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 27, 2019

or

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

For the transition period from______ to ______

Commission File Number 001-37961

ICHOR HOLDINGS, LTD.
(Exact name of registrant as specified in its charter)

Cayman Islands	**001-37961**	**Not Applicable**
(State or other jurisdiction of incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**

3185 Laurelview Ct.
Fremont, California 94538
(Address of principal executive offices, including Zip Code)

(510) 897-5200
(Registrant's telephone number, including area code)

Not Applicable
(Former name or former address, if changed since last report)

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

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Ordinary Shares, par value $0.0001	ICHR	The NASDAQ Stock 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 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 in Rule 12b-2 of the Act). Yes ☐ No ☒

There were 22,805,443 ordinary shares, $0.0001 par value, outstanding as of March 4, 2020. The aggregate market value of voting ordinary shares held by non-affiliates was $526,288,000 as of June 28, 2019, the last business day of our most recently completed second fiscal quarter.

DOCUMENTS INCORPORATED BY REFERENCE

The information required by Part III of Form 10-K is incorporated herein by reference to the registrant’s definitive Proxy Statement relating to its 2020 General Meeting, which will be filed with the Securities and Exchange Commission within 120 days after the end of the registrant’s fiscal year.

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CAUTIONARY STATEMENT CONCERNING FORWARD-LOOKING STATEMENTS

This report contains forward-looking statements within the meaning of the federal securities laws. All statements other than statements of historical fact included in this report are forward-looking statements. These statements relate to analyses and other information, which are based on forecasts of future results and estimates of amounts not yet determinable. These statements also relate to our future prospects, developments and business strategies. These forward-looking statements are identified by the use of terms and phrases such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “predict,” “project,” “will” and similar terms and phrases, including references to assumptions. However, these words are not the exclusive means of identifying such statements. These statements are contained in many sections of this report, including those entitled “Business” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” Although we believe that our plans, intentions and expectations reflected in or suggested by such forward-looking statements are reasonable, we cannot assure you that we will achieve those plans, intentions or expectations. All forward-looking statements are subject to risks and uncertainties that may cause actual results to differ materially from those that we expected.

Important factors that could cause actual results to differ materially from our expectations, or cautionary statements, are disclosed under the sections entitled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in this report. All written and oral forward-looking statements attributable to us, or persons acting on our behalf, are expressly qualified in their entirety by the cautionary statements contained in this report under the heading “Risk Factors,” as well as other cautionary statements that are made from time to time in our other filings with the Securities and Exchange Commission and public communications. You should evaluate all forward-looking statements made in this report in the context of these risks and uncertainties.

We caution you that the important factors referenced above may not contain all of the factors that are important to you. In addition, we cannot assure you that we will realize the results or developments we expect or anticipate or, even if substantially realized, that they will result in the consequences or affect us or our operations in the way we expect. The forward-looking statements included in this report are made only as of the date hereof. We undertake no obligation to publicly update or revise any forward-looking statement as a result of new information, future events or otherwise, except as otherwise required by law.

PART I

ITEM 1. BUSINESS

Unless expressly indicated or the context requires otherwise, the terms "Ichor," "Company," "we," "us," "our," and similar terms in this report refer to Ichor Holdings, Ltd. and its consolidated subsidiaries.

We use a 52 or 53 week fiscal year ending on the last Friday in December. The following table details our fiscal periods included elsewhere in this report. All references to fiscal years or quarters relate to our fiscal period as so detailed.

Fiscal Period	Period Ending	Weeks in Period
Fiscal Year 2019:	December 27, 2019	52
First Quarter	March 29, 2019	13
Second Quarter	June 28, 2019	13
Third Quarter	September 27, 2019	13
Fourth Quarter	December 27, 2019	13
Fiscal Year 2018:	December 28, 2018	52
First Quarter	March 30, 2018	13
Second Quarter	June 29, 2018	13
Third Quarter	September 28, 2018	13
Fourth Quarter	December 28, 2018	13
Fiscal Year 2017:	December 29, 2017	52
First Quarter	March 31, 2017	13
Second Quarter	June 30, 2017	13
Third Quarter	September 29, 2017	13
Fourth Quarter	December 29, 2017	13
Fiscal Year 2016	December 30, 2016	53
Fiscal Year 2015	December 25, 2015	52

Company Overview

We are a leader in the design, engineering, and manufacturing of critical fluid delivery subsystems and components for semiconductor capital equipment. Our product offerings include gas and chemical delivery systems and subsystems, collectively known as fluid delivery systems and subsystems, which are key elements of the process tools used in the manufacturing of semiconductor devices. Our gas delivery subsystems deliver, monitor, and control precise quantities of the specialized gases used in semiconductor manufacturing processes such as etch and deposition. Our chemical delivery systems and subsystems precisely blend and dispense the reactive liquid chemistries used in semiconductor manufacturing processes such as chemical-mechanical planarization, electroplating, and cleaning. We also manufacture precision machined components, weldments, and proprietary products for use in fluid delivery systems for direct sales to our customers. This vertically integrated portion of our business is primarily focused on metal and plastic parts that are used in gas and chemical systems, respectively.

Fluid delivery subsystems ensure accurate measurement and uniform delivery of specialty gases and chemicals at critical steps in the semiconductor manufacturing processes. Any malfunction or material degradation in fluid delivery reduces yields and increases the likelihood of manufacturing defects in these processes. Most OEMs outsource all or a portion of the design, engineering, and manufacturing of their gas delivery subsystems to a few specialized suppliers, including us. Additionally, many OEMs are also increasingly outsourcing the design, engineering, and manufacturing of their chemical delivery subsystems due to the increased fluid expertise required to manufacture these subsystems. Outsourcing these subsystems has allowed OEMs to leverage the suppliers' highly specialized engineering, design, and production skills while focusing their internal resources on their own value-added processes. We believe that this outsourcing trend has enabled OEMs to reduce their costs and development time, as well as provide growth opportunities for specialized subsystems suppliers like us.

Our goal is to be a leading supplier of fluid delivery subsystems and components to OEMs engaged in manufacturing capital equipment to produce semiconductors and to leverage our technology and products to expand the share of our addressable markets. To achieve this goal, we engage with our customers early in their design and development processes and utilize our deep engineering resources and operating expertise, as well as our expanded product portfolio, to jointly create innovative and advanced solutions that meet the current and future needs of our customers. These collaborations frequently involve our engineers working at our customers' sites and serving as an extension of our customers' product design teams. We employ this approach with three of the largest manufacturers of semiconductor capital equipment in the world. We believe this approach enables us to design products that meet the precise specifications our customers demand, allows us to often be the sole supplier of these subsystems during the initial production ramp, and positions us to be the preferred supplier for the full five to ten-year lifespan of the process tool.

The broad technical expertise of our engineering team, coupled with our early customer engagement approach, enables us to offer innovative and reliable solutions to complex fluid delivery challenges. With two decades of experience developing complex fluid delivery subsystems and meeting the constantly changing production requirements of leading semiconductor OEMs, we have developed expertise in fluid delivery that we offer to our OEM customers. In addition, our capital efficient model and the integration of our business systems with those of our customers provides us the flexibility to fulfill increased demand and meet changing customer requirements with relatively low levels of capital expenditures. With an aim to provide superior customer service, we have a global footprint with many facilities strategically located in close proximity to our customers. We have long standing relationships with top tier OEM customers, including Lam Research, Applied Materials, and ASML, which were our three largest customers by sales in 2019.

We generated revenue from continuing operations of $620.8 million, $823.6 million, and $655.9 million in 2019, 2018, and 2017, respectively (hereinafter, all references to "sales" or "revenue" relates to net sales from continuing operations, unless explicitly stated otherwise). We generated net income from continuing operations of $10.7 million, $57.9 million, and $56.9 million in 2019, 2018, and 2017, respectively. We generated non-GAAP adjusted net income from continuing operations of $28.3 million, $75.1 million, and $65.1 million in 2019, 2018, and 2017, respectively. See *Item 7 – Management's Discussion and Analysis of Financial Condition and Results of Operations, Non-GAAP Results* for a discussion of non-GAAP adjusted net income from continuing operations, an accompanying presentation of the most directly comparable financial measure calculated in accordance with generally accepted accounting principles in the United States, net income from continuing operations, and a reconciliation of the differences between non-GAAP adjusted net income from continuing operations and net income from continuing operations.

Our Competitive Strengths

As a leader in the fluid delivery industry, we believe that our key competitive strengths include the following:

Deep Fluids Engineering Expertise

We believe that our engineering team, comprised of chemical engineers, mechanical engineers, and software and systems engineers, has positioned us to expand the scope of our solutions, provide innovative products and subsystems, and strengthen our incumbent position at our OEM customers. Many of our engineers are industry veterans and have spent a significant portion of their careers at our customers, bringing first-hand expertise and a heightened understanding of our customers' needs. Our engineering team acts as an extension of our customers' product development teams, providing our customers with technical expertise that is outside of their core competencies.

Early Engagement with Customers on Product Development

We seek to engage with our customers and potential customers very early in their process for new product development. We believe this approach enables us to collaborate on product design, qualification, manufacturing, and testing in order to provide a comprehensive, customized solution. Through early engagement during the complex design stages, our engineering team gains early insight into our customers' technology roadmaps which enables us to pioneer innovative and advanced solutions. In many cases our early engagement with our customers enables us to be the sole source supplier when the product is initially introduced.

Long History and Strong Relationships with Top Tier Customers

We have established deep relationships with top tier OEMs such as Lam Research, Applied Materials, and ASML, which were our three largest customers by sales in 2019. Our customers are global leaders by sales in the semiconductor capital equipment industry. Our existing relationships with our customers have enabled us to effectively compete for new fluid delivery subsystems for our customers' next generation products in development. We leverage our deep rooted existing customer relationships with these market leaders to penetrate new business opportunities created through industry consolidation. Our close collaboration with them has contributed to our established market position and several key supplier awards.

Operational Excellence with Scale to Support the Largest Customers

Over our 20 year experience in designing and building gas delivery systems, we have developed deep capabilities in operations. We have strategically located our manufacturing facilities near our customers' locations in order to provide fast and efficient responses to new product introductions and accommodate configuration or design changes late in the manufacturing process. We will continue to add capacity as needed to support future growth. In addition to providing high quality and reliable fluid delivery subsystems, one of our principal strategies is delivering the lead-times that provide our customers the required flexibility needed in their production processes. We have accomplished this by investing in manufacturing systems and processes and an efficient supply chain. Our focus on operational efficiency and flexibility allows us to reduce manufacturing cycle times in order to respond quickly to customer requests and lead-times that are often less than four weeks.

Capital Efficient and Scalable Business Model

In general, our business is not capital intensive and we are able to grow sales with a low investment in property, plant, and equipment. In 2019, 2018, and 2017, our total capital expenditures were $12.3 million, $13.9 million, and $8.2 million, respectively, representing only 2.0%, 1.7%, and 1.3% of sales, respectively. The semiconductor capital equipment market has historically been cyclical. We have structured our business to minimize fixed manufacturing overhead and operating expenses to enable us to grow net income at a higher rate than sales during periods of growth. Conversely, our low fixed cost approach allows us to minimize the impact of cyclical downturns on our net income, but results in a lower level of gross margin leverage or improvement as a percentage of sales in times of increased demand.

Our Growth Strategy

Our objective is to enhance our position as a leader in providing fluid delivery solutions, including subsystems, components, and tool refurbishment, to our customers by leveraging our core strengths. The key elements of our growth strategy are:

Grow Our Market Share within Existing Customer Base

We intend to grow our position within our existing customers by continuing to leverage our specialized engineering talent, early collaboration approach with OEMs to foster long-term relationships, and expanded product offerings. Each of our customers produces many different process tools for various process steps. At each customer, we are an outsourced supplier of fluid delivery subsystems and components for a subset of their entire process tool offerings. We are constantly looking to expand our market share at our existing customers. We believe that our early collaborative approach with customers positions us to deliver innovative and dynamic solutions, offer timely deployment and meet competitive cost targets, further increasing our market share. Through our intellectual property ("IP") purchase of developed flow controller technology in May 2019 and our acquisitions of a Korean gas panel supplier in April 2018, a weldment company and a precision machining company in July and December 2017, respectively, and a plastic machining & fabrication company in April 2016, we significantly expanded our served market and also entered the market for chemical delivery subsystems for wet process tools where we had only limited engagement in the past. Using this and our existing engineering capability, we developed a liquid delivery module and was qualified on a wet process equipment system at one of our largest customers who is a market leader in this space.

Grow Our Total Available Market at Existing Customers with Expanded Product Offerings

We continue to work with our existing core customers on additional opportunities, including chemical delivery, one of our important potential growth areas. We believe that wet processes, including clean and electro chemical deposition ("ECD"), that require precise chemical delivery are currently an underpenetrated market opportunity for us. By leveraging our existing customer relationships and strong reputation in fluid mechanics, we intend to increase our chemical delivery module market share and introduce additional related products. Through our IP purchase of developed flow controller technology in May 2019 and our acquisitions of a Korean gas panel supplier in April 2018, a weldment company and a precision machining company in July and December 2017, respectively, and a plastic machining & fabrication company in April 2016, we significantly expanded our served market and entered the market for chemical delivery subsystems. The acquisitions allow us to manufacture and assemble the complex plastic and metal products and precision machined components for the semiconductor equipment, aerospace, and general-industrial industries, as well as provide us exposure to and growth opportunities in the Korean semiconductor capital equipment market.

Expand Our Total Customer Base within Fluid Delivery Market

We have expanded our customer base and are currently a supplier of gas delivery systems for a leading lithography system manufacturer, a leading ALD system manufacturer, and Korean process tool OEMs. We continue to actively engage with new customers that are considering outsourcing their gas and chemical delivery needs as well as expanding our components business.

Continue to Improve Our Manufacturing Process Efficiency

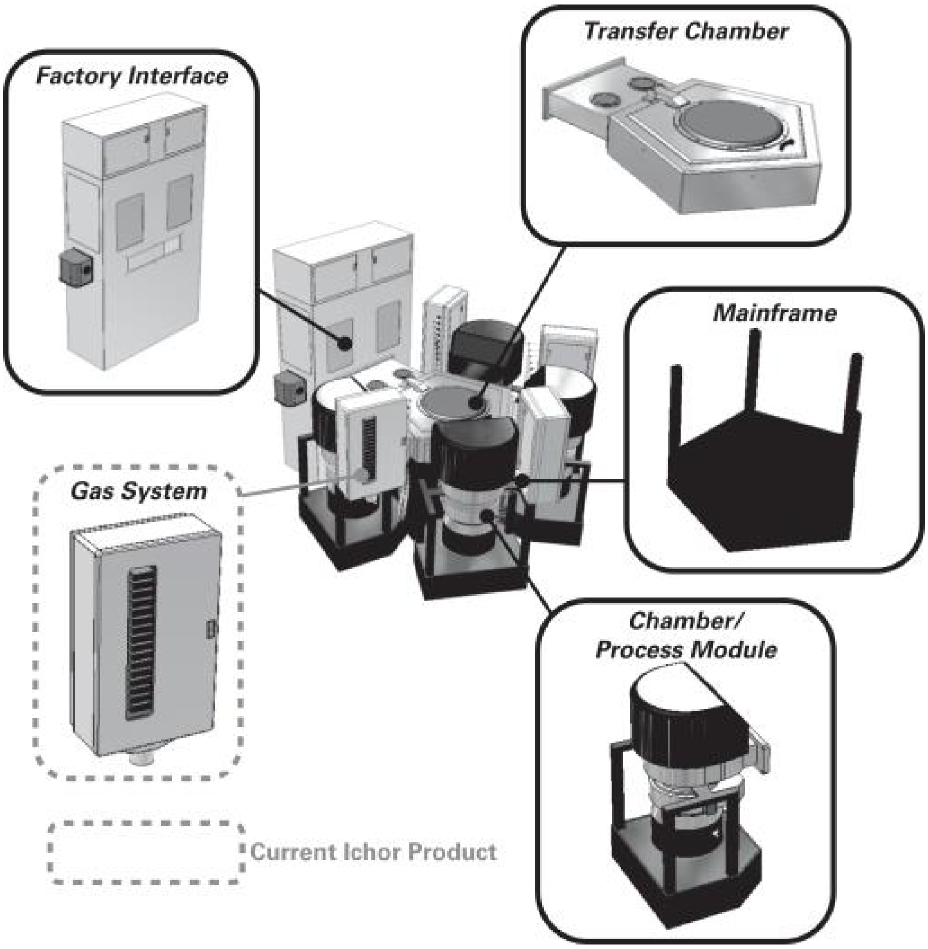
We continually strive to improve our processes to reduce our manufacturing process cycle time, improve our ability to respond to short lead-time and last minute configuration changes, reduce our manufacturing costs, and improve our inventory efficiency requirements in order to improve profitability and make our product offerings more attractive to new and existing customers.

Our Products and Services

We are a leader in the design, engineering and manufacturing of critical fluid delivery subsystems. Our product and service offerings are classified in the following categories:

Gas Delivery Subsystems

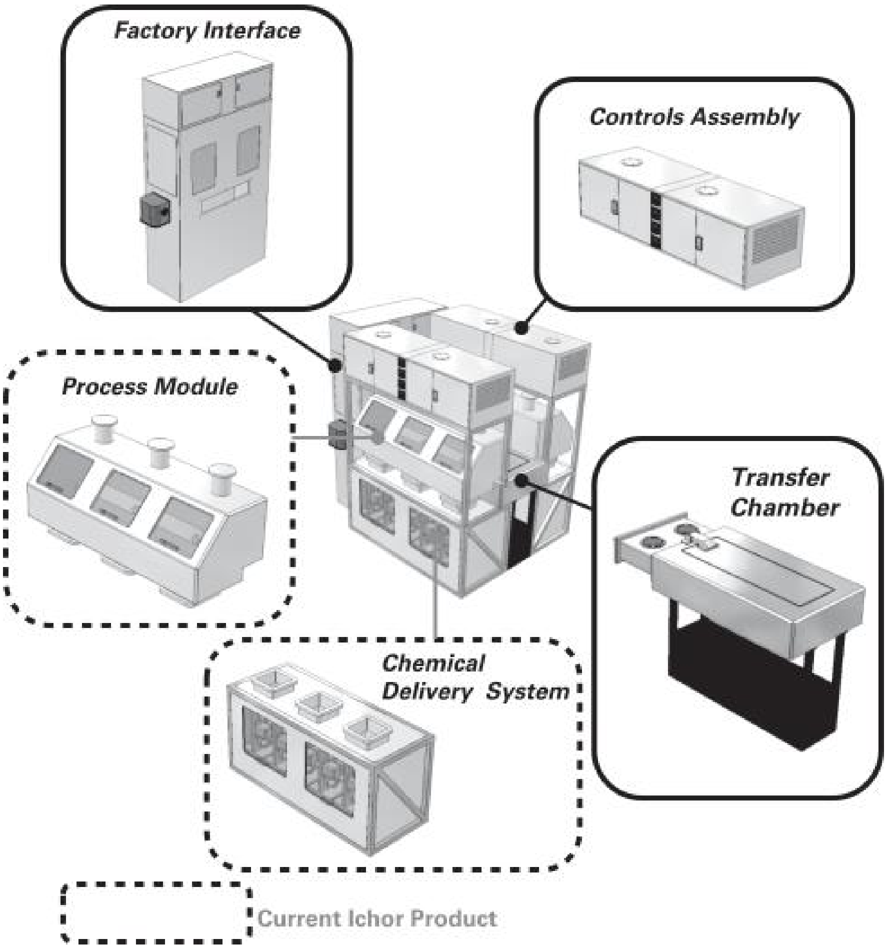
Gas delivery is among the most technologically complex functions in semiconductor capital equipment and is used to deliver, monitor and control precise quantities of the vapors and gases critical to the manufacturing process. Our gas delivery systems consist of a number of gas lines, each controlled by a series of mass flow controllers, regulators, pressure transducers, and valves, and an integrated electronic control system. Our gas delivery subsystems are primarily used in equipment for "dry" manufacturing processes, such as etch, chemical vapor deposition, physical vapor deposition, epitaxy, and strip.



Chemical Delivery Products and Subsystems

Our chemical delivery products and subsystems are used to precisely blend and dispense reactive chemistries and colloidal slurries critical to the specific "wet" front-end process, such as wet clean, electro chemical deposition, and chemical-mechanical planarization ("CMP"). In addition to the chemical delivery subsystem, we also manufacture the process modules that apply the various chemicals directly to the wafer in a process and application-unique manner to create the desired chemical reaction.

The image below shows a typical wet-process front end semiconductor tool, with a chemical delivery subsystem and corresponding application process module highlighted:



Weldments

Our complete offering of weldments support the delivery of gases through the process tool. We have developed both automated and manual welding processes to support world class workmanship on all types of metals needed to support fluid delivery within the semiconductor market. The welded assemblies are used in both wet and dry processes.

Precision Machining

Precision machining provides us the ability to supply our customers with components used in our gas delivery systems and weldments, while also providing custom machined solutions throughout customers' equipment. Many of these items are used downstream of the gas system and in process critical applications. Our precision machined products can be used in both wet and dry applications.

History

We were originally incorporated as Celerity, Inc. ("Celerity") in 1999. Our business of designing and manufacturing critical systems for semiconductor capital equipment manufacturers operated as a stand-alone business until 2009 when Celerity sold the business to a private equity fund. Francisco Partners ("FP") acquired the business in December 2011 and formed Ichor Holdings, Ltd., an exempt company incorporated in the Cayman Islands, in March 2012 to serve as the parent company as part of a restructuring to accommodate the expansion of our business in Singapore and Malaysia. In April 2012, we acquired Semi Scenic UK Limited to provide refurbishment services for legacy tools. In April 2016, we purchased Ajax-United Patterns & Molds, Inc. ("Ajax") for $17.6 million to add chemical delivery subsystem capabilities with existing customers. We completed the initial public offering of our ordinary shares in December 2016. In July 2017 we acquired Cal-Weld, Inc. ("Cal-Weld") for $56.2 million to add to our gas delivery subsystem and weldment capabilities. In December 2017 we acquired Talon Innovations Corporation ("Talon") for $137.8 million to add to our gas delivery subsystem, precision machining, and component manufacturing capabilities. In April 2018, we acquired IAN Engineering Co., Ltd. ("IAN") for $6.5 million to provide us exposure to and growth opportunities in the Korean semiconductor capital equipment market. We intend to continue to evaluate opportunistic acquisitions to supplement our organic growth.

Customers, Sales and Marketing

We primarily market and sell our products directly to equipment OEMs in the semiconductor equipment market. In Japan, we utilize a value added reseller to market and sell our chemical delivery system. We are dependent upon a small number of customers, as the semiconductor equipment manufacturer market is highly concentrated with four companies accounting for over 80% of all process tool revenues. For 2019, our two largest customers were Lam Research and Applied Materials, which accounted for 51% and 33% of sales, respectively. We do not have long-term contracts that require customers to place orders with us in fixed or minimum volumes, and we generally operate on a purchase order basis with customers.

Our sales and marketing efforts focus on fostering close business relationships with our customers. As a result, we locate many of our account managers near the customer they support. Our sales process involves close collaboration between our account managers and engineering and operations teams. Account managers and engineers work together with customers and in certain cases provide on-site support, including attending customers' internal meetings related to production and engineering design. Each customer project is supported by our account managers and customer support team who ensure we are aligned with all of the customer's quality, cost, and delivery expectations.

Operations, Manufacturing and Supply Chain Management

We have developed a highly flexible manufacturing model with cost-effective locations situated nearby the manufacturing facilities of our largest customers. We have facilities in the United States, Singapore, Malaysia, the United Kingdom, and Korea.

Operations

Our product cycle engagements begin by working closely with our customers to outline the solution specifications before design and prototyping even begin. Our design and manufacturing process is highly flexible, enabling our customers to make alterations to their final requirements throughout the design, engineering, and manufacturing process. This flexibility results in significantly decreased order-to-delivery cycle times for our customers. For instance, it can take as little as 20 to 30 days for us to manufacture a gas delivery system with fully evaluated performance metrics after receiving an order.

Manufacturing

We are ISO 9001 certified or compliant at each of our manufacturing locations, and our manufactured subsystems and modules adhere to strict design tolerances and specifications. We operate Class 100 and Class 10,000 clean room facilities for customer-specified testing, assembly, and integration of high-purity gas and chemical delivery systems at our locations in Singapore, Oregon, Texas, and Korea. We operate additional facilities in Malaysia, Oregon, and California for weldments and related components used in our gas delivery subsystems, and we operate a separate facility in California for critical components used in our chemical delivery subsystems. We operate facilities in Minnesota and Florida for precision machining of components for sale to our customers and internal use. Many of our facilities are located in close proximity to our largest customers to allow us to collaborate with them on a regular basis and to enable us to deliver our products on a just-in-time basis, regardless of order size or the degree of changes in the applicable configuration or specifications.

We qualify and test key components that are integrated into our subsystems and test our fluid delivery subsystems during the design process and again prior to shipping. Our quality management system allows us to access real-time corrective action reports, non-conformance reports, customer complaints, and controlled documentation. In addition, our senior management conducts quarterly reviews of our quality control system to evaluate effectiveness. Our customers also complete quarterly surveys which allow us to measure satisfaction.

Supply Chain Management

We use a wide range of components and materials in the production of our gas and chemical delivery systems, including filters, mass flow controllers, regulators, pressure transducers, and valves. We obtain components and materials from a large number or sources, including single source and sole source suppliers.

We use consignment material and just-in-time stocking programs to better manage our component inventories and better respond to changing customer requirements. These approaches enable us to significantly reduce our inventory levels and maintain flexibility in responding to changes in product demand. A key part of our strategy is to identify multiple suppliers with a strong global reach that are located within close proximity to our manufacturing locations.

Technology Development and Engineering

We have a long history of engineering innovation and development. We continue to transition from being an integration engineering and components company into a gas and chemical delivery system and subsystem leader with product development and systems engineering, as well as integration expertise. Our industry continues to experience rapid technological change, requiring us to continuously invest in technology and product development and regularly introduce new products and features that meet our customers' evolving requirements.

We have built a team of fluid delivery experts. As of December 27, 2019, our engineering team consisted of approximately 95 engineers and designers with mechanical, electrical, chemical, systems, and software expertise. Our engineers are closely connected with our customers and typically work at our customers' sites and operate as an extension of our customers' design team. We engineer within our customers' processes, design vaults, drawing standards, and part numbering systems. These development efforts are designed to meet specific customer requirements in the areas of subsystem design, materials, component selection, and functionality. The majority of our sales are generated from projects during which our engineers cooperated with our customer early in the design cycle. Through this early collaborative process, we become an integral part of our customers' design and development processes, and we are able to quickly anticipate and respond to our customers' changing requirements.

Our engineering team 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 customers with a wide range of appropriate component and design choices for their gas and chemical delivery systems and other critical subsystems. Our analytical and testing capabilities also help us anticipate technological changes and the requirements in component features for next-generation gas delivery systems and other critical subsystems.

Competition

The markets for our products are very competitive. When we compete for new business, we face competition from other suppliers of gas or chemical delivery subsystems, and in some cases with the internal manufacturing groups of OEMs. While many OEMs have outsourced the design and manufacturing of their gas and chemical delivery systems, we would face additional competition if in the future these OEMs elected to develop these systems internally.

The fluid delivery subsystem market is concentrated and we face competition primarily from Ultra Clean Technology, with additional competition from regional suppliers. The chemical delivery subsystem, weldments, and precision machining industries are fragmented and we face competition from numerous smaller suppliers. In addition, the market for tool refurbishment is fragmented and we compete with many regional competitors. The primary competitive factors we emphasize include:

- customer relationships;
- early engagement with customers;
- large and experienced engineering staff;
- design-to-delivery cycle times; and
- flexible manufacturing capabilities.

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. In addition, the limited number of potential customers in our industry further intensifies competition. We anticipate that increased competitive pressures may 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.

Intellectual Property

Our success depends, in part, upon our ability to develop, maintain, and protect our technology and products and to conduct our business without infringing the proprietary rights of others. We continue to invest in securing intellectual property protection for our technology and products and protect our technology by, among other things, filing patent applications. We also rely on a combination of trade secrets and confidentiality provisions, and to a much lesser extent, copyrights and trademarks, to protect our proprietary rights. We have historically focused our patent protection efforts in the United States. As of December 27, 2019, we held 47 patents, 21 of which were U.S. patents and 17 of which were acquired as part of our IP purchase of developed flow controller technology in May 2019. While we consider our patents to be valuable assets, we do not believe the success of our business or our overall operations are dependent upon any single patent or group of related patents. In addition, we do not believe that the loss or expiration of any single patent or group of related patents would materially affect our business.

Intellectual property that we develop on behalf of our customers is generally owned exclusively by those customers. In addition, we have agreed to indemnify certain of our customers against claims of infringement of the intellectual property rights of others with respect to our products. Historically, we have not paid any claims under these indemnification obligations, and we do not have any pending indemnification claims against us.

Employees and Labor Relations

As of December 27, 2019, we had approximately 1,355 full-time employees and 360 contract or temporary workers, which allow flexibility as business conditions and geographic demand change. Of our total employees, approximately 95 are engineers, 70 are engaged in sales and marketing, 1,440 are engaged in manufacturing, and 110 perform executive and administrative functions. None of our employees are unionized, but in various countries, local law requires our participation in works councils. We have not experienced any material work stoppages at any of our facilities. We consider our relationship with our employees to be good.

Environmental, Health, and Safety Regulations

Our operations and facilities are subject to federal, state, and local regulatory requirements and foreign laws and regulations, relating to environmental, waste management, and health and safety matters, including those relating to the release, use, storage, treatment, transportation, discharge, disposal, and remediation of contaminants, hazardous substances, and wastes, as well as practices and procedures applicable to the construction and operation of our facilities. We believe that our business is operated in substantial compliance with applicable regulations. However, in the future we could incur substantial costs, including cleanup costs, fines or civil or criminal sanctions, or third-party property damage, or personal injury claims, in the event of violations or liabilities under these laws and regulations, or non-compliance with the environmental permits required at our facilities. Potentially significant expenditures could be required in order to comply with environmental laws that may be adopted or imposed in the future. We are not aware of any threatened or pending environmental investigations, lawsuits, or claims involving us, our operations, or our current or former facilities.

Available Information

Our internet address is ichorsystems.com. We make a variety of information available, free of charge, at our Investor Relations website, ir.ichorsystems.com. This information includes our Annual Reports on Form 10-K, our Quarterly Reports on Form 10-Q, our Current Reports on Form 8-K, and any amendments to those reports as soon as reasonably practicable after we electronically file those reports with or furnish them to the Securities and Exchange Commission ("SEC"), as well as our Code of Business Ethics and Conduct and other governance documents.

The SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file documents electronically with the SEC at sec.gov.

The contents of these websites, or the information connected to those websites, are not incorporated into this report. References to websites in this report are provided as a convenience and do not constitute, and should not be viewed as, incorporation by reference of the information contained on, or available through, the website.

ITEM 1A. RISK FACTORS

There are many factors that affect our business and the results of operations, some of which are beyond our control. The following is a description of some important factors that may cause the actual results of operations in future periods to differ materially from those currently expected or desired.

Risks Related to Our Business

Our business depends significantly on expenditures by manufacturers in the semiconductor capital equipment industry, which, in turn, is dependent upon the semiconductor device industry. When that industry experiences cyclical downturns, demand for our products and services is likely to decrease, which would likely result in decreased sales. We may also be forced to reduce our prices during cyclical downturns without being able to proportionally reduce costs.

Our business, financial condition and results of operations depend significantly on expenditures by manufacturers in the semiconductor capital equipment industry. In turn, the semiconductor capital equipment industry depends upon the current and anticipated market demand for semiconductor devices. The semiconductor device industry is subject to cyclical and volatile fluctuations in supply and demand and in the past has periodically experienced significant downturns, which often occur in connection with declines in general economic conditions, and which have resulted in significant volatility in the semiconductor capital equipment industry. The semiconductor device industry has also experienced recurring periods of over-supply of products that have had a severe negative effect on the demand for capital equipment used to manufacture such products. We have experienced, and anticipate that we will continue to experience, significant fluctuations in customer orders for our products and services as a result of such fluctuations and cycles. Any downturns in the semiconductor device industry could have a material adverse effect on our business, financial condition and results of operations.

In addition, we must be able to appropriately align our cost structure with prevailing market conditions, effectively manage our supply chain and motivate and retain employees, particularly during periods of decreasing demand for our products. We may be forced to reduce our prices during periods of decreasing demand. While we operate under a low fixed cost model, we may not be able to proportionally reduce all of our costs if we are required to reduce our prices. If we are not able to timely and appropriately adapt to the changes in our business environment, our business, financial condition and results of operations will be materially adversely affected. The cyclical and volatile nature of the semiconductor device industry and the absence of long-term fixed or minimum volume contracts make any effort to project a material reduction in future sales volume difficult.

We rely on a very small number of OEM customers for a significant portion of our sales. Any adverse change in our relationships with these customers could materially adversely affect our business, financial condition and results of operations.

The semiconductor capital equipment industry is highly concentrated and has experienced significant consolidation in recent years. As a result, a relatively small number of OEM customers have historically accounted for a significant portion of our sales, and we expect this trend to continue for the foreseeable future. For 2019, our top two customers accounted for approximately 51% and 33%, respectively, of sales, and we expect that our sales will continue to be concentrated among a very small number of customers. We do not have any long-term contracts that require customers to place orders with us in fixed or minimum volumes. Accordingly, the success of our business depends on the success of our customers and those customers and other OEMs continuing to outsource the manufacturing of critical subsystems and process solutions to us. Because of the small number of OEMs in the markets we serve, a number of which are already our customers, it would be difficult to replace lost sales resulting from the loss of, or the reduction, cancellation or delay in purchase orders by, any one of these customers, whether due to a reduction in the amount of outsourcing they do, their giving orders to our competitors, their acquisition by an OEM who is not a customer or with whom we do less business, or otherwise. We have in the past lost business from customers for a number of these reasons. If we are unable to replace sales from customers who reduce the volume of products and services they purchase from us or terminate their relationship with us entirely, such events could have a material adverse impact on our business, financial condition and results of operations.

Additionally, if one or more of the largest OEMs were to decide to single- or sole-source all or a significant portion of manufacturing and assembly work to a single equipment manufacturer, such a development would heighten the risks discussed above.

Our customers exert a significant amount of negotiating leverage over us, which may require us to accept lower prices and gross margins or increased liability risk in order to retain or expand our market share with them.

By virtue of our largest customers' size and the significant portion of our sales that is derived from them, as well as the competitive landscape, our customers are able to exert significant influence and pricing pressure in the negotiation of our commercial arrangements and the conduct of our business with them. Our customers often require reduced prices or other pricing, quality or delivery commitments as a condition to their purchasing from us in any given period or increasing their purchase volume, which can, among other things, result in reduced gross margins in order to maintain or expand our market share. Our customers' negotiating leverage also can result in customer arrangements that may contain significant liability risk to us. For example, some of our customers require that we provide them indemnification against certain liabilities in our arrangements with them, including claims of losses by their customers caused by our products. Any increase in our customers' negotiating leverage may expose us to increased liability risk in our arrangements with them, which, if realized, may have a material adverse effect on our business, financial condition and results of operations. In addition, new products often carry lower gross margins than existing products for several quarters following their introduction. If we are unable to retain and expand our business with our customers on favorable terms, or if we are unable to achieve gross margins on new products that are similar to or more favorable than the gross margins we have historically achieved, our business, financial condition and results of operations may be materially adversely affected.

The industries in which we participate are highly competitive and rapidly evolving, and if we are unable to compete effectively, our business, financial condition and results of operations could be materially adversely affected.

We face intense competition from other suppliers of gas or chemical delivery subsystems, as well as the internal manufacturing groups of OEMs. 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 materially adversely affect our business, financial condition and results of operations. We are subject to significant pricing pressure as we attempt to maintain and increase market share with our existing customers. Our competitors may offer reduced prices or introduce new products or services for the markets currently served by our products and services. These products may have better performance, lower prices and achieve broader market acceptance than our products. OEMs also typically own the design rights to their products. Further, 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 results of operations could be materially adversely affected.

Certain of our competitors may have or may develop 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. In addition to organic growth by our competitors, there may be merger and acquisition activity among our competitors and potential competitors that may provide our competitors and potential competitors with an advantage over us by enabling them to expand their product offerings and service capabilities to meet a broader range of customer needs. The introduction of new technologies and new market entrants may also increase competitive pressures.

We are exposed to risks associated with weakness in the global economy and geopolitical instability.

Our business is dependent upon manufacturers of semiconductor capital equipment, whose businesses in turn ultimately depend largely on consumer spending on semiconductor devices. Continuing uncertainty regarding the global economy continues to pose challenges to our business. Economic uncertainty and related factors, including current unemployment levels, uncertainty in European debt markets, geopolitical instability in various parts of the world, fiscal uncertainty in the U.S. economy, market volatility and the slow rate of recovery of many countries from recent recessions, 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 adversely affect our business, financial condition and results of operations. 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 our key suppliers, which could impair their ability to deliver parts and result in delays for our products or require us to either procure products from higher-cost suppliers, or if no additional suppliers exist, to reconfigure the design and manufacture of our products, and we may be unable to fulfill some customer orders. Any of these conditions or events could have a material adverse effect on our business, financial condition and results of operations.

In 2016, the United Kingdom voted to leave the European Union ("EU") (commonly referred to as "Brexit"). As a result of the referendum, a complex and uncertain process of negotiation has taken place which to date has not resulted in a definitive agreement to establish the future terms of the UK's relationship with the EU or other countries. Notwithstanding, the UK exited the EU on January 31, 2020 under a transitional arrangement scheduled to remain in place until the end of 2020. The transitional arrangement is intended primarily to maintain the status quo with respect to UK-EU trade and adherence to EU rules while a definitive exit agreement is negotiated. The long-term nature of the UK's relationship with the EU is unclear and there is considerable uncertainty when, or if, any withdrawal agreement or long-term relationship strategy, including trade deals, will be agreed to and implemented by the UK and the EU. Brexit could adversely affect European or worldwide political, regulatory, economic or market conditions and could contribute to instability in political institutions and regulatory agencies. Brexit could also have the effect of disrupting the free movement of goods, services, and people between the UK, the EU and elsewhere. There can be no assurance that any or all of these events, or others that we cannot anticipate at this time, will not have a material adverse effect on our business, financial condition and results of operations.

An outbreak of disease, global or localized health pandemic or epidemic or a similar public health threat, or the fear of such an event may impact economic activity, including, but not limited to demand for our products, workforce availability, and costs to manufacture our products.

In December 2019, a novel strain of coronavirus ("COVID-19") was reported in Wuhan, China. The World Health Organization has declared COVID-19 to constitute a "Public Health Emergency of International Concern." On January 30, 2020, the U.S. Department of State issued a Level 4 "do not travel" advisory for China. The U.S. government has also implemented enhanced screenings, quarantine requirements, and travel restrictions in connection with the COVID-19 outbreak. The disruption to global markets that has occurred due to the epidemic has increased uncertainty for semi-conductor demand. In addition, many suppliers in the semi-conductor industry have had work forces disrupted due to the quarantine requirements and restricted travel. The extent of the impact of COVID-19 on our operational and financial performance will depend on future developments, including, but not limited to, the duration and spread of the outbreak and related travel advisories and restrictions, all of which are highly uncertain and cannot be predicted. Preventing the effects from and responding to this market disruption if any other public health threat, related or otherwise, may further increase costs of our business and may have a material adverse effect on our business, financial condition, and results of operations.

If we do not keep pace with developments in the industries we serve and with technological innovation generally, our products and services 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 offerings, services and technologies obsolete. In particular, the design and manufacturing of semiconductors is constantly evolving and becoming more complex in order to achieve greater power, performance and efficiency with smaller devices. Capital equipment manufacturers need to keep pace with these changes by refining their existing products and developing new products.

We believe that our future success will depend upon our ability to design, engineer and manufacture products 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 in a cost-effective and timely manner. If we are unable to integrate new technical specifications into competitive product designs, develop the technical capabilities necessary to manufacture new products or make necessary modifications or enhancements to existing products, our business, financial condition and results of operations could be materially adversely affected.

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

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

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

We must design, develop and introduce new products that are accepted by OEMs in order to retain our existing customers and obtain new customers.

The introduction of new products 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. We attempt to mitigate this risk by collaborating with our customers during their design and development processes. We cannot, however, assure you that we will be able to successfully introduce, market and cost-effectively manufacture new products, or that we will be able to develop new or enhanced products and processes that satisfy customer needs. In addition, new capital equipment typically has a lifespan of five to ten 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 often continue to be purchased for that piece of equipment on an exclusive basis for 18 to 24 months before the OEM generates enough sales volume to consider adding alternative suppliers. Accordingly, it is important that our products are designed into the new systems introduced by the OEMs. If any of the new products we develop are not launched or successful in the market, our business, financial condition and results of operations could be materially adversely affected.

The manufacturing of our products is highly complex, and if we are not able to manage our manufacturing and procurement process effectively, our business, financial condition and results of operations may be materially adversely affected.

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 re- configure manufacturing processes or components in response to these modifications. 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. We have from time to time experienced bottlenecks and production difficulties that have caused delivery delays and quality control problems. These risks are even greater as we seek to expand our business into new subsystems. In addition, certain of our suppliers have been, and may in the future be, forced out of business as a result of the economic environment. In such cases, we may be required to procure products from higher-cost suppliers or, if no additional suppliers exist, reconfigure the design and manufacture of our products. This could materially limit our growth, adversely impact our ability to win future business and have a material adverse effect on our business, financial condition and results of operations.

Defects in our products could damage our reputation, decrease market acceptance of our products and result in potentially costly litigation.

A number of factors, including design flaws, material and component failures, contamination in the manufacturing environment, impurities in the materials 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. Errors, defects or other problems with our products may:

- cause delays in product introductions and shipments;
- 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;
- 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 increased 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 may be damaged and customers may be reluctant to buy our products. We may also face a higher rate of product defects as we increase our production levels in periods of significant growth. Product defects could result in warranty and indemnification liability or 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. In addition, hazardous materials flow through and are controlled by certain of 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.

We may incur unexpected warranty and performance guarantee claims that could materially adversely affect our business, financial condition and results of operations.

In connection with our products and services, we provide various product warranties, performance guarantees and indemnification rights. Warranty or other performance guarantee or indemnification claims against us could cause us to incur significant expense to repair or replace defective products or indemnify the affected customer for losses. In addition, quality issues can have various other ramifications, including delays in the recognition of sales, loss of sales, loss of future sales opportunities, increased costs associated with repairing or replacing products, and a negative impact on our reputation, all of which could materially adversely affect our business, financial condition and results of operations.

Our dependence on a limited number of suppliers may harm our production output and increase our costs, and may prevent us from delivering acceptable products on a timely basis.

Our ability to meet our customers' demand for our products depends upon obtaining adequate supplies of quality components and other raw materials on a timely basis. In addition, our customers often specify components from particular suppliers that we must incorporate into our products. We also use consignment and just-in-time stocking programs, which means we carry very little inventory of components or other raw materials, and we rely on our suppliers to deliver necessary components and raw materials in a timely manner. However, our suppliers are under no obligation to provide us with components or other raw materials. As a result, the loss of or failure to perform by any of our key suppliers could materially adversely affect our ability to deliver products on a timely basis. In addition, if a supplier was unable to provide the volume of components we require on a timely basis and at acceptable prices and quality, we would have to identify and qualify replacements from alternative sources of supply. However, the process of qualifying new suppliers for complex components is also lengthy and could delay our production. We may also experience difficulty in obtaining sufficient supplies of components and raw materials in times of significant growth in our business. If we are unable to procure sufficient quantities of components or raw materials from suppliers, our customers may elect to delay or cancel existing orders or not place future orders, which could have a material adverse effect on our business, financial condition and results of operations.

We are subject to order and shipment uncertainties, and any significant reductions, cancellations or delays in customer orders could have a material adverse effect on our business, financial condition and results of operations.

Our sales are 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 manufacture and deliver products to our customers. Most of our sales for a particular quarter depend on customer orders placed during that quarter or shortly before it commences. Our contracts generally do not require our customers to commit to minimum purchase volumes. While most of our customers provide periodic rolling forecasts for product orders, those forecasts do not become binding until a formal purchase order is submitted, which generally occurs only a short time prior to shipment. As a result of the foregoing and the cyclicality and volatility of the industries we serve, it is difficult to predict future orders with precision. Occasionally, we order component inventory and build products 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 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 result in unanticipated reductions or delays in sales. If we do not obtain orders as we anticipate, we could have excess components for a specific product and/or finished goods inventory 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 results of operations.

Because our customers generally require that they qualify our engineering, documentation, manufacturing and quality control procedures, our ability to add new customers quickly is limited.

We are generally required to qualify and maintain our status as a supplier for each of our customers. This is a time-consuming process that involves the inspection and approval by a customer of our engineering, documentation, manufacturing and quality control procedures before that customer will place orders with us. 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 in part because of these qualification requirements. Consequently, the risk that our business, financial condition and results of operations would be materially adversely affected by the loss of, or any reduction in orders by, any of our significant customers is increased. Moreover, if we lost 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 business, financial condition and results of operations.

We may be subject to interruptions or failures in our information technology systems.

We rely on our information technology systems to process transactions, summarize our operating results and manage our business. Our information technology systems are subject to damage or interruption from power outages, computer and telecommunications failures, computer viruses, cyber-attack or other security breaches, catastrophic events, such as fires, floods, earthquakes, tornadoes, hurricanes, acts of war or terrorism, and usage errors by our employees. If our information technology systems are damaged or cease to function properly, we may have to make a significant investment to fix or replace them, and we may suffer loss of critical data and interruptions or delays in our operations.

We may be the target of attempted cyber-attacks, computer viruses, malicious code, phishing attacks, denial of service attacks and other information security threats. To date, cyber-attacks have not had a material impact on our financial condition, results or business; however, we could suffer material financial or other losses in the future and we are not able to predict the severity of these attacks. Our risk and exposure to these matters remains heightened because of, among other things, the evolving nature of these threats, the current global economic and political environment, our prominent size and scale and our role in the financial services industry, the outsourcing of some of our business operations, the ongoing shortage of qualified cyber-security professionals, and the interconnectivity and interdependence of third parties to our systems. The occurrence of a cyber-attack, breach, unauthorized access, misuse, computer virus or other malicious code or other cyber-security event could jeopardize or result in the unauthorized disclosure, gathering, monitoring, misuse, corruption, loss or destruction of confidential and other information that belongs to us, our customers, our counterparties, third-party service providers or borrowers that is processed and stored in, and transmitted through, our computer systems and networks. The occurrence of such an event could also result in damage to our software, computers or systems, or otherwise cause interruptions or malfunctions in our, our customers', our counterparties' or third parties' operations. This could result in significant losses, loss of customers and business opportunities, reputational damage, litigation, regulatory fines, penalties or intervention, reimbursement or other compensatory costs, or otherwise adversely affect our business, financial condition or results of operations.

The reliability and capacity of our information technology systems is critical to our operations and the implementation of our growth initiatives. Any material disruption in our information technology systems, or delays or difficulties in implementing or integrating new systems or enhancing current systems, could have an adverse effect on our business, and results of operations.

Our business is subject to a variety of U.S. and international laws, rules, policies, and other obligations regarding privacy, data protection, and other matters.

We are subject to federal, state, and international laws relating to the collection, use, retention, security, and transfer of customer, employee, and business partner personally identifiable information ("PII"), including the European Union's General Data Protection Regulation ("GDPR"), which came into effect in May 2018 and the California Consumer Privacy Act ("CCPA"), which came into effect on January 1, 2020. In many cases, these laws apply not only to third-party transactions, but also to transfers of information between one company and its subsidiaries, and among the subsidiaries and other parties with which we have commercial relations. The introduction of new products or expansion of our activities in certain jurisdictions may subject us to additional laws and regulations. Foreign data protection, privacy, and other laws and regulations, including GDPR, can be more restrictive than those in the United States. These U.S. federal and state and foreign laws and regulations, including GDPR which can be enforced by private parties or government entities, are constantly evolving and can be subject to significant change. In addition, the application and interpretation of these laws and regulations, including GDPR, are often uncertain, particularly in the new and rapidly evolving industry in which we operate, and may be interpreted and applied inconsistently from country to country and inconsistently with our current policies and practices. These existing and proposed laws and regulations can be costly to comply with and can delay or impede the development of new products, result in negative publicity, increase our operating costs, require significant management time and attention, and subject us to inquiries or investigations, claims or other remedies, including fines, which may be significant, or demands that we modify or cease existing business practices.

A failure by us, our suppliers, or other parties with whom we do business to comply with posted privacy policies or with other federal, state, or international privacy-related or data protection laws and regulations, including GDPR and CCPA, could result in proceedings against us by governmental entities or others, which could have a material adverse effect on our business, results of operations, and financial condition.

Restrictive covenants under our Credit Facilities may limit our current and future operations. If we fail to comply with those covenants, the lenders could cause outstanding amounts, which are currently substantial, to become immediately due and payable, and we might not have sufficient funds and assets to pay such loans.

As of December 27, 2019, we had $161.9 million of indebtedness outstanding under our term loan facility and $19.2 million of indebtedness outstanding under our revolving credit facility (our "Credit Facilities"). The outstanding amount of our Credit Facilities reflected in our consolidated financial statements included elsewhere in this report is net of $3.0 million of debt issuance costs. We may incur additional indebtedness in the future. Our Credit Facilities contain certain restrictive covenants and conditions, including limitations on our ability to, among other things:

- incur additional indebtedness or contingent obligations;
- create or incur liens, negative pledges or guarantees;
- make investments;
- make loans;
- sell or otherwise dispose of assets;
- merge, consolidate or sell substantially all of our assets;
- make certain payments on indebtedness;
- pay dividends on or make distributions in respect of capital stock or make certain other restricted payments or investments;
- enter into certain agreements that restrict distributions from restricted subsidiaries;
- enter into transactions with affiliates;
- change the nature of our business; and
- amend the terms of our organizational documents.

As a result of these covenants, we may be restricted in our ability to pursue new business opportunities or strategies or to respond quickly to changes in the industries that we serve. A violation of any of these covenants would be deemed an event of default under our Credit Facilities. In such event, upon the election of the lenders, the loan commitments under our Credit Facilities would terminate and the principal amount of the loans and accrued interest then outstanding would be due and payable immediately. A default may also result in the acceleration of any other debt to which a cross-acceleration or cross-default provision applies. In the event our lenders accelerate the repayment of our borrowings, we cannot assure you that we and our subsidiaries would have sufficient funds to repay such indebtedness or be able to obtain replacement financing on a timely basis or at all. These events could force us into bankruptcy or liquidation, which could have a material adverse effect on our business, financial condition and results of operations.

We also may need to negotiate changes to the covenants in the agreements governing our Credit Facilities in the future if there are material changes in our business, financial condition or results of operations, but we cannot assure you that we will be able to do so on terms favorable to us or at all.

The interest rates on our credit agreement might change based on changes to the method in which LIBOR or its replacement rate is determined.

In July 2017, the Financial Conduct Authority ("FCA") that regulates LIBOR announced it intends to stop compelling banks to submit rates for the calculation of LIBOR after 2021. As a result, the Federal Reserve Board and the Federal Reserve Bank of New York organized the Alternative Reference Rates Committee ("ARRC") which identified the Secured Overnight Financing Rate ("SOFR") as its preferred alternative to USD-LIBOR in derivatives and other financial contracts. We are not able to predict when LIBOR will cease to be available or when there will be sufficient liquidity in the SOFR markets. Any changes adopted by FCA or other governing bodies in the method used for determining LIBOR may result in a sudden or prolonged increase or decrease in reported LIBOR. If that were to occur, our interest payments could change. In addition, uncertainty about the extent and manner of future changes may result in interest rates and/or payments that are higher or lower than if LIBOR were to remain available in its current form.

We have agreements that are indexed to LIBOR, including our credit agreement. We are monitoring and evaluating the related risks that arise in connection with transitioning contracts to a new alternative rate, including any resulting value transfer that may occur. The value of loans, securities, or derivative instruments tied to LIBOR could also be impacted if LIBOR is limited or discontinued. For some instruments, the method of transitioning to an alternative rate may be challenging, as they may require negotiation with the respective counterparty.

If an agreement is not transitioned to an alternative rate and LIBOR is discontinued, the impact is likely to vary by agreement. If LIBOR is discontinued or if the methods of calculating LIBOR change from their current form, interest rates on our current or future indebtedness and related interest rate swaps may be adversely affected.

While we expect LIBOR to be available in substantially its current form until the end of 2021, it is possible that LIBOR will become unavailable prior to that point. This could result, for example, if sufficient banks decline to make submissions to the LIBOR administrator. In that case, the risks associated with the transition to an alternative reference rate will be accelerated and magnified.

Certain of our customers require that we consult with them in connection with specified fundamental changes in our business, and address any concerns or requests such customer may have in connection with a fundamental change. While those customers do not have contractual approval or veto rights with respect to fundamental changes, our failure to consult with such customers or to satisfactorily respond to their requests in connection with any such fundamental change could constitute a breach of contract or otherwise be detrimental to our relationships with such customers.

Certain of our key customers require that we consult with them in connection with specified fundamental changes in our business, including, among other things:

- entering into any new line of business;
- amending or modifying our organizational documents;
- selling all or substantially all of our assets, or merging or amalgamating with a third party;
- incur borrowings in excess of a specific amount;
- making senior management changes;
- entering into any joint venture arrangement; and
- effecting an initial public offering.

These customers do not have contractual approval or veto rights with respect to any fundamental changes in our business. However, our failure to consult with such customers or to satisfactorily respond to their requests in connection with any such fundamental change could constitute a breach of contract or otherwise be detrimental to our relationships with such customers, which could have a material adverse effect on our business, financial condition and results of operations.

We may not be able to generate sufficient cash to service all of our indebtedness, including under our Credit Facilities, and may be forced to take other actions to satisfy our obligations under our indebtedness, which may not be successful.

Our ability to make scheduled payments on or to refinance our indebtedness, including under our Credit Facilities, depends on our financial condition and results of operations, which are subject to prevailing economic and competitive conditions and other factors beyond our control. We may be unable to maintain a level of cash flows from operating activities sufficient to permit us to fund our day-to-day operations or to pay the principal, premium, if any, and interest on our indebtedness. If our cash flows and capital resources are insufficient to fund our debt service obligations, we could face substantial liquidity problems and could be forced to reduce or delay investments and capital expenditures or to sell assets or operations, seek additional capital or restructure or refinance our indebtedness. If we cannot make scheduled payments on our debt, we will be in default and, as a result, the lenders under our Credit Facilities could terminate their commitments to loan money, or foreclose against the assets securing such borrowings, and we could be forced into bankruptcy or liquidation, in each case, which would have a material adverse effect on our business, financial condition and results of operations.

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.

We believe that the success of our business depends in part on our proprietary technology, information, processes and know-how and on our ability to operate without infringing on the proprietary rights of third parties. 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. Accordingly, our intellectual property position is more vulnerable than it would be if it were protected primarily by patents. We cannot assure you that we have adequately protected or will be able to adequately protect our technology, that our competitors will not be able to utilize our existing technology or develop similar technology independently, that the claims allowed with respect to any patents held by us will be broad enough to protect our technology or that foreign intellectual property laws will adequately protect our intellectual property rights. If we fail to protect our proprietary rights successfully, our competitive position could suffer. Any future litigation to enforce patents issued to us, to protect trade secrets or know-how possessed by us or to defend ourselves or to indemnify others against claimed infringement of the rights of others could have a material adverse effect on our business, financial condition and results of operations.

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 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 our management and key personnel from our business operations, any of which could have a material adverse effect on our business, financial condition 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 a customer if we are subjected to litigation for third-party claims of infringement of such customer’s 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.

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 in 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, 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.

The technology labor market is very competitive, and our business will suffer if we are unable to hire 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 and manufacturing personnel, most of whom are not subject to employment or non-competition agreements. Competition for qualified personnel in the technology industry is particularly intense, and we operate in geographic locations in which labor markets are competitive. Our management team has significant industry experience and deep customer relationships, and therefore would be difficult to replace. In addition, our business is dependent to a significant degree on the expertise and relationships which only a limited number of engineers possess. Many of these engineers often work at our customers’ sites and serve as an extension of our customers’ product design teams. The loss of any of our key executive officers or key engineers and other personnel, including our engineers working at our customers’ sites, or the failure to attract additional personnel as needed, could have a material adverse effect on our business, financial condition and results of operations and could lead to higher labor costs, the use of less-qualified personnel and the loss of customers. In addition, if any of our key executive officers or other key employees were to join a competitor or form a competing company, we could lose customers, suppliers, know-how and key personnel.

We do not maintain key-man life insurance with respect to any of our employees. Our business will suffer if we are unable to attract, employ and retain highly skilled personnel.

Future acquisitions may present integration challenges, and if the goodwill, indefinite-lived intangible assets and other long-term assets recorded in connection with such acquisitions become impaired, we would be required to record impairment charges, which may be significant.

We have acquired strategic businesses in the past and if we find appropriate opportunities in the future, we may acquire businesses, products or technologies that we believe are strategic. The process of integrating an acquired business, product or technology may produce unforeseen operating difficulties and expenditures, fail to result in expected synergies or other benefits and absorb significant attention of our management that would otherwise be available for the ongoing development of our business. In addition, we may record a portion of the assets we acquire as goodwill, other indefinite-lived intangible assets or finite-lived intangible assets. We do not amortize goodwill and indefinite-lived intangible assets, but rather review them for impairment on an annual basis or whenever events or changes in circumstances indicate that their carrying value may not be recoverable. The recoverability of goodwill and indefinite-lived intangible assets is dependent on our ability to generate sufficient future earnings and cash flows. Changes in estimates, circumstances or conditions, resulting from both internal and external factors, could have a significant impact on our fair valuation determination, which could then have a material adverse effect on our business, financial condition and results of operations.

Our quarterly sales and operating results fluctuate significantly from period to period, and this may cause volatility in our share price.

Our quarterly sales and operating results have fluctuated significantly in the past, and we expect them to continue to fluctuate in the future for a variety of reasons, including the following:

- demand for and market acceptance of our products 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;
- strategic decisions by our customers to terminate their outsourcing relationship with us or give market share to our competitors;
- 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 prices 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, thereby causing us to delay the shipment of products;
- decreased margins for several or more quarters following the introduction of new products, especially as we introduce new subsystems or other products or services;
- 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;
- write-offs of excess or obsolete inventory;
- one-time expenses or charges; and
- announcements by our competitors of new products, services or technological innovations, which may, among other things, render our products less competitive.

As a result of the foregoing, we believe that quarter-to-quarter comparisons of our sales and results of operations 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 results of operations in any particular quarter. Moreover, our results of operations 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 ordinary shares.

Labor disruptions could materially adversely affect our business, financial condition and results of operations.

As of December 27, 2019, we had approximately 1,355 full time employees and 360 contract or temporary workers worldwide. None of our employees are unionized, but in various countries, local law requires our participation in works councils. While we have not experienced any material work stoppages at any of our facilities, any stoppage or slowdown could cause material interruptions in manufacturing, and we cannot assure you that alternate qualified capacity would be available on a timely basis, or at all. As a result, labor disruptions at any of our facilities could materially adversely affect our business, financial condition and results of operations.

As a global company, we are subject to the risks of doing business internationally, including periodic foreign economic downturns and political instability, which may adversely affect our sales and cost of doing business in those regions of the world.

Foreign economic downturns have adversely affected our business and results of operations in the past and could adversely affect our business and results of operations in the future. In addition, other factors relating to the operation of our business outside of the United States may have a material adverse effect on our business, financial condition and results of operations in the future, including:

- the imposition of governmental controls or changes in government regulations, including tax regulations;
- difficulties in enforcing our intellectual property rights;
- difficulties in developing relationships with local suppliers;
- difficulties in attracting new international customers;
- difficulties in complying with foreign and international laws and treaties;
- restrictions on the export of technology;
- compliance with U.S. and international laws involving international operations, including the Foreign Corrupt Practices Act, export control laws and export license requirements;
- difficulties in achieving headcount reductions due to unionized labor and works councils;
- restrictions on transfers of funds and assets between jurisdictions;
- geo-political instability; and
- trade restrictions and changes in taxes and tariffs.

In the future, we may seek to expand our presence in certain foreign markets or enter emerging markets. Evaluating or entering into an emerging market may require considerable management time, as well as start-up expenses for market development before any significant sales and earnings are generated. Operations in new foreign markets may achieve low margins or may be unprofitable, and expansion in existing markets may be affected by local political, economic and market conditions. As we continue to operate our business globally, our success will depend, in part, on our ability to anticipate and effectively manage these and the other risks noted above. The impact of any one or more of these factors could materially adversely affect our business, financial condition and results of operations.

Changes in U.S. trade policy, tariff and import/export regulations may have a material adverse effect on our business, financial condition and results of operations.

Our international operations and transactions also depend upon favorable trade relations between the United States and the foreign countries in which our customers and suppliers have operations. Changes in U.S. or international social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment in the territories or countries where we currently sell our products or conduct our business, as well as any negative sentiment toward the U.S. as a result of such changes, could adversely affect our business. The current U.S. presidential administration has instituted or proposed changes in trade policies that include the negotiation or termination of trade agreements, the imposition of higher tariffs on imports into the U.S., economic sanctions on individuals, corporations or countries, and other government regulations affecting trade between the U.S. and other countries where we conduct our business. It may be time-consuming and expensive for us to alter our business operations in order to adapt to or comply with any such changes.

As a result of recent policy changes of the U.S. presidential administration and recent U.S. government proposals, there may be greater restrictions and economic disincentives on international trade. The new tariffs and other changes in U.S. trade policy could trigger retaliatory actions by affected countries, and certain foreign governments have instituted or are considering imposing trade sanctions on certain U.S. goods. We do a significant amount of business that would be impacted by changes to the trade policies of the U.S. and foreign countries (including governmental action related to tariffs, international trade agreements, or economic sanctions). Such changes have the potential to adversely impact the U.S. economy or certain sectors thereof, our industry and the global demand for our products. We may not succeed in developing and implementing policies and strategies to counter the foregoing factors effectively in each location where we do business and the foregoing factors may cause a reduction in our sales, profitability or cash flows, or cause an increase in our liabilities.

We are subject to fluctuations in foreign currency exchange rates which could cause operating results and reported financial results to vary significantly from period to period.

The vast majority of our sales are denominated in U.S. Dollars. Many of the costs and expenses associated with our Singapore, Malaysian and U.K. operations are paid in Singapore Dollars, Malaysian Ringgit or British Pounds (or Euros), respectively, and we expect our exposure to these currencies to increase as we increase our operations in those countries. As a result, our risk exposure from transactions denominated in non-U.S. currencies is primarily related to the Singapore Dollar, Malaysian Ringgit, British Pound and Euro. In addition, because the majority of our sales are denominated in the U.S. Dollar, if one or more of our competitors sells to our customers in a different currency than the U.S. Dollar, we are subject to the risk that the competitors' products will be relatively less expensive than our products due to exchange rate effects. We have not historically established transaction-based hedging programs. Foreign currency exchange risks inherent in doing business in foreign countries could have a material adverse effect on our business, financial condition and results of operations.

We are subject to numerous environmental laws and regulations, which could require us to incur environmental liabilities, increase our manufacturing and related compliance costs or otherwise adversely affect our business.

We are subject to a variety of federal, state, local and foreign laws and regulations governing the protection of the environment. These environmental laws and regulations include those relating to the use, storage, handling, discharge, emission, disposal and reporting of toxic, volatile or otherwise hazardous materials used in our manufacturing processes. These materials may have been or could be released into the environment at properties currently or previously owned or operated by us, at other locations during the transport of materials or at properties to which we send substances for treatment or disposal. In addition, we may not be aware of all environmental laws or regulations that could subject us to liability in the United States or internationally. If we were to violate or become liable under environmental laws and regulations or become non-compliant with permits required at some of our facilities, we could be held financially responsible and incur substantial costs, including cleanup costs, fines and civil or criminal sanctions, third-party property damage or personal injury claims.

Failure to maintain effective internal controls in accordance with Section 404 of the Sarbanes-Oxley Act could have a material adverse effect on our business and stock price.

As a publicly traded company, we are required to comply with the SEC's rules implementing Section 302 and 404 of the Sarbanes-Oxley Act, which require management to certify financial and other information in our quarterly and annual reports and provide an annual management report on the effectiveness of controls over financial reporting. Pursuant to the JOBS Act, our independent registered public accounting firm will not be required to attest to the effectiveness of our internal control over financial reporting until the later of the year following our first annual report required to be filed with the SEC or the date we are no longer an emerging growth company, which may be up to five full fiscal years following our initial public offering in December 2016.

If we identify weaknesses in our internal control over financial reporting, are unable to comply with the requirements of Section 404 in a timely manner or to assert that our internal control over financial reporting is effective, or if our independent registered public accounting firm is unable to express an opinion as to the effectiveness of our internal control over financial reporting, investors may lose confidence in the accuracy and completeness of our financial reports and the market price of our common stock could be negatively affected, and we could become subject to investigations by NASDAQ, the SEC or other regulatory authorities, which could require additional financial and management resources.

In the third quarter of 2019, we identified material weaknesses in our internal control over financial reporting and may identify additional material weaknesses in the future that may cause us to fail to meet our reporting obligations or result in material misstatements of our financial statements. If our internal control over financial reporting or our disclosure controls and procedures are not effective, we may not be able to accurately report our financial results, prevent fraud or file our periodic reports in a timely manner, which may cause investors to lose confidence in our reported financial information and may lead to a decline in our share price.

During the third quarter of 2019, we identified a material weakness in our controls related to the prevention and timely detection of funds transfers to unauthorized accounts. We were the target of criminal fraud by persons impersonating one of our suppliers, which resulted in the transfer of funds to unauthorized bank accounts. The fraud did not represent a breach of our information systems, as confirmed by an external forensic examination, but rather it was a targeted phishing scam. Although our internal controls were not properly designed to prevent and timely detect the transfer of funds to unauthorized accounts, a secondary control was properly designed and operated effectively, which aided in a full recovery of all funds that were transferred. Accordingly, there was no financial loss to record in our financial statements.

We determined that certain internal controls required for safeguarding our cash assets were not properly designed due to insufficient specificity regarding our policies and procedures surrounding supplier banking information changes, not identifying segregation of duties, and insufficient training on exercising professional skepticism.

We initiated a remediation plan during the third quarter of 2019 and have completed the following actions:

- enhanced the approval process for adding or modifying supplier banking information;
- increased the level of segregation of duties surrounding those who have the ability to modify supplier information, and;
- increased communication of our internal controls and processes and emphasized security awareness and the importance of exercising professional skepticism

We consider the material weakness remediated as of December 27, 2019, as the remedial controls have operated for a sufficient period of time and we have concluded, through testing, that these controls are operating effectively.

There are limitations on the effectiveness of controls, and the failure of our control systems may materially and adversely impact us.

We do not expect that disclosure controls or internal controls over financial reporting will prevent all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system’s objectives will be met. Further, the design of a control system must reflect the fact that there are resource constraints and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. Failure of our control systems to prevent error or fraud could have a material adverse effect on our business, financial condition and results of operations.

Compliance with SEC rules relating to "conflict minerals" may require us and our suppliers to incur substantial expense and may result in disclosure by us that certain minerals used in products we manufacture are not "DRC conflict free."

Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, or the Dodd-Frank Act, required the SEC to promulgate rules requiring disclosure by a public company of any "conflict minerals" (tin, tungsten, tantalum and gold) necessary to the functionality or production of a product manufactured or contracted to be manufactured by such company. The SEC adopted final rules in 2012 which took effect at the end of January 2013. Because we manufacture products which may contain tin, tungsten, tantalum or gold, we will be required under these rules to determine whether those minerals are necessary to the functionality or production of our products and, if so, conduct a country of origin inquiry with respect to all such minerals. If any such minerals may have originated in the Democratic Republic of the Congo, or the DRC, or any of its adjoining countries, or the "covered countries," then we and our suppliers must conduct diligence on the source and chain of custody of the conflict minerals to determine if they did originate in one of the covered countries and, if so, whether they financed or benefited armed groups in the covered countries. Disclosures relating to the products which may contain conflict minerals, the country of origin of those minerals and whether they are "DRC conflict free" must be provided in a Form SD (and accompanying conflict minerals report if one is required to disclose the diligence undertaken by us in sourcing the minerals and our conclusions relating to such diligence). If we are required to submit a conflict minerals report, that report must be audited by an independent auditor pursuant to existing government auditing standards, unless (for the first two years) we are unable to determine whether the minerals are "DRC conflict free." Compliance with this disclosure rule may be very time consuming for management and our supply chain personnel (as well as time consuming for our suppliers) and could involve the expenditure of significant amounts of money and resources by us and them. Disclosures by us mandated by the rules which are perceived by the market to be "negative" may cause customers to refuse to purchase our products. We are currently unable to assess the cost of compliance with this rule, and we cannot assure you that such cost will not have a material adverse effect on our business, financial condition and results of operations.

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. If any of our facilities were to experience a catastrophic loss, it could disrupt our operations, delay production and shipments, reduce sales and result in large expenses to repair or replace the facility. In addition, we may experience extended power outages at our facilities. Disruption in supply resulting from natural disasters or other causalities or catastrophic events 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. 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, our business, financial condition and results of operations would be adversely affected.

Changes in tax laws, tax rates or tax assets and liabilities could materially adversely affect our financial condition and 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 applicable tax laws, the amount and composition of pre-tax income in countries with differing tax rates or valuation of our deferred tax assets and liabilities. We have significant operations in the United States and our holding company structure includes entities organized in the Cayman Islands, Netherlands, Singapore and Scotland. As a result, changes in applicable tax laws in these jurisdictions could have a material adverse effect on our financial condition and results of operations.

We are also 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, we cannot assure you 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. We cannot assure you 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.

Our operations might be affected by the occurrence of a natural disaster or other catastrophic event.

We depend on our customers and facilities for the continued operation of our business. While we maintain disaster recovery plans, they might not adequately protect us. Despite any precautions we take for natural disasters or other catastrophic events, these events, including terrorist attack, a pandemic, epidemic or outbreak of a disease (including the COVID-19 coronavirus), hurricanes, fire, floods and ice and snow storms, could result in damage to and closure of our or our customers' facilities or the infrastructure on which such facilities rely. Such disruptions could significant delays in the shipments of our products, reduce our capacity to provide services, eradicate unique manufacturing capabilities, result in our customers' inability to pay for our products or services and, ultimately, result in the loss of revenue and clients. Although we carry business interruption insurance policies and typically have provisions in our contracts that protect us in certain events, our coverage might not be adequate to compensate us for all losses that may occur. Any natural disaster or catastrophic event affecting us or our customers could have a significant negative impact on our operations and financial performance.

Risks Related to Ownership of Our Ordinary Shares

The price of our ordinary shares may fluctuate substantially.

You should consider an investment in our ordinary shares to be risky, and you should invest in our ordinary shares only if you can withstand a significant loss and wide fluctuations in the market value of your investment. Some factors that may cause the market price of our ordinary shares to fluctuate, in addition to the other risks mentioned in this report, are:

- our announcements or our competitors' announcements regarding new products or services, enhancements, significant contracts, acquisitions or strategic investments;
- changes in earnings estimates or recommendations by securities analysts, if any, who cover our ordinary shares;
- speculation about our business in the press or investment community;
- failures to meet external expectations or management guidance;
- fluctuations in our quarterly financial results or the quarterly financial results of companies perceived to be similar to us;
- changes in our capital structure or dividend policy, future issuances of securities, sales of large blocks of ordinary shares by our shareholders, our incurrence of additional debt or our failure to comply with the agreements governing our Credit Facilities;
- our decision to enter new markets;
- reputational issues;
- changes in general economic and market conditions in any of the regions in which we conduct our business;
- material litigation or government investigations;
- changes in industry conditions or perceptions; and
- changes in applicable laws, rules or regulations.

In addition, if the market for stocks in our industry or industries related to our industry, or the stock market in general, experiences a loss of investor confidence, the trading price of our ordinary shares could decline for reasons unrelated to our business, financial condition and results of operations. If any of the foregoing occurs, it could cause our share price to fall and may expose us to lawsuits that, even if unsuccessful, could be costly to defend and a distraction to management.

Future sales of our ordinary shares, or the perception in the public markets that these sales may occur, may depress our share price.

We may seek to raise additional capital from time to time in the future, which may involve the issuance of additional ordinary shares, or securities convertible into ordinary shares. Sales of substantial amounts of our ordinary shares in the public market, or the perception that these sales could occur, could adversely affect the price of our ordinary shares and could impair our ability to raise capital through the sale of additional shares.

We are an "emerging growth company" and have elected to comply with reduced public company reporting requirements, which could make our ordinary shares less attractive to investors.

We are an emerging growth company, as defined in the JOBS Act. For as long as we continue to be an emerging growth company, we may choose to take advantage of exemptions from various public company reporting requirements. These exemptions include, but are not limited to, (i) not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, (ii) reduced disclosure obligations regarding executive compensation in our periodic reports, proxy statements and registration statements, and (iii) exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. We could be an emerging growth company for up to five years after the first sale of our ordinary shares pursuant to an effective registration statement under the Securities Act, which fifth anniversary will occur in December 2021. However, if certain events occur prior to the end of such five-year period, including if we become a "large accelerated filer," our annual gross revenue exceeds $1.0 billion or we issue more than $1.0 billion of non-convertible debt in any three-year period, we would cease to be an emerging growth company prior to the end of such five-year period. We have taken advantage of certain of the reduced disclosure obligations regarding executive compensation and may elect to take advantage of other reduced disclosure obligations in our SEC filings. As a result, the information that we provide to holders of our ordinary shares may be different than you might receive from other public reporting companies in which you hold equity interests. We cannot predict if investors will find our ordinary shares less attractive as a result of our reliance on these exemptions. If some investors find our ordinary shares less attractive as a result of any choice we make to reduce disclosure, there may be a less active trading market for our ordinary shares and the price for our ordinary shares may be more volatile.

Under the JOBS Act, emerging growth companies may also elect to delay adoption of new or revised accounting standards until such time as those standards apply to private companies. We have elected not to avail ourselves of this extended transition period for complying with new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies.

We do not expect to pay any cash dividends for the foreseeable future.

We do not anticipate that we will pay any cash dividends on our ordinary shares for the foreseeable future. Any determination to pay dividends in the future will be at the discretion of our Board of Directors and will depend upon our financial condition, results of operations, contractual restrictions (including those under our Credit Facilities and any potential indebtedness we may incur in the future), restrictions imposed by applicable law, tax considerations and other factors our Board of Directors deems relevant. There can be no assurance that we will pay a dividend in the future or continue to pay any dividend if we do commence paying dividends. Accordingly, realization of a gain on an investment in our ordinary shares will depend on the appreciation of the price of our ordinary shares, which may never occur. Investors seeking cash dividends in the foreseeable future should not purchase our ordinary shares.

Our articles of association contain anti-takeover provisions that could adversely affect the rights of our shareholders.

Our articles of association contain provisions to limit the ability of others to acquire control of our company or cause us to engage in change-of control transactions, including, among other things:

- provisions that authorize our Board of Directors, without action by our shareholders, to issue additional ordinary shares and preferred shares with preferential rights determined by our Board of Directors;
- provisions that permit only a majority of our Board of Directors or the chairman of our Board of Directors to call shareholder meetings and therefore do not permit shareholders to call shareholder meetings;
- provisions that impose advance notice requirements, minimum shareholding periods and ownership thresholds, and other requirements and limitations on the ability of shareholders to propose matters for consideration at shareholder meetings; and
- a staggered board whereby our directors are divided into three classes, with each class subject to re-election once every three years on a rotating basis.

These provisions could have the effect of depriving our shareholders of an opportunity to sell their shares at a premium over prevailing market prices by discouraging third parties from seeking to obtain control of our company in a tender offer or similar transaction. With our staggered Board of Directors, at least two annual meetings of shareholders are generally required in order to effect a change in a majority of our directors. Our staggered Board of Directors can discourage proxy contests for the election of our directors and purchases of substantial blocks of our shares by making it more difficult for a potential acquirer to gain control of our Board of Directors in a relatively short period of time.

The issuance of preferred shares could adversely affect holders of ordinary shares.

Our Board of Directors is authorized to issue preferred shares without any action on the part of holders of our ordinary shares. Our Board of Directors also has the power, without shareholder approval, to set the terms of any such preferred shares that may be issued, including voting rights, dividend rights, and preferences over our ordinary shares with respect to dividends or if we liquidate, dissolve or wind up our business and other terms. If we issue preferred shares in the future that have preference over our ordinary shares with respect to the payment of dividends or upon our liquidation, dissolution or winding up, or if we issue preferred shares with voting rights that dilute the voting power of our ordinary shares, the rights of holders of our ordinary shares or the price of our ordinary shares could be adversely affected.

You may face difficulties in protecting your interests as a shareholder, as Cayman Islands law provides substantially less protection when compared to the laws of the United States.

Our corporate affairs are governed by our amended and restated memorandum and articles of association and by the Companies Law (2013 Revision) and common law of the Cayman Islands. The rights of shareholders to take legal action against our directors and us, actions by minority shareholders and the fiduciary responsibilities of our directors to us under Cayman Islands law are to a large extent governed by the common law of the Cayman Islands. The common law of the Cayman Islands is derived in part from comparatively limited judicial precedent in the Cayman Islands as well as from English common law, which has persuasive, but not binding, authority on a court in the Cayman Islands. The rights of our shareholders and the fiduciary responsibilities of our directors under Cayman Islands law are not as clearly established as they would be under statutes or judicial precedents in the United States. In particular, the Cayman Islands have a less exhaustive body of securities laws as compared to the United States. In addition, Cayman Islands companies may not have standing to initiate a shareholder derivative action before the United States federal courts.

As a result of all of the above, our shareholders may have more difficulty in protecting their interests through actions against us or our officers, directors or major shareholders than would shareholders of a corporation incorporated in a jurisdiction in the United States.

Certain judgments obtained against us by our shareholders may not be enforceable.

We are a Cayman Islands company and a portion our assets are located outside of the United States. As a result, it may be difficult or impossible for you to bring an action against us in the United States in the event that you believe that your rights have been infringed under U.S. federal securities laws or otherwise. Even if you are successful in bringing an action of this kind, the laws of the Cayman Islands may render you unable to enforce a judgment against our assets. There is no statutory recognition in the Cayman Islands of judgments obtained in the United States, although the courts of the Cayman Islands will generally recognize and enforce a non-penal judgment of a foreign court of competent jurisdiction without retrial on the merits.

There can be no assurance that we will not be a passive foreign investment company for any taxable year, which could result in adverse U.S. federal income tax consequences to U.S. Holders of our ordinary shares.

A non-U.S. corporation will be a passive foreign investment company, or PFIC, for any taxable year if either (i) at least 75% of its gross income for such year is passive income or (ii) at least 50% of the value of its assets (generally based on an average of the quarterly values of the assets) during such year is attributable to assets that produce or are held for the production of passive income. Our PFIC status for any taxable year can be determined only after the close of that year.

Based on the value of our assets and the composition of our income and assets, we do not believe we were treated as a PFIC for U.S. federal income purposes for our taxable year ending December 27, 2019. However, the determination of PFIC status is based on an annual determination that cannot be made until the close of a taxable year, involves extensive factual investigation, including ascertaining the fair market value of all of our assets on a quarterly basis and the character of each item of income that we earn, and is subject to uncertainty in several respects. Accordingly, we cannot assure you that we were not treated as a PFIC for our taxable year ending December 27, 2019 or any prior taxable year, or that we will not be treated as a PFIC for any future taxable year or that the IRS will not take a contrary position.

If we are a PFIC for any taxable year during which a U.S. person holds ordinary shares, certain adverse U.S. federal income tax consequences could apply to such U.S. person. You are strongly urged to consult your tax advisors as to whether or not we will be a PFIC.

If a U.S. person is treated as owning at least 10% of our shares, such person may be subject to adverse U.S. federal income tax consequences.

If a U.S. person is treated as owning (directly, indirectly, or constructively) at least 10% of the value or voting power of our shares, such person may be treated as a "United States shareholder" with respect to each "controlled foreign corporation" in our group (if any). Because our group includes one or more U.S. subsidiaries, certain of our non-U.S. subsidiaries could be treated as controlled foreign corporations (regardless of whether we are or are not treated as a controlled foreign corporation).

A United States shareholder of a controlled foreign corporation may be required to annually report and include in its U.S. taxable income its pro rata share of "Subpart F income," "global intangible low-taxed income" and investments in United States property by controlled foreign corporations, whether or not we make any distributions. An individual that is a United States shareholder with respect to a controlled foreign corporation generally would not be allowed certain tax deductions or foreign tax credits that would be allowed to a United States shareholder that is a U.S. corporation. A failure to comply with these reporting obligations may subject a United States shareholder to significant monetary penalties and may prevent starting of the statute of limitations with respect to such shareholder's U.S. federal income tax return for the year for which reporting was due. We cannot provide any assurances that we will assist investors in determining whether we are or any of our current or future non-U.S. subsidiaries is treated as a controlled foreign corporation or whether such investor is treated as a United States shareholder with respect to any such controlled foreign corporation. In addition, we cannot provide assurances we will furnish to any United States shareholders information that may be necessary to comply with the aforementioned reporting and tax paying obligations.

A U.S. investor should consult its tax advisors regarding the potential application of these rules to its investment in our shares.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our principal executive office is located at 3185 Laurelview Ct., Fremont, California 94538. As of December 27, 2019, our principal manufacturing and administrative facilities, including our executive offices, comprises approximately 595,700 square feet. All of our facilities are leased, which allows for flexibility as business conditions and geographic demand change. The table below sets forth the approximate square footage of each of our facilities.

Location	Approximate Square Footage
Austin, Texas	25,700
East Blantyre, Scotland	37,700
Fremont, California	62,800
Seoul, Korea	32,800
Osakis, Minnesota	22,300
Sauk Rapids, Minnesota	58,600
Selangor, Malaysia	31,900
Singapore	97,700
Tampa, Florida	30,000
Tualatin, Oregon	143,400
Union City, California	52,800

We believe that our existing facilities and equipment are well maintained, in good operating condition, and are adequate to meet our currently anticipated requirements.

ITEM 3. LEGAL PROCEEDINGS

We are currently not a party to any material legal proceedings. However, in the future we may be subject to various legal claims and proceedings which arise in the ordinary course of our business involving claims incidental to our business, including employment-related claims.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR THE REGISTRANT'S COMMON EQUITY, RELATED SHAREHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Holders of Record

On March 4, 2020, other than ordinary shares held in "nominee" or "street" name and those in our treasury account, we had 2 holders of record.

Dividends

We do not anticipate that we will pay any cash dividends on our ordinary shares for the foreseeable future. Any determination to pay dividends in the future will be at the discretion of our Board of Directors and will depend upon our financial condition, results of operations, contractual restrictions (including those under our Credit Facilities and any potential indebtedness we may incur in the future), restrictions imposed by applicable law, tax considerations, and other factors our Board of Directors deems relevant.

Share Repurchase Program

Information related to repurchases of our ordinary shares during 2019 is as follows:

	Total Number of Shares Repurchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Program	Amount Available Under Repurchase Program (1)
	(dollars in thousands, except per share amounts)			
Amount available at December 28, 2018				$ 10,021
Quarter ended March 29, 2019	97,910	$ 16.34	97,910	$ 8,421
Quarter ended June 28, 2019	—	$ —	—	$ 8,421
Quarter ended September 27, 2019	—	$ —	—	$ 8,421
October 2019	—	$ —	—	$ 8,421
November 2019	—	$ —	—	$ 8,421
December 2019	—	$ —	—	$ 8,421
Quarter ended December 27, 2019	—	$ —	—	$ 8,421

(1) The amounts presented in this column are the remaining total authorized value to be spent after each month's repurchases. On February 15, 2018, we announced that our Board of Directors authorized a $50.0 million share repurchase program under which we may repurchase our ordinary shares in the open market or through privately negotiated transactions, depending on market conditions and other factors. Repurchases were funded with cash on-hand and cash flows from operations. On August 18, 2018, our Board of Directors increased the amount authorized under the share repurchase program by $50.0 million.

Stock Performance Graph

The information included under the heading "Stock Performance Graph" is "furnished" and not "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or otherwise subject to the liabilities of that section, nor shall it be deemed to be "soliciting material" subject to Regulation 14A or incorporated by reference in any filing under the Securities Act or the Exchange Act.

Our ordinary shares are listed for trading on the NASDAQ under the symbol "ICHR." The Stock Price Performance Graph set forth below plots the cumulative total shareholder return on a quarterly basis of our ordinary shares from December 9, 2016, the date on which our shares began trading, through December 27, 2019, with the cumulative total return of the Nasdaq Composite Index and the PHLX Semiconductor Sector Index over the same period. The comparison assumes $100 was invested on December 9, 2016 in the ordinary shares of Ichor Holdings, Ltd., in the Nasdaq Composite Index, and in the PHLX Semiconductor Sector Index and assumes reinvestment of dividends, if any.

The stock price performance shown on the graph above is not necessarily indicative of future price performance. Information used in the graph was obtained from the Nasdaq Stock Market, a source believed to be reliable, but we are not responsible for any errors or omissions in such information.

ITEM 6. SELECTED FINANCIAL DATA

The following tables present our historical selected consolidated financial data. The selected consolidated statement of operations data for 2019, 2018, and 2017, and the selected balance sheet data as of December 27, 2019 and December 28, 2018, are derived from our audited consolidated financial statements that are included elsewhere in this report. The selected statement of operations data for 2016 and 2015 and balance sheet data as of December 29, 2017, December 30, 2016, and December 25, 2015 are derived from our audited consolidated financial statements not included in this report.

Our historical results are not necessarily indicative of the results that may be expected in the future. You should read the selected historical financial data below in conjunction with the section titled *Item 7 – Management's Discussion and Analysis of Financial Condition and Results of Operations* and the financial statements and related notes included elsewhere in this report.

	Year Ended				
	December 27, 2019	December 28, 2018	December 29, 2017	December 30, 2016	December 25, 2015
	(dollars in thousands, except per share amounts)				
Consolidated Statement of Operations Data:					
Net sales	$ 620,837	$ 823,611	$ 655,892	$ 405,747	$ 290,641
Gross profit (1) (2)	$ 86,364	$ 136,137	$ 100,761	$ 65,395	$ 48,554
Operating expenses (1)	$ 71,387	$ 72,172	$ 54,581	$ 41,524	$ 35,953
Operating income	$ 14,977	$ 63,965	$ 46,180	$ 23,871	$ 12,601
Net income from continuing operations (3) (4)	$ 10,729	$ 57,883	$ 56,915	$ 20,779	$ 12,807
Diluted earnings per share from continuing operations, attributable to ordinary shareholders (5)	$ 0.47	$ 2.30	$ 2.17	$ 0.87	$ (292.39)
Shares used to compute diluted earnings per share from continuing operations, attributable to ordinary shareholders (5)	22,766,903	25,128,055	26,218,424	1,967,926	31,875

	December 27, 2019	December 28, 2018	December 29, 2017	December 30, 2016	December 25, 2015
	(in thousands)				
Consolidated Balance Sheet Data:					
Cash and restricted cash	$ 60,612	$ 43,834	$ 69,304	$ 52,648	$ 24,188
Working capital	$ 113,080	$ 123,821	$ 131,233	$ 56,020	$ 24,860
Total assets	$ 566,555	$ 485,489	$ 557,684	$ 282,491	$ 198,023
Long-term debt (6)	$ 181,037	$ 204,787	$ 189,535	$ 39,830	$ 65,000
Preferred shares	$ —	$ —	$ —	$ —	$ 142,728
Total shareholders' equity	$ 221,416	$ 198,326	$ 216,762	$ 141,659	$ 74,678

(1) Share-based compensation included in the consolidated statement of operations data above was as follows:

	Year Ended				
	December 27, 2019	December 28, 2018	December 29, 2017	December 30, 2016	December 25, 2015
	(in thousands)				
Share-Based Compensation Expense:					
Gross profit	$ 705	$ 608	$ 118	$ 20	$ 105
Operating expenses	7,832	6,969	2,112	3,196	1,013
Total share-based compensation expense	$ 8,537	$ 7,577	$ 2,230	$ 3,216	$ 1,118

(2) As part of our purchase price allocations for our acquisitions of IAN in April 2018, Talon in December 2017, and Cal-Weld in July 2017, we recorded acquired-inventory at fair value, resulting in a fair value step-up. Accordingly, $4.8 million and $5.2 million were subsequently charged to cost of sales in 2018 and 2017, respectively, as the acquired-inventory was sold.

(3) During 2019, income tax benefit consists primarily of taxable loss incurred in the United States, the benefit from our tax holiday in Singapore, as well as the impacts of withholding taxes, stock option exercises, credit generation, and the release of tax reserves established in purchase accounting. During 2018, income tax benefit consists primarily of the impact of U.S. operations, offset by discrete tax benefits, including the release of a valuation allowance against our foreign tax credit carryforwards we now expect to realize as a result of additional analysis of the Tax Cuts and Jobs Act and stock option exercises. During 2017, income tax benefit from continuing operations consisted primarily of the impact of foreign operations, including withholding taxes, offset by a $7.6 million tax benefit as a result of our acquisitions (see *Note 2 – Acquisitions* of our consolidated financial statements included elsewhere in this report), a $5.9 million tax benefit from revaluing our deferred taxes from 35% to 21% due to the Tax Cuts and Jobs Act, and a $1.6 million benefit from re-characterizing intercompany debt to equity between our U.S. and Singapore entities related to the reversal of previously accrued withholding taxes. During 2016 and 2015, income tax benefit from continuing operations consisted primarily of the impact of foreign operations, including withholding taxes, offset by a tax benefit in 2016 as a result of our acquisition (see *Note 2 – Acquisitions* of our consolidated financial statements included elsewhere in this report).

(4) In January 2016, we made the decision to shut down our Kingston, New York facility as this location consumed a significant amount of resources while contributing very little income. We completed the shutdown of the operations of the New York facility in May 2016 through abandonment as a buyer for the facility and operation was not found. The discontinued operation was deemed to be fully disposed of at December 29, 2017.

(5) Diluted earnings per share from continuing operations, attributable to ordinary shareholders, was presented in conformity with the two-class method during 2016 and 2015, as we had two classes of stock until our December 2016 IPO. We considered our convertible preferred shares to be a participating security as the convertible preferred shares participated in dividends with ordinary shareholders, when and if declared by our Board of Directors. In the event a dividend was paid on ordinary shares, the holders of preferred shares were entitled to a proportionate share of any such dividend as if they were holders of ordinary shares (on an as-if converted basis). The convertible preferred shares did not participate in incurred losses. In accordance with the two-class method, earnings allocated to these participating securities and the related number of outstanding shares of the participating securities, which include contractual participation rights in undistributed earnings, have been excluded from the computation of basic and diluted net income per share attributable to ordinary shareholders.

(6) Does not include debt issuance costs of $3.0 million, $3.9 million, $2.8 million, $1.9 million, and $2.4 million as of December 27, 2019, December 28, 2018, December 29, 2017, December 30, 2016, and December 25, 2015, respectively.

ITEM 7. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations in conjunction with our consolidated financial statements and related notes included elsewhere in this report. The following discussion contains forward-looking statements based upon our current plans, expectations and beliefs that involve risks and uncertainties. Our actual results may differ materially from those anticipated in these forward-looking statements. Factors that could cause or contribute to these differences include those discussed below and elsewhere in this report, particularly in “Risk Factors”.

Overview

We are a leader in the design, engineering, and manufacturing of critical fluid delivery subsystems and components for semiconductor capital equipment. Our product offerings include gas and chemical delivery systems and subsystems, collectively known as fluid delivery systems and subsystems, which are key elements of the process tools used in the manufacturing of semiconductor devices. Our gas delivery subsystems deliver, monitor, and control precise quantities of the specialized gases used in semiconductor manufacturing processes such as etch and deposition. Our chemical delivery systems and subsystems precisely blend and dispense the reactive liquid chemistries used in semiconductor manufacturing processes such as chemical-mechanical planarization, electroplating, and cleaning. We also manufacture precision machined components, weldments, and proprietary products for use in fluid delivery systems for direct sales to our customers. This vertically integrated portion of our business is primarily focused on metal and plastic parts that are used in gas and chemical systems, respectively.

Fluid delivery subsystems ensure accurate measurement and uniform delivery of specialty gases and chemicals at critical steps in the semiconductor manufacturing processes. Any malfunction or material degradation in fluid delivery reduces yields and increases the likelihood of manufacturing defects in these processes. Most OEMs outsource all or a portion of the design, engineering, and manufacturing of their gas delivery subsystems to a few specialized suppliers, including us. Additionally, many OEMs are also increasingly outsourcing the design, engineering, and manufacturing of their chemical delivery subsystems due to the increased fluid expertise required to manufacture these subsystems. Outsourcing these subsystems has allowed OEMs to leverage the suppliers’ highly specialized engineering, design, and production skills while focusing their internal resources on their own value-added processes. We believe that this outsourcing trend has enabled OEMs to reduce their costs and development time, as well as provide growth opportunities for specialized subsystems suppliers like us.

We have a global footprint with production facilities in Malaysia, Singapore, Korea, California, Florida, Minnesota, Oregon, and Texas. In 2019, 2018, and 2017, our two largest customers by revenue were Lam Research and Applied Materials.

Key Factors Affecting Our Business

Investment in Semiconductor Manufacturing Equipment

The design and manufacturing of semiconductor devices is constantly evolving and becoming more complex in order to achieve greater performance and efficiency. To keep pace with these changes, OEMs need to refine their existing products and invest in developing new products. In addition, semiconductor device manufacturers will continue to invest in new wafer fabrication equipment to expand their production capacity and to support new manufacturing processes.

Outsourcing of Subsystems by Semiconductor OEMs

Faced with increasing manufacturing complexities, more complex subsystems, shorter product lead times, shorter industry spend cycles, and significant capital requirements, outsourcing of subsystems and components by OEMs has continued to grow. In the past two decades, OEMs have outsourced most of their gas delivery systems to suppliers such as us. OEMs have also started to outsource their chemical delivery systems in recent years. Our results will be affected by the degree to which outsourcing of these fluid delivery systems by OEMs continues to grow.

Cyclicality of Semiconductor Device Industry

Our business is indirectly subject to the cyclicality of the semiconductor device industry. In 2019, we derived approximately 85% of our sales from the semiconductor device industry. Demand for semiconductor devices can fluctuate significantly based on changes in general economic conditions, including consumer spending, demand for the products that include these devices, and other factors. In the past, these fluctuations have resulted in significant variations in our results of operations. The cyclicality of the semiconductor device industries will continue to impact our results of operations in the future.

Customer Concentration

The number of capital equipment manufacturers for the semiconductor device industry is significantly consolidated, resulting in a small number of large manufacturers. Our customers are a significant component of this consolidation, resulting in our sales being concentrated in a few customers. In 2019, our top two customers were Lam Research and Applied Material, with Lam Research and Applied Materials accounting for approximately 51% and 33% of sales, respectively. The sales we generated from these customers in 2019 were spread across 35 different product lines utilized in 13 unique manufacturing process steps. We believe the diversity of products that we provide to these customers, combined with the fact that our customers use our products on numerous types of process equipment, lessens the impact of the inherent concentration in the industry. Our customers often require reduced prices or other pricing, quality, or delivery commitments as a condition to their purchasing from us in any given period or increasing their purchase volume, which can, among other things, result in reduced gross margins in order to maintain or expand our market share. Although we do not have any long-term contracts that require customers to place orders with us, Lam Research and Applied Materials have been our customers for over 10 years.

Acquisitions

We acquired Cal-Weld, a California-based leader in the design and fabrication of precision, high purity industrial components, subsystems, and systems, in July 2017 for $56.2 million. We also acquired Talon, a Minnesota-based leader in the design and manufacturing of high precision machined parts used in leading edge semiconductor tools, in December 2017 for $137.8 million. On a combined basis, these acquisitions contributed approximately $57.5 million to sales in 2017. We acquired IAN, a Seoul-based leader in providing locally-sourced design and manufacturing of gas delivery systems to customers in South Korea, for $6.5 million, which contributed $7.7 million to sales in 2018. These acquisitions continue to have a significant impact on our financial position and results of operations. We intend to continue to evaluate opportunistic acquisitions to supplement our organic growth, and any such acquisitions could have a material impact on our business and results of operations.

Components of Our Results of Operations

The following discussion sets forth certain components of our statements of operations as well as significant factors that impact those items.

Sales

We generate sales primarily from the design, manufacture, and sale of subsystems and components for semiconductor capital equipment. Sales are recognized when control of promised goods or services is transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. Our shipping terms are generally “shipping point.” Accordingly, control transfers, and sales are recognized, at this point-in-time.

Cost of Sales and Gross Profit

Cost of sales consists primarily of purchased materials, direct labor, indirect labor, factory overhead cost, and depreciation expense for our manufacturing facilities and equipment, as well as certain engineering costs that are related to non-recurring engineering services that we provide to, and for which we invoice, our customers in connection with their product development activities. Our business has a highly variable cost structure with a low fixed overhead structure as a percentage of cost of sales. In addition, our existing global manufacturing plant capacity is scalable and we are able to adjust to increased customer demand for our products without significant additional capital investment. We operate our business in this manner to avoid having excessive fixed costs during a cyclical downturn while retaining flexibility to expand our production volumes during periods of growth. However, this approach results in a smaller increase in gross margin as a percentage of sales in times of increased demand.

Since the gross margin on each of our products differs, our overall gross margin as a percentage of our sales changes based on the mix of products we sell in any period.

Operating Expenses

Our operating expenses primarily include research and development and sales, general, and administrative expenses. Personnel costs are the most significant component of operating expenses and consist of salaries, benefits, bonuses, share-based compensation, and, with regard to sales and marketing expense, sales commissions. Operating expenses also include overhead costs for facilities, IT, and depreciation. In addition, our operating expenses include costs related to amortization of intangible assets and restructuring costs.

Research and development – Research and development expense consists primarily of activities related to product design and other development activities, new component testing and evaluation, and test equipment and fixture development. Research and development expense does not include engineering costs that are related to non-recurring engineering services that we provide to, and for which we invoice, our customers as part of sales, which are reflected as cost of sales. We expect research and development expense will increase in absolute dollars as our customers continue to increase their demand for new product designs and as we invest in our research and product development efforts to enhance our product capabilities and access new customer markets.

Selling, general, and administrative – Selling expense consists primarily of salaries and commissions paid to our sales and sales support employees and other costs related to the sales of our products. General and administrative expense consists primarily of salaries and overhead associated with our administrative staff, professional fees, and depreciation and other allocated facility related costs. We expect selling expenses to increase in absolute dollars as we continue to invest in expanding our markets and as we expand our international operations. We expect general and administrative expenses to also increase in absolute dollars due to an increase in costs related to being a public company, including higher legal, corporate insurance, and accounting expenses.

Amortization of intangibles – Amortization of intangible assets is related to our finite-lived intangible assets and is computed using the straight-line method over the estimated economic life of the asset.

Interest Expense

Interest expense consists of interest on our outstanding debt under our Credit Facilities and any other indebtedness we may incur in the future.

Other Expense (Income), Net

The functional currency of our international subsidiaries located in the United Kingdom, Singapore, and Malaysia is the U.S. dollar. Transactions denominated in currencies other than the functional currency generate foreign exchange gains and losses that are included in other expense (income), net on the accompanying consolidated statements of operations. Substantially all of our sales and agreements with third party suppliers provide for pricing and payments in U.S. dollars and, therefore, are not subject to material exchange rate fluctuations.

Income Tax Benefit

During 2019, income tax benefit consists primarily of taxable loss incurred in the United States, the benefit from our tax holiday in Singapore, as well as the impacts of withholding taxes, stock option exercises, credit generation, and the release of tax reserves established in purchase accounting. During 2018, income tax benefit consists primarily of the impact of U.S. operations, offset by discrete tax benefits, including the release of a valuation allowance against our foreign tax credit carryforwards we now expect to realize as a result of additional analysis of the Tax Cuts and Jobs Act and stock option exercises. During 2017, income tax benefit from continuing operations consisted primarily of the impact of foreign operations, including withholding taxes, offset by a $7.6 million tax benefit as a result of our acquisitions (see *Note 2 – Acquisitions* of our consolidated financial statements included elsewhere in this report), a $5.9 million tax benefit from revaluing our deferred taxes from 35% to 21% due to the Tax Cuts and Jobs Act, and a $1.6 million benefit from re-characterizing intercompany debt to equity between our U.S. and Singapore entities related to the reversal of previously accrued withholding taxes.

Results of Operations

The following table sets forth our results of operations for the periods presented. The period-to-period comparison of results is not necessarily indicative of results for future periods.

	Year Ended		
	December 27, 2019	**December 28, 2018**	**December 29, 2017**
		(in thousands)	
Consolidated Statements of Operations Data:			
Net sales	$ 620,837	$ 823,611	$ 655,892
Cost of sales	534,473	687,474	555,131
Gross profit	86,364	136,137	100,761
Operating expenses:			
Research and development	11,102	9,355	7,899
Selling, general, and administrative	47,270	47,448	37,802
Amortization of intangible assets	13,015	15,369	8,880
Total operating expenses	71,387	72,172	54,581
Operating income	14,977	63,965	46,180
Interest expense	10,647	9,987	3,277
Other expense (income), net	55	(241)	(126)
Income before income taxes	4,275	54,219	43,029
Income tax benefit	(6,454)	(3,664)	(13,886)
Net income from continuing operations	10,729	57,883	56,915
Discontinued operations:			
Loss from discontinued operations before taxes	—	—	(722)
Income tax benefit from discontinued operations	—	—	(261)
Net loss from discontinued operations	—	—	(461)
Net income	$ 10,729	$ 57,883	$ 56,454

The following table sets forth our results of operations as a percentage of our total sales for the periods presented.

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
Consolidated Statements of Operations Data:			
Net sales	100.0	100.0	100.0
Cost of sales	86.1	83.5	84.6
Gross profit	13.9	16.5	15.4
Operating expenses:			
Research and development	1.8	1.1	1.2
Selling, general, and administrative	7.6	5.8	5.8
Amortization of intangible assets	2.1	1.9	1.4
Total operating expenses	11.5	8.8	8.3
Operating income	2.4	7.8	7.0
Interest expense	1.7	1.2	0.5
Other expense (income), net	0.0	0.0	0.0
Income before income taxes	0.7	6.6	6.6
Income tax benefit	(1.0)	(0.4)	(2.1)
Net income from continuing operations	1.7	7.0	8.7
Discontinued operations:			
Loss from discontinued operations before taxes	0.0	0.0	(0.1)
Income tax benefit from discontinued operations	0.0	0.0	0.0
Net loss from discontinued operations	0.0	0.0	(0.1)
Net income	1.7	7.0	8.6

Comparison of Fiscal Years 2019 and 2018

Sales

	Year Ended		Change	
	December 27, 2019	December 28, 2018	Amount	%
	(dollars in thousands)			
Net sales	$ 620,837	$ 823,611	$ (202,774)	-24.6%

The decrease in net sales from 2018 to 2019 was primarily related to the reduced demand for semiconductor capital equipment during much of 2019, partially offset by market share gains. We refer to the volume of purchases from us by a customer of ours relative to its other suppliers as our market share of that customer. On a geographic basis, sales in the U.S. decreased by $173.7 million to $329.0 million, and foreign sales decreased by $29.1 million to $291.8 million.

Cost of Sales and Gross Margin

	Year Ended		Change	
	December 27, 2019	December 28, 2018	Amount	%
	(dollars in thousands)			
Cost of sales	$ 534,473	$ 687,474	$ (153,001)	-22.3%
Gross profit	$ 86,364	$ 136,137	$ (49,773)	-36.6%
Gross margin	13.9%	16.5%		- 260 bps

The decrease in cost of sales and gross profit from 2018 to 2019 was primarily due to decreased sales volume.

The 260 basis point decrease in our gross margin was primarily due to lower factory utilization, resulting from reduced demand for semiconductor capital equipment during much of 2019, and product mix.

Research and Development

	Year Ended		Change	
	December 27, 2019	December 28, 2018	Amount	%
	(dollars in thousands)			
Research and development	$ 11,102	$ 9,355	$ 1,747	18.7%

The increase in research and development expenses from 2018 to 2019 was primarily due to incremental expenses from our IP purchase of developed flow controller technology assets in May 2019, in which we assumed an engineering team.

Selling, General, and Administrative

	Year Ended		Change	
	December 27, 2019	December 28, 2018	Amount	%
	(dollars in thousands)			
Selling, general, and administrative	$ 47,270	$ 47,448	$ (178)	-0.4%

The decrease in selling, general, and administrative expense from 2018 to 2019 was primarily due a $1.0 million reduction in employee-related expenses as a result of leadership and management restructuring that was completed in 2019 and a combined $0.9 million reduction in professional, consulting, and other corporate overhead expenses as a result of successful cost-management policies enacted during 2019, partially offset by a $1.1 million separation benefit charge in January 2018 that did not repeat in 2019 and increased share-based compensation expense of $0.6 million.

Amortization of Intangible Assets

	Year Ended		Change	
	December 27, 2019	December 28, 2018	Amount	%
	(dollars in thousands)			
Amortization of intangibles assets	$ 13,015	$ 15,369	$ (2,354)	-15.3%

The decrease in amortization expense from 2018 to 2019 was due certain intangible assets being fully amortized as of the end of the fourth quarter of 2018.

Interest Expense

	Year Ended		Change	
	December 27, 2019	December 28, 2018	Amount	%
	(dollars in thousands)			
Interest expense	$ 10,647	$ 9,987	$ 660	6.6%

The increase in interest expense from 2018 to 2019 was primarily due to an increase in our weighted average interest rate, from 4.36% to 4.78%, partially offset by a $2.7 million reduction in the average amount borrowed during the year as a result of quarterly term loan payments which were partially offset by a net draw on our revolving facility.

Other Expense (Income), Net

	Year Ended		Change	
	December 27, 2019	December 28, 2018	Amount	%
	(dollars in thousands)			
Other expense (income), net	$ 55	$ (241)	$ 296	n/m

The change in other income, net for 2019 was primarily due to exchange rate fluctuations on transactions denominated in the local currencies of our foreign operations, principally the Singapore Dollar, Malaysian Ringgit, and British Pound.

Income Tax Benefit from Continuing Operations

	Year Ended		Change	
	December 27, 2019	December 28, 2018	Amount	%
	(dollars in thousands)			
Income tax benefit	$ (6,454)	$ (3,664)	$ (2,790)	76.1%

The increase in income tax benefit from 2018 to 2019 was primarily due to the decrease in taxable income in the U.S. in 2019 and the release of tax reserves in 2019 previously established in purchase accounting, offset in part by the release of the valuation allowance related to foreign tax credits in 2018 that did not repeat in 2019.

Comparison of Fiscal Years 2018 and 2017

Sales

	Year Ended		Change	
	December 28, 2018	December 29, 2017	Amount	%
	(dollars in thousands)			
Net sales	$ 823,611	$ 655,892	$ 167,719	25.6%

The increase in net sales from 2017 to 2018 was primarily related to an increase in volume resulting from industry growth, our acquisitions of Cal-Weld, Talon, and IAN, and market share gains. We refer to the volume of purchases from us by a customer of ours relative to its other suppliers as our market share of that customer. On a geographic basis, sales in the U.S. increased by $116.1 million to $502.8 million, and foreign sales increased by $51.6 million to $320.9 million.

Cost of Sales and Gross Margin

	Year Ended		Change	
	December 28, 2018	December 29, 2017	Amount	%
	(dollars in thousands)			
Cost of sales	$ 687,474	$ 555,131	$ 132,343	23.8%
Gross profit	$ 136,137	$ 100,761	$ 35,376	35.1%
Gross margin	16.5%	15.4%		+ 110 bps

The increase in cost of sales and gross profit from 2017 to 2018 was primarily due to increased sales volume and our acquisitions of Cal-Weld and Talon in the third and fourth quarters of 2017, respectively.

The 110 basis point increase in our gross margin was primarily due to the accretive impact of our acquisitions of Cal-Weld and Talon. The increase was due to the following: (1) 70 basis points from sales accretive to gross margin, primarily from our acquisitions of Cal-Weld and Talon; (2) 20 basis points from a charge to cost of sales of $4.8 million (0.6% of revenue) and $5.2 million (0.8% of revenue) in 2018 and 2017, respectively, due to recording acquired inventory at fair value; and (3) 20 basis points from a $1.8 million charge to cost of sales in the second quarter of 2017 from an error correction relating to translated inventory balances at our Malaysia and Singapore subsidiaries using an incorrect foreign currency rate.

Research and Development

	Year Ended		Change	
	December 28, 2018	December 29, 2017	Amount	%
		(dollars in thousands)		
Research and development	$ 9,355	$ 7,899	$ 1,456	18.4%

The increase in research and development expenses from 2017 to 2018 was primarily due to incremental expenses from our acquisition of Talon, increased share-based compensation expense, and an increase in headcount and other program expenses to support additional new product developments.

Selling, General, and Administrative

	Year Ended		Change	
	December 28, 2018	December 29, 2017	Amount	%
		(dollars in thousands)		
Selling, general and administrative	$ 47,448	$ 37,802	$ 9,646	25.5%

The increase in selling, general, and administrative expense from 2017 to 2018 was primarily due to $8.6 million in incremental operating expenses from our acquisitions of Cal-Weld, Talon, and IAN, a $4.5 million increase in share-based compensation expense (inclusive of $2.9 million associated with modifying our former CFO’s equity awards), $1.1 million in non-equity separation benefits for former CFO, and $1.1 million in various costs to support growth, partially offset by a $2.2 million decrease in acquisition-related expenses, a $1.3 million credit from derecognizing our IAN earn-out liability, a $1.0 million charge in the third quarter of 2017 from a final arbitration ruling on our working capital claim with the sellers of Ajax, and $1.0 million in expense incurred in 2017 associated with the secondary offerings of our shares by affiliates of our former principal shareholder, FP.

Amortization of Intangible Assets

	Year Ended		Change	
	December 28, 2018	December 29, 2017	Amount	%
		(dollars in thousands)		
Amortization of intangibles assets	$ 15,369	$ 8,880	$ 6,489	73.1%

The increase in amortization expense from 2017 to 2018 was due to incremental amortization expense from intangible assets acquired in connection with our acquisitions of Cal-Weld and Talon in the second half of 2017 and IAN in the second quarter of 2018. The fair value assigned to intangible assets acquired in connection with our acquisition IAN is still preliminary.

Interest Expense

	Year Ended		Change	
	December 28, 2018	December 29, 2017	Amount	%
		(dollars in thousands)		
Interest expense	$ 9,987	$ 3,277	$ 6,710	204.8%

The increase in interest expense from 2017 to 2018 was primarily due to an increase in the average amount borrowed, which was primarily due to our acquisition of Talon in December 2017, resulting in an additional $120.0 million borrowed. Our average amount borrowed in 2018 was $196.6 million compared to $58.9 million in 2017. Our weighted average interest rate was 4.36% in 2018 compared to 4.30% in 2017.

Other Income, Net

	Year Ended		Change	
	December 28, 2018	December 29, 2017	Amount	%
	(dollars in thousands)			
Other income, net	$ (241)	$ (126)	$ (115)	91.3%

The change in other income, net for 2018 was primarily due to exchange rate fluctuations on transactions denominated in the local currencies of our foreign operations, principally the Singapore Dollar, Malaysian Ringgit, and British Pound, and a gain of $0.2 million on the sale of our cost method investment, CHawk Technology International, Inc. ("CHawk") in the first quarter of 2017 that did not repeat in the first quarter of 2018.

Income Tax Benefit from Continuing Operations

	Year Ended		Change	
	December 28, 2018	December 29, 2017	Amount	%
	(dollars in thousands)			
Income tax benefit	$ (3,664)	$ (13,886)	$ 10,222	-73.6%

The decrease in income tax benefit from 2017 to 2018 was primarily due to $12.7 million in discrete tax benefits recognized in 2017 relating to the reversal of previously accrued withholding taxes from our re-characterization of intercompany debt to equity, our acquisitions of Talon and Cal-Weld, and the impact of the Tax Cuts and Jobs Act that did not repeat in 2018, a $4.2 million decrease in excess tax benefits from share-based compensation from 2017 to 2018, and a $2.4 million decrease in permanently disallowed expenses in 2018, partially offset by a $4.1 million tax benefit recognized due to the release of a valuation allowance against foreign tax credit carryforwards in the second quarter of 2018.

Non-GAAP Results

Management uses non-GAAP adjusted net income and non-GAAP adjusted diluted EPS to evaluate our operating and financial results. We believe the presentation of non-GAAP results is useful to investors for analyzing business trends and comparing performance to prior periods, along with enhancing investors' ability to view our results from management's perspective. Non-GAAP adjusted net income excludes amortization of intangible assets, share-based compensation expense, non-recurring expenses including adjustments to the cost of goods sold, tax adjustments related to those non-GAAP adjustments, and non-recurring discrete tax items including tax impacts from releasing a valuation allowance related to foreign tax credits. Non-GAAP adjusted diluted EPS is defined as non-GAAP adjusted net income from continuing operations divided by weighted average diluted ordinary shares outstanding during the period.

The following table presents our unaudited non-GAAP adjusted net income from continuing operations and a reconciliation from net income from continuing operations, the most comparable GAAP measure, for the periods indicated:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
	(dollars in thousands, except per share amounts)		
Non-GAAP Data:			
U.S. GAAP net income	$ 10,729	$ 57,883	$ 56,915
Non-GAAP adjustments:			
Amortization of intangible assets	13,015	15,369	8,880
Share-based compensation	8,537	7,577	2,230
Other non-recurring expense, net (1)	2,808	1,727	4,767
Tax adjustments related to non-GAAP adjustments	(6,743)	(8,203)	(626)
Tax benefit from acquisitions (2)	—	—	(7,582)
Tax benefit from re-characterizing intercompany debt to equity (3)	—	—	(1,627)
Tax impact from tax law change (4)	—	—	(5,911)
Tax benefit from release of valuation allowance (5)	—	(4,140)	—
Adjustments to cost of goods sold (6)	—	—	1,752
Fair value adjustment to inventory from acquisitions (7)	—	4,839	5,230
Loss on Ajax acquisition arbitration settlement (8)	—	—	1,032
Non-GAAP net income	$ 28,346	$ 75,052	$ 65,060
U.S. GAAP diluted EPS	$ 0.47	$ 2.30	$ 2.15
Non-GAAP diluted EPS	$ 1.25	$ 2.99	$ 2.48
Shares used to compute diluted EPS	22,766,903	25,128,055	26,218,424

(1) Included in this amount for fiscal year 2019 are (i) acquisition-related expenses, comprised primarily of a charge to expense from the extinguishment of an indemnification asset related to our acquisition of Cal Weld in 2017 and expense associated with a two-year retention agreement between the Company and key management personnel of IAN (the “IAN retention agreement”), (ii) costs associated with restructuring and transitioning key leadership roles, and (iii) costs associated with implementation of our Sarbanes-Oxley compliance program and a new ERP system.

Included in this amount for fiscal year 2018 are (i) expenses associated with separation benefits for a former officer that became effective in January 2018, (ii) a gain on the extinguishment of the IAN earn-out liability, and (iii) acquisition-related expenses, comprised primarily of expense associated with the IAN retention agreement.

Included in this amount for 2017 are (i) acquisition-related expenses, (ii) expenses incurred in connection with sales or other dispositions of our ordinary shares by affiliates of FP, (iii) executive search expenses incurred in connection with replacing the Company’s Chief Financial Officer, (iv) a refund of previously paid consulting fees from FP Consulting (“FPC”), and (v) a gain on sale of our investment in CHawk.

(2) We recorded $2.3 million in tax benefit in the fourth quarter of 2017 and $5.3 million in the third quarter of 2017 in connection with our acquisitions of Talon and Cal-Weld, respectively.

(3) In the third quarter of 2017, we re-characterized intercompany debt to equity between our U.S. and Singapore entities resulting in a tax benefit of $1.6 million related to the reversal of previously accrued withholding taxes.

(4) This adjustment represents the impact of U.S. corporate tax reform.

(5) Represents the release of a valuation allowance against our foreign tax credit carryforwards we now expect to realize as a result of additional analysis of the Tax Cuts and Jobs Act.

(6) During the second quarter of 2017, we corrected an error relating to translated inventory balances at our Malaysia and Singapore subsidiaries using an incorrect foreign currency rate. The error arose in prior period financial statements beginning in periods prior to 2014 and through 2016. The correction resulted in a $1.8 million increase in cost of sales and a corresponding decrease in gross profit in our consolidated statement of operations and a decrease to inventories in our consolidated balance sheet during the second quarter of 2017.

(7) As part of our purchase price allocations for our acquisitions of Cal-Weld in July 2017, Talon in December 2017, and IAN in April 2018, we recorded acquired-inventory at fair value, resulting in a fair value step-up of $3.6 million, $6.2 million, and $0.3 million, respectively. These amounts were subsequently released to cost of sales as acquired-inventory was sold.

(8) During the third quarter of 2017, we received a final arbitration ruling on our working capital claim with the sellers of Ajax. The ruling was outside the one year measurement period and therefore could not be considered an adjustment to goodwill, resulting in a charge to selling, general, and administrative expense.

Non-GAAP adjusted net income from continuing operations has limitations as an analytical tool, and you should not consider it in isolation or as a substitute for net income or any of our other operating results reported under GAAP. Other companies may calculate adjusted net income differently or may use other measures to evaluate their performance, both of which could reduce the usefulness of our adjusted net income as a tool for comparison.

Because of these limitations, you should consider non-GAAP adjusted net income from continuing operations alongside other financial performance measures, including net income from continuing operations and other financial results presented in accordance with GAAP. In addition, in evaluating non-GAAP adjusted net income, you should be aware that in the future we will incur expenses such as those that are the subject of adjustments in deriving adjusted net income and you should not infer from our presentation of adjusted net income that our future results will not be affected by these expenses or any unusual or non-recurring items.

Unaudited Quarterly Financial Results

The following table set forth statement of operations data for the periods indicated. The information for each of these periods is unaudited and has been prepared on the same basis as our audited consolidated financial statements included herein and includes all adjustments, consisting only of normal recurring adjustments that we consider necessary for a fair presentation of our unaudited operations data for the periods presented. Historical results are not necessarily indicative of the results to be expected in the future.

	Three Months Ended							
	December 27, 2019	**September 27, 2019**	**June 28, 2019**	**March 29, 2019**	**December 28, 2018**	**September 28, 2018**	**June 29, 2018**	**March 30, 2018**
	(in thousands, except share and per share amounts)							
Sales	$ 189,355	$ 154,456	$ 139,195	$ 137,831	$ 141,402	$ 175,207	$ 248,973	$ 258,029
Cost of sales	163,440	133,763	119,662	117,608	119,953	146,993	205,098	215,430
Gross profit	25,915	20,693	19,533	20,223	21,449	28,214	43,875	42,599
Operating expenses:								
Research and development	3,090	2,987	2,634	2,391	2,203	2,123	2,577	2,452
Selling, general and administrative	13,779	11,048	10,685	11,758	9,432	10,658	11,647	15,711
Amortization of intangible assets	3,340	3,336	3,202	3,137	3,833	3,885	3,772	3,879
Total operating expenses	20,209	17,371	16,521	17,286	15,468	16,666	17,996	22,042
Operating income	5,706	3,322	3,012	2,937	5,981	11,548	25,879	20,557
Interest expense	2,454	2,663	2,762	2,768	2,627	2,553	2,303	2,504
Other expense (income), net	67	(43)	7	24	(181)	(84)	(217)	241
Income before income taxes	3,185	702	243	145	3,535	9,079	23,793	17,812
Income tax expense (benefit)	(4,767)	(221)	(93)	(1,373)	50	(558)	(4,247)	1,091
Net income	7,952	923	336	1,518	3,485	9,637	28,040	16,721
Diluted net income per share:	$ 0.35	$ 0.04	$ 0.01	$ 0.07	$ 0.15	$ 0.39	$ 1.07	$ 0.63
Shares used to compute diluted net income per share:	22,993,767	22,718,882	22,663,053	22,536,209	23,014,317	24,674,912	26,120,717	26,734,710

The following table sets forth our unaudited quarterly consolidated statement of operations data as a percentage of sales for the periods indicated.

	Three Months Ended							
	December 27, 2019	September 27, 2019	June 28, 2019	March 29, 2019	December 28, 2018	September 28, 2018	June 29, 2018	March 30, 2018
Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cost of sales	86.3	86.6	86.0	85.3	84.8	83.9	82.4	83.5
Gross profit	13.7	13.4	14.0	14.7	15.2	16.1	17.6	16.5
Operating expenses:								
Research and development	1.6	1.9	1.9	1.7	1.6	1.2	1.0	1.0
Selling, general and administrative	7.3	7.2	7.7	8.5	6.7	6.1	4.7	6.1
Amortization of intangible assets	1.8	2.2	2.3	2.3	2.7	2.2	1.5	1.5
Total operating expenses	10.7	11.2	11.9	12.5	10.9	9.5	7.2	8.5
Operating income	3.0	2.2	2.2	2.1	4.2	6.6	10.4	8.0
Interest expense	1.3	1.7	2.0	2.0	1.9	1.5	0.9	1.0
Other expense (income), net	0.0	0.0	0.0	0.0	(0.1)	0.0	(0.1)	0.1
Income before income taxes	1.7	0.5	0.2	0.1	2.5	5.2	9.6	6.9
Income tax expense (benefit)	(2.5)	(0.1)	(0.1)	(1.0)	0.0	(0.3)	(1.7)	0.4
Net income	4.2	0.6	0.2	1.1	2.5	5.5	11.3	6.5

Seasonality

We have not historically experienced meaningful seasonality with respect to our business or results of operations.

Liquidity and Capital Resources

We had cash of $60.6 million as of December 27, 2019, compared to $43.8 million as of December 28, 2018. Our principal uses of liquidity are to fund our working capital needs, purchase new capital equipment, acquisitions, and our share repurchase program. The increase was primarily due to operating cash flows of $57.2 million and net proceeds from the issuance of ordinary shares under our share-based compensation plans of $5.5 million, partially offset by net payments on long-term debt of $23.8 million, capital expenditures of $12.3 million, cash paid for intangible assets of $8.1 million.

We believe that our cash, the amounts available under our revolving credit facility, and our cash flows from operations will be sufficient to meet our anticipated cash needs for at least the next 12 months.

Cash Flow Analysis

The following table sets forth a summary of operating, investing, and financing activities for the periods presented:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
		(in thousands)	
Cash provided by operating activities	$ 57,150	$ 60,475	$ 38,803
Cash used in investing activities	(20,490)	(15,363)	(186,751)
Cash provided by (used in) financing activities	(19,882)	(70,582)	164,604
Net increase (decrease) in cash	$ 16,778	$ (25,470)	$ 16,656

Operating Activities

We generated $57.2 million from operating activities during 2019 due to net income of $10.7 million, net non-cash charges of $24.2 million, and a decrease in our net operating assets and liabilities of $22.2 million. Non-cash charges of $24.2 million primarily consist of depreciation and amortization of $21.9 million and share-based compensation of $8.5 million, partially offset by deferred taxes of $7.1 million. The decrease in our net operating assets and liabilities was primarily due to an increase in accounts payable of $68.0 million, partially offset by an increase in accounts receivable of $44.6 million, resulting from increased purchasing and sales activity as we ended 2019 compared to ending 2018.

We generated $60.5 million from operating activities during 2018 due to net income of $57.9 million and net non-cash charges of $24.9 million, partially offset by an increase in our net operating assets and liabilities of $22.3 million, net of acquired assets and liabilities. Non-cash charges primarily consist of depreciation and amortization of $23.1 million and share-based compensation of $7.6 million, partially offset by deferred income taxes of $6.7 million. The increase in our net operating assets and liabilities was primarily due to a decrease in accounts payable and accrued and other liabilities of $62.2 million and $5.0 million, respectively, partially offset by a decrease in inventories and accounts receivable of $35.1 million and $10.4 million, respectively.

We generated $38.8 million of cash from operating activities during 2017 due to net income of $56.5 million, partially offset by net non-cash charges of $(0.2) million and an increase in our net operating assets and liabilities of $17.4 million. Non-cash charges primarily related to $12.5 million in depreciation and amortization, $2.2 million in share-based compensation, and $0.6 million in amortization of debt issuance cost, offset by $15.3 million in deferred tax benefit and a gain on the sale of our investment in CHawk of $0.2 million. The increase in net operating assets and liabilities was primarily due to an increase in inventories of $43.4 million in order to meet sales demand in the first quarter of 2018, partially offset by an increase in accounts payable of $22.6 million and prepaid expenses and other assets of $3.4 million.

Investing Activities

Cash used in investing activities during 2019 was $20.5 million due to capital expenditures of $12.3 million and cash paid for developed technology assets of $8.1 million.

Cash used in investing activities during 2018 was $15.4 million due to capital expenditures of $13.9 million and net cash paid in connection with acquisitions of $1.4 million.

Cash used in investing activities during 2017 was $186.8 million. We used approximately $131.4 million and $49.5 million, net of acquired cash, to acquire Talon and Cal-Weld, respectively, and $8.2 million to fund capital expenditures to purchase test fixtures and leasehold improvements primarily related to our plant expansions in the United States and Malaysia. These outflows were partially offset by proceeds from the sale of our investments in Ajax Foresight Global Manufacturing Sdn. Bhd. (“AFGM”) and CHawk and the settlement of a note receivable from AFGM of $2.4 million.

Financing Activities

Cash used in financing activities during 2019 was $19.9 million due to net payments on long-term debt of $23.8 million and share repurchases of $1.6 million, partially offset by net proceeds from the issuance of ordinary shares under our share-based compensation plans of $5.5 million.

Cash used in financing activities during 2018 was $70.6 million due to share repurchases of $90.0 million and debt modification costs in connection with the refinancing of our credit facilities in February 2018 of $2.1 million, partially offset by net borrowing on long-term debt of $15.3 million and proceeds related to issuances of ordinary shares under our share-based compensation plans of $6.2 million.

We generated $164.6 million of cash from financing activities during 2017, which primarily consisted of $150.0 million in proceeds from the issuance of long-term debt to fund our acquisitions of Talon and Cal-Weld, $9.1 million in proceeds from employees’ and directors’ exercise of stock options, and $7.3 million of proceeds from the exercise of the underwriters’ over-allotment option in January 2017 in connection with our December 2016 IPO, partially offset by $1.5 million in financing costs associated with the issuance of long-term debt.

Credit Facilities

For a description of our Credit Facilities, please review the information provided in *Note 9 – Credit Facilities* of our consolidated financial statements included in Part IV, Item 15 of this report.

Contractual Obligations and Commitments

The following summarizes our contractual obligations and commitments as of December 27, 2019:

	Payments Due by Period				
	Total	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
			(in thousands)		
Operating leases	$ 15,723	$ 5,492	$ 9,000	$ 1,231	$ —
Long-term debt obligations, principal (1)	181,037	8,750	17,500	154,787	—
Long-term debt obligations, interest (2)	24,784	8,364	15,521	899	—
Total	$ 221,544	$ 22,606	$ 42,021	$ 156,917	$ —

(1) Represents the contractually required principal payments under our Credit Facilities in accordance with the required principal payment schedule.

(2) Represents the contractually required interest payments under our Credit Facilities in accordance with the required interest payment schedule. Interest costs have been estimated based on interest rates in effect for such indebtedness as of December 27, 2019.

Critical Accounting Policies and Estimates

Our consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, sales, expenses, and related disclosures. We base our estimates on historical experience and on various other assumptions that we believe are reasonable under the circumstances. We evaluate our estimates and assumptions on an ongoing basis. Actual results may differ from these estimates. To the extent that there are material differences between these estimates and our actual results, our future financial statements will be affected.

The critical accounting policies requiring estimates, assumptions, and judgments that we believe have the most significant impact on our consolidated financial statements are described below.

Revenue Recognition

To understand our revenue recognition accounting policy, please review the information provided in *Note 1 – Organization and Summary of Significant Accounting Policies*.

Inventory Valuation

To understand our inventory valuation accounting policy, please review the information provided in *Note 1 – Organization and Summary of Significant Accounting Policies*. During 2019, 2018, and 2017, we wrote down inventory determined to be excessive or obsolete by $1.1 million, $1.9 million, and $0.9 million, respectively.

Recent Accounting Pronouncements

From time to time, the Financial Accounting Standards Board (“FASB”) or other standards setting bodies issue new accounting pronouncements. Updates to the FASB Accounting Standards Codification are communicated through issuance of an Accounting Standards Update (“ASU”). Unless otherwise discussed, we believe that the impact of recently issued guidance, whether adopted or to be adopted in the future, is not expected to have a material impact on our Consolidated Financial Statements upon adoption.

To understand the impact of recently issued guidance, whether adopted or to be adopted, please review the information provided in *Note 1 – Organization and Summary of Significant Accounting Policies* of our consolidated financial statements in Part IV, Item 15 of this report.

Off-Balance Sheet Arrangements

As of December 27, 2019, we did not have any relationships with unconsolidated entities or financial partnerships, such as structured finance or special purpose entities, established for the purpose of facilitating off-balance sheet arrangements or other purposes.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to financial market risks, including changes in currency exchange rates and interest rates.

Foreign Currency Exchange Risk

Currently, substantially all of our sales and arrangements with third-party suppliers provide for pricing and payment in U.S. dollars and, therefore, are not subject to material exchange rate fluctuations. As a result, we do not expect foreign currency exchange rate fluctuations to have a material effect on our results of operations. However, increases in the value of the U.S. dollar relative to other currencies would make our products more expensive relative to competing products priced in such other currencies, which could negatively impact our ability to compete. Conversely, decreases in the value of the U.S. dollar relative to other currencies could result in our foreign suppliers raising their prices in order to continue doing business with us.

While not currently significant, we do have certain operating expenses that are denominated in currencies of the countries in which our operations are located, and may be subject to fluctuations due to foreign currency exchange rates, particularly the Singapore dollar, Malaysian Ringgit, British Pound, and Euro. Fluctuations in foreign currency exchange rates may cause us to recognize transaction gains and losses in our statement of operations. To date, foreign currency transaction gains and losses have not been material to our financial statements, and we have not engaged in any foreign currency hedging transactions.

Interest Rate Risk

We had total indebtedness of $181.0 million as of December 27, 2019, exclusive of $3.0 million in debt issuance costs, of which $8.8 million was due within 12 months. The outstanding amount of debt included elsewhere in this report is net of debt issuance costs.

We do not enter into investments for trading or speculative purposes and have not used any derivative financial instruments to manage our interest rate risk exposure. We have not been exposed to, nor do we anticipate being exposed to, material risks due to changes in interest rates. The interest rate on our outstanding debt is based on LIBOR, the Prime Rate, or the Federal Funds Rate. A hypothetical 1% interest rate change on our outstanding debt would have resulted in a $1.8 million change to interest expense during 2019.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The financial statements and supplementary financial information required to be filed under this Item 8 are presented beginning on page F-1 in Part IV, Item 15 of this annual report on Form 10-K and are incorporated herein by reference.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

During the third quarter of 2019, we identified a material weakness in our controls related to the prevention and timely detection of funds transfers to unauthorized accounts. We were the target of criminal fraud by persons impersonating one of our suppliers, which resulted in the transfer of funds to unauthorized bank accounts. The fraud did not represent a breach of our information systems, as confirmed by an external forensic examination, but rather it was a targeted phishing scam. Although our internal controls were not properly designed to prevent and timely detect the transfer of funds to unauthorized accounts, a secondary control was properly designed and operated effectively, which aided in a full recovery of all funds that were transferred. Accordingly, there was no financial loss to record in our financial statements.

Evaluation of Disclosure Controls and Procedures

As required by Rule 13a-15(b) under the Exchange Act, we carried out an evaluation under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of the end of the period covered by this report. There are inherent limitations to the effectiveness of any system of disclosure controls and procedures, including the possibility of human error and the circumvention or overriding of the controls and procedures. Accordingly, even effective disclosure controls and procedures can only provide reasonable assurance of achieving their control objectives. Based on this evaluation, our CEO and CFO concluded that our disclosure controls and procedures were effective as of December 27, 2019.

Notwithstanding the identified and remediated material weakness described above and below, we did not identify any misstatements in our reported operating results or financial condition and we have determined that the financial statements and other information included in this report and other periodic filings present fairly in all material respects our financial condition, results of operations, and cash flows at and for the periods presented in accordance with U.S. GAAP.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act). With the participation of our Chief Executive Officer and Chief Financial Officer, our management evaluated the effectiveness of our internal control over financial reporting based on the framework issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in Internal Control—Integrated Framework (2013). Because of its inherent limitations, internal control over financial reporting is not intended to provide absolute assurance that a misstatement of our financial statements would be prevented or detected. Based on that assessment, management has concluded that our internal control over financial reporting was effective as of December 27, 2019 to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements in accordance with GAAP.

We have not engaged an independent registered accounting firm to perform an audit of our internal control over financial reporting as of any balance sheet date or for any period reported in our financial statements. Our independent public registered accounting firm will first be required to attest to the effectiveness of our internal control over financial reporting for our Annual Report on Form 10-K for the first year we are no longer an "emerging growth company" as defined by the JOBS Act.

Changes in Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed by, or under the supervision of, a company's principal executive and principal financial officers, or persons performing similar functions, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements in accordance with GAAP. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. In addition, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies or procedures may deteriorate. If we cannot provide reliable financial information, our business, operating results and share price could be negatively impacted. Other than the changes associated with the remediation plan described below, there have been no changes in our internal control over financial reporting (as defined in Rule 13a-15(f) of the Exchange Act) during the fourth quarter ended December 27, 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

We determined that certain internal controls required for safeguarding our cash assets were not properly designed due to insufficient specificity regarding our policies and procedures surrounding supplier banking information changes, not identifying appropriate segregation of duties, and insufficient training on exercising professional skepticism.

Remediation of the Material Weakness

We initiated a remediation plan during the third quarter of 2019 and have completed the following actions:

- enhanced the approval process for adding or modifying supplier banking information;
- increased the level of segregation of duties surrounding those who have the ability to modify supplier information, and;
- increased communication of our internal controls and processes and emphasized security awareness and the importance of exercising professional skepticism

We consider the material weakness remediated as of December 27, 2019, as the remedial controls have operated for a sufficient period of time and we have concluded, through testing, that these controls are operating effectively.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this item is incorporated by reference to our Proxy Statement for our 2020 General Meeting to be filed with the SEC within 120 days after the close of the year ended December 27, 2019.

Code of Conduct

We have adopted a code of business ethics and conduct (the "Code of Conduct") that applies to all employees, officers, and directors, including the principal executive officer, principal financial officer, and principal accounting officer. The Code of Conduct is available on our investor relations website at ir.ichorsystems.com. We intend to post all disclosures that are required by law or NASDAQ listing rules regarding any amendment to, or a waiver of, any provision of the Code of Conduct for the principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is incorporated by reference to our Proxy Statement for our 2020 General Meeting to be filed with the SEC within 120 days after the close of the year ended December 27, 2019.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED SHAREHOLDER MATTERS

The information required by this item is incorporated by reference to our Proxy Statement for our 2020 General Meeting to be filed with the SEC within 120 days after the close of the year ended December 27, 2019.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item is incorporated by reference to our Proxy Statement for our 2020 General Meeting to be filed with the SEC within 120 days after the close of the year ended December 27, 2019.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this item is incorporated by reference to our Proxy Statement for our 2020 General Meeting to be filed with the SEC within 120 days after the close of the year ended December 27, 2019.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

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

(1) Financial Statements.

The following Consolidated Financial Statements are filed as part of this report under *Item 8 – Financial Statements and Supplementary Data*.

(2) Exhibits. Exhibits are listed on the Exhibit Index at the end of this report.

ITEM 16. FORM 10-K SUMMARY

Not applicable.

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Ichor Holdings, Ltd.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Ichor Holdings, Ltd. and subsidiaries (the Company) as of December 27, 2019 and December 28, 2018, the related consolidated statements of operations, shareholders' equity, and cash flows for each of the years in the three year period ended December 27, 2019, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 27, 2019 and December 28, 2018, and the results of its operations and its cash flows for each of the years in the three year period ended December 27, 2019, in conformity with U.S. generally accepted accounting principles.

Change in Accounting Principle

As discussed in Note 1 to the consolidated financial statements, the Company has changed its method of accounting for leases as of December 29, 2018 due to the adoption of Accounting Standards Update ("ASU") 2016-02, *Leases*, and ASU 2018-11, *Leases: Targeted Improvements (Topic 842)*, and its method of accounting for revenue as of December 30, 2017 due to the adoption of ASU 2014-09, *Revenue from Contracts with Customers (Topic 606)*.

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2011.

Portland, Oregon
March 6, 2020

ICHOR HOLDINGS, LTD.
Consolidated Balance Sheets
(dollars in thousands, except per share data)

	December 27, 2019	December 28, 2018
Assets		
Current assets:		
Cash	$ 60,612	$ 43,834
Accounts receivable, net	84,849	40,287
Inventories, net	127,037	121,106
Prepaid expenses and other current assets	4,449	6,348
Total current assets	276,947	211,575
Property and equipment, net	44,541	41,740
Operating lease right-of-use assets	14,198	—
Other noncurrent assets	1,094	906
Deferred tax assets, net	4,738	1,363
Intangible assets, net	52,027	56,895
Goodwill	173,010	173,010
Total assets	$ 566,555	$ 485,489
Liabilities and Shareholders' Equity		
Current liabilities:		
Accounts payable	$ 131,578	$ 64,300
Accrued liabilities	12,814	9,556
Other current liabilities	5,233	5,148
Current portion of long-term debt	8,750	8,750
Current portion of lease liabilities	5,492	—
Total current liabilities	163,867	87,754
Long-term debt, less current portion, net	169,304	192,117
Lease liabilities, less current portion	9,081	—
Deferred tax liabilities	210	3,966
Other non-current liabilities	2,677	3,326
Total liabilities	345,139	287,163
Shareholders' equity:		
Preferred shares ($0.0001 par value; 20,000,000 shares authorized; zero shares issued and outstanding)	—	—
Ordinary shares ($0.0001 par value; 200,000,000 shares authorized; 22,618,708 and 22,234,508 shares outstanding, respectively; 27,056,147 and 26,574,037 shares issued, respectively)	2	2
Additional paid in capital	242,318	228,358
Treasury shares at cost (4,437,439 and 4,339,529 shares, respectively)	(91,578)	(89,979)
Retained earnings	70,674	59,945
Total shareholders' equity	221,416	198,326
Total liabilities and shareholders' equity	$ 566,555	$ 485,489

ICHOR HOLDINGS, LTD.
Consolidated Statements of Operations
(dollars in thousands, except per share data)

	Year Ended December 27, 2019	Year Ended December 28, 2018	Year Ended December 29, 2017
Net sales	$ 620,837	$ 823,611	$ 655,892
Cost of sales	534,473	687,474	555,131
Gross profit	86,364	136,137	100,761
Operating expenses:			
Research and development	11,102	9,355	7,899
Selling, general, and administrative	47,270	47,448	37,802
Amortization of intangible assets	13,015	15,369	8,880
Total operating expenses	71,387	72,172	54,581
Operating income	14,977	63,965	46,180
Interest expense	10,647	9,987	3,277
Other expense (income), net	55	(241)	(126)
Income before income taxes	4,275	54,219	43,029
Income tax benefit	(6,454)	(3,664)	(13,886)
Net income from continuing operations	10,729	57,883	56,915
Discontinued operations:			
Loss from discontinued operations before taxes	—	—	(722)
Income tax benefit from discontinued operations	—	—	(261)
Net loss from discontinued operations	—	—	(461)
Net income	10,729	57,883	56,454
Net income per share from continuing operations:			
Basic	$ 0.48	$ 2.34	$ 2.27
Diluted	$ 0.47	$ 2.30	$ 2.17
Net income per share:			
Basic	$ 0.48	$ 2.34	$ 2.25
Diluted	$ 0.47	$ 2.30	$ 2.15
Shares used to compute net income from continuing operations and net income per share:			
Basic	22,418,802	24,706,542	25,118,031
Diluted	22,766,903	25,128,055	26,218,424

ICHOR HOLDINGS, LTD.
Consolidated Statements of Shareholders' Equity
(dollars in thousands)

	Ordinary Shares		Additional Paid-In Capital	Treasury Shares		Retained Earnings (Accumulated Deficit)	Total Shareholders' Equity
	Shares	Amount		Shares	Amount		
Balance at December 30, 2016	23,857,381	$ 2	$ 196,049	—	$ —	$ (54,392)	$ 141,659
Ordinary shares issued from initial public offering, net of transaction costs	881,667	1	7,277	—	—	—	7,278
Ordinary shares issued from exercise of stock options	1,078,182	—	9,141			—	9,141
Ordinary shares issued from vesting of restricted share units	74,932	—	—	—	—	—	—
Share-based compensation expense	—	—	2,230	—	—	—	2,230
Net income	—	—	—	—	—	56,454	56,454
Balance at December 29, 2017	25,892,162	3	214,697	—	—	2,062	216,762
Ordinary shares issued from exercise of stock options	573,162	—	5,661	—	—	—	5,661
Ordinary shares issued from vesting of restricted share units	79,336	—	(91)	—	—	—	(91)
Ordinary shares issued from employee share purchase plan	29,377	—	514	—	—	—	514
Repurchase of ordinary shares	(4,339,529)	(1)	—	4,339,529	(89,979)	—	(89,980)
Share-based compensation expense	—	—	7,577	—	—	—	7,577
Net income	—	—	—	—	—	57,883	57,883
Balance at December 28, 2018	22,234,508	2	228,358	4,339,529	(89,979)	59,945	198,326
Ordinary shares issued from exercise of stock options	353,027	—	5,042	—	—	—	5,042
Ordinary shares issued from vesting of restricted share units	81,438	—	(290)	—	—	—	(290)
Ordinary shares issued from employee share purchase plan	47,645	—	671	—	—	—	671
Repurchase of ordinary shares	(97,910)	—	—	97,910	(1,599)	—	(1,599)
Share-based compensation expense	—	—	8,537	—	—	—	8,537
Net income	—	—	—	—	—	10,729	10,729
Balance at December 27, 2019	22,618,708	$ 2	$ 242,318	4,437,439	$ (91,578)	$ 70,674	$ 221,416

ICHOR HOLDINGS, LTD.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
Cash flows from operating activities:			
Net income	$ 10,729	$ 57,883	$ 56,454
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	21,869	23,064	12,509
Gain on sale of investments and settlement of note receivable	—	—	(241)
Share-based compensation	8,537	7,577	2,230
Deferred income taxes	(7,131)	(6,687)	(15,347)
Amortization of debt issuance costs	937	970	608
Changes in operating assets and liabilities, net of acquisitions:			
Accounts receivable, net	(44,562)	10,425	(1,059)
Inventories, net	(5,931)	35,126	(43,425)
Prepaid expenses and other assets	6,067	(685)	3,386
Accounts payable	67,966	(62,173)	22,612
Accrued liabilities	3,214	(3,518)	848
Other liabilities	(4,545)	(1,507)	228
Net cash provided by operating activities	57,150	60,475	38,803
Cash flows from investing activities:			
Capital expenditures	(12,343)	(13,920)	(8,226)
Cash paid for acquisitions, net of cash acquired	—	(1,443)	(180,955)
Cash paid for intangible assets	(8,147)	—	—
Proceeds from sale of investments and settlement note receivable	—	—	2,430
Net cash used in investing activities	(20,490)	(15,363)	(186,751)
Cash flows from financing activities:			
Issuance of ordinary shares, net of fees	—	—	7,278
Issuance of ordinary shares under share-based compensation plans	5,757	6,329	9,141
Employees' taxes paid upon vesting of restricted share units	(290)	(91)	—
Repurchase of ordinary shares	(1,599)	(89,980)	—
Debt issuance and modification costs	—	(2,092)	(1,520)
Borrowings on revolving credit facility	13,000	44,162	10,000
Repayments on revolving credit facility	(28,000)	(20,000)	—
Proceeds from term loan	—	—	140,000
Repayments on term loan	(8,750)	(8,910)	(295)
Net cash provided by (used in) financing activities	(19,882)	(70,582)	164,604
Net increase (decrease) in cash	16,778	(25,470)	16,656
Cash at beginning of period	43,834	69,304	52,648
Cash at end of period	$ 60,612	$ 43,834	$ 69,304
Supplemental disclosures of cash flow information:			
Cash paid during the period for interest	$ 8,424	$ 8,273	$ 3,436
Cash paid during the period for taxes, net of refunds	$ 896	$ 2,278	$ 1,068
Supplemental disclosures of non-cash activities:			
Capital expenditures included in accounts payable	$ 774	$ 1,462	$ 723
Right-of-use assets obtained in exchange for new operating lease liabilities	$ 817	$ —	$ —

Note 1 – Organization and Summary of Significant Accounting Policies

Organization and Operations of the Company

Ichor Holdings, Ltd. and Subsidiaries (the “we”, “us”, “our”, “Company”) designs, develops, manufactures, and distributes gas and liquid delivery subsystems and components purchased by capital equipment manufacturers for use in the semiconductor markets. We are headquartered in Fremont, California and have operations in the United States, United Kingdom, Singapore, Malaysia, and Korea.

On December 30, 2011, Ichor Systems Holdings, LLC consummated a sales transaction with Icicle Acquisition Holdings, LLC, a Delaware limited liability company. Shortly after consummation of the sale transaction, Icicle Acquisition Holdings, LLC changed its name to Ichor Holdings, LLC.

In March 2012, Ichor Holdings, LLC completed a reorganization of its legal structure, forming Ichor Holdings, Ltd., a Cayman Islands entity. Ichor Holdings, Ltd. is now the reporting entity and the ultimate parent company of the operating entities.

In January 2016, we decided to close our Kingston, New York facility which was the primary facility for the Precision Flow Technologies, Inc. (“PFT”) subsidiary. In May 2016, we ceased operations in this facility and ended the relationship with the customer it served in this location. Our consolidated financial statements and accompanying notes for current and prior periods have been retroactively adjusted to present the results of operations of the Precision Flow Technologies, Inc. subsidiary as a discontinued operation. In addition, the assets and liabilities to be disposed of have been treated and classified as a discontinued operation. For more information on the discontinued operation see *Note 14 – Discontinued Operations*.

Basis of Presentation

These consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the U.S. (“GAAP”). All intercompany balances and transactions have been eliminated upon consolidation. All dollar figures presented in tables in the notes to consolidated financial statements are in thousands, except per share amounts.

These consolidated financial statements include the following wholly owned subsidiaries of Ichor Holdings, Ltd.:

Name of Subsidiary	Jurisdiction of Incorporation, Organization, or Formation
Ichor Intermediate Holdings, Ltd.	Cayman Islands
Icicle Acquisition Holding Co-op	Netherlands
Icicle Acquisition Holding B.V.	Netherlands
Ichor Holdings Ltd.	Scotland
Ichor Systems Ltd.	Scotland
Ichor Holdings, LLC	Delaware
Ichor Systems, Inc.	Delaware
Ichor Systems Korea Ltd.	Korea
Ichor Systems Malaysia Sdn Bhd	Malaysia
Ichor Systems Singapore, PTE Ltd.	Singapore
Talon Innovations Korea	Korea
IAN Engineering Co., Ltd.	Korea

Public Offering

On December 14, 2016, we completed an initial public offering (“IPO”) of 5,877,778 ordinary shares at a price to the public of $9.00 per share. We received net proceeds from the offering of $47.1 million after offering fees and expenses. The net proceeds were used to repay $40.0 million of loans outstanding under our Credit Facilities. In January 2017, we received $7.3 million, net of fees and expenses, from the exercise of the underwriters’ over-allotment option to sell an additional 881,667 ordinary shares.

Year End

We use a 52- or 53-week fiscal year ending on the last Friday in December. The years ended December 27, 2019, December 28, 2018 and December 29, 2017 were all 52 weeks. All references to 2019, 2018, and 2017 are references to the fiscal years then ended.

Use of Estimates

The preparation of consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting periods presented. We base our estimates and judgments on historical experience and on various other assumptions that we believe are reasonable under the circumstances. Actual results could differ from the estimates made by management. Significant estimates include the fair value of assets and liabilities acquired in acquisitions, estimated useful lives for long-lived assets, allowance for doubtful accounts, inventory valuation, uncertain tax positions, fair value assigned to stock options granted, and impairment analysis for both definite-lived intangible assets and goodwill.

Revenue Recognition

We recognize revenue when control of promised goods or services is transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. This amount is recorded as net sales in our consolidated statements of operations.

Transaction price – In most of our contracts, prices are generally determined by a customer-issued purchase order and generally remain fixed over the duration of the contract. Certain contracts contain variable consideration, including early-payment discounts and rebates. When a contract includes variable consideration, we evaluate the estimate of the variable consideration to determine whether the estimate needs to be constrained; therefore, we include the variable consideration in the transaction price only to the extent that it is probable that a significant reversal will not occur. Variable consideration estimates are updated at each reporting date. Historically, we have not incurred significant costs to obtain a contract. All amounts billed to a customer relating to shipping and handling are classified as net sales, while all costs incurred by us for shipping and handling are classified as cost of sales.

Performance obligations – Substantially all of our performance obligations pertain to promised goods (“products”), which are primarily comprised of fluid delivery subsystems, weldments, and other components. Most of our contracts contain a single performance obligation and are generally completed within twelve months. Product sales are recognized at a point-in-time, generally upon delivery, as such term is defined within the contract, as that is when control of the promised good has transferred. Products are covered by a standard assurance warranty, generally extended for a period of one to two years depending on the customer, which promises that delivered products conform to contract specifications. As such, we account for such warranties under ASC 460, *Guarantees*, and not as a separate performance obligation.

Contract balances – Accounts receivable represents our unconditional right to receive consideration from our customers. Accounts receivable are carried at invoice price less an estimate for doubtful accounts and estimated payment discounts. Payment terms vary by customer but are generally due within 15-60 days. Historically, we have not incurred significant payment issues with our customers. We had no significant contract assets or liabilities on our consolidated balance sheets in any of the periods presented.

Commitments and Contingencies

We are periodically involved in legal actions and claims that arise as a result of events that occur in the normal course of operations. The ultimate resolution of these actions is not expected to have a material adverse effect on our financial position or results of operations.

Concentration of Credit Risk

Financial instruments that subject us to credit risk consist of accounts receivable, accounts payable, and long-term debt. At December 27, 2019 and December 28, 2018, two customers represented, in the aggregate, approximately 66% and 40%, respectively, of the balance of accounts receivable.

We establish an allowance for doubtful accounts based upon the credit risk of specific customers, historical trends, and other information. Activity and balances related to the allowance for doubtful accounts is as follows:

		Allowance for doubtful accounts
Balance at December 30, 2016	$	194
Charges to costs and expenses		62
Write-offs		—
Balance at December 29, 2017		256
Charges to costs and expenses		195
Write-offs and recoveries		(111)
Balance at December 28, 2018		340
Charges to costs and expenses		—
Write-offs and recoveries		(45)
Balance at December 27, 2019	$	295

We require collateral, typically cash, in the normal course of business if customers do not meet the criteria established for offering credit. If the financial condition of our customers were to deteriorate and result in an impaired ability to make payments, additions to the allowance may be required. Accounts receivable are written off when deemed uncollectible. Recoveries of accounts receivable previously written off are recorded to income when received.

We use qualified manufacturers to supply many components and subassemblies of our products. We obtain the majority of our components from a limited group of suppliers. A majority of the purchased components used in our products are customer specified. An interruption in the supply of a particular component would have a temporary adverse impact on our operating results.

We maintain cash balances at both United States-based and foreign-based commercial banks. Cash balances in the United States exceed amounts that are insured by the Federal Deposit Insurance Corporation (FDIC). The majority of the cash maintained in foreign-based commercial banks is insured by the government where the foreign banking institutions are based. Cash held in foreign-based commercial banks totaled $34.4 million and $25.5 million at December 27, 2019 and December 28, 2018, respectively, and at times exceeds insured amounts. No losses have been incurred at December 27, 2019 or December 28, 2018 for amounts exceeding the insured limits.

Fair Value Measurements

We estimate the fair value of financial assets and liabilities based upon comparison of such assets and liabilities to the current market values for instruments of a similar nature and degree of risk. We utilize valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible. We determine fair value based on assumptions that market participants would use in pricing an asset or liability in the principal or most advantageous market. When considering market participant assumptions in fair value measurements, the following fair value hierarchy distinguishes between observable and unobservable inputs, which are categorized in one of the following levels:

- Level 1 Inputs: Unadjusted quoted prices in active markets for identical assets or liabilities accessible to the reporting entity at the measurement date
- Level 2 Inputs: Other than quoted prices included in Level 1 inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the asset or liability
- Level 3 Inputs: Unobservable inputs for the asset or liability used to measure fair value to the extent that observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date

There were no changes to our valuation techniques during 2019. We estimate the recorded value of our financial assets and liabilities approximates fair value at December 27, 2019 and December 28, 2018.

We estimate the value of intangible assets on a nonrecurring basis based on an income approach utilizing discounted cash flows. Under this approach, we estimate the future cash flows from our asset groups and discount the income stream to its present value to arrive at fair value. Future cash flows are based on recently prepared operating forecasts. Operating forecasts and cash flows include, among other things, revenue growth rates that are calculated based on management's forecasted sales projections. A discount rate is utilized to convert the forecasted cash flows to their present value equivalent. The discount rate applied to the future cash flows includes a subject-company risk premium, an equity market risk premium, a beta, and a risk-free rate. As this approach contains unobservable inputs, the measurement of fair value for intangible assets is classified as Level 3.

Inventories

Inventories are stated at the lower of cost or net realizable value. The majority of inventory values are based upon average costs. We analyze inventory levels and record write-downs for inventory that has become obsolete, inventory that has a cost basis in excess of its expected net realizable value, and inventory in excess of expected customer demand. We assess the valuation of all inventories, including raw materials, work-in-process, finished goods and spare parts on a periodic basis. Obsolete inventory or inventory in excess of our estimated usage is written down to its estimated market value less costs to sell, if less than its cost. Inherent in our estimates of demand and market value in determining inventory valuation are estimates related to economic trends, future demand for our products, and technological obsolescence of our products. If actual demand and market conditions are less favorable than our projections, additional inventory write-downs may be required. If the inventory value is written down to its net realizable value, and subsequently there is an increased demand for the inventory at a higher value, the increased value of the inventory is not realized until the inventory is sold either as a component of a subsystem or as separate inventory.

Property and Equipment

Property and equipment are stated at cost, less accumulated depreciation. Depreciation is computed using the straight-line method over the following estimated useful lives:

	Estimated useful lives of property & equipment
Machinery	5-10 years
Leasehold improvements	10 years
Computer software, hardware, and equipment	3-5 years
Office furniture, fixtures, and equipment	5-7 years
Vehicles	5 years

Maintenance and repairs that neither add material value to the asset nor appreciably prolong its useful life are charged to expense as incurred. Gains or losses on the disposal of property and equipment are included in selling, general, and administrative expenses on the consolidated statements of operations.

Leases

We determine if an arrangement is a lease, or contains a lease, at the inception of the arrangement. If we determine the arrangement is a lease, or contains a lease, at lease inception, we then determine whether the lease is an operating lease or a finance lease. Operating and finance leases result in recording a right-of-use ("ROU") asset and lease liability on our consolidated balance sheets. ROU assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at the commencement date based on the present value of lease payments over the lease term. For purposes of calculating operating lease ROU assets and operating lease liabilities, we use the non-cancellable lease term plus options to extend that we are reasonably certain to take. Lease expense for operating lease payments is recognized on a straight-line basis over the lease term. Our leases generally do not provide an implicit rate. As such, we use our incremental borrowing rate based on the information available at commencement date in determining the present value of lease payments. This rate is generally consistent with the interest rate we pay on borrowings under our credit facilities, as this rate approximates our collateralized borrowing capabilities over a similar term of lease payments. We utilize the consolidated group incremental borrowing rate for all leases, as we have centralized treasury operations. We have elected not to recognize ROU assets and lease liabilities that arise from short-term (12 months or less) leases for any class of underlying asset. We have elected not to separate lease and non-lease components for any class of underlying asset.

Long-Lived Assets

Long-lived assets are reviewed for impairment whenever events or changes in circumstances indicate, in management's judgment, that the carrying amount of an asset (or asset group) may not be recoverable. In analyzing potential impairments, projections of future cash flows from the asset group are used to estimate fair value. If the sum of the expected future undiscounted cash flows is less than the carrying amount of the asset group, a loss is recognized for the difference between the estimated fair value and the carrying value of the asset group. The projections are based on assumptions, judgments, and estimates of revenue growth rates for the related business; anticipated future economic, regulatory, and political conditions; the assignment of discount rates relative to risk; and estimates of terminal values. At December 27, 2019 and December 28, 2018, intangible assets passed the recoverability test resulting in no impairment.

Intangible Assets

We account for intangible assets that have a definite life and are amortized on a basis consistent with their expected cash flows over the following estimated useful lives:

	Estimated useful lives of intangible assets
Trademarks	10 years
Customer relationships	6-10 years
Developed technology	7-10 years

Goodwill

Goodwill represents the future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognized. We review goodwill for impairment annually and whenever events or changes in circumstances indicate the carrying value of goodwill may not be recoverable. We first make a qualitative assessment of whether it is more likely than not that a reporting unit's fair value is less than its carrying amount before applying a quantitative goodwill impairment test. Under the quantitative test, the fair value of the reporting unit is compared to its carrying value and an impairment loss is recognized for any excess of carrying amount over the reporting unit's fair value. Fair value of the reporting unit is determined using a discounted cash flow analysis. For purposes of testing goodwill for impairment, we have concluded that we operate as one reporting unit.

We performed a qualitative goodwill assessment at December 27, 2019 and December 28, 2018. This assessment indicated that it was more likely than not our reporting unit's fair value exceeded its carrying value.

Research and Development Costs

Research and development costs are expensed as incurred.

Share-Based Payments

We use the Black-Scholes option-pricing model to value awards on the date of grant. We use the simplified method to estimate the expected term of share-based awards for all periods as we do not have sufficient history to estimate the weighted average expected term. The risk-free interest rate is based on the U.S. Treasury rates in effect on the corresponding date of grant. Estimated volatility is based on the historical volatility of ours and similar entities' publicly traded shares.

Income Taxes

We recognize deferred income taxes using the asset and liability method of accounting for income taxes. Under the asset and liability method, deferred income taxes are recognized for differences between the financial reporting and tax bases of assets and liabilities at enacted statutory tax rates in effect for the years in which the differences are expected to reverse. The effect on deferred taxes of a change in tax rates is recognized in income in the period that includes the enactment date. Valuation allowances are established when necessary to reduce deferred tax assets to the amount expected to be realized. Income tax benefit for the current year differs from the statutory rate primarily as a result of the impact of foreign operations and discrete tax benefits recorded in connection with our historical acquisitions and stock option exercises.

When tax returns are filed, it is highly certain that some positions taken would be sustained upon examination by the taxing authorities, while others may be subject to uncertainty about the merits of the position taken or the amount of the position that would be ultimately sustained. The benefit of a tax position is recognized in the consolidated financial statements in the period during which, based on all available evidence, management believes it is more likely than not that the position will be sustained upon examination, including the resolution of appeals or litigation processes, if any. Tax positions taken are not offset or aggregated with other positions. Tax positions that meet the more-likely-than-not recognition threshold are measured as the largest amount of tax benefit that is more than 50% likely of being realized upon settlement with the applicable taxing authority. The portion of the benefits associated with tax positions taken that exceeds the amount measured as described above is reflected as a liability for unrecognized tax benefits in our consolidated balance sheets along with any associated interest and penalties that would be payable to the taxing authorities upon examination. We recognize interest and penalties as a component of income tax expense.

Foreign Operations

The functional currency of our international subsidiaries located in the United Kingdom, Singapore, and Malaysia, is the U.S. dollar. Transactions denominated in currencies other than the functional currency generate foreign exchange gains and losses that are included in other expense (income), net on our consolidated statements of operations. Substantially, all of our sales and agreements with third-party suppliers provide for pricing and payments in U.S. dollars and, therefore, are not subject to material exchange rate fluctuations. Foreign operations consist of revenue of $291.3 million, $379.1 million, and $346.0 million, during 2019, 2018, and 2017, respectively. Assets of foreign operations totaled $203.8 million and $157.0 million at December 27, 2019 and December 28, 2018, respectively.

Accounting Pronouncements Recently Adopted

In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Updated ("ASU") 2014-09, *Revenue from Contracts with Customers (Topic 606)*, which supersedes nearly all existing revenue recognition guidance. Subsequent to the issuance of ASU 2014-09, the FASB clarified the guidance through several ASUs. We adopted Accounting Standards Codification ("ASC") Topic 606, *Revenue from Contracts with Customers*, on December 30, 2017, the first day of fiscal year 2018, using the modified retrospective method. After assessing our contracts with our customers, we determined that there was not a significant change to the nature, timing, and extent of our revenues under the new standard. Accordingly, we did not make a cumulative-effect adjustment to retained earnings on December 30, 2017, as there was no adjustment to be made.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)*, which consists of a comprehensive lease accounting standard. Under the new standard, assets and liabilities arising from most leases will be recognized on the balance sheet. Leases will be classified as either operating or financing, and the lease classification will determine whether expense is recognized on a straight-line basis (operating leases) or based on an effective interest method (financing leases). The standard also contains expanded disclosure requirements regarding the amounts, timing, and uncertainties of cash flows related to leasing activities.

The new standard is effective for interim and annual periods beginning after December 15, 2018. In July 2018, the FASB issued ASU 2018-11, *Leases (Topic 842): Targeted Improvements*, which provides an optional transition method allowing entities to initially apply the new lease standard at the adoption date and recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. We adopted and applied the lease standard as of December 29, 2018, the first day of fiscal year 2019, using this optional transition method.

The new standard provides a number of practical expedients in transition. We elected the package of practical expedients, which permits us not to reassess our prior conclusions about lease identification, lease classification, and initial direct costs. We elected to not recognize short-term leases, those with an initial term of 12 months or less, on our consolidated balance sheets.

The new standard had material effects on our consolidated financial statements. The most significant effects relate to the recognition of right-of-use ("ROU") assets and lease liabilities on our balance sheet for our facilities operating leases and the new disclosure requirements about our leasing activities. Upon adoption, we recorded operating lease liabilities of $18.1 million, with an offsetting increase to operating lease ROU assets of $17.7 million in exchange for the liabilities assumed. We did not recognize a cumulative-effect adjustment to the opening balance of retained earnings, as there was no adjustment to be made as a result of our adoption and application of the standard. The standard did not have a significant impact on our consolidated statements of operations or cash flows.

In June 2018, the FASB issued ASU 2018-07, *Compensation-Stock Compensation (Topic 718): Improvements to Non-Employee Share-Based Payment Accounting*. This standard is intended to reduce cost and complexity and to improve financial reporting for share-based payments issued to nonemployees. ASU 2018-07 expands the scope of ASC Topic 718, which currently only includes share-based payments issued to employees, to also include share-based payments issued to nonemployees for goods and services. We adopted ASU 2018-07 on December 29, 2018, the first day of fiscal year 2019, which did not have a significant impact on our consolidated financial statements.

Accounting Pronouncements Recently Issued

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments–Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*. This standard changes the methodology for measuring credit losses on financial instruments and the timing of when such losses are recorded. ASU 2016-13 is effective for fiscal years beginning after December 15, 2019, using a modified retrospective adoption method. We will adopt this standard in the first quarter of 2020, and the adoption will not have a material impact on our consolidated financial statements.

Note 2 – Acquisitions

IAN Engineering Co., Ltd.

On April 19, 2018, we completed the acquisition, via stock purchase, of IAN Engineering Co., Ltd. ("IAN"), a Seoul-based leader in providing locally-sourced design and manufacturing of gas delivery systems to customers in South Korea, for an aggregate purchase price of $6.5 million, inclusive of $5.3 million paid at closing and contingent consideration with a fair value of $1.3 million. Contingent consideration consisted of an earn-out liability that would become payable in 2019 and 2020 if certain financial targets were achieved. During 2018, we determined those financial targets would not be met and, therefore, derecognized the earn-out liability, resulting in a gain of $1.3 million recognized in operating income on our consolidated statements of income. As this determination was made because of facts and circumstances that arose after the acquisition date, there was no change to total acquisition consideration. IAN provides us exposure to and growth opportunities in the South Korean semiconductor capital equipment market.

The following table presents the preliminary purchase price allocation as of April 19, 2018 and the final allocation as of December 28, 2018. Measurement period adjustments recognized in 2018 relate to the fair value of IAN's opening balance of deferred taxes.

	Preliminary Allocation April 19, 2018	2018 Measurement Period Adjustment	Final Allocation December 28, 2018
Cash acquired	$ 3,952	$ —	$ 3,952
Accounts receivable	863	—	863
Inventories	1,870	—	1,870
Prepaid expenses and other current assets	56	—	56
Property and equipment	396	—	396
Other noncurrent assets	101	—	101
Intangible assets	1,559	—	1,559
Goodwill	2,856	6	2,862
Accounts payable	(4,193)	—	(4,193)
Accrued and other current liabilities	(452)	—	(452)
Deferred tax liabilities	(383)	(6)	(389)
Other non-current liabilities	(82)	—	(82)
Total acquisition consideration	$ 6,543	$ —	$ 6,543

We allocated $1.6 million to customer relationships with an amortization period of 6 years. Goodwill recognized from the acquisition was primarily attributed to an assembled workforce and expected synergies and is not tax deductible.

Our consolidated statements of operations for 2018 include approximately eight months of IAN operating activity, including revenue of $7.7 million.

Pro forma financial information has not been provided for the acquisition of IAN as it was not material to our operations and overall financial position.

Talon Innovations Corporation

On December 11, 2017 we completed the acquisition, via stock purchase, of Talon Innovations Corporation ("Talon"), a Minnesota-based leader in the design and manufacturing of high precision machined parts used in leading edge semiconductor tools, for $137.8 million. Talon expanded our capacity and capabilities in the area of component manufacturing for gas and chemical delivery tools used in semiconductor manufacturing and other industrial applications.

The following table presents the preliminary purchase price allocation as of December 11, 2017 and the final allocation as of December 11, 2018. Measurement period adjustments recognized in 2018 primarily relate to the fair value of Talon's opening balance of accounts receivable, inventory, income taxes payable, deferred taxes, developed technology, and other working capital amounts.

	Preliminary Allocation December 11, 2017	2018 Measurement Period Adjustment	Final Allocation December 11, 2018
Cash acquired	$ 5,586	$ —	$ 5,586
Accounts receivable	11,471	600	12,071
Inventories	19,399	209	19,608
Prepaid expenses and other current assets	182	—	182
Property and equipment	16,655	—	16,655
Other noncurrent assets	76	—	76
Intangible assets	38,000	(2,700)	35,300
Goodwill	74,594	892	75,486
Accounts payable	(4,706)	—	(4,706)
Accrued liabilities	(2,767)	170	(2,597)
Other current liabilities	(1,838)	972	(866)
Deferred tax liabilities	(19,652)	652	(19,000)
Total acquisition consideration	$ 137,000	$ 795	$ 137,795

We allocated $32.4 million to customer relationships and $2.9 million to intellectual property with weighted average amortization periods of 6 years and 10 years, respectively. Goodwill recognized from the acquisition was primarily attributed to an assembled workforce and expected synergies and is not tax deductible. We incurred transaction costs of $1.5 million in connection with the acquisition during 2017. The fair value adjustment to inventory as part of our purchase price allocation resulted in a $4.5 million and $1.6 million charge to cost of sales during 2018 and 2017, respectively.

Our consolidated statement of operations for 2017 includes approximately 3 weeks of Talon operating activity, which was not material to our 2017 results of operations.

Cal-Weld, Inc.

On July 27, 2017, we completed the acquisition, via stock purchase, of Cal-Weld, Inc. ("Cal-Weld"), a California-based leader in the design and fabrication of precision, high purity industrial components, subsystems, and systems, for $56.2 million. Cal-Weld expanded our capacity and capabilities in the area of component manufacturing for gas delivery tools used in semiconductor manufacturing.

The following table presents the preliminary purchase price allocation as of July 27, 2017 and the final allocation on June 29, 2018. Measurement period adjustments recognized in 2017 and 2018 primarily relate to the fair value of Cal-Weld's opening balance of inventory, income taxes payable, and other working capital amounts.

	Preliminary Allocation July 27, 2017	2017 Measurement Period Adjustment	2018 Measurement Period Adjustment	Final Allocation June 29, 2018
Cash acquired	$ 7,337	$ —	$ —	$ 7,337
Accounts receivable	10,318	—	—	10,318
Inventories	20,836	—	(388)	20,448
Prepaid expenses and other current assets	287	113	—	400
Property and equipment	1,639	—	—	1,639
Other noncurrent assets	587	—	—	587
Intangible assets	12,140	—	—	12,140
Goodwill	17,957	(223)	(143)	17,591
Accounts payable	(5,991)		—	(5,991)
Accrued liabilities	(2,016)	79	(173)	(2,110)
Other non-current liabilities	(908)	—	—	(908)
Deferred tax liabilities	(5,307)	31	11	(5,265)
Total acquisition consideration	$ 56,879	$ —	$ (693)	$ 56,186

We allocated $11.5 million to customer relationships and $0.7 million to order backlog with weighted average amortization periods of 6 years and 6 months, respectively. Goodwill recognized from the acquisition was primarily attributed to an assembled workforce and expected synergies and is not tax deductible. We incurred transaction costs of $1.9 million in connection with the acquisition during 2017. The fair value adjustment to inventory as part of our purchase price allocation resulted in a $3.6 million charge to cost of sales during 2017.

Our consolidated statement of operations for 2017 includes approximately 5 months of Cal-Weld operating activity, including revenue of $53.0 million and net income from continuing operations of $6.7 million.

Note 3 – Inventories

Inventories consist of the following:

	December 27, 2019	December 28, 2018
Raw materials	$ 85,329	$ 90,713
Work in process	31,825	20,852
Finished goods	17,700	17,233
Excess and obsolete adjustment	(7,817)	(7,692)
Total inventories, net	$ 127,037	$ 121,106

The following table presents changes to our excess and obsolete adjustment:

	Excess and obsolete adjustment
Balance at December 30, 2016	$ (8,080)
Charge to cost of sales	(909)
Disposition of inventory	2,967
Balance at December 29, 2017	(6,022)
Charge to cost of sales	(1,871)
Disposition of inventory	201
Balance at December 28, 2018	(7,692)
Charge to cost of sales	(1,086)
Disposition of inventory	961
Balance at December 27, 2019	$ (7,817)

Note 4 – Property and Equipment

Property and equipment consist of the following:

	December 27, 2019	December 28, 2018
Machinery	$ 33,684	$ 29,885
Leasehold improvements	27,835	15,333
Computer software, hardware, and equipment	5,796	4,884
Office furniture, fixtures and equipment	1,040	1,058
Vehicles	26	26
Construction-in-process	3,760	9,514
	72,141	60,700
Less accumulated depreciation	(27,600)	(18,960)
Total property and equipment, net	$ 44,541	$ 41,740

Depreciation expense for 2019, 2018, and 2017 was $8.9 million, $7.7 million, and $3.6 million, respectively.

Note 5 – Intangible Assets and Goodwill

Definite-lived intangible assets consist of the following:

	December 27, 2019				
	Gross value	Accumulated amortization	Accumulated impairment charges	Carrying amount	Weighted average useful life
Trademarks	$ 9,690	$ (7,750)	$ —	$ 1,940	10.0 years
Customer relationships	82,986	(42,621)	—	40,365	7.8 years
Developed technology	11,047	(1,325)	—	9,722	10.0 years
Total intangible assets	$ 103,723	$ (51,696)	$ —	$ 52,027	

	December 28, 2018				
	Gross value	Accumulated amortization	Accumulated impairment charges	Carrying amount	Weighted average useful life
Trademarks	$ 9,690	$ (6,781)	$ —	$ 2,909	10.0 years
Customer relationships	82,986	(31,308)	—	51,678	7.8 years
Developed technology	2,900	(592)	—	2,308	10.0 years
Total intangible assets	$ 95,576	$ (38,681)	$ —	$ 56,895	

During the second quarter of 2019, we acquired a developed technology asset for $8.1 million, which has a useful life of 10 years.

Future projected annual amortization expense consists of the following:

	Future amortization expense
2020	$ 13,394
2021	13,394
2022	9,578
2023	8,360
2024	1,917
Thereafter	5,384
	$ 52,027

The following tables present the changes to goodwill:

	Goodwill
Balance at December 30, 2016	$ 77,093
Acquisitions	92,306
Balance at December 29, 2017	169,399
Acquisitions	3,611
Balance at December 28, 2018	173,010
Acquisitions	—
Balance at December 27, 2019	$ 173,010

Note 6 – Leases

We lease facilities under various non-cancellable operating leases expiring through 2024. In addition to base rental payments, we are generally responsible for our proportionate share of operating expenses, including facility maintenance, insurance, and property taxes. As these amounts are variable, they are not included in lease liabilities. As of December 27, 2019, we had no operating leases executed for which the rental period had not yet commenced.

The components of lease expense are as follows:

	Year Ended December 27, 2019
Operating lease cost	$ 5,420

Supplemental information related to leases is as follows:

	Year Ended December 27, 2019
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	$ 5,220
Weighted-average remaining lease term of operating leases	3.1 years
Weighted-average discount rate of operating leases	4.5%

Future minimum lease payments under non-cancellable leases as of December 27, 2019 are as follows

2020	$ 5,492
2021	4,892
2022	4,108
2023	1,109
2024	122
Total future minimum lease payments	15,723
Less imputed interest	(1,150)
Total lease liabilities	$ 14,573

Future minimum lease payments under non-cancellable leases as of December 28, 2018, as reported under previous guidance, are as follows:

2019	$ 4,910
2020	4,873
2021	4,356
2022	3,820
2023	1,103
Thereafter	120
Total future minimum lease payments	$ 19,182

Note 7 – Income Taxes

In December 2017, the Tax Cuts and Jobs Act (the "2017 Tax Act") was enacted. The 2017 Tax Act included a number of changes to existing U.S. tax laws that impact us, most notably a reduction of the U.S. corporate income tax rate from 35% to 21% for tax years beginning after December 31, 2017. The 2017 Tax Act also provided for a one-time transition tax on certain foreign earnings, the acceleration of depreciation for certain assets placed into service after September 27, 2017, and prospective changes beginning in 2018, including the repeal of the domestic manufacturing deduction, acceleration of tax revenue recognition, capitalization of research and development expenditures, additional limitations on executive compensation, and limitations on the deductibility of interest.

We recognized the income tax effects of the 2017 Tax Act in our 2017 financial statements in accordance with Staff Accounting Bulletin ("SAB") No. 118, which provides SEC staff guidance for the application of ASC Topic 740, *Income Taxes*, in the reporting period in which the 2017 Tax Act was signed into law. As of December 27, 2019, our accounting for the impact of the 2017 Tax Act was substantially complete and is included in our provision for income taxes.

The changes to existing U.S. tax laws as a result of the 2017 Tax Act, which we believe have the most significant impact on the federal income taxes, are as follows:

Reduction of the U.S. Corporate Income Tax Rate

We measure deferred tax assets and liabilities using enacted tax rates that will apply in the years in which the temporary differences are expected to be recovered or paid. Accordingly, our deferred tax assets and liabilities were re-measured in 2017 to reflect the reduction in the U.S. corporate income tax rate from 35% to 21%, resulting in a $5.9 million increase in income tax benefit for 2017 and a corresponding $5.9 million decrease in net deferred tax liabilities at December 29, 2017.

Transition Tax on Foreign Earnings

In 2017, we recognized a provisional income tax expense of $0.7 million related to the one-time transition tax on certain foreign earnings. This resulted in a corresponding decrease in deferred tax assets due to the utilization of net operating loss carryforwards. This amount was adjusted in 2018 to $0.6 million, resulting in a tax benefit of $0.1 million recorded in 2018.

Global Intangible Low-Taxed Income ("GILTI")

Beginning in 2018, a portion of foreign subsidiaries' earnings, net of a return on investment in tangible assets, are subject to tax in the United States. During 2019, we recognized income tax expense of zero, net of foreign tax credits, related to GILTI.

Foreign Derived Intangible Income ("FDII") Deduction

Beginning in 2018, a deduction is allowed in the United States for a portion of foreign-derived income, net of a return on investment in tangible assets. During 2019, we recognized income tax benefit of zero related to the FDII deduction.

Foreign Tax Credits

Beginning in 2018, rules surrounding the utilization and carryforward of foreign tax credits in the United States were changed as a result of the 2017 Tax Act. Due to these changes, we released a valuation allowance on our accrued foreign tax credits which were previously limited under the tax code in effect before the 2017 Tax Act was enacted, resulting in a $4.1 million discrete benefit. During the fourth quarter of 2019, the IRS issued proposed regulations that may limit our utilization of foreign tax credit carryforwards. Therefore, if the proposed regulations are finalized without changes, we believe a valuation allowance may be necessary to reduce approximately $1.7 million of our deferred tax assets related to foreign tax credit carryforwards.

Income from continuing operations before tax was as follows:

	Year Ended		
	December 27, 2019	**December 28, 2018**	**December 29, 2017**
United States	$ (20,993)	$ 7,519	$ 370
Foreign	25,268	46,700	42,659
Income from continuing operations before tax	$ 4,275	$ 54,219	$ 43,029

Significant components of income tax benefit from continuing operations consist of the following:

	Year Ended December 27, 2019	Year Ended December 28, 2018	Year Ended December 29, 2017
Current:			
Federal	$ (812)	$ 861	$ 809
State	649	316	249
Foreign	868	1,751	397
Total current tax expense	705	2,928	1,455
Deferred:			
Federal	(5,315)	(5,379)	(13,251)
State	(1,218)	(667)	(1,553)
Foreign	(626)	(546)	(537)
Total deferred tax benefit	(7,159)	(6,592)	(15,341)
Income tax benefit from continuing operations	$ (6,454)	$ (3,664)	$ (13,886)

The reconciliation of income tax computed at the U.S. federal statutory tax rates to income tax benefit from continuing operations consist of the following:

	Year Ended December 27, 2019	Year Ended December 28, 2018	Year Ended December 29, 2017
Effective rate reconciliation:			
U.S. federal tax expense	$ 898	$ 11,386	$ 15,060
State income taxes, net	(523)	(329)	(373)
Permanent items	(75)	30	2,141
Foreign rate differential	(1,051)	(1,679)	(7,498)
Tax holiday	(4,582)	(7,583)	(7,437)
Credits	(918)	(1,158)	(1,818)
Tax contingencies	(830)	168	335
Share-based compensation	(285)	(1,270)	(5,438)
Withholding tax	554	727	840
Impact of re-characterizing intercompany debt to equity	—	—	1,409
Impact of Tax Cuts and Jobs Act	—	199	(6,188)
Other, net	201	(15)	(248)
Valuation allowance	157	(4,140)	(4,671)
Income tax benefit from continuing operations	$ (6,454)	$ (3,664)	$ (13,886)

Deferred income tax assets and liabilities from continuing operations consist of the following as of:

	December 27, 2019	December 28, 2018
Deferred tax assets:		
Inventory	$ 3,620	$ 3,500
Share-based compensation	2,176	1,295
Accrued payroll	906	896
Net operating loss carryforwards	938	534
Interest carryforwards	1,382	
Transaction costs	144	99
Tax credits	7,318	7,258
Other assets	1,770	1,747
Deferred tax assets	18,254	15,329
Valuation allowance	(270)	(112)
Total deferred tax assets	17,984	15,217
Deferred tax liabilities:		
Intangible assets	(10,627)	(13,789)
Property, plant and equipment	(2,703)	(3,687)
Other liabilities	(126)	(344)
Total deferred tax liabilities	(13,456)	(17,820)
Net deferred tax asset	$ 4,528	$ (2,603)

At December 27, 2019, we had federal, state, and foreign net operating loss carryforwards of $0.5 million, $9.8 million, and $0.6 million respectively. The federal, state, and foreign net operating loss carryforwards, if not utilized, will begin to expire in 2035, 2032, and 2029, respectively. At December 27, 2019, we had federal and state research and development credits of $1.8 million and $0.1 million, respectively. The federal research and development credits, if not utilized, will begin to expire in 2032, while the state research and development credits will carryforward indefinitely. Additionally, we had foreign tax credits of $2.3 million, which if not utilized, will begin to expire in 2022.

We have determined the amount of our valuation allowance based on our estimates of taxable income by jurisdiction in which we operate over the periods in which the related deferred tax assets will be recoverable. During 2017, we completed the acquisitions of Cal-Weld and Talon, resulting in a release of valuation allowance against our net deferred tax assets. During the second quarter of 2018, as part of our evaluation of the 2017 Tax Act, we determined we would be able to utilize our foreign tax credit carryforwards, including our currently generated credits and accrued credits related to intercompany payables. As such, we recognized an addition $4.1 million benefit from releasing the associated valuation allowance. As of December 27, 2019, we believe it is more-likely-than-not that we will realize our U.S. deferred tax assets, with the exception of certain state and foreign net operating loss carryforwards we believe are not likely to be realized within the carryforward period.

We were granted a tax holiday for our Singapore operations effective 2011 through 2021. The net impact of the tax holiday in Singapore as compared to the Singapore statutory rate was a benefit of $4.6 million, $7.6 million, and $7.4 million during 2019, 2018, and 2017, respectively. Our income tax fluctuates based on the geographic mix of earnings and is calculated quarterly based on actual results pursuant to ASC Topic 740-270.

As of December 27, 2019, we have recognized $1.9 million of unrecognized tax benefits in long-term liabilities on the accompanying consolidated balance sheet. If recognized, $1.0 million of this amount would impact our effective tax rate. We expect a decrease of $0.3 million to the total amount of unrecognized tax benefits within the next twelve months.

Our ongoing practice is to recognize potential accrued interest and penalties related to unrecognized tax benefits within our global operations in income tax benefit. During 2019, we recognized a net decrease of approximately $0.2 million in potential interest and penalties associated with uncertain tax positions in the consolidated statements of operations. At December 27, 2019, we had approximately zero and $0.4 million of interest and penalties, respectively, associated with uncertain tax positions, which are excluded from the unrecognized tax benefits table below. We recognize interest and penalties relating to unrecognized tax benefits as part of its income tax expense.

The following table summarizes the activity related to our unrecognized tax benefits:

	Unrecognized tax benefits
Balance at December 30, 2016	$ 576
Increase in tax positions for current year	458
Increase in tax positions for prior period	214
Increase in tax positions due to acquisitions	710
Impact of Tax Cuts and Jobs Act	(48)
Balance at December 29, 2017	1,910
Increase in tax positions for current year	407
Decreases in tax positions for prior period	(61)
Balance at December 28, 2018	2,256
Increase in tax positions for current year	380
Increase in tax positions for prior period	8
Decrease in tax positions for prior period	(784)
Balance at December 27, 2019	$ 1,860

Our three major filing jurisdictions are the United States, Singapore and Malaysia. We are no longer subject to U.S. Federal examination for tax years ending before 2016, to state examinations before 2015, or to foreign examinations before 2014. However, to the extent allowed by law, the tax authorities may have the right to examine prior periods where net operating losses or tax credits were generated and carried forward, and make adjustments up to the amount of the net operating losses or credit carryforward.

Note 8 – Employee Benefit Programs

401(k) Plan

We sponsor a 401(k) plan available to employees of our U.S.-based subsidiaries. Participants may make salary deferral contributions not to exceed 50% of a participant's annual compensation or the maximum amount otherwise allowed by law. Eligible employees receive a discretionary matching contribution equal to 50% of a participant's deferral, up to an annual maximum of 4% of a participant's annual compensation. For 2019, 2018, and 2017, matching contributions were $1.5 million, $1.5 million, and $0.7 million, respectively.

Note 9 – Long-Term Debt

Long-term debt consists of the following:

	December 27, 2019	December 28, 2018
Term loan	$ 161,875	$ 170,625
Revolving credit facility	19,162	34,162
Total principal amount of long-term debt	181,037	204,787
Less unamortized debt issuance costs	(2,983)	(3,920)
Total long-term debt, net	178,054	200,867
Less current portion	(8,750)	(8,750)
Total long-term debt, less current portion, net	$ 169,304	$ 192,117

Maturities of long-term debt consist of the following:

	Future maturities of long-term debt
2020	$ 8,750
2021	8,750
2022	8,750
2023	154,787
Total	$ 181,037

The weighted average interest rate across all credit facilities was 4.78%, 4.36%, and 4.30% during 2019, 2018, and 2017, respectively.

On August 11, 2015, we entered into a new credit agreement with a syndicate of lenders and repaid all outstanding indebtedness under our previous credit agreement. The credit agreement included a $55.0 million term loan facility and $20.0 million revolving credit facility. We recorded $2.6 million in debt issuance costs associated with the new credit agreement.

In April 2016, we acquired Ajax-United Patterns & Molds, Inc. (“Ajax”). To fund the acquisition, we amended our credit agreement, increasing the term loan facility by $15.0 million. The amendment did not meet the definition of an extinguishment and was accounted for as a modification.

In July 2017, we acquired Cal-Weld. To fund the acquisition, we amended our credit agreement, increasing the term loan facility by $20.0 million, increasing the revolving credit facility capacity by $20.0 million, and reducing our interest rate. The amendment did not meet the definition of an extinguishment and was accounted for as a modification.

In December 2017, we acquired Talon. To fund the acquisition, we amended our credit agreement, increasing the term loan facility by $120.0 million. The amendment did not meet the definition of an extinguishment and was accounted for as a modification.

On February 15, 2018, we amended and restated our credit agreement, which replaced our existing credit facilities with a $175.0 million term loan and a $125.0 million revolving credit facility. The amendment reduced our borrowing rate, depending on our leverage ratio, and extended the maturity date. We incurred debt issuance costs of $2.1 million in connection with the amendment. The amendment did not meet the definition of an extinguishment and was accounted for as a modification.

Our credit agreement is secured by our tangible and intangible assets and includes customary representations, warranties, and covenants. We are required to maintain a minimum fixed charge coverage ratio of 1.25 : 1 and a maximum leverage ratio 3.00 : 1.

Interest is charged at either the Base Rate or the Eurodollar rate (as such terms are defined in the credit agreement) at our option, plus an applicable margin. The Base Rate is equal to the higher of i) the Prime Rate, ii) the Federal Funds Rate plus 0.5%, or iii) the Eurodollar Rate plus 1.00%. The Eurodollar rate is equal to LIBOR. The applicable margin on Base Rate and Eurodollar Rate loans is 0.75-1.50% and 1.75-2.50% per annum, respectively, depending on our leverage ratio. We are also charged a commitment fee of 0.20%-0.35% on the unused portion of our revolving credit facility. Base Rate interest payments and commitment fees are due quarterly. Eurodollar interest payments are due on the last day of the applicable interest period. At December 27, 2019, the term loan and revolver bore interest at the Eurodollar rate option of 4.60% and 4.46%, respectively.

Term loan payments of $2.2 million are due on a quarterly basis. The term loan and revolving credit facility mature on February 15, 2023.

Note 10 – Shareholders' Equity

Share Repurchase Program

In February 2018, our Board of Directors authorized a share repurchase program up to $50.0 million under which we may repurchase our ordinary shares in the open market or through privately negotiated transactions, depending on market conditions and other factors. Ordinary shares repurchased are recorded as treasury shares using the cost method on a first-in, first-out basis. In August 2018, our Board of Directors authorized a $50 million increase to the share repurchase program.

The following tables details our share repurchases for the periods indicated :

	Total Number of Shares Repurchased	Total Cost of Repurchase	Average Price Paid per Share	Amount Available Under Repurchase Program
Amount available at February 15, 2018				$ 50,000
Quarter ended March 30, 2018	195,750	$ 5,000	$ 25.54	$ 45,000
Quarter ended June 29, 2018	1,061,855	24,970	$ 23.52	$ 20,030
Board authorization, $50 million increase, August 18, 2018				$ 70,030
Quarter ended September 28, 2018	1,424,359	30,348	$ 21.31	$ 39,683
Quarter ended December 28, 2018	1,657,565	29,662	$ 17.89	$ 10,021
Year Ended December 28, 2018	4,339,529	89,980	$ 20.73	$ 10,021
Quarter ended March 29, 2019	97,910	1,599	$ 16.33	$ 8,421
Quarter ended June 28, 2019	—	—	$ —	$ 8,421
Quarter ended September 27, 2019	—	—	$ —	$ 8,421
Quarter ended December 27, 2019	—	—	$ —	$ 8,421
Year ended December 27, 2019	97,910	$ 1,599	$ 16.33	$ 8,421

Note 11 – Share-Based Compensation

2016 Plan

In December 2016, we adopted the 2016 Omnibus Incentive Plan ("the 2016 Plan"). The 2016 Plan provides for grants of share-based awards to employees, directors, and consultants. Under the 2016 Plan, 1,888,000 ordinary shares were reserved for issuance. The number of shares reserved for issuance under the 2016 Plan increases annually beginning in fiscal year 2018 by the lesser of (i) 2% of the ordinary shares outstanding on the last day of the immediately preceding fiscal year or (ii) such amount determined by our Board of Directors. Awards may be in the form of stock options ("options"), tandem and non-tandem stock appreciation rights, restricted share awards or restricted share units ("RSUs"), performance awards, and other share-based awards. Forfeited or expired awards are returned to the incentive plan pool for future grants.

Options granted under the 2016 Plan generally have a term of 7 years. Vesting of options and RSUs generally occurs 25% on the first anniversary of the date of grant and quarterly thereafter over the remaining 3 years. Upon vesting of RSUs, employees may elect to have shares withheld to cover statutory minimum withholding taxes. Shares withheld are not reflected as an issuance of ordinary shares within our consolidated statements of shareholders' equity, as the shares were never issued, and the associated tax payments are reflected as financing activities within our consolidated statements of cash flows.

2012 Plan

In March 2012, we adopted the Ichor Holdings Ltd. 2012 Equity Incentive Plan (the "2012 Plan"). Under the 2012 Plan, we could grant either restricted shares, RSUs, or options to employees, directors, and consultants. Options granted under the 2012 Plan generally had a term of 7 years. Vesting of options and RSUs generally occurred 25% on the first anniversary of the date of grant and quarterly thereafter over the remaining 3 years. There have been no issuances of equity-based awards under the 2012 Plan since the adoption of the 2016 Plan.

Share-based compensation expense across all plans for options, RSUs, and employee share purchase rights was $8.5 million, $7.6 million, and $2.2 million during 2019, 2018, and 2017, respectively.

On November 12, 2019, in connection with the transition of our former Chief Executive Officer to Executive Chairman, the Compensation Committee of the Board of Directors modified all outstanding equity awards such that the next 18 months of vesting events would be pulled forward and become immediately vested on January 6, 2020. Consequently, 98,825 options and 60,721 RSUs will vest on January 6, 2020. This was accounted for as a probable-to-probable modification under ASC Topic 718, resulting in approximately $1.4 million in share-based compensation expense pulled forward into 2019.

On January 18, 2018, in connection with the resignation of our former Chief Financial Officer, certain separation benefits became effective, which included a vesting acceleration of all outstanding and unvested stock options and restricted shares. Consequently, 88,445 options and 39,175 RSUs vested on January 18, 2018. This was accounted for as an improbable-to-probable modification under ASC Topic 718, resulting in $2.9 million in share-based compensation expense recognized in 2018.

Stock Options

The table below sets forth the weighted average assumptions used to measure the fair value of options granted:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
Weighted average expected term	5 years	5 years	5 years
Risk-free interest rate	2.1%	2.6%	1.9%
Dividend yield	0.0%	0.0%	0.0%
Volatility	55.3%	52.6%	47.7%

The following table summarizes option activity:

	Number of Stock Options				
	Time vesting	Performance vesting	Weighted average exercise price per share	Weighted average remaining contractual term	Aggregate intrinsic value (in thousands)
Outstanding, December 28, 2018	1,706,441	65,908	$ 18.57		
Granted	532,705	—	$ 23.00		
Exercised	(353,027)	—	$ 14.28		
Forfeited or expired	(197,181)	—	$ 20.43		
Outstanding, December 27, 2019	1,688,938	65,908	$ 20.57	4.7 years	$ 23,302
Exercisable, December 27, 2019	653,422	65,908	$ 17.16	3.3 years	$ 12,004

Fair value information for options granted and the intrinsic value of options exercised are as follows:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
Weighted average grant-date fair value of options granted	$ 11.33	$ 11.81	$ 8.52
Total intrinsic value of options exercised	$ 3,619	$ 8,744	$ 16,423

At December 27, 2019, total unrecognized share-based compensation expense relating to options was $9.7 million, with a weighted average remaining service period of 2.7 years.

Restricted Share Units

The following table summarizes RSU activity:

	Number of Restricted Share Units		
	Time vesting	Performance vesting	Weighted average grant date fair value per share
Unvested, December 28, 2018	192,300	—	$ 22.64
Granted	297,637	17,730	$ 23.25
Vested	(93,892)	—	$ 22.76
Forfeited	(6,875)	—	$ 25.41
Unvested, December 27, 2019	389,170	17,730	$ 23.03

Fair value information for RSUs granted and vested is as follows:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
Weighted average grant-date fair value of shares granted	$ 23.25	$ 23.89	$ 19.63
Total fair value of shares vested	$ 2,217	$ 2,041	$ 634

At December 27, 2019, total unrecognized share-based compensation expense relating to RSUs was $7.3 million, with a weighted average remaining service period of 2.8 years.

2017 ESPP

In May 2017, we adopted the 2017 Employee Stock Purchase Plan (the “2017 ESPP”). The 2017 ESPP grants employees the ability to designate a portion of their base-pay to purchase ordinary shares at a price equal to 85% of the fair market value of our ordinary shares on the first or last day of each 6 month purchase period. Purchase periods begin on January 1 or July 1 and end on June 30 or December 31, or the next business day if such date is not a business day. Shares are purchased on the last day of the purchase period.

The table below sets forth the weighted average assumptions used to measure the fair value of 2017 ESPP rights:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
Weighted average expected term	0.5 years	0.5 years	0.4 years
Risk-free interest rate	2.3%	1.9%	1.1%
Dividend yield	0.0%	0.0%	0.0%
Volatility	56.0%	52.7%	47.8%

We recognize share-based compensation expense associated with the 2017 ESPP over the duration of the purchase period. We recognized$0.3 million, $0.3 million, and $0.1 million of share-based compensation expense associated with the 2017 ESPP during 2019, 2018, and 2017, respectively. At December 27, 2019, there was no unrecognized share-based compensation expense.

Note 12 – Segment Information

Our Chief Operating Decision Maker, the Chief Executive Officer, reviews our results of operations on a consolidated level and executive staff is structured by function rather than by product category. Therefore, we operate in one operating segment. Key resources, decisions, and assessment of performance are also analyzed on a company-wide level.

Foreign operations are conducted primarily through our wholly owned subsidiaries in Singapore and Malaysia. Our principal markets include North America, Asia and, to a lesser degree, Europe. Sales by geographic area represent sales to unaffiliated customers.

All information on sales by geographic area is based upon the location to which the products were shipped. The following table sets forth sales by geographic area:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
United States of America	$ 329,037	$ 502,750	$ 386,645
Singapore	198,657	224,230	223,277
Europe	56,090	60,688	27,555
Other	37,053	35,943	18,415
Total net sales	$ 620,837	$ 823,611	$ 655,892

The following table sets forth our two major customers, which comprised 85%, 88%, and 93% of net sales from continuing operations in 2018, 2017, and 2016, respectively:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
Lam Research	$ 319,144	$ 458,705	$ 350,372
Applied Materials	$ 207,391	$ 262,146	$ 259,234

Foreign long-lived assets, exclusive of deferred tax assets, were $30.3 million and $25.0 million at December 27, 2019 and December 28, 2018, respectively.

Note 13 – Earnings per Share

The following table sets forth the computation of our basic and diluted net income (loss) per share and a reconciliation of the numerator and denominator used in the calculation:

	Year Ended		
	December 27, 2019	December 28, 2018	December 29, 2017
Numerator:			
Net income from continuing operations	$ 10,729	$ 57,883	$ 56,915
Net loss from discontinued operations	$ —	$ —	$ (461)
Net income	$ 10,729	$ 57,883	$ 56,454
Denominator:			
Basic weighted average ordinary shares outstanding	22,418,802	24,706,542	25,118,031
Dilutive effect of Options	259,337	398,590	1,030,793
Dilutive effect of RSUs	85,603	20,530	68,184
Dilutive effect of ESPP	3,161	2,393	1,416
Diluted weighted average ordinary shares outstanding	22,766,903	25,128,055	26,218,424
Weighted average number of shares used in basic and diluted per share calculation for net loss from discontinued operations	22,418,802	24,706,542	25,118,031
Earnings per share:			
Net income from continuing operations:			
Basic	$ 0.48	$ 2.34	$ 2.27
Diluted	$ 0.47	$ 2.30	$ 2.17
Net loss from discontinued operations:			
Basic	$ —	$ —	$ (0.02)
Diluted	$ —	$ —	$ (0.02)
Net income:			
Basic	$ 0.48	$ 2.34	$ 2.25
Diluted	$ 0.47	$ 2.30	$ 2.15

An combined total of 1,587,555, 1,319,511, and 389,058 potentially dilutive options and RSUs were excluded from the calculation of net income per share for 2019, 2018, and 2017, respectively, because including them would have been antidilutive under the treasury stock method.

Note 14 – Discontinued Operations

In January 2016, we made the decision to shut down our Kingston, New York facility, as this location consumed a significant amount of resources while contributing very little income. We completed the shutdown of the operations of the New York facility in May 2016 through abandonment, as a buyer for the facility and operation was not found. We recorded lease abandonment and inventory charges of approximately $0.6 million and $2.0 million, respectively, in 2016. In 2017, we accrued for remaining costs of $0.3 million to occupy the facility through its lease expiration in February 2018. The discontinued operation was deemed to be fully disposed of at December 29, 2017. Accordingly, there was no activity associated with the discontinued operation during 2018 and 2019.

The results of the discontinued operation were as follows:

	Year Ended December 29, 2017
Selling, general, and administrative	$ 722
Operating loss	(722)
Loss from discontinued operations before income taxes	(722)
Income tax benefit	(261)
Loss from discontinued operations	$ (461)

EXHIBIT INDEX

The following exhibits are filed with this Form 10-K or are incorporated herein by reference:

Exhibit Number	Description of Exhibit
3.1	Amended and Restated Memorandum and Articles of Association of Ichor Holdings, Ltd., effective as of December 9, 2016 (Incorporated by reference to Exhibit 3.1 to Ichor Holdings, Ltd.'s Current Report on Form 8-K filed with the Securities and Exchange Commission on December 14, 2016).
10.1	Amended and Restated Credit Agreement, dated as of February 14, 2018, by and among Ichor Holdings, LLC, Ichor Systems, Inc., Precision Flow Technologies, Inc., Ajax United Patterns & Molds, Inc., Cal Weld, Inc., Talon Innovations Corporation, and Talon Innovations (FL) Corporation as borrowers, Bank of America, N.A., as administrative agent, and the financial institutions party thereto, as lenders (Incorporated by reference to Exhibit 10.1 to Ichor Holdings, Ltd.'s Current Report on Form 8 K filed with the Securities and Exchange Commission on February 15, 2018).
10.2+	Employment Agreement, dated as of September 19, 2014, by and among Ichor Systems, Inc., Thomas Rohrs and, with respect to Sections 1.2 and 3.4 therein only, Ichor Holdings, Ltd (Incorporated by reference to Exhibit 10.7 to Ichor Holdings, Ltd's Registration Statement on Form S-1, filed with the Securities and Exchange Commission on November 14, 2016).
10.3+	Ichor Holdings, Ltd. 2016 Omnibus Incentive Plan (Incorporated by reference to Exhibit 10.11 to Ichor Holdings, Ltd's Amendment No. 2 to Registration Statement on Form S-1, filed with the Securities and Exchange Commission on November 29, 2016).
10.4+	Form of Incentive Stock Option Agreement (Incorporated by reference to Exhibit 10.12 to Ichor Holdings, Ltd's Amendment No. 2 to Registration Statement on Form S-1, filed with the Securities and Exchange Commission on November 29, 2016).
10.5+	Form of Restricted Stock Agreement (Incorporated by reference to Exhibit 10.13 to Ichor Holdings, Ltd's Amendment No. 2 to Registration Statement on Form S-1, filed with the Securities and Exchange Commission on November 29, 2016).
10.6+	Form of Nonqualifed Stock Option Agreement (Incorporated by reference to Exhibit 10.14 to Ichor Holdings, Ltd's Amendment No. 2 Registration Statement on Form S-1, filed with the Securities and Exchange Commission on November 29, 2016).
10.7+	Offer Letter, dated as of January 8, 2013, by and between Ichor Systems, Inc. and Philip Barros (Incorporated by reference to Exhibit 10.16 to Ichor Holdings, Ltd's Registration Statement on Form S-1, filed with the Securities and Exchange Commission on November 14, 2016).
10.8+	Offer Letter, dated as of September 30, 2015, by and between Ichor Systems, Inc. and Philip Barros (Incorporated by reference to Exhibit 10.17 to Ichor Holdings, Ltd's Registration Statement on Form S-1, filed with the Securities and Exchange Commission on November 14, 2016).
10.9+	Select Severance Plan, dated as of March 6, 2019, by and among Ichor Holdings, Ltd. and certain officers and directors party thereto (Incorporated by reference to Exhibit 10.9 to Ichor Holdings, Ltd.'s Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 8, 2019).
10.10+	Offer Letter, dated April 8, 2019, between Ichor Systems, Inc. and Jeffrey Andreson (Incorporated by reference to Exhibit 10.1 to Ichor Holdings, Ltd.'s Current Report on Form 8-K filed with the Securities and Exchange Commission on April 10, 2019).
10.11+	Offer Letter, dated August 23, 2019, between Ichor Systems, Inc. and Larry Sparks (Incorporated by reference to Exhibit 10.1 to Ichor Holdings, Ltd.'s Current Report on Form 8-K filed with the Securities and Exchange Commission on September 9, 2019).
10.12*+	Letter Agreement, dated November 20, 2019, between Ichor Systems, Inc. and Thomas Rohrs.
10.13*+	Offer Letter, dated November 20, 2019, between Ichor Systems, Inc. and Jeffrey Andreson.
21.1*	List of subsidiaries
23.1*	Consent of KPMG LLP
31.1*	Certifications of Chief Executive Officer of the Company under Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2*	Certifications of Chief Financial Officer of the Company under Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1*	Certifications of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002. This certification accompanies this report and shall not, except to the extent required by the Sarbanes-Oxley Act of 2002, be deemed filed for purposes of §18 of the Securities Exchange Act of 1934, as amended.
32.2*	Certifications of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002. This certification accompanies this report and shall not, except to the extent required by the Sarbanes-Oxley Act of 2002, be deemed filed for purposes of §18 of the Securities Exchange Act of 1934, as amended.
101.INS*	XBRL Instance Document
101.SCH*	XBRL Taxonomy Extension Schema Document
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document

* Filed herewith

\+ A management contract or compensatory arrangement required to be filed as an exhibit pursuant to Item 601 of Regulation S-K

SIGNATURES

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

Dated: March 6, 2020

ICHOR HOLDINGS, LTD.

By: /s/ Jeffrey S. Andreson
Jeffrey S. Andreson
Chief Executive Officer

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

Signature	Name and Title	Date
/s/ Jeffrey S. Andreson Jeffrey S. Andreson	Chief Executive Officer and Director (Principal Executive Officer)	March 6, 2020
/s/ Larry J. Sparks Larry J. Sparks	Chief Financial Officer (Principal Accounting and Financial Officer)	March 6, 2020
/s/ Thomas M. Rohrs Thomas M. Rohrs	Executive Chairman and Director	March 6, 2020
/s/ Wendy Arienzo Wendy Arienzo	Director	March 6, 2020
/s/ Laura Black Laura Black	Director	March 6, 2020
/s/ John Kispert John Kispert	Director	March 6, 2020
/s/ Marc Haugen Marc Haugen	Director	March 6, 2020
/s/ Andrew Kowal Andrew Kowal	Director	March 6, 2020
/s/ Iain MacKenzie Iain MacKenzie	Lead Independent Director	March 6, 2020

Exhibit 10.12

November 20, 2019

Mr. Tom Rohrs
[XXXXX]
[XXXXX]

Dear Tom:

On behalf of Ichor Holdings, Ltd. (the "Company"), we would like to formally confirm our offer to you to serve as chairman ("Executive Chairman") of the board of directors of the Company (the "Board"). This letter agreement (this "Agreement") supersedes and replaces that certain Employment Agreement by and between you, Ichor Systems, Inc. and the Company, dated as of September 19, 2014 (the "Prior Agreement"), which, other than as set forth herein, shall be terminated in connection with this Agreement; provided, that, you agree that nothing contained in this Agreement shall constitute grounds for your resignation with Good Reason (as defined in the Prior Agreement).

As a member of the Board, you will be involved in the oversight of the Company and its subsidiaries. We strongly believe that the Company will benefit from your involvement and are looking forward to working with you in the future. This letter will provide you with information relating to your service as Executive Chairman of the Board, the compensation associated with such service, conditions applicable to our offer, and the other terms of your Board membership.

Duties: It is our understanding that you are familiar, in a general way, with the duties and obligations associated with board membership at public companies, and we will not attempt to review those responsibilities in this letter. However, as a practical matter, the Executive Chairman is generally responsible for oversight of the Board on a day-to-day basis.

Conflicts of Interest: You shall immediately disclose to the Company any conflict of interest that arises in relation to your service as Executive Chairman as a result of any present or future appointment, employment or other engagement.

Start Date: You will commence service as Executive Chairman on January 6, 2020, or such other date as mutually agreed between you and the Company (the "Start Date").

Term: You agree to serve as Executive Chairman for an initial term of one year. The Company may extend your term as Executive Chairman on a year-by-year basis.

Cash Compensation for Board Service: You will be entitled to the following compensation in connection with your acceptance of the position as Executive Chairman, commencing as of the Start Date:

1. An annual cash retainer of $300,000, which will be paid every two weeks and prorated for any partial years of service (the "Cash Retainer"). The Cash Retainer may be changed from time to time, at the discretion of the Board.

2. An annual bonus opportunity equal to 100% of the Cash Retainer (the "Bonus"). The Bonus will be calculated based on mutually agreed upon performance objectives established between you and the Company, and will be payable when bonuses for similarly situated individuals are paid their bonuses.

3. Coincident with the Start Date or as soon as practicable thereafter, a one-time grant of incentive equity consisting of restricted stock units in the Company pursuant to the Company's 2016 Omnibus Incentive Plan with a grant value equal to $500,000, measured as of the date of Grant (the "RSU Grant"). The RSU Grant will be delivered to you for signature under separate cover.

4. A one-time cash bonus equal to $1,800,000 (the "Signing Bonus"). The Signing Bonus will be payable as soon as reasonably practicable following the Start Date, but no later than 30 days thereafter.

5. Effective as of the Start Date, eighteen months of accelerated vesting of your current unvested equity incentive awards pursuant to a Company resolution. For the avoidance of doubt, any of your unvested equity incentive awards following the acceleration described herein shall continue to be eligible to vest in accordance with the terms therein.

The Company may withhold (or cause there to be withheld, as the case may be) from any amounts otherwise due or payable under or pursuant to this letter agreement such federal, state and local income, employment, or other taxes or other amounts as may be required to be withheld pursuant to any applicable law or regulation.

Termination. Upon your separation from service with the Company for any reason, all compensation and benefits due to you shall be governed by the Company's Select Severance Plan, in which you will participate as an Eligible Employee and, for avoidance of doubt, not as the Chief Executive Officer.

D&O Insurance. As a director of the Company, you will be covered by the Directors & Officers Liability insurance policy of the Company. This policy protects directors and officers of the Company from liability in the event of a claim or lawsuit against them alleging wrongdoing in connection with the Company's business. This policy does not cover fines and penalties once a verdict of dishonesty or fraud by a court of law or other regulatory body has been made against the director.

Confidentiality. You hereby agree that, notwithstanding anything contained herein to the contrary, the restrictions, commitments and covenants set forth in Section 6 of the Prior Agreement shall survive the termination thereof and shall be incorporated into this Agreement by reference.

General: This Agreement supersedes any conversations we may have had about your service as Executive Chairman or compensation as a Board member, or any written materials previously provided to you relating to this subject. Further, this letter, if accepted by you, will represent our entire agreement relating to your service on the Board, subject only to written amendment. This Agreement resulting from its acceptance shall be governed by United States Law and any disputes arising or relating to the same shall be heard and determined only by a court sitting in Delaware.

* * * * *

Signature Page to Follow

We are delighted to be able to extend you this offer on behalf of the Board and the Company, and look forward to having the pleasure of working with you in the future. To indicate your acceptance of the Company's offer, please sign and date this letter in the space provided below and return it to Jeffrey Andreson.

Sincerely,	Accepted by,
/s/ Jeffrey Andreson	/s/ Tom Rohrs
Jeffrey Andreson	Tom Rohrs

Exhibit 10.13

November 20, 2019

Mr. Jeffrey Andreson
[XXXXX]
[XXXXX]

Dear Jeff,

Ichor Systems, Inc. (the "Company") and Ichor Holdings, Ltd. are pleased to offer you a promotion to Chief Executive Officer with the Company. Should you accept our offer, your home office will be in Fremont, CA reporting directly to the board of directors (the "Board") of the Company. The purpose of this letter offer (this "Letter") is to confirm with you the specifics of your offer, consistent with the terms below. For the avoidance of doubt, the terms of this Letter, if accepted, shall replace and supersede all prior offer letter arrangements between you and the Company, including that certain offer letter from the Company to you dated as of November 9, 2017 and that certain promotion letter from the Company to you dated as of April 8, 2019.

Start Date
Your start date of hire is January 6, 2020 or another date as mutually agreed upon.

Salary
Your base salary will be approximately $20,384.62 biweekly, which, when annualized, is equivalent to $530,000 per year.

Incentive Bonus
You are eligible to participate in the Company's performance incentive program. This program is subject to the terms and conditions of the plan and at the discretion of the Board. Your target bonus is 85% of your annual base salary. This bonus is based on companywide financial metrics and successful completion of established MBOs. This plan is subject to change at any time at the Company's discretion.

Equity Incentive
You will continue to be eligible to participate in the Company's 2016 Omnibus Incentive Plan, and will be granted new incentive equity grants under separate cover substantially concurrently with your start date.

Benefits
Your participation in the benefit programs, including health and welfare, life and disability, along with other offerings, will continue following your start date. You will also be eligible to continue to participate in the 401(k) Retirement Savings Plan.

Direct Deposit
As a condition of continued employment, you will be required to accept payment of salary or wages by direct deposit or Pay Card.

Work Classification
Your position will be full-time, and is considered exempt for purposes of federal wage-hour law, which means that you will not be eligible for overtime pay.

Severance
Upon your separation from service with the Company for any reason, all compensation and benefits due to you shall be governed by the Ichor Holdings, Ltd. Select Severance Plan.

General.
Per company policy, your employment with the Company is at will. This means that either you or the Company may terminate the employment relationship at any time, with or without cause or notice.

With respect to the nature of your employment relationship with the Company, this Letter constitutes the full, complete, and final agreement between you and the Company. Additionally, no element or elements of the compensation plan listed above can be assigned or transferred by you to any other person, company, or entity of any type.

This Letter shall be governed by the laws of the state of California.

This offer of employment, if not previously accepted by you, will expire three days from the date of this Letter.

If you wish to accept this offer, please sign, date, and return the enclosed copy of this Letter to the Human Resources Department. Please sign, date and retain a copy for your records.

* * * * *

Signature Page to Follow

Jeff, we are excited to have you continue with the Ichor team and trust that this Letter finds you mutually excited about your new role with us! Should you have any questions, please contact me at [XXXXX] or email if that is more convenient.

Sincerely,

Tom Rohrs
Chief Executive Officer at the Company

ACKNOWLEDGEMENT

I, the undersigned, understand and agree to the terms and conditions of employment set forth in this Letter. I understand and agree that the terms of this Letter supersede any and all prior or contemporaneous agreements and/or promises concerning the terms of my employment and that there are no other promises, expressed or implied, concerning the terms of my employment with the Company, other than those expressly set forth or reference herein.

/s/ Jeffrey Andreson	November 25, 2019
Jeffrey Andreson	Date
/s/ Tom Rohrs	November 25, 2019
Tom Rohrs Chief Executive Officer at the Company	Date

Exhibit 21.1

Name of Subsidiary	Jurisdiction of Incorporation, Organization, or Formation
Ichor Intermediate Holdings, Ltd.	Cayman Islands
Icicle Acquisition Holding Co-op	Netherlands
Icicle Acquisition Holding B.V.	Netherlands
Ichor Holdings Ltd.	Scotland
Ichor Systems Ltd.	Scotland
Ichor Holdings, LLC	Delaware
Ichor Systems, Inc.	Delaware
Ichor Systems Korea Ltd.	Korea
Ichor Systems Malaysia Sdn Bhd	Malaysia
Ichor Systems Singapore, PTE Ltd.	Singapore
Talon Innovations Korea	Korea
IAN Engineering Co., Ltd.	Korea

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Ichor Holdings, Ltd.:

We consent to the incorporation by reference in the registration statements (No. 333-215984 and No. 333-219846) on Form S-8 of Ichor Holdings, Ltd. and subsidiaries (the Company) of our report dated March 6, 2020, with respect to the consolidated balance sheets of Ichor Holdings, Ltd. and subsidiaries as of December 27, 2019 and December 28, 2018, and the related consolidated statements of operations, shareholders' equity, and cash flows for each of the years in the three-year period ended December 27, 2019, and the related notes, which report appears in the December 27, 2019 annual report on Form 10-K of the Company.

Our report on the consolidated financial statements refers to a change in the method of accounting for leases as of December 29, 2018 due to the adoption of Accounting Standards Update ("ASU") 2016-02, *Leases* and ASU 2018-11, *Leases: Targeted Improvements (Topic 842)* and its method of accounting for revenue as of December 30, 2017 due to the adoption of ASU 2014-09, *Revenue from Contracts with Customers (Topic 606)*.

/s/ KPMG LLP

Portland, Oregon

March 6, 2020

Exhibit 31.1

CEO CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Jeffrey S. Andreson, certify that:

1. I have reviewed this annual report on Form 10-K of Ichor Holdings, Ltd.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant’s other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 6, 2020

By: /s/ Jeffrey S. Andreson
Jeffrey S. Andreson
Chief Executive Officer

Exhibit 31.2

CFO CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Larry J. Sparks, certify that:

1. I have reviewed this annual report on Form 10-K of Ichor Holdings, Ltd.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant’s other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 6, 2020

By: /s/ Larry J. Sparks
Larry J. Sparks
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Ichor Holdings, Ltd. (the "Company") on Form 10-K for the period ending December 27, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, to my knowledge, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: March 6, 2020

By: /s/ Jeffrey S. Andreson
Jeffrey S. Andreson
Chief Executive Officer

Exhibit 32.2

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Ichor Holdings, Ltd. (the “Company”) on Form 10-K for the period ending December 27, 2019 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I certify, to my knowledge, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: March 6, 2020

By: /s/ Larry J. Sparks
Larry J. Sparks
Chief Financial Officer