

Ultra Clean Holdings, Inc.
Form 10-K
March 22, 2019

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 28, 2018

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 000-50646

Ultra Clean Holdings, Inc.

(Exact name of Registrant as specified in its charter)

Delaware (State or other jurisdiction of incorporation or organization)	61-1430858 (IRS Employer Identification No.)
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26462 Corporate Avenue

Hayward, California (Address of principal executive offices) Registrant's telephone number, including area code:	94545 (Zip Code)
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(510) 576-4400

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

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, \$0.001 par value	The NASDAQ Global Market LLC

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

None

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted 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 such files). Yes No

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

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

Large accelerated filer Accelerated filer

Non-accelerated filer Smaller reporting company
Emerging growth company

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

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

The aggregate market value of the voting and non-voting stock held by non-affiliates of the Registrant, based on the closing sale price of the Registrant's common stock on June 29, 2018 as reported on the NASDAQ Global Market, was

approximately \$635.5 million. Shares of common stock held by each executive officer and director have been excluded from this computation. The determination of affiliate status for this purpose is not necessarily a conclusive determination for other purposes.

Number of shares of the registrant's common stock outstanding as of February 22, 2019: 39,110,649

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement to be delivered to stockholders in connection with the 2018 annual meeting of stockholders are incorporated by reference in Part III of this Form 10-K where indicated. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 28, 2018.

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This Annual Report on Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as “expects,” “anticipates,” “targets,” “goals,” “projects,” “intends,” “plans,” “believes,” “seeks,” “estimates,” “continues,” “may,” “will be,” “will continue,” “will likely results,” variations of such words, and similar expressions are intended to identify such forward-looking statements, but the absence of these words does not necessarily mean that a statement is not forward-looking. These forward-looking statements include, but are not limited to, statements concerning the following: projections of our financial performance, our anticipated growth and trends in our business, levels of capital expenditures, the adequacy of our capital resources to fund operations and growth, our ability to compete effectively with our competitors, our strategies and ability to protect our intellectual property, future acquisitions, customer demand, our manufacturing and procurement process, employee matters, supplier relations, foreign operations (including our operations in China and Singapore), the legal and regulatory backdrop (including environmental regulation), our exposure to market risks and other characterizations of future events or circumstances described in this Annual Report. Readers are cautioned that these forward-looking statements are only predictions and are subject to risks, uncertainties, and assumptions that are difficult to predict, including those identified below, under “Risk Factors,” and elsewhere herein. Therefore, actual results may differ materially and adversely from those expressed in any forward-looking statements. We undertake no obligation to revise or update any forward-looking statements for any reason, except as required by law.

Item 1. Business

Overview

Ultra Clean Holdings, Inc. (“UCT”, the “Company” or “We”) was founded in November 2002 for the purpose of acquiring Ultra Clean Technology Systems and Services, Inc. a US-based company founded in 1991 by Mitsubishi Corporation and operated as a subsidiary of Mitsubishi. UCT became a publicly traded company in March 2004. In 2006, we acquired Sieger Engineering, Inc. to better position ourselves as a subsystem supplier primarily to the semiconductor and display capital equipment industries. Sieger Engineering merged into Ultra Clean Technology Systems and Service, Inc. in July of 2016. To facilitate operations in Asia, Ultra Clean Technology (Shanghai) Co., Ltd (“UCTS”) and Ultra Clean Micro-Electronics Equipment (Shanghai) Co., Ltd. (“UCME”) were established in China in 2005 and 2007, respectively, and Ultra Clean Asia Pacific, Pte, Ltd. was established in Singapore in 2008. UCTS merged into UCME in December of 2015. Our July 2012 acquisition of American Integration Technologies LLC (“AIT”) added to our existing customer base in the semiconductor and medical spaces and provided additional manufacturing capabilities. In February 2015, we acquired Marchi Thermal Systems, Inc. (“Marchi”) and in July 2015, we acquired MICONEX s.r.o (“Miconex”), both privately held companies with a majority of their revenues in the semiconductor market. Marchi designs and manufactures specialty heaters, thermocouples and temperature controllers, delivering flexible heating elements and thermal solutions to our customers. The Company believes heaters are increasingly critical in equipment design for the most advanced semiconductor nodes. Miconex is a provider of advanced precision fabrication of plastics that has expanded our capabilities with existing customers. In May 2018, Marchi and Miconex changed their names to UCT Thermal Solutions, Inc. (“Thermal”) and to UCT Fluid Delivery Solutions s.r.o (“FDS”), respectively.

In August 2018, the Company acquired Quantum Global Technologies, LLC (“QGT”), a provider of ultra-high purity outsourced parts cleaning, process tool part recoating, surface treatment and analytical services to the semiconductor and related industries, for a total purchase price of approximately \$340.8 million. See Note 5 to the Company’s Consolidated Financial Statements for further information about the acquisition of QGT.

We are a global leader in the design, engineering, and manufacture of production tools, modules and subsystems for the semiconductor capital equipment industry and industry segments with similar requirements including display, consumer and medical. We focus on providing specialized engineering and manufacturing solutions for these applications. We enable our customers to realize lower manufacturing costs and reduced design-to-delivery cycle times while maintaining high quality standards.

With our acquisition of QGT, a leader in the parts cleaning, coating and semiconductor Fab-related analytical services, we expanded our capabilities to provide ultra-high purity parts cleaning, process tool part recoating, surface treatment, and analytical services to the semiconductor and related industries.

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We ship a majority of our products and serviced parts to U.S. registered customers with locations in and outside the U.S. In addition to U.S. manufacturing and service operations, we manufacture products and provide parts cleaning and other related services in our Asian and European facilities to support local and U.S. based customers. We conduct our operating activities primarily through our subsidiaries, Ultra Clean Technology Systems and Service, Inc., AIT, UCME, UCAP, Thermal, FDS and QGT.

Our international revenues represented 56.7%, 53.6% and 48.0% of revenues for fiscal years ended 2018, 2017 and 2016, respectively. See Note 13 to the Notes to Consolidated Financial Statements for further information about our geographic areas.

Our Suite of Offerings

We are a leading developer and supplier of critical subsystems, ultra-high purity cleaning and analytical services primarily for the semiconductor industry. We offer our customers an integrated outsourced solution for major subassemblies, improved design-to-delivery cycle times, design for manufacturability, prototyping and component manufacturing, and tool chamber parts cleaning and coating, as well as micro contamination analytical services. We offer our customers:

- A vertically integrated solution for complex and highly configurable systems. We provide our original equipment manufacturing (OEM) customers a broad outsourced solution for the development, design, component sourcing, prototyping, engineering, manufacturing and testing of advanced systems. We utilize our machining, sheet metal, and frame fabrication capabilities with highly specialized engineering, global supply chain management, and assembly capabilities to produce high performance products that are customized to meet the needs of our customers, as well as their respective end users. We minimize the overall number of suppliers and manage our global supply chain logistics to reduce inventory levels that our customers would otherwise be required to manage.

- Subsystem manufacturing. Our experience with the demanding requirements in semiconductor equipment manufacturing has enabled us to grow from primarily supplying gas delivery modules to being a leading developer and supplier of other critical modules and subsystems. These assemblies include chemical and fluid delivery modules, wafer transport, and process modules.

- Improved design-to-delivery cycle times. Our strong relationships with our customers and familiarity with their product requirements and the ever-changing needs of their customer base help us reduce their design-to-delivery cycle times. We seek to optimize our supply chain management, design and manufacturing coordination and controls to respond rapidly to order requests, enabling us to decrease design-to-delivery cycle times for our customers. Because our engineers work closely with our customers' engineers and understand the fabrication, assembly and testing of their products, we often can improve their design for manufacturability, thereby improving their cost, quality and consistency.

- Component neutral design and manufacturing. We do not manufacture components such as mass flow controllers and valves which are selected based on manufacturer published specifications. Our component neutral position enables us to recommend components on the basis of technology, performance and cost and to optimize our customers' overall designs based on these criteria. Furthermore, our neutral approach allows us to maintain close relationships with a wide range of component suppliers.

- Component testing capabilities. We utilize our technical expertise to test and characterize key components and subsystems. We have made significant investments in advanced analytical and automated test equipment, enabling us to test and qualify key components. We can perform diagnostic tests, design verifications and failure analyses for our customers and suppliers. Our analytical and testing capabilities of supplier components provide us the ability to recommend to our customers a wide range of appropriate component and design choices for their products.

- Increased integration with OEMs through local presence. Our local presence in close proximity to the facilities of most of our OEM customers enables us to remain closely integrated with their design, development and implementation teams. This level of integration enables us to respond quickly and efficiently to customer changes

and requests.

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• **Precision machining capabilities.** We manufacture high quality, precision machined parts using equipment capable of efficiently providing complex parts with exacting tolerances. Our diverse precision fabrication equipment enables us to manufacture a broad range of machined parts using a wide range of materials, from exotic metals to high purity plastics. Our manufacturing capabilities include horizontal and vertical milling, turning, welding and joining, among others. We own and operate advanced machining and fabrication systems at multiple sites in the U.S., Europe and Asia.

• **Precision frame fabrication.** We design and manufacture frames using tubing or sheet metal in all customary sizes with exacting standards to meet or exceed our customers' needs. We utilize over 25 years of experience in the fabrication of complex frames to provide a cost competitive edge in our vertical integration model. Many of our customers require frames that are powder coated; in 2016, we added this capability to our Chandler, Arizona frame fabrication facility.

• **Precision sheet metal fabrication.** Our ability to provide broad sheet metal solutions for our customers enables us to support prototype to volume production, from brackets to sheet metal frames, and from structural to high quality cosmetic finishing of the final product. Our automated equipment and design capabilities allow us to develop accurate prototype and final production products for our customers.

• **Custom thermal control.** Our acquisition of Thermal has enabled us to design and manufacture heaters, sensors, and controllers for precise temperature control. These products are complementary to our gas delivery systems products.

• **Parts cleaning and coating and analytical verification:** Our acquisition of QGT has enabled us to extend our offerings to our OEM and integrated device manufacturer (IDM) customers. Through QGT, we now offer customers validated, ultra-high purity outsourced process tool chamber parts cleaning and coating services. Included in these services is tool part process optimization solutions that could lower the total cost of ownership for our customers. Through ChemTrace, we also now provide analytical verification of process tool chamber part cleaning effectiveness. ChemTrace offers micro contamination analysis of tool parts, wafers and depositions, chemicals, cleanroom materials, deionized water and airborne molecular contamination.

Our Strategy

Our objective is to grow our position as a leading solutions and service provider in the semiconductor markets we serve, while supporting other technologically similar markets in the display, consumer, medical, energy, industrial and research industries. Our strategy is comprised of the following key elements:

• **Expand our solutions and service market share with semiconductor OEMs and IDMs.** We believe that equipment outsourcing among OEMs creates a significant market opportunity for us to grow our business with existing and new customers. We believe our customers will continue to outsource critical subsystems and that we are well positioned to capture a significant portion of these outsourcing opportunities. We believe that our continued focus on efficient manufacturing, reduced design-to-delivery cycle times, and quality and reliability will also allow us to gain market share. Similarly, we believe there is room to gain market share with our QGT service and analytical offerings, both with IDMs and OEMs, as customers typically outsource these solutions. By providing customers process improvement through consistently cleaner parts and analytical verification of process tool chamber part cleaning effectiveness, we have expanded our total available market significantly.

• **Develop or acquire solutions that allow our customer's customers to succeed at the leading edge of the semiconductor processing nodes.** We continue to expand the number and type of subsystems and services that we offer in this rapidly advancing semiconductor market.

• **Leverage our geographic presence in lower cost manufacturing regions.** Our manufacturing facilities in Shanghai, China allow us to produce in a low-cost region. These facilities house precision machined parts and subsystem assembly operations. Together, these facilities put us in close proximity to the manufacturing facilities of existing and potential customers and their end users. In Singapore, we have a procurement office and substantial manufacturing capabilities. Our manufacturing facilities all use similar processes and procedures, enabling us to respond rapidly to demand changes from our customer.

Several QGT cleaning and analytic facilities are also in low cost regions, strategically close to our customers, adding to our competitive advantage.

• Drive profitable growth with our flexible cost structure. We implement cost containment and capacity enhancement initiatives throughout the semiconductor capital equipment demand cycle and benefit from the global presence and efficiencies of our supply chain. In addition, we believe our Shanghai and Singapore facilities position us to respond effectively to future business demands. We employ a core engineering strategy with flexible partnering to augment our staff during the steep rise and fall often associated with cycles in the semiconductor industry.

• Continue to selectively pursue strategic acquisitions. We will continue to consider strategic acquisitions that will enable us to improve our financial model, expand our geographic presence, secure new customers and diversify into complementary products and services markets as well as broaden our technological and cleaning and analytical capabilities in the markets we serve.

• Strengthen vertical integration. We continue to invest in our operations to meet customer quality delivery targets. We have expanded welding operations at several of our manufacturing sites, developed/built in-house powder coating capability, and purchased new machining tools. In addition to organic growth, we continue to manage/foster key strategic partnerships to efficiently meet production needs.

• In late 2018, UCT began a series of cost improvement initiatives aimed at improving the flexibility of its operating and financial model over time. These initiatives include the closure or combination of some facilities to maximize operations, the postponement of selective capital expenditures, and a significant reduction in workforce, without constraining our capacity or ability to grow when the semiconductor industry recovers. These initiatives will roll out over the coming quarters and are expected to be complete by the end of 2019.

Products and Services

We design, develop, prototype, manufacture and test subsystems, and clean and analyze tool parts, primarily for the semiconductor market. We also support customers in the consumer, medical, energy, industrial, and research industries. Our products include precision robotic solutions, gas delivery systems, a variety of industrial and automation production equipment products, and subsystems that include wafer cleaning modules, chemical delivery modules, top-plate assemblies, frame assemblies, and process modules. Our services include ultra-high purity outsourced process tool chamber parts cleaning and coating services, tool part life extension and process tool part optimization solutions, and analytical verification of process tool chamber part cleaning effectiveness.

• **Chemical delivery modules:** Chemical delivery modules deliver gases and reactive chemicals in a liquid or gaseous form from a centralized subsystem to the reaction chamber. The module may be a gas delivery system in combination with liquid and vapor precursor delivery systems or may be a liquid delivery system in combination with a liquid storage system.

• **Frame assemblies:** Frame assemblies are support structures fabricated from steel tubing or folded sheet metal and form the backbone to which all other assemblies are attached. The complexity of the frames includes powder coating, pneumatic harnesses and cables that connect other critical subsystems together.

• **Gas delivery systems:** A typical OEM gas delivery system consists of one or more gas lines, comprised of small diameter internally polished stainless steel tubing, filters, mass flow controllers, regulators, pressure transducers and valves, component heaters, and an integrated electronic and/or pneumatic control system. These systems are mounted on a pallet and are typically enclosed in a sheet metal encasing. Our gas delivery system designs are developed in collaboration with our customers and are customized to meet the needs of specific processing requirements for OEMs. Our customers either specify the particular brands of components they want incorporated into a particular system or rely on our design expertise and component characterization capabilities to help them select the appropriate components for their particular system.

Fluid delivery system: A typical OEM liquid delivery system consists of one or more chemical delivery units, comprised of small diameter high purity PFA tubing, filters, flow controllers, regulators, component heaters, and an integrated electronic and/or pneumatic control system. These units are typically contained in a plastic enclosure and further integrated into a frame. Our liquid delivery system designs are developed in collaboration with our customers and are customized to meet the needs of specific processing requirements for OEMs. Our customers either specify the particular materials and the brands of components they want incorporated into a particular system or rely on our design expertise and component characterization capabilities to help them select the appropriate components for their particular system.

Precision robotics: Precision robotic systems are used when accurate controlled motion is required. Some of the systems that employ robotic systems are: semiconductor wafer and chip handling, wire bonding and industrial equipment.

Process modules: Process modules refer to the larger subsystems of semiconductor manufacturing tools that process integrated circuits onto wafers. Process modules include several smaller subsystems such as the frame assembly, top-plate assembly and gas and chemical delivery modules, as well as the chamber and electronic, pneumatic and mechanical subsystems.

Other high level assemblies: Other high level assemblies refer to large subsystems used in semiconductor manufacturing, display, medical, energy, industrial and research industries.

Parts cleaning and coating: Through QGT, we now offer customers validated, ultra-high purity outsourced process tool chamber parts cleaning and coating services. Included in these services are tool part process optimization solutions that could lower the total cost of ownership for our customers.

Cleaning analysis: Through QGT, we now provide analytical verification of process tool chamber part cleaning effectiveness. We offer micro contamination analysis of tool parts, wafers and depositions, chemicals, cleanroom materials, deionized water and airborne molecular contamination.

Customers

We sell our products and services primarily to customers in the semiconductor capital equipment and semiconductor integrated device manufacturing industries, and we also sell to the display, consumer, medical, energy, industrial, and research equipment industries.

The majority of our total revenues comes from the semiconductor capital equipment industry (OEM's), which is highly concentrated, so we are therefore highly dependent upon a small number of customers. Our two largest customers for our equipment product revenues in fiscal year 2018, 2017 and 2016 were Applied Materials, Inc. and Lam Research Corporation, each of which accounted for more than 10.0% of our total revenues in fiscal years 2018, 2017 and 2016. As a group, our respective year's top two customers accounted for 76.6%, 84.4% and 82.2% of the Company's revenues for fiscal years 2018, 2017 and 2016, respectively. The composition of our most significant customers changes from time to time based on various factors, including acquisition activity by our customers.

Approximately 4.0% of our total revenues came from the semiconductor integrated device manufacturing industry (IDM's). We expect this percentage to increase in fiscal 2019 with a full year of operations of QGT. This industry is not as concentrated and we have a diverse customer base with no single customer representing more than 10% of total revenues for 2018.

We have successfully qualified as a supplier of equipment and cleaning and analytical services with each of our customers who require it. This lengthy qualification process involves the inspection and audit of our facilities and evaluation by our customers of our engineering, documentation, manufacturing and quality control processes and procedures. Our customers generally place orders with suppliers who have met and continue to meet their qualification criteria.

Customer Business Management

We sell and support our products and services through our Customer Business Management organization which, consisted of customer relationship directors, managers and support staff. Our customer relationship directors are responsible for establishing sales strategy and setting the objectives for specific customer accounts. Each customer relationship manager is dedicated to a specific customer account and is responsible for maintaining strong working relationships with that customer. Customer relationship managers work closely with customers and in many cases provide on-site support. OEM Customer relationship managers often attend customers' internal meetings

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related to production and engineering design and quality to ensure that customer expectations are interpreted and communicated properly to our operations group. Customer relationship managers also work with our customers to identify and meet their cost and design-to-delivery cycle time objectives. Our IDM Customer relationship managers work with process tool owners and Fab maintenance managers relating to the development of validation of cleaning recipes, addressing new tools, and to optimize processes toward node transitions.

We have dedicated business development managers responsible for new business development for gas delivery systems and other critical subsystems as well as our service business. Our new business development managers initiate and develop long-term, multilevel relationships with customers and work closely with customers on new business opportunities. Our customer relationship organization includes technical sales support for order placement, spare parts quotes, production status updates as well as service and maintenance contracts and analysis business. We have a technical relationship representative located at most of our manufacturing facilities.

We integrate new business wins into our facilities via a rigorous product transition process, working in concert with our customers to ensure all production and test requirements are identified, documented, and validated. We employ the same process at all our sites, enabling products and service offerings to smoothly transition into and between our sites as needed to support customer demand.

In addition, we have developed an overall service and support infrastructure to provide our customers with service and support 24 hours a day, seven days a week. Our dedicated global field service engineers provide customer support through the performance of on-site installation, servicing and repair.

Technology Development

We engage in ongoing technology development efforts to remain a leader for gas delivery systems and to further develop our expertise in other critical subsystems. Our design engineering and new product engineering groups support our technology development activities. Our technology development group works closely with our customers to identify and anticipate changes and trends in next-generation equipment. Our technology development group participates in customer technology partnership programs that focus on process application requirements for gas and liquid delivery systems and other critical subsystems. These development efforts are designed to meet specific customer requirements in the areas of subsystem design, materials, component selection and functionality. Our technology development group also works directly with our suppliers to help them identify new component technologies and make necessary changes in, and enhancements to, the components that we integrate into our products. Our analytical and testing capabilities enable us to evaluate multiple supplier component technologies and provide our customers with a wide range of appropriate component and design choices for their gas delivery systems and other critical subsystems.

Our analytical and testing capabilities also help us anticipate technological changes and requirements in component features for our core UCT next-generation gas delivery systems and other critical subsystems. We are developing additional features to improve the performance and functionality of our gas delivery systems and other critical subsystems. Our technology development activities for next-gen gas delivery and other critical subsystems are performed principally in Hayward, California.

We also engage in ongoing technology development to maintain technological leadership in the cleaning, coating and analytical markets. Our QGT subsidiary works closely with customers to identify and anticipate changes that will be required in next-generation equipment. QGT service's technical capability is becoming extremely critical and differentiated to ensure high wafer yields and throughput as geometries shrink and density increases. QGT's development activities are performed primarily in Phoenix, AZ.

Our technology development and new product engineering expenses were approximately \$13.3 million, \$11.7 million and \$9.9 million for the 2018, 2017 and 2016 fiscal years, respectively.

Intellectual Property

Our success depends in part on our ability to maintain and protect our proprietary technology and to conduct our business without infringing the proprietary rights of others. Both our products and services businesses largely

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depend upon our design, engineering, manufacturing, testing, cleaning, coating and analytical know-how. We also rely on a combination of trade secrets and confidentiality provisions, and to a much lesser extent, patents, copyrights and trademarks, to protect our proprietary rights. We have four patents with various expiration dates ranging from 2019 to 2034. We have no pending U.S. patents. Intellectual property that we develop on behalf of our customers is generally owned exclusively by those customers.

We require our employees, suppliers and potential business partners to enter into confidentiality and non-disclosure agreements before we disclose to them any sensitive or proprietary information regarding our products, technology or business plans. We require employees to assign to us proprietary information, inventions and other intellectual property they create, modify or improve.

Competition

Our industry is highly fragmented. When we compete for new business, we face competition from other suppliers of gas delivery systems, critical subsystems, cleaning and analytical services, as well as the internal manufacturing groups of our customers. Customers that have elected to outsource their gas delivery systems and other critical subsystems including cleaning and analytics, could elect in the future to develop and manufacture these subsystems internally, leading to further competition.

Our principal competitor for gas delivery systems is Ichor Systems, Inc., and our principal competitors for other critical subsystems are Flex Ltd., Foxsemicon Integrated Technology Inc. and Celestica Inc. Some of these competitors have substantially greater financial, technical, manufacturing and marketing resources than we do. We expect our competitors to continue to improve the performance of their current products and to introduce new products or new technologies that could adversely affect sales of our current and future products. For our services, coating and analytical offerings, our main competitors in the US are Pentagon Technologies and Cleanpart, and in Korea, KoMiCo.

The limited number of potential customers in our industry further intensifies competition. The primary competitive factors in our industry are quality, meeting customer timeline demands, price, technology, design-to-delivery cycle time, customer qualification approvals, the development of product recipes for cleaning and analytics and historical customer relationships. We anticipate that increased competitive pressures will cause intensified price-based competition and we may have to reduce the prices of our products. In addition, we expect to face new competitors as we enter new markets.

Employees

As of December 28, 2018, we had 4,280 employees, of which 443 were temporary. Of our total employees, there were 126 in engineering, 11 in technology development, 235 in sales and support, 2,861 in direct manufacturing, 690 in indirect manufacturing and 357 in executive and administrative functions. These figures include 1,706 employees in Asia and 519 employees in Europe. None of our employees are represented by a labor union and we have not experienced any work stoppages.

Governmental Regulation and Environmental Matters

Our operations are subject to federal, state and local regulatory requirements and foreign laws 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 waste, as well as practices and procedures applicable to the construction and operation of our UCT and QGT facilities.

Our past or future operations may result in injury or claims of injury by employees or the public which may result in material costs and liabilities to us. Although some risk of costs and liabilities related to these matters is inherent in our business, we believe that our business is in compliance with applicable regulations. However, new, modified or more stringent requirements or enforcement policies could be adopted, which could adversely affect us.

Available Information

We file with the Securities and Exchange Commission (“SEC”) annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act. You may read and copy any materials we file with the SEC at the Public Reference Room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. You may also request copies of all or any portion of such material from the SEC at prescribed rates. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the public reference room. In addition, materials filed electronically with the SEC are available at the SEC’s website at <http://www.sec.gov>.

In addition, we make available free of charge, on or through our website at <http://www.uct.com>, our annual, quarterly and current reports and any amendments to those reports, as soon as reasonably practicable after electronically filing such reports with, or furnishing them to, the SEC. This website address is intended to be an inactive textual reference only; none of the information contained on our website is part of this report or is incorporated by reference herein.

Executive Officers

Set forth below is information concerning our executive officers as of February 22, 2019.

Name	Age	Position
James P. Scholhamer	52	Chief Executive Officer & Director
Sheri Savage	48	Chief Financial Officer
Scott Nicholas	62	President, Semiconductor Services Business
Joe Williams	46	President, Semiconductor Products & Solutions Business
Joan Sterling	61	Senior Vice President, Human Resources

James P. Scholhamer joined UCT as Chief Executive Officer and a member of the Board of Directors in January 2015. Prior to joining UCT, Mr. Scholhamer served in various capacities with Applied Materials Inc., most recently as corporate vice president and general manager of the Equipment Products Group and Display Services Group within its Global Service Division from February 2011 to January 2015. Mr. Scholhamer was the corporate vice president and general manager of the Display Business Group from December 2008 to February 2011 and vice president of Operations-Energy for the Environmental and Display Products Division from July 2006 to December 2008 at Applied Materials, Inc. Mr. Scholhamer held various positions at Applied Films Corporation from August 1997 to July 2006, including chief operating officer, chief technology officer and executive vice president as well as vice president of Operations, Engineering and Research & Development. In addition to managing Applied Films Germany and Taiwan sites, Mr. Scholhamer served as vice president and general manager of the Thin Film Coating Division and the Thin Film Equipment Division in the company’s Colorado office from July 2000 to September 2004. Prior to that, Mr. Scholhamer held various operational and technical positions in several companies related to the design and fabrication of optical components such as Visible, UV and X-ray optics. Mr. Scholhamer holds a Bachelor of Science degree in materials and metallurgical engineering from the University of Michigan.

Sheri Savage has served as our Chief Financial Officer and Secretary since July 2016. Ms. Savage joined the Company as the Senior Director of Finance in April 2009. She was Senior Vice President of Finance and Chief Accounting Officer from February 2016 to July 2016. Prior to joining UCT, Ms. Savage served at Credence Systems Corporation, a manufacturer of test equipment for the global semiconductor industry, as its Corporate Controller and Vice President of Finance from February 2008 to February 2009 and as Director of Internal Audit from May 2006 to February 2008. Prior to Credence Systems, Ms. Savage served in various accounting and finance roles at Protiviti, a global business consulting and internal audit firm, and KLA-Tencor Corporation, a supplier of process control and yield management solutions for the semiconductor and related nanoelectronics industries. Ms. Savage also served as Manager, Business Process Risk Accounting, at Arthur Anderson LLP, the former accounting firm, from May 1996 to October 1999. Ms. Savage holds a Bachelor of Science degree in Managerial Economics from the University of California, Davis.

Scott Nicholas joined UCT with the acquisition of QGT in August 2018. At QGT, Mr. Nicholas was the President, CEO and Chairman of the Board from February 2000 until August 2018. Mr. Nicholas has more than thirty years of leadership and executive management experience in manufacturing, service and distribution companies. In addition to his more than 15 years semiconductor experience, Mr. Nicholas has held leadership positions in protective clothing, sterile pharmaceutical, and implantable medical device manufacturing businesses, including executing two successful business turnaround ventures leading to profitable exits. Mr. Nicholas earned a Masters of Management degree from Northwestern University's J.L. Kellogg Graduate School of Management in 1984 and a Bachelor of Science in Chemical Engineering from Lehigh University in 1979.

Joe Williams joined UCT in February 2015 with the acquisition of Thermal as President of Thermal. He continues to manage Thermal and serves as our Senior Vice President of Customer Business Management since October 2016. Mr. Williams was president of Thermal from April 2013 to 2015. He worked previously at UCT as vice president of new business development. Mr. Williams was Senior Vice President of Business Development & Engineering at AIT from 2007 to 2013. Prior to that, Mr. Williams co-founded Integrated Flow Systems and served as vice president of engineering and operations and director of engineering and operations from 1997 to 2004. He worked at Watkins-Johnson Company as a mechanical design engineer from 1994 to 1997. Mr. Williams holds a Bachelor of Science Degree in Mechanical Engineering from North Carolina State University.

Joan Sterling has served as our Senior Vice President of Global Human Resources since 2016. Ms. Sterling joined UCT in March 2013 as Director of Global Human Resources. Prior to joining UCT, Ms. Sterling was the Human Resources Director for Engineering and Broadcast Operations at SiriusXM Satellite Radio from 2009 to 2013. She worked at Hitachi Data Systems from 2007 to 2009 as an executive change management consultant for a global IT redesign. Ms. Sterling served as human resource senior vice president for the consumer credit group at Wells Fargo from 2005 to 2007. From 2000 to 2005, Ms. Sterling served in several senior director roles at Hewlett Packard managing human resources sites and functions of staffing, compensation, benefits, training and development. She was the corporate director of human resource strategic planning for First Energy Corporation from 1999 to 2000. She worked at Hewlett Packard Enterprise from 1994 to 1999 as the Midwest Region Headquarters Human Resource Manager. Ms. Sterling holds a Bachelor of Science in business from DePaul University and a Master of Arts in organizational development from Loyola University.

Item 1A. Risk Factors

The cyclical and highly volatile nature of the industries we serve could harm our operating results.

Our business and operating results depend in significant part upon capital expenditures by manufacturers in the semiconductor and display industries, which in turn depend upon the current and anticipated market demand for such products. Historically, the industries we serve (in particular the semiconductor industry) have been highly cyclical, with recurring periods of over-supply of products that have had a severe negative effect on the demand for capital equipment and related services involved in manufacturing such products. We have experienced and anticipate that we will continue to experience significant fluctuations in customer orders for our products through such cycles. Although certain aspects of our business, including the cleaning, coating and analytical services delivered by QGT which also supports the semiconductor chip market are less susceptible to variations in capital expenditures by manufacturers than other aspects of our business, slowdowns in the industries we serve have had, and future slowdowns may also have, a material adverse effect on our operating results. During periods of decreasing demand for our products and services, we must be able to appropriately align our cost structure with

prevailing market conditions, effectively manage our supply chain and motivate and retain employees. During periods of increased demand, we must expand manufacturing capacity and inventory to meet customer demands, effectively manage our supply chain and attract, retain and motivate a sufficient number of employees. If the industries we serve experience downturns, or if we are not able to timely and appropriately adapt to the changes in our business environment, our results of operations will be harmed. Also, the limited visibility we have from the majority of our customers of their future orders, combined with the cyclical and volatile nature of the industries we serve, make future revenues, results of operations and net cash flows difficult to estimate.

We rely on a small number of original equipment manufacturing (“OEM”) and integrated device manufacturing (“IDM”) customers for a significant portion of our revenues, and any adverse change in our relationships with these customers, including a decision by such customers not to continue to outsource critical subsystems or part cleaning, coating or analytical services to us or to give market share to one of our competitors, would adversely affect our business, results of operations and financial condition. Our customers also exert a significant amount of negotiating leverage over us, which may require us to accept lower operating margins, increased liability risks or changes in our operations in order to retain or expand our market share with them.

A relatively small number of OEM customers have historically accounted for a significant portion of our revenues, and we expect this trend to continue. As a group, the respective year’s top two customers accounted for 76.6%, 84.4% and 82.2% of our revenues for fiscal years 2018, 2017 and 2016, respectively, and we expect that our revenues will continue to be concentrated among a small number of customers. In addition, our customer contracts generally do not require customers to place any orders. Accordingly, the success of our products business depends on OEMs continuing to outsource the manufacturing of critical subsystems to us. Because of the small number of OEMs in the markets we serve, most of which are already our customers, it would be difficult to replace lost revenue resulting from the loss of, or the reduction, cancellation or delay in purchase orders by, any one of these customers, whether due to such customer’s decision to not continue to outsource all or a portion of its critical subsystems for its capital equipment to us, such customer giving market share to our competitors or for other reasons, such as a customer’s bankruptcy or insolvency or decreased demand for such customer’s products. We have in the past lost business from customers who have taken the manufacturing of our products in-house, given market share to our competitors or declared bankruptcy. Further, since our customers generally own the designs and other intellectual property to the products we manufacture, we cannot prevent them from licensing such designs and other intellectual property to our competitors for the manufacturing of such products. If we are unable to replace revenue from customers who determine to take subsystem assembly in-house, give market share to our competitors or from whom we otherwise lose business, such events could have a material adverse impact on our financial position and results of operations.

Our services business, providing part cleaning, coating and analytical expertise, to IDM and OEM customers has expanded our customer base to include IDM customers. Our IDM business is concentrated in a relatively small number of customers, and we compete with in-house capabilities, OEM’s who perform cleaning as part of service contracts and cleaning, coating and analytical services competitors. The OEM customer profile has significant overlap with our products business and is subject to risks of market share loss to cleaning, coating and analytical services competitors. The cleaning and analytical process are proprietary to QuantumClean and ChemTrace, respectively, and transition to new suppliers may require requalification on the part of the customer.

Consolidation among our customers, or a decision by any one or more of our customers to outsource all or most manufacturing, assembly, cleaning, coating and analytical services work to a single equipment manufacturer, may further concentrate our business in a limited number of customers and expose us to increased risks relating to dependence on an even smaller number of customers.

In addition, due to the size and revenue contribution levels from our largest customers, they are able to exert significant pricing pressure in the negotiation of our commercial agreements and individual purchase orders. Our

customers often require reduced prices or other quality, manufacturing or delivery commitments as a condition to their awarding the placement of orders with us in any given period. This may, among other things, result in reduced operating margins or require capital or other expenditures in order to maintain or expand our market share. Our customers' negotiating leverage also can result in terms and conditions that may contain significant liability risk to us. For example, our customers generally require that we provide them indemnification against certain liabilities, which may include claims of losses by their. In some cases, we have self-insured against liability risk meaning that we may be directly responsible for a high magnitude of liability claims by our customers without recourse to insurance proceeds from third-party insurers. Our customers may also pressure us to make other concessions in

order to preserve or expand our market share with them. Those concessions may harm our business. For example, customers may require us to move the manufacturing of our products from lower-cost geographies such as China to higher-cost geographies such as Singapore. The transfer of manufacturing could result in reduced margins and a sub-optimal cost structure. If we are unable to retain and expand our business with our customers on favorable terms, our business and operating results will be adversely affected and we may be susceptible to increased liability risk. This additional liability risk could have a material adverse effect on our business, cash flows, results of operations and financial condition.

We may not be able to respond quickly enough to changes in demand for our products.

Demand shifts in the industries we serve are rapid and difficult to predict, and we may not be able to anticipate or respond quickly enough to changes in demand. Our ability to increase revenues of our products and services in periods of increasing demand depends, in part, upon our ability to:

- mobilize our supply chain in order to maintain component and raw material supply;
- optimize the use of our design, engineering and manufacturing capacity in a timely manner;
- deliver our products and services to our customers in a timely fashion;
- expand, if necessary, our manufacturing, cleaning, coating and analytical services capacity; and
- maintain our product and service quality as we increase production.

If we are unable to respond to rapid increases in demand for our products and services on a timely basis, or to manage any corresponding expansion of our manufacturing and service capacity effectively, our customers could divert their purchases of products and services from us to our competitors, which would adversely affect our business.

Our ability to remain profitable and mitigate the impact on our business in periods of decreasing demand depends, in part, upon our ability to:

- optimize our inventory levels and reduce or cancel orders from our suppliers without compromising our relationships with such suppliers;
- reduce our fixed and variable costs through a number of initiatives, which may include reducing our manufacturing workforce;
 - continue to motivate our employees; and
- maintain the prices, quality and delivery cycles of our products and services in order to retain our customers' business.

Our dependence on our suppliers may prevent us from delivering an acceptable product on a timely basis.

We rely on both single-source and sole-source suppliers, some of whom are relatively small, for many of the components we use in our products and services. In addition, our customers often specify components or raw materials of particular suppliers that we must incorporate into our products. Our suppliers may be under no long-term obligation to provide us with components or raw materials. As a result, the loss of or failure to perform by any of these suppliers could adversely affect our business and operating results. In addition, the manufacturing of certain components and subsystems and the cleaning, coating and analysis of tool parts are complex processes. Therefore, if a supplier were unable to provide the volume of supplies, components or raw materials we require on a timely basis and at acceptable prices and quality, we would have to identify and qualify replacements from alternative sources. However, the process of qualifying new suppliers for complex components and raw materials is lengthy and could delay our production or delivery of services, which would adversely affect our business, operating results and financial condition.

We may also experience difficulty in obtaining sufficient supplies of components and raw materials in times of growth in our business. For example, we have in the past experienced shortages in supplies of various components, such as mass flow controllers, valves and regulators, and certain prefabricated parts, such as sheet metal enclosures, used in the manufacture of our products. In addition, one of our competitors manufactures mass flow controllers that may be specified by one or more of our customers. If we are unable to obtain these particular mass flow controllers from our competitor or convince a customer to select alternative mass flow controllers, we may be unable to meet that customer's requirements, which could result in a loss of market share.

If we, or our suppliers, are unable to procure sufficient quantities of supplies, components or raw materials from suppliers, it could influence decisions by our customers to delay or cancel orders or service contracts and decisions by our vendors to fulfill our purchase orders and, consequently, have a material adverse effect on our results of operations.

Our inability to successfully manage the implementation of a company-wide enterprise resource planning ("ERP") system could adversely affect our operating results.

We are in the process of implementing a new company-wide ERP system. This process has been and continues to be complex and time-consuming and we expect to incur additional expenses. This ERP system will replace many of our existing operating and financial systems, which is a major undertaking from a financial management and personnel perspective. Should the new ERP system not be implemented successfully throughout all our business units and within budget and on time, or if the system does not perform in a satisfactory manner, it could be disruptive and adversely affect our operations, including our potential ability to report accurate, timely and consistent financial results; our ability to purchase supplies, components and raw materials from and pay our suppliers; and our ability to deliver products and services to customers on a timely basis and to collect our receivables from them. Furthermore, we began to place this new ERP system into service in the third quarter of 2018 and anticipate that it will be fully in service by the end of fiscal year 2020. Amortization of previously capitalized costs amounted to \$0.9 million in fiscal year 2018 and are expected to be substantially greater in fiscal year 2019 and the years that follow as the system goes into service company-wide.

In addition, we have teams leading the implementation of the ERP system at most of our locations. To the extent that these teams or key individuals are not retained through the implementation period, the success of our implementation could be compromised and the expected benefits of the ERP system may not be realized. If the new ERP system is not successfully and fully implemented, it could negatively affect our financial reporting, inventory management and our future sales, profitability and financial condition.

We are subject to order and shipment uncertainties and any significant reductions, cancellations or delays in customer orders could cause our revenue to decline and our operating results to suffer.

Our revenue is difficult to forecast because we generally do not have a material backlog of unfilled orders and because of the short time frame within which we are often required to design, produce or deliver products to our customers. Most of our revenue in any quarter depends on customer orders for our products that we receive and fulfill in the same quarter. We generally do not have long-term purchase orders or contracts that contain minimum purchase commitments from our customers. Instead, we receive non-binding forecasts of the future volume of orders

from our customers. Occasionally, we order and build component inventory in advance of the receipt of actual customer orders. Customers may cancel order forecasts, change production quantities from forecasted volumes or delay production for reasons beyond our control. Furthermore, reductions, cancellations or delays in customer order forecasts, which may occur for various reasons, including reduced demand for our customer's products, customer bankruptcies or customer insolvency, usually occur without penalty to, or compensation from, the customer. Reductions, cancellations or delays in forecasted orders could cause us to hold inventory longer than anticipated, which could reduce our gross profit, restrict our ability to fund our operations and cause us to incur unanticipated reductions or delays in revenue. Moreover, many of the products we manufacture are custom built for our customers and are therefore not fungible with products we sell to other customers. If we do not obtain orders as we anticipate, we could have excess component inventory for a specific product that we would not be able to sell to another customer, likely resulting in inventory write-offs, which could have a material adverse effect on our business, financial condition and operating results. In addition, because many of our costs are fixed in the short term, we could experience deterioration in our gross profit and operating margins when our sales volumes decline.

The manufacturing of our products is highly complex, and if we are not able to manage our manufacturing and procurement process effectively, our business and operating results will suffer.

The manufacturing of our products is a highly complex process that involves the integration of multiple components and requires effective management of our supply chain while meeting our customers' design-to-delivery cycle time requirements. Through the course of the manufacturing process, our customers may modify design and system configurations in response to changes in their own customers' requirements. In order to rapidly respond to these modifications and deliver our products to our customers in a timely manner, we must effectively manage our manufacturing and procurement process. If we fail to manage this process effectively, we risk losing customers and damaging our reputation. We may also be subject to liability under our agreements with our customers if we or our suppliers fail to effectively or timely re-configure manufacturing processes or components in response to these modifications or if shipments of our products are delayed, which may lead to product defect or other claims by our customers or cancelled orders. In addition, if we acquire inventory in excess of demand or that does not meet customer specifications, we could incur excess or obsolete inventory charges. These risks are even greater during periods of macroeconomic uncertainty or down cycles in our industry, and as we continue to expand our business beyond gas delivery systems into new subsystems or services with which we have less experience. During periods of economic uncertainty or down cycles in our industry, certain of our suppliers may be forced to reduce or go out of business, which could require us to either procure products from higher-cost suppliers or, if no additional suppliers exist, reconfigure the design and manufacture of our products. This could limit our growth and have a material adverse effect on our business, financial condition and operating results.

Our results of operations, financial position and cash flows may suffer if we do not effectively manage our inventory.

Inventory is typically the largest asset on our balance sheet, representing 19.3% of our total assets as of December 28, 2018. We must manage our inventory of raw materials, work-in-process and finished goods effectively to meet changing customer requirements, while keeping inventory costs down and maintaining or improving gross margins.

Historically, the industries we serve (in particular the semiconductor capital equipment industry) have been highly cyclical, which makes accurately forecasting customers' product needs difficult. Although we seek to maintain sufficient inventory levels of materials to guard against interruptions in supply and to meet our customers' needs, we may experience shortages of certain key materials, particularly in times of high industry demand. We also face long lead times from our suppliers, which may be longer than the lead times provided to us by our customers. If we underestimate customer demand or if insufficient manufacturing capacity or raw materials are available, we may have to forego sales opportunities, lose market share and damage our customer relationships.

In the event we overestimate customer demand, we may allocate resources to manufacturing products that we may not be able to sell. As a result, we could hold excess or obsolete inventory, which would reduce our profit margins and adversely affect our financial results. Some of our products have in the past and may in the future become obsolete while in inventory due to changing customer specifications, or become excess inventory due to decreased demand for our products and an inability to sell the inventory within a foreseeable period. Furthermore,

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our customers may be able to cancel orders on short notice. This could result in charges that reduce our gross profit and gross margin. Furthermore, if market prices drop below the prices at which we value inventory, we would need to take a charge for a reduction in inventory values in accordance with the applicable accounting rules. Any future unexpected changes in demand or increases in costs of production that cause us to take additional charges for un-saleable, obsolete or excess inventory, or to reduce inventory values, would adversely affect our results of operations.

We hold inventory at our various manufacturing sites globally and many of these sites have more than one inventory warehouse. Successfully managing our inventory is dependent upon our information technology systems and internal controls. We rely upon such information technology systems and internal controls to accurately and timely manage, store and replenish inventory, complete and track customer orders, coordinate sales activities across all of our products and maintain and report vital data and information. A disruption in our information technology systems or a failure of our internal controls could result in delays or disruptions in receiving inventory and supplies or filling customer orders, incorrect inventory counts, over or under stocking or loss of inventory and adversely affect our business, customer relationships and results of operations. In particular, our largest customer requires that certain of our products are manufactured and shipped out of our Singapore facility. High levels of customer demand at such facility in fiscal year 2017 created substantial strain on our processes, internal controls and information technology systems. There can be no assurance that such delays, failures or disruptions will not have a material adverse effect on our cash flows, results of operations and financial condition.

Our customers require our products to undergo a lengthy and expensive qualification process. If we are unsuccessful or delayed in qualifying any of our products with a customer, our results of operations and financial condition could suffer.

We have had to qualify, and are required to maintain our status, as a supplier for each of our customers. This is often a lengthy process that involves the inspection and approval by a customer of our engineering, documentation, manufacturing and quality control procedures before that customer will place volume orders. Our ability to lessen the adverse effect of any loss of, or reduction in sales to, an existing customer through the rapid addition of one or more new customers is limited because of these qualification requirements. Consequently, the risk that our business, operating results and financial condition would be adversely affected by the loss of, or any reduction in orders by, any of our significant customers is increased. Moreover, if we lose our existing status as a qualified supplier to any of our customers, such customer could cancel its orders from us or otherwise terminate its relationship with us, which could have a material adverse effect on our results of operations and financial condition.

Acquisitions could result in operating and integration difficulties, dilution, margin deterioration, diversion of management's attention, and other consequences that may adversely impact our business and results of operations.

We have made, and may in the future make, acquisitions of, or significant investments in, businesses that offer complementary products, services, technologies or market access. We expect that management will evaluate potential strategic transactions regularly with its advisors and our board of directors in the ordinary course of business. We may not be successful in negotiating the terms of potential acquisitions or financing potential acquisitions, and our due diligence may fail to identify all of the problems, liabilities or other challenges associated with an acquired business, product or technology, including issues related to intellectual property, product quality or product architecture, regulatory compliance practices, revenue recognition or other accounting practices or employee or customer retention issues. In addition, we may not be successful in effectively integrating the acquired business, product or technology into our existing business and operations. The areas where we face risks include:

- management of a larger, more complex and capital intensive, combined business, including integrating supply and distribution channels, computer and accounting systems, and other aspects of operations;

• exposure to new operational risks, rules, regulations, worker expectations, customs and practices to the extent acquired businesses are located in regions where UCT has not historically conducted business;
• inability to complete proposed transactions due to the failure to obtain regulatory or other approvals, litigation or other disputes, and any ensuing obligation to pay a termination fee;

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- deterioration of gross margins due to the acquired company having the same customer base as us, resulting in reduced pricing leverage;
- the failure to realize expected returns from acquired businesses;
- reductions in cash balances or increases in debt obligations to finance the acquisition, which reduce the availability of cash flow for general corporate or other purposes;
- integration of the capabilities of the acquired businesses while maintaining focus on providing consistently high quality products;
- incorporation of different financial and reporting controls, processes, systems and technologies into our existing business environment;
- unforeseen liabilities, expenses, or other losses associated with the acquisitions for which we do not have recourse under their respective agreements;
- the risk of litigation or claims associated with a proposed or completed transaction;
- inadequacy or ineffectiveness of an acquired company's internal financial controls, disclosure controls and procedures, or environmental, health and safety, anti-corruption, human resource or other policies or practices;
- performance shortfalls as a result of the diversion of management's attention from the Company's operations;
- cultural challenges associated with integrating employees from the acquired business into our organization, and incentivization and retention of employees from the businesses we acquire; and
- difficulties associated with the retention and transition of new customers and partners into our existing business.

Our failure to address these risks or other problems encountered in connection with our past or future acquisitions and investments could cause us to fail to realize the anticipated benefits of such acquisitions or investments, incur unanticipated liabilities and substantial costs, and materially harm our business generally.

Our acquisitions could also result in dilutive issuances of our equity securities, the incurrence of debt, contingent liabilities, or amortization expenses, impairment charges and restructuring charges, any of which could harm our financial condition. Also, the anticipated benefits or value of our acquisitions or investments may not materialize. Even if an acquisition or other investment is not completed, we may divert significant management time and effort and incur significant financial cost in evaluating such acquisition or investment, which could have an adverse effect on our results of operations. Furthermore, due to prevailing conditions in the credit market and our existing leverage, the financing of any such acquisition may be difficult to obtain if at all, and the terms of any such financing may not be favorable.

Failure to realize the benefits expected from the QGT acquisition could adversely affect the value of our common stock.

Although we expect significant benefits to result from the QGT acquisition, there can be no assurance that we will actually realize them. Achieving these benefits will depend, in part, on our ability to integrate QGT's business successfully and efficiently. The challenges involved in this integration, which will be complex and time consuming, include the following: preserving customer and other important relationships of QGT; managing effectively a new business and competing in a new industry; consolidating and integrating information technology, finance, general and administrative infrastructures; coordinating sales and marketing efforts to effectively position our capabilities; coordinating and integrating operations in countries in which we have not previously operated; and integrating employees and related HR systems and benefits, maintaining employee morale and retaining key employees. The successful integration of the QGT business will require significant management attention, and may divert the attention of management from our business and operational issues.

If we do not successfully manage these issues and the other challenges inherent in integrating an acquired business, then we may not achieve the anticipated benefits of the QGT acquisition and our revenue, expenses, operating results, financial condition and stock price could be materially adversely affected.

We are exposed to risks associated with volatility in the global economy.

We rely to a significant extent on OEM customers, whose business, in turn, depends largely on consumer spending and capital expenditures by businesses. Uncertainty regarding the global economy may pose challenges to our business. Economic uncertainty may exacerbate negative trends in business and consumer spending and may cause certain of our customers to push out, cancel, or refrain from placing orders for products or services, which may reduce sales and materially affect our results of operations and financial condition. Inflationary trends could also have an impact on labor costs and component costs, reducing our margins. Difficulties in obtaining capital, uncertain market conditions, or reduced profitability may also cause some customers to scale back operations, exit businesses, merge with other manufacturers, or file for bankruptcy protection and potentially cease operations, leading to customers' reduced research and development funding and/or capital expenditures and, in turn, lower orders from our customers and/or additional slow moving or obsolete inventory or bad debt expense for us. These conditions may also similarly affect key suppliers, which could impair their ability to deliver supplies, components or raw materials and result in delays for our products or services or require us to either procure supplies, components or raw materials from higher-cost suppliers, or if no additional suppliers exist, to reconfigure the design and manufacture of our products or services, and we may be unable to fulfill customer orders.

Escalating trade tensions and the adoption or expansion of tariffs and trade restrictions could negatively impact us.

International trade tensions or trade wars, as well as other changes in social, political, regulatory and economic conditions or laws and policies, could have a material adverse effect on our business, financial condition and operating results. The U.S. Government has recently announced tariffs on steel and aluminum products and materials imported into the United States. The U.S. Government has also implemented or announced plans to impose tariffs on a wide-range of goods imported from China, where we and our customers have significant operations. Additionally, various countries and economic regions have announced plans or intentions to impose retaliatory tariffs on a wide-range of products they import from the U.S., and there is a risk that a broader trade conflict could ensue. These newly imposed or threatened U.S. tariffs and retaliatory tariffs could have the effect of increasing the cost of materials for our products, which could result in our products becoming less competitive or generating lower margins. This has the potential to impact global trade and economic conditions in many of the regions where we do business.

The United Kingdom's (UK) pending withdrawal from the European Union (EU), commonly referred to as "Brexit," has created significant uncertainty concerning the future relationship between the UK and the EU and the impact on global markets. It is unclear what financial, trade, regulatory and legal implications the withdrawal of the UK from the EU will have and how such withdrawal will affect us. Furthermore, the announcement of Brexit caused significant volatility in global stock markets and currency exchange rate fluctuations, and the pending withdrawal of the UK from the EU may also adversely affect European and global economic and market conditions, which may cause our customers to closely monitor their costs and reduce their spending budgets. Any of these effects of Brexit, among others, could have a material adverse impact on our business, financial condition and results of operations.

Other changes in U.S. or international social, political, regulatory and economic conditions or laws and policies governing tax laws, foreign trade, manufacturing, and development and investment in the countries where we or our customers operate could also adversely affect our operating results and our business.

We have significant existing indebtedness; the restrictive covenants under our credit agreement or other limitations on financing may limit our ability to expand or pursue our business strategy or make capital expenditures; if we are

forced to pay some or all of our indebtedness prior to its maturity, our financial position could be severely and adversely affected.

We have total debt as of December 28, 2018 of \$341.2 million. Such debt is composed of a \$350.0 million term loan outstanding under our Credit Agreement with Barclays Bank less debt costs of \$11.5 million and \$2.7 million under FDS's revolving credit facility in the Czech Republic.

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Our indebtedness could have adverse consequences including:

- risk associated with any inability to satisfy debt obligations;
- the portion of our cash flows that must be dedicated to interest and principal payments and will not be available for operations, working capital, capital expenditures, expansion, acquisitions or general corporate or other purposes; and
- impairing our ability to obtain additional financing in the future, if needed.

If we are unable to meet our debt obligations as they come due, we could be forced to restructure or refinance such obligations, seek additional equity financing or sell assets, which we may not be able to do on satisfactory terms, or at all. If we determine it is necessary to seek additional funding for any reason, we may not be able to obtain such funding or, if funding is available, may not be able to obtain it on acceptable terms.

Our Credit Agreement contains certain covenants that restrict our ability to take certain actions, including our ability to incur additional debt, including guarantees, create liens, make certain investments, engage in transactions with affiliates and engage in certain mergers and acquisitions.

Our Credit Agreement requires us to maintain certain financial covenants, including compliance with a maximum consolidated total gross leverage ratio and a minimum fixed charge coverage ratio. Our failure to comply with these covenants could result in an event of default which, if not cured or waived, could result in the acceleration of all of our indebtedness, which would materially adversely affect our financial health if we are unable to access sufficient funds to repay all of the outstanding amounts.

As long as our indebtedness remains outstanding, the restrictive covenants and mandatory prepayment provisions could impair our ability to expand or pursue our business strategies or obtain additional funding.

We may not be able to fund our future capital requirements or strategic acquisitions from our operations, and financing from other sources may not be available on favorable terms or at all.

We made capital expenditures of approximately \$29.2 million and \$18.5 million for fiscal years 2018 and 2017, respectively, which primarily related to our ERP system implementation and to investment in our manufacturing facilities in the United States, China and Singapore. The amount of our future capital requirements will depend on many factors, including:

- the cost required to ensure appropriate IT systems;
- the cost required to ensure access to adequate manufacturing capacity;
- the timing and extent of spending to support product development efforts;
- the timing of introductions of new products and enhancements to existing products;
- the timing, size and availability of strategic transactions we may enter into;
- the cost required to integrate our acquisitions into our business, including into our ERP system;
- changing manufacturing capabilities to meet new or increased customer requirements;
- market acceptance of our products; and
- an ability to generate sufficient cash flow from our operating activities.

We regularly consider opportunities for strategic acquisitions. On August 27, 2018, we completed the acquisition of QGT for approximately \$340.8 million in cash consideration, subject to certain post-closing adjustments, and we may pay up to \$15.0 million in earn-out payments if QGT achieves certain specified revenue levels through December 27, 2019. In connection with our acquisition of QGT, we borrowed a total of \$350.0 million under our term loan B facility with Barclays, which was used to finance the acquisition of QGT and, along with existing cash, repay the total outstanding amount under our prior credit facility.

In order to finance our capital expenditures or any future strategic acquisitions, we may need to raise additional funds through public or private equity or debt financing, but such financing may not be available on terms satisfactory to us, or at all. Access to capital markets has, in the past, been unavailable to companies such as ours. In addition, equity financings could be dilutive to holders of our common stock, and debt financings would likely involve additional covenants that restrict our business operations. Any potential strategic acquisition or significant capital expenditure may also require the consent of our existing lenders. If we cannot raise funds on acceptable terms if and when needed, we may not be able to develop or enhance our products, take advantage of future opportunities, including potential acquisitions, grow our business or respond to competitive pressures or unanticipated requirements, any of which could adversely affect our business, operating results and financial condition.

Our quarterly revenue and operating results fluctuate significantly from period to period, and this may cause volatility in our common stock price.

Our quarterly revenue and operating results, including our gross margin, have fluctuated significantly in the past, and we expect them to continue to fluctuate in the future for a variety of reasons which may include:

- demand for and market acceptance of our products and services as a result of the cyclical nature of the industries we serve or otherwise, often resulting in reduced sales during industry downturns and increased sales during periods of industry recovery or growth;
- overall economic conditions;
- changes in the timing and size of orders by our customers;
- loss of business from one or more significant customers due to strategic decisions by our customers to terminate their outsourcing relationship with us or give market share to our competitors, or due to decreased demand for our customers' products by end customers;
- strategic consolidation by our customers;
- cancellations and postponements of previously placed orders;
- pricing pressure from either our competitors or our customers, resulting in the reduction of our product or service prices, margins or loss of market share;
- disruptions or delays in the manufacturing of our products or in the supply of components or raw materials that are incorporated into or used to manufacture our products or provide our services, thereby causing us to delay the shipment of products;
- decreased margins for several or more quarters following the introduction of new products or services, especially as we introduce new subsystems;
- delays in ramp-up in production, low yields or other problems experienced at our manufacturing facilities in China or Singapore;
- changes in design-to-delivery cycle times;
- inability to reduce our costs quickly in step with reductions in our prices or in response to decreased demand for our products;
- changes in our mix of products sold or services;
- write-offs of excess or obsolete inventory due to a customer's bankruptcy or insolvency;
- one-time expenses or charges associated with failed acquisition negotiations or completed acquisitions;
- inability to control our operating costs consistent with target levels;
- announcements by our competitors of new products, services or technological innovations, which may, among other things, render our products less competitive; and
- geographic mix of customer orders or worldwide earnings.

As a result of the foregoing, we believe that quarter-to-quarter comparisons of our revenue and operating results may not be meaningful and that these comparisons may not be an accurate indicator of our future performance. Changes in the timing or terms of a small number of transactions could disproportionately affect our operating results in any particular quarter. Moreover, our operating results in one or more future quarters may fail to meet our guidance or the expectations of securities analysts or investors. If this occurs, we would expect to experience an immediate and significant decline in the trading price of our common stock.

We have established and, as markets will allow, intend to expand our operations in Asia and Europe, which exposes us to risks associated with operating in foreign countries.

We generated approximately 56.7% and 53.6% of our revenues in international markets for fiscal years 2018 and 2017, respectively. Depending on market conditions, we intend to further expand our operations in Asia and Europe. Through our acquisition of QGT, we expanded our operations to several regions outside of the United States, including in South Korea, Taiwan, Ireland, Scotland and Israel, and increased our operations in China and Singapore. The carrying amount of our fixed assets in Asia and Europe were \$83.7 million and \$2.7 million, respectively as of December 28, 2018.

We are exposed to political, economic, legal and other risks associated with operating in Asia and Europe, including:

foreign currency exchange fluctuations;

political, civil and economic instability;

- restrictive governmental actions, such as restrictions on the transfer or repatriation of funds and foreign investments and trade protection measures, including increasing protectionism, import/export restrictions, import/export duties and quotas, trade sanctions and customs duties and tariffs, all of which could increase under the current or future U.S. administration;

uncertainty regarding social, political and trade policies in the United States and abroad;

timing and availability of export licenses;

disruptions to our and our customers' operations due to increased risk of outbreak of diseases, such as SARS and avian flu;

- disruptions in operations due to China's developing domestic infrastructure, including transportation and energy;

difficulties in developing relationships with local suppliers;

difficulties in attracting new international customers;

difficulties in conducting due diligence with respect to business partners in certain international markets;

difficulties in accounts receivable collections;

difficulties in staffing and managing distant international subsidiary and branch operations;

the burden of complying with foreign and international laws and treaties;

legal systems potentially subject to undue influence or corruption; and

potentially adverse tax consequences, including restrictions on the repatriation of earnings to the United States.

Negative or uncertain global conditions could prevent us from accurately forecasting demand for our products and services which could adversely affect our results of operations. In addition, due to generally lower labor and materials costs in the Asian markets in which we currently operate, a shift in the mix of orders from our customers away from such Asian markets or from low cost Asian markets, such as China, to higher cost Asian markets, such as Singapore, could adversely affect our operating margins.

Our operations in Asia and Europe are also subject us to U.S. laws governing the export of equipment. These laws are complex and require us to obtain clearances for the export to Asia and Europe of certain equipment. We may fail to comply with these laws and regulations, which could require us to cease the export of certain equipment and expose us to fines or penalties.

Over the past several years, the Chinese government has pursued economic reform policies, including the encouragement of private economic activity and greater economic decentralization. The Chinese government may not continue these policies or may significantly alter them to our detriment from time to time without notice. Changes in laws and regulations or their interpretation, the imposition of confiscatory taxation policies, new restrictions on currency conversion or limitations on sources of supply could materially and adversely affect our Chinese operations, which could result in the partial or total loss of our investment in that country and materially and adversely affect our future operating results.

A significant legal risk associated with conducting business internationally is compliance with the various and differing laws and regulations, including anti-corruption and anti-bribery laws and regulations, of the countries in which we do business, antitrust and competition laws, data privacy laws and export regulations. In addition, the laws in various countries are constantly evolving and may, in some cases, conflict with each other. Although our Code of Business Conduct and Ethics and other policies prohibit us, our employees and our agents from engaging in unethical business practices, there can be no assurance that all of our employees or agents will refrain from acting in violation of our related anti-corruption policies and procedures. Any such violation could have a material adverse effect on our business.

Business practices in Asia may entail greater risk and dependence upon the personal relationships of senior management than is common in North America, and therefore some of our agreements with other parties in South Korea and China could be difficult or impossible to enforce.

Through our acquisition of QGT, we have expanded our business activities in Asia. The business culture in parts of Asia is, in some respects, different from the business cultures in Western countries. Personal relationships among business principals of companies and business entities in Asia are very significant in their business cultures. In some cases, because so much reliance is based upon personal relationships, written contracts among businesses in Asia may be less detailed and specific than is commonly accepted for similar written agreements in Western countries. In some cases, material terms of an understanding are not contained in the written agreement but exist only as oral agreements. In addition, in contrast to the Western business environment where a written agreement specifically defines the terms, rights and obligations of the parties in a legally-binding and enforceable manner, the parties to a written agreement in Asia may view that agreement more as a starting point for an ongoing business relationship which will evolve and undergo ongoing modification over time. As a result, any contractual arrangements we enter into with a counterparty in Asia may be more difficult to enforce.

We could be adversely affected by risks associated with joint ventures, including those in the Asian markets.

From time to time, we may seek to expand our business through investments in joint ventures with complementary businesses, technologies, services or products, subject to our business plans and management's ability to identify, acquire and develop suitable investments or acquisition targets in both new and existing market categories and geographic markets. Our investments in joint ventures are subject to a number of risks, including many of those described for acquisitions above under Risk Factors—"Acquisitions could result in operating and integration difficulties, dilution, margin deterioration, diversion of management's attention, and other consequences that may adversely impact our business and results of operations." In particular, at the closing of the QGT acquisition, we indirectly became a party to QGT's joint venture with Cinos Co., Ltd. ("Cinos") and Cinos Xi'an in South Korea and China, which is our first experience with a joint venture. There can be no assurances that the joint ventures will be successful. The success of

the joint ventures will require significant management and capital resources and there can be no assurances that such resources will be available. Operations at the joint ventures could expose us to increased risks inherent in such activities, such as protection of our intellectual property, economic and political stability, labor matters, language and cultural differences; contractual enforcement issues; and the need to manage product development, operations and sales activities that are located a long distance from our headquarters and have historically been centralized with local management. In addition, from time to time in the future, our joint venture partners may have economic or business interests or goals that are different from ours. Furthermore, our joint venture with Cinos will require us to make purchases of equity from time to time up to specified amounts. If

each joint venture business does not progress according to our plans and anticipated timing, our investment in the joint ventures may not be successful.

The industries in which we participate are highly competitive and rapidly evolving, and if we are unable to compete effectively, our operating results will be harmed.

We face intense competition from subsystem and component manufacturers in the industries we serve. Increased competition has in the past resulted, and could in the future result, in price reductions, reduced gross margins or loss of market share, any of which would harm our operating results. We are subject to significant pricing pressure as we attempt to maintain and increase market share with our existing customers. Competitors may offer reduced prices or introduce new products for the markets currently served by our products. These products may have better performance, lower prices and achieve broader market acceptance than our products. Further, OEMs typically own the design rights to their products and may provide these designs to other subsystem manufacturers. If our competitors obtain proprietary rights to these designs such that we are unable to obtain the designs necessary to manufacture products for our OEM customers, our business, financial condition and operating results could be adversely affected. The cleaning and analytical process are proprietary to QuantumClean and ChemTrace, respectively, and are subject to less risk of from cleaning, coating and analytics competitors. OEMs are looking to increase their maintenance services and could create proprietary cleaning processes with competitors, limiting our ability to compete for future business.

Our competitors may have greater financial, technical, manufacturing and marketing resources than we do. As a result, they may be able to respond more quickly to new or emerging technologies and changes in customer requirements, devote greater resources to the development, promotion, sale and support of their products and services, and reduce prices to increase market share. Moreover, there may be merger and acquisition activity among our competitors and potential competitors that may provide our competitors and potential competitors an advantage over us by enabling them to expand their product offerings and service capabilities to meet a broader range of customer needs. Further, if one of our customers develops or acquires the internal capability to develop and produce critical subsystems that we produce, or cleaning, coating and analytical services we provide, the loss of that customer could have a material adverse effect on our business, financial condition and operating results. The introduction of new technologies and new market entrants may also increase competitive pressures.

If our new products are not accepted by OEMs or other customers or if we are unable to obtain historical margins on our new products, our operating results would be adversely impacted.

We design, develop and market critical subsystems and proprietary cleaning, coating and analytical services to OEMs, IDMs and other customers. The introduction of new products and processes is inherently risky because it is difficult to foresee the adoption of new standards, coordinate our technical personnel and strategic relationships and win acceptance of new products by OEMs, IDMs and other customers. We may not be able to recoup design and development expenditures if our new products are not accepted by OEMs, IDMs or other customers. Newly introduced products typically carry lower gross margins than existing products for several or more quarters following their introduction. If any of our new systems or subsystems are not successful in the market, or if we are unable to obtain gross margins on new products that are similar to the gross margins we have historically achieved, our business, operating results and financial condition could be adversely affected.

Our business may be adversely affected by information technology, disruptions, including by impairing our ability to effectively deliver our products or services, which could cause us to lose customers and harm our results of operations.

The manufacture and delivery of our products, the provision of our services and our financial reporting depends on the continuing operation of our technology infrastructure and systems, particularly our data center located in California.

Any damage to or failure of our systems could result in interruptions in our ability to manufacture or deliver products or services on agreed upon lead times, or at all, on a local or worldwide basis, or adversely affect our impact to accurately and timely report our financial results. Interruptions could reduce our sales and profits, and our reputation could be damaged if people believe our systems are unreliable. Our systems and operations are vulnerable to damage or interruption from earthquakes, terrorist attacks, floods, fires, power loss, hardware or software failures, telecommunications failures, cybersecurity attacks, and similar events. Some of the

critical components of our system are not redundant and we currently do not have a backup data center. Accordingly, the risk associated with such events beyond our control is heightened.

Cybersecurity attacks, in particular, are evolving and include, but are not limited to, malicious software, attempts to gain unauthorized access to data, and other electronic security breaches that could lead to disruptions in systems, unauthorized release of confidential or otherwise protected information and corruption of data (our own or that of third parties). Although we have adopted certain measures to mitigate potential risks to our systems from information technology-related disruptions, given the unpredictability of the timing, nature and scope of such disruptions, we could potentially be subject to production downtimes, operational delays, other detrimental impacts on our operations or ability to provide products and services to our customers, the compromising of confidential or otherwise protected information, misappropriation, destruction or corruption of data, security breaches, other manipulation or improper use of our systems or networks, financial losses from remedial actions, loss of business or potential liability, and/or damage to our reputation, any of which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

If we experience frequent or persistent system failures, the attractiveness of our products or services to customers could be permanently harmed. Any steps we take to increase the reliability and redundancy of our systems may be expensive, reduce our operating margin and may not be successful in reducing the frequency or duration of unscheduled interruptions.

If we were required to write down all or part of our goodwill, our net income and net worth could be materially adversely affected.

We had \$150.2 million of goodwill recorded on our consolidated balance sheet as of December 28, 2018. Goodwill represents the excess of cost over the fair market value of net tangible and finite lived, identifiable intangible assets acquired in business combinations. If our market capitalization drops significantly below the amount of net equity recorded on our balance sheet, it could indicate a decline in our value and would require us to further evaluate whether our goodwill has been impaired. During the fourth quarter of each year, we perform an annual review of our goodwill to determine if it has become impaired. We also evaluate goodwill for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. If we were required to write down all or a significant part of our goodwill, our financial results and net worth could be materially adversely affected.

Our business is largely dependent on the know-how of our employees, and we generally do not have an intellectual property position that is protected by patents.

Our business is largely dependent upon our design, engineering, manufacturing, chemical processing, analytical and testing know-how. We rely on a combination of trade secrets and contractual confidentiality provisions and, to a much lesser extent, patents, copyrights and trademarks to protect our proprietary rights. Confidentiality agreements with our employees and others may not adequately prevent disclosure of trade secrets and other proprietary information. Accordingly, our intellectual property position is more vulnerable than it would be if it were protected primarily by patents. If we fail to protect our proprietary rights successfully, our competitive position could suffer, which could harm our operating results. We may be required to spend significant resources to monitor and protect our proprietary rights, and, in the event infringement or breach of our proprietary rights occurs, our competitive position in the market may be harmed. In addition, competitors may design around our technology or develop competing technologies and know-how. Further, since our customers generally own the designs and other intellectual property to the products we manufacture, we cannot prevent them from licensing such designs and other intellectual property to our competitors for the manufacture of such products.

Third parties have claimed and may in the future claim we are infringing their intellectual property, which could subject us to litigation or licensing expenses, and we may be prevented from selling our products if any such claims prove successful.

We have in the past and may in the future receive claims that our products, processes or technologies infringe the patents or other proprietary rights of third parties. In addition, we may be unaware of intellectual property rights of others that may be applicable to our products. Any litigation regarding our patents or other intellectual property could be costly and time-consuming and divert the attention of our management and key personnel from our business operations, any of which could have a material adverse effect on our business and results of operations. The complexity of the technology involved in our products and the uncertainty of intellectual property litigation increase

these risks. Claims of intellectual property infringement may also require us to enter into costly license agreements. However, we may not be able to obtain licenses on terms acceptable to us, or at all. We also may be subject to significant damages or injunctions against the development, manufacture and sale of certain of our products if any such claims prove successful. We also rely on design specifications and other intellectual property of our customers in the manufacture of products for such customers. While our customer agreements generally provide for indemnification of us by our customers if we are subjected to litigation for third-party claims of infringement of such intellectual property, such indemnification provisions may not be sufficient to fully protect us from such claims, or our customers may breach such indemnification obligations to us, which could result in costly litigation to defend against such claims or enforce our contractual rights to such indemnification.

If we do not keep pace with developments in the industries we serve and with technological innovation generally, our products may not be competitive.

Rapid technological innovation in the markets we serve requires us to anticipate and respond quickly to evolving customer requirements and could render our current product or service offerings and technology obsolete. Technological innovations are inherently complex. We must devote resources to technology development in order to keep pace with such rapidly evolving technologies. We believe that our future success will depend upon our ability to design, engineer and manufacture products and services that meet the changing needs of our customers. This requires that we successfully anticipate and respond to technological changes in design, engineering and manufacturing processes, as well as cleaning and analytical processes, in a cost-effective and timely manner. If we are unable to integrate new technical specifications into competitive product and service designs, develop the technical capabilities necessary to manufacture new products or provide new services or make necessary modifications or enhancements to existing products or services, our business prospects could be harmed.

The timely development of new or enhanced products and services is a complex and uncertain process which requires that we:

- design innovative and performance-enhancing features that differentiate our products and services from those of our competitors;
- identify emerging technological trends in the industries we serve, including new standards for our products and services;
- accurately identify and design new products and services to meet market needs;
- collaborate with OEMs to design and develop products and IDMs to design and develop services on a timely and cost-effective basis;
- ramp-up production of new products, especially new subsystems, in a timely manner and with acceptable yields at acceptable costs;
- successfully manage development production cycles; and
- respond effectively to technological changes or product or service announcements by others.

If we are unsuccessful in keeping pace with technological developments for the reasons above or other reasons, our business prospects, results of operations and financial condition could be materially and adversely affected.

We must achieve design wins to retain our existing customers and to obtain new customers.

New capital equipment typically has a lifespan of several years, and OEMs frequently specify which systems, subsystems, components and instruments are to be used in their equipment. Once a specific system, subsystem, component or instrument is incorporated into a piece of capital equipment, it will likely continue to be incorporated into that piece of equipment for at least several months before the OEM would be in a position to switch to the product of another supplier. IDMs typically establish cleaning, coating, and analytical services as they develop and qualify new chip designs for production. Once a cleaned or coated part has been qualified, the associated

refurbishment processes are likely to continue to be used. Accordingly, it is important that our products are designed into the new capital equipment of OEMs and new chip designs, which we refer to as a design win, in order to retain our competitive position with existing customers and to obtain new customers.

We incur technology development and sales expenses with no assurance that our products will ultimately be designed into an OEM's capital equipment. Further, developing new customer relationships, as well as maintaining and increasing our market share with existing customers, requires a substantial investment of our sales, engineering and management resources without any assurance from prospective customers that they will place significant orders. We believe that OEMs and IDMs often consider long-term relationships in selecting and placing orders with suppliers. Accordingly, we may have difficulty achieving design wins from OEMs and IDMs that are not currently our customers. Our operating results and potential growth could be adversely affected if we fail to achieve design wins with leading OEMs and IDMs.

Defects in our products could damage our reputation, decrease market acceptance of our products, cause the unintended release of hazardous materials, and result in potentially costly litigation, indemnification liability or unexpected warranty claims.

A number of factors, including design flaws, material and component failures, workmanship issues, contamination in the manufacturing, cleaning, coating or analytical environment, impurities in the materials or chemicals used and unknown sensitivities to process conditions, such as temperature and humidity, as well as equipment failures, may cause our products to contain undetected errors or defects. Problems with our products may:

- cause delays in product introductions and shipments for us or our customers;
- result in increased costs and diversion of development resources;
- cause us to incur increased charges due to unusable inventory;
- require design modifications;
- result in liability for the unintended release of hazardous materials or other damages to our or our customers' property;
- create claims for rework, replacement and/or damages under our contracts with customers, as well as indemnification claims from customers;
- decrease market acceptance of, or customer satisfaction with, our products, which could result in decreased sales and product returns; or
- result in lower yields for semiconductor manufacturers.

If any of our products contain defects or have reliability, quality or compatibility problems, our reputation might be damaged and customers might be reluctant to buy our products or services. We may also face a higher rate of product defects as we increase our production levels. Product defects could result in warranty and indemnification liability, the loss of existing customers or impair our ability to attract new customers. In addition, we may not find defects or failures in our products until after they are installed in a manufacturer's fabrication facility. We may have to invest significant capital and other resources to correct these problems. Our current or potential customers also might seek to recover from us any losses resulting from defects or failures in our products. Hazardous materials flow through and are controlled by our products and an unintended release of these materials could result in serious injury or death. Liability claims could require us to spend significant time and money in litigation or pay significant damages or indemnification claims.

Fluctuations in currency exchange rates may adversely affect our financial condition and results of operations.

Our international revenues are denominated primarily, though not entirely, in U.S. dollars. Many of the costs and expenses associated with our international operations are paid in foreign currencies, including Chinese Renminbi, Singapore dollars, Japanese Yen, South Korean won and Euro and we expect our exposure to these foreign currencies to increase as we increase production in those facilities. Changes in exchange rates among other currencies in which our revenue or costs are denominated and the U.S. dollar may affect our revenue, cost of sales and operating margins.

The Company uses derivative instruments, such as foreign currency forward contracts, to hedge certain exposures to fluctuations in foreign currency exchange rates. The use of such hedging activities may not offset any, or more than a portion, of the adverse financial effects of unfavorable movements in foreign exchange rates over the limited time the hedges are in place.

The market for our stock is subject to significant fluctuation.

The size of our public market capitalization is relatively small, and the average volume of our shares that are traded is relatively low. The market price of our common stock could be subject to significant fluctuations. Among the factors that could affect our stock price are:

- quarterly variations in our operating results;
- our ability to successfully introduce new products and services and manage new product transitions;
- changes in revenue or earnings estimates or publication of research reports by analysts;
- speculation in the press or investment community;
- strategic actions by us, our customers or our competitors, such as acquisitions or restructurings;
- announcements relating to any of our key customers, significant suppliers or the semiconductor manufacturing and capital equipment industry generally;
- general market conditions;
- the effects of war and terrorist attacks; and
- domestic and international economic or political factors unrelated to our performance.

The stock markets in general, and the markets for technology stocks in particular, have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. These broad market fluctuations may adversely affect the trading price of our common stock.

The technology labor market is very competitive, and our business will suffer if we are unable to effectively hire, promote and retain key personnel.

Our future success depends in part on the continued service of our key executive officers, as well as our research, engineering, sales, manufacturing and administrative personnel, most of whom are not subject to employment or non-competition agreements. In addition, competition for qualified personnel in the technology industry is intense, and we operate in geographic locations in which labor markets are particularly competitive.

Our business is particularly dependent on expertise which only a limited number of engineers possess. The loss of any of our key employees and officers, including our Chief Executive Officer, our Chief Financial Officer, any of our Executive or Senior Vice Presidents or any of our other senior managers, or the failure to attract, promote and retain qualified employees, could adversely affect our business, operating results and financial condition.

Management transition also creates uncertainties and could harm our business. Disruption to our organization as a result of executive management transition could divert the executive management's attention away from certain key areas of our business and have a material adverse effect on our business, financial condition and results of operations.

The challenges of employee retention has also increased during the integration process with the companies we have acquired because of the necessity of combining personnel with varied business backgrounds and combining different corporate cultures and objectives, and several acquired employees, including members of the acquired companies' senior management, have left our company. The process of integrating operations and making such adjustments could cause an interruption of, or loss of momentum in, the activities of one or more of our businesses and the loss of key personnel. Employee uncertainty, lack of focus or turnover during the integration process may also disrupt our businesses.

If we fail to maintain an effective system of internal controls, we might not be able to report our financial results accurately or prevent fraud; in that case, our stockholders could lose confidence in our financial reporting, which would harm our business and could negatively impact the price of our stock.

Effective internal controls are necessary for us to provide reliable financial reports and prevent fraud. In addition, Section 404 of the Sarbanes-Oxley Act of 2002 requires us and our independent registered public accounting firm to evaluate and report on our internal control over financial reporting. The process of designing, implementing, maintaining and updating our internal controls and complying with Section 404 is expensive and time consuming, and requires significant attention from management and company resources. In addition, following the expiration of applicable grace periods, we are required to evaluate and report on the internal controls of the companies we acquire, and the attestation report we are required to obtain from our independent registered public accounting firm must include the internal control over financial reporting of the companies we acquire. Integrating acquired companies' internal control frameworks into the Company and upgrading acquired companies' controls to comply with the Sarbanes-Oxley Act has required and will require substantial resources, and we cannot assure you that we will be able to successfully or effectively maintain adequate controls over our financial processes at our acquired companies, or for our consolidated business. In addition, even though we have concluded, and our independent registered public accounting firm has concurred, that our internal control over financial reporting provides reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles as of December 28, 2018, because of its inherent limitations may not be effective as of future periods. Failure to maintain existing or implement new or improved controls, or difficulties encountered in their implementation, could harm our results of operations or cause us to fail to meet our reporting obligations. If we or our independent registered public accounting firm discover a material weakness, the disclosure of that fact, even if quickly remedied, could reduce the market's confidence in our financial statements and harm our stock price.

If environmental contamination were to occur in one of our production facilities, we could be subject to substantial liabilities.

We use substances regulated under various foreign, domestic, federal, state and local environmental laws and regulations in our facilities. In addition, we may not be aware of or in compliance with all environmental laws or regulations that could subject us to liability in the U.S. or internationally. Our failure or inability to comply with existing or future environmental requirements could result in significant remediation and other liabilities, the imposition of fines or the suspension or termination of the production of our services or products, and thus a material adverse impact on our business.

Our business is subject to the risks of earthquakes, fire, power outages, floods, and other catastrophic events, and to interruption by man-made disruptions, such as terrorism.

Our facilities could be subject to a catastrophic loss caused by natural disasters, including fires and earthquakes. We have facilities in areas with above average seismic activity, such as our facilities in South San Francisco, California, Hayward, California and our Taiwan facilities in Hsinchu and Tainan. If any of our facilities were to experience a catastrophic loss, it could disrupt our operations, delay production and shipments, reduce revenue and result in large expenses to repair or replace the facility. In addition, we have in the past experienced, and may in the future experience, fires and extended power outages at our facilities, such as the fire that occurred at a plant operated by our joint venture, Cinos, in Balan, Republic of Korea, which we announced on September 19, 2018. We do not carry insurance policies that cover potential losses caused by earthquakes or other natural disasters or power loss.

In addition, disruption in supply resulting from natural disasters or other causalities or catastrophic events, such as earthquakes, severe weather such as storms or floods, fires, labor disruptions, power outages, terrorist attacks or

political unrest, may result in certain of our suppliers being unable to deliver sufficient quantities of components or raw materials at all or in a timely manner, disruptions in our operations or disruptions in our customers' operations. For example, in 2011, the northern region of Japan experienced a severe earthquake followed by a tsunami. These geological events caused significant damage in that region and adversely affected Japan's infrastructure and economy. Some of our suppliers are located in Japan and they experienced, and may experience in the future, shutdowns or disruptions as a result of these types of events, and their operations may be negatively

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impacted by these events. Many of our customers and suppliers are also located in California, and may be subject to the same risk of seismic activity as described for us above.

To the extent that natural disasters or other calamities or causalities should result in delays or cancellations of customer orders, or the delay in the manufacture or shipment of our products or services, our business, financial condition and operating results would be adversely affected.

Changes in tax rates or tax assets and liabilities could affect results of operations.

As a global company, we are subject to taxation in the United States and various other countries. Significant judgment is required to determine and estimate worldwide tax liabilities. Our future annual and quarterly tax rates could be affected by numerous factors, including changes in the: (1) applicable tax laws; (2) amount and composition of pre-tax income in countries with differing tax rates; or (3) valuation of our deferred tax assets and liabilities.

On December 22, 2017, the Tax Act Cuts and Jobs (“TCJA”) was signed into law. The TCJA contains significant changes to corporate taxation, including reduction of the corporate tax rate from 35% to 21%, additional limitations on the tax deductibility of interest, substantial changes to the taxation of foreign earnings, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modification or repeal of many business deductions and credits. The Company has made reasonable estimates of the financial impact of the TCJA on the Company. However, the estimates are provisional and a change in estimate can have an impact on our results of operations, cash flows and financial conditions, as well as the trading price of our Common Stock. UCT will continue to analyze the effects of the TCJA on its financial statements and operations. Additional impacts from the enactment of the TCJA will be recorded as they are identified during the one-year measurement period as provided for in SEC Staff Accounting Bulletin 118.

In addition, we are subject to regular examination by the Internal Revenue Service and other tax authorities, and from time to time we initiate amendments to previously filed tax returns. We regularly assess the likelihood of favorable or unfavorable outcomes resulting from these examinations and amendments to determine the adequacy of our provision for income taxes, which requires estimates and judgments. Although we believe our tax estimates are reasonable, there can be no assurance that the tax authorities will agree with such estimates. We may have to engage in litigation to achieve the results reflected in the estimates, which may be time-consuming and expensive. There can be no assurance that we will be successful or that any final determination will not be materially different from the treatment reflected in our historical income tax provisions and accruals, which could materially and adversely affect our financial condition and results of operations.

Certain regulations related to conflict minerals could adversely impact our business.

The Dodd-Frank Wall Street Reform and Consumer Protection Act contains provisions to improve transparency and accountability concerning the supply of certain minerals, known as conflict minerals, originating from the Democratic Republic of Congo (DRC) and adjoining countries. As a result, in August 2012 the SEC adopted annual disclosure and reporting requirements for those companies who use conflict minerals mined from the DRC and adjoining countries in their products. These requirements require us to perform ongoing due diligence efforts on our supply chain and require public disclosure of the nature and results of these efforts. We filed our most recent conflict minerals report on Form SD on May 30, 2018 reporting that we could not yet determine whether the conflict minerals we source were, directly or indirectly, used to finance or benefit armed groups in the Covered Countries. There have been and there will be costs associated with complying with these disclosure requirements to determine the sources of conflict minerals used in our products and other potential changes to products, processes or sources of supply as a consequence of such verification activities. Complying with these rules could adversely affect the sourcing, supply and pricing of materials used in our products and result in substantial additional costs. As there may be only a limited

number of suppliers offering “conflict free” conflict minerals, we cannot be sure that we will be able to obtain necessary conflict minerals from such suppliers in sufficient quantities or at competitive prices. Also, we may face reputational challenges if we determine that certain of our products contain minerals not determined to be conflict free or if we are unable to sufficiently verify the origins for all conflict minerals used in our products through the procedures we may implement. In addition, there is uncertainty about the future of the regulations related to conflict minerals as a result of legal challenges and statements by the SEC. If we are unable to comply with these rules, we could be subject to enforcement actions by the Securities and Exchange Commission

and liability under the Securities Exchange Act of 1934, as amended, which could result in material adverse consequences to our business, as well as significant fines and penalties.

If securities or industry analysts do not publish research or reports about our business, or if they issue an adverse opinion regarding our stock, our stock price and trading volume could decline.

The trading market for our common stock is influenced by the research and reports that industry or securities analysts publish about us or our business. If any of the analysts who cover us issue an adverse opinion regarding our stock, our stock price would likely decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

We do not currently intend to pay dividends on our common stock and, consequently, your ability to achieve a return on your investment will depend on appreciation in the price of our common stock.

We do not intend to declare and pay dividends on our capital stock for the foreseeable future. We currently intend to invest our future earnings, if any, to fund our growth. Additionally, the terms of our credit agreement also restrict our ability to pay dividends. Therefore, you are not likely to receive any dividends on your common stock for the foreseeable future.

From time to time, we may become involved in other litigation and regulatory proceedings, which could require significant attention from our management and result in significant expense to us and disruptions to our business.

In addition to any litigation related to our intellectual property rights, we may in the future be named as a defendant from time to time in other lawsuits and regulatory actions relating to our business, such as commercial contract claims, environmental compliance claims, employment claims and tax examinations, some of which may claim significant damages or cause us reputational harm. Due to the inherent uncertainties of litigation and regulatory proceedings, we cannot predict the ultimate outcome of any such proceeding. An unfavorable outcome could have a material adverse effect on our business, financial condition and results of operations or limit our ability to engage in certain of our business activities. In addition, regardless of the outcome of any litigation or regulatory proceeding, such proceedings are often expensive, time-consuming and disruptive to normal business operations and require significant attention from our management. As a result, any such lawsuits or proceedings could materially adversely affect our business, financial condition and results of operations.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

UCT's headquarters is located in Hayward, California and its QGT subsidiary's headquarters is located in Quakertown, Pennsylvania. These facilities provide administrative, sales and support, engineering and technology development and manufacturing operations. The leases for these facilities expire in 2021 and 2022, respectively.

The Company has manufacturing and engineering facilities in Hayward, South San Francisco and Fremont, California, Austin, Texas, Chandler, Arizona; Shanghai, China; Singapore; Cebu, Philippines and Liberec, Czech Republic. The Company has parts cleaning, analytics and engineering facilities in Colorado Springs, Colorado; Phoenix, Arizona; San Jose, California; Fremont, California; Hillsboro, Oregon; Portland, Oregon; Scarborough, Maine; Carrollton, Texas; Israel, Taiwan, South Korea and Singapore. These facilities have leases that expire on various dates through 2031 and are subject to periodic changes.

We also own buildings and land that are located in South Korea, China and the United Kingdom.

We believe that our existing facilities are well-maintained and in good operating condition.

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The table below lists our properties as of March 22, 2019:

Location	Principal Use	Square Footage	Ownership
Hayward, California	Headquarters, manufacturing, sales, engineering, technology development	148,855	Leased
South San Francisco, California	Manufacturing, engineering	123,847	Leased
Fremont, California	Manufacturing, engineering	9,000	Leased
Austin, Texas	Manufacturing, engineering	56,400	Leased
Chandler, Arizona	Manufacturing	127,301	Leased
Cebu, Philippines	Manufacturing	15,726	Leased
Singapore	Manufacturing, customer support	161,814	Leased
Shanghai, China	Manufacturing	154,068	Leased
Czech Republic	Manufacturing, customer support	97,171	Leased
Quakertown, Pennsylvania	Headquarters	8,077	Leased
Colorado Springs, Colorado	Parts Cleaning	14,000	Leased
Scarborough, Maine	Parts Cleaning	20,000	Leased
San Jose, California	Parts Cleaning	20,130	Leased
Fremont, California	Parts Cleaning, R&D, Laboratory & Recycling	59,161	Leased
Hillsboro, Oregon	Parts Cleaning	61,334	Leased
Portland, Oregon	Testing & Parts Cleaning	5,156	Leased
Phoenix, Arizona	Parts Cleaning	72,884	Leased
Carrollton, Texas	Parts Cleaning	121,968	Leased
Quiryat Gat, Israel	Parts Cleaning	56,758	Leased
Fife, Scotland, United Kingdom	Parts Cleaning	26,658	Own
Singapore	Parts Cleaning	55,122	Leased
Hukou Township, Taiwan	Parts Cleaning	30,354	Leased
Tainan, Taiwan	Parts Cleaning	90,000	Leased
Gyeonggi-do, South Korea	Parts Cleaning	40,000	Leased
Gyeonggi-do, South Korea	Parts Cleaning	157,453	Own
Hwaseong-si, South Korea	Parts Cleaning	95,814	Own
Xi'an, China	Parts Cleaning	66,185	Own

(1) We lease this facility from one of our directors. We incurred rent expense resulting from the lease of this facility of \$0.3 million for each of fiscal years 2018 and 2017.

Item 3. Legal Proceedings

From time to time, we are subject to various legal proceedings and claims, either asserted or unasserted, that arise in the ordinary course of business. Although the outcome of the various legal proceedings and claims cannot be predicted with certainty, we have not had a history of outcomes to date that have been material to our statement of operations and do not believe that any of these proceedings or other claims will have a material adverse effect on our consolidated financial condition or results of operations.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Our common stock has been traded on the NASDAQ Global Market under the symbol "UCTT" since March 25, 2004. The following table sets forth for the periods indicated the high and low sales prices per share of our common stock as reported by the NASDAQ Global Market:

	High	Low
Fiscal year 2017		
First quarter	\$ 16.99	\$ 9.42
Second quarter	\$ 26.21	\$ 14.93
Third quarter	\$ 30.92	\$ 18.41
Fourth quarter	\$ 34.59	\$ 18.86
Fiscal year 2018		
First quarter	\$ 27.20	\$ 16.29
Second quarter	\$ 19.59	\$ 15.36
Third quarter	\$ 17.35	\$ 12.28
Fourth quarter	\$ 13.00	\$ 6.94

To date, we have not declared or paid cash dividends to our stockholders and we do not intend to do so for the foreseeable future in order to retain earnings for use in our business. Our credit facility also limits our ability to pay dividends. As of February 22, 2019, we had three stockholders of record.

Recent Sales of Unregistered Sales of Equity Securities

None.

Purchase of Equity Securities by the Issuer and Affiliated Purchasers

None.

Item 6. Selected Consolidated Financial Data

You should read the following tables in conjunction with other information contained under “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” our consolidated financial statements and related notes and other financial information contained elsewhere in this Annual Report on Form 10-K.

Statements of Operations Data (in thousands, except per share amounts):

	Years Ended				
	12/28/2018**	12/29/2017	12/30/2016	12/25/2015*	12/26/2014
Consolidated Statements of Operations Data:					
Revenues	\$ 1,096,523	\$ 924,351	\$ 562,759	\$ 469,103	\$ 513,957
Cost of goods sold	920,682	756,722	475,976	398,073	440,824
Gross profit	175,841	167,629	86,783	71,030	73,133
Operating expenses, excluding acquisition costs	105,134	78,232	64,392	64,605	54,949
Acquisition costs	10,003	—	—	584	—
Income from operations	60,704	89,397	22,391	5,841	18,184
Interest expense and other, net	(8,436)	(2,455)	(3,444)	(2,234)	(1,854)
Income before income taxes	52,268	86,942	18,947	3,607	16,330
Income tax provision	15,319	11,857	8,896	14,339	4,973
Net income (loss)	36,949	75,085	10,051	(10,732)	11,357
Net income attributable to noncontrolling interest	353	—	—	—	—
Net income (loss) attributable to Ultra					
Clean Holdings, Inc.	\$ 36,596	\$ 75,085	\$ 10,051	\$ (10,732)	\$ 11,357
Net income (loss) per share attributable to Ultra					
Clean Holdings, Inc. common stockholders:					
Basic	\$ 0.95	\$ 2.25	\$ 0.31	\$ (0.34)	\$ 0.39
Diluted	\$ 0.94	\$ 2.19	\$ 0.30	\$ (0.34)	\$ 0.38
Shares used in computing net income (loss)					
per share:					
Basic	38,366	33,409	32,632	31,564	29,301
Diluted	38,919	34,303	33,150	31,564	29,936

Consolidated Balance Sheet Data (in thousands):

	12/28/2018**	12/29/2017	12/30/2016	12/25/2015*	12/26/2014
Cash & cash equivalents	\$ 144,145	\$ 68,306	\$ 52,465	\$ 50,103	\$ 78,997
Working capital	\$ 323,627	\$ 200,101	\$ 136,389	\$ 125,428	\$ 142,279
Total assets	\$ 965,477	\$ 563,412	\$ 380,697	\$ 336,153	\$ 296,142
Bank borrowings and long-term debt	\$ 341,220	\$ 52,274	\$ 67,750	\$ 75,539	\$ 48,155

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Other long term liabilities	\$ 43,642	\$ 6,556	\$ 3,291	\$ 3,769	\$ 2,948
Total stockholders' equity	\$ 450,988	\$ 300,305	\$ 216,131	\$ 200,943	\$ 188,552

*Includes the results of operations of Thermal and FDS for the period February 5, 2015 through December 25, 2015 and for the period from July 31, 2015 to December 25, 2015, respectively.

**Include the results of operations of QGT for the period from August 27, 2018 to December 28, 2018. See Note 5 to the Notes to Consolidated Financial Statements for further information.

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

This section and other parts of this Annual Report on Form 10-K contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements involve risks and uncertainties. Forward-looking statements can also be identified by words such as “anticipate,” “believe,” “estimate,” “expect,” “intend,” “may,” “might,” “plan,” “project,” “will,” “would,” “should,” “could,” “can,” “predict,” “potential,” “continue,” “objective,” and similar. Forward-looking statements are not guarantees of future performance and our actual results may differ significantly from the results discussed in the forward-looking statements. Factors that might cause such differences include, but are not limited to, those discussed in “Item 1A — Risk Factors” above. The following discussion should be read in conjunction with the consolidated financial statement and notes thereto included in Item 8 of this report. We assume no obligation to revise or update any forward-looking statements for any reason, except as required by law.

Overview

We are a global leader in the design, engineering, and manufacture of production tools, modules and subsystems for the semiconductor capital equipment industry and industry segments with similar requirements including display, consumer and medical. We focus on providing specialized engineering and manufacturing solutions for these applications. We enable our customers to realize lower manufacturing costs and reduced design-to-delivery cycle times while maintaining high quality standards.

With our acquisition of Quantum Global Technologies, LLC (“QGT”), on August 27, 2018, a leader in parts cleaning, coating and semiconductor Fab-related analytical services, we expanded our capabilities to provide ultra-high purity parts cleaning, process tool part recoating, surface treatment, and analytical services to the semiconductor and related industries. The results of operations for 2018 and the discussion below reflect approximately four months of activity resulting from the acquisition of QGT.

In August 2018, we sold all outstanding common stock of UCT Additive Manufacturing Center PTE. LTD. (“UAMC”), our 3D printing initiative, which was set up and launched in Singapore in November of 2014 to develop additive manufacturing capabilities for our existing customer base, for \$0.1 million, in the form of \$0.3 million note receivable from the purchaser and \$0.2 of payables retained by us. As a result of this transaction, we recognized a loss of \$1.1 million.

We ship a significant number majority of our products and serviced parts to U.S. registered customers with locations both in and outside the U.S. In addition to U.S. manufacturing and service operations, we manufacture products and provide parts cleaning and other related services in our Asian and European facilities to support local and U.S. based customers. We conduct our operating activities primarily through our subsidiaries, Ultra Clean Technology Systems and Service, Inc., AIT, Ultra Clean Micro-Electronics Equipment (Shanghai) Co., Ltd., Ultra Clean Asia Pacific, Pte, Ltd., UCT Thermal Solutions, Inc., UCT Fluid Delivery Solutions s.r.o. and QGT.

Results of Operations

The following table sets forth income statement data for the periods indicated as a percentage of revenue:

	Year Ended		
	December 31, 2018	December 29, 2017	December 30, 2016
Revenues	100.0 %	100.0 %	100.0 %
Cost of goods sold	84.0	81.9	84.6
Gross profit	16.0	18.1	15.4
Operating expenses:			
Research and development	1.2	1.3	1.8
Sales and marketing	1.5	1.5	2.1
General and administrative	7.8	5.6	7.6
Total operating expenses	10.5	8.4	11.5
Income from operations	5.5	9.7	3.9
Interest and other income (expense), net	(0.8)	(0.3)	(0.6)
Income before provision for income taxes	4.7	9.4	3.3
Income tax provision	1.4	1.3	1.6
Net income	3.3	8.1	1.7
Net income attributable to noncontrolling interest	0.0	0.0	0.0
Net income attributable to Ultra Clean Holdings, Inc.	3.3 %	8.1 %	