investee in which it had previously owned a 50% equity interest. The transaction was accounted for under the acquisition method of accounting and the results of operations of the entity are included in the Company's consolidated financial statements as of and since April 2, 2012. The investee's sales and operating results were not material to the Company's consolidated financial statements. The Company paid \$3.4 million in cash for the additional 50% equity interest in the entity.

The Company remeasured its previously held equity interest in the entity at its April 2, 2012 fair value of \$2.9 million. Based on the carrying value of the Company's equity interest in EPT before the business combination, the Company recognized a gain of \$1.3 million. In addition, in prior reporting periods the Company recognized changes in the value of its equity interest in EPT related to translation adjustments in other comprehensive income. As required under the acquisition method of accounting, the \$0.2 million recognized previously in other comprehensive income was reclassified and added in the calculation of the gain noted above.

The purchase price was allocated based on the fair values of all of the assets acquired and liabilities assumed. The sum of the purchase price of the additional 50% equity interest and the fair value of the equity interest in the investee held by the Company at the acquisition date exceeded the net of the acquisition-date amounts of the identifiable assets acquired and the liabilities assumed by \$2.2 million, resulting in goodwill, which is included in other non-current assets in the Company's consolidated balance sheets and is not deductible for income tax purposes. EPT is part of the Company's Contamination Control Solutions segment.

As described above, the Company acquired businesses in 2013 and 2012. As part of the accounting for these transactions, the Company allocated the purchase price of the acquired entities based on the fair value of all the assets acquired and liabilities assumed. The valuation of the assets acquired and liabilities assumed, as well as the Company's contingent consideration obligation in the case of Jetalon and the Company's previously held equity interest in the case of EPT, was based on the information that was available as of the acquisition date and the expectations and assumptions that have been deemed

reasonable by the Company's management. See note 14 to the consolidated financial statements for further information about these valuations.

#### Purchase of Noncontrolling interest.

On April 4, 2011, the Company exercised the second option and purchased the 30% noncontrolling interest in Pureline for \$1.5 million. Based on the carrying value of the Company's noncontrolling interest in Pureline as of the date of the transaction, the Company recorded increases to additional paid-in capital and accumulated other comprehensive income as reflected in the Company's consolidated statements of equity. The cash outflow is reflected as a financing activity in the Company's consolidated statements of cash flows.

### (3) SHORT-TERM INVESTMENTS

Available-for-sale investments as of December 31, 2012 were as follows:

<i>(In thousands)</i>	Cost basis	Gross unrealized gains	Gross unrealized losses	Fair value
Commercial paper	\$ 19,999	\$ —	\$ (4)	\$ 19,995
Total available-for-sale investments	\$ 19,999	\$ —	\$ (4)	\$ 19,995

Investments with continuous unrealized losses for less than 12 months and their related fair values as of December 31, 2012 were as follows:

<i>(In thousands)</i>	Less than 12 months	
	Fair value	Gross unrealized losses
Commercial paper	\$ 19,995	\$ (4)
Total	\$ 19,995	\$ (4)

Unrealized losses from corporate bonds are primarily attributable to general changes in interest rates and market conditions. Management does not believe the unrealized losses represent other-than-temporary impairments based on our evaluation of available evidence as of December 31, 2012.

The amortized cost and fair value of available-for-sale investments as of December 31, 2012, by contractual maturity, were as follows:

<i>(In thousands)</i>	Cost basis	Fair value
Due in 1 year or less	\$ 19,999	\$ 19,995
Total	\$ 19,999	\$ 19,995

### (4) TRADE ACCOUNTS AND NOTES RECEIVABLE

Trade accounts and notes receivable from customers at December 31, 2013 and 2012 consist of the following:

<i>(In thousands)</i>	2013	2012
Accounts receivable	\$ 94,613	\$ 86,717
Notes receivable	9,039	9,613
	103,652	96,330
Less allowance for doubtful accounts	1,779	2,314
	\$ 101,873	\$ 94,016

## (5) INVENTORIES

Inventories at December 31, 2013 and 2012 consist of the following:

<i>(In thousands)</i>	2013	2012
Raw materials	\$ 26,012	\$ 27,720
Work-in-process	10,512	10,242
Finished goods <sup>(a)</sup>	56,998	60,667
Supplies	552	515
	<u>\$ 94,074</u>	<u>\$ 99,144</u>

(a) Includes consignment inventories held by customers for \$5.1 million and \$5.2 million at December 31, 2013 and 2012, respectively.

## (6) PROPERTY, PLANT AND EQUIPMENT

Property, plant, and equipment at December 31, 2013 and 2012 consist of the following:

<i>(In thousands)</i>	2013	2012	Estimated useful lives in years
Land	\$ 12,866	\$ 11,065	
Buildings and improvements	109,105	85,239	5-35
Manufacturing equipment	168,197	151,559	5-10
Molds	76,909	79,959	3-5
Office furniture and equipment	70,158	65,950	3-8
Construction in progress	33,021	26,551	
	<u>470,256</u>	<u>420,323</u>	
Less accumulated depreciation	<u>283,816</u>	<u>263,302</u>	
	<u>\$ 186,440</u>	<u>\$ 157,021</u>	

The table below sets forth the depreciation expense for the years ended December 31, 2013, 2012, and 2011:

<i>(In thousands)</i>	2013	2012	2011
Depreciation expense	\$ 29,468	\$ 28,013	\$ 26,839

## (7) INVESTMENTS

At December 31, 2013 and 2012, the Company held an equity investment for \$2.4 million and \$2.4 million, respectively, represented by an interest in a privately held company. This investment is accounted for under the cost method.

During 2012, the Company acquired the remaining 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. The transaction was accounted for under the acquisition method of accounting and the results of operations of the entity are included in the Company's consolidated financial statements as of and since April 2, 2012. The investee's sales and operating results are not material to the Company's consolidated financial statements. The Company paid \$3.4 million in cash for the additional 50% equity interest in the entity. A detailed description of the transaction can be found in note 2 to the consolidated financial statements.

During 2011, the Company recorded a gain of \$1.5 million on the sale of an equity method investment that was classified within other income, net, in the consolidated statements of operations. A detailed description of the transaction can be found in note 14 under the heading "Items Measured at Fair Value on a Nonrecurring Basis".

## (8) INTANGIBLE ASSETS

Intangible assets at December 31, 2013 and 2012 consist of the following:

2013				
<i>(In thousands)</i>	Gross carrying Amount	Accumulated amortization	Net carrying value	Weighted average life in years
Patents	\$ 1,369	\$ 649	\$ 720	9.8
Developed technology	78,686	62,257	16,429	7.4
Trademarks and trade names	13,092	7,306	5,786	12.0
Customer relationships	57,617	39,146	18,471	11.0
Other	2,213	110	2,103	13.3
	<u>\$ 152,977</u>	<u>\$ 109,468</u>	<u>\$ 43,509</u>	9.3
2012				
<i>(In thousands)</i>	Gross carrying amount	Accumulated amortization	Net carrying value	Weighted average life in years
Patents	\$ 19,104	\$ 18,226	\$ 878	9.1
Developed technology	76,414	59,147	17,267	7.5
Trademarks and trade names	12,677	6,633	6,044	12.1
Customer relationships	56,700	33,761	22,939	11.1
Other	1,510	1,431	79	9.4
	<u>\$ 166,405</u>	<u>\$ 119,198</u>	<u>\$ 47,207</u>	9.3

The table below sets forth the amortization expense for the years ended December 31, 2013, 2012, and 2011:

<i>(In thousands)</i>	2013	2012	2011
Amortization expense	\$ 9,347	\$ 9,594	\$ 10,225

The amortization expense for each of the five succeeding years and thereafter relating to intangible assets currently recorded in the Company's consolidated balance sheets is estimated to be the following at December 31, 2013:

Fiscal year ending December 31	<i>(In thousands)</i>
2014	\$ 8,441
2015	6,394
2016	6,394
2017	6,394
2018	5,547
Thereafter	10,339
	<u>\$ 43,509</u>

## (9) FINANCING ARRANGEMENTS

On June 9, 2011, the Company entered into a Credit Agreement (Agreement) with Wells Fargo Bank, National Association, as administrative agent, and certain other banks parties thereto.

The Agreement provides for a \$30.0 million revolving credit facility maturing June 9, 2014. The financial covenants in the Agreement require that the Company maintain a cash flow leverage ratio of at least 3.0 to 1.0, measured by comparing quarterly total funded debt to EBITDA. In addition, the Company and its subsidiaries must maintain minimum cash and cash equivalents and certain other approved investments of at least \$25.0 million, with \$10.0 million held by the Borrowers with the Agent or its affiliates in bank accounts in the United States. Cash and cash equivalents and investments held by foreign subsidiaries are valued at 65% of the applicable currency value for purposes of these calculations. In addition to the financial metric covenants required under the revolving credit facility, under the terms of the Agreement, as amended in August 2012, the Company is restricted from making annual capital expenditures during any fiscal year in excess of \$85.0 million. At both December 31, 2013 and 2012, the Company had no outstanding borrowings and was in compliance with all applicable debt covenants included in the terms of the Agreement. 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.

Under the terms of the Agreement, the Company may elect that the loans comprising each borrowing bear interest at a rate per annum equal to either (a) the sum of 2.50%, plus the one month LIBOR rate then in effect, for base rate loans ("Base Rate Loans"); or (b) the sum of 2.50% plus, (i) the one-month LIBOR rate then in effect, (ii) the two-month LIBOR rate then in effect or (iii) the three-month LIBOR rate then in effect, for LIBOR loans ("LIBOR Loans"). The interest rate on Base Rate Loans will remain the same while such loan is outstanding, while the interest rate for LIBOR Loans will only be effective for the interest period which corresponds to the effective LIBOR rate. LIBOR Loans will convert to Base Rate Loans at the end of an applicable interest period unless the Company requests a new LIBOR Loan. Base Rate Loans may be converted to LIBOR Loans at the Company's option with three days notice to the Agent. In addition, the Company pays a commitment fee of 0.375% on the unborrowed commitments under the Agreement.

The Company has entered into unsecured line of credit agreements, which expire at various dates, with two international commercial banks, which provide for borrowings of Japanese yen for its foreign subsidiaries, equivalent to \$11.4 million as of December 31, 2013. Interest rates for these facilities are based on a factor of the banks' reference rates. Borrowings outstanding under international line of credit agreements were none at both December 31, 2013 and 2012.

## (10) LEASE COMMITMENTS

As of December 31, 2013, the Company was obligated under noncancellable operating lease agreements for certain sales offices and manufacturing facilities, manufacturing equipment, vehicles, information technology equipment and warehouse space. Future minimum lease payments for noncancellable operating leases with initial or remaining terms in excess of one year are as follows:

Fiscal year ending December 31	(In thousands)	
2014	\$	7,014
2015		6,264
2016		4,051
2017		3,430
2018		3,211
Thereafter		669
Total minimum lease payments	\$	24,639

Total rental expense for all equipment and building operating leases for the years ended December 31, 2013, 2012, and 2011, were \$9.5 million, \$9.4 million, and \$9.4 million, respectively.

## (11) INCOME TAXES

Income before income taxes for the years ended December 31, 2013, 2012 and 2011 was derived from the following sources:

(In thousands)	2013	2012	2011
Domestic	\$ 29,066	\$ 49,056	\$ 68,839
Foreign	67,129	50,647	59,125
Income before income taxes	\$ 96,195	\$ 99,703	\$ 127,964

Income tax (benefit) expense for the years ended December 31, 2013, 2012, and 2011 is summarized as follows:

(In thousands)	2013	2012	2011
Current:			
Federal	\$ 854	\$ 5,797	\$ 2,382
State	772	654	1,335
Foreign	12,937	11,183	17,784
	14,563	17,634	21,501
Deferred (net of valuation allowance):			
Federal	6,003	11,165	(19,853)
State	(650)	168	(647)
Foreign	1,753	1,914	3,216
	7,106	13,247	(17,284)
Income tax expense	\$ 21,669	\$ 30,881	\$ 4,217

Income tax expense differs from the expected amounts based upon the statutory federal tax rates for the years ended December 31, 2013, 2012, and 2011 as follows:

(In thousands)	2013	2012	2011
Expected federal income tax at statutory rate	\$ 33,668	\$ 34,896	\$ 44,788
State income taxes before valuation allowance, net of federal tax effect	(357)	440	1,013
Income (losses) without tax expense (benefit)	22	(40)	(1,357)
Effect of foreign source income	(10,583)	(5,314)	1,959
Valuation allowance	445	358	(41,038)
U.S. federal research credit	(3,233)	(790)	(1,412)
Other items, net	1,707	1,331	264
Income tax expense	\$ 21,669	\$ 30,881	\$ 4,217

As a result of commitments made by the Company related to investments in tangible property and equipment, the establishment of a research and development center in 2006 and certain employment commitments, income from certain manufacturing



activities in Malaysia is exempt from tax for years up through 2015. The income tax benefits attributable to the tax status of this subsidiary are estimated to be \$5.4 million (\$0.04 cents per diluted share), \$2.4 million (\$0.02 cents per diluted share), and \$0 million for the years ended December 31, 2013, 2012, and 2011, respectively.

The significant components of the Company's deferred tax assets and deferred tax liabilities at December 31, 2013 and 2012 are as follows:

<i>(In thousands)</i>	2013	2012
Deferred tax assets attributable to:		
Accounts receivable	\$ 269	\$ 389
Inventory	2,853	2,643
Accruals not currently deductible for tax purposes	8,844	10,054
Net operating loss and credit carryforwards	3,972	2,669
Capital loss carryforward	2,779	3,105
Depreciation	1,070	2,870
Equity compensation	3,157	3,155
Asset impairments	732	1,021
Purchased intangible assets	1,439	1,396
Other, net	2,976	3,604
Gross deferred tax assets	28,091	30,906
Valuation allowance	(5,435)	(4,990)
Total deferred tax assets	22,656	25,916
Deferred tax liabilities attributable to:		
Depreciation	(3,245)	(1,252)
Purchased intangible assets	(601)	(692)
Total deferred tax liabilities	(3,846)	(1,944)
Net deferred tax assets	\$ 18,810	\$ 23,972

Deferred tax assets are generally required to be reduced by a valuation allowance if, based on the weight of available positive and negative evidence, it is more likely than not that some portion or all of the deferred tax assets will not be realized.

As of December 31, 2013 and 2012, the Company had a net U.S. deferred tax asset position of \$16.0 million and \$18.7 million, respectively, which are composed of temporary differences and various tax credit carryforwards. Management believes that it is more likely than not that the benefit from certain state net operating loss carryforwards, state credits, and a federal capital loss carryforward will not be realized. In recognition of this risk, management has provided a valuation allowance of \$5.4 million and \$4.4 million as of December 31, 2013 and 2012, respectively, on the related deferred tax assets. If the assumptions change and management determines the assets will be realized, the tax benefits relating to any reversal of the valuation allowance on deferred tax assets at December 31, 2013 will be recognized as a reduction of income tax expense. Management estimates taxable income of \$21.5 million will be necessary to utilize the remaining U.S. deferred tax assets as of December 31, 2013.

As of December 31, 2013 and 2012, the Company had a net non-U.S. deferred tax asset position of \$8.2 million and \$10.2 million, respectively, for which management determined based upon the available evidence a valuation allowance of \$0.0 million and \$0.6 million as of December 31, 2013 and 2012, respectively, were required against the non-U.S. deferred tax assets. For other non-U.S. jurisdictions, management is relying upon projections of future taxable income to utilize deferred tax assets. Estimated taxable income of \$26.9 million will be necessary to utilize the non-U.S. deferred tax assets, of which an estimated \$18.2 million is related to Nihon Entegris KK, the Company's Japanese subsidiary.

At December 31, 2013, there were approximately \$257.0 million of accumulated undistributed earnings of subsidiaries outside the United States, all of which are considered to be reinvested indefinitely. Management has considered its future cash needs and affirms its intention to indefinitely invest such earnings overseas to be utilized for working capital purposes, expansion of existing operations, possible acquisitions and other international items. No U.S. tax has been provided on such earnings. If they were remitted to the Company, applicable U.S. federal and foreign withholding taxes may be partially offset by available foreign tax credits. Management has concluded that it is impracticable to compute the full actual tax impact, but it estimates that \$6.3 million of withholding taxes would be incurred if the \$257.0 million were distributed.

At December 31, 2013, the Company had state operating loss carryforwards of approximately \$2.0 million, which begin to expire in 2014; foreign tax credit carryforwards of approximately \$3.2 million, which begin to expire in 2019; and foreign operating loss carryforwards of \$1.2 million, which begin to expire in 2015.

Benefits from tax positions should be recognized in the financial statements only when it is more likely than not that the tax positions will be sustained upon examination by the appropriate taxing authority that would have full knowledge of all relevant information. A tax position that meets the more-likely-than-not recognition threshold is measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. Tax positions that fail to meet the more-likely-than-not recognition threshold should be recognized in the first subsequent financial reporting period in which that threshold is met. Previously recognized tax positions that no longer meet the more-likely-than-not recognition threshold should be derecognized in the first subsequent financial reporting period in which that threshold is no longer met. The provisions also provide guidance on the accounting for and disclosure of unrecognized tax benefits, interest and penalties.

Reconciliations of the beginning and ending balances of the total amounts of gross unrecognized tax benefits for the years ended December 31, 2013 and 2012 are as follows:

<i>(In thousands)</i>	2013	2012
Gross unrecognized tax benefits at beginning of year	\$ 5,419	\$ 2,467
Increases in tax positions for prior years	28	—
Decreases in tax positions for prior years	—	(19)
Increases in tax positions for current year	1,879	4,608
Settlements	(2,298)	(1,044)
Lapse in statute of limitations	(751)	(593)
Gross unrecognized tax benefits at end of year	\$ 4,277	\$ 5,419

The total amount of net unrecognized tax benefits that, if recognized, would affect the effective tax rate was \$1.9 million at December 31, 2013.

Penalties and interest paid or received are recorded in other income, net, in the consolidated statements of operations. For the years ended December 31, 2013 and 2012, the Company has accrued interest and penalties related to unrecognized tax benefits of \$0.8 million and \$1.0 million, respectively. Credits of \$0.1 million, \$0.0 million and \$0.0 million were recognized as interest and penalties in the consolidated statements of operations for the years ended December 31, 2013, 2012 and 2011, respectively.

The Company files income tax returns in the U.S. and in various state, local and foreign jurisdictions. The statutes of limitations related to the consolidated Federal income tax return and state returns are closed for all years up to and including 2009 and 12/31/2009, respectively. With respect to foreign jurisdictions, the statute of limitations varies from country to country, with the earliest open year for the Company's major foreign subsidiaries being 2007.

Due to the potential for resolution of a foreign examination and the expiration of various statutes of limitations, it is reasonably possible that the Company's gross unrecognized tax benefit balance may decrease within the next twelve months by approximately \$1.4 million.

## (12) EQUITY

### Share Repurchase Program

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 expired on February 7, 2014. The Company's 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.

### 2010 Stock Plan

At December 31, 2009, the Company had outstanding stock awards under five stock incentive plans: the Entegris, Inc. 1999 Long-Term Incentive and Stock Option Plan; the Entegris, Inc. Outside Directors' Option Plan and three former Mykrolis stock option plans assumed by the Company on August 10, 2005; the 2001 Equity Incentive Plan; the 2003 Employment Inducement and Acquisition Stock Option Plan; and the 2001 Non-Employee Director Stock Option Plan. On December 17, 2009, the

Company's Board of Directors approved the 2010 Stock Plan, subject to the approval of the Company's stockholders. On May 5, 2010, the stockholders approved the 2010 Stock Plan. The 2010 Stock Plan replaced the above existing plans for future stock awards and stock option grants. Subsequent to the replacement of the prior plans on May 5, 2010, no awards were or will be made under the prior plans.

The 2010 Stock Plan provides for the issuance of stock options and other share-based awards to selected employees, directors, and other individuals or entities that provide services to the Company or its affiliates. The 2010 Stock Plan has a term of ten years. Under the 2010 Stock Plan, the Board of Directors or a committee selected by the Board of Directors will determine for each award, the term, price, number of shares, rate at which each award is exercisable and whether restrictions are imposed on the shares subject to the awards. The exercise price for option awards generally may not be less than the fair market value per share of the underlying common stock on the date granted. The 2010 Stock Plan allows that after December 31, 2009 any stock awards that were awarded from the expired plans mentioned above that are forfeited, expired or otherwise terminated without issuance of such stock award again be available for issuance under the 2010 Stock Plan.

### General Option Information

Option activity for the 2010 Stock Plan and predecessor plans for the years ended December 31, 2013, 2012 and 2011 is summarized as follows:

	2013		2012		2011	
	Number of shares	Weighted average exercise price	Number of shares	Weighted average exercise price	Number of shares	Weighted average exercise price
<i>(Shares in thousands)</i>						
Options outstanding, beginning of year	2,565	\$ 8.20	3,561	\$ 6.53	5,001	\$ 6.25
Granted	553	9.88	470	9.27	511	8.75
Exercised	(786)	7.54	(1,293)	3.76	(1,698)	5.95
Expired or Forfeited	(371)	12.10	(173)	9.83	(253)	9.41
Options outstanding, end of year	1,961	\$ 8.20	2,565	\$ 8.20	3,561	\$ 6.53
Options exercisable, end of year	1,001	\$ 6.92	1,828	\$ 8.18	2,078	\$ 7.53

Options outstanding for the Company's stock plans at December 31, 2013 are summarized as follows:

	Options outstanding			Options exercisable	
	Number outstanding	Weighted average remaining life in years	Weighted-average exercise price	Number exercisable	Weighted average exercise price
<i>(Shares in thousands)</i>					
Range of exercise prices					
\$1.13 to \$8.37	684	1.9 years	\$ 5.67	684	\$ 5.67
\$8.47 to \$9.27	642	4.6 years	9.00	235	8.90
\$9.40 to \$14.50	635	5.4 years	10.11	82	11.65
	1,961	3.9 years	8.20	1,001	6.92

The weighted average remaining contractual term for options outstanding and exercisable for all plans at December 31, 2013 was 3.9 years and 2.4 years, respectively.

For all plans, the Company had shares available for future grants of 6.8 million shares, 7.7 million shares, and 8.6 million shares at December 31, 2013, 2012 and 2011, respectively.

For all plans, the total pre-tax intrinsic value of stock options exercised during the years ended December 31, 2013 and 2012 was \$1.8 million and \$6.7 million, respectively. The aggregate intrinsic value, which represents the total pre-tax intrinsic value based on the Company's closing stock price of \$11.59 at December 31, 2013, which theoretically could have been received by the option holders had all option holders exercised their options as of that date, was \$6.7 million and \$4.8 million for options outstanding and options exercisable, respectively.

### Employee Stock Purchase Plan

The Company maintains the Entegris, Inc. Employee Stock Purchase Plan (ESPP). A total of 4.0 million common shares are reserved for issuance under the ESPP. The ESPP allows employees to elect, at six-month intervals, to contribute up to 10% of

their compensation, subject to certain limitations, to purchase shares of common stock at a discount of 15% from the fair market value on the first day or last day of each six-month period. The Company treats the ESPP as a compensatory plan. As of December 31, 2013, 3.5 million shares had been issued under the ESPP. At December 31, 2013, 0.5 million shares remained available for issuance under the ESPP. Employees purchased 0.2 million shares, 0.3 million shares, and 0.4 million shares, at a weighted-average price of \$8.00, \$7.34, and \$4.35 during the years ended December 31, 2013, 2012 and 2011, respectively.

The table below sets forth the amount of cash received by the Company from the exercise of stock options and employee contributions to the ESPP during the years ended December 31, 2013, 2012 and 2011:

<i>(In thousands)</i>	2013	2012	2011
Exercise of stock options and employee contributions to the ESPP	\$ 7,685	\$ 7,431	\$ 11,690

### Restricted Stock Awards

Restricted stock awards are awards of common stock made under the 2010 Stock Plan that are subject to restrictions on transfer and to a risk of forfeiture if the awardee terminates employment with the Company prior to the lapse of the restrictions. The value of such stock is determined using the market price on the grant date. Compensation expense for restricted stock awards is generally recognized using the straight-line single-option method. A summary of the Company's restricted stock activity for the years ended December 31, 2013, 2012 and 2011 is presented in the following table:

	2013		2012		2011	
<i>(Shares in thousands)</i>	Number of shares	Weighted average grant date fair value	Number of shares	Weighted average grant date fair value	Number of shares	Weighted average grant date fair value
Unvested, beginning of year	1,802	\$ 7.02	2,298	\$ 5.49	2,738	\$ 4.43
Granted	717	9.85	744	9.21	795	8.65
Vested	(871)	5.67	(1,132)	5.42	(1,087)	5.22
Forfeited	(78)	8.66	(108)	6.22	(148)	4.89
Unvested, end of year	1,570	\$ 8.98	1,802	\$ 7.02	2,298	\$ 5.49

The weighted average remaining contractual term for unvested restricted shares at December 31, 2013 and 2012 was 2.0 years and 1.8 years, respectively.

As of December 31, 2013, the total compensation cost related to unvested stock options and restricted stock awards not yet recognized was \$3.1 million and \$9.8 million, respectively, and is expected to be recognized over the next 2.4 years on a weighted-average basis.

### Valuation and Expense Information

The Company recognizes compensation expense for all share-based payment awards made to employees and directors based on their estimated fair values on the date of grant. Share-based compensation expense is based on the value of the portion of share-based payment awards that is ultimately expected to vest during the period. The following table summarizes the allocation of share-based compensation expense related to employee stock options, restricted stock awards and grants under the employee stock purchase plan accounted for under ASC 718 for the years ended December 31, 2013, 2012 and 2011:

<i>(In thousands)</i>	2013	2012	2011
Cost of sales	\$ 690	\$ 575	\$ 650
Engineering, research and development expenses	502	500	566
Selling, general and administrative expenses	6,736	8,806	6,303
Share-based compensation expense	7,928	9,881	7,519
Tax benefit	2,643	3,686	2,805
Share-based compensation expense, net of tax	\$ 5,285	\$ 6,195	\$ 4,714

### Stock Options

Share-based payment awards in the form of stock option awards for 0.6 million, 0.5 million and 0.5 million options were granted to employees during the years ended December 31, 2013, 2012, and 2011. Compensation expense is based on the grant

date fair value. The awards vest annually over a three-year or four-year period and have a contractual term of seven years. The Company estimates the fair value of stock options using the Black-Scholes valuation model. Key inputs and assumptions used to estimate the fair value of stock options include the grant price of the award, the expected option term, volatility of the Company's stock, the risk-free rate and the Company's dividend yield. Estimates of fair value are not intended to predict actual future events or the value ultimately realized by employees who receive equity awards, and subsequent events are not indicative of reasonableness of the original estimates of fair value made by the Company.

The fair value of each stock option grant was estimated at the date of grant using a Black-Scholes option pricing model. The following table presents the weighted-average assumptions used in the valuation and the resulting weighted-average fair value per option granted for the years ended December 31, 2013, 2012 and 2011:

<i>Employee stock options:</i>	2013	2012	2011
Volatility	51.7%	82.4%	79.3%
Risk-free interest rate	0.7%	0.6%	1.8%
Dividend yield	—%	—%	—%
Expected life (years)	3.6	3.8	4.0
Weighted average fair value per option	\$ 3.80	\$ 5.42	\$ 5.14

A historical daily measurement of volatility is determined based on the expected life of the option granted. The risk-free interest rate is determined by reference to the yield on an outstanding U.S. Treasury note with a term equal to the expected life of the option granted. Expected life is determined by reference to the Company's historical experience. The Company determines the dividend yield by dividing the expected annual dividend on the Company's stock by the option exercise price.

**Shareholder Rights Plan** On July 27, 2005, the Company's 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 the Company's common stock until certain triggering events specified in the Rights Agreement occur, including, unless approved by the Company's Board of Directors, an acquisition by a person or group of specified levels of beneficial ownership of Entegris common stock or a tender offer for Entegris 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 the Company's common stock having a value equal to twice the exercise price. The Rights are redeemable by the Company for \$0.01 and will expire on August 8, 2015. One of the events which will 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 its subsidiaries or employee benefit plans, of 15% or more of the outstanding shares of the Company's common stock. An Acquiring Person may not exercise a Right.

### (13) BENEFIT PLANS

**401(k) Plan** The Company maintains the Entegris, Inc. 401(k) Savings and Profit Sharing Plan (the 401(k) Plan) that qualifies as a deferred salary arrangement under Section 401(k) of the Internal Revenue Code. Under the Plan, eligible employees may defer a portion of their pre-tax wages, up to the Internal Revenue Service annual contribution limit. Entegris matches employees' contributions to a maximum match of 4% of the employee's eligible wages. The employer matching contribution expense under the Plan was \$3.2 million, \$3.0 million and \$3.2 million in the fiscal years ended December 31, 2013, 2012 and 2011, respectively.

**Defined Benefit Plans** The employees of the Company's subsidiaries in Japan, Taiwan and Germany are covered in defined benefit pension plans. The Company uses a December 31 measurement date for its pension plans.

The tables below set forth the Company's estimated funded status as of December 31, 2013 and 2012:

<i>(In thousands)</i>	2013	2012
Change in benefit obligation:		
Benefit obligation at beginning of year	\$ 12,607	\$ 16,364
Service cost	98	89
Interest cost	122	163
Actuarial gain	(158)	367
Benefits paid	(1,072)	(3,329)
Foreign exchange impact	(1,742)	(1,047)
Benefit obligation at end of year	9,855	12,607
Change in plan assets:		
Fair value of plan assets at beginning of year	382	357
Return on plan assets	5	4
Employer contributions	9	8
Foreign exchange impact	(12)	13
Fair value of plan assets at end of year	384	382
Funded status:		
Plan assets less than benefit obligation - Net amount recognized	\$ (9,471)	\$ (12,225)

Amounts recognized in the consolidated balance sheets consist of:

<i>(In thousands)</i>	2013	2012
Noncurrent liability	\$ (9,471)	\$ (12,225)
Accumulated other comprehensive loss, net of taxes	857	1,059

Amounts recognized in accumulated other comprehensive loss, net of tax consist of:

<i>(In thousands)</i>	2013	2012
Net actuarial loss	\$ 811	\$ 1,028
Prior service cost	259	287
Unrecognized transition obligation	(11)	(12)
Gross amount recognized	1,059	1,303
Deferred income taxes	(202)	(244)
Net amount recognized	\$ 857	\$ 1,059

Information for pension plans with an accumulated benefit obligation in excess of plan assets:

<i>(In thousands)</i>	2013	2012
Projected benefit obligation	\$ 9,855	\$ 12,607
Accumulated benefit obligation	8,651	11,293
Fair value of plan assets	384	382

The components of the net periodic benefit cost for the years ended December 31, 2013, 2012 and 2011 are as follows:

<i>(In thousands)</i>	2013	2012	2011
<b>Pension benefits:</b>			
Service cost	\$ 98	\$ 89	\$ 1,268
Interest cost	122	163	290
Expected return on plan assets	(7)	(7)	(65)
Amortization of prior service cost	19	19	126
Amortization of net transition obligation	(1)	(1)	(1)
Amortization of plan loss	219	20	49
Recognized actuarial net loss	8	1	1
Acquisition	—	—	16
Curtailments	—	—	(726)
<b>Net periodic pension benefit cost</b>	<b>\$ 458</b>	<b>\$ 284</b>	<b>\$ 958</b>

The estimated amount that will be amortized from accumulated other comprehensive income into net periodic benefit cost in 2014 is as follows:

<i>(In thousands)</i>	
Transition obligation	\$ (1)
Prior service cost	19
Net actuarial loss	29
	<b>\$ 47</b>

Assumptions used in determining the benefit obligation and net periodic benefit cost for the Company's pension plans for the years ended December 31, 2013, 2012 and 2011 are presented in the following table as weighted-averages:

	2013	2012	2011
<b>Benefit obligations:</b>			
Discount rate	1.23%	1.19%	1.40%
Rate of compensation increase	4.10%	4.18%	4.22%
<b>Net periodic benefit cost:</b>			
Discount rate	1.41%	1.80%	1.38%
Rate of compensation increase	2.01%	2.84%	5.14%
Expected return on plan assets	0.70%	1.14%	1.52%

The plans' expected return on assets as shown above is based on management's expectations of long-term average rates of return to be achieved by the underlying investment portfolios. In establishing this assumption, management considers historical and expected returns for the asset classes in which the plans are invested, as well as current economic and capital market conditions. The discount rate primarily used by the Company is based on market yields at the valuation date on government bonds as well as the estimated maturity of benefit payments.

## Plan Assets

At December 31, 2013 and 2012, the Company's pension plan assets are deposited in Bank of Taiwan in the form of money market funds, where Bank of Taiwan is the assigned funding vehicle for the statutory retirement benefit.

The fair value measurements of the Company's pension plan assets at December 31, 2013, by asset category are as follows:

<i>(In thousands)</i>		Quoted prices in active markets for identical assets	Significant observable inputs	Significant unobservable inputs
Asset category	Total	(Level 1)	(Level 2)	(Level 3)
Taiwan plan assets (a)	\$ 384	\$ 384	—	—
	\$ 384	\$ 384	—	—



- (a) This category includes investments in the government of Taiwan's pension fund. The government of Taiwan is responsible for the strategy and allocation of the investment contributions.

The fair value measurements of the Company's pension plan assets at December 31, 2012, by asset category are as follows:

<i>(In thousands)</i>				
Asset category	Total	Quoted prices in active markets for identical assets (Level 1)	Significant observable inputs (Level 2)	Significant unobservable inputs (Level 3)
Taiwan plan assets (a)	\$ 382	\$ 382	—	—
	\$ 382	\$ 382	—	—

- (a) This category includes investments in the government of Taiwan's pension fund. The government of Taiwan is responsible for the strategy and allocation of the investment contributions.

#### Cash Flows

The Company expects to make the following contributions and benefit payments:

<i>(In thousands)</i>		
	Contributions	Payments
2014	\$ 9	\$ 242
2015	—	123
2016	—	195
2017	—	265
2018	—	293
Years 2019-2023	—	2,340

#### (14) FAIR VALUE MEASUREMENTS

Generally accepted accounting principles establish a fair value hierarchy that prioritizes the inputs used to measure fair value. The three levels of the fair value hierarchy are as follows:

Level 1—Quoted prices in active markets accessible at the reporting date for identical assets and liabilities.

Level 2—Quoted prices for similar assets or liabilities in active markets. Quoted prices for identical or similar assets and liabilities in markets that are not considered active or financial instruments for which all significant inputs are observable, either directly or indirectly.

Level 3—Prices or valuations that require inputs that are significant to the valuation and are unobservable.

A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

#### Financial Assets Measured at Fair Value on a Recurring Basis

The following table presents the Company's financial assets and liabilities that are measured at fair value on a recurring basis at December 31, 2013 and 2012.

(In thousands)	December 31, 2013				December 31, 2012			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
<b>Assets:</b>								
<b>Cash equivalents</b>								
Commercial paper	\$ —	\$ 49,988	\$ —	\$ 49,988	\$ —	\$ 59,980	\$ —	\$ 59,980
Money market fund deposits	118,090	—	—	118,090	73,026	—	—	73,026
<b>Short-term investments</b>								
Commercial paper	—	—	—	—	—	19,995	—	19,995
<b>Total assets measured and recorded at fair value</b>	<b>\$ 118,090</b>	<b>\$ 49,988</b>	<b>\$ —</b>	<b>\$ 168,078</b>	<b>\$ 73,026</b>	<b>\$ 79,975</b>	<b>\$ —</b>	<b>\$ 153,001</b>
<b>Liabilities:</b>								
Foreign exchange forward contracts	\$ —	\$ 514	\$ —	\$ 514	\$ —	\$ 4,603	\$ —	\$ 4,603
Contingent consideration	\$ —	\$ —	\$ 1,282	\$ 1,282	\$ —	\$ —	\$ —	\$ —
<b>Total liabilities measured and recorded at fair value</b>	<b>\$ —</b>	<b>\$ 514</b>	<b>\$ 1,282</b>	<b>\$ 1,796</b>	<b>\$ —</b>	<b>\$ 4,603</b>	<b>\$ —</b>	<b>\$ 4,603</b>

The following table provides information about derivative positions held by the Company as of December 31, 2013 and 2012:

(In thousands)	December 31, 2013			December 31, 2012		
	Gross amounts of recognized liabilities	Gross amounts offset in the consolidated balance sheet	Net amount of liabilities in the consolidated balance sheet	Gross amounts of recognized liabilities	Gross amounts offset in the consolidated balance sheet	Net amount of liabilities in the consolidated balance sheet
Foreign exchange forward contracts	\$620	\$106	\$514	\$4,730	\$127	\$4,603

Gains and losses associated with derivatives are recorded in other income, net, in the consolidated statements of operations. Losses associated with derivative instruments not designated as hedging instruments for the years ended December 31, 2013 and 2012 were as follows:

(In thousands)	2013	2012
Losses on foreign currency forward contracts	\$5,726	\$5,759

#### Items Measured at Fair Value on a Nonrecurring Basis

As described in note 2 to the consolidated financial statements, the Company acquired businesses in 2013 and 2012. As part of the accounting for these transactions, the Company allocated the purchase price of the acquired entities based on the fair value of all the assets acquired and liabilities assumed. The valuation of the assets acquired and liabilities assumed, as well as the Company's contingent consideration obligation in the case of Jetalon and the Company's previously held equity interest in the case of EPT, was based on the information that was available as of the acquisition date and the expectations and assumptions that have been deemed reasonable by the Company's management.

In performing these valuations, the Company used independent appraisals, discounted cash flows and other factors as the best evidence of fair value. The key underlying assumptions of the discounted cash flows were projected revenues, gross margin expectations and operating cost estimates. There are inherent uncertainties and management judgment required in these determinations. No assurance can be given that the underlying assumptions will occur as projected. The fair value measurements of the assets acquired and liabilities assumed were based on valuations involving significant unobservable inputs, or Level 3 in the fair value hierarchy.

In the second quarter of 2011, the Company recorded a gain of \$1.5 million on the sale of an equity investment that was classified within other income, net, in the consolidated statements of operations. The gain comprised two components—a \$0.2 million loss related to the disposition of the equity interest and a \$1.7 million gain related to the cumulative translation reclassification adjustment associated with the equity method investee. The carrying value of the investment at the time of the sale was \$4.1 million. The Company received assets recorded at fair value of \$3.9 million (\$1.8 million of cash, \$0.4 million of equipment, and \$1.7 million of intangible assets) resulting in the aforementioned loss. The fair value measurement of the intangible assets received was based on valuations involving significant unobservable inputs, generally utilizing the market approach, or Level 3 in the fair value hierarchy.

## (15) EARNINGS PER SHARE (EPS)

Basic EPS is computed by dividing net income attributable to Entegris, Inc. by the weighted average number of shares of common stock outstanding during each period. The following table presents a reconciliation of the share amounts used in the computation of basic and diluted earnings per share:

<i>(In thousands)</i>	2013	2012	2011
Basic earnings per share—Weighted common shares outstanding	138,950	137,306	134,685
Weighted common shares assumed upon exercise of options and vesting of restricted stock units	668	1,106	1,538
Diluted earnings per share—Weighted common shares outstanding	139,618	138,412	136,223

The Company excluded the following shares underlying stock-based awards from the calculations of diluted EPS because their inclusion would have been anti-dilutive for the years ended December 31, 2013, 2012 and 2011:

<i>(In thousands)</i>	2013	2012	2011
Shares excluded from calculations of diluted EPS	1,248	1,431	1,471

## (16) SEGMENT INFORMATION

The Company's financial reporting segments are: Contamination Control Solutions (CCS), Microenvironments (ME), and Specialty Materials (SMD).

- *CCS*: provides a wide range of products and subsystems that purify, monitor and deliver critical liquids and gases used in the semiconductor manufacturing process.
- *ME*: provides products that protect wafers, reticles and electronic components at various stages of transport, processing and storage.
- *SMD*: provides specialized graphite components used in semiconductor equipment and offers low-temperature, plasma-enhanced chemical vapor deposition coatings of critical components of semiconductor manufacturing equipment used in various stages of the manufacturing process.

Intersegment sales are not significant. Corporate assets consist primarily of cash and cash equivalents, short-term investments, assets held for sale, investments, deferred tax assets and deferred tax charges.

Segment profit is defined as net sales less direct segment operating expenses, excluding certain unallocated expenses, consisting mainly of general and administrative costs for the Company's human resources, finance and information technology functions, as well as amortization of intangible assets and contingent consideration fair value adjustment before interest expense, income taxes and equity in earnings of affiliates.

Summarized financial information for the Company's reportable segments is shown in the following table:

<i>(In thousands)</i>	2013	2012	2011
Net sales:			
CCS	\$ 447,410	\$ 461,838	\$ 483,958
ME	178,201	182,375	182,150
SMD	67,848	71,690	83,151
Total net sales	<u>\$ 693,459</u>	<u>\$ 715,903</u>	<u>\$ 749,259</u>
<i>(In thousands)</i>	2013	2012	2011
Segment profit:			
CCS	\$ 106,120	\$ 116,356	\$ 140,313
ME	35,737	37,223	29,959
SMD	7,087	12,230	18,255
Total segment profit	<u>\$ 148,944</u>	<u>\$ 165,809</u>	<u>\$ 188,527</u>
<i>(In thousands)</i>	2013	2012	2011
Total assets:			
CCS	\$ 276,386	\$ 234,766	\$ 213,477
ME	86,810	86,755	89,642
SMD	89,343	90,797	94,191
Corporate	422,755	399,226	327,353
Total assets	<u>\$ 875,294</u>	<u>\$ 811,544</u>	<u>\$ 724,663</u>
<i>(In thousands)</i>	2013	2012	2011
Depreciation and amortization:			
CCS	\$ 17,010	\$ 15,725	\$ 15,682
ME	9,302	8,765	7,859
SMD	10,322	10,626	10,694
Corporate	2,181	2,491	2,829
Total depreciation and amortization	<u>\$ 38,815</u>	<u>\$ 37,607</u>	<u>\$ 37,064</u>
<i>(In thousands)</i>	2013	2012	2011
Capital expenditures:			
CCS	\$ 43,635	\$ 29,650	\$ 16,170
ME	7,633	12,632	8,618
SMD	5,467	3,980	3,039
Corporate	3,625	3,667	2,440
Total capital expenditures	<u>\$ 60,360</u>	<u>\$ 49,929</u>	<u>\$ 30,267</u>
The following table reconciles total segment profit to operating income:			
<i>(In thousands)</i>	2013	2012	2011
Total segment profit	\$ 148,944	\$ 165,809	\$ 188,527
Less:			
Amortization of intangibles	9,347	9,594	10,225
Contingent consideration fair value adjustment	(1,813)	—	—
Unallocated general and administrative expenses	47,173	56,771	51,424
Operating income	94,237	99,444	126,878
Other income, net	(1,958)	(259)	(1,086)
Income before income taxes and equity in net income of affiliates	<u>\$ 96,195</u>	<u>\$ 99,703</u>	<u>\$ 127,964</u>

The following table presents amortization of intangibles for each of the Company's segments for the years ended December 31, 2013, 2012 and 2011:

<i>(In thousands)</i>	2013	2012	2011
Amortization of intangibles:			
CCS	\$ 4,099	\$ 4,230	\$ 4,588
ME	36	139	406
SMD	5,212	5,225	5,231
	<u>\$ 9,347</u>	<u>\$ 9,594</u>	<u>\$ 10,225</u>

The following table summarizes total net sales, based upon the country to which sales to external customers were made for the years ended December 31, 2013, 2012 and 2011:

<i>(In thousands)</i>	2013	2012	2011
Net sales:			
United States	\$ 201,380	\$ 218,903	\$ 213,671
Japan	101,529	131,521	140,657
Germany	23,240	24,437	33,020
Taiwan	128,194	126,732	116,007
Singapore	30,942	25,607	28,337
South Korea	76,353	70,763	76,888
China	36,299	31,499	40,080
Other	95,522	86,441	100,599
	<u>\$ 693,459</u>	<u>\$ 715,903</u>	<u>\$ 749,259</u>

The following table summarizes property, plant and equipment, net, attributed to significant countries for the years ended December 31, 2013, 2012 and 2011:

<i>(In thousands)</i>	2013	2012	2011
Property, plant and equipment:			
United States	\$ 123,846	\$ 86,476	\$ 59,444
Japan	24,007	27,024	29,295
Malaysia	23,801	28,398	30,328
Other	14,786	15,123	11,487
	<u>\$ 186,440</u>	<u>\$ 157,021</u>	<u>\$ 130,554</u>

In the years ended December 31, 2013, 2012, and 2011, no single customer accounted for ten percent or more of net sales.

## (17) COMMITMENTS AND CONTINGENT LIABILITIES

The Company is subject to various claims, legal actions, and complaints arising in the ordinary course of business. The Company believes the final outcome of these matters will not have a material adverse effect on its consolidated financial statements. The Company expenses legal costs as incurred.

## (18) 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 (the Merger Agreement) with ATMI and Atomic Merger Corporation, a Delaware corporation and wholly-owned subsidiary of Entegris (Merger Sub). The Merger Agreement provides that, upon the terms and subject to the conditions thereof, Merger Sub will be merged with and into ATMI (the Merger). As a result of the Merger, ATMI will become a wholly-owned subsidiary of the Company.

ATMI is a leading supplier of high-performance materials, materials packaging and materials delivery systems used worldwide in the manufacture of microelectronics devices. Its products consist of "front-end" semiconductor performance materials, sub-atmospheric pressure gas delivery systems for safe handling and delivery of toxic and hazardous gases to semiconductor process equipment, and high-purity materials packaging and dispensing systems that allow for the reliable introduction of low volatility liquids and solids to microelectronics processes. 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.

Pursuant to the terms and subject to the conditions of the Merger Agreement, each share of ATMI's common stock (ATMI Common Stock) issued and outstanding immediately will be cancelled and extinguished and converted into the right to receive \$34 in cash, without interest or dividends, other than shares of ATMI Common Stock: (i) owned directly by Entegris, or any of its subsidiaries; (ii) owned by ATMI as treasury stock, or by any of its subsidiaries, (iii) subject to time and/or performance vesting conditions; or (iv) as to which dissenters' rights have been properly exercised.

The consummation of the Merger is subject to customary regulatory approvals and closing conditions, which includes receiving the approval of holders of a majority of the outstanding ATMI common stock entitled to vote on the Merger and the expiration

of the applicable waiting period under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended and under certain foreign regulatory review processes.

The transaction is expected to close in the second quarter of 2014.

The Merger Agreement also includes customary termination provisions for both ATMI and Entegris and provides that, in connection with the termination of the Merger Agreement by Entegris, under specified circumstances ATMI will be required to pay Entegris a termination fee of \$30 million. In the event that the conditions to consummating the Merger have been met on the date that the closing of the Merger is required to occur but Entegris and Merger Sub fail to consummate the Merger, ATMI, if it is not then in material breach of the Merger Agreement, may terminate the Merger Agreement and Entegris shall be required to pay ATMI a termination fee of \$100 million.

In connection with the Merger, on February 4, 2014 the Company entered into a commitment letter (the Debt Commitment Letter) with Goldman Sachs Bank USA (Goldman Sachs). Pursuant to the Debt Commitment Letter, Goldman Sachs has agreed to provide the financing (the Debt Commitment Financing) necessary to consummate the Merger.

The Debt Commitment Financing will be subject to customary conditions and is anticipated to be comprised of the following elements:

- a senior secured term loan facility, with Entegris as borrower, in an aggregate principal amount of \$460 million.
- senior unsecured notes of Entegris in an aggregate principal amount of \$360 million. These notes are intended to be issued in an underwritten offering, but will be issued as a bridge loan from Goldman Sachs if for any reason the underwritten offering cannot be completed by the Merger closing.
- a senior secured asset-based revolving credit facility in an aggregate principal amount of \$85 million, only a portion of which may be advanced on the Merger closing.

Neither the senior secured term loan facility nor the senior unsecured notes carry any financial covenants; the senior secured asset-based revolving credit facility carries a financial covenant only in the event that the amount outstanding under the facility exceeds 90% of the maximum principal amount of the credit facility.

## (19) QUARTERLY INFORMATION-UNAUDITED

<i>(In thousands, except per share data).</i>	Fiscal quarter ended			
	March 30, 2013	June 29, 2013	September 28, 2013	December 31, 2013
Net sales	\$ 165,070	\$ 177,544	\$ 164,585	\$ 186,260
Gross profit	67,128	77,570	70,132	79,384
Net income	16,397	19,781	17,807	20,541
Basic income per share	0.12	0.14	0.13	0.15
Diluted income per share	0.12	0.14	0.13	0.15

<i>(In thousands, except per share data).</i>	Fiscal quarter ended			
	March 31, 2012	June 30, 2012	September 29, 2012	December 31, 2012
Net sales	\$ 175,403	\$ 188,233	\$ 184,449	\$ 167,818
Gross profit	76,244	82,746	81,932	66,461
Net income	17,859	21,673	18,037	11,256
Basic income per share	0.13	0.16	0.13	0.08
Diluted income per share	0.13	0.16	0.13	0.08

## MEMBRANE MANUFACTURE AND SUPPLY TRANSITION AGREEMENT

This Membrane Manufacture and Supply Transition Agreement (this "Agreement") is entered into effective as of November 22, 2013 (the "Effective Date"), between EMD Millipore Corporation ("EMD Millipore"), a Massachusetts corporation, with its principal place of business at 290 Concord Road, Billerica, MA 01821, and Entegris, Inc. ("Entegris"), a Delaware corporation, with its principal place of business at 129 Concord Road, Billerica, MA 01821.

### RECITALS

1. The Parties entered into a Fourth Amended and Restated Membrane Manufacture and Supply Agreement, dated as of January 13, 2011, (the "Fourth Agreement") which, among other things, provided for the continued manufacture of certain ultrahigh molecular weight polyethylene membranes at the Premises that are located in a portion of EMD Millipore's Building "C" located at 80 Ashby Road, Bedford, MA by Entegris for use and incorporation into Entegris products and for the continued supply of such membranes for use and incorporation into products of EMD Millipore.

2. The Fourth Agreement addressed Entegris' preliminary plans to move its operations out of EMD Millipore's facility in an orderly manner. Since the date of the Fourth Agreement: (i) Entegris has purchased and commenced renovation and facilitization of the Crosby Drive Plant; (ii) a significant increase in the demand for such membranes has occurred and, related thereto, severe capacity constraints have been encountered in the manufacturing process for such membranes as conducted on the Premises, all of which require the Parties to adjust the transition arrangements included in the Fourth Agreement and to add enhanced provisions to effect a smooth transition of the manufacture and supply of such membranes without disruption to the business relationship between them.

3. Accordingly, the Parties wish to cancel and replace the Fourth Agreement as of the Effective Date of this Agreement in order to implement revised provisions relating to: **(i)** the occupancy of the Premises and the use of the Equipment by Entegris to manufacture Flat Sheet UPE Membrane for incorporation into Entegris Products and for the supply to EMD Millipore of EMD Millipore Flat Sheet UPE Membrane for incorporation into EMD Millipore products until the Manufacturing Transfer is complete; **(ii)** the qualification of Flat Sheet UPE Membrane manufactured at the Crosby Drive Plant to be EMD Millipore Flat Sheet UPE Membrane for supply to EMD Millipore and the subsequent transfer of the manufacturing of Flat Sheet UPE Membrane from the Premises to the Crosby Drive Plant; and **(iii)** the closure of the manufacturing of Flat Sheet UPE Membrane at the Premises and the vacating of the Premises by Entegris in accordance with the Terms of this Agreement.

NOW, THEREFORE, in consideration of the foregoing and of the covenants and agreements set forth below, the parties hereto agree as follows:

### 1. Definitions

The following terms shall have the meanings assigned to them below whenever they are used in this Agreement or any Exhibit or Attachment hereto. Terms defined elsewhere in this Agreement shall have the meaning ascribed thereto at the location of their definition. Except where the context otherwise requires, words imparting the singular shall include the plural and vice versa, words denoting any gender shall include all genders and words denoting persons shall include bodies corporate and vice versa.

**1.1.** "Ashby Rd. Plant" means the manufacturing facility owned by EMD Millipore located at 80 Ashby Road, Bedford, MA in which the Premises are located.

**1.2.** "Crosby Drive Plant" means the manufacturing facility owned and being renovated and facilitized by Entegris located at 9 Crosby Drive, Bedford, MA.

**1.3.** “Crosby Membrane” is defined in Section 6.3 below.

**1.4.** “EMD Millipore Equipment” means the Equipment located on the Premises and listed on **Attachment 1** hereto which is currently used to manufacture Flat Sheet UPE Membrane, all right title and interest to which is solely owned by EMD Millipore.

**1.5.** “EMD Millipore Field of Use” means: **(i)** the **Biopharm Industry** including pharmaceutical/biotechnology and genetic engineering companies as well as manufacturers of cosmetics medical devices, diagnostic products and clinical analytical products; **(ii)** the **Lab & Life Science Research Industry** including government, university and private research and testing analytical laboratories for proteomic, genomic, microbiological and similar research and analysis as well as for environmental research and analysis; and **(iii)** the **Food & Beverage Industry** including companies that manufacture or process foods and beverages including dairy products, beer, wine, juice and soft drink manufacturers and bottled water companies.

**1.6.** “EMD Millipore Flat Sheet UPE Membranes” means those five types of Flat Sheet UPE Membranes listed on **Exhibit A** under the heading “1. EMD Millipore Flat Sheet UPE Membranes” (whether manufactured at the Ashby Rd. Plant or the Crosby Drive Plant) to be sold to EMD Millipore pursuant to Section 5 below.

**1.7.** “Entegris Equipment” means the Equipment located on the Premises listed on **Attachment 2** hereto which is currently used by Entegris to manufacture Flat Sheet UPE Membrane, all right title and interest to which is solely owned by Entegris.

**1.8.** “Equipment” means the EMD Millipore Equipment and the Entegris Equipment, collectively.

**1.9.** “Flat Sheet UPE Membranes” means the microporous membranes produced from an ultrahigh molecular weight polyethylene material by a melt cast process in rollstock form of typically less than 300 microns in sheet thickness listed on **Exhibit A** to this Agreement including those designated on **Exhibit A** as “EMD Millipore Flat Sheet UPE Membranes” and “Entegris Flat Sheet UPE Membranes” all as heretofore produced at the Premises pursuant to the Fourth Agreement immediately prior to the Effective Date and as may be developed or refined thereafter.

**1.10.** “Fourth Agreement” is defined in Recital 1 above.

**1.11.** “Lease Terms” means the terms upon which the Premises are leased to Entegris as provided in Section 2 hereof and as set forth in **Exhibit B** to this Agreement.

**1.12.** “Machines” is defined in Section 4.5 hereof.

**1.13.** “Machine Hourly Rates” is defined in Section 4.5 hereof.

**1.14.** “Manufacturing Transfer” is defined in Section 6.1 hereof.

**1.15.** “Parties” means Entegris and EMD Millipore, collectively; “Party” means either Entegris or EMD Millipore as the context requires.

**1.16.** “Premises” means those portions of Buildings C, D and F of the Ashby Rd. Plant leased to Entegris pursuant to Section 2 below and on **Exhibit B** hereto.

**1.17.** “Releases” shall mean any purchase orders or other documents of purchase that EMD Millipore may place with Entegris for EMD Millipore Flat Sheet UPE Membranes pursuant to Section 5 hereof.

**1.18.** “Rent” is defined in **Exhibit B** hereto.

**1.19.** “Specifications” shall mean the test specifications to which EMD Millipore Flat Sheet UPE Membrane shall conform as heretofore used by the Parties and as set forth in a document entitled “Entegris Test Specification #0008393TS”, plus the applicable EMD Millipore Purchase Specifications, excluding provisions regarding visual quality. Entegris Test Specification #0008393TS shall provide the acceptance criteria for visual quality. “Specifications” shall also refer, where applicable, to the Specifications for membranes manufactured at the Crosby Drive Plant, which are functionally equivalent to the products designated as “EMD Millipore Flat Sheet UPE Membranes” as set forth on Exhibit A but will have different



product numbers and other attributes appropriately adjusted for dimensional and other differences between membranes produced at the Ashby Rd. Plant and those produced at the Crosby Drive Plant. Entegris Test Specification #0008393TS will be modified by mutual agreement of the Parties so as to apply to the functional equivalent of EMD Millipore Flat Sheet UPE Membrane manufactured at the Crosby Drive Plant.

**1.20.** “Supplement” means the schedule of supplemental terms and conditions specifying detailed provisions to implement the contractual commitments set forth in this Agreement relating to membrane manufacturing operations and membrane manufacturing process improvements which is attached as **Exhibit C** hereto.

**1.21.** The term “Target” when used to modify a date or a numerical quantity means (i) a date by which the Parties reasonably anticipate that the indicated activity can be completed through the use of commercially reasonable efforts and (ii) a quantity which the Parties reasonably anticipate can be achieved through the use of commercially reasonable efforts; provided that no Target date or Target quantity specified in this Agreement shall constitute a binding commitment.

**1.22.** “Term” means the effective period of this Agreement commencing on the Effective Date and ending on June 30, 2015, or until this Agreement is earlier terminated or extended in accordance with Section 8 below. The Term is sub-divided into two periods - the “Initial Period” which means the period from the Effective Date through the date on which Entegris delivers to EMD Millipore an aggregate of 1,500,000 linear feet of EMD Millipore Flat Sheet UPE Membrane meeting the Specifications which has been accepted by EMD Millipore, calculated on a cumulative basis to include all deliveries from January 1, 2013 through the Effective Date together with all such EMD Millipore Flat Sheet UPE Membrane delivered after the Effective Date; and the “Second Period” which means the period from the end of the Initial Term through the end of the Term.

## **2. Lease of the Premises**

In order to enable Entegris to continue to manufacture Flat Sheet UPE Membranes in the Premises upon the terms specified in **Exhibit B** hereto, and to operate the same processes as used to manufacture Flat Sheet UPE Membranes prior to the Effective Date both **(i)** for its own use and incorporation into Entegris products for sale to its customers and **(ii)** for supply to EMD Millipore of EMD Millipore Flat Sheet UPE Membrane as provided in this Agreement, EMD Millipore and Entegris agree to the arrangements regarding Entegris’ lease of the Premises in accordance with the Lease Terms set forth in **Exhibit B** hereto for the duration of the Term of this Agreement.

**2.1. Rent for Occupancy of the Premises.** Commencing on the Effective Date and continuing through the Initial Period, Rent for occupancy and use of the Premises shall be as set forth in **Exhibit B** hereto. During the Second Period the Rent for occupancy and use of the Premises is subject to reduction in certain circumstances in accordance with **Exhibit B** hereto.

**2.2. Access to the Premises and Other Facilities.** Throughout the Term EMD Millipore shall provide Entegris with full access to the Premises in accordance with the Lease Terms. At any time during the Term, upon reasonable advance notice by a Party, such Party’s authorized representatives shall be provided access to the facilities of the other Party to audit or verify conformity with applicable laws and regulations and mutually agreed to quality standards. During the Term of this Agreement, EMD Millipore’s authorized representatives shall be provided access to the Premises for the purpose of auditing or troubleshooting (to be coordinated with Entegris) of technical problems with Flat Sheet UPE Membranes or their manufacture. Also, EMD Millipore and Entegris customers (subject to appropriate confidentiality obligations and on reasonable advance notice, and for the purposes indicated above) shall be provided reasonable access, respectively, to the Premises (during the Term) and to the Crosby Drive Plant during the qualification process specified in Section 6.3 below and to any areas of the Ashby Rd. Plant where the EMD Millipore Equipment is located and used.

## **3. Ownership and Use of the Equipment**

**3.1. Ownership.** For purposes of clarification, the parties acknowledge and agree that:

- 3.1.1. EMD Millipore Equipment.** All right, title and interest in and to any equipment other than the Entegris Equipment used in the manufacture of Flat Sheet UPE Membranes, including the EMD Millipore Equipment listed on **Attachment 1** hereto, currently used in such manufacture is solely owned by EMD Millipore.
- 3.1.2. Entegris Equipment.** All right, title and interest in and to the major equipment listed on **Attachment 2** hereto which is currently used in the manufacture of Flat Sheet UPE Membranes, and which is currently located in the Premises, is solely owned by Entegris.

**3.2. Support for Use of the Equipment; Rates.** At all times during the Term, EMD Millipore shall provide Entegris with access to and use of the EMD Millipore Equipment, each as necessary for use in the manufacture of Flat Sheet UPE Membranes and will provide a reasonable level of operational assistance and general technical support and assistance in resolving technical problems in Flat Sheet UPE Membrane manufacture all in accordance with the Supplement. EMD Millipore shall be responsible for maintaining the EMD Millipore Equipment in its current operational capability, and Entegris shall be responsible for maintaining the Entegris Equipment in its current operational capability and condition, in each case as specified in the Supplement, unless the parties agree in writing during the Term to alter such maintenance responsibilities. To the extent EMD Millipore provides extraordinary services to Entegris for supervisory, operational assistance or technical support during the period from the Effective Date through the Initial Period, such services will be charged in accordance with the rate structure described in the Supplement. In the event that Entegris grants EMD Millipore the option with respect to surplus Entegris Equipment pursuant to Section 7.3 below or that EMD Millipore grants Entegris the option with respect to surplus EMD Millipore Equipment pursuant to Section 7.4 below, the support provided for by Subsections 7.3.1 and 7.4.1 shall be provided by the selling Party in the manner and at the rates provided in the Supplement.

#### **4. Manufacture of Membranes**

**4.1. Membrane Manufacturing Operations.** EMD Millipore and Entegris agree that manufacturing operations for Flat Sheet UPE Membrane during the Term shall be carried out in accordance with this Section 4 and with the Supplement.

**4.2. Maintenance of Existing Capacity, etc.** EMD Millipore and Entegris agree that during the Term they shall maintain the capacity of the VMF-4 line and the Film 1 Annealing line, in the case of EMD Millipore, and all relevant process steps, in the case of Entegris, at least at the level in effect on the Effective Date as specified in the Supplement and shall take no action, other than as may be required by applicable regulatory requirements, to reduce such capacity. At all times during the Term, Entegris agrees to generally schedule operations in alignment with EMD Millipore's plan for shutdown periods and holidays. However, it is acknowledged and agreed that there will be times of high demand during the Term where Entegris will be required to run the Entegris Equipment during these shutdown periods. In such cases, EMD Millipore and Entegris will mutually agree on a plan allowing for high utilization of the Entegris Equipment.

**4.3. Capacity Improvements.** In addition to the commitments set forth in Section 4.2 above and in order to alleviate the capacity constraints referred to in Recital 2 above, EMD Millipore and Entegris agree to implement mutually agreeable manufacturing process improvements for Flat Sheet UPE Membranes. Entegris has proposed specific process changes to the operating methods for the Film 1 Annealing Line to increase the speed of the throughput of Flat Sheet UPE Membrane; EMD Millipore agrees to use its commercially reasonable efforts to complete the qualification of Flat Sheet UPE Membrane generated by this changed process by the Target date of March 31, 2014. In addition EMD Millipore agrees to use its commercially reasonable efforts to discontinue the processing of other membrane currently processed on the Film 1 Annealing Line by the Target date of March 31, 2014 and to devote the Film 1 capacity created thereby to Entegris for the manufacture of Flat Sheet UPE Membranes in accordance with the Supplement. For its part, Entegris agrees to use its commercially reasonable efforts to maintain and improve utilization of the NZE extraction processes used to produce EMD Millipore Flat Sheet UPE Membranes, and to ensure

that additional Film 1 Annealing Line capacity created pursuant to this Section is fairly allocated between the manufacture of Entegris Flat Sheet UPE Membranes and EMD Millipore Flat Sheet UPE Membranes as those terms are used on **Exhibit A** hereto.

**4.4. Joint Know-How.** In the event that any know-how results from or is developed in the course of the manufacture of Flat Sheet UPE Membranes in the Premises during the Term (including the use of EMD Millipore Equipment in such manufacture), whether by employees of EMD Millipore, employees of Entegris or jointly, such know-how shall be jointly owned by Entegris and EMD Millipore. During the Term, EMD Millipore shall have rights to use such know-how in the EMD Millipore Field of Use, and Entegris shall have rights to use such know-how in all fields other than the EMD Millipore Field of Use and shall have the rights to use such know-how to manufacture and supply EMD Millipore Flat Sheet UPE Membrane to EMD Millipore hereunder. After the Term, such know-how shall continue to be owned jointly without restriction.

**4.5. Machine Hourly Rates.** The hourly rates ("Machine Hourly Rates") for use by Entegris of EMD Millipore's VMF4 Line, Film 1 Annealing Line and Mix Room equipment (the "Machines"), and the invoicing thereof, shall be as set forth in this Section 4.5. Machine usage (including production and research and development usage) shall be calculated in accordance with the Supplement. Commencing on the Effective Date, the Machine Hourly Rates calculated as provided in the Supplement shall be applicable from the Effective Date through the Initial Period; provided, however, that commencing with the start of the Second Period the Machine Hourly Rates for the Machines shall be reduced as set forth in the Supplement. Machine Hourly Rates to Entegris are independent of EMD Millipore production volumes on the Machines. EMD Millipore shall be entitled to invoice Entegris monthly for Machine usage following the end of each month. The Machine Hourly Rates used for the first two months of each calendar quarter shall be the average Machine Hourly Rates that would apply for the budgeted use of each Machine for such quarter, as calculated by EMD Millipore based on the then most recent projections provided by Entegris pursuant to Subsection 5.4.2 hereof. The invoice for the third month of each calendar quarter shall be adjusted to effect a "true up" to actual Machine usage by invoicing for the net difference between the Machine Hourly Rate applicable to the actual hourly usage of the Machine in question for the entire quarter multiplied times the actual hours of usage of such Machine for the quarter less the amounts invoiced for usage of such Machine for the first two months of the quarter. This "true up" is so that Entegris effectively pays for all of a quarter's hours at the Machine Hourly Rates appropriate for those total hours.

**4.6. Impact of Capital Investment on Prices.** Entegris shall be responsible for funding required capital improvements to the Entegris Equipment for production of Flat Sheet UPE Membranes. EMD Millipore shall be responsible for funding required capital improvements to the EMD Millipore Equipment for production of Flat Sheet UPE Membranes. To the extent that capital improvements are required for the EMD Millipore Equipment used in the production of Flat Sheet UPE Membranes designated on Exhibit A as Entegris Treated Flat Sheet UPE Membranes, responsibility for funding that capital improvement shall be mutually agreed upon in accordance with Section 1.7 of the Supplement. If one party funds the purchase of additional equipment for use in manufacture of Flat Sheet UPE Membranes at the Premises, that equipment shall be owned by the funding party. Changes to the Equipment and the related impact on Machine Hourly Rates and other charges under this Section 4 shall be approved, managed and reflected in accordance with the Supplement.

## **5. Supply of Membranes**

**5.1. Sale of Membrane.** During the Term but subject to: **(i)** EMD Millipore fulfilling its commitment to maintain the capacity of the Film 1 Annealing Line as specified in Section 4.2 above; **(ii)** and any new or changed restrictions imposed by the applicable air emission permit(s) for the Premises; Entegris agrees to use commercially reasonable efforts to manufacture and sell to EMD Millipore and EMD Millipore agrees to use commercially reasonable efforts to purchase and issue Releases for the following Target quantities of EMD Millipore Flat Sheet UPE Membranes from Entegris during the Term a rolling four-week average

Target quantity of 23,000 linear feet per week or at the rate of a Target quantity of 300,000 linear feet per quarter.

**5.2. Terms of Sale.** Unless otherwise agreed by both parties in writing, this Agreement applies to all Releases placed by EMD Millipore with Entegris for EMD Millipore Flat Sheet UPE Membrane during the Term. The terms and conditions of this Agreement shall apply to any Release, whether or not this Agreement or its terms and conditions are expressly referenced in the Release. All EMD Millipore Flat Sheet UPE Membrane shall be tested, inspected and packaged for delivery by Entegris as mutually agreed by the Parties. Except as set forth above, in Section 5.4 hereof and in the Supplement, EMD Millipore shall have no minimum or maximum per order requirements.

**5.3. Priority.** Unless otherwise agreed by both parties in writing for a specific transaction, no inconsistent or additional term or condition in any Release, or in any acknowledgment, invoice or other document issued by Entegris or by EMD Millipore, shall be applicable to a transaction within the scope of this Agreement. Both parties specifically agree that any terms and conditions in any such documents which are in any way inconsistent with this Agreement shall be inapplicable, and the terms of this Agreement shall govern.

**5.4. Forecasts and Releases.** EMD Millipore will provide Entegris with a rolling one-year forecast of its demand for EMD Millipore Flat Sheet UPE Membranes hereunder, by calendar quarter (a "One-Year Forecast"), which will be updated on a quarterly basis, at least thirty (30) days prior to the start of each calendar quarter. The first One-Year Forecast shall be delivered to Entegris no later than the thirtieth (30<sup>th</sup>) day following the Effective Date. The sub-forecast for the first three (3) months within any One-Year Forecast shall be referred to as a "3 Month Forecast". EMD Millipore must provide Releases for delivery, during the three (3) months covered by any 3 Month Forecast, of EMD Millipore Flat Sheet UPE Membranes in at least those quantities set forth in such 3 Month Forecast. Except for such semi binding nature of the 3 Month Forecasts as described more specifically in Subsection 5.4.2 below, the One-Year Forecasts will be used for planning purposes only and are not binding. Entegris will ship EMD Millipore Flat Sheet UPE Membranes so as to arrive on the delivery date set forth in a Release, provided that the delivery date set forth in such Release is not less than the applicable mutually agreed upon lead times following the date Entegris receives such Release and provided, further that the quantities set forth in such Release, together with those in all other Releases calling for delivery during the same quarter, are not greater than the *lesser* of the quantities applicable to the period in question as provided in Section 5.1 above or in the applicable 3 Month Forecast. For any Releases calling for quantities that are less than the Target quantity provided in Section 5.1 above but greater than the quantities provided in such 3 Month Forecast, Entegris shall use commercially reasonable efforts to deliver such quantities within ninety (90 ) days following the date Entegris receives such Release or as soon as practicable thereafter.

**5.4.1.** EMD Millipore shall be entitled to reduce the amount specified in a 3 Month Forecast without penalty or other charge if the written change notice is received by Entegris prior to the requested lot of EMD Millipore Flat Sheet UPE Membrane being extruded.

**5.4.2** Within ten (10) days after receipt of each One Year Forecast, Entegris will provide a non-binding, good faith projection of its Flat Sheet UPE Membrane manufacturing volume (broken down between EMD Millipore Flat Sheet UPE Membrane, Entegris Flat Sheet UPE Membrane and Entegris Treated Flat Sheet UPE Membrane), by calendar quarter, for the upcoming four calendar quarters. This information will be used by EMD Millipore for budgeting of resources and revenue, and for the determination of budgeted Machine Hourly Rates for purposes of Section 4.5.

**5.5. Membrane Prices.** Commencing on the Effective Date the prices for EMD Millipore Flat Sheet UPE Membranes to EMD Millipore produced at the Premises shall be as provided in accordance with Exhibit A hereto. The price for Flat Sheet UPE Membranes produced at the Crosby Drive Plant (other than the rolls for Feasibility Evaluation and Operational Qualification as described in Section 6.3 below) shall be as provided on Exhibit A hereto for the Term. The Parties acknowledge that all EMD Millipore Flat Sheet UPE Membranes will be produced at the Crosby Drive Plant after the Term pursuant to a separate Membrane

Supply Agreement. Delivery terms for all EMD Millipore Flat Sheet UPE Membranes delivered to EMD Millipore hereunder will be FOB 80 Ashby Road, Bedford, MA.

**5.5.1. *Payment of Invoices.*** All amounts payable by either Party to the other pursuant to this Agreement, except for amounts payable as Rent, shall be payable within forty-five (45) days following the later of (i) receipt of EMD Millipore Flat Sheet UPE Membranes ordered hereunder, performance of services or Machine usage, and (ii) receipt of invoice. All payments shall be made in U.S. Dollars. Any late payments shall be subject to interest at a rate of three percent (3%) per annum.

**5.6. Membrane Warranty.** Entegris warrants to EMD Millipore that:

- (i) All EMD Millipore Flat Sheet UPE Membranes supplied hereunder shall conform to the Specifications, as such Specifications may be amended by mutual agreement of the Parties;
- (ii) Subject to the tolerances set forth in Entegris Test Specification #0008393TS relating to visual quality, all EMD Millipore Flat Sheet UPE Membranes supplied hereunder shall be free of defects in materials and workmanship; and
- (iii) Entegris will abide by all applicable laws and regulations in manufacturing and supplying EMD Millipore Flat Sheet UPE Membranes pursuant to this Agreement.

**5.6.2.** In the event of a breach of the foregoing warranties, the Entegris' sole obligation to EMD Millipore shall be to replace, if possible through the use of commercially reasonable efforts, any non-conforming EMD Millipore UPE Flat Sheet Membranes; if such replacement is not possible, then Entegris shall refund the purchase price for any non-conforming EMD Millipore UPE Flat Sheet Membranes.

**5.6.3. ENTEGRIS MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. FURTHERMORE, ENTEGRIS SHALL NOT BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL OR ANY OTHER INDIRECT DAMAGES RESULTING FROM ECONOMIC LOSS OR PROPERTY DAMAGE SUSTAINED BY EMD MILLIPORE FROM THE USE OF THE EMD MILLIPORE FLAT SHEET UPE MEMBRANES.**

**5.6.4.** Entegris agrees to indemnify and hold harmless EMD Millipore from and against any claim or legal action by a third party against it (including reasonable attorneys' fees associated therewith) based on damages incurred as a result of property damages, personal injury or death, to the proportionate extent arising from a breach of any of the above warranties of Entegris.

**5.6.5.** Without limiting any other rights or remedies that EMD Millipore may have, if EMD Millipore determines that delivered EMD Millipore Flat Sheet UPE Membranes do not conform to the Specifications for such EMD Millipore Flat Sheet UPE Membranes, then EMD Millipore may reject or withdraw its acceptance thereof and shall notify Entegris in writing of such nonconformity or error within thirty (30) days following receipt of such EMD Millipore Flat Sheet UPE Membranes. EMD Millipore may subject any EMD Millipore Flat Sheet UPE Membrane to internal testing for purposes of determining conformity to Specifications. Entegris shall have fifteen (15) days following receipt of written notice of nonconformity or error to replace nonconforming EMD Millipore Flat Sheet UPE Membranes at the expense of Entegris. If so directed by Entegris, EMD Millipore shall return nonconforming EMD Millipore Flat Sheet UPE Membranes to Entegris' manufacturing facilities, at Entegris' expense and using such carrier and such delivery dates and terms as Entegris shall reasonably specify.

**5.6.6.** The Parties agree to have their representatives meet at least once every three (3) months (unless otherwise agreed) to review compliance with the manufacturing, specifications, product quality, forecasting and delivery terms set forth in this Agreement, and to agree on any necessary corrective actions or modifications to the Supplement as then in effect.

## **6. Transition of Manufacturing.**

**6.1. Purpose of Transition.** Entegris has heretofore been supplying EMD Millipore with EMD Millipore Flat Sheet UPE Membrane manufactured by Entegris at the Premises in accordance with the Fourth Agreement. The Parties hereby agree that Entegris will transfer its membrane manufacturing operations currently conducted in the Premises to the Crosby Drive Plant in an orderly manner (the "Manufacturing Transfer") during the Term. It is the intent of the Parties that this Agreement establish the terms and conditions pursuant to which: (i) EMD Millipore Flat Sheet UPE Membrane manufactured at the Crosby Drive Plant will be qualified by EMD Millipore; (ii) the supply of EMD Millipore Flat Sheet UPE Membrane will be transferred to the Crosby Drive Plant by Entegris; and (iii) the Premises will thereupon be closed by the Parties in accordance with their respective responsibilities under the Lease Terms. The Parties agree to use commercially reasonable efforts to assure the smooth transition of the manufacturing process for Flat Sheet UPE Membrane to the Crosby Drive Plant, in the case of Entegris and to qualify EMD Millipore Flat Sheet UPE Membrane manufactured at the Crosby Drive Plant, in the case of EMD Millipore. Entegris agrees that, pending the completion of the qualification of EMD Millipore Flat Sheet UPE Membrane manufactured at the Crosby Drive Plant, it shall use commercially reasonable efforts to continue to supply EMD Millipore with EMD Millipore Flat Sheet UPE Membrane manufactured at the Premises in accordance with the provisions of this Agreement.

**6.2. Timing of Manufacturing Transfer.** The Parties acknowledge that Entegris has heretofore given EMD Millipore the "Move Notice" under the Fourth Agreement. Upon completion of the renovation and facilitization of the Crosby Drive Plant and the development of Flat Sheet UPE Membrane manufacturing capability at the Crosby Drive Plant, Entegris agrees to initiate and use commercially reasonable efforts to prosecute the qualification process specified in Section 6.3 below. EMD Millipore agrees to use commercially reasonable efforts to prosecute and complete such qualification process within fifteen (15) months following the last delivery to EMD Millipore of performance qualification samples of Crosby Membrane in accordance with Section 6.3(iii) below. Upon successful completion of such qualification process, Entegris agrees to undertake the supply and EMD Millipore agrees to accept deliveries of EMD Millipore Flat Sheet UPE Membrane manufactured at the Crosby Drive Plant in accordance with separate supply arrangements. The Parties agree to thereafter initiate the closure of the Premises in accordance with the Lease Terms. Entegris agrees to use commercially reasonable efforts to complete the Manufacturing Transfer and to have vacated the Premises no later than the end of the Term. Entegris further agrees to consult with EMD Millipore concerning the schedule for and progress of the Manufacturing Transfer and vacation of the Premises. Notwithstanding the foregoing, the operation of the Premises may be extended to a date not later than December 31, 2015, pursuant to mutually agreed upon terms in order to assure adequate capacity to supply Flat Sheet UPE Membrane and/or EMD Millipore Flat Sheet UPE Membrane from a qualified manufacturing operation.

**6.3. Qualification.** The Parties recognize that the qualification of the EMD Millipore Flat Sheet UPE Membranes manufactured at the Crosby Drive Plant ("Crosby Membrane") is a critical precondition to the Manufacturing Transfer, the supply of Crosby Membrane to meet EMD Millipore's requirements for EMD Millipore Flat Sheet UPE Membrane and the closure of the Premises. EMD Millipore and Entegris agree to work together in good faith to facilitate such qualification in a timely and expeditious manner in accordance with **Exhibit D**. The parties contemplate that the qualification process shall be comprised of three stages:

- (i) **Feasibility Evaluation** pursuant to which Entegris will provide four (4) rolls of feasibility sample UPDP type Crosby Membrane and four (4) rolls of feasibility sample UPHP type Crosby Membrane to EMD Millipore free of charge and EMD Millipore will undertake the testing and evaluation of these feasibility samples of Crosby Membrane in accordance with the validation and qualification testing protocols referred to under the heading "1. Feasibility Evaluation Stage" on **Exhibit D** hereto and will promptly provide Entegris with the test results, data and other technical information yielded by such testing by the Target specified in such section of Exhibit D, or sooner if reasonably possible. In the event that EMD Millipore requires additional quantities of feasibility sample Crosby

Membrane, it shall purchase such additional quantities at the prices as provided in accordance with Exhibit A hereto; EMD Millipore will provide Entegris with regular updates concerning the testing of the feasibility samples and will notify Entegris in writing when the Feasibility Evaluation is complete;

- (ii) Operational Qualification during which Entegris will provide to EMD Millipore operational qualification samples of UPDP type Crosby Membrane and operational qualification samples of UPHP type Crosby Membrane in each of the four Specification range conditions specified under the heading "2. Operational Qualification Stage" on **Exhibit D** hereto. EMD Millipore will undertake the testing and evaluation of these operational samples of Crosby Membrane in accordance with the validation and qualification testing protocols referred to under the heading "2. Operational Qualification Stage" on **Exhibit D** hereto and will use commercially reasonable efforts to promptly provide Entegris with the test results, data and other technical information yielded by such testing by the Target date specified in such section of Exhibit D. Up to 32 rolls of operational qualification samples of Crosby Membrane will be provided free of charge. In the event that EMD Millipore requires additional quantities of operational qualification sample Crosby Membrane, it shall purchase such additional quantities at the prices as provided in accordance with Exhibit A hereto; EMD Millipore will provide Entegris with regular updates concerning the testing of the operational qualification samples and will notify Entegris in writing when the Operational Qualification is complete;
- (iii) Performance Qualification during which Entegris will supply and EMD Millipore agrees to purchase performance qualification samples of UPDP type Crosby Membrane and UPHP type Crosby Membrane as specified under the heading "3. Performance Qualification" on **Exhibit D** for testing and evaluation by EMD Millipore in accordance with the validation and qualification testing protocols referred to under the heading "3. Performance Qualification" on **Exhibit D**. The purchase price for such performance qualification samples of Crosby Membrane shall be as provided in accordance with Exhibit A hereto. If these tests confirm that these performance samples of Crosby Membrane meet the Specifications, they shall be deemed to be accepted by EMD Millipore as finished EMD Millipore Flat Sheet UPE Membrane; and
- (iv) Notice of Qualification Completion. If EMD Millipore's tests confirm that the performance qualification samples of Crosby Membrane meet the Specifications, then EMD Millipore will notify Entegris in writing that Performance Qualification is complete in accordance with section 3. Performance Qualification" on **Exhibit D**. The Parties shall then by mutual agreement establish a schedule for the beginning of commercial supply from the Crosby Drive Plant, and the termination of supply of EMD Millipore Flat Sheet UPE Membranes from the Ashby Rd. Plant .

Entegris agrees that all such Feasibility and Operational and Performance qualification rolls of Crosby Membrane provided to EMD Millipore by Entegris will meet the Specifications as in effect on the Effective Date. The Parties agree that they shall diligently undertake all additional qualification actions referred to on Exhibit D hereto.

**6.4. No Supply Disruption.** Notwithstanding the Manufacturing Transfer, Entegris will use commercially reasonable efforts to continue to meet its supply obligations to EMD Millipore under Section 5.1 of this Agreement of any EMD Millipore Flat Sheet UPE Membranes from a manufacturing process qualified by EMD Millipore. It is the expectation of the Parties that, once Flat Sheet UPE Membrane is being manufactured at the Crosby Drive Plant, Entegris will produce EMD Millipore Flat Sheet UPE Membranes from both the Premises and the Crosby Drive Plant, at the prices calculated in accordance with Exhibit A, until the earlier of: (i) completion of the fifteen (15) month qualification process set forth in Section 6.3 above for the Crosby Membrane or (ii) the end of the Term or as may be otherwise agreed by the Parties.

**6.5. No VMF4 Disruption.** Notwithstanding the Manufacturing Transfer, EMD Millipore will at all times during the Term continue to meet its obligations to Entegris under this Agreement to provide hydrophilization of Flat Sheet UPE Membranes on its VMF4 Line at the same level as on the Effective Date.

**END OF TERM ARRANGEMENTS**

**7.1. End of Term Arrangements for the Premises.** Unless otherwise agreed by the Parties, Entegris shall vacate the Premises in accordance with the Lease Terms. Entegris will bear all costs of dismantling, packaging, freight, shipping, installation, testing and requalification of all Entegris Equipment to be removed from the Premises.

**7.2. End of Term Arrangements for Entegris Equipment.** Entegris shall remove and transport, at its own expense, the Entegris Equipment (subject to the consummation of any sale pursuant to any option to purchase certain items of such Entegris Equipment as specifically set forth in Section 7.3 below) from the Premises to a location of its choice within one-hundred eighty (180) days following the early termination of the Term, but in no event later than the extension date specified in Section 8.1 below. Entegris shall use its best efforts to avoid or minimize damage to the Premises or to any other part of the Ashby Rd. Plant from such removal, and shall promptly reimburse EMD Millipore for its reasonable and actual costs of making any necessary repairs to any damage, to the extent caused by Entegris or its agents or representatives in the process of removing the Entegris Equipment from the Premises or any other parts of the Ashby Rd. Plant.

**7.3. End of Term Arrangements for Surplus Entegris Equipment.** Following the expiration or earlier termination of the Term, Entegris agrees, in the event that during the Term Entegris determines, in its sole discretion, that the Extrusion Line and/or one NZE Extractor are surplus and are to be disposed of, then Entegris agrees to grant EMD Millipore an option to purchase, prior to or at the termination of this Agreement, at their then current book values and on such other reasonable terms as the Parties may agree, such surplus Extrusion Line and/or NZE Extractor. Upon consummation of any such sale transaction, Entegris agrees to leave in their then current locations at the Premises, the surplus Extrusion Line and/or NZE Extractor purchased hereunder, as the case may be. Entegris agrees to notify EMD Millipore if it is granting EMD Millipore such an option, at least six (6) months prior to the termination of this Agreement.

**7.3.1.** In the event that the parties consummate a sale of any equipment deemed to be surplus by Entegris as specified above, Entegris agrees to provide EMD Millipore with the know-how (including copies of all pertinent documentation) and a reasonable amount of transition assistance relating to the design, specifications, functionality, operation and maintenance of such equipment, or otherwise necessary or useful for EMD Millipore to be able to continue the manufacturing process for EMD Millipore Flat Sheet UPE Membrane immediately upon the termination of this Agreement, so as to be able to make or have made EMD Millipore Flat Sheet UPE Membrane in the same process and of the same quality as made and supplied under this Agreement. All Entegris transition assistance time shall be charged to EMD Millipore at the rates per person-hour calculated in accordance with Section 3.2 above.

**7.4. End of Term Arrangements for Surplus EMD Millipore Equipment.** Following the expiration or earlier termination of the Term of this Agreement, EMD Millipore agrees in the event that it determines during the Term of this Agreement, in its sole discretion, that the VMF4 Line and/or the Film 1 Line are surplus and are to be disposed of, then EMD Millipore agrees to grant Entegris an option to purchase, prior to or at the termination of this Agreement, at their then current book values and at such other reasonable terms as the Parties may agree, such surplus VMF4 Line and/or the Film 1 Line. Upon consummation of any such sale transaction, Entegris shall remove and transport, at its own expense, any such purchased surplus equipment from the Premises to a location of its choice within one-hundred eighty (180) days following the expiration or early termination of the Term. Entegris shall use its best efforts to avoid or minimize damage to the Premises or to any other part of the Ashby Rd. Plant from such removal, and shall promptly reimburse EMD Millipore for its reasonable and actual costs of making any necessary repairs to any damage to the extent caused by Entegris or its agents or representatives in the process of removing such purchased surplus equipment from the Premises or any other parts of the Ashby Rd. Plant. EMD Millipore agrees to



notify Entegris if it is granting Entegris such an option, at least six (6) months prior to the termination of this Agreement.

**7.4.1.** EMD Millipore shall provide Entegris with know-how (including copies of all pertinent documentation) and a reasonable amount of transition assistance relating to the design, specifications, functionality, operation and maintenance of the EMD Millipore Equipment, such that Entegris can make or have made, and operate and maintain, equipment substantially equivalent or comparable to the EMD Millipore Equipment, or successfully outsource the functions performed by the EMD Millipore Equipment, in the manufacture of Flat Sheet UPE Membranes. All EMD Millipore transition assistance shall be charged to Entegris at the rates per person-hour calculated in accordance with Section 3.2 above.

## **8. Term and Termination**

**8.1. Term.** The Term of this Agreement shall begin on the Effective Date and continue thereafter until June 30, 2015 or until earlier termination in accordance with Section 8.2, unless extended by mutual agreement of the Parties to December 31, 2015 or such other date as may be agreed by the Parties. Any Release issued by EMD Millipore before the effective date of termination and in accordance with Section 5.4 hereof shall be fulfilled by Entegris.

**8.2. Termination.** Either Party may terminate this Agreement prior to June 30, 2015 without prejudice to any rights or liabilities accruing up to the date of termination:

**8.2.1** in the event of a material breach by the other Party of any of the terms and conditions of this Agreement, by giving the breaching Party written notice of such breach, provided that such breach shall not have been cured within one hundred twenty (120 ) days following such notice; or,

**8.2.2** immediately, by written notice thereof, if any of the following events or an event analogous thereto occurs:

- a. an adjudication has been made that the other party is bankrupt or insolvent;
- b. the other Party has made a filing to initiate bankruptcy proceedings or has had such proceedings filed against it, except as part of a bona fide scheme for reorganization;
- c. a receiver has been appointed for all or substantially all of the property of the other Party;
- d. the other Party has assigned or attempted to assign this Agreement for the benefit of its creditors; or
- e. the other Party has begun any proceeding for the liquidation or winding up of its business affairs.

**8.3. Termination Upon Completion of Qualification/Survivability of Provisions.** Upon the completion of the qualification of the Crosby Membrane, the Manufacturing Transfer, the closure of manufacturing at the Premises and the vacating of the Premises by Entegris, the Term shall terminate and this Agreement shall thereafter be of no further force or effect, provided, however, that the provisions of the following Sections shall continue in effect thereafter as provided therein or for such period as may be necessary for performance of such provisions with respect to events occurring prior to such expiration or termination: Section 4.4 (Joint Know-How), Section 5.6 (Membrane Warranty), Section 7 (End of Term Arrangements), Section 8.3 (re Survivability), Section 9.3 (Confidentiality), and Section 9.4 (Indemnification), and 11 (General).

## **9. Special Covenants**

**9.1. Non Compete** From the Effective Date through March 31, 2014, the Parties agree that the following non-compete provisions shall continue to apply; after March 31, 2014 the provisions of this Section 9.1 shall expire and shall be of no further force or effect.

- 9.1.1. *By EMD Millipore.*** EMD Millipore agrees that neither it nor any of its Affiliated Companies will (i) sell outside of the EMD Millipore Field of Use any Flat Sheet UPE Membranes, or (ii) sell any Flat Sheet UPE Membranes to any distributor, OEM manufacturer or other third party that has rights to, or that EMD Millipore or any such Affiliated Company has reason to believe will, resell such Flat Sheet UPE Membranes outside of the Millipore Field of Use or sell other products which include Flat Sheet UPE Membranes as materials or components outside of the Millipore Field of Use.
- 9.1.2. *By Entegris - In the EMD Millipore Field of Use.*** Entegris agrees that neither it nor any of its Affiliated Companies will (i) sell into the EMD Millipore Field of Use any Flat Sheet UPE Membranes, or (ii) sell any Flat Sheet UPE Membranes to any distributor, OEM manufacturer or other third party that has rights to, or that Entegris or any such Affiliated Company has reason to believe will, resell such Flat Sheet UPE Membranes into the EMD Millipore Field of Use or sell other products which include Flat Sheet UPE Membranes as materials or components into the Millipore Field of Use.
- 9.1.3. *By Entegris - Outside the Entegris Core Business.*** Entegris agrees that neither it nor any of its Affiliated Companies will (i) sell outside of the "Entegris Core Business" (as defined in Subsection 9.1.4 below) any of the Flat Sheet UPE Membranes designated on Exhibit A as Entegris Treated Flat Sheet UPE Membranes or any device or other product into which include such Entegris Treated Flat Sheet UPE Membranes or (ii) sell any of the Flat Sheet UPE Membranes designated on Exhibit A as Entegris Treated Flat Sheet UPE Membranes or any device or other product into which include such Entegris Treated Flat Sheet UPE Membranes to any distributor, OEM manufacturer or other third party that has rights to, or that Entegris or any such Affiliated Company has reason to believe will, resell such Entegris Treated Flat Sheet UPE Membranes or any such device or other product outside of such Entegris Core Business or sell other products which include such Entegris Treated Flat Sheet UPE Membranes as materials or components outside of such Entegris Core Business
- 9.1.4. *"Entegris Core Business"*** shall mean: **(i)** the IC Manufacturing Industry including companies that manufacture integrated circuits, semiconductors, semiconductor chips and other microelectronics components, flat panel displays, solar cells and fiber optic cables, optical coatings, coated optical lenses and coated optical fibers; **(ii)** the IC OEM Equip & Materials Mfg. Industry including companies that manufacture equipment for the fabrication and processing of semiconductors and integrated circuits for sale to companies in the IC Manufacturing Industry as well as companies that integrate a number of components into subsystems sold to OEM equipment manufacturers for incorporation into semiconductor fabrication equipment, as well as companies that manufacture, process and supply liquids, gases, conductive materials and other advanced materials to the IC Manufacturing Industry and which provide products and systems to purify, monitor and control atmospheric conditions in clean room manufacturing environments of the IC Manufacturing Industry; and **(iii)** the IC Research Laboratory Industry including university, governmental and commercial laboratories and research operations that research and/or develop innovations in the structure and composition of integrated circuits, the processes and materials used to manufacture integrated circuits and new forms of integrated circuits.

**9.2. Exclusivity.** This Section 9.2 shall take effect as of March 31, 2014. Entegris agrees that: **(i)** EMD Millipore shall have the Exclusive right (even as to Entegris) to sell the EMD Millipore Flat Sheet UPE Membranes when used as a substrate for membrane chromatography products or tangential flow ultrafiltration products into the EMD Millipore Field of Use, and **(ii)** EMD Millipore shall have the Non-Exclusive right to sell the EMD Millipore Flat Sheet UPE Membranes when used as direct filtration media in a product sold into the EMD Millipore Field of Use. The exclusive and non-exclusive rights granted hereunder shall also apply to any distributor, OEM manufacturer or other third party which EMD Millipore has appointed by written agreement to resell the EMD Millipore Flat Sheet UPE Membranes for such uses into the EMD Millipore Field of Use. EMD Millipore agrees that Entegris reserves the Exclusive right to sell Flat Sheet

UPE Membranes outside of the EMD Millipore Field of Use. The rights reserved hereunder shall also apply to any distributor, OEM manufacturer or other third party which Entegris has appointed by written agreement to resell such Flat Sheet UPE Membranes outside of the EMD Millipore Field of Use. EMD Millipore shall at all times during and after the Term remain free and without restriction to manufacture, market, use for its own purposes and/or sell any UPE membrane that EMD Millipore manufactures itself or purchases from a source other than Entegris, provided, however, that the exclusive rights granted EMD Millipore pursuant to clause (i) above shall continue in effect during the Term only so long as EMD Millipore continues to purchase not less than 90% of its requirements for Flat Sheet UPE Membrane from Entegris. After the termination or expiration of the Term, or the termination of EMD Millipore's exclusive rights pursuant to the preceding sentence, Entegris shall be free to manufacture, market, use for its own purposes and/or sell any Flat Sheet UPE Membrane that Entegris manufactures itself or purchases in either case free of the restrictions imposed by this Section 9.2.

**9.3. Confidential Information.** For the purpose of this Agreement the term "Confidential Information" means information which is not otherwise in the public domain and of which the owner actively undertakes to restrict or control the disclosure to persons or entities other than EMD Millipore or Entegris or their Subsidiaries in a manner reasonably intended to maintain its confidentiality, and which: **(i)** the Party owning or disclosing Confidential Information ("Disclosing Party") disclosed to the non-owning Party or recipient of the Confidential Information ("Receiving Party") or the Receiving Party had access to on or before March 31, 2001; **(ii)** is contained in or referred to by this Agreement or any exhibit or attachment hereto and is known to or in the possession of the Receiving Party as of the Effective Date; or **(iii)** is disclosed to the Receiving Party pursuant to this Agreement during the Term (the "Disclosure Period"). Confidential Information may include information relating to, by way of example, research, products, services, customers, markets, software, developments, inventions, manufacturing processes, designs, drawings, engineering, marketing or finances, and may be in writing, disclosed orally or learned by inspection of computer programming code, equipment or facilities. Confidential Information of third parties that is known to, in the possession of or acquired by a Receiving Party pursuant to a relationship with the Disclosing Party shall be deemed to be the Disclosing Party's Confidential Information for purposes of this Section 9.3.

**9.3.1. Highly Confidential Information** means Confidential Information that is technical know-how and trade secrets relating to: **(i)** information relating to manufacturing processes or procedures with respect to devices or other products that are commercially released or for which substantial steps have been taken towards commercialization as of the Effective Date; **(ii)** information generated by research and development activities; **(iii)** chemical and other scientific formulae used for the manufacture or treatment of membranes or other separations media or of devices or other products that are commercially released or for which substantial steps have been taken towards commercialization as of the Effective Date; or **(iv)** any other information which EMD Millipore and Entegris agree is Highly Confidential hereunder.

**9.3.2. Exclusions from Confidential Information.** Notwithstanding the foregoing provisions of this Section 9.3, Confidential Information shall exclude information that: **(i)** was in the Receiving Party's possession before receipt from the Disclosing Party and obtained from a source other than the Disclosing Party and other than through the prior relationship of the Disclosing Party and the Receiving Party before March 31, 2001; **(ii)** is or becomes a matter of public knowledge through no fault of the Receiving Party; **(iii)** is rightfully received by the Receiving Party from a third party without a duty of confidentiality; **(iv)** is disclosed by the Disclosing Party to a third party without a duty of confidentiality on such third party; **(v)** is independently developed by the Receiving Party; or **(vi)** is publicly disclosed by the Receiving Party with the Disclosing Party's prior written approval.

**9.3.3. Confidentiality and Non-Use Obligations.** During the Confidentiality Period (as defined in Subsection 9.3.4 below), the Receiving Party shall: **(i)** protect the Confidential Information of the Disclosing Party by using the same degree of care, but no less than a reasonable degree of care, to prevent the unauthorized use, dissemination, or publication of the Confidential Information as Receiving Party uses to protect its own confidential information of a like nature, **(ii)** not use such Confidential Information in violation of any use restriction herein, and **(iii)** not disclose such

Confidential Information to any third party, except as expressly permitted under this Agreement or in any other agreements entered into between the parties in writing, without prior written consent of the Disclosing Party.

**9.3.4. *Duration of Confidentiality Obligations.*** The confidentiality obligations provided for in this Section 9.2 shall continue in effect for the following periods (the "Confidentiality Period"): **(i)** with respect to Confidential Information that is not Highly Confidential Information, for a period of five (5) years following either **(A)** the Effective Date with respect to Confidential Information of the Disclosing Party that is known to or in the possession of the Receiving Party as of the Effective Date or **(B)** the date of disclosure with respect to Confidential Information that was or will be disclosed by the Disclosing Party to the Receiving Party after the Effective Date but before the expiration of the Disclosure Period (as defined in clause (iii) of Section 9.2 above); and **(ii)** with respect to Highly Confidential Information, in perpetuity. The obligations set forth in this Section 9.3 shall survive any termination of this Agreement.

**9.3.5. *Compelled Disclosure.*** If the Receiving Party or any of its respective Subsidiaries believes that it (i) is legally obligated to disclose, or (ii) will be compelled by a court or other authority of competent jurisdiction to disclose, Confidential Information of the Disclosing Party, it shall give the Disclosing Party prompt written notice so that the Disclosing Party may take steps to oppose such disclosure and cooperate with the Disclosing Party in its attempts to oppose such disclosure. If the Receiving Party complies with the preceding sentence, it shall not be prohibited from complying with such requirement to disclose, but shall take all reasonable steps to make such disclosure subject to a suitable protective order or otherwise to prevent unrestricted or public disclosure.

**9.3.6. *No Restriction on Disclosing Party.*** Nothing in this Section 9.2 shall restrict the Disclosing Party from using, disclosing, or disseminating its own Confidential Information in any way.

**9.4. *Indemnification.*** Each Party agrees to indemnify and hold the other Party harmless from and against any claim or legal action by a third party against such Party (including reasonable attorneys' fees associated therewith) based on damages incurred as a result of property damages, personal injury or death, to the proportionate extent arising from a breach of any of the provisions of this Agreement.

**9.5. *Insurance.*** Each Party agrees to procure and maintain, at all times during the Term, product liability insurance with respect to the products and services supplied by it hereunder (Broad Form Vendor's Endorsement) and contractual liability coverage, with the minimum limits of \$5,000,000 (Five Million Dollars). Each Party shall, upon request by the other Party, furnish to the Party a certificate of insurance evidencing the foregoing coverage and limits. The insurance provider shall not be changed without providing the Party with ten (10) days' prior written notice.

## **10. Dispute Resolution**

**10.1. *Discussion of Parties.*** In the event of a dispute between the Parties arising out of or related to this Agreement (the "Dispute"), a Party seeking to resolve the Dispute shall give written notice to the other Party, describing briefly the nature of the Dispute and its claim and identifying an individual with authority to settle the Dispute on its behalf. The Party receiving such notice shall have five (5) business days within which to designate, in a written notice given to the initiating Party, an individual with authority to settle the Dispute on its behalf. Neither of such authorized individuals shall have had direct substantive involvement in the matters involved in the Dispute. The authorized individuals shall make such investigation as they deem appropriate and thereafter promptly (but in no event later than thirty (30) days following the date of the initiating Party's notice) shall commence discussions concerning resolution of the Dispute.

**10.2. *Arbitration.*** If the Dispute has not been resolved within thirty (30) days following the commencement of discussions, it shall be submitted to final and binding arbitration under the then current Commercial Arbitration Rules of the American Arbitration Association ("AAA"), by one (1) arbitrator in Boston,

Massachusetts. Such arbitrator shall be selected by the mutual agreement of the Parties or, failing such agreement, shall be selected according to the aforesaid AAA rules. The arbitrator will be instructed to prepare and deliver a written, reasoned opinion stating its decision within thirty (30) days following the completion of the arbitration. The prevailing Party in such arbitration shall be entitled to expenses, including costs and reasonable attorneys' and other professional fees, incurred in connection with the arbitration. The decision of the arbitrator shall be final and non-appealable and may be enforced in any court of competent jurisdiction.

**10.3. Continuity of Service and Performance.** Unless otherwise agreed in writing, the Parties will continue to provide service and honor all other commitments under this Agreement during the course of dispute resolution pursuant to the provisions of this Section 10 with respect to all matters not subject to such dispute, controversy or claim.

## **11. General Provisions**

**11.1. Effect of Agreement** This Agreement shall take effect as of the Effective Date and shall cancel, replace and supersede the Fourth Agreement in its entirety. From and after the Effective Date the Fourth Amendment shall be of no further force or effect and this Agreement shall set forth the complete agreement between the Parties with respect to the transactions contemplated hereby. Upon the completion of the Manufacturing Transfer and the closure and vacating of the Premises as provided in the Lease Terms, this Agreement and the Term hereof shall expire and shall be of no further force or effect.

**11.2. Notices.** Any notice or other communication required or permitted to be given by either Party pursuant to the terms of this Agreement shall be in writing and shall be deemed given if and when delivered by hand or sent by certified mail, return receipt requested, overnight courier, confirmed telecopy, or confirmed electronic mail transmission, addressed as follows:

If to EMD Millipore: EMD Millipore Corporation  
290 Concord Road  
Billerica, MA 01821  
Attn: Vice President, Global Operations  
Fax: (978) 715-1385

with a copy to: EMD Millipore Corporation  
290 Concord Road  
Billerica, MA 01821  
Attn: General Counsel  
Fax: (978) 715-1382

If to Entegris: Entegris, Inc.  
129 Concord Road  
Billerica, MA 01821  
Attn: President & CEO  
Fax: (978) 436-6739

with a copy to: Entegris, Inc.  
129 Concord Road  
Billerica, MA 01821  
Attn: General Counsel  
Fax: (978) 436-6739

or to such electronic mail address as may be specified by an addressee Party to the other Party by one of the other means provided above, or to such other address, telecopy number or electronic mail address as may be specified by an addressee Party to the other by one of the means provided above.

- 11.3. Force Majeure.** The obligations of a Party under this Agreement will be suspended to the extent that it is wholly or partially precluded from complying with its obligations under this Agreement by force majeure. Force majeure includes, but is not restricted to, fire, storm, flood, earthquake, explosion, accident, act of the public enemy, war, rebellion, insurrection, sabotage, epidemic, quarantine restriction, Equipment breakdown or capacity limitation, labor dispute, labor shortage, transportation embargo or failure or delay in transportation, act of God, act (including laws, regulations, disapprovals or failure to approve) of any government agency, whether national, municipal, or otherwise. During the existence of any such force majeure condition, the affected Party shall nevertheless use its best efforts to remove the cause thereof.
- 11.4. Entire Agreement.** This Agreement, including Exhibits A, B, C and D, together with any annexes and Attachments 1 and 2 attached hereto, is the entire agreement between the Parties with respect to the subject matter hereof, and supersedes any prior negotiations and agreements or understandings and any contemporaneous oral agreements or understandings with respect to the subject matter hereof.
- 11.5. Governing Law.** This Agreement shall be construed in accordance with and all Disputes hereunder shall be governed by the laws of the Commonwealth of Massachusetts as applied to transactions taking place wholly within Massachusetts between Massachusetts residents. The Superior Court of Middlesex County and/or the United States District Court for the District of Massachusetts shall have jurisdiction and venue over all Disputes between the parties that are permitted to be brought in a court of law pursuant to Section 10 above.
- 11.6. Counterparts.** This Agreement and the Exhibits and Attachments hereto and the other documents referred to herein, may be executed in counterparts, each of which shall be deemed to be an original but all of which shall constitute one and the same agreement.
- 11.7. Binding Effect; Assignment.** This Agreement shall inure to the benefit of and be binding upon the Parties hereto and their respective legal representatives and successors, and nothing in this Agreement, express or implied, is intended to confer upon any other person any rights or remedies of any nature whatsoever under or by reason of this Agreement. Neither Party may assign this Agreement or any rights or obligations hereunder, without the prior written consent of the other Party, and any such assignment shall be void. Notwithstanding the foregoing, either Party may assign this Agreement and all (but not less than all) of its rights and obligations hereunder to a purchaser or transferee of, or other successor to, substantially all of its business.
- 11.8. Severability.** If any term or other provision of this Agreement or the Exhibits or Attachments attached hereto is determined by a court, administrative agency or arbitrator to be invalid, illegal or incapable of being enforced by any rule of law or public policy, all other conditions and provisions of this Agreement shall nevertheless remain in full force and effect so long as the economic or legal substance of the transactions contemplated hereby is not affected in any manner materially adverse to either party. Upon such determination that any term or other provision is invalid, illegal or incapable of being enforced, the Parties hereto shall negotiate in good faith to modify this Agreement so as to effect the original intent of the Parties as closely as possible in an acceptable manner to the end that transactions contemplated hereby are fulfilled to the fullest extent possible.
- 11.9. Failure or Indulgence Not Waiver; Remedies Cumulative.** No failure or delay on the part of either Party hereto in the exercise of any right hereunder shall impair such right or be construed to be a waiver of, or acquiescence in, any breach of any representation, warranty or agreement herein, nor shall any single or partial exercise of any such right preclude other or further exercise thereof or of any other right. All rights and remedies existing under this Agreement or the Exhibits and Attachments attached hereto are cumulative to, and not exclusive of, any rights or remedies otherwise available.

- 11.10. Amendment.** No change or amendment will be made to this Agreement or the Exhibits or Attachments attached hereto except by an instrument in writing signed on behalf of each of the Parties.
- 11.11. Authority.** Each of the Parties hereto represents to the other that **(a)** it has the corporate or other requisite power and authority to execute, deliver and perform this Agreement, **(b)** the execution, delivery and performance of this Agreement by it have been duly authorized by all necessary corporate or other actions, **(c)** it has duly and validly executed and delivered this Agreement, and **(d)** this Agreement is a legal, valid and binding obligation, enforceable against it in accordance with its terms subject to applicable bankruptcy, insolvency, reorganization, moratorium or other similar laws affecting creditors' rights generally and general equity principles.
- 11.12. Interpretation.** The headings contained in this Agreement or in any Exhibit hereto are for reference purposes only and shall not be conclusive as to the meaning or interpretation of this Agreement. When a reference is made in this Agreement to a Section, Exhibit or Attachment, such reference shall be to a Section, Exhibit or Attachment of this Agreement unless otherwise indicated.
- 11.13. Exhibits.** This Agreement includes the following Exhibits and Attachments, each of which together with any annexes thereto constitutes an integral component part of this Agreement:
- Exhibit A.** Membranes Covered by Agreement
  - Exhibit B** Lease Terms including Diagram A
  - Exhibit C** The Supplement
  - Exhibit D** Qualification Stages and Tests
  - Attachment 1** List of EMD Millipore Equipment
  - Attachment 2** List of Entegris Equipment

**IN WITNESS WHEREOF**, the Parties hereto have caused this Agreement to be executed by their duly authorized representatives effective as of the Effective Date.

**EMD MILLIPORE CORPORATION**

**ENTEGRIS, INC.**

By: /s/ Christos Ross.

Name: Christos Ross

Title: Senior V.P., Head of Operations

By: /s/ Bertrand Loy.

Name: Bertrand Loy

Title: President and Chief Executive Officer

## EXHIBIT A FLAT SHEET UPE Membranes Covered By Agreement

Membrane	Description	Note
<b>EMD Millipore Flat Sheet UPE Membranes</b>		
UPDP	0.65 um phobic UPE	With Interleaf; Manufactured by Entegris for EMD Millipore use and resale; price determined in accordance with any annex hereto or as otherwise agreed in writing by the Parties
UPHP00000	0.45 um phobic, thick UPE	With Interleaf; Manufactured by Entegris for EMD Millipore use and resale; price determined in accordance with any annex hereto or as otherwise agreed in writing by the Parties
UPGP000HC	0.2 um phobic, thick UPE	With Interleaf; Manufactured by Entegris for EMD Millipore use and resale; price determined in accordance with any annex hereto or as otherwise agreed in writing by the Parties
UPVP00000	0.1 um phobic, thick UPE	Manufactured by Entegris for EMD Millipore use and resale; price determined in accordance with any annex hereto or as otherwise agreed in writing by the Parties
UPZP000HC	0.05 um phobic, thick UPE	With Interleaf; Manufactured f by Entegris for EMD Millipore use and resale; price determined in accordance with Annex any annex hereto or as otherwise agreed in writing by the Parties
<b>Entegris Flat Sheet UPE Membranes</b>		
UPBP00000	1.0 um phobic, thick UPE	Manufactured by Entegris for its own use and resale
DOHP00000	0.65 um phobic, thick UPE	Manufactured by Entegris for its own use and resale
UPHP000NI	0.45 um phobic, thick UPE	Manufactured by Entegris for its own use and resale
UPGP00000	0.2 um phobic, thick UPE	Manufactured by Entegris for its own use and resale
UPVP00000	0.1 um phobic, thick UPE	Manufactured by Entegris for its own use and resale
UPVP000HF	0.1 um phobic, thick UPE	Manufactured by Entegris for its own use and resale
UPZP00000	0.05 um phobic, thick UPE	Manufactured by Entegris for its own use and resale
GOHT	0.25 um phobic UPE	Manufactured by Entegris for its own use and resale
TPGP00000	0.2 um phobic, thin UPE	Manufactured by Entegris for its own use and resale
VOHT	0.15 um phobic UPE	Manufactured by Entegris for its own use and resale
TPVP00000	0.1 um phobic, thin UPE	Manufactured by Entegris for its own use and resale
ZOHT	0.05 um phobic UPE	Manufactured by Entegris for its own use and resale
TPZP00000	0.05 um phobic, thin UPE	Manufactured by Entegris for its own use and resale
TPLP	0.04 um phobic, thin UPE	Manufactured by Entegris for its own use and resale
TPYP00000	<b>0.03 um phobic, thin UPE</b>	Manufactured by Entegris for its own use and resale
TPXP00000	<b>0.02 um phobic, thin UPE</b>	Manufactured by Entegris for its own use and resale
TPTP00000	<b>0.01 um phobic, thin UPE</b>	Manufactured by Entegris for its own use and resale
APAP	<b>0.005 um phobic, Asym. UPE</b>	Manufactured by Entegris for its own use and resale



APKP	0.003 um phobic, Asym. UPE	Manufactured by Entegris for its own use and resale
APTP	0.01 um phobic, Asym. UPE	Manufactured by Entegris for its own use and resale
APYP	0.03 um phobic, Asym. UPE	Manufactured by Entegris for its own use and resale
APAPC	<b>0.005 um phobic, Asym. Clean UPE</b>	Manufactured by Entegris for its own use and resale
APKPC	0.003 um phobic, Asym. Clean UPE	Manufactured by Entegris for its own use and resale
APTPC	0.01 um phobic, Asym. Clean UPE	Manufactured by Entegris for its own use and resale
APYPC	0.03 um phobic, Asym. Clean UPE	Manufactured by Entegris for its own use and resale

Entegris Treated Flat Sheet UPE Membranes

JOTD00000	0.25 um Charged, philic UPE	Manufactured by Entegris for its own use and resale
WOTD00000	0.15 um Charged, philic UPE	Manufactured by Entegris for its own use and resale
ZOTD00000	0.05 um Charged, philic UPE	Manufactured by Entegris for its own use and resale
WOTN00000	0.15 um Charged, neutral UPE	Manufactured by Entegris for its own use and resale
VOTN00000	0.10 um Charged, neutral UPE	Manufactured by Entegris for its own use and resale
ZOTN00000	0.05 um Charged, neutral UPE	Manufactured by Entegris for its own use and resale
LOTN00000	0.04 um Charged, neutral UPE	Manufactured by Entegris for its own use and resale
JETA00000	0.25 um anionic UPE	Manufactured by Entegris for its own use and resale
WETA00000	0.15 um anionic UPE	Manufactured by Entegris for its own use and resale
ZETA00000	0.05 um anionic UPE	Manufactured by Entegris for its own use and resale
LETA00000	0.04 um anionic UPE	Manufactured by Entegris for its own use and resale
ZOTAM0000	<b>0.05 um PCM modified UPE</b>	Manufactured by Entegris for its own use and resale
ZOTN00000	PCM modified UPE	Manufactured by Entegris for its own use and resale
YOTAM0000	0.02 um PCM modified UPE	Manufactured by Entegris for its own use and resale

Other Entegris Treated Flat Sheet Membranes

TATA00000	0.01 um Thin Philic UPE	Manufactured by Entegris for its own use and resale
LFPA	0.02 um Philic Membrane	Manufactured by Entegris for its own use and resale
LFPP	0.02 um Philic Membrane	Manufactured by Entegris for its own use and resale

## EXHIBIT B

### Lease Terms

1. EMD Millipore hereby leases to Entegris, and Entegris hereby leases from EMD Millipore, the areas within Buildings “C”, “D” and “F” of EMD Millipore’s Ashby Rd. Plant, as more specifically described and shown in Diagram A upon the terms set forth in this Exhibit B (collectively, the “Lease Terms”), as such areas may be added to, reduced or substituted for as provided in these Lease Terms (the “Premises”), including as specifically set forth in Section 3.3 of these Lease Terms, solely for purposes of its manufacture of Flat Sheet UPE Membranes, warehousing of raw materials and components used in such manufacture, and storage Entegris equipment located in the Premises on the Effective Date and for no other purposes except as EMD Millipore may specifically authorize in its sole discretion. Capitalized terms not otherwise defined in these Lease Terms shall have the meanings assigned to them in the Agreement.
2. The Lease of the Premises shall commence as of the Effective Date and continue through the end of the Term of this Agreement, or until such time as Entegris has removed all Entegris Equipment from the Premises in accordance with the terms of Section 7.2 of this Agreement.
3. Entegris shall pay to EMD Millipore rent/occupancy charges for the Premises (“Rent”) as follows:
  - 3.1 During the Term Rent shall be at the rate per square foot of the Premises specified on any annex hereto or as otherwise agreed in writing by the Parties, subject to reduction under certain circumstances during the Second Period as specified on any annex hereto or as otherwise agreed in writing by the Parties. Rent shall be payable by Entegris monthly on or before the fifth day of each month.
  - 3.2 It is acknowledged and agreed that in the event that the square footage of the Premises is adjusted during the Term as a result of a shift of production as provided in this Agreement or pursuant to Section 3.3 of these Lease Terms, the corresponding Rent due to EMD Millipore shall be adjusted accordingly.
  - 3.3 The parties acknowledge that implementation of the Manufacturing Transfer will likely result in decreasing production by Entegris at the Premises during the Term and therefore commensurate reductions in Entegris’ need for the full original Premises. Accordingly, at least ten (10) days prior to the end of any month during which Entegris believes it has vacated any portion of the Premises, Entegris will notify EMD Millipore of such occurrence in writing, such notice to include with reasonable specificity the portion of the Premises vacated and the square footage proposed to be surrendered. Upon receipt of the notice, EMD Millipore will promptly review in good faith with Entegris the vacated portion of the Premises to confirm that such space has been vacated and, to the extent applicable, complies with Section 7.6 of these Lease Terms with respect to the condition of the portion of vacated Premises. Upon the Parties’ mutual agreement of the actual surrender and the square footage affected, the parties will agree on the revised square footage of the Premises and amend Diagram A to reflect such reduced square footage, to be effective for the ensuing month for purposes of calculating Rent pursuant to Sections 3.1 and 3.2 of these Lease Terms thereafter until any further reductions occur.
4. At all times during the Term, those employees or consultants of Entegris that are involved regularly or from time to time in the manufacture of Flat Sheet UPE Membranes and reasonably need access to the Premises for such purposes, and that are not objectionable to EMD Millipore in its sole reasonable discretion, (“Entegris Permitted Persons”) shall have access to the Premises for the purposes of manufacturing of Flat Sheet UPE Membranes and Treated Flat Sheet UPE Membranes and warehousing of raw materials and components used in such manufacture, including reasonable ingress to and egress from the Premises through other parts of EMD Millipore’s facility at 80 Ashby Road. To the extent that EMD Millipore believes in its sole reasonable discretion that an individual or individuals are objectionable and hence prohibited from entering the Premises, it shall provide Entegris a written summary of the reasons for, and basis of, such belief within three (3) days of notifying Entegris of such a determination. Without limiting the generality of the foregoing, EMD Millipore shall provide security badges to such Entegris Permitted Persons enabling their entry to the Premises. Entegris agrees to provide an initial list of proposed Entegris Permitted Persons to EMD Millipore’s facilities personnel (as shall be identified to Entegris by EMD Millipore) promptly after the execution of this Agreement, and to promptly update such list from time to time as necessary with any additions or deletions. In addition, Entegris Permitted Persons shall be, to the same extent, on the same terms, and subject to the same rules and restrictions, as provided to EMD Millipore employees in general, (i) provided access to and use of restrooms, parking areas, driveways and footways, other common areas reasonably necessary to be used by such Entegris Permitted Persons, and conference rooms as reasonably necessary for meetings relating to UPE Membranes manufacture, and (ii) permitted reasonable use of mailroom services, telephone and voicemail systems, information services, fax, copy

machines, cafeteria/refreshment services, and the like. Without limiting the generality of the parties' respective obligations of confidentiality and non-use as described in this Agreement, Entegris hereby agrees that any Confidential Information of EMD Millipore that the Entegris Permitted Persons gain access to as a result of their presence in EMD Millipore's facility shall be subject to strict obligations of confidentiality and non-use as provided in, and subject to the limitations and other provisions of, Section 9.3 of the Agreement.

5. EMD Millipore shall have the right, upon at least twenty-four (24) months written notice to Entegris, to relocate all or any portion of the Premises to any other location of comparable size and utility within its 80 Ashby Road facility. The parties shall cooperate in enabling any such relocation to occur in a coordinated manner so as to minimize interruption both to Entegris' manufacturing activities hereunder and EMD Millipore manufacturing and other activities at such facility. EMD Millipore shall reimburse Entegris for all reasonable and substantiated costs incurred by Entegris in connection with any such relocation. The definition of the "Premises" shall be modified to include any such relocated space.
6. Entegris shall comply with all federal, state or local statutes, ordinances, codes, rules, regulations, orders and decrees ("Laws") applicable to the conduct of its business on the Premises. Entegris shall not cause or permit any hazardous substances to be transported to or from, brought upon, kept, stored or used in or about the Premises by, its agents, employees, contractors or invitees, except for such hazardous substances as are reasonably necessary in the performance of the activities permitted under this Agreement. Any hazardous substance permitted pursuant to the foregoing sentence and all containers therefore shall be used, kept, stored, transported and disposed of in a manner that strictly complies with all applicable Laws relating thereto as now or at any time hereafter during the Term may be in effect. Except as may be otherwise agreed between the Parties in writing, during the Term responsibility for regulatory, health, safety and environmental compliance, as well as hazardous and solid waste disposal, generated by Entegris' use of the Premises and Entegris' manufacture of Flat Sheet UPE Membranes shall be allocated in accordance with Section 4 of the Supplement.

## 7. Repairs and Alterations; Condition of Premises

- 7.1 Entegris agrees that it shall, throughout the Term, maintain the Premises in good and operable repair and in such condition as may be required by any laws, ordinances, regulations or requirements of any public authorities having jurisdiction and shall not permit or allow to remain any waste or damage to any portion of the Premises, except as may be permitted herein, provided, however, that EMD Millipore shall be responsible for maintaining, keeping in good repair and, if necessary, replacing the foundation, the exterior and interior walls, the roof, floors and ceilings, the heating, ventilating and air-conditioning system, all utility systems (including water, gas, electricity, drainage, and sewerage), conduits, fixtures and equipment, all meters and all other fixtures and equipment within or appurtenant to the Premises; provided, further, that Entegris shall promptly reimburse EMD Millipore, as additional Rent, for the cost of any such maintenance, repair or replacement to the extent necessitated or occasioned by any omission, negligence, fault or act of Entegris, its partners, officers, employees, agents, independent contractors or invitees; provided, however, that any maintenance, repair or replacement necessitated by fire or other casualty shall be subject to the provisions of Section 10 below. Entegris' maintenance of the Premises shall include, without limitation, cleaning the Premises regularly. If Entegris fails to perform such maintenance, within fifteen (15) days after written notice from EMD Millipore (or as promptly as practicable if Entegris' failure to make such repairs or replacements or perform such maintenance constitutes an emergency or poses a threat to persons or property), then EMD Millipore may elect to make the same at Entegris' cost (without creating any obligation on behalf of EMD Millipore to do so). If EMD Millipore fails to perform, or commence performance of, any maintenance, replacement or repair for which it is obligated under these Lease Terms within fifteen (15) days after written notice from Entegris (or as promptly as practicable if EMD Millipore's failure to make such repairs or replacements or perform such maintenance constitutes an emergency or poses a threat to persons or property), then Entegris may elect to make the same at EMD Millipore's cost (without creating any obligation on behalf of Entegris to do so).
- 7.2 Entegris agrees that it will not make any installations, alterations, additions or improvements to or upon the Premises (including without limitation the installation of signs) without the prior written consent of EMD Millipore, which consent shall not be unreasonably withheld, conditioned or delayed if such installations, alterations, additions or improvements are reasonably consistent with the permitted use of the Premises hereunder; provided, however, that if any proposed installations, alterations, additions or improvements, in EMD Millipore's reasonable judgment, are either unlikely to be of use to EMD Millipore after the termination of the Agreement or are likely to be expensive or difficult to remove, then EMD Millipore may require Entegris to remove such installations, alterations, additions or improvements at the expiration or earlier termination of the Term. Upon completion of any installations, alterations, additions or improvements to the Premises, Entegris shall provide EMD Millipore with a copy of any plans and specifications (or similar drawings) prepared for Entegris in connection therewith; if Entegris is required to submit plans and specifications which have been prepared by a licensed civil engineer or architect in order to obtain a building permit for any such installations, alterations, additions or improvements, then upon completion of such

installations, alterations, additions or improvements, Entegris shall provide EMD Millipore with a copy of the plans and specifications which have been stamped as appropriate by such licensed civil engineer or architect, as appropriate.

- 7.3 All work on or at the Premises for which Entegris is responsible or permitted to perform under these Lease Terms shall be performed at Entegris' cost and only by contractors and subcontractors approved in writing by EMD Millipore, which approval shall not be unreasonably withheld. Entegris shall cause all contractors and subcontractors to procure and maintain insurance coverage naming EMD Millipore as an additional insured against such risks, in such amounts and with such companies as EMD Millipore may reasonably require. Entegris agrees that it will procure, at its sole cost and expense, all necessary permits before making any repairs, installations, alterations, additions, improvements or removals. EMD Millipore agrees that it will reasonably cooperate with Entegris, at no out-of-pocket cost to EMD Millipore in obtaining any permits, licenses or approvals related to the Premises. Entegris agrees (a) that all repairs, installations, alterations, improvements or removals done by or on behalf of Entegris (including without limitation the installation of signs) shall be done in a good and workmanlike manner in conformity with all applicable laws, ordinances and regulations of all public authorities (and Entegris shall be responsible for any additional installations or improvements required by any such laws, ordinances or regulations as a result of any repairs, installations, alterations, improvements or renewals done by or on behalf of Entegris) and all insurance inspection or rating bureaus having jurisdiction, (b) that the structure of the buildings in which the Premises are located or the operations in any other party in such buildings will not be endangered or impaired as a result of any such repairs, installations, alterations, improvements or removals done by or on behalf of Entegris, and (c) that Entegris will repair any and all damage caused by or resulting from any such repairs, installations, alterations, additions, improvements or removals, including, without limitation, the filling of holes. Entegris agrees to save EMD Millipore harmless from, and indemnify EMD Millipore against, any and all claims by third parties for injury, loss or damage to persons or property to the extent caused by or resulting from the doing of any such repairs, installations, alterations, improvements or removals by or on behalf of Entegris. Entegris agrees to pay promptly when due all charges for labor and materials in connection with any work done by Entegris or anyone claiming under Entegris upon the Premises so that the Premises and all such buildings shall at all times be free of liens in respect of such labor and materials. If such a lien is filed, then Entegris shall immediately, after EMD Millipore has delivered written notice of the filing thereof to Entegris, either pay the amount of the lien or diligently contest such lien. If Entegris fails to timely take either such action, and after written notice to Entegris of its intention to do so, then EMD Millipore may pay the amount of the lien, and any amounts so paid, including expenses and interest, shall be paid by Entegris to EMD Millipore immediately after EMD Millipore has invoiced Entegris therefor, and until paid, such amount shall be additional Rent.
- 7.4 EMD Millipore may in its discretion and at its own cost, but shall not be obligated to, make repairs, installations, alterations, additions or improvements to the Premises at any time during the Term as it determines necessary or appropriate, provided that no such work will be done if it will materially adversely impact Entegris' use of the Premises, unless EMD Millipore will have previously made accommodations to eliminate or minimize such adverse impact and reasonable advance written notice has been given to Entegris.
- 7.5 Entegris acknowledges that the Premises are being leased in their "AS IS" condition as of the Effective Date and that no warranties or representations, express, implied or statutory, have been made by EMD Millipore or any agent, employee or representative of EMD Millipore to Entegris, as to condition (environmental or otherwise), compliance with law, or fitness or suitability for any purpose other than as hereinafter set forth, all of which are expressly disclaimed. EMD Millipore agrees that if at any time during the Term the Premises are altered by an act or omission of EMD Millipore (other than as specifically permitted in Section 5 of these Lease Terms) such that Entegris is not reasonably able to conduct such manufacturing and warehouse operations in substantially the manner in which it had been conducting such operations prior to the Effective Date, that circumstance shall constitute a material breach by EMD Millipore of its obligations under this Agreement and that Entegris may then terminate this Agreement upon written notice to EMD Millipore. Entegris acknowledges that except as set forth herein, Entegris has not been induced or persuaded by, nor has Entegris relied upon, any statement, promise or representation made by EMD Millipore or any agent, employee or representative of EMD Millipore, orally or in writing, as an inducement to entering into this Agreement including, without limitation, those relating to land use, zoning, hazardous or toxic wastes or other environmental matters.
- 7.6 At the expiration or earlier termination of the Term Entegris shall surrender all keys to the Premises, remove all its furnishings, fixtures, equipment (including the Entegris Equipment, subject to any provisions in this Agreement to the contrary) and other personal property now or hereafter located in the Premises, purchased or leased by Entegris with its own funds, which are not affixed to the buildings in which the Premises are located. Entegris may also so remove any furnishings, fixtures, equipment which are affixed to buildings in which the Premises are located if EMD Millipore has agreed to such removal in writing. Entegris shall repair all damage caused by any such removal, and yield up the Premises broom-clean and in the same good order and repair in which Entegris is obliged to keep and maintain the Premises by the provisions of these Lease Terms. Any property not so removed shall be deemed abandoned and may be retained by EMD Millipore or may be removed and disposed of by EMD Millipore in such manner as EMD Millipore shall determine and Entegris shall pay EMD Millipore the d

irectly related and reasonable cost and expense incurred by EMD Millipore in effecting such removal and disposition and in making any incidental repairs and replacements to the Premises.

## 8. Indemnity

- 8.1 Entegris agrees that during the Term and for such further time as Entegris shall occupy or hold the Premises or any part thereof, EMD Millipore shall not be liable to Entegris and Entegris shall defend (with counsel reasonably acceptable to EMD Millipore), indemnify, and hold EMD Millipore, its officers, directors, agents, employees, independent contractors, and invitees harmless from and against any and all liability for all injuries, losses, accidents or damage to any person or property, and from all claims, actions, proceedings and costs in connection therewith, including reasonable counsel fees, to the extent arising from (a) any act, omission, fault or negligence of Entegris, its officers, directors, agents, employees, independent contractors, licensees, or invitees, and relating to the presence of any of the foregoing persons or of Entegris' operations on the Premises or anywhere at the 80 Ashby Road facility.
- 8.2 EMD Millipore agrees that during the Term and for such further time as Entegris shall occupy or hold the Premises or any part thereof pursuant to a reasonable claim of right, Entegris shall not be liable to EMD Millipore and EMD Millipore shall defend (with counsel reasonably acceptable to Entegris), indemnify, and hold Entegris, its officers, directors, agents, employees, independent contractors, and invitees harmless from and against any and all liability for all injuries, losses, accidents or damage to any person or property, and from all claims, actions, proceedings and costs in connection therewith, including reasonable counsel fees, to the extent arising from any act, omission, fault or negligence of EMD Millipore, its officers, directors, agents, employees, independent contractors, licensees, or invitees and relating to the presence of any of the foregoing persons on the Premises or relating to EMD Millipore's operations on the Premises or anywhere at the 80 Ashby Road facility.
- 8.3 Each of EMD Millipore and Entegris hereby releases and waives any claim it might have against the other for any loss or damage caused by theft, destruction, fire or any other casualty, regardless of whether such loss or damage shall be brought about by the fault or negligence of the other party or its agents, to the extent the same (a) is insured against under any insurance policy that covers the Premises or the buildings in which the Premises are located, EMD Millipore's or Entegris' fixtures, personal property, leasehold improvements or business, or (b) is required to be insured against under the terms hereof, it being understood and agreed that the waiving party reserves any rights with respect to any excess loss or injury over the amount recovered on account of such insurance. Each of EMD Millipore and Entegris agrees to cause its insurance carrier to endorse all applicable policies waiving the carrier's rights of recovery under subrogation or otherwise against the other party.
- 8.4 In addition to its obligations under Section 8.2, EMD Millipore agrees that Entegris shall not be liable to EMD Millipore and EMD Millipore shall defend (with counsel reasonably acceptable to Entegris), indemnify, and hold Entegris, its officers, directors, agents, employees, independent contractors, and invitees harmless from and against any and all liability for all injuries, losses, accidents or damage to any person or property, and from all claims, actions, proceedings and costs in connection therewith, including reasonable counsel fees, arising from any release of hazardous waste by EMD Millipore or its employees or agents in the Premises, only to the extent not caused by Entegris or its employees or agents.
- 8.5 In addition to its obligations under Section 8.1, Entegris agrees that EMD Millipore shall not be liable to Entegris and Entegris shall defend (with counsel reasonably acceptable to EMD Millipore), indemnify, and hold EMD Millipore, its officers, directors, agents, employees, independent contractors, and invitees harmless from and against any and all liability for all injuries, losses, accidents or damage to any person or property, and from all claims, actions, proceedings and costs in connection therewith, including reasonable counsel fees, arising from any release of hazardous waste by Entegris or its employees or agents in the Premises, only to the extent not caused by EMD Millipore or its employees or agents.

## 9. Insurance

- 9.1 During the Term, EMD Millipore shall maintain all risk property insurance in an amount at least equal to the replacement cost of (a) the buildings in which the Premises are located and (b) EMD Millipore property and equipment inside those buildings (excluding Entegris' personal property and any alterations, installations, additions or improvements made to such buildings by Entegris). Such insurance may be maintained under a blanket policy covering the Premises and other real estate of EMD Millipore or its affiliated business organizations. The policies of such insurance may be payable in case of loss to the holders of any mortgages upon such buildings or the 80 Ashby Road facility as their interests may appear. Entegris shall be named as an additional insured on such EMD Millipore property insurance, as its interests may appear. Certificates of insurance evidencing all such coverages and Entegris additional insured status for the foregoing shall be supplied to Entegris promptly upon execution of this Agreement and as such policy(ies) renew or are changed.
- 9.2 During the Term, Entegris will maintain at its own expense comprehensive general liability insurance, including umbrella coverage, with respect to the Entegris Equipment and its operations on the Premises, naming EMD Millipore as additional insured, in amounts which shall, as of the Effective Date, be not less than Five Million Dollars (\$5,000,000.00) with respect to injuries to any one person and not less than Five Million Dollars (\$5,000,000.00) with respect to injuries suffered in any

one accident, and not less than Five Million Dollars (\$5,000,000.00) with respect to property damage liability. From time to time during the Term, EMD Millipore shall have the right in its reasonable discretion to require that the limits of such insurance coverage be increased, provided however, that such increases shall be in accordance with limits that are customarily carried in the metropolitan Boston area on property similar to the Premises used for similar purposes.

- 9.3 During the Term, Entegris shall maintain workers compensation insurance covering all of Entegris' employees in such coverage amounts as required by law and employer's liability insurance in an amount of at least Five Hundred Thousand Dollars (\$500,000.00). During the Term, Entegris shall maintain all risk property insurance in an amount at least equal to the replacement cost of Entegris' personal property on the Premises and any other alterations, installations, additions or improvements made to the Premises by Entegris. Said replacement cost for Entegris property shall be clearly delineated and summarized promptly upon execution of this Agreement, at each renewal/change of said Entegris property policies, or at any other point of significant change in magnitude of Entegris properties on EMD Millipore Premises. During the Term Entegris shall maintain comprehensive automobile liability insurance in an amount of at least Five Hundred Thousand Dollars (\$500,000.00) per person and per accident for bodily injury, and of at least One Hundred Thousand Dollars (\$100,000) per accident for property damage. EMD Millipore shall be named as an additional insured on the foregoing Entegris employer's liability, property, and automobile liability insurances, as its interests may appear. Certificates of insurance evidencing all such coverages and EMD Millipore additional insured status for the foregoing and for comprehensive general liability and umbrella liability coverages shall be supplied to EMD Millipore promptly upon execution of this Agreement and as any policies renew or are changed.
- 9.4 All policies of insurance obtained by Entegris pursuant to the terms of this Lease shall be issued by insurance companies reasonably acceptable to EMD Millipore and authorized to do business in the Commonwealth of Massachusetts. All such policies shall provide for no less than thirty (30) days prior notice to EMD Millipore and any mortgagee of the Premises of their commencement or cancellation. Within ten (10) days after execution of this Agreement, Entegris shall deliver to EMD Millipore certificates thereof. Entegris shall also deliver to EMD Millipore each renewal certificate thereof as soon as is reasonably practicable after receiving request therefore by any mortgage lender of EMD Millipore and at least fifteen (15) days prior to the expiration of the policy it renews. If Entegris fails to obtain and maintain any insurance policies required to be obtained and maintained by Entegris pursuant to Section 9.2 or 9.3 of these Lease Terms, then, after written notice to Entegris of its intention to do so and notification from Entegris of its unwillingness or inability to acquire such insurance coverages, EMD Millipore may obtain and maintain such insurance policies (without creating any obligation on behalf of EMD Millipore to do so), and Entegris shall pay to EMD Millipore the cost thereof within ten (10) days after EMD Millipore has invoiced Entegris therefor, and until paid, such amount shall be additional Rent.

#### 10. Casualty or Taking

- 10.1 In the event that the Premises, or more than 25% thereof, shall be taken by any public authority or for any public use, or shall be destroyed or damaged by fire or casualty, or by the action of any public authority, and the same cannot, in EMD Millipore's reasonable judgment, be restored within 180 days from such taking or casualty, or if in Entegris' reasonable judgment, such circumstance would prevent it from continuing the conduct of its manufacturing operations at the Premises substantially in the manner contemplated under this Agreement, then this Agreement may be terminated at the election of either EMD Millipore or Entegris. Such election shall be made by either Party, by the giving of notice to the other Party within thirty (30) days following such taking or casualty.
- 10.2 If neither EMD Millipore nor Entegris exercises said election, this Agreement shall continue in force and a just proportion of the Rent reserved, as mutually agreed between the Parties, according to the nature and extent of the damages sustained by the Premises, shall be suspended or abated until the Premises, or what may remain thereof, shall be put by EMD Millipore in proper condition for use and otherwise restored to its former condition or the substantial equivalent, which EMD Millipore covenants to do with reasonable diligence to the extent permitted by the net proceeds of insurance recovered or damages awarded for such taking, destruction or damage and subject to zoning and building laws or ordinances then in existence. "Net proceeds of insurance recovered or damages awarded" refers to the gross amount of such insurance or damages less the reasonable expenses of EMD Millipore in connection with the collection of the same, including without limitation, fees and expenses for legal and appraisal services. If the Premises are not so restored to its former condition or the substantial equivalent within one-hundred eighty (180) days from such taking or casualty described in Section 10.1 of these Lease Terms, this Agreement may be terminated by Entegris upon thirty (30) days prior written notice to EMD Millipore but only if such restoration is not completed prior to the expiration of the 30 day notice period.

#### 11. Defaults and Remedies

- 11.1 Events of Default. If Entegris shall default in the performance of any of its obligations to pay the Rent hereunder and if such default shall continue for thirty (30) days after written notice from EMD Millipore designating such default, or if within thirty (30) days after written notice from EMD Millipore to Entegris specifying any other default or defaults and Entegris has not then commenced diligently to correct the default or defaults so specified, then, and in either of such events, EMD Millipore

and the agents and servants of EMD Millipore lawfully may, (in addition to and not in derogation of any remedies for any preceding breach of covenant), immediately or at any time thereafter and after demand and notice and without process of law enter into and upon the Premises or any part thereof or mail a notice of termination addressed to Entegris, and repossess the same as EMD Millipore's former estate and expel Entegris and those claiming through or under Entegris and remove its and their effects without being deemed guilty of any manner of trespass and without prejudice to any remedies which might otherwise be used for arrears of rent or prior breach of covenant, and upon such entry or mailing as aforesaid this Agreement shall terminate, and EMD Millipore, with notice to Entegris, may store Entegris' effects, and those of any person claiming through or under Entegris at the expense and risk of Entegris.

- 11.2 EMD Millipore may, but shall not be obligated to, cure, at any time, following the expiration of the applicable cure period as set forth in Section 11.1 except in cases of emergency when no notice shall be required, any material default by Entegris under these Lease Terms; and whenever EMD Millipore so elects, all direct and reasonable costs and expenses incurred by EMD Millipore, including reasonable attorneys' fees, in curing a material default shall be paid by Entegris to EMD Millipore on demand.
12. At all times during the Term, EMD Millipore reserves the right for its employees or contractors to enter the Premises as it determines necessary or desirable, for purposes of (i) ensuring compliance with this Agreement, (ii) health, safety and environmental compliance, (iii) maintenance or repair as required or permitted under this Agreement, or (iii) other reasonable purposes relating to the Premises or to any areas of its 80 Ashby Road facility other than the Premises, provided in each case that such entry into the Premises does not unreasonably interfere with Entegris' use of the Premises. EMD Millipore shall provide advance notice of such entry to Entegris where reasonably practicable.
13. Entegris shall not, without EMD Millipore's prior written consent, (a) assign, transfer, or encumber this Agreement or any interest therein, whether directly or by operation of law, (b) sublet any portion of the Premises; (c) grant any license, concession or other right of occupancy for any portion of the Premises; or (d) permit the use of the Premises by any parties other than Entegris. The foregoing provisions shall not apply to either (x) transactions with an entity into which Entegris is merged or consolidated or to which all or substantially all of its assets are transferred, or (y) transactions with any entity which controls Entegris or is controlled by Entegris or is under common control with Entegris.
14. Subject to the provisions of these Lease Terms, including but not limited to Section 5 hereof, EMD Millipore covenants and warrants that upon performance by Entegris of its obligations under these Lease Terms, EMD Millipore will keep and maintain Entegris in exclusive, quiet, peaceable, and uninterrupted possession of the Premises during the Term.
15. EMD Millipore shall at all times comply with all laws, orders, ordinances and other public requirements now or hereafter affecting the Premises.
16. Any obligation of either party to indemnify the other party pursuant to these Lease Terms or this Agreement shall be barred or limited to the extent that failure of the Indemnified Party to give prompt notice to the Indemnifying Party of a claim giving rise to such indemnification obligation, or failure of the Indemnified Party to provide the Indemnifying Party with all reasonably necessary assistance and cooperation in connection therewith, prejudices the position of the Indemnifying Party in providing such indemnity hereunder. The Indemnifying Party shall have sole control of the defense with respect to any such claim (including settlement thereof). The Indemnifying Party shall keep the Indemnified Party informed at all times as to the status of the matter and the Indemnifying Party's efforts in connection therewith. The Indemnifying Party shall not settle any such claim whereby the settlement imposes upon the Indemnified Party an obligation to take some action or refrain from doing so, without the prior written consent of the Indemnified Party, which shall not be unreasonably withheld or delayed.
17. Neither Party shall unreasonably withhold or delay its consent with respect to any matter for which such Party's consent is required or desirable under these Lease Terms or this Agreement.

In witness whereof, the Parties set forth their signatures below by their authorized representatives:

**EMD MILLIPORE CORPORATION**

**ENTEGRIS, INC.**

By: /s/ Christos Ross.

Name: Christos Ross

Title: Senior V.P., Head of Operations

By: /s/ Bertrand Loy.

Name: Bertrand Loy

Title: President and Chief Executive Officer



**EXHIBIT C**  
**The Supplement**

**Membrane Manufacturing Operations**

**1. Film 1 Manufacturing Operations**

**1.1.** EMD Millipore retains ownership of the EMD Millipore Equipment including the related processes (financially and operationally). Entegris retains ownership of the Entegris Equipment including the related processes (financially and operationally).

**1.2.** At all times during the Term, EMD Millipore agrees to have **(i)** Film 1 Annealing Line processing capacity sufficient to handle projected volumes Flat Sheet UPE Membrane hereunder of up 1,400 hours per quarter of Entegris operating time, and **(ii)** mix capacity sufficient to handle up to four (4) mixes of 400 pounds each on any days on which Entegris is running its extrusion process on the Premises. EMD Millipore agrees to use commercially reasonable efforts to provide Entegris with additional Film 1 operating time as follows: (i) for the period from the Effective Date through March 31, 2014, a Target quantity of 1,600 hours of Entegris Film 1 operating time per quarter; and (ii) for the period from April 1, 2014 through the end of the Term, a Target total quantity of 1,800 hours of Entegris Film 1 operating time per quarter.

**1.3.** The Film 1 Annealing Line manufacturing process will be staffed by regular EMD Millipore employees when possible and supervised / managed by EMD Millipore. Only regular EMD Millipore employees certified on Film I operations will be rotated into Film I manufacturing operations. Exceptions may include new or contract employees under supervision of an employee certified for Film 1 operation.

**1.4.** Entegris is responsible for technical direction as to all process operating conditions (a la EMD Millipore Product Owner model) for UPE Film 1 manufacturing activities.

**1.5.** Entegris is responsible for UPE process development.

**1.6.** Entegris is responsible for documentation and training for changes to the job content for UPE processing on Film I.

**1.7.** EMD Millipore is responsible for maintaining and repairing Film 1 manufacturing equipment to be in good and efficient working order.

**1.8.** EMD Millipore proposed modifications for non-Entegris UPE membranes that could influence UPE running on Film I process will be subject to mutual agreement.

**1.9.** Priorities during the time when UPE is running on the Film 1 Annealing Line shall be established by Entegris, subject to EMD Millipore's recommendations for run priorities for EMD Millipore Flat Sheet UPE Membranes.

**1.10.** EMD Millipore will give Entegris advance notice of the schedule for pending runs of non-Entegris UPE membranes on Film 1 Annealing Line. This notice would consist of a quarterly schedule with monthly updates.

**1.11.** All of the foregoing obligations of both parties under this Section 1 shall expire on the earlier of (i) the expiration of the Term, or (ii) the date Entegris no longer requires the operation of the Film 1 Annealing Line at the Premises.

**1.12.** EMD Millipore shall have approval authority for any Entegris proposed modifications to Film 1 manufacturing process for Flat Sheet UPE Membranes. The financial impact of those modifications would be mutually agreed upon prior to proceeding.

**2. VMF 4 Manufacturing Operations**

**2.1** At all times during the Term of this Agreement, EMD Millipore agrees to have VMF4 Line capacity sufficient to handle projected volumes of Flat Sheet UPE Membranes that are to be chemically treated to make them hydrophilic using EMD Millipore's VMF4 Line or using EMD Millipore's VMF4 technology, of up to 500 hours of machine time per quarter. The Parties agree to use commercially reasonable efforts to cooperate to increase the efficiency of their respective use of the VMF 4 machine in order to satisfy Entegris' demand within the above specified 500 hours of machine time per quarter.

**2.2.** Entegris will submit its estimated VMF 4 total quarterly requirements prior to the beginning of each quarter including both Entegris production requirements and R&D requirements.

**2.3.** These requirements will be translated by EMD Millipore into an adequate number of production days to meet the quarter's estimated requirements. These days will be identified in a quarterly schedule by EMD Millipore which shall be routinely available to Entegris. Schedule changes during the quarter will be reflected in an update to the quarterly schedule and communicated to Entegris in a timely fashion.

**2.4.** Entegris shall have control of the detailed schedule for operations during these Entegris dedicated days and will, in-turn, provide EMD Millipore with the detailed schedule for the Entegris dedicated days at least one week in advance.

**2.5.** In the event of a high priority urgent need combined with no Entegris time scheduled within an upcoming two week window, Entegris shall be entitled to a 24 hour emergency run on the VMF 4 equipment within the following week. This right is intended only in case of emergency and it is anticipated that this set of circumstances would only come up during times of low Entegris volume on VMF 4.

**2.6.** Entegris shall be entitled to propose corrections to the dedicated operating schedule for the quarter to EMD Millipore; subject to mutual agreement, the schedule of Entegris dedicated days will be revised accordingly for the remainder of the quarter.

**2.7.** Detailed plans for periods of Entegris R&D VMF 4 operations will be submitted in advance to EMD Millipore. Where proposed R&D operations involve extensions of existing chemistries on UPE substrates, this pre-notification would need to be at least one week in advance and will be subject to EMD Millipore's approval. Where proposed R&D operations involve new chemistries or new substrates, Entegris shall advise EMD Millipore of that fact and shall submit any details that EMD Millipore reasonably requests and will be subject to EMD Millipore's approval within one month following the submission. In the event that EMD Millipore does not give its approval, it shall advise Entegris as to the reasons why the proposal was not acceptable in reasonable detail and shall consult with Entegris as to alternatives that might be acceptable.

**2.8.** EMD Millipore will continue to be responsible for planning, procurement and performance of incoming QC of all standard chemicals in support of the Entegris dedicated VMF 4 operating schedule for each quarter. Any non-standard chemicals required for Entegris R&D operations will be provided by Entegris R&D.

**2.9.** Entegris documentation shall govern production of all Entegris RTM'd products. With consultation support from EMD Millipore as may be required, Entegris shall also be responsible for the upgrade and updating of all Entegris documentation and for notification and training of the EMD Millipore Supervisor and Product Owner as designated by EMD Millipore.

**2.10.** VMF 4 operations shall be staffed by regular EMD Millipore employees where possible and supervised /managed by qualified EMD Millipore personnel. VMF 4 operations will always be staffed by at least one employee certified in the operation of VMF 4.

**2.11.** Entegris shall be responsible for UPE process development with respect to hydrophilic membranes.

**2.12.** EMD Millipore shall be responsible for maintaining and repairing all VMF 4 equipment in good and efficient working order.

**2.13.** EMD Millipore shall be responsible for supervision, technical direction and support during the running of standard Entegris production materials and this routine supervision and support, as well as all other services provided pursuant to this Agreement in connection with Membrane manufacture, is included within the rate structure specified in Section 7.3 of the Agreement.

**2.14.** Identified Entegris contact(s) must be available 24 hours per day for technical consultation.

**2.15.** EMD Millipore shall have approval authority with respect to any Entegris proposed modifications to VMF 4 equipment for Treated Flat Sheet UPE Membrane processing. EMD Millipore agrees that proposed modifications to the VMF4 equipment for any Flat Sheet UPE Membrane other than Treated Flat Sheet UPE Membrane processing that could influence the processing of Treated Flat Sheet UPE Membranes on the VMF 4 equipment shall be reviewed with Entegris and shall be subject to mutual agreement.

**2.16.** Entegris may shift production of its membranes to its own hydrophilization machine (to be located at a Entegris location). Any such shifting of production shall not result in a termination of the Agreement , which may be only be terminated in accordance with its terms.

### **3. Minimum Lot Size and Minimum Scrap levels for VMF 4 and Film I Production**

**3.1.** Entegris shall not be responsible for time & materials for unsuccessful VMF 4 campaigns > 3 rolls in duration where phobic membrane is determined not to be the cause, unless Entegris authorizes extending the run beyond three rolls - in which case Entegris will document that authorization in the form of an email or letter.

**3.2.** Entegris shall not be responsible for the cost of time and materials incurred in unsuccessful VMF 4 process runs where it is demonstrated that EMD Millipore failed to adhere to the process documentation and to Entegris' technical directions.

**3.3.** Entegris shall not be responsible for the cost of time and materials incurred in unsuccessful Film 1 process runs where it is demonstrated that EMD Millipore failed to adhere to the process documentation and to Entegris' technical directions.

#### **4. Charges for Machine Usage; Changes**

**4.1.** Entegris agrees to pay for Machine usage hereunder by paying the applicable Machine Hourly Rates specified on any annex hereto or as otherwise agreed in writing by the Parties multiplied times the Machine Usage Hours calculated in accordance with the formula specified any annex hereto or as otherwise agreed in writing by the Parties.

**4.2** Changes to depreciation charges as a result of capital improvements to the Equipment will be reflected in the appropriate work center rates. EMD Millipore and Entegris each agree to inform the other of capital purchases that may affect work center rates hereunder no later than the time that purchase orders for such capital purchases are placed. In the event of a process change to either the Film 1 or VMF4 lines, EMD Millipore shall be responsible for change control management for any impact on EMD Millipore products. Likewise, Entegris would be responsible for change control management for any impact on Entegris products.

#### **5. Revised Responsibilities for Regulatory & HSE Compliance**

##### **5.1 Responsibilities.**

Current responsibilities shall be revised to reflect current operating procedures, including: Entegris has assumed full responsibility for waste disposal in connection with waste generated by the Entegris Equipment. Millipore continues to provide spill control support to ensure prompt response to any emergency situation, however, Entegris is responsible for any follow-up actions that are required as a result of any emergency situation. VMF 4 waste treatment costs continue to be included in VMF 4 rates.

Entegris is solely responsible for the generation, control, compliance and reporting of chemical emissions resulting from its dedicated operations located at the Premises. EMD Millipore is responsible for the generation, control, compliance and reporting of chemical emissions from its operations. Where Entegris products are processed on EMD Millipore Equipment, Entegris and EMD Millipore will work together to ensure compliance with federal, state and local regulations, and conformance with EHS self certifications programs similar to ISO 14001. Furthermore, as dedicated Entegris-owned operations may have a potential impact on the surrounding community, Entegris agrees to continue to make commercially reasonable attempts to lessen the environmental impact of its operations at the Premises and to notify EMD Millipore of any chemical spills, notices of non-compliance or inspections.

##### **5.2 Incident Response.**

Entegris shall notify EMD Millipore of all spills or releases from Entegris operations in the Premises greater than the Reportable Quantity, as defined by the Commonwealth of Massachusetts and Town of Bedford, whichever is less. Entegris is responsible for timely notification and applicable follow up of regulatory agencies, as required by law or best practice. For any such spill or release, Entegris shall ensure a clean up scheme that follows all of the requirements set forth in OSHA 29 CFR 1910.120 - Hazardous Waste Operation and Emergency Response, and the Massachusetts Contingency Plan, 310 CMR 40. In the event of a spill or release from an Entegris process requiring a clean up, Millipore shall provide Entegris with clean-up services using EMD Millipore Corporation's Emergency Response Team. In the event of a spill or release from an Entegris process requiring a clean up using EMD Millipore's Emergency Response Team, EMD Millipore will conduct any cleanup services with the same degree of care it would use to respond to a spill or release from an EMD Millipore process and shall be compensated by Entegris at the rates set forth on any annex hereto or as otherwise agreed in writing by the Parties; provided, that Entegris will compensate EMD Millipore for at least 4 hours in the event of any such incident.

Entegris shall also compensate EMD Millipore for all reasonable and customary costs associated with engaging professional consulting services with respect to any spills or releases from Entegris operations in the Premises, as deemed appropriate by EMD Millipore's corporate EHS department and approved by Entegris' corporate EHS department (such approval not to be unreasonably withheld or delayed, provided that if EMD Millipore reasonably

deems the need for such consulting services urgent, such as an emergency response, and cannot reach an Entegris representative in a timely manner after diligent efforts to obtain Entegris' approval, EMD Millipore may proceed on a limited basis to address such urgent situation without Entegris' prior approval but shall notify Entegris promptly) as a result of the aforementioned spills or releases. Entegris shall also reimburse EMD Millipore for all supplies consumed during the response event. Entegris shall be responsible for appropriate disposal of wastes associated with any clean-up.

Entegris may also contract with a third party that meets the requirements of OSHA 29 CFR 1910.120 - Hazardous Waste Operation and Emergency Response in lieu of using EMD Millipore's Emergency Response Team.

### **5.3 Equipment Operability and Risk Mitigation.**

Entegris shall perform an initial process hazard analysis (hazard evaluation), and proactively manage any subsequent changes, on any process or equipment ("Processes") proposed for installation or use on Millipore managed property. The process hazard analysis shall be completed with current process safety information and be reasonable with respect to the complexity of the Processes and shall identify, evaluate, and mitigate hazards involved in the Processes. Entegris shall conduct and implement the process hazard analysis and a management of change procedure in a manner consistent with OSHA 29 CFR 1910.119 - Process Safety Management and in conjunction and consultation with EMD Millipore's EHS staff. Entegris shall implement all reasonable corrective actions or improvements identified by the process hazard analysis in a timely manner and at its sole expense, in all cases in accordance with applicable regulatory and reasonable EMD Millipore requirements, unless such corrective actions are facility related, in which case such actions will be at the expense of Millipore to the extent not caused by Entegris. Copies of the process hazard analysis, corrective actions and implementation schedules shall be provided to EMD Millipore promptly upon availability. Furthermore, all applicable process safety information will be updated with any change to the process not considered a replacement in kind.

## **6. Entegris Option to Assume Supply Chain Responsibilities**

**6.1.** During the Facility Term, upon six months prior notice to EMD Millipore, Entegris shall have the option to assume responsibility for planning and procurement for all raw materials used in the manufacture of UPE Membranes and Treated Other Entegris Membranes. If Entegris assumes this responsibility, Entegris shall be accountable for un-utilized machine time occurring as a result of raw material availability if Millipore cannot utilize that machine time for any alternative membranes. After the Facility Term, Entegris will have all, and Millipore will have no, responsibility for planning and procurement of any raw materials (other than with respect to VMF4) unless the parties otherwise agree in writing.

**6.2.** Notwithstanding the exercise by Entegris of the option in 6.1, Entegris shall continue to be entitled to contract with EMD Millipore for incoming quality control services.

## **7. Resolution of Technical Issues; Technical Support.**

**7.1.** It is recognized that there are some inconsistencies with respect to visual quality between "Entegris Test Specification #0008393TS" and the EMD Millipore Purchase Specifications as in effect on the Effective Date, the Parties agree to continue discussions to resolve these inconsistencies. Entegris Test Specification #0008393TS and the EMD Millipore Purchase Specifications will be modified and harmonized by mutual agreement of the Parties so as to apply to the functional equivalent of EMD Millipore Flat Sheet UPE Membrane manufactured at the Crosby Drive Plant.

**7.2.** In the event of chronic low yielding runs, Entegris can issue a corrective action request. This request would result in a inter-company meeting(s) to develop a mutually agreed upon corrective action plan within two weeks of the issuance of the request.

**7.3.** EMD Millipore will support this activity with at least one mutually agreed upon representative (usually the Production Supervisor and / or the EMD Millipore Product Owner).

**7.4.** In the event that this vehicle is unsuccessful in resolving the issue, the corrective action team will be supported by additional mutually agreed upon representatives with special expertise from both/either EMD Millipore and Entegris. The cost of Millipore support for this "above and beyond" technical support will be at the technical support rate established in accordance with Section 3.2 of the Agreement.

**7.5.** In accordance with Section 3.2 of the Agreement if EMD Millipore provides extraordinary services or technical support to Entegris or if Entegris provides extraordinary services or technical support to EMD Millipore in each case in the circumstances referred to in Section 3.2, then the Party supplying such extraordinary services or

technical support shall be compensated at the Support Services Rates provided on any annex hereto or other written agreement of the Parties. The Parties further agree that in providing any such extraordinary services or technical support to the other Party hereunder they shall use commercially reasonable efforts to assure that any such extraordinary services or technical support shall be provided in a diligent, competent and professional manner.

**Exhibit D**  
**Qualification Stages and Tests**

**1. Feasibility Evaluation Stage:**

*Objective and Outline of Feasibility Evaluation.* The objective of the Feasibility Evaluation is to permit EMD Millipore to fabricate UPDP type Crosby Membrane and UPHP type Crosby Membrane into sample EMD Millipore products so as to compare the performance of such sample EMD Millipore products with the performance of the same EMD Millipore products made from the corresponding types of EMD Millipore Flat Sheet UPE Membrane manufactured at the Premises. This is a critical evaluation in order to promptly identify and communicate to Entegris any significant performance differences between the EMD Millipore products made from the feasibility sample Crosby Membranes and the EMD Millipore products made from EMD Millipore Flat Sheet UPE Membrane manufactured at the Premises. It is agreed that the feasibility samples delivered by Entegris in accordance with Section 6.3(i) will be the first UPDP type Crosby Membrane and UPHP type Crosby Membrane that meet the Specifications. Entegris will use commercially reasonable efforts to deliver the feasibility samples to EMD Millipore by a Target date of November 15, 2013; EMD Millipore will use commercially reasonable efforts to provide Entegris with performance data yielded by the testing conducted on the feasibility samples by a Target date of thirty (30) days following receipt of the feasibility samples. The validation and qualification testing of the feasibility samples by EMD Millipore shall be conducted pursuant to protocols set forth in any annex hereto or as otherwise agreed in writing by the Parties.

**2. Operational Qualification Stage:**

*Objective and Outline of Operational Qualification.* The objective of the Operational Qualification is to conduct a sensitivity analysis as to the performance of UPDP type Crosby Membrane and UPHP type Crosby Membrane fabricated to be at the extreme ends of the Specification range with respect to two independent criteria included in the Specifications. To that end Entegris will deliver the following operational samples with the indicated characteristics with respect to the specified Specification criteria:

- (a) Ten (10) rolls of UPDP type Crosby Membrane with thickness in the middle of the range required by the Specifications and a bubble point at the *top* of the range required by the Specifications;
- (b) Ten (10) rolls of UPDP type Crosby Membrane with thickness in the middle of the range required by the Specifications and a bubble point at the *bottom* of the range required by the Specifications;
- (c) Ten (10) rolls of UPDP type Crosby Membrane with bubble point in the middle of the range required by the Specifications and a thickness at the *top* of the range required by the Specifications;
- (d) Ten (10) rolls of UPDP type Crosby Membrane with bubble point in the middle of the range required by the Specifications and a thickness at the *bottom* of the range required by the Specifications;
- (e) Six (6) rolls of UPHP type Crosby Membrane with thickness in the middle of the range required by the Specifications and a bubble point at the *top* of the range required by the Specifications;
- (f) Six (6) rolls of UPHP type Crosby Membrane with thickness in the middle of the range required by the Specifications and a bubble point at the *bottom* of the range required by the Specifications;
- (g) Six (6) rolls of UPHP type Crosby Membrane with bubble point in the middle of the range required by the Specifications and a thickness at the *top* of the range required by the Specifications;
- (h) Six (6) rolls of UPHP type Crosby Membrane with bubble point in the middle of the range required by the Specifications and a thickness at the *bottom* of the range required by the Specifications.

The above specified numbers of the rolls of operational samples may be reduced to eliminate the quantities specified in clauses (c), (d), (g) & (h) to the extent that the machinery producing the Crosby Membrane can be shown to reliably produce a consistent thickness within Specification of the respective type of Crosby Membrane, and after review and approval by EMD Millipore, which approval shall not be unreasonably withheld or delayed. As provided in Section 6.3(ii) above, the first four rolls of each of the configurations of operational samples specified in clauses (a) through

(h) above shall be free of charge; the remaining operational samples shall be purchased by EMD Millipore in accordance with Section 6.3(ii).

Entegris will use commercially reasonable efforts to deliver the operational samples to EMD Millipore by a Target date of February 18, 2014; EMD Millipore will use commercially reasonable efforts to provide Entegris with performance data yielded by the testing conducted on the operational samples by a Target date of five (5) months following receipt of the final operational samples. The validation and qualification testing of the operational samples by EMD Millipore shall be conducted pursuant to protocols set forth in any annex hereto or as otherwise agreed in writing by the Parties

### **3. Performance Qualification Stage:**

*Objective and Outline of Performance Qualification.* The objective of the Performance Qualification is to conduct a final performance evaluation of performance qualification samples of UPDP type Crosby Membrane and UPHP type Crosby Membrane fabricated to have both bubble point and thickness in the middle of the range required by the Specifications. It is expected that these performance qualification samples will be confirmed as meeting the Specifications and will be accepted as finished product to replace EMD Millipore Flat Sheet UPE Membrane manufactured at the Premises. The validation and qualification testing of the performance qualification samples by EMD Millipore shall be conducted pursuant to protocols set forth in any annex hereto or as otherwise agreed in writing by the Parties. Entegris shall use commercially reasonable efforts to deliver the performance qualification samples for purchase by EMD Millipore in three lots each comprised of twelve (12) rolls of UPDP type Crosby Membrane and six (6) rolls of UPHP type Crosby Membrane by a Target date of July 1, 2014.

Entegris shall use commercially reasonable efforts to deliver to EMD Millipore a written performance qualification report by a Target date of four (4) weeks after delivery of the performance qualification samples identifying the lots of performance qualification samples delivered.

EMD Millipore will use commercially reasonable efforts to provide Entegris with confirmation that the above performance qualification samples are accepted as finished product meeting the Specifications to replace EMD Millipore Flat Sheet UPE Membrane manufactured at the Premises by a Target date of fifteen (15) months following receipt of the third lot of performance qualification samples.

**Attachment 1**  
**List of EMD Millipore Equipment**

<b><u>Item#</u></b>	<b><u>Description</u></b>	<b><u>Current Location</u></b>	<b><u>Quantity</u></b>
1.	Slurry Mix Stations; Control Modules 1-3	Bldg C -105	3
2.	Film 1 Annealing Line	Bldg. C-123	1
3.	VMF 4 Line (chemical modification)	Bldg. C-124	1
4.	Testing: Flow, Wet Time, Stability	Bldg.C-124	various
5.	Monomer Chemical Mixing Stations 4-6	Bldg. C-105	3



**Attachment 2**  
**List of Entegris Equipment**

<b><u>Item#</u></b>	<b><u>Description</u></b>	<b><u>Current Location</u></b>	<b><u>Quantity</u></b>
1.	Slurry Mixing Vessels	Bldg C - Mix Room	2
2.	Extrusion Line & support equipment (cranes, vents etc.)	Bldg D - 101	1
3.	NZE Extractors & support equipment (scales, vents etc.)	Bldg C - 103	2
4.	Release/Testing Equipment (porosimeter, flow stands, VBP stands, digital dimension equipment)	Bldg D-101	1
5.	Monomer Chemical Mixing Vessel (for philic Flat Sheet UPE Membranes)	Bldg C-Mix Room	1
6.	MSR Batch Extractors & support equipment (cranes, LS-15, etc.)	Bldg D-101	3
7.	Release/Testing Equipment (flow stands, VBP stands, digital dimension equipment)	Bldg F-Cell 5	1
8.	CUPE Mix/recirculation Pumps	Bldg C-Mix Room	2
9.	NZE Chiller Loop (~100 Tons)	Bldg C-Roof	1
10.	Oil Mist Collector (and duct/hood)	Bldg D-101	1
11.	7 Ton Edwards Chiller	Bldg D-outside	1
12.	Tiyoda-Serec Extractor	Bldg F-Cell 5	1
13.	Tiyoda-Serec Ext 42 Ton Chiller	Bldg C-roof	1

## Subsidiaries of Entegris, Inc.

<u>Name of Subsidiary</u>	<u>Jurisdiction</u>
Entegris-Jetalon Solutions, Inc.	Delaware
Entegris Singapore Pte. Ltd.	Singapore
Entegris Pte. Ltd.	Singapore
Entegris Korea Ltd.	South Korea
Pureline Co. Ltd. (1)	South Korea
Entegris Pacific Ltd.	Delaware
Entegris (Shanghai) Microelectronics Trading Company Ltd.	Peoples Republic of China
Entegris International Holdings B.V.	The Netherlands
Entegris Asia Pte. Ltd.	Singapore
Entegris GmbH (2)	Germany
Entegris (UK) Ltd.	United Kingdom
Entegris Ireland Ltd.	Ireland
Entegris SAS	France
Entegris Israel Ltd.	Israel
Entegris Cleaning Process (ECP) SAS	France
Nihon Entegris K.K.	Japan
Entegris Japan Co. Ltd.	Japan
Entegris Taiwan Enterprise Partnership (3)	Taiwan
Entegris Asia LLC	Delaware
Entegris Taiwan Technologies Co. Ltd.	Taiwan
Entegris Malaysia Sdn. Bhd.	Malaysia
Entegris Precision Technology Corp.(4)	Taiwan
Entegris Specialty Materials, LLC	Delaware
Poco Graphite, Inc.	Delaware
Poco Graphite International, Inc.	Delaware
Poco Graphite SARL (5)	France

- (1) Owned 37.5% by Entegris Korea Ltd. and 62.5% by registrant
- (2) Owned 90% by Entegris International Holdings B.V. and 10% by registrant
- (3) Owned 99% by Entegris International Holdings B.V. and 1% by registrant
- (4) Owned 50% by Entegris International Holdings B.V. and 50% by registrant
- (5) Owned 90% by Poco Graphite, Inc. and 10% by Poco Graphite International, Inc.

**Consent of Independent Registered Public Accounting Firm**

The Board of Directors  
Entegris, Inc.:

We consent to the incorporation by reference in the registration statement (Nos. 333-160212 and 333-105962) on Form S-3 and (Nos. 333-167178, 333-127599, and 333-53382) on Form S-8 of Entegris, Inc. of our report dated February 20, 2014, with respect to the consolidated balance sheets of Entegris, Inc. as of December 31, 2013 and 2012, and the related consolidated statements of operations, comprehensive income, equity, and cash flows for each of the years in the three-year period ended December 31, 2013 and the effectiveness of internal control over financial reporting as of December 31, 2013, which report appears in the December 31, 2013 annual report on Form 10-K of Entegris, Inc.

/s/ KPMG LLP

Minneapolis, Minnesota  
February 20, 2014

## POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that the undersigned Directors and Officers of **Entegris, Inc.** (the “Corporation”), do hereby constitute and appoint Bertrand Loy, Gregory B. Graves and Peter W. Walcott and each of them individually, their true and lawful attorneys and agents to execute on behalf of the Corporation the Form 10-K Annual Report of the Corporation for the fiscal year ended December 31, 2013, together with all such amendments thereto on Form 10-K/A as well as additional instruments related thereto which such attorneys and agents may deem to be necessary and desirable to enable the Corporation to comply with the requirements of the Securities Exchange Act of 1934, as amended, and any regulations, orders, or other requirements of the United States Securities and Exchange Commission thereunder in connection with the preparation and filing of said documents, including specifically, but without limitation of the foregoing, power and authority to sign the names of each of such Directors and Officers on his behalf, as such Director or Officer, as indicated below to the said Form 10-K Annual Report or documents filed or to be filed as a part of or in connection with such Form 10-K Annual Report; and each of the undersigned hereby ratifies and confirms all that said attorneys and agents shall do or cause to be done by virtue thereof.

<u>SIGNATURE</u>	<u>TITLE</u>	<u>DATE</u>
/s/ Bertrand Loy Bertrand Loy	President, Chief Executive Officer and Director	February 12, 2014
/s/ Paul L. H. Olson Paul L. H. Olson	Chairman of the Board, Director	February 12, 2014
/s/ Michael A. Bradley Michael A. Bradley	Director	February 12, 2014
/s/ Marvin D. Burkett Marvin D. Burkett	Director	February 12, 2014
/s/ R. Nicholas Burns Nicholas Burns	Director	February 12, 2014
/s/ Daniel W. Christman Daniel W. Christman	Director	February 12, 2014
/s/ James F. Gentilcore James F. Gentilcore	Director	February 12, 2014
/s/ Roger D. McDaniel Roger D. McDaniel	Director	February 12, 2014
/s/ Brian F. Sullivan Brian F. Sullivan	Director	February 12, 2014

**CERTIFICATIONS**

I, Bertrand Loy, certify that:

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

Date: February 20, 2014

/s/ Bertrand Loy

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Bertrand Loy

Chief Executive Officer

(Principal Executive Officer)

**CERTIFICATIONS**

I, Gregory B. Graves, certify that:

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

Date: February 20, 2014

/s/ Gregory B. Graves

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Gregory B. Graves

Chief Financial Officer

(Principal Financial Officer)

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906  
OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K (the "Report") of Entegris, Inc, a Delaware corporation (the "Company"), for the period ended December 31, 2013 as filed with the Securities and Exchange Commission on the date hereof, I, Bertrand Loy, President and Chief Executive Officer of the Company, hereby certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 20, 2014

/s/ Bertrand Loy

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Bertrand Loy

Chief Executive Officer

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906  
OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K (the "Report") of Entegris, Inc, a Delaware corporation (the "Company"), for the period ended December 31, 2013 as filed with the Securities and Exchange Commission on the date hereof, I, Gregory B. Graves, Chief Financial Officer of the Company, hereby certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 20, 2014

/s/ Gregory B. Graves

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Gregory B. Graves

Chief Financial Officer