NOVANTA INC
Form 10-K
February 27, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018

or

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to

Commission File No. 001-35083

Novanta Inc.

(Exact name of registrant as specified in its charter)

New Brunswick, Canada	98-0110412
(State or other jurisdiction	(I.R.S. Employer
of incorporation or organization)	Identification No.)
125 Middlesex Turnpike	01730
Bedford, Massachusetts, USA	(Zip Code)
(Address of principal executive offices)	

(781) 266-5700

(Registrant's telephone number, including area code)

Securities Registered Pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Exchange on Which Registered
Common Shares, no par value	The Nasdaq Global Select Market

Securities Registered Pursuant to Section 12(g) of the Act:

None

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (Section 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

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

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

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

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

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

The aggregate market value of the Registrant's outstanding common shares held by non-affiliates of the Registrant, based on the closing price of the common shares on the Nasdaq Global Select Market on the last business day of the Registrant's most recently completed second fiscal quarter (June 29, 2018) was $1,779,955,516. For purposes of this disclosure, common shares held by officers and directors of the Registrant and by persons who hold more than 10% of the Registrant's outstanding common shares have been excluded because such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily conclusive.

As of February 19, 2019, there were 34,900,599 shares of the Registrant's common shares, no par value, issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Definitive Proxy Statement for the Registrant's Annual Meeting of Shareholders scheduled to be held on May 9, 2019 to be filed with the Securities and Exchange Commission are incorporated by reference in answer to Part III of this Annual Report on Form 10-K.

NOVANTA INC.

FORM 10-K

YEAR ENDED DECEMBER 31, 2018

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As used in this report, the terms "we," "us," "our," "Novanta," "NOVT" and the "Company" mean Novanta Inc. and its subsidiaries, unless the context indicates another meaning.

Unless otherwise noted, all dollar amounts in this report are expressed in United States dollars.

The following brand and trade names of Novanta Inc. are used in this report: Cambridge Technology, Lincoln Laser, ExoTec Precision, Synrad, Laser Quantum, WOM, NDS, NDSsi, Reach Technology, JADAK, ThingMagic, Photo Research, General Scanning, Celera Motion, MicroE, Applimotion, Zettlex and Westwind.

PART I

Cautionary Note Regarding Forward Looking Statements

Except for historical information, the matters discussed in this Annual Report on Form 10-K are forward looking statements that involve risks, uncertainties and assumptions that, if they never materialize or if they prove incorrect, could cause our consolidated results to differ materially from those expressed or implied by such forward looking statements. The Company makes such forward looking statements under the provision of the "Safe Harbor" section of the Private Securities Litigation Reform Act of 1995. Actual future results may vary materially from those projected, anticipated, or indicated in any forward-looking statements as a result of various important factors, including those set forth in Item 1A of this Annual Report on Form 10-K under the heading "Risk Factors." Readers should also carefully review the risk factors described in the other documents that we file with the SEC from time to time. In this Annual Report on Form 10-K, the words "anticipates," "believes," "expects," "intends," "future," "could," "estimates," "plans," "woul "potential," "continues" and similar words or expressions (as well as other words or expressions referencing future events, conditions or circumstances) identify forward looking statements. Forward looking statements also include the assumptions underlying or relating to any of the forward-looking statements. The forward looking statements contained in this Annual Report include, but are not limited to, statements related to: our belief that the Purchasing Managers Index (PMI) may provide an indication of the impact of general economic conditions on our sales into the advanced industrial end market; our strategy; anticipated financial performance; expected liquidity and capitalization; drivers of revenue growth and our growth expectations in various markets; management's plans and objectives for future operations, expenditures and product development, and investments in research and development; business prospects; potential of future product releases and expansion of our product and service offerings; anticipated revenue performance; industry trends; market conditions; our competitive positions; changes in economic and political conditions; changes in accounting principles; changes in actual or assumed tax liabilities; expectations regarding tax exposures; anticipated reinvestment of future earnings and dividend policy; anticipated expenditures in regard to the Company's benefit plans; future acquisitions, integration and anticipated benefits from acquisitions and dispositions; anticipated economic benefits and expected costs of restructuring programs; ability to repay our indebtedness; our intentions regarding the use of cash; expectations regarding legal and regulatory environmental requirements and our compliance thereto; and other statements that are not historical facts. All forward looking statements included in this document are based on information available to us on the date hereof. We will not undertake and specifically decline any obligation to update any forward-looking statements, except as required under applicable law.

Item 1. Business

Overview

Novanta Inc. and its subsidiaries (collectively referred to as the "Company", "Novanta", "we", "us", "our") is a leading global supplier of core technology solutions that give medical and advanced industrial original equipment manufacturers ("OEMs") a competitive advantage. We combine deep proprietary technology expertise and competencies in photonics, vision and precision motion with a proven ability to solve complex technical challenges. This enables us to engineer core components and sub-systems that deliver extreme precision and performance, tailored to customers' demanding applications.

Novanta Inc. was founded and initially incorporated in Massachusetts in 1968 as General Scanning, Inc. ("General Scanning"). In 1999, General Scanning merged with Lumonics Inc. The post-merger entity, GSI Lumonics Inc., continued under the laws of the Province of New Brunswick, Canada. In 2005, the Company changed its name to GSI Group Inc. Through a series of strategic divestitures and acquisitions, the Company transformed from one that was

more focused on the semiconductor industry to one that primarily sells components and sub-systems to OEMs in the medical and advanced industrial markets. The Company changed its name to Novanta Inc. in May 2016.

Strategy

Our strategy is to drive sustainable, profitable growth through short-term and long-term initiatives, including:

- disciplined focus on our diversified business model of providing functionality to long life-cycle OEM customer platforms in attractive medical and advanced industrial niche markets;
- improving our business mix to increase medical sales as a percentage of total revenue by:
  - introducing new products aimed at attractive medical applications, such as minimally invasive and robotic surgery, ophthalmology, patient monitoring, drug delivery, clinical laboratory testing and life science equipment;
  - deepening our key account management relationships with and driving cross selling of our product offerings to leading medical equipment manufacturers; and
  - pursuing complementary medical technology acquisitions;

- increasing our penetration of high growth advanced industrial applications, such as laser materials processing, robotics, automation and metrology, by working closely with OEM customers to launch application specific products that closely match the requirements of each application;
- broadening our portfolio of enabling proprietary technologies and capabilities through increased investment in new product development, expanded sales and marketing channels to reach target customers, and investments in application development to further penetrate existing customers, while expanding the applicability of our solutions to new markets;
- broadening our product and service offerings through the acquisition of innovative and complementary technologies and solutions in medical and advanced industrial technology applications, including increasing our recurring revenue streams such as services, spare parts and consumables;
- improving our existing operations to expand profit margins and improve customer satisfaction by implementing lean manufacturing principles and strategic sourcing across our major production sites; and
- attracting, retaining, and developing world-class talented and motivated employees.

Acquisitions

We continuously evaluate our business mix and financial performance. Since 2013, we have executed a series of acquisitions in line with our strategy.

In May 2018, the Company acquired Zettlex Holdings Limited (“Zettlex”), a Cambridge, United Kingdom-based provider of inductive encoder products that provide absolute and accurate positioning, even in extreme operating environments, to OEMs in the medical and advanced industrial markets, for a total purchase price of £23.3 million ($32.0 million).

In July 2017, the Company acquired W.O.M. World of Medicine GmbH (“WOM”), a Berlin, Germany-based provider of medical insufflators, pumps and related disposables to OEMs in the minimally invasive surgery market, for a total purchase price of €118.1 million ($134.9 million).

In January 2017, the Company acquired an additional approximately 35% of the outstanding shares of Laser Quantum Limited (“Laser Quantum”), a Manchester, United Kingdom-based provider of solid state continuous wave lasers, ultrafast lasers, and optical light engines to OEMs in the medical market, for a total purchase price of £25.5 million ($31.1 million). As a result of the acquisition of these additional shares, the Company’s equity ownership percentage increased from approximately 41% to approximately 76%. In September 2018, the Company acquired the remaining approximately 24% of the outstanding shares of Laser Quantum for a total purchase price of $45.1 million.

In January 2017, the Company acquired ThingMagic, a Woburn, Massachusetts-based provider of ultra-high frequency (“UHF”) radio frequency identification (“RFID”) modules and finished RFID readers to OEMs in the medical and advanced industrial markets, for a total purchase price of $19.1 million.

In May 2016, the Company acquired Reach Technology Inc., a Fremont, California-based provider of embedded touch screen technology solutions to OEMs in the medical and advanced industrial markets, for a total purchase price of $9.4 million.

In December 2015, the Company acquired all assets and certain liabilities of Skyetek Inc., a Denver, Colorado-based provider of embedded and standalone RFID solutions for OEM customers in the medical and advanced industrial markets, for a total purchase price of $2.8 million.

In November 2015, the Company acquired certain assets and liabilities of Lincoln Laser Company, a Phoenix, Arizona-based provider of ultrafast precision polygon scanners and other optical scanning solutions for the medical and advanced industrial markets, for a total purchase price of $12.1 million.

In February 2015, the Company acquired Applimotion Inc., a Loomis, California-based provider of advanced precision motor and motion control technology to OEM customers in the medical and advanced industrial markets, for a total purchase price of $14.0 million.

In March 2014, the Company acquired JADAK LLC, JADAK Technologies Inc. and Advance Data Capture Corporation (together, “JADAK”), a North Syracuse, New York-based provider of optical data collection and machine vision technologies to OEM medical device manufacturers, for a total purchase price of $93.7 million.

In January 2013, the Company acquired NDS Surgical Imaging LLC ("NDS"), a San Jose, California-based company that designs, manufactures, and markets high definition visualization solutions and imaging informatics products for the surgical and radiology market segments, for a total purchase price of $75.4 million.

Divestitures and Product Rationalization

As part of our ongoing evaluation of our business mix and financial performance, we also review our business for potential divestitures and product rationalizations. Since 2011, we have executed a series of divestitures and product rationalizations in line with our strategy.

In January 2016, the Company discontinued its radiology products, sold under the Dome brand name and operated within the Company's Visualization Solutions product line. Total revenue from these products was zero in 2018 and 2017, respectively, and approximately $1.4 million in 2016.

In June 2015, the Company divested its 50% owned joint venture in India, Excel Laser Technology Private Limited, for net cash proceeds of $0.2 million.

In April 2015, the Company completed the sale of its fiber laser business, operated under the JK Lasers brand name, for $29.6 million in cash.

In July 2014, the Company completed the sale of its Scientific Lasers business, operated under the Continuum and Quantronix brand names, for $6.5 million in cash.

In May 2013, the Company sold its Semiconductor Systems business, operated under the GSI Group brand name, for $9.7 million in cash.

In October 2012, the Company sold its Laser Systems business, operated under the Control Laser and Baublys brand names, for $6.6 million in cash.

Segments

Our Chief Operating Decision Maker ("CODM") utilizes financial information to make decisions about allocating resources and assessing performance for the entire Company. We evaluate the performance of, and allocate resources to, our segments based on revenue, gross profit and operating profit. Our reportable segments have been identified based on commonality and adjacency of technologies, applications, and customers amongst our individual product lines.

Based upon the information provided to the CODM, we have determined that we have three reportable segments. The following table shows the external revenues, gross profit margin and operating profit for each of the segments for the year ended December 31, 2018 (dollars in thousands):

	Revenue	Gross Profit Margin		Operating Profit
Photonics	$249,339	47.0	%	$59,285
Vision	$232,902	37.4	%	$8,991
Precision Motion	$132,096	45.0	%	$31,674

See Note 19 to Consolidated Financial Statements for additional financial information about our reportable segments.

Photonics

The Photonics segment designs, manufactures and markets photonics-based solutions, including laser scanning, laser beam delivery, CO2 laser, continuous wave and ultrafast laser, and optical light engine products to customers worldwide. The segment serves highly demanding photonics-based applications for advanced industrial processes, metrology, medical and life science imaging, DNA sequencing, and medical laser procedures. The vast majority of the segment’s product offerings are sold to OEM customers. The segment sells these products both directly, utilizing a highly technical sales force, and indirectly, through resellers and distributors.

The Photonics segment is comprised of four product lines:

Product Line	Key End Market	Brand Names	Description
Laser Beam Delivery Components	Advanced Industrial and Medical	Cambridge Technology	Galvanometer and polygon-based optical scanning components. These products provide precise control and delivery of laser beams through motorized manipulation of mirrors and optical elements and are integrated by OEM manufacturers with their controlling hardware and software. Advanced industrial applications include additive manufacturing, packaging converting, laser marking, micromachining and metrology. Medical applications include optical coherence tomography imaging, microscopy, and laser-based vision correction.
Laser Beam Delivery Solutions	Advanced Industrial and Medical	Cambridge Technology, Synrad, Laser Quantum	Galvanometer and polygon based optical scan heads that provide precise control and delivery of laser beams through motorized manipulation of mirrors and optical elements in two and three-axis scan heads, scanning subsystems, and controlling hardware and software. Optical light engine products that integrate lasers into light engines with full beam parameter control. Advanced industrial applications include additive manufacturing, packaging converting, laser marking, micromachining and metrology. Medical applications include DNA sequencing, optical coherence tomography imaging, microscopy, super-resolution imaging, and laser-based vision correction.
CO_2 Lasers	Advanced Industrial	Synrad	Continuous and pulsed CO2 lasers with power ranges from 5 to 400 watts. Applications include coding, marking, engraving, cutting and trimming of non-metals, fine materials processing, additive manufacturing, packaging converting, and medical applications in dental and dermatology.
Solid State and Ultrafast Lasers	Medical and Advanced Industrial	Laser Quantum	Diode-pumped solid state lasers and ultrafast lasers in the visible to near-infrared. Applications include DNA sequencing, microscopy, and super-resolution imaging.
Vision			

The Vision segment designs, manufactures and markets a range of medical grade technologies, including medical insufflators, pumps and related disposables; visualization solutions; wireless imaging and operating room integration technologies; optical data collection and machine vision technologies; radio frequency identification (“RFID”) technologies; thermal chart recorders; spectrometry technologies, and embedded touch screen solutions. The vast majority of the segment’s product offerings are sold to OEM customers. The segment sells these products both directly, utilizing a highly technical sales force, and indirectly, through resellers and distributors.

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The Vision segment has nine product lines:

Product Line	Key End Market	Brand Names	Description
Medical Insufflators, Pumps and Accessories	Medical	WOM	Insufflators, pumps, light sources and video couplers, gamma probes and related accessories for minimally invasive surgery.
Visualization Solutions	Medical	NDS, NDSsi	High definition visualization solutions for minimally invasive surgery and robotic surgery.
Video Processing and Streaming	Medical	NDS, NDSsi	Imaging management for visual information, including real-time distribution, documentation, control, and streaming for multiple imaging modalities for surgical applications. High definition wireless transmission of video signals to replace video cables in minimally invasive surgical equipment.
Touch Panel Displays	Medical and Advanced Industrial	Reach Technology	Embedded capacitive and resistive touch panel technology that delivers high-performance solutions.
Machine Vision	Medical and Advanced Industrial	JADAK	Camera-based machine vision products and solutions performing image analysis within medical devices.
Radio Frequency Identification (RFID)	Medical and Advanced Industrial	JADAK, ThingMagic	RFID technologies via High-Frequency (HF) and Ultra-High Frequency (UHF) readers, writers and antennas for applications such as surgical part tracking and counterfeit detection.
Barcode Identification	Medical and Advanced Industrial	JADAK	Embedded and handheld data collection products for barcode identification.
Thermal Chart Recorders	Medical	JADAK	Rugged thermal chart recorders for patient monitoring, defibrillator equipment, blood gas analyzers, and pulse oximeters.
Light and Color Measurement	Medical and Advanced Industrial	Photo Research	Light and color measurement devices, including spectroradiometers, photometers, and color characterization software, used in research and development and quality control testing.

Precision Motion

The Precision Motion segment designs, manufactures and markets optical and inductive encoders, precision motors, motion control sub-assemblies, air bearings, air bearing spindles and precision machined components to customers worldwide. The vast majority of the segment’s product offerings are sold to OEM customers. The segment sells these products both directly, utilizing a highly technical sales force, and indirectly, through resellers and distributors.

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The Precision Motion segment includes five product lines:

Product Line	Key End Market	Brand Names	Description
Optical Encoders	Advanced Industrial and Medical	Celera Motion, MicroE	Optical encoders from core product brand MicroE. Applications include precision motion control and sensing in semiconductor and electronics manufacturing, industrial and medical robotics, metrology, satellite communications, medical devices, and laboratory and diagnostics equipment.
Inductive Encoders	Advanced Industrial and Medical	Celera Motion, Zettlex	Inductive encoders from core product brand Zettlex. Applications include precision motion control and sensing in satellite communications, surveillance, medical devices, industrial and medical robotics, autonomous vehicles, and laboratory and diagnostics equipment.
Precision Motors	Advanced Industrial and Medical	Celera Motion, Applimotion	Direct drive motor components from core product brand Applimotion. Applications include precision motion control in semiconductor and electronics manufacturing, industrial and medical robotics, autonomous vehicles, metrology, satellite communications, surveillance, medical devices, and laboratory and diagnostics equipment.
Integrated Motion Control Solutions	Advanced Industrial and Medical	Celera Motion	Integrated motion sub-assemblies. Applications include precision motion control in semiconductor and electronics manufacturing, industrial and medical robotics, autonomous vehicles, metrology, satellite communications, surveillance, medical devices, and laboratory and diagnostics equipment.
Air Bearing Spindles	Advanced Industrial	Celera Motion, Westwind	High-speed and precision air bearings and air bearing spindles from core product brand Westwind. Applications include printed circuit board (“PCB”) manufacturing, automotive coating, semiconductor manufacturing equipment, micro machining, and power generation.

End Markets

We primarily operate in two end markets: the advanced industrial market and the medical market.

Advanced Industrial Market

For the year ended December 31, 2018, the advanced industrial market accounted for approximately 50% of the Company’s revenue. Revenue from our products sold to the advanced industrial market is affected by a number of

factors, including changing technology requirements and preferences of our customers, productivity or quality investments in a manufacturing environment, the financial condition of our customers, changes in regulatory requirements and laws, and general economic conditions. We believe that the Purchasing Managers Index (PMI) on manufacturing activities specific to different regions around the world may provide an indication of the impact of general economic conditions on our sales into the advanced industrial market.

Medical Market

For the year ended December 31, 2018, the medical market accounted for approximately 50% of the Company's revenue. Revenue from our products sold to the medical market is generally affected by hospital and other healthcare provider capital spending, changes in regulatory requirements and laws, aggregation of purchasing by healthcare networks, trends in surgical procedures, changes in technology requirements, changes in customer or patient preferences, and general demographic trends.

Working Capital Requirements

There are no special inventory requirements or credit terms extended to customers that would have a material adverse effect on our working capital.

Customers

We have a diverse group of customers that include companies that are global leaders in their industries. Many of our customers participate in several market industries. No customer accounted for greater than 10% of our consolidated revenue during the years ended December 31, 2018, 2017 or 2016.

Customers of our Photonics, Vision, and Precision Motion segments include a large number of OEM customers who integrate our products into their systems for sale to end users. We also sell directly to end users. Our customers include leaders in the medical and advanced industrial markets. A typical OEM customer will usually evaluate our products and our ability to provide application knowledge and expertise, post-sales application support and services, supply chain management over long durations, manufacturing capabilities, product quality, global presence, and product customization before deciding to incorporate our products into their products or systems. Customers generally choose suppliers based on a number of factors, including product performance, reliability, application support, price, breadth of the supplier's product offerings, the financial condition of the supplier, and the geographical coverage offered by the supplier. Once certain of our products have been designed into a given OEM customer's product or system, there are generally significant barriers to subsequent supplier changes until the end of the product or system life cycle, especially in the medical market.

Seasonality

While our revenues are not highly seasonal on a consolidated basis, the revenues of some of our individual product lines, particularly our visualization solutions, imaging informatics, and thermal chart recorder products, are impacted in the first and fourth quarters by seasonality due to hospital budgeting cycles.

Backlog

As of December 31, 2018 and 2017, our consolidated backlog was approximately $234.4 million and $187.1 million, respectively. The majority of orders included in backlog represent open orders for products and services that, based on management's projections, have a reasonable probability of being delivered over the subsequent twelve-month period. Orders included in backlog may be canceled or rescheduled by customers without significant penalty. Management believes that backlog is not a meaningful indicator of future business prospects for any of our business segments due to the short lead time required on our products and the ability of customers to reschedule or cancel orders. Therefore, backlog as of any particular date should not be relied upon as indicative of our revenues for any future period.

Manufacturing

Manufacturing functions are performed internally when we choose to maintain control over critical portions of the production process or for cost related reasons while some of the less critical portions are outsourced to third parties. To the extent it makes financial sense, we will consider outsourcing additional portions of the production process.

Products offered by our Photonics segment are manufactured at facilities in Bedford, Massachusetts; Mukilteo, Washington; Phoenix, Arizona; Taunton and Manchester, United Kingdom; and Suzhou, China. Products offered by our Vision segment are manufactured at facilities in Syracuse and Rochester, New York; San Jose, California; and Ludwigsstadt, Germany. Products offered by our Precision Motion segment are primarily manufactured at facilities in Bedford, Massachusetts; Loomis, California; Poole and Cambridge, United Kingdom; and Suzhou, China.

Many of our products are manufactured under ISO 9001 certification, while the majority of our products manufactured for the medical market are manufactured under ISO 13485 certification. Our medical insufflators, pumps, cameras and accessories products are also manufactured under ISO 14001 certification. Certain visualization solutions, thermal chart recorders and imaging informatics

products are manufactured under current good manufacturing practices (CGMPs), which is a requirement of their medical device classification by the U.S. Food and Drug Administration (the "FDA"). In addition, certain visualization solutions, thermal printers, imaging informatics and medical insufflators, pumps, cameras and accessories products are manufactured under section 510(k) of the FDA.

Marketing, Sales and Distribution

We sell our products globally, primarily through our direct sales force. Sales outside of the United States are largely based on a direct sales force, but occasionally are sold through distributors, including manufacturers' representatives, to either augment our selling effort or serve a local market where we have no direct sales force. Our local sales, applications, and service teams and our distributors work closely with our customers to ensure customer satisfaction with our products. We have sales and service centers located in the United States, Europe and Asia.

To support our sales efforts, we maintain and continue to invest in a number of application centers around the world, where our application experts work closely with customers on integrating and using our solutions in their equipment. We currently maintain several service and application centers in the United States, Europe and Asia.

Competition

The markets in which we compete are dynamic and highly competitive. Due to the wide range of our products, we face many different types of competition and competitors. This affects our ability to sell our products and the prices at which these products are sold. Our competitors range from large foreign and domestic organizations, which produce a comprehensive array of goods and services and may have greater financial and other resources than we do, to small firms producing a limited number of goods or services for specialized market segments.

Competitive factors in our Photonics, Vision, and Precision Motion segments include product performance, price, quality and reliability, features, compatibility of products with existing systems, technical support, product breadth, market presence, on-time delivery and our overall reputation. We believe that our products offer a number of competitive advantages. However, some of our competitors are substantially larger and have greater financial and other resources.

Raw Materials, Components and Supplies

Each of our businesses uses a wide variety of raw materials, key components and parts that are generally available from alternative sources of supply and in adequate quantities from domestic and foreign sources. In some instances, we design and/or re-engineer the parts and components used in our products. For certain critical raw materials, key components and parts used in the production of some of our principal products, we have identified only a limited number of suppliers or, in some instances, a single source of supply. We also rely on a limited number of suppliers to manufacture subassemblies for some of our products.

For a further discussion of the importance and risks associated with our supply chain, see applicable risk factors under Item 1A of this Annual Report on Form 10-K.

Patents and Intellectual Property

We rely upon a combination of copyrights, patents, trademarks, trade secret laws and restrictions on disclosure to protect our intellectual property rights. We hold a number of registered and pending patents in the United States and other countries. In addition, we also have trademarks registered in the United States and other countries. We will continue to actively pursue applications for new patents and trademarks as we deem appropriate. However, there can

be no assurance that any other patents will be issued to us or that such patents, if and when issued, will provide any protection or benefit to us.

Although we believe that our patents and pending patent applications are important, we rely upon several additional factors that are essential to our business success, including: market position, technological innovation, know-how, application knowledge and product performance. However, there can be no assurance that we will be able to sustain these advantages. Considering the diversified nature of our businesses, we do not believe that any individual patent is material to our business as a whole.

We also protect our proprietary rights by controlling access to our proprietary information and by maintaining confidentiality agreements with our employees, consultants, and certain customers and suppliers. For a further discussion of the importance of risks associated with our intellectual property rights, see applicable risk factors under Item 1A of this Annual Report on Form 10-K.

Human Resources

As of December 31, 2018 and 2017, we employed 2,133 and 2,034 employees, respectively. We also utilize temporary and contract personnel that are not included in these headcount numbers.

Government Regulation

Our current and contemplated activities and the products and processes that will result from such activities are subject to substantial government regulations, both in the United States and internationally. Most of our production facilities are subject to various federal, state, local, and/or foreign environmental regulations related to the use, storage, handling, and disposal of regulated materials, chemicals, and certain waste products. Such rules are subject to changes by the governing agencies and we monitor those changes closely.

We may face increasing complexity in our product designs and procurement operations due to the evolving nature of product compliance standards. Those standards may impact the material composition of our products entering specific markets. Such regulations went into effect in the European Union ("EU") in 2006 ("The Restriction of Hazardous Substances Directive" ("RoHS")) and in 2007 ("Registration, Evaluation, Authorisation and Restriction of Chemicals" ("REACH")), and in China in 2007 ("Management Methods for Controlling Pollution Caused by Electronic Information Products Regulation" ("China-RoHS")).

Our capital expenditures, earnings, and competitive position have not been, and are not expected to be, materially affected by our compliance with federal, state, and local environmental provisions which have been enacted or adopted to regulate the distribution of materials into the environment.

Medical Device Regulation

Certain products manufactured by us are integrated into systems by our customers that are subject to regulation by the United States Food and Drug Administration (the "FDA"). We must comply with certain quality control measurements in order for our products to be effectively used in our customers' end products. Non-compliance with quality control measurements could result in fines, penalties, and loss of business with our customers.

We are also subject to certain medical device regulations. Medical devices are subject to extensive and rigorous regulation by the FDA and by other federal, state and local authorities. The Federal Food, Drug and Cosmetic Act (the "FDCA") and related regulations govern the conditions of safety, efficacy, clearance, approval, manufacturing, quality system requirements, labeling, packaging, distribution, storage, recordkeeping, reporting, marketing, advertising, and promotion of products.

FDA Premarket Clearance and Approval Requirements

Unless an exemption applies, each medical device commercially distributed in the United States requires either FDA clearance of a 510(k) premarket notification or approval of a premarket approval application ("PMA"). Under the FDCA, medical devices are classified into one of three classes—Class I, Class II or Class III—depending on the degree of risk associated with each medical device and the extent of manufacturer and regulatory control needed to ensure its safety and effectiveness. Class I includes devices with the lowest risk to the patient and are those for which safety and effectiveness can be assured by adherence to the FDA's General Controls for medical devices, which include compliance with the applicable portions of the Quality System Regulation (the "QSR"), facility registration and product listing, reporting of adverse medical events, and truthful and non-misleading labeling, advertising, and promotional materials. Class II devices are subject to the FDA's General Controls and special controls as deemed necessary by the FDA to ensure the safety and effectiveness of the device. These special controls can include performance standards,

postmarket surveillance, patient registries and FDA guidance documents. While most Class I devices are exempt from the 510(k) premarket notification requirement, manufacturers of most Class II devices are required to submit to the FDA a premarket notification under Section 510(k) of the FDCA, requesting permission to commercially distribute the device. The FDA's permission to commercially distribute a device subject to a 510(k) premarket notification is generally known as 510(k) clearance. Devices deemed by the FDA to pose the greatest risks, such as life-sustaining, life-supporting or some implantable devices, or devices that have a new intended use, or use advanced technology that is not substantially equivalent to that of a legally marketed device are placed in Class III, requiring approval of a PMA. Some pre-amendment devices are unclassified, but are subject to the FDA's premarket notification and clearance process in order to be commercially distributed. In many cases, our customers are responsible for compliance with the FDA's requirements applicable to medical devices. However, we also currently market certain Class II medical device products independently that are subject to these requirements.

510(k) Marketing Clearance Pathway

To obtain 510(k) clearance, we must submit to the FDA a premarket notification submission demonstrating that the proposed device is ‘‘substantially equivalent’’ to a predicate device already on the market. A predicate device is a legally marketed device that is not subject to premarket approval, i.e., a device that was legally marketed prior to May 28, 1976 (pre-amendments device) and for which a PMA is not required, a device that has been reclassified from Class III to Class II or Class I, or a device that was found substantially equivalent through the 510(k) process. The FDA's 510(k) clearance process usually takes from nine to twelve months, but may take significantly longer. The FDA may require additional information, including clinical data, to make a determination regarding substantial equivalence.

If the FDA agrees that the device is substantially equivalent to a predicate device currently on the market, it will grant 510(k) clearance to commercially market the device. If the FDA determines that the device is "not substantially equivalent" to a previously cleared device, the device is automatically designated as a Class III device. The device sponsor must then fulfill more rigorous PMA requirements, or can request a risk-based classification determination for the device in accordance with the "de novo" process, which is a route to market for novel medical devices that are low to moderate risk and are not substantially equivalent to a predicate device.

After a device receives 510(k) marketing clearance, any modification that could significantly affect its safety or effectiveness, or that would constitute a major change or modification in its intended use, will require a new 510(k) marketing clearance or, depending on the modification, a de novo classification or PMA approval. The FDA requires each manufacturer to determine whether the proposed change requires submission of a 510(k) or a PMA in the first instance, but the FDA can review any such decision and disagree with a manufacturer's determination. Many minor modifications today are accomplished by a letter-to-file in which the manufacturer documents the change in an internal letter-to-file. The letter-to-file is in lieu of submitting a new 510(k) to obtain clearance for every change. The FDA can always review these letters-to-file in an inspection. If the FDA disagrees with a manufacturer's determination, the FDA can require the manufacturer to cease marketing and/or request the recall of the modified device until 510(k) marketing clearance or PMA approval is obtained. Also, in these circumstances, we may be subject to significant regulatory fines or penalties.

Post-market Regulation

After a device is cleared or approved for marketing, numerous and pervasive regulatory requirements continue to apply. These include:

- establishment registration and device listing with the FDA;
- QSR requirements, which require manufacturers, including third-party manufacturers, to follow stringent design, testing, control, documentation and other quality assurance procedures during all aspects of the design and manufacturing process;
- labeling and marketing regulations, which require that promotion is truthful, not misleading and fairly balanced, provides adequate directions for use and that all claims are substantiated, and also prohibit the promotion of products for unapproved or "off-label" uses and impose other restrictions on labeling;
- FDA guidance on off-label dissemination of information and responding to unsolicited requests for information;
- clearance or approval of product modifications to 510(k)-cleared devices that could significantly affect safety or effectiveness or that would constitute a major change in intended use of one of the cleared devices;
- medical device reporting regulations, which require that a manufacturer report to the FDA if a device that it markets may have caused or contributed to a death or serious injury, or has malfunctioned and the device or a similar device that it markets would be likely to cause or contribute to a death or serious injury, if the malfunction were to recur;
- correction, removal and recall reporting regulations, which require that manufacturers report to the FDA field corrections and product recalls or removals if undertaken to reduce a risk to health posed by the device or to remedy

a violation of the FDCA that may present a risk to health;
- complying with requirements governing Unique Device Identifiers (UDI) on devices and also requiring the submission of certain information about each device to the FDA's Global Unique Device Identification Database (GUDID);
- the FDA's recall authority, whereby the agency can order device manufacturers to recall from the market a product that is in violation of governing laws and regulations; and
- post-market surveillance activities and regulations, which apply when deemed by the FDA to be necessary to protect the public health or to provide additional safety and effectiveness data on the device.

We may be subject to similar foreign laws that may include applicable post-marketing requirements such as safety surveillance. Our manufacturing processes are required to comply with the applicable portions of the QSR, which cover the methods and the

facilities and controls for the design, manufacture, testing, production, processes, controls, quality assurance, labeling, packaging, distribution, installation and servicing of finished devices intended for human use. The QSR also requires, among other things, maintenance of a device master file, device history file, and a complaints file. As a manufacturer, we are subject to periodic scheduled or unscheduled inspections by the FDA. Our failure to maintain compliance with the QSR requirements could result in the shut-down of, or restrictions on, our manufacturing operations and the recall or seizure of our products, which would have a material adverse effect on our business. The discovery of previously unknown problems with any of our products, including unanticipated adverse events or adverse events of increasing severity or frequency, whether resulting from the use of the device within the scope of its clearance or off-label by a physician in the practice of medicine, could result in restrictions on the device, including the removal of the product from the market or voluntary or mandatory device recalls.

The FDA has broad regulatory compliance and enforcement powers. If the FDA determines that we failed to comply with applicable regulatory requirements, it can take a variety of compliance or enforcement actions, which may result in any of the following sanctions:

- warning letters, untitled letters, fines, injunctions, consent decrees and civil penalties;
- recalls, withdrawals, or administrative detention or seizure of our products;
- operating restrictions or partial suspension or total shutdown of production;
- refusing or delaying requests for 510(k) marketing clearance or PMA approvals of new products or modified products;
- withdrawing 510(k) clearances or PMA approvals that have already been granted;
- refusal to grant export or import approvals for our products; or
- criminal prosecution.

Other Healthcare Laws and Regulations

In the United States and other jurisdictions where we operate our business, there are healthcare laws and regulations that constrain our business operations, including our sales, marketing and promotional activities, and that limit the kinds of arrangements we may have with customers, physicians, healthcare entities and others in a position to purchase or recommend our products or other products or services we may develop and commercialize. These laws include, without limitation: the federal Anti-Kickback Statute, which prohibits, among other things, persons and entities from knowingly and willfully soliciting, receiving, offering or paying remuneration to induce, or in return for, either the referral of an individual or the purchase or recommendation of an item or service for which payment may be made under any federal healthcare program; federal civil and criminal false claims laws and civil monetary penalty laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment to the federal government, including federal healthcare programs, that are false or fraudulent; the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created additional federal criminal statutes that prohibit, among other things, executing a scheme to defraud any healthcare benefit program and making false statements relating to healthcare matters; HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their implementing regulations, which imposes certain requirements on certain types of individuals and entities relating to the privacy, security and transmission of individually identifiable health information; the federal Physician Payments Sunshine Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children’s Health Insurance Program to annually report to the federal government information related to payments or other transfers of value made to physicians and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members; and state and foreign law equivalents of each of the above federal laws, which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts. Violations of these laws may result in substantial civil penalties, including treble damages, and criminal penalties, including imprisonment, fines, the curtailment or restructuring of our operations, and exclusion from participation in governmental healthcare programs. For further

information regarding other healthcare laws and regulations that our operations are subject to, see “Item 1A. Risk Factors—Risks Relating to our Business—Our business is indirectly subject to healthcare industry cost containment and healthcare reform measures that could result in reduced sales of our products.”

Other Information

We maintain a website with the address https://www.novanta.com. We are not including the information contained on our website as part of, or incorporating it by reference into, this Annual Report on Form 10-K. We make available, free of charge through our website (https://investors.novanta.com), our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to these reports as soon as reasonably practicable after we electronically file these materials with, or otherwise furnish them to, the Securities and Exchange Commission (“SEC”). In addition, our reports and other information are filed with securities commissions or other similar authorities in Canada and are available over the Internet at https://www.sedar.com.

Item 1A. Risk Factors

The following risk factors could have a material adverse effect on our business, financial position, results of operations and cash flows and could cause the market value of our common shares to fluctuate or decline. These risk factors may not include all of the important factors that could affect our business or that could cause our future financial results to differ materially from historical or expected results or cause the market price of our common shares to fluctuate or decline.

Risks Relating to our Business

Our results of operations could be adversely affected by economic and political conditions and the effects of these conditions on our customers' businesses and levels of business activities.

A large portion of our product sales are dependent on our customers' need for increased capacity, productivity and cost saving initiatives, improved product quality and performance, and new investments. Weaknesses in our end markets could negatively impact our revenue and gross margin and consequently have a material adverse effect on our business, financial condition and results of operations. A severe and/or prolonged overall economic downturn or a negative or uncertain political climate could lead to weaknesses in our end markets and adversely affect our customers' financial condition and the timing or levels of business activity of our customers and the industries we serve. In particular, diminished growth expectations in China, economic and political uncertainty in Europe as Britain negotiates withdrawal from the European Union, as well as political and economic uncertainty in the U.S. could adversely impact our customers' financial condition and ability to maintain product order levels in the future. This may reduce the demand for our products or depress pricing for our products and have a material adverse effect on our results of operations. Changes in global economic conditions could also shift demand for products or services for which we do not have competitive advantages. This could negatively affect the amount of business that we are able to obtain. In addition, if we are unable to successfully anticipate changes in economic and political conditions, we may be unable to effectively plan for and respond to those changes, and our business could be negatively affected.

Our business depends significantly upon our customers' capital expenditures, which are subject to cyclical market fluctuations.

Certain sub-segments of the advanced industrial market that we serve, including the microelectronics and industrial capital equipment markets, are cyclical and have historically experienced periods of oversupply, resulting in downturns in demand for capital equipment in which many of our products are used. The timing, length and severity of these downturns and their impact on our business are difficult to predict. Further, our order levels or results of operations for a given period may not be indicative of order levels or results of operations for subsequent periods. For the foreseeable future, our operations will continue to depend upon industries that are subject to market cycles which, in turn, could adversely affect the market demand for our products.

We experienced significant cyclical end market fluctuations in the past. We cannot predict when slowdowns will recur or that the impact of such slowdowns will be more or less significant compared to historical fluctuations.

Our business success depends upon our ability to respond to fluctuations in product demand, but doing so may require us to incur costs despite limited visibility toward future business declines.

During a period of increasing demand and rapid growth, we must be able to increase manufacturing capacity quickly. Our inability to quickly increase production in response to a surge in demand could prompt customers to look for alternative sources of supply or leave our customers without a supply, both of which events could harm our reputation and make it difficult for us to retain our existing customers or to obtain new customers and have a material adverse effect on our business.

In periods of weak demand, we may be required to reduce costs while maintaining the ability to motivate and retain key employees at the same time. Additionally, to remain competitive, we must continually invest in research and development, which may inhibit our ability to reduce costs in a down cycle. Long product lead-times create a risk that we may purchase or manufacture inventories of products that we are unable to sell.

The success of our business depends on our ability to continuously innovate and to manage transitions to new product innovations.

Technology requirements in our markets are constantly changing. We must continually introduce new products that meet evolving customer needs. Our ability to grow depends on the successful development, introduction and market acceptance of new or enhanced products that address our customers' requirements. Developing new technology is a complex and uncertain process requiring us to accurately anticipate technological and market trends and meet those trends with the right products. Additionally, this requires that we manage the transition from older products to minimize disruption in customer ordering patterns, avoid excess inventory and ensure

adequate supplies of new products. Failure to develop new products, failed market acceptance of new products or problems associated with new product transitions could harm our business.

We cannot predict how the market will react to new products introduced by us or to enhancements made to our existing products. If any of our new or enhanced products contain defects or perceived defects or have reliability, quality or compatibility problems or perceived problems, or if our competitors release similar products or enhancements at the same time that are more widely accepted by our customers, our revenue and results of operations for one or more reporting periods could be adversely affected.

If we fail to introduce new products in a timely manner, we may lose market share and be unable to achieve revenue growth targets.

Our research and development efforts may not lead to the successful introduction of products within the time frame that our customers demand. Our competitors may introduce new or improved products, processes or technologies that make our current or proposed products obsolete or less competitive. We may encounter delays or problems in connection with our research and development efforts. Product development delays may result from numerous factors, including:

- changing product specifications and customer requirements;
- inability to manufacture new products cost effectively;
- difficulties in reallocating engineering resources and overcoming resource limitations;
- changing market or competitive product requirements; and
- unanticipated engineering complexities.

New products often take longer to develop, may have fewer features than originally considered desirable, and have higher costs than initially estimated. There may be difficulty in sourcing components for new products and delays in starting volume production. New products may also not be commercially successful. Any of these adverse developments could lead to loss of market share and inability to achieve our anticipated revenue growth targets.

Customer order timing and other factors beyond our control may cause our operating results to fluctuate from period to period.

Changes in customer order timing and the existence of certain other factors beyond our control may cause our operating results to fluctuate from period to period. Such factors include:

- fluctuations in our customers' businesses;
- timing and recognition of revenues from customer orders;
- timing and market acceptance of new products or enhancements introduced by us or our competitors;
- availability of parts from our suppliers and the manufacturing capacity of our subcontractors;
- decisions by customers to reduce their purchases of our products;
- changes in the prices of our products or of our competitors' products; and
- fluctuations in foreign currency exchange rates.

We may receive several large orders in one quarter from a customer and then receive no orders from that customer in the next quarter. As a result, the timing of revenue recognition from customer orders can cause significant fluctuations in our operating results from quarter to quarter. In addition, our sales are reactive to changes in our customers' businesses. For instance, a customer that placed a large order in one period could subsequently experience a downturn in business and, as a result, could cancel an order or reduce the amount of products it purchases from us in future periods.

A delay in a shipment near the end of a reporting period due to rescheduling or cancellation by customers or unexpected production delays experienced by us may cause revenue in the period to decline significantly and may have a material adverse effect on our operating results for that period.

In addition, we or our competitors may raise or lower prices of products in response to market demands or competitive pressures. If we lower the prices of our products, or if our competitors lower the prices of their products such that demand for our products weakens, our revenue for one or more quarters may decline and our operating results would be adversely affected.

As a result of these factors, our results of operations for any quarter are not necessarily indicative of results to be expected in future periods.

If we experience a significant disruption in, or breach in security of, our information technology systems, our business may be adversely affected.

We rely on information technology systems throughout the Company to manage orders, process shipments to customers, manage inventory levels and maintain financial, customer and employee information. Certain events could result in the disruption of our systems, including power outages, computer attacks by hackers, viruses, catastrophes, hardware and software failures and other unforeseen events. If we were to experience a significant period of disruption in information technology systems that involve our interactions with customers or suppliers, it could result in the loss of revenue and customers as well as significant response and mitigation costs, which would adversely affect our business. In addition, security breaches of our information technology systems could result in the misappropriation or unauthorized disclosure of confidential information belonging to us or to our employees, partners, customers or suppliers, which could result in significant financial or reputational damage to us, as well as litigation, regulatory enforcement action, or other liability risks that could lead to substantial damages, fines, penalties and legal costs. We also expend substantial amounts to protect our information technology systems, and if we were to experience a significant breach in security of our information technology systems, we may need to materially increase such expenditures, which would adversely affect our results of operations. Moreover, our insurance to cover costs in the event of a breach may be insufficient to cover such costs.

Risks associated with data privacy issues, including evolving laws, regulations and associated compliance efforts, may adversely impact our business and financial results.

Legislation in various countries around the world with regard to cybersecurity, privacy and data protection is rapidly expanding and creating a complex compliance environment. We are subject to many privacy and data protection laws and regulations in the U.S. and around the world, some of which place restrictions on our ability to process personal data across our business. In particular, the General Data Protection Regulation (the “GDPR”), which became effective in May 2018, has caused more stringent data protection requirements in the European Union. The GDPR imposes onerous accountability obligations requiring data controllers and processors to maintain a record of their data processing and implement policies as part of its mandated privacy governance framework. It also requires data controllers to be transparent and disclose to data subjects how their personal information is to be used;, imposes limitations on retention of personal data; introduces mandatory data breach notification requirements; and sets higher standards for data controllers to demonstrate that they have obtained valid consent for certain data processing activities. We are subject to the supervision of local data protection authorities in those E.U. jurisdictions where we are established or otherwise subject to the GDPR. Certain breaches of the GDPR requirements could result in substantial fines, which can be up to four percent of worldwide revenue or 20 million Euros, whichever is greater. In addition to the foregoing, a breach of the GDPR could result in regulatory investigations, reputational damage, orders to cease/change our use of data, enforcement notices, as well potential civil claims including class action type litigation where individuals suffer harm. We have invested, and continue to invest, human and technology resources in our GDPR compliance efforts and our data privacy compliance efforts in general. These compliance efforts may be time-intensive and costly. Despite those efforts, there is a risk that we may be subject to fines and penalties, litigation and reputational harm if we fail to protect the privacy of third party data or comply with the GDPR or other applicable regimes.

As we transact a portion of our sales, and maintain significant cash balances, in foreign currencies, changes in interest rates, credit ratings or foreign currency rates could have a material adverse effect on our financial position, results of operations, and cash flows.

A portion of our revenue is derived from our European and Asian operations and includes transactions in Euros, British Pounds and Japanese Yen, while our products are mainly manufactured in the U. S., U.K., Germany and China. In the event of a decline in the value of the Euro, British Pounds or Japanese Yen, we would typically experience a decline in our revenues and profit margins. If we increase the selling prices on our products sold in Europe and Asia in order to maintain profit margins and recover costs, we may lose customer sales to lower cost competitors.

Additionally, balances maintained in foreign currencies create additional financial exposure to changing foreign currency rates. If foreign currency rates were to change significantly, we could incur material losses. While we use foreign currency contracts and other risk management techniques to hedge our foreign currency exposure, we cannot be certain that our efforts will be adequate to protect us against significant foreign currency fluctuations or that such efforts will not expose us to additional exchange rate risks.

Our reliance on international operations in foreign countries subjects us to risks not typically faced by companies operating exclusively in the U.S.

During the year ended December 31, 2018, approximately 61% of our revenues were derived from operations and customers outside of the U.S. The scope of our international operations subjects us to risks that could materially impact our results of operations, including:

- foreign exchange rate fluctuations;
- increases in shipping costs;
- longer customer payment cycles;
- greater difficulty in collecting accounts receivable;
- use of incompatible systems and equipment;
- problems with staffing and managing foreign operations in diverse cultures;
- trade tariffs;
- trade barriers and export/import controls;
- transportation delays and interruptions;
- increased vulnerability to the theft of, and reduced protection for, intellectual property rights;
- government currency control and restrictions, delays, penalties or required withholdings on repatriation of earnings;
- compliance with foreign laws and regulations, including those that potentially conflict with other jurisdictions;
- the impact of recessionary foreign economies; and
- natural disasters and acts of terrorism.

We also are subject to risks that our operations outside the U.S. could be conducted by our employees, contractors, service providers, representatives or agents in ways that violate the Foreign Corrupt Practices Act or other similar anti-bribery laws. Any such violations could have a negative impact on our business and could result in government investigations and/or injunctive, monetary or other penalties. Moreover, our anti-bribery policy and procedures may be violated by third-party sales representatives or other agents that help sell our products or provide other services. Such representatives or agents are not our employees and it may be more difficult to oversee their conduct, which may increase the risk of violations of anti-bribery laws.

Increased outsourcing of components manufacturing to manufacturers outside the U.S. leads to additional risks that could negatively impact our business.

We are increasingly outsourcing the manufacture of subassemblies to suppliers based in China and elsewhere overseas in order to reduce our manufacturing cost. However, economic, political or trade problems with foreign countries could substantially impact our ability to obtain critical parts needed in the timely manufacture of our products, or could substantially increase the costs of these parts. Additionally, this practice increases our vulnerability to the theft of, and reduced protection for, our intellectual property.

Increases in tariffs, trade restrictions or taxes on our products could have an adverse impact on our operations.

During the year ended December 31, 2018, approximately 61% of our revenues were derived from operations and customers outside of the U.S. We also manufacture certain of our products and purchase a portion of our raw materials and components from suppliers in China and other foreign countries. The commerce we conduct in the international marketplace makes us subject to tariffs, trade restrictions and other taxes when the raw materials or components we purchase, and the products we ship, cross international borders. Trade tensions between the U.S. and China, as well as those between the U.S. and Canada, Mexico and other countries have been escalating in recent months. Most notably, three rounds of U.S. tariffs were placed on Chinese goods being exported to the U.S., with such tariffs taking effect in July, August and September 2018. Each of these U.S. tariff impositions against Chinese exports were followed by a round of retaliatory Chinese tariffs on U.S. exports to China. Certain of the raw materials and components we

purchase from China are subject to these tariffs, which has increased our manufacturing costs and could make our products less competitive than those of our competitors whose inputs are not subject to these tariffs. Certain of our finished products manufactured in the U.S. have been subject to the retaliatory tariffs in China, which has increased our cost and made our products less competitive than those of our competitors whose products are not subject to such retaliatory tariffs. In addition, the U.S. administration has threatened to impose tariffs on all products imported from China, which would impact all of our products and supplies imported from China to the U.S.; and the Chinese government has threatened to levy additional retaliatory tariffs on U.S. manufactured goods. If these were to occur, we

may not be able to mitigate the impacts of these tariffs, and our business, results of operations and financial position would be materially adversely affected. Products we sell into certain foreign markets could also become subject to similar retaliatory tariffs, making the products we sell uncompetitive to similar products not subjected to such import tariffs. Further changes in U.S. trade policies, tariffs, taxes, export restrictions or other trade barriers, or restrictions on raw materials or components may limit our ability to produce products, increase our manufacturing costs, decrease our profit margins, reduce the competitiveness of our products, or inhibit our ability to sell products or purchase raw materials or components, which would have a material adverse effect on our business, results of operations and financial conditions.

Our global operations are subject to extensive and complex import and export rules that vary among the legal jurisdictions in which we operate. Failure to comply with these rules could result in substantial penalties.

Due to the international scope of our operations, we are subject to a complex system of import and export related laws and regulations, including U.S. export control and customs regulations and customs regulations of other countries. These regulations are complex and vary among the legal jurisdictions in which we operate. Any alleged or actual failure to comply with such regulations may subject us to government scrutiny, investigation and civil and criminal penalties, and may limit our ability to import or export our products or to provide services outside the U.S. Any of these penalties could have a material adverse effect on our financial position, results of operations and cash flows. Additionally, the U.K. is likely to implement new import and export rules as part of the process of exiting the European Union. There will likely be new costs of compliance associated with such rules, as well as the additional risk of penalties for failure to comply.

The U.K.’s plan for withdrawal from the European Union and the actions of the current U.S. government may have a negative effect on global economic conditions, financial markets and our business, which could reduce the price of our common shares.

We are a multinational company with worldwide operations, including business operations and investments in the U. K., Germany and China. In March 2017, Prime Minister Theresa May of the U.K. formally began the process of withdrawing the U. K. from the European Union, following the June 2016 referendum in which a majority of voters in the U. K. supported such withdrawal. The terms of the withdrawal are subject to a negotiation period that could last at least until March 2019. The announcement has created significant uncertainty about the future relationship between the U. K. and the European Union, and has given rise to calls for the governments of other European Union member states to consider withdrawal. If the U. K. and the European Union are unable to negotiate acceptable withdrawal terms or if other European Union member states pursue withdrawal, barrier-free access between the U. K. and other European Union member states or among the European economic area overall could be diminished or eliminated. These developments in turn may inhibit our sales of products, mobility of our personnel, and our access to capital.

The policies of the current U.S. government regarding U.S. trade, tax and health care policies, among other things, have led to substantial uncertainty in global financial markets. The current U.S. government has withdrawn the U.S. from the Trans-Pacific Partnership trade agreement, has re-negotiated the North American Free Trade Agreement (“NAFTA”) and has made various comments suggesting the possible re-negotiation of, or withdrawal from, other trade agreements, has imposed significant tariffs on imports from China and other countries, and has suggested the potential imposition of other significant new import barriers. The current U.S. government has also enacted comprehensive tax law reform, and attempted to repeal the U.S. Patient Protection and Affordable Care Act (the “PPACA”), and may continue to seek repeal of the PPACA. These developments and the lack of clarity regarding future U.S. tax, trade and health care policies have created significant uncertainty that could have a material adverse effect on global economic conditions and the stability of global financial markets. Any major changes in these policies could have a material adverse effect on our business, financial condition and results of operations and reduce the price of our common

shares. Because of the global nature of our business, and our strategy to increase our sales to the medical market, our business may be particularly impacted by any major changes in U.S. trade, tax and health care policies.

Others may violate our intellectual property rights and cause us to incur significant costs to protect our rights.

Our future success depends in part upon our intellectual property rights, including patents, trade secrets, know-how and continuing technological innovation. We do not have personnel dedicated to the oversight, organization and management of our intellectual property. There can be no assurance that the steps we take to protect our intellectual property rights will be adequate to prevent misappropriation or disclosure. It is possible that, despite our efforts, other parties may use, obtain or try to copy our technology and products. There can be no assurance that other companies are not investigating or developing other technologies similar to ours, that any patents will be issued from any application filed by us, or that, if patents are issued, the claims allowed will be sufficient to deter or prohibit others from marketing similar products. In addition, our patents may be challenged, invalidated or circumvented in a legal or administrative proceeding. Policing unauthorized use of our intellectual property rights is difficult and time consuming and may involve initiating claims or litigation against third parties for infringement of our proprietary rights, which could be costly and divert management resources.

Our efforts to protect our intellectual property rights against infringement may not be effective in some foreign countries where we operate or sell our products. If we fail to adequately protect our intellectual property in these countries, we may lose significant business to our competitors.

Our operating results would suffer if we are unable to successfully defend against infringement claims by third parties.

We have received in the past, and could receive in the future, notices from third parties alleging that our products infringe patent or other proprietary rights. These allegations could result in significant costs and diversion of the attention of management. Adverse consequences may also apply if we fail to avoid or successfully defend litigation for infringement or misappropriation of proprietary rights of third parties. If a successful claim were brought against us and we were found to have infringed a third-party's intellectual property rights, we could be required to pay substantial amounts for damages or be enjoined from using the technology deemed to be infringing, or from using, making or selling products deemed to be infringing, any of which could adversely affect our operating results. If we have supplied infringing products to third parties, we may be obligated to indemnify these third parties for any damages that they may be required to pay to the patent holder and for any losses that they may sustain as a result of the infringement.

We operate in highly competitive industries and, if we lose competitive advantages, our business would suffer adverse consequences.

Some of our competition comes from established competitors that have greater financial, engineering, manufacturing and marketing resources than we do. Our competitors will continue to improve the design and performance of their existing products and introduce new products. It is possible that we may not successfully differentiate our current and proposed products from the products of our competitors, or that the marketplace will not consider our products to be superior to competing products. To remain competitive, we will be required to invest heavily in research and development, marketing and customer service and support. However, we may not be able to make the necessary technological advances to maintain our competitive position and our products may not receive market acceptance. These factors would cause us not to be able to compete successfully in the future. Increased competition may also result in price reductions, reduced profit margins, loss of market share and an inability to generate cash flows that are sufficient to maintain or expand our new product development programs.

Our results of operations will be adversely affected if we fail to successfully integrate future acquisitions or to grow the acquired businesses.

As part of our business strategy, we expect to broaden our product and service offerings by acquiring businesses, technologies, assets and product lines that, we believe, complement or expand our existing businesses. In recent years, we have made a number of acquisitions, including the acquisitions of W.O.M. World of Medicine GmbH, Laser Quantum Limited and Zettlex Limited, and we expect to continue to make acquisitions in the future. We may fail to successfully identify appropriate acquisition candidates or integrate acquired businesses, products, technologies or personnel into our businesses and, as a result, may fail to realize the synergies, cost savings and other benefits expected from the acquisitions. If we are not able to successfully achieve these objectives, the anticipated benefits of such acquisitions may not be realized fully or at all, and our results of operations could be adversely affected. As a result of the number of recent and expected future acquisitions in a relatively short amount of time, these risks may be heightened due to limited resources available to integrate these new businesses. Our acquisition activities may divert management's attention from our regular operations. Managing a larger and more geographically dispersed operation and product portfolio could also pose challenges for our management team.

Further, our ability to maintain and increase profitability of an acquired business will depend on our ability to manage and control operating expenses and to generate and sustain increased levels of revenue. Our expectations to achieve

more consistent and predictable levels of revenue and to increase profitability as a result of any acquisition may not be realized. Such revenues and profitability may even decline as we integrate operations into our businesses. If revenues of acquired businesses decline or grow more slowly than we anticipate, or if their operating expenses are higher than we expect, we may not be able to sustain or increase their profitability, in which case our financial condition will suffer and our stock price could decline. In addition, through our acquisitions, we may assume liabilities, losses or costs for which we are not indemnified or insured or for which our indemnity or insurance is inadequate. Any such liabilities may have a material adverse effect on our financial position or results of operations.

If we do not attract and retain our key personnel, our ability to execute our business strategy will be limited.

Our success depends, to a significant extent, upon the continued service of our executive officers, key management and technical personnel, particularly our experienced engineers, and upon our ability to continue to attract, retain, and motivate qualified personnel. The competition for these employees is intense. The loss of the services of one or more of our key personnel could have a material adverse effect on our operating results. In addition, there could be a material adverse effect on us should the turnover rates for engineers and other key personnel increase significantly or if we are unable to continue to attract qualified personnel.

Our success also depends on our ability to execute leadership succession plans. The inability to successfully transition key management roles could have a material adverse effect on our operating results.

We have undertaken restructuring and realignment activities in the past, and we will continue to assess our operating structure in the future. These actions may not improve our financial position, and may ultimately prove detrimental to our operations and sales.

We have undertaken restructuring and realignment activities in the past, and we will continue to assess our operating structure in the future. Our ability to reduce operating expenses is dependent upon the nature of the actions we take to reduce expenses and our subsequent ability to implement those actions and realize expected cost savings. We may need to take additional restructuring actions, such as eliminating or consolidating certain of our facilities or operations, reducing our headcount, or eliminating certain positions for a variety of reasons, including deterioration in global economic conditions or significant declines in demand for our products. Failure to successfully implement such restructuring activities could adversely affect our ability to meet customer demand for our products and could increase the cost of production versus our projections, both of which could adversely impact our operating results. Further, expenses and cost inefficiencies associated with our restructuring activities, including severance costs and the loss of trained employees with knowledge of our business and operations, could exceed our expectations and negatively impact our financial results.

Product defects or problems with integrating our products with other vendors' products used by our customers may seriously harm our business and reputation.

We produce complex products that can contain latent defects or performance problems. This could happen to both existing and new products. Such defects or performance problems could result in litigation against us and be detrimental to our business and reputation.

In addition, customers frequently integrate our products with other vendors' products. When problems occur in a combined environment, it may be difficult to identify the source of the problem. These problems may cause us to incur significant warranty and repair costs, divert the attention of our engineering personnel from our product development efforts, and cause significant customer relationship issues, any of which could adversely affect our results of operations and financial condition.

Disruptions in the supply of certain key components and other goods from our suppliers, including limited or single source suppliers, could have an adverse effect on the results of our business operations, and could damage our relationships with customers.

The production of our products requires a wide variety of raw materials, key components and other goods that are generally available from alternate sources of supply. However, certain critical raw materials, key components and other goods required for the production of some of our principal products are available from limited or single source of supply. If a single source supplier decides to stop producing a key component for us, or if the receipt of certain limited source or single source materials is otherwise delayed, our relationship with customers may be harmed if such decisions or delays cause us to miss our scheduled shipment deadlines. Our current or alternative sources may not be able to continue to meet all of our demands on a timely basis. If suppliers or subcontractors experience difficulties or fail to meet our manufacturing requirements, our business would be harmed until we are able to secure alternative sources, if any, on commercially reasonable terms. A prolonged inability to obtain certain raw materials, key components or other goods is possible and could have a significant adverse effect on our business operations, damage our relationships with customers, or even lead to permanent loss of customer orders.

In addition, certain of our businesses buy components, including limited or sole source items, from competitors of our other businesses. This dynamic may adversely impact our relationship with these suppliers. For example, these suppliers could increase the price of those components or reduce their supply of those components to us, which could have a significant adverse effect on our business operations or lead to permanent loss of customer orders.

If we fail to accurately forecast component and raw material requirements for our products, we could incur additional costs and experience significant delays in shipments, which could have an adverse effect on the results of our business operations, and could damage our relationships with customers.

We use rolling forecasts based on anticipated product orders to determine our production requirements. It is important that we accurately predict both the demand for our products and the lead times required to obtain the necessary components and raw materials to manufacture our products. Lead times for our components and raw materials vary significantly and depend on factors including the specific supplier requirements, the size of the order, contract terms and current market demand. For substantial increases in our sales levels of certain products, some of our suppliers may need significant lead time. If we overestimate our component and raw material requirements, we may have excess inventory, which would increase our costs. If we underestimate our component and raw material requirements, we may have inadequate inventory, which could interrupt and delay delivery of our products to customers. Any of these occurrences could adversely affect our results of operations and damage our relationships with customers.

Production difficulties and product delivery delays or disruptions could have a material adverse effect on our business.

We assemble our products at our facilities in the U.S., the U. K., Germany and China. Each of our products is typically manufactured in a single manufacturing location. If production activities at any of our manufacturing facilities were disrupted by a natural disaster or otherwise, our operations would be negatively impacted until we could establish alternative production and service operations. Significant production difficulties could be the result of:

- mistakes made while transferring manufacturing processes between locations;
- changing process technologies;
- ramping production;
- installing new equipment at our manufacturing facilities;
- implementing new information technology systems;
- shortage of key components; and
- loss of electricity or employees' access to the manufacturing facilities due to man-made and natural disasters.

From time to time, we determine to consolidate certain of our manufacturing facilities, or otherwise move our production of certain products to another facility. Moving complicated manufacturing facilities involves various risks, including the inability to commence production within the cost and timeframe estimated, damage to equipment, inability to produce a high-quality product, shipping delays, distraction to management and employees, and the inability to hire and retain a sufficient number of qualified personnel. Failure to successfully move manufacturing facilities due to these and other unforeseen risks could adversely affect our ability to meet customer demand, harm our relationships with customers, and adversely impact our results of operations and financial position.

In addition, we may experience product delivery delays in the future. We ship a significant portion of our products to our customers through independent package delivery and import/export companies. We also ship our products through national trucking firms, overnight carrier services and local delivery practices. If one or more of the package delivery or import/export providers experience significant disruption in services or institutes a significant price increase, the delivery of our products could be disrupted or delayed. Such events could cause us to incur increased shipping costs that could not be passed on to our customers, negatively impacting our profitability and our relationships with customers.

We are subject to extensive and dynamic medical device regulation, which may impede or hinder the approval or sale of our products and, in some cases, may ultimately result in an inability to obtain approval of certain products or may result in the recall or seizure of previously approved products.

Some of our products and the related sales and marketing development activities and manufacturing processes are subject to extensive and rigorous regulation by the FDA pursuant to the Federal Food, Drug, and Cosmetic Act (the "FDCA"), by comparable agencies in foreign countries, and by other regulatory agencies and governing bodies. Under the FDCA, medical devices must receive FDA clearance or approval or an exemption from such clearance or approval before they can be commercially marketed in the U.S. In the European Union, we are required to comply with applicable medical device directives (including the Medical Devices Directive) and to obtain CE Mark certification in order to market medical devices. The CE Mark is applied following approval from an independent notified body or declaration of conformity. The process of obtaining marketing approval or clearance from the FDA or by comparable agencies in foreign countries for new products, or with respect to enhancements or modifications to existing products, could:

- take a significant period of time;

- require the expenditure of substantial resources;
- involve rigorous pre-clinical and clinical testing, as well as increased post-market surveillance;
- require changes to products; and
- result in limitations on the indicated uses of products.

In addition, exported devices are subject to the regulatory requirements of each country to which the device is exported. Some countries do not have medical device regulations, but in most foreign countries, medical devices are regulated. Most countries outside of the U.S. require that product approvals be renewed or recertified on a regular basis, generally every four to five years. The renewal or recertification process requires that we evaluate any device changes and any new regulations or standards relevant to the device and conduct appropriate testing to document continued compliance. Where renewal or recertification applications are required, they may need to be renewed and/or approved in order for us to continue selling our products in those countries. There can be no assurance that we will receive the required approvals for new products or modifications to existing products on a timely basis or that any approval will not be subsequently withdrawn or conditioned upon extensive post-market study requirements.

In addition, on April 5, 2017, the European Parliament passed the Medical Devices Regulation (the “MDR”) which repeals and replaces the EU Medical Devices Directive. Unlike directives, which must be implemented into the national laws of the European Economic Area (the “EEA”) member states, the regulations are directly applicable (i.e., without the need for adoption of EEA member state laws implementing them) in all EEA member states and are intended to eliminate current differences in the regulation of medical devices among EEA member states. The MDR, among other things, is intended to establish a uniform, transparent, predictable and sustainable regulatory framework across the EEA for medical devices and in vitro diagnostic devices and ensure a high level of safety and health while supporting innovation. The MDR will, however, only become applicable three years after publication. Once applicable, the new regulations will, among other things:

- strengthen the rules on placing devices on the market and reinforce surveillance once they are available;
- establish explicit provisions on manufacturers’ responsibilities for the follow-up of the quality, performance and safety of devices placed on the market;
- improve the traceability of medical devices throughout the supply chain to the end-user or patient through a unique identification number;
- set up a central database to provide patients, healthcare professionals and the public with comprehensive information on products available in the European Union; and
- strengthen rules for the assessment of certain high-risk devices, such as implants, which may have to undergo an additional check by experts before they are placed on the market.

We face uncertainties as the MDR is rolled out and enforced by the European Commission and EEA competent authorities, creating risks in several areas including the CE Marking process and data transparency in the upcoming years.

The FDA and other worldwide regulatory agencies actively monitor compliance with local laws and regulations through review and inspection of design and manufacturing practices, recordkeeping, reporting of adverse events, labeling and promotional practices. The FDA can ban certain medical devices; detain or seize adulterated or misbranded medical devices; order recall, repair, replacement or refund of these devices; and require notification of healthcare professionals and others with regard to medical devices that present unreasonable risks of substantial harm to the public health. The FDA can take action against a company that promotes "off-label" uses. The FDA may also enjoin and restrain a company for certain violations of the FDCA and regulations pertaining to medical devices, or initiate action for criminal prosecution of such violations. Any adverse regulatory action, depending on its magnitude, may restrict a company from effectively marketing and selling its products, may limit a company's ability to obtain future premarket clearances or approvals, and could results in a substantial modification to the company's business practices and operations. International sales of medical devices manufactured in the U.S. that are not approved by the FDA for use in the U.S., or that are banned or deviate from lawful performance standards, are subject to FDA export

requirements.

Regulations regarding the development, manufacture and sale of medical devices are evolving and subject to future change. We cannot predict what impact, if any, those changes might have on our business. Failure to comply with regulatory requirements could have a material adverse effect on our business, financial condition and results of operations. Later discovery of previously unknown problems with a product or manufacturer could result in fines, delays or suspensions of regulatory clearances or approvals, seizures or recalls of products, physician advisories or other field actions, operating restrictions and/or criminal prosecution. We may also initiate field actions as a result of a failure to strictly comply with our internal quality policies. The failure to receive product approval clearance on a timely basis, suspensions of regulatory clearances, seizures or recalls of products, physician advisories or other field

actions, or the withdrawal of product approval by the FDA or by comparable agencies in foreign countries could have a material adverse effect on our business, financial condition and results of operations.

Our products and operations are subject to various foreign, U.S. federal, and state healthcare laws and regulations, which could expose us to penalties.

Our products and our operations may be directly, or indirectly through our customers, subject to various foreign, U.S. federal and state healthcare laws and regulations, including, without limitation, anti-kickback, false claims and privacy statutes. These laws may restrict, among other things, the development, sales, marketing and distribution of our products. These laws include:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying remuneration, directly or indirectly, to induce, or in return for, the purchase or recommendation of an item or service reimbursable under a federal healthcare program, such as the Medicare and Medicaid programs;
- federal civil and criminal false claims laws and civil monetary penalty laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, false or fraudulent claims for payment from Medicare, Medicaid, or other third-party payors;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPPA, which created new federal criminal statutes that prohibit executing a scheme to defraud any healthcare benefit program and making false statements relating to healthcare matters;
- HIPAA as amended by the Health Information Technology and Clinical Health Act, or HITECH, and its implementing regulations, which imposes certain requirements relating to the privacy, security, and transmission of individually identifiable health information;
- the federal physician “sunshine” requirements under PPACA, which requires manufacturers of drugs, devices, biologics, and medical supplies to report annually to CMS information related to payments and other transfers of value to physicians, other healthcare providers, and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members;
- state and foreign law equivalents of each of the above federal laws, such as anti-kickback and false claims laws that may apply to items or services reimbursed by any third-party payor, including commercial insurers; state laws that require device manufacturers to comply with the industry’s voluntary compliance guidelines and the applicable compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws that require device manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways, thus complicating compliance efforts.

Efforts to ensure that our business operations comply with applicable healthcare laws may involve substantial costs. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to, without limitation, civil, criminal and administrative penalties, damages, monetary fines, disgorgement, possible exclusion from participation in governmental healthcare programs, contractual damages, reputational harm, diminished profits and future earnings and curtailment or restructuring of our operations. Further, defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

Our business is indirectly subject to healthcare industry cost containment and healthcare reform measures that could result in reduced sales of our products.

Several of our customers rely on third party payors, such as government programs and private health insurance plans, to reimburse some or all of the cost of the procedures in which our products are used. The continuing efforts of governments, insurance companies and other payors of healthcare costs to contain or reduce those costs could lead to patients being unable to obtain approval for payment from these third-party payors for procedures in which our products are used. If that occurred, sales of medical devices may decline significantly and our customers may reduce or eliminate purchases of our products, or demand further price reductions. The cost containment measures that healthcare payors are instituting, both in the U.S. and internationally, could reduce our revenues and harm our operating results.

In addition, in the U.S. and other jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes to reform healthcare systems. For example, PPACA imposes an annual excise tax of 2.3% on any entity that manufactures or imports medical devices offered for sale in the U.S., with limited exceptions, although the

effective rate paid may be lower. Through a series of legislative amendments, the excise tax was suspended through December 31, 2019. On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas ruled that the PPACA was invalid due to the legislative repeal of the individual mandate. While the ruling will have no immediate effect, it is unclear how this decision, subsequent appeals, if any, and other efforts to repeal and replace the PPACA will impact the PPACA and our business. There may be additional challenges and amendments to the PPACA in the future. Other elements of health care reform such as comparative effectiveness research, an independent payment advisory board, payment system reforms including shared savings pilots and other provisions could meaningfully change the way healthcare is developed and delivered, and may materially adversely impact numerous aspects of our business, results of operations and financial condition. Changes in governmental regulations related to our business or our products could reduce demand for our products or increase our expenses.

We are subject to many governmental regulations, including, but not limited to, the laser radiation safety regulations of the Radiation Control for Health and Safety Act administered by the National Center for Devices and Radiological Health, a branch of the FDA, and certain health regulations related to the manufacture of products using beryllium, an element used in some of our products. Among other things, these regulations require us to file annual reports, to maintain quality control and sales records, to perform product testing, to distribute appropriate operating manuals, to conduct safety reviews, to incorporate design and operating features in products sold to end-users, and to certify and label our products. Depending on the class of the product, various warning labels must be affixed and certain protective devices must be installed.

We are also subject to regulatory oversight, including comparable enforcement mechanisms, in the markets we serve. We compete in many markets in which we and our customers must comply with federal, state, local and international regulations, such as environmental, health and safety and food and drug regulations. We develop, configure and market our products to meet customer needs created by those regulations. Any significant changes in these regulations could reduce demand for our products or increase our expenses, which in turn could adversely affect our business, financial condition, results of operations and cash flows.

Compliance or the failure to comply with current and future environmental regulations could result in significant costs.

Our operations are subject to a variety of federal, state, local and international environmental regulations relating to the use, storage, discharge and disposal of hazardous chemicals used during our manufacturing process or the recycling of products we manufacture. We are subject to regulations of the Environmental Protection Agency in the U.S. and comparable authorities in other countries. If we fail to comply with any present or future regulations, we could be subject to regulatory fines.

Future developments, administrative actions or liabilities relating to environmental matters could have a material adverse effect on our business, results of operations or financial condition. It is difficult to anticipate how such regulations will be implemented and enforced. We continue to evaluate the necessary steps for compliance with regulations as they are enacted. Certain regulations may require us to redesign our products to ensure compliance with the applicable standards. These redesigns may adversely affect the performance of our products, add greater testing lead-times for product introductions and reduce our profitability.

If we fail to implement new information technology systems successfully, our business could be adversely affected.

We rely on centralized information systems throughout the Company to keep financial records, process orders, manage inventory, process shipments to customers, and operate other critical functions. We are in the process of upgrading our information technology infrastructure, including implementing new enterprise resource planning (“ERP”) systems and other complementary information technology systems. We have invested, and will continue to invest,

significant capital and human resources in the upgrades and new ERP systems. Any disruptions, delays or deficiencies in the transition, design and implementation of the upgrades and new ERP systems, particularly any disruptions, delays or deficiencies that impact our operations, could have a material adverse effect on our results of operations and cash flows.

We may experience difficulties as we transition to these new upgraded systems and processes, including loss of data and the ability to process customer orders, ship products, provide services and support to our customers, issue sales invoices, collect accounts receivable, fulfill contractual obligations, satisfy internal and external financial reporting requirements in a timely manner, or otherwise run our business. We may also experience decreases in productivity as our personnel implement these systems and become familiar with the new systems. In addition, as we are dependent upon our ability to gather and promptly transmit accurate information to key decision makers, our business, results of operations and financial condition may be materially and adversely affected if our information technology infrastructure does not allow us to transmit accurate information, even for a short period of time. Furthermore, the transition, design and implementation of upgrades and new ERP systems may be much more costly than we anticipated.

Our results of operations will be adversely affected if we fail to realize the full value of our intangible assets.

As of December 31, 2018, we had $360.6 million of net intangible assets, including goodwill, on our consolidated balance sheet. Net intangible assets consist principally of goodwill, customer relationships, patents, trademarks, core technologies and technology

licenses. Goodwill and indefinite-lived intangible assets are tested for impairment at least on an annual basis. All other intangible assets are evaluated for impairment should discrete events occur that call into question the recoverability of the intangible assets.

Adverse changes in our business, adverse changes in the assumptions used to determine the fair value of our reporting units, or the failure to grow our businesses may result in an impairment of our intangible assets, which could adversely affect our results of operations.

We are exposed to the credit risk of some of our customers and to credit exposures in weakened markets, which could adversely affect our results of operations.

Customers with liquidity issues may lead to additional bad debt expense. There can be no assurance that our open credit customers will pay the amounts they owe to us or that the reserves we maintain will be adequate to cover such credit exposures. In addition, to the extent that turmoil in the credit markets or increases in interest rates make it more difficult for some customers to obtain financing, their ability to pay may be adversely impacted. Our customers' failure to pay and/or our failure to maintain sufficient reserves could have a material adverse effect on our future cash flows and financial condition.

Our reliance upon third party distribution channels subjects us to credit, inventory, business concentration, and business failure risks beyond our control.

We sell many of our products through resellers, distributors, and system integrators. As these third parties tend to have more limited financial resources than OEM and end-user customers, they generally represent sources of increased credit risk. Any downturn in the business of our resellers, distributors, and systems integrators would in turn harm our results of operations and financial condition.

Our sales also depend upon the ability of our OEM customers to develop and sell systems that incorporate our products. Adverse economic conditions, large inventory positions, limited marketing resources and other factors influencing these OEM customers could have a substantial adverse effect on our financial results. We cannot assure investors that our OEM customers will not experience financial or other difficulties that could adversely affect their operations and, in turn, adversely affect our results of operations and financial condition.

Risks Relating to Taxes

Novanta Inc. may be subject to U.S. federal income taxation even though it is a non-U.S. corporation.

Novanta, Inc. is a holding company organized in Canada and is subject to Canadian tax laws. However, we are also subject to U.S. tax rules and file U.S. federal income tax returns for our operations in the U.S. In addition, distributions or payments from entities in one jurisdiction to entities in another jurisdiction may be subject to income and/or withholding taxes. We do not intend to operate in a manner that will cause Novanta, Inc. to be treated as engaged in a U.S. trade or business or otherwise be subject to U.S. federal income taxes on its income, but it generally will be subject to U.S. federal withholding tax on certain U.S.-sourced passive income items, such as dividends and certain types of interest.

Tax audits by tax authorities could adversely affect future results.

We are subject to regular examination of our income tax returns by the Internal Revenue Service ("IRS") and other tax authorities. We regularly assess the likelihood of favorable or unfavorable outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. Although we believe our tax estimates are

reasonable, there can be no assurance that any final determination will not be materially different than the treatment reflected in our historical income tax provisions and accruals, which could materially and adversely affect our financial condition, net income and earnings per share.

Our effective tax rate is subject to fluctuation, which could impact our financial position and earnings per share.

Our effective tax rate is subject to fluctuation as the effective income tax rate for each year is a function of (a) taxable income levels in numerous tax jurisdictions, (b) our ability to utilize recognized deferred tax assets, (c) taxes, interest, or penalties resulting from tax audits and, (d) credits and deductions as a percentage of total taxable income. From time to time, the U.S., foreign and state governments make substantive changes to tax rules where significant judgment is required to determine the impact of such changes on our provision for income taxes, which may result in increased costs. Further, such tax law changes may cause our effective tax rate to fluctuate between periods.

Risks Relating to Our Common Shares and Our Capital Structure

We may require additional capital to adequately respond to business challenges or opportunities and repay or refinance our existing indebtedness, but this capital may not be available on acceptable terms or at all.

We may require additional capital to adequately respond to future business challenges or opportunities, including, but not limited to, the need to develop new products or enhance our existing products, maintaining or expanding research and development projects, the need to build inventory or to invest other cash to support business growth, and opportunities to acquire complementary businesses and technologies.

As of December 31, 2018, we had outstanding debt of $209.6 million under the amended and restated senior secured credit agreement (the "Second Amended and Restated Credit Agreement") and $189.9 million available to be drawn under the revolving credit facility. If we are unable to satisfy the conditions in the Second Amended and Restated Credit Agreement or our needs exceed the amounts available under the revolving credit facility, we may need to engage in equity or debt financings to obtain additional funds. If we raise additional funds through further issuances of equity or convertible debt securities, our existing shareholders could suffer significant dilution. Any new equity securities we issue could have rights, preferences and privileges superior to those of the holders of our common shares. Further, our Second Amended and Restated Credit Agreement restricts our ability to obtain additional debt financing from other sources. If we are unable to obtain adequate financing or obtain financing on terms satisfactory to us when we need it, our ability to continue to support our business growth and to respond to business challenges could be significantly limited. In addition, the terms of any additional equity or debt issuances may adversely affect the value and price of our common shares.

Global credit conditions have varied widely over the past decade and could continue to vary significantly in the future. Although these conditions have not affected our current plans, adverse credit conditions in the future could have a material negative impact on our ability to execute on future strategic initiatives.

Our existing indebtedness could adversely affect our future business, financial condition and results of operations.

As of December 31, 2018, we had $209.6 million of outstanding debt. This level of debt could have significant consequences on our future operations, including:

- reducing the availability of our cash flow to fund working capital, capital expenditures, research and development efforts, acquisitions and other general corporate purposes, and limiting our ability to obtain additional financing for these purposes;
- limiting our flexibility in planning for or reacting to, and increasing our vulnerability to, changes in our business, changes in the general economic environment, and market changes in the industries in which we operate; and
- placing us at a competitive disadvantage compared to our competitors that have less debt or are less leveraged.

Any of these factors could have an adverse effect on our business, financial condition and results of operations.

In addition, as a global corporation, we have significant cash reserves held in foreign countries. Some of these balances may not be immediately available to repay our debt.

Our Second Amended and Restated Credit Agreement contains covenants that limit our ability to engage in activities that may be in our long-term best interests. Our failure to comply with those covenants could result in an event of default which, if not cured or waived, could result in the acceleration of all of our borrowings thereunder.

The market price for our common shares may be volatile.

The market price of our common shares could be subject to wide fluctuations. These fluctuations could be caused by:

- quarterly variations in our results of operations;
- changes in earnings estimates by analysts;
- conditions in the markets we serve; or
- general market or economic conditions.

In addition, the stock market has experienced extreme price and volume fluctuations in recent years. These fluctuations have had a substantial effect on the market prices of many companies, often unrelated to the operating performance of the specific companies. These market fluctuations could adversely affect the price of our common shares.

Certain provisions of our corporate documents may delay or prevent a change in control of the Company.

Our corporate documents and our existence as a corporation under the laws of New Brunswick subject us to provisions of Canadian law that may enable our Board of Directors to resist a change in control of the Company. These provisions include:

- limitations on persons authorized to call a special meeting of shareholders;
- the ability to issue an unlimited number of common shares; and
- advance notice procedures required for stockholders to nominate candidates for election as directors or to bring matters before an annual meeting of shareholders.

These anti-takeover defenses could discourage, delay or prevent a transaction involving a change in control of the Company. These provisions could also discourage proxy contests and make it more difficult for shareholders to elect directors of their choosing and cause us to take other corporate actions that shareholders desire. In addition, under New Brunswick law, cumulative voting is mandatory in director elections which can result in stockholders holding less than a majority of shares being able to elect persons to the Board of Directors and prevent a majority stockholder from controlling the election of all of the directors.

Risks Relating to Our Internal Controls

If we fail to maintain appropriate internal controls in the future, we may not be able to report our financial results accurately, which may adversely affect our stock price and our business.

While our management and our independent registered public accounting firm concluded that our internal control over financial reporting was effective as of December 31, 2018, it is possible that material weaknesses may be identified in the future.

If we are unable to maintain effective internal controls, we may not have adequate, accurate or timely financial information, and we may be unable to meet our reporting obligations as a publicly traded company or to comply with the requirements of the SEC or the Sarbanes-Oxley Act of 2002. This could result in a restatement of our financial statements, the imposition of sanctions, including the inability of registered broker dealers to make a market in our common shares, or investigation by regulatory authorities. Any such action or other negative results caused by our inability to meet our internal control and financial reporting requirements or to comply with legal and regulatory requirements could adversely affect the trading price of our common shares and our business. Material weaknesses in our internal control over financial reporting could also reduce our ability to obtain financing or could increase the cost of any financing we obtain.

As part of our growth strategy, we may make additional acquisitions of privately held businesses. Prior to becoming part of our consolidated company, the acquired businesses would not be required to implement or maintain the disclosure controls and procedures or internal control over financial reporting that are required of public companies. We are required to integrate the acquired businesses into our consolidated company’s system of disclosure controls and procedures and internal control over financial reporting, but we cannot provide assurance as to how long the integration process may take for our recently acquired businesses or any businesses that we may acquire in the future. Additionally, we may need to improve our internal control or those of any business we acquire and may be required to design enhanced processes and controls in order to make such improvements. This could result in significant costs to us and could require us to divert substantial resources, including management time and attention, from other activities.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our principal owned and leased properties as of December 31, 2018 are listed in the table below.

Location	Principal Use	Current Segment	Approximate Square Feet	Owned/Leased
Bedford, Massachusetts, United States	Manufacturing, R&D, Marketing, Sales and Administration	Photonics, Precision Motion & Corporate	147,000	Leased; expires in 2031
Ludwigsstadt, Germany	Manufacturing	Vision	105,000	Owned
San Jose, California, United States	Manufacturing, R&D, Marketing, Sales and Administration	Vision	73,000	Leased; expires in 2019
Mukilteo, Washington, United States	Manufacturing, R&D, Marketing, Sales and Administration	Photonics	63,000	Owned
North Syracuse, New York, United States	Manufacturing, R&D, Marketing, Sales and Administration	Vision	55,000	Leased; expires in 2029
Suzhou, People's Republic of China	Manufacturing, R&D, Marketing, Sales and Administration	Photonics, Vision & Precision Motion	55,000	Leased; expires in 2023
Poole, United Kingdom	Manufacturing, R&D, Marketing, Sales and Administration	Precision Motion	51,000	Building owned; land leased through 2078
Berlin, Germany	R&D, Marketing, Sales and Administration	Vision	51,000	Leased; expires in 2026

Manchester, United Kingdom	Manufacturing, R&D, Marketing, Sales and Administration	Photonics	35,000	(1)
Phoenix, Arizona, United States	Manufacturing, R&D, Marketing, Sales and Administration	Photonics	31,000	Owned
Rocklin, California, United States	Manufacturing, R&D, Marketing, Sales and Administration	Precision Motion	28,000	Leased; expires in 2023
Taunton, United Kingdom	Manufacturing, R&D, Marketing and Sales	Photonics	19,000	Leased; expires in 2019

(1) Novanta owns one facility of 9,000 square feet and leases six other facilities of 26,000 square feet in aggregate with lease expiration dates ranging from 2019 to 2026.

A portion of our leased facility in San Jose, California is currently under-utilized. As of December 31, 2018, the Company had exited approximately 22,000 square feet of this facility.

Additional research and development, sales, service and logistics sites are located in Arizona, California, Florida, New York, Oregon and Colorado, United States; Munich, Reichenbach and Konstanz, Germany; Cambridge, United Kingdom; Breda, the Netherlands; Brno, Czech Republic; Tokyo, Japan; Beijing, Shenzhen and Hong Kong, China; and Milan, Italy. These additional offices are leased facilities occupying approximately 120,000 square feet in the aggregate, and are related to our Photonics, Vision and Precision Motion segments.

Item 3. Legal Proceedings

The Company is subject to various legal proceedings and claims that arise in the ordinary course of business. The Company does not believe that the outcome of these claims will have a material adverse effect upon its financial condition or results of operations but there can be no assurance that any such claims, or any similar claims, would not have a material adverse effect upon its financial condition or results of operations.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Market Information

The Company's common shares, no par value, are traded on the Nasdaq Global Select Market under the symbol "NOVT".

Holders

As of the close of business on February 19, 2019, there were approximately 37 holders of record of the Company's common shares. Since many of the common shares are registered in "nominee" or "street" names, the Company believes that the total number of beneficial owners is considerably higher.

Dividend Policy

The Company has never declared or paid cash dividends on its common shares and does not anticipate paying any cash dividends in the foreseeable future.

Purchases of Equity Securities by the Issuer and Affiliated Purchaser

In October 2013, the Company's Board of Directors authorized a share repurchase plan (the "2013 Repurchase Plan") for the repurchase of up to an aggregate of $10.0 million of the Company's common shares. As of December 31, 2018, the Company had completed the 2013 Repurchase Plan and had repurchased an aggregate of 385 thousand common shares.

The following table sets forth certain information with respect to repurchases of the Company's common shares under the 2013 Repurchase Plan for the periods indicated.

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value that May Yet Be Purchased Under the Plans or Programs
October 1 - November 2, 2018	11,750	$ 64.15	11,750	$ 1,325,330
November 3 - November 30, 2018	8,000	$ 68.92	8,000	$ 773,963
December 1 - December 31, 2018	12,767	$ 61.13	12,767	—

Total	32,517	32,517

In October 2018, the Company's Board of Directors approved a new share repurchase plan (the "2018 Repurchase Plan") authorizing the repurchase of an additional $25.0 million worth of common shares. The 2018 Repurchase Plan does not obligate the Company to acquire any particular amount of our common shares. No time limit was set for the completion of the 2018 Repurchase Plan, and the plan may be suspended or discontinued at any time. No shares had been repurchased under the 2018 Repurchase Plan as of December 31, 2018.

Performance Graph

The following graph compares the cumulative total return on the Company's common shares with the cumulative total return on the Nasdaq Composite Index and the Russell 2000 Index for the period from December 31, 2013 through December 31, 2018. The comparison assumes an investment of $100 is made on December 31, 2013 in the Company's common shares and in each of the indices and, in the case of the indices, it also assumes reinvestment of all dividends. The performance shown is not necessarily indicative of future performance.

	December 31, 2013	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017	December 31, 2018
Novanta Inc.	$ 100.00	$ 130.96	$ 121.17	$ 186.83	$ 444.84	$ 560.50
Nasdaq Composite Index	$ 100.00	$ 114.75	$ 122.74	$ 133.62	$ 173.22	$ 168.30
Russell 2000 Index (1)	$ 100.00	$ 104.89	$ 100.26	$ 121.63	$ 139.49	$ 124.09

(1)

Item 6. Selected Financial Data

The selected financial data set forth below is not necessarily indicative of results of future operations, and should be read in conjunction with "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Item 7 and the consolidated financial statements and related notes thereto in Item 8 of this Annual Report on Form 10-K to fully understand factors that may affect the comparability of the information presented below. The selected consolidated financial data in this section is not intended to replace the consolidated financial statements.

The consolidated statement of operations data for the years ended December 31, 2018, 2017 and 2016 and the consolidated balance sheet data as of December 31, 2018 and 2017 are derived from our audited consolidated financial statements included in this Annual Report on Form 10-K. The consolidated statement of operations data for the years ended December 31, 2015 and 2014 and the consolidated balance sheet data as of December 31, 2016, 2015 and 2014 are derived from our audited consolidated financial statements that are not included in this Annual Report on Form 10-K.

	Year Ended December 31,				
	2018	2017 (1)	2016	2015	2014
	(In thousands, except per share data)				
Consolidated Statement of Operations Data:					
Revenue	$614,337	$521,290	$384,758	$373,598	$364,706
Gross profit	261,528	220,531	162,452	157,890	150,167
Operating expenses (2) (3)	190,515	162,965	129,497	128,586	166,896
Operating income (loss) from continuing operations (2) (3)	71,013	57,566	32,955	29,304	(16,729)
Income (loss) from continuing operations before income taxes (2) (4) (5)	61,302	76,134	32,522	46,022	(17,915)
Income tax provision (benefit)	10,207	13,827	10,519	10,394	(1,006)
Income (loss) from continuing operations	51,095	62,307	22,003	35,628	(16,909)
Loss from discontinued operations, net of tax	—	—	—	(13)	(5,607)
Loss on disposal of discontinued operations, net of tax (6)	—	—	—	—	(1,726)
Consolidated net income (loss)	51,095	62,307	22,003	35,615	(24,242)
Less: Net income attributable to noncontrolling interest	(1,986)	(2,256)	—	—	(10)
Net income (loss) attributable to Novanta Inc.	$49,109	$60,051	$22,003	$35,615	$(24,252)
Earnings (loss) per common share from continuing operations. (7):					
Basic	$1.46	$1.14	$0.63	$1.03	$(0.49)
Diluted	$1.43	$1.13	$0.63	$1.02	$(0.49)
Loss per common share from discontinued operations:					
Basic	$—	$—	$—	$(0.00)	$(0.21)
Diluted	$—	$—	$—	$(0.00)	$(0.21)
Earnings (loss) per common share attributable to Novanta Inc. (7):					
Basic	$1.46	$1.14	$0.63	$1.03	$(0.70)
Diluted	$1.43	$1.13	$0.63	$1.02	$(0.70)
Weighted average common shares outstanding—basic	34,913	34,817	34,694	34,579	34,352
Weighted average common shares outstanding—diluted	35,473	35,280	34,914	34,827	34,352

(1) In 2017, the Company completed the acquisitions of WOM, Laser Quantum and ThingMagic businesses, which contributed a total of $102.7 million in revenue for the year ended December 31, 2017. The operating results of these businesses have been included in the consolidated statement of operations since their respective acquisition dates.

(2) In 2014, the Company recorded an impairment charge of $41.4 million related to goodwill ($19.6 million) and identifiable intangible assets ($21.8 million) of our NDS business acquired in January 2013.

(3) In May 2017, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2017-07, "Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost." ASU 2017-07 requires employers that offer or maintain defined benefit plans to disaggregate the service component from the other components of net periodic benefit cost and provides guidance on the presentation of the service component and the other components of net periodic benefit cost in the statement of operations. The Company retrospectively adopted the provisions of ASU 2017-07 during 2018. Amounts prior to 2018 have been revised to conform with this presentation.

(4) In 2015, the Company sold its JK Lasers business and recorded a gain on disposal of $19.6 million.

(5) In 2017, the Company acquired an additional approximately 35% of the outstanding shares of Laser Quantum and recorded a gain of $26.4 million, representing the excess of the fair value of the Company's previously-held equity interest in Laser Quantum over its carrying value upon gaining control.
(6) In 2014, the Company sold its Scientific Lasers business and recorded a loss on disposal, net of tax, of $1.7 million.
(7) In the computation of earnings per common share attributable to Novanta Inc., net income attributable to Novanta Inc. included $1.8 million and ($20.2) million of redeemable noncontrolling interest redemption value adjustment for the years ended December 31, 2018 and 2017, respectively.

	December 31,				
	2018	2017 (1)	2016	2015	2014
	(in thousands)				
Consolidated Balance Sheet Data:					
Cash and cash equivalents	$82,043	$100,057	$68,108	$59,959	$51,146
Total assets (2)	719,576	726,703	425,637	416,045	396,294
Debt, current (2)	4,535	9,119	7,366	7,385	7,345
Debt, long-term (2)	202,843	225,500	70,554	88,426	105,030
Long-term liabilities, excluding debt	44,282	44,567	25,717	25,965	25,951
Redeemable noncontrolling interest (3)	—	46,923	—	—	—
Total stockholders' equity	368,255	311,545	258,870	244,701	210,825

(1) In 2017, the Company completed the acquisitions of WOM, Laser Quantum and ThingMagic businesses. Total assets acquired amounted to $284.4 million as of the acquisition date. The acquisitions were financed with borrowings under the revolving credit facility in the aggregate amount of $176.8 million.
(2) In April 2015, the FASB issued ASU 2015-03, "Simplifying the Presentation of Debt Issuance Costs." ASU 2015-03 requires debt issuance related costs to be presented in the balance sheet as a direct reduction to the carrying amount of the associated debt liability. The Company adopted the provisions of ASU 2015-03 during 2015. Amounts prior to 2015 have been revised to conform with this presentation.
(3) In 2017, the Company acquired an additional approximately 35% of the outstanding shares of Laser Quantum, which increased our ownership position in Laser Quantum from approximately 41% to approximately 76%. The noncontrolling interest was considered a redeemable equity instrument and was presented as temporary equity on the consolidated balance sheet at the greater of the carrying value or the estimated redemption value of the noncontrolling interest. In 2018, the Company acquired the remaining approximately 24% of the outstanding shares of Laser Quantum.

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

Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") should be read in conjunction with the Consolidated Financial Statements and Notes included in Item 8 of this Annual Report on Form 10-K. The MD&A contains certain forward looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. In addition to historical financial information, the following discussion and analysis contains forward-looking statements that involve risks, uncertainties and assumptions. These forward-looking statements include, but are not limited to, our belief that the Purchasing Managers Index ("PMI") may provide an indication of the impact of general economic conditions on our sales into the advanced industrial end market; our strategy; anticipated financial performance; expected liquidity and capitalization; drivers of revenue growth and our growth expectations in various markets; management's plans and objectives for future operations, expenditures and product development, and investments in research and development; business prospects; potential of future product releases and expansion of our product and service offerings; anticipated revenue performance; industry trends; market conditions; our competitive positions; changes in economic and political conditions; changes in accounting principles; changes in actual or assumed tax liabilities; expectations regarding tax exposures; anticipated reinvestment of future earnings and dividend policy; anticipated expenditures in regard to the Company's benefit plans; future acquisitions, integration and anticipated benefits from acquisitions and dispositions; anticipated economic benefits and expected costs of restructuring programs; ability to repay our indebtedness; our intentions regarding the use of cash; expectations regarding legal and regulatory environmental requirements and our compliance thereto; and other statements that are not historical facts. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of various important factors, including those set forth in Item 1A of this Annual Report on Form 10-K under the heading "Risk Factors." The words "anticipates," "believes," "expects," "intends," "future," "c "estimates," "plans," "would," "should," "potential," "continues," and similar words or expressions (as well as other words or expressions referencing future events, conditions or circumstances) identify forward looking statements. Readers should not place undue reliance on any such forward looking statements, which speak only as of the date they are made. Management and the Company disclaim any obligation to publicly update or revise any such statements to reflect any change in its expectations or in events, conditions, or circumstances on which any such statements may be based, or that may affect the likelihood that actual results will differ from those contained in the forward looking statements, except as required under applicable law.

Business Overview

Novanta Inc. and its subsidiaries (collectively referred to as, the "Company", "Novanta", "we", "us", "our") is a leading global supplier of core technology solutions that give medical and advanced industrial original equipment manufacturers ("OEMs") a competitive advantage. We combine deep proprietary technology expertise and competencies in photonics, vision and precision motion with a proven ability to solve complex technical challenges. This enables us to engineer core components and sub-systems that deliver extreme precision and performance, tailored to our customers' demanding applications.

End Markets

We primarily operate in two end markets: the advanced industrial market and the medical market.

Advanced Industrial Market

For the year ended December 31, 2018, the advanced industrial market accounted for approximately 50% of our revenue. Revenue from our products sold to the advanced industrial market is affected by a number of factors, including changing technology requirements and preferences of our customers, productivity or quality investments in

a manufacturing environment, the financial condition of our customers, changes in regulatory requirements and laws, and general economic conditions. We believe that the Purchasing Managers Index (PMI) on manufacturing activities specific to different regions around the world may provide an indication of the impact of general economic conditions on our sales into the advanced industrial market.

Medical Market

For the year ended December 31, 2018, the medical market accounted for approximately 50% of our revenue. Revenue from our products sold to the medical market is generally affected by hospital and other healthcare provider capital spending, changes in regulatory requirements and laws, aggregation of purchasing by healthcare networks, trends in surgical procedures, changes in technology requirements, changes in customer or patient preferences, and general demographic trends.

Strategy

Our strategy is to drive sustainable, profitable growth through short-term and long-term initiatives, including:

- disciplined focus on our diversified business model of providing functionality to long life-cycle OEM customer platforms in attractive medical and advanced industrial niche markets;
- improving our business mix to increase medical sales as a percentage of total revenue by:
  - introducing new products aimed at attractive medical applications, such as minimally invasive and robotic surgery, ophthalmology, patient monitoring, drug delivery, clinical laboratory testing and life science equipment;
  - deepening our key account management relationships with and driving cross selling of our product offerings to leading medical equipment manufacturers; and
  - pursuing complementary medical technology acquisitions;
- increasing our penetration of high growth advanced industrial applications, such as laser materials processing, robotics, automation and metrology, by working closely with OEM customers to launch application specific products that closely match the requirements of each application;
- broadening our portfolio of enabling proprietary technologies and capabilities through increased investment in new product development, expanded sales and marketing channels to reach target customers, and investments in application development to further penetrate existing customers, while expanding the applicability of our solutions to new markets;
- broadening our product and service offerings through the acquisition of innovative and complementary technologies and solutions in medical and advanced industrial technology applications, including increasing our recurring revenue streams such as services, spare parts and consumables;
- improving our existing operations to expand profit margins and improve customer satisfaction by implementing lean manufacturing principles and strategic sourcing across our major production sites; and
- attracting, retaining, and developing world-class talented and motivated employees.

Significant Events and Updates

Acquisition of Zettlex Holdings Limited

On May 1, 2018, we acquired 100% of the outstanding stock of Zettlex Holdings Limited (“Zettlex”), a Cambridge, United Kingdom-based provider of inductive encoder products that provide absolute and accurate positioning, even in extreme operating environments, to OEMs in the medical and advanced industrial markets. The purchase price of £23.3 million ($32.0 million), net of working capital adjustments, was financed with cash on hand and borrowings under our revolving credit facility. We expect that the addition of Zettlex will broaden the range of components and solutions that we can provide our customers by combining our commercial resources and application-specific competencies with Zettlex's technologies and strong team. Zettlex is included in our Precision Motion reportable segment.

Acquisition of Remaining Equity Ownership in Laser Quantum

On September 27, 2018, we acquired the remaining approximately 24% of the outstanding shares of Laser Quantum for an aggregate consideration of $45.1 million in cash and restricted stock. The acquisition of these noncontrolling interests was accounted for as a transaction among shareholders. No gain or loss was recognized in the consolidated statement of operations. The total purchase price was financed with cash on hand, borrowings under our credit facility, and the issuance of 213,219 shares of restricted stock with a fair market value of $14.4 million. The restricted stock will become fully vested upon achievement of certain milestones as specified in the restricted stock agreement. Restricted stock not otherwise vested as of December 31, 2025 will be subject to forfeiture.

Overview of Financial Results

Total revenue for 2018 was $614.3 million, an increase of $93.0 million, or 17.8%, versus 2017. The effect of our acquisitions in 2017 and 2018 resulted in an increase in revenue of $52.9 million, or 10.2%. Foreign exchange rates positively impacted our revenue by $3.7 million, or 0.6%, in 2018.

Operating income increased $13.4 million from $57.6 million in 2017 to $71.0 million in 2018. This increase was primarily attributable to an increase in gross profit of $41.0 million as a result of higher revenue, partially offset by an increase in operating expenses of $27.5 million, primarily due to acquisitions in 2017 and 2018.

Diluted earnings per share ("EPS") of $1.43 in 2018 increased $0.30 from an EPS of $1.13 in 2017. This increase was primarily attributable to higher operating income and a $22.0 million decrease in the Laser Quantum nontaxable redeemable noncontrolling interest redemption value adjustment from 2017, partially offset by the $26.4 million nontaxable gain recognized from the acquisition of the additional approximately 35% of Laser Quantum equity interest in 2017. Diluted EPS for the year ended December 31, 2018 was positively impacted by a $1.8 million redeemable noncontrolling interest redemption value adjustment, while Diluted EPS for the year ended December 31, 2017 was negatively impacted by a $20.2 million redeemable noncontrolling interest redemption value adjustment. (See Note 10 to the accompanying Consolidated Financial Statements.)

Specific components of our operating results for 2018, 2017 and 2016 are further discussed below.

Results of Operations

The following table sets forth our results of operations as a percentage of revenue for the years indicated:

	2018	2017	2016
Revenue	100.0%	100.0%	100.0%
Cost of revenue	57.4	57.7	57.8
Gross profit	42.6	42.3	42.2
Operating expenses:			
Research and development and engineering	8.3	8.0	8.3
Selling, general and administrative	18.9	19.5	21.1
Amortization of purchased intangible assets	2.5	2.3	2.1
Restructuring, acquisition and divestiture related costs	1.3	1.4	2.1
Total operating expenses	31.0	31.3	33.7
Operating income	11.6	11.0	8.6
Interest income (expense), net	(1.6)	(1.4)	(1.2)
Foreign exchange transaction gains (losses), net	0.0	(0.1)	0.6
Other income (expense), net	(0.0)	(0.0)	0.5
Gain on acquisition of business	—	5.1	—
Income before income taxes	10.0	14.6	8.5
Income tax provision	1.7	2.7	2.7
Consolidated net income	8.3	12.0	5.7
Less: Net income attributable to noncontrolling interest	(0.3)	(0.4)	—
Net income attributable to Novanta Inc.	8.0%	11.5%	5.7%

Revenue

The following table sets forth external revenue by reportable segment for 2018, 2017 and 2016 (dollars in thousands):

	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Photonics	$249,339	$232,359	$174,158	7.3 %	33.4 %
Vision	232,902	183,074	122,250	27.2 %	49.8 %
Precision Motion	132,096	105,857	88,350	24.8 %	19.8 %
Total	$614,337	$521,290	$384,758	17.8 %	35.5 %

Photonics

Photonics segment revenue in 2018 increased by $17.0 million, or 7.3%, versus 2017, due to an increase in revenue across all of our product lines. Revenue from our laser beam delivery products increased $13.1 million as a result of increased volumes in the advanced industrial and medical markets.

Photonics segment revenue in 2017 increased by $58.2 million, or 33.4%, versus 2016, primarily as a result of the Laser Quantum acquisition, which increased segment revenues by $44.7 million, and an increase in revenue of our laser beam delivery products and our CO2 lasers products as a result of increased volumes in the advanced industrial market.

Vision

Vision segment revenue in 2018 increased by $49.8 million, or 27.2%, versus 2017. The increase was primarily due to a $46.9 million increase in revenue as a result of full-year revenue from WOM being included in 2018 results.

Vision segment revenue in 2017 increased by $60.8 million, or 49.8%, versus 2016. The increase was primarily due to a $58.4 million increase in revenue as a result of the WOM, ThingMagic and Reach acquisitions.

Precision Motion

Precision Motion segment revenue in 2018 increased by $26.2 million, or 24.8%, versus 2017. The increase was primarily due to an increase in revenue across all of our product lines as a result of increased demand in the advanced industrial and medical markets and the Zettlex acquisition in May 2018.

Precision Motion segment revenue in 2017 increased by $17.5 million, or 19.8%, versus 2016. The increase was primarily due to an increase in revenue of our Celera Motion products and our air bearing spindles products as a result of increased demand in the advanced industrial and medical markets.

Gross Profit

The following table sets forth the gross profit and gross profit margin for each of our reportable segments for 2018, 2017 and 2016 (dollars in thousands):

	2018	2017	2016
Gross profit:			
Photonics	$117,109	$106,117	$76,696
Vision	87,198	69,249	47,181
Precision Motion	59,477	46,564	40,044
Unallocated Corporate and Shared Services	(2,256)	(1,399)	(1,469)
Total	$261,528	$220,531	$162,452
Gross profit margin:			
Photonics	47.0%	45.7%	44.0%
Vision	37.4%	37.8%	38.6%
Precision Motion	45.0%	44.0%	45.3%
Total	42.6%	42.3%	42.2%

Gross profit and gross profit margin can be influenced by a number of factors, including product mix, pricing, volume, manufacturing efficiencies and utilization, costs for raw materials and outsourced manufacturing, headcount, inventory obsolescence and warranty expenses.

Photonics

Photonics segment gross profit for 2018 increased $11.0 million, or 10.4%, versus 2017, due to an increase in revenue. Photonics segment gross profit margin was 47.0% for 2018, compared with a gross profit margin of 45.7% for 2017. The increase in gross profit margin was primarily attributable to changes in product mix, productivity improvements and reductions in cost of poor quality. Amortization of inventory fair value adjustments and amortization of developed technologies also decreased $2.0 million, which resulted in a 0.8 percentage point increase in gross profit margin.

Photonics segment gross profit for 2017 increased $29.4 million, or 38.4%, versus 2016, due to an increase in revenue as a result of the Laser Quantum acquisition and increased volumes in our legacy product lines. Photonics segment gross profit margin was 45.7% for 2017, compared with a gross profit margin of 44.0% for 2016. The increase in gross profit margin was primarily attributable to the Laser Quantum acquisition. Gross profit margin for the year ended December 31, 2017 was negatively impacted by an increase in amortization of inventory fair value adjustments and amortization of developed technology of $3.2 million.

Vision

Vision segment gross profit for 2018 increased $17.9 million, or 25.9%, versus 2017, primarily due to full-year gross profit from WOM being included in 2018 results. Vision segment gross profit margin was 37.4% for 2018, compared with a gross profit margin of 37.8% for 2017. The decrease in gross profit margin was primarily attributable to unfavorable product mix, partially offset by a net decrease in amortization of inventory fair value adjustments and amortization of developed technologies of $1.9 million, which resulted in a 0.8 percentage point increase in gross profit margin.

Vision segment gross profit for 2017 increased $22.1 million, or 46.8%, versus 2016. The increase was primarily attributable to an increase in revenue from the WOM, ThingMagic and Reach acquisitions, which increased gross profit by $17.6 million. Vision segment gross profit margin was 37.8% for 2017, compared with a gross profit margin of 38.6% for 2016. The decrease in gross profit margin was primarily attributable to an increase in amortization of inventory fair value adjustments and amortization of developed technology of $6.1 million, which resulted in a 3.3 percentage point decrease in gross profit margin, partially offset by changes in product mix and cost savings from restructuring activities in 2016.

Precision Motion

Precision Motion segment gross profit for 2018 increased $12.9 million, or 27.7%, versus 2017, primarily due to an increase in revenue. Precision Motion segment gross profit margin was 45.0% for 2018, compared with a gross profit margin of 44.0% for 2017. The increase in gross profit margin was primarily related to changes in product mix.

Precision Motion segment gross profit for 2017 increased $6.5 million, or 16.3%, versus 2016, primarily due to an increase in revenue. Precision Motion segment gross profit margin was 44.0% for 2017, compared with a gross profit margin of 45.3% for 2016. The decrease in gross profit margin was attributable to temporary supply chain transition challenges in our Celera Motion business, which led to production inefficiencies and quality impacts.

Operating Expenses

The following table sets forth operating expenses for 2018, 2017 and 2016 (dollars in thousands):

				% Change	
	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Research and development and engineering	$51,024	$41,673	$32,002	22.4%	30.2%
Selling, general and administrative	115,900	101,654	81,299	14.0%	25.0%
Amortization of purchased intangible assets	15,550	12,096	8,251	28.6%	46.6%
Restructuring, acquisition and divestiture related costs	8,041	7,542	7,945	6.6%	(5.1)%

Total	$190,515	$162,965	$129,497	16.9%	25.8 %

Research and Development and Engineering Expenses

Research and development and engineering ("R&D") expenses are primarily comprised of employee compensation and related expenses and cost of materials for R&D projects.

R&D expenses were $51.0 million, or 8.3% of revenue, in 2018, versus $41.7 million, or 8.0% of revenue, in 2017. R&D expenses increased in terms of total dollars and as a percentage of revenue primarily due to higher investments across the majority of our product lines and acquisitions in 2017 and 2018.

R&D expenses were $41.7 million, or 8.0% of revenue, in 2017, versus $32.0 million, or 8.3% of revenue, in 2016. R&D expenses increased in terms of total dollars primarily due to R&D expenses from acquisitions in 2016 and 2017.

Selling, General and Administrative Expenses

Selling, general and administrative ("SG&A") expenses include costs for sales and marketing, sales administration, finance, human resources, legal, information systems and executive management.

SG&A expenses were $115.9 million, or 18.9% of revenue, in 2018, versus $101.7 million, or 19.5% of revenue, in 2017. SG&A expenses increased in terms of total dollars primarily due to acquisitions in 2017 and 2018, and an increase in compensation as a result of higher headcount and stock-based compensation expense.

SG&A expenses were $101.7 million, or 19.5% of revenue, in 2017, versus $81.3 million, or 21.1% of revenue, in 2016. SG&A expenses increased in terms of total dollars primarily due to acquisitions in 2016 and 2017, investments in sales and marketing resources and higher variable compensation associated with the Company's financial performance.

Amortization of Purchased Intangible Assets

Amortization of purchased intangible assets is charged to our Photonics, Vision and Precision Motion segments. Amortization of core technologies is included in cost of revenue in the consolidated statement of operations. Amortization of customer relationships, trademarks, backlog and other intangibles are included in operating expenses in the consolidated statement of operations.

Amortization of purchased intangible assets, excluding the amortization of developed technologies that is included in cost of revenue, was $15.6 million, or 2.5% of revenue, in 2018, versus $12.1 million, or 2.3% of revenue, in 2017. The increase, in terms of total dollars and as a percentage of revenue, was the result of acquired intangible assets from acquisitions in 2017 and 2018.

Amortization of purchased intangible assets, excluding the amortization of developed technologies that is included in cost of revenue, was $12.1 million, or 2.3% of revenue, in 2017, versus $8.3 million, or 2.1% of revenue, in 2016. The increase, in terms of total dollars and as a percentage of revenue, was the result of acquired intangible assets from acquisitions in 2016 and 2017.

Restructuring, Acquisition and Divestiture Related Costs

Restructuring, acquisition and divestiture related charges primarily relate to our restructuring programs, acquisition related costs incurred for completed acquisitions, acquisition costs related to future potential acquisitions and failed acquisitions, and changes in fair value of contingent considerations.

We recorded restructuring, acquisition and divestiture related costs of $8.0 million in 2018, versus $7.5 million in 2017. The increase in restructuring, acquisition and divestiture related costs versus 2017 was primarily due to a $1.7 million increase in restructuring related charges as a result of the 2018 and 2019 restructuring programs, partially offset by a decrease in acquisition related charges of $1.2 million mostly attributable to an investment banking success fee related to the acquisition of WOM in 2017.

We recorded restructuring, acquisition and divestiture related costs of $7.5 million in 2017, versus $7.9 million in 2016. The decrease in restructuring, acquisition and divestiture related costs versus 2016 was primarily due to a $2.6 million decrease in restructuring related charges as a result of the 2016 restructuring program which was substantially completed in 2016, partially offset by an increase in acquisition related charges of $2.2 million mostly attributable to an investment banking success fee related to the WOM acquisition.

Operating Income (Loss) by Segment

The following table sets forth operating income (loss) by segment for 2018, 2017 and 2016 (in thousands):

	2018	2017	2016
Operating Income (Loss)			
Photonics	$59,285	$51,660	$35,217
Vision	8,991	7,883	(1,277)
Precision Motion	31,674	27,146	21,101
Unallocated Corporate and Shared Services	(28,937)	(29,123)	(22,086)
Total	$71,013	$57,566	$32,955

Photonics

Photonics segment operating income was $59.3 million, or 23.8% of revenue, in 2018, versus $51.7 million, or 22.2% of revenue, in 2017. The increase in operating income was primarily due to an increase in gross profit of $11.0 million, partially offset by an increase in R&D expenses and SG&A expenses of $3.7 million. Photonics segment operating income was favorably affected by a $2.3 million decrease in amortization of inventory fair value adjustments and amortization of intangible assets.

Photonics segment operating income was $51.7 million, or 22.2% of revenue, in 2017, versus $35.2 million, or 20.2% of revenue, in 2016. The increase in operating income was primarily due to an increase in gross profit of $29.4 million, partially offset by increases in operating expenses, primarily related to the Laser Quantum acquisition and increased volumes in our legacy product lines. Photonics segment operating income for the year ended December 31, 2017 was negatively affected by a $7.1 million increase in amortization of inventory fair value adjustments and amortization of intangible assets.

Vision

Vision segment operating income was $9.0 million, or 3.9% of revenue, in 2018, versus $7.9 million, or 4.3% of revenue, in 2017. The increase in operating income in terms of total dollars was primarily due to an increase in gross profit, partially offset by the inclusion of full-year operating expenses from WOM in 2018. Vision segment operating income was negatively affected by a $1.1 million net increase in amortization of inventory fair value adjustments and amortization of intangible assets.

Vision segment operating income was $7.9 million, or 4.3% of revenue, in 2017, versus an operating loss of $1.3 million, or (1.0%) of revenue, in 2016. The increase in operating income was primarily due to an increase in gross profit of $22.1 million and a decrease in spending primarily related to our 2016 restructuring program, which was substantially completed in 2016, partially offset by an increase in R&D and SG&A expenses related to acquisitions in 2017. Vision segment operating income for the year ended December 31, 2017 was negatively affected by a $6.0 million increase in amortization of inventory fair value adjustments and amortization of intangible assets.

Precision Motion

Precision Motion segment operating income was $31.7 million, or 24.0% of revenue, in 2018, versus $27.1 million, or 25.6% of revenue, in 2017. The increase in operating income in terms of total dollars was primarily due to an increase in gross profit of $12.9 million, partially offset by an increase in R&D and SG&A expenses of $3.5 million and an increase in acquisition earn-out costs of $4.0 million associated with the Zettlex acquisition.

Precision Motion segment operating income was $27.1 million, or 25.6% of revenue, in 2017, versus $21.1 million, or 23.9% of revenue, in 2016. The increase in operating income was primarily due to an increase in gross profit of $6.5 million.

Unallocated Corporate and Shared Services

Unallocated corporate and shared services costs primarily represent costs of corporate and shared service functions and other public company costs that are not allocated to the operating segments, including certain restructuring and most acquisition related costs.

Unallocated corporate and shared services costs for 2018 decreased by $0.2 million, or 0.6%, from 2017.

Unallocated corporate and shared services costs for 2017 increased by $7.0 million, or 31.9%, from 2016 primarily due to an increase in acquisition related costs of $2.3 million mostly attributable to an investment banking success fee related to the WOM acquisition, and an increase in SG&A expenses of $5.4 million as a result of higher headcount and higher variable compensation associated with the Company's financial performance.

Interest Income (Expense), Foreign Exchange Transaction Gains (Losses), and Other Income (Expense), Net

The following table sets forth interest income (expense), foreign exchange transaction gains (losses), and other income (expense) for 2018, 2017 and 2016 (in thousands):

	2018	2017	2016
Interest income (expense), net	$(9,814)	$(7,165)	$(4,559)
Foreign exchange transaction gains (losses), net	147	(447)	2,317
Other income (expense), net	(44)	(229)	1,809
Gain on acquisition of business	—	26,409	—

Interest Income (Expense), Net

Net interest expense was $9.8 million in 2018 versus $7.2 million in 2017. The increase in net interest expense was primarily due to an increase in average debt levels as a result of acquisitions in 2017 and 2018 and an increase in the weighted average interest rate on our senior credit facilities. The weighted average interest rate on our Senior Credit Facilities was 3.53% and 3.32% during 2018 and 2017, respectively. Included in net interest expense was non-cash interest expense of approximately $1.0 million and $0.8 million in 2018 and 2017, respectively, related to the amortization of deferred financing costs on our debt.

Net interest expense was $7.2 million in 2017 versus $4.6 million in 2016. The increase in net interest expense was primarily due to an increase in average debt levels as a result of acquisitions in 2017, partially offset by a decrease in the weighted average interest rate on our senior credit facilities. The weighted average interest rate on our Senior Credit Facilities was 3.32% and 3.52% during 2017 and 2016, respectively. Included in net interest expense was non-cash interest expense of approximately $0.8 million and $0.9 million in 2017 and 2016, respectively, related to the amortization of deferred financing costs on our debt.

Foreign Exchange Transaction Gains (Losses), Net

Foreign exchange transaction gains (losses), net, were $0.1 million net gains in 2018 versus $0.4 million net losses in 2017 primarily due to changes in the value of the U.S. Dollar against the British Pound, Euro and Japanese Yen, and net realized gains from foreign currency contracts.

Foreign exchange transaction gains (losses), net, were $0.4 million net losses in 2017 versus $2.3 million net gains in 2016 primarily due to changes in the value of the U.S. Dollar against the British Pound, Euro and Japanese Yen.

Other Income (Expense), Net

Net other expense was nominal in 2018 versus $0.2 million in 2017. The decrease in net other expense was primarily due to a decrease in net periodic pension costs of our frozen U.K. defined benefit pension plan covering employees of a divested business.

Other income (expense) was $0.2 million net other expense in 2017 versus $1.8 million net other income in 2016 primarily due to earnings from our equity-method investment in Laser Quantum reported in other income (expense) prior to 2017. In January 2017, we acquired an additional approximately 35% of the outstanding shares of Laser Quantum. As a result of this acquisition, earnings from Laser Quantum have been consolidated in the Company’s consolidated financial statements since the acquisition date.

Gain on Acquisition of Business

The gain on acquisition of business in 2017 was related to a nontaxable gain of $26.4 million recognized upon gaining control of Laser Quantum in January 2017 as a result of acquiring an additional approximately 35% of its outstanding shares.

Income Taxes

We recorded a tax provision of $10.2 million in 2018, as compared to a tax provision of $13.8 million in 2017. The effective tax rate for 2018 was 16.7% of income before taxes, compared to an effective tax rate of 18.2% of income before taxes for 2017. Our effective tax rate in 2018 differs from the Canadian statutory rate of 29.0% primarily due to the mix of income earned in jurisdictions with varying tax rates, including the benefit of the new 21% U.S. corporate

income tax rate and $1.6 million of estimated deductions for Foreign Derived Intangible Income under the U.S. Tax Cuts and Jobs Act (the "Tax Reform Act"), a $0.9 million benefit from share-based compensation, a $1.9 million U.K. patent box deduction and $1.3 million of other tax credits; offset by $0.8 million of non-deductible expenses recognized under an earn-out agreement in connection with the Zettlex acquisition.

We recorded a tax provision of $13.8 million in 2017, as compared to a tax provision of $10.5 million in 2016. The effective tax rate for 2017 was 18.2% of income before taxes, compared to an effective tax rate of 32.3% of income before taxes for 2016. Our effective tax rate in 2017 differs from the Canadian statutory rate of 29.0% primarily due to a $1.2 million tax effect of non-deductible acquisition related expenses and a $2.8 million provision for the revaluation of deferred tax assets and liabilities as of December 31, 2017 as a result of the Tax Reform Act, which reduced the U.S. federal statutory corporate income tax rate from 35% to 21%. These increases were offset by a $2.0 million benefit from international tax rate differences, a $1.1 million benefit due to the Section 199 Domestic Production Activity deduction in the U.S., a $1.0 million benefit associated with R&D and foreign tax credits generated in 2017, recognition of $1.6 million net tax benefits from uncertain tax positions upon expiration of statute of limitations and conclusion of income tax audits, and a $1.6 million benefit from the patent box deduction in the U.K. In addition, in 2017, we reported a nontaxable gain of $26.4 million on our previously-held Laser Quantum equity interest and wrote off $1.5 million of Laser Quantum related deferred tax liability, which had a combined 8.7% favorable impact on our effective tax rate for the year ended December 31, 2017.

Liquidity and Capital Resources

We assess our liquidity in terms of our ability to generate cash to fund our operating, investing, and financing activities. Our primary ongoing cash requirements are funding operations, capital expenditures, investments in businesses, and repayment of our debt and related interest expense. Our primary sources of liquidity are cash flows from operations and borrowings under our revolving credit facility. We believe our future operating cash flows will be sufficient to meet our future operating and capital expenditure cash needs for the foreseeable future, including at least the next 12 months. The availability of borrowing capacity under our revolving credit facility provides another potential source of liquidity for acquisitions. We may seek to raise additional capital, which could be in the form of bonds, convertible debt or equity, to fund business development activities or other future investing cash requirements, subject to approval by the lenders in the Second Amended and Restated Credit Agreement.

Significant factors affecting the management of our ongoing cash requirements are the adequacy of available bank lines of credit and our ability to attract long term capital with satisfactory terms. The sources of our liquidity are subject to all of the risks of our business and could be adversely affected by, among other factors, a decrease in demand for our products, our ability to integrate current and future acquisitions, deterioration in certain financial ratios, availability of borrowings under our revolving credit facility, and market changes in general. See “Risks Relating to Our Common Shares and Our Capital Structure” included in Item 1A of this Annual Report on Form 10-K.

Our ability to make payments on our indebtedness and to fund our operations may be dependent upon the earnings and the distribution of funds from our subsidiaries. Local laws and regulations and/or the terms of our indebtedness restrict certain of our subsidiaries from paying dividends and transferring assets to us. We cannot assure you that applicable laws and regulations and/or the terms of our indebtedness will permit our subsidiaries to provide us with sufficient dividends, distributions or loans when necessary.

As of December 31, 2018, $49.2 million of our $82.0 million cash and cash equivalents was held by our subsidiaries outside of Canada and the United States. Generally, our intent is to use cash held in these foreign subsidiaries to fund our local operations or acquisitions by those local subsidiaries and to pay down borrowings under our revolving credit facility. Approximately 64.4% of our outstanding borrowings under our Senior Credit Facilities (defined below) were held in our subsidiaries outside of Canada and the United States. Additionally, we may use intercompany loans to address short-term cash flow needs for various subsidiaries. In certain instances, we have identified excess cash for which we may repatriate and have established liabilities for the expected tax cost. Because of the ownership structure of the Company, our foreign entities outside the U.S. are not considered controlled foreign corporations of the U.S. company, as defined under U.S. tax principles, and accordingly, the accumulated earnings of these foreign subsidiaries are not subject to the one-time tax on the repatriation of foreign earnings (the “Toll Charge”) under the Tax Reform Act.

Share Repurchase Plans

In October 2013, our Board of Directors authorized a share repurchase plan (the “2013 Repurchase Plan”) under which we could repurchase outstanding shares of our common stock up to an aggregate amount of $10.0 million. During 2018, we repurchased 89 thousand shares for an aggregate purchase price of $5.9 million at an average price of $65.43 per share under the 2013 Repurchase Plan. As of December 31, 2018, we had repurchased a cumulative total of 385 thousand shares under the 2013 Repurchase Plan for an aggregate purchase price of $10.0 million at an average price of $25.97 per share. As of December 31, 2018, we had completed the 2013 Repurchase Plan.

In October 2018, our Board of Directors approved a new share repurchase plan (the “2018 Repurchase Plan”) authorizing the repurchase of an additional $25.0 million worth of common shares. We expect that share repurchases will be made under the 2018 Repurchase Plan pursuant to Rule 10b-18 under the Securities Exchange Act of 1934.

We had $25.0 million available for share repurchases under the 2018 Repurchase Plan as of December 31, 2018.

Under the 2018 Repurchase Plan, shares may be repurchased from time to time, at our discretion, based on its ongoing assessment of the capital needs of the business, the market price of our common stock, and general market conditions. Shares may also be repurchased through an accelerated stock purchase agreement, on the open market or in privately negotiated transactions in accordance with applicable federal securities laws. Repurchases may be made under certain SEC regulations, which would permit common stock to be purchased when we would otherwise be prohibited from doing so under insider trading laws. The 2018 Repurchase Plan does not obligate us to acquire any particular amount of common stock. No time limit was set for the completion of the 2018 Repurchase Plan, and the plan may be suspended or discontinued at any time. We expect to fund the share repurchases through cash on hand and future cash generated from operations.

Second Amended and Restated Credit Agreement

In May 2016, we entered into the second amended and restated senior secured credit agreement (the “Second Amended and Restated Credit Agreement”), consisting of a $75.0 million, 5-year term loan facility and a $225.0 million, 5-year revolving credit

facility (collectively, the "Senior Credit Facilities"). The Senior Credit Facilities mature in May 2021. In August 2017, we entered into a third amendment (the "Third Amendment") to the Second Amended and Restated Credit Agreement. The Third Amendment increased the borrowing limit under the revolving credit facility commitment from $225 million to $325 million and reset the accordion feature to $125 million for future expansion. Additionally, the Third Amendment increased the term loan balance from $65.6 million to $90.6 million. The term loan is payable in quarterly installments of $2.3 million beginning in October 2017, with the remaining amount due upon maturity. We may make payments to pay down our revolving credit facility with cash on hand and cash generated from future operations.

On February 26, 2018, we entered into a fourth amendment (the "Fourth Amendment") to the Second Amended and Restated Credit Agreement. The Fourth Amendment increased the maximum permitted consolidated leverage ratio from 3.00 to 3.50, increased the maximum consolidated leverage ratio for permitted acquisitions and stock repurchases from 2.50 to 3.00, increased the maximum permitted consolidated leverage ratio for a designated acquisition from 3.00 to 3.50, and increased the maximum leverage ratio for four consecutive quarters following a designated acquisition from 3.50 to 4.00. Certain other technical changes were made to the Second Amended and Restated Credit Agreement as a result of the Fourth Amendment and are not considered material.

As of December 31, 2018, we had a term loan of $74.5 million and revolving loans of $135.1 million outstanding under the Second Amended and Restated Credit Agreement.

The Second Amended and Restated Credit Agreement contains various covenants that we believe are usual and customary for this type of agreement, including a maximum allowed leverage ratio and a minimum required fixed charge coverage ratio (as defined in the Second Amended and Restated Credit Agreement). The following table summarizes these financial covenants and our compliance therewith as of December 31, 2018:

		Actual
	Requirement	December 31, 2018
Maximum consolidated leverage ratio	3.50	1.66
Minimum consolidated fixed charge coverage ratio	1.50	5.11

In addition, the Second Amended and Restated Credit Agreement contains various other customary representations, warranties and covenants applicable to the Company and its subsidiaries, including: (i) limitations on certain payments; (ii) limitations on fundamental changes involving the Company; (iii) limitations on the disposition of assets; and (iv) limitations on indebtedness, investments, and liens.

Cash Flows

Cash and cash equivalents totaled $82.0 million at December 31, 2018, versus $100.1 million at December 31, 2017. The net decrease in cash and cash equivalents is primarily attributable to debt repayments of $74.6 million, acquisition of the remaining equity interest in Laser Quantum of $30.8 million, current year business acquisitions of $29.6 million, and capital expenditures of $14.7 million. These cash outflows were offset by cash provided by operating activities of $89.6 million and borrowings under our revolving credit facility of $55.3 million.

The following table summarizes our cash and cash equivalent balances, cash flows and unused borrowing capacity available under our revolving credit facility for the years indicated (in thousands):

	2018	2017	2016
Cash and cash equivalents, end of year	$82,043	$100,057	$68,108
Net cash provided by operating activities	$89,647	$63,378	$47,788
Net cash used in investing activities	$(45,590)	$(177,380)	$(12,865)
Net cash provided by (used in) financing activities	$(60,164)	$143,330	$(23,189)
Unused borrowing capacity available under revolving credit facility, end of year	$189,942	$175,547	$215,000

Operating Cash Flows

Cash provided by operating activities was $89.6 million in 2018, versus $63.4 million in 2017. Cash provided by operating activities in 2018 increased from 2017 primarily due to the increase in operating income.

Cash provided by operating activities for 2018 was positively impacted by an increase in our days payables outstanding and an increase in accrued expenses. The Company’s growth in revenue of $93.0 million and gross profit of $41.0 million increased our outstanding trade receivables and inventories, which negatively impacted our cash provided by operating activities.

Cash provided by operating activities for 2017 was positively impacted by an increase in our outstanding payables and accrued expenses. Cash provided by operating activities was negatively impacted by an increase in outstanding trade receivables and an increase in inventories, excluding trade receivables and inventories acquired from acquisitions in 2017, and an increase in income tax payments.

Cash provided by operating activities for 2016 was positively impacted by an increase in our days payables outstanding from 41 days at December 31, 2015 to 53 days at December 31, 2016 and improvement in our inventory turnover ratio from 3.6 at December 31, 2015 to 3.7 at December 31, 2016. Cash provided by operating activities was negatively impacted by an increase in our days sales outstanding from 57 days at December 31, 2015 to 59 days at December 31, 2016.

In January 2019, we paid £3.0 million ($3.9 million) as the first installment under our earn-out obligations in connection with the Zettlex acquisition, which will be reported as cash used in operating activities in the first quarter of 2019.

Investing Cash Flows

Cash used in investing activities was $45.6 million during 2018, primarily related to $29.6 million in cash outflows (net of cash acquired of $3.8 million) related to acquisitions in 2018 and $14.7 million in capital expenditures.

Cash used in investing activities was $177.4 million during 2017, primarily driven by our acquisitions of WOM, ThingMagic and Laser Quantum. In connection with these acquisitions, we paid $185.0 million in cash considerations, which is reported in the consolidated statement of cash flows as $168.3 million cash outflows from investing activities (net of cash acquired of $16.7 million and working capital adjustments). We also paid $9.1 million for capital expenditures during 2017.

Cash used in investing activities was $12.9 million during 2016, primarily due to $13.4 million in cash consideration paid for the Reach acquisition and the acquisition of certain developed technology assets, and $8.5 million in cash paid for capital expenditures, partially offset by $3.6 million in net cash consideration received from the sale of our Orlando, Florida facility in March 2016, $3.4 million in net cash consideration received from the sale of our Chatsworth, California facility in August 2016, $0.4 million received from the finalization of the Lincoln Laser acquisition working capital adjustments, and $1.5 million received from the release of escrow funds from our 2014 Scientific Lasers divestiture.

We have no material commitments to purchase property, plant and equipment. We expect to use approximately $14 million to $16 million in 2019 for capital expenditures related to investments in new property, plant and equipment for our existing businesses.

Financing Cash Flows

Cash used in financing activities was $60.2 million during 2018, primarily due to $30.8 million of cash consideration paid for the acquisition of the remaining equity interest in Laser Quantum, $9.2 million of contractual term loan payments, $65.4 million of optional repayments of borrowings under our revolving credit facility, $3.6 million of payroll tax payments on stock-based compensation awards, and $5.9 million of repurchases of common stock, partially offset by $55.3 million of borrowings under our revolving credit facility used to fund a portion of the cash consideration paid for the acquisition of Zettlex and the remaining equity interest in Laser Quantum.

Cash provided by financing activities was $143.3 million during 2017, primarily due to $176.8 million of borrowings under our revolving credit facility used to fund a portion of the cash considerations paid for the WOM, ThingMagic

and Laser Quantum acquisitions, partially offset by $7.9 million of contractual term loan payments, $19.0 million of optional repayments of borrowings under our revolving credit facility, $2.5 million of contingent consideration payments, $2.1 million of payroll withholding tax payments on stock-based compensation awards, $0.4 million of repurchases of our common shares and $0.9 million of principal payments under our capital lease obligations. We also paid $0.7 million for debt issuance costs as a result of the Third Amendment to the Second Amended and Restated Credit Agreement entered into in August 2017.

Cash used in financing activities was $23.2 million during 2016, primarily due to $7.5 million of contractual term loan payments, $8.8 million of optional repayments of borrowings under our revolving credit facility, $1.8 million of payroll withholding tax payments on stock-based compensation awards, $1.6 million of repurchases of our common shares, and $1.2 million of principal payments under our capital lease obligations. We also paid $2.5 million for debt issuance costs as a result of the Second Amended and Restated Credit Agreement signed in May 2016.

In 2019, we are contractually required to pay $4.6 million (comprised of two quarterly payments of $2.3 million) on our term loan facility and $0.6 million in principal payments under our capital lease obligations. In addition, we may pay down our term loan and revolving credit facility from time to time with available cash generated from future operating activities.

Other Liquidity Matters

Pension Plans

We maintain a defined benefit pension plan in the U.K. (the "U.K. Plan"). Our U.K. Plan was closed to new members in 1997 and stopped accruing additional pension benefits for existing members in 2003, thereby limiting our obligation to benefits earned through that date. Benefits under this plan were based on the employees' years of service and compensation as of the date the plan was frozen, adjusted for inflation. On July 1, 2013, the Company provided a Guarantee (the "Guarantee") in favor of the trustees of the U.K. Plan with respect to all present and future obligations and liabilities (whether actual or contingent and whether owed jointly or severally and in any capacity whatsoever) under the U.K. Plan of Novanta Technologies UK Limited, a wholly owned subsidiary of Novanta Inc.

Our funding policy is to fund pensions based on actuarial methods as permitted by regulatory authorities. The results of funding valuations depend on both the funding deficit and the assumptions used (such as asset returns, discount rates, mortality, retail price inflation and other market driven changes). The assumptions used represent one estimate of many possible future outcomes. The final cost to us will be determined by events as they actually become known. Due to the underfunded position that our U.K. Plan currently has and potential changes in the actual outcomes relative to the assumptions used in funding valuations, we may have to increase payments to fund this plan in the future. As of December 31, 2018, the projected benefit obligation under the U.K. Plan exceeded the fair value of plan assets by $3.8 million.

Based on the results of the most recent funding valuation, the Company's annual contributions are expected to be approximately $0.9 million in 2019 and will increase by 2.9% per year thereafter.

As a result of the covenant that exists between our U.K. subsidiary and the Plan Trustees regarding the funding of the U.K. Plan, our ability to transfer assets outside our U.K. subsidiary, and its wholly owned subsidiary in China, may be limited.

Off-Balance Sheet Arrangements, Contractual Obligations

Contractual Obligations

The following table summarizes our contractual obligations at December 31, 2018 and the effect that such obligations are expected to have on our liquidity and cash flows in future years. We have excluded the future cash payments for unrecognized tax benefits of $4.5 million, including interest and penalties, because we are uncertain if and when such amounts may be settled. These unrecognized tax benefits are further explained in Note 15 to our Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

Contractual Obligations	Total	2019	2020 - 2021	2022 - 2023	Thereafter
	(In thousands)				
Senior Credit Facilities (1)	$209,583	$4,600	$204,983	$—	$ —
Interest on Senior Credit Facilities (2)	15,591	6,970	8,621	—	—
Capital leases	10,108	990	1,887	1,837	5,394
Operating leases (3)	55,949	7,797	12,020	9,983	26,149
Purchase commitments (4)	98,951	93,810	5,141	—	—
U.K. pension plan (5)	3,758	928	1,937	893	—

Contingent consideration and earn-outs (6)	7,733	3,823	2,967	943	—
Total contractual cash obligations	$401,673	$118,918	$237,556	$13,656	$ 31,543

(1) As of December 31, 2018, a total of $74.5 million of borrowings under our term loan and $135.1 million of borrowings under our revolving credit facility were outstanding under the Senior Credit Facilities. The term loan is payable in quarterly installments of $2.3 million with the final installment of $56.1 million due upon maturity in May 2021. As of December 31, 2018, the contractually required quarterly payments for the first two quarters of 2019 had been prepaid. Borrowings under the revolving credit facility are due at maturity in May 2021.

(2) For the purpose of this calculation, current interest rates on floating rate obligation (LIBOR plus applicable margin, as defined in the Second Amended and Restated Credit Agreement) were used for the remainder contractual life of both the term loan and outstanding borrowings under the revolving credit facility.

(3) These amounts primarily represent the gross amounts due for facilities that are leased. The amounts include payments due with respect to both active operating facilities and idle facilities that have been vacated.

(4) Purchase commitments represent purchase obligations as of December 31, 2018.

(5) Amounts shown represent funding obligations equivalent to $0.9 million per year, increasing 2.9% through 2022 based on annual funding contributions in effect as of December 31, 2018. Future funding requirements will be subject to change as a result of future changes in various actuarial assumptions and actual investment returns on plan assets.

(6) These amounts represent the estimated contingent consideration and earn-out payments accrued in the consolidated balance sheet as of December 31, 2018 that are expected to be paid between 2019 and 2022. The undiscounted range of the possible contingent consideration and earn-out payments is zero to $17.5 million.

Off-Balance Sheet Arrangements

Through December 31, 2018, we have not entered into any off-balance sheet arrangements or material transactions with unconsolidated entities or other persons.

Critical Accounting Policies and Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the dates of the financial statements and the reported amounts of revenues and expenses for the reporting periods. On an ongoing basis, we evaluate our estimates, assumptions and judgments, including those related to revenue recognition, inventory valuation, assessment of the valuation of goodwill, intangible assets and tangible long-lived assets, contingent consideration obligations, employee benefit plans, restructuring charges, accounting for income taxes, and accounting for loss contingencies. Actual results in the future could differ significantly from our estimates.

We believe that the following critical accounting policies and estimates most significantly affect the portrayal of our financial condition and results of operations and require the most difficult and subjective judgments.

Revenue Recognition. Beginning January 1, 2018, we adopted Accounting Standards Update (“ASU”) 2014-09, “Revenue from Contracts with Customers” (“ASU 2014-09” or “Topic 606”) using the modified retrospective method. Under Topic 606, an entity recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. To determine revenue recognition for arrangements within the scope of Topic 606, the entity performs the following five steps: (i) identifying the contract(s) with a customer; (ii) identifying the performance obligations in the contract; (iii) determining the transaction price; (iv) allocating the transaction price to the performance obligations in the contract; and (v) recognizing revenue when (or as) the entity satisfies a performance obligation.

We recognize revenue when control of promised goods or services is transferred to customers. This generally occurs upon shipment when the title and risk of loss pass to the customer. The vast majority of our revenue is generated from the sale of distinct products. Revenue is measured as the amount of consideration we expect to receive in exchange for such products, which is generally at contractually stated prices. Sales taxes and value added taxes collected concurrently with revenue generating activities are excluded from revenue.

Substantially all of our revenue is recognized at a point in time, upon shipment, rather than over time. At the request of our customers, we may perform professional services, generally for the maintenance and repair of products previously sold to those customers and for engineering services. Professional services are typically short in duration, mostly less than one month, and total less than 3% of our consolidated revenue. Revenue is typically recognized at a point in time when control transfers to the customer upon completion of professional services. These services

generally involve a single distinct performance obligation. The consideration expected to be received in exchange for such services is normally the contractually stated amount.

We occasionally sell separately priced non-standard/extended warranty services or preventative maintenance plans with the sale of products. The transfer of control over the service plans is over time. We recognize the related revenue ratably over the terms of the service plans. The transaction price of a contract is allocated to each performance obligation based on its relative standalone selling price. Standalone selling prices are generally determined based on the prices charged to customers or using the expected cost plus a margin.

We account for shipping and handling activities that occur after the transfer of control over the related goods as fulfillment activities rather than performance obligations. The shipping and handling fees charged to customers are recognized as revenue and the related costs are recorded in cost of revenue at the time of transfer of control.

We generally provide warranties for our products. The standard warranty period is typically 12 months to 24 months for our Photonics and Precision Motion segments and 12 months to 36 months for the Vision segment. The standard warranty period for product sales is accounted for under the provisions of ASC 450, “Contingencies,” as we have the ability to ascertain the likelihood of

the liability and can reasonably estimate the amount of the liability. A provision for the estimated cost related to warranty is recorded to cost of revenue at the time revenue is recognized. Our estimate of costs to service the warranty obligations is based on historical experience and expectations of future conditions. To the extent our experience in warranty claims or costs associated with servicing those claims differ from the original estimates, revisions to the estimated warranty liability are recorded at that time, with an offsetting entry recorded to cost of revenue.

We expense incremental direct costs of obtaining a contract when incurred if the expected amortization period is one year or less. These costs are recorded within selling, general and administrative expenses in the consolidated statement of operations. We do not adjust the promised amount of consideration for the effects of a financing component because the transfer of a promised good to a customer and the customer's payment for that good are typically one year or less.

Inventories. Inventories, which include materials and conversion costs, are stated at the lower of cost or net realizable value, using the first-in, first-out method. Cost includes the cost of purchased materials, inbound freight charges, external and internal processing and applicable labor and overhead costs. Net realizable value is the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation.

We regularly review inventory quantities on hand and, when necessary, record provisions for excess and obsolete inventory based on either our forecasted product demand and production requirements or historical trailing usage of the product. If our sales do not materialize as planned or at historical levels, we may have to increase our reserve for excess and obsolete inventory, which would reduce our earnings. If actual market conditions are more favorable than anticipated, inventory previously written down may be sold, resulting in lower cost of revenue and higher income from operations than expected in that period.

Share-Based Compensation. We record expenses associated with share-based compensation awards to employees and directors based on the fair value of awards as of the grant date. For share-based compensation awards that vest over time based on employment, the associated expenses are recognized in the consolidated statements of operations ratably over the vesting period of the award, net of estimated forfeitures.

We grant two types of performance-based awards to certain members of the executive management team: non-GAAP EPS performance-based restricted stock units ("EPS-PSUs") and relative total shareholder return performance-based restricted stock units ("TSR-PSUs"). For EPS-PSUs, share-based compensation expense is recognized ratably over the vesting period when it is probable that specified performance targets are expected to be achieved based on management's projections. Management's projections are revised, if necessary, in subsequent periods when underlying factors change the evaluation of the probability of achieving the performance targets. Accordingly, share-based compensation expense associated with EPS-PSUs may differ significantly from period to period based on changes to the probability of achieving performance targets. For TSR-PSUs, we recognize the related compensation expense based on the fair value of the TSR-PSUs, which is determined using the Monte-Carlo simulation valuation model as of the date of grant. The expense related to TSR-PSUs is recognized on a straight-line basis from the grant date to the end of the performance period, which is generally three years.

The Monte Carlo simulation model utilizes multiple input variables that determine the probability of satisfying the performance conditions stipulated in the grant agreement and calculates the fair market value for the market-based restricted stock units granted. The Monte Carlo simulation model also uses stock price volatility and other variables to estimate the probability of satisfying the performance conditions, including the possibility that the market condition may not be satisfied, and the resulting fair value of the award.

Valuation of Long-lived Assets. The purchase price we pay for acquired companies is allocated first to the identifiable assets acquired and liabilities assumed at their fair value. Any excess purchase price is then allocated to goodwill. We

make various assumptions and estimates in order to assign fair value to acquired tangible and intangible assets and liabilities. These assumptions typically include cash flow forecasts, discount rates, technology royalty rates, and customer attrition rates, among others. Actual cash flows may vary from forecasts used to value these assets at the time of the business combination.

Our most significant identifiable intangible assets are customer relationships, acquired technologies, trademarks and trade names. In addition to our review of the carrying value of each asset, the useful life assumption for each asset, including the classification of certain intangible assets as “indefinite-lived,” are reviewed on a periodic basis to determine if changes in circumstances warrant revisions to them. All definite-lived intangible assets are amortized over the periods in which their economic benefits are expected to be realized.

Impairment analyses of goodwill and indefinite-lived intangible assets are conducted in accordance with ASC 350, “Intangibles—Goodwill and Other.” During the second quarter of 2018, we adopted ASU 2017-14, “Simplifying the Test for Goodwill Impairment” (“ASU 2017-04” or “Topic 350”), which eliminates Step 2 of the goodwill impairment test. We test our goodwill balances annually as of the beginning of the second quarter or more frequently if indicators are present or changes in circumstances suggest that an

impairment may exist. Should the fair value of our goodwill or indefinite-lived intangible assets decline because of reduced operating performance, market declines, or other indicators of impairment, or as a result of changes in the discount rate, charges for impairment loss may be necessary.

We evaluate our goodwill, intangible assets and other long-lived assets for impairment at the reporting unit level which is generally at least one level below our reportable segments. We have the option of first performing a qualitative assessment to determine whether it is necessary to perform the quantitative impairment test. In performing the qualitative assessment, we review factors both specific to the reporting unit and to the Company as a whole, such as financial performance, macroeconomic conditions, industry and market considerations, and the fair value of each reporting unit at the last valuation date. If we elect this option and believe, as a result of the qualitative assessment, that it is more likely than not that the carrying value of goodwill is not recoverable, the quantitative impairment test is required; otherwise, no further testing is required.

Alternatively, we may elect to bypass the qualitative assessment and perform the quantitative impairment test. This approach requires a comparison of the carrying value of each of our reporting units to the fair value of these reporting units. If the carrying value of a reporting unit exceeds its fair value, an impairment charge is recorded for the difference. The fair value of a reporting unit is estimated primarily using a discounted cash flow (“DCF”) method. The DCF approach requires that we forecast future cash flows for each of the reporting units and discount the cash flow streams based on a weighted average cost of capital (“WACC”) that is derived, in part, from comparable companies within similar industries. The DCF calculations also include a terminal value calculation that is based upon an expected long-term growth rate for the applicable reporting unit. The carrying values of each reporting unit include assets and liabilities which relate to the reporting unit’s operations. Additionally, reporting units that benefit from corporate assets or liabilities are allocated a portion of those corporate assets and liabilities on a proportional basis.

We assess indefinite-lived intangible assets for impairment on an annual basis, and more frequently if impairment indicators are identified. We also periodically reassess their continuing classification as indefinite-lived intangible assets. Impairment exists if the fair value of the intangible asset is less than its carrying value. An impairment charge equal to the difference is recorded to reduce the carrying value to its fair value.

We evaluate amortizable intangible assets and other long-lived assets for impairment in accordance with ASC 360-10-35-15, “Impairment or Disposal of Long-Lived Assets,” whenever changes in events or circumstances indicate that the carrying values of the reporting units may exceed the undiscounted cash flow forecasts attributable to the reporting units. If undiscounted cash flow forecasts indicate that the carrying value of definite-lived intangible assets or other long-lived assets may not be recoverable, a fair value assessment is performed. For intangible assets, fair value estimates are derived from discounted cash flow forecasts. For other long-lived assets (primarily property, plant and equipment), fair value estimates are derived from the sources most appropriate for the particular asset and have historically included such approaches as sales comparison approach and replacement cost approach. If fair value is less than carrying value, an impairment charge equal to the difference is recorded. We also review the useful life and residual value assumptions for definite-lived intangible assets and other long-lived assets on a periodic basis to determine if changes in circumstances warrant revisions to them.

Factors which may trigger an impairment of our goodwill, intangible assets and other long-lived assets include the following:

- significant underperformance relative to historical or projected future operating results;
- changes in our use of the acquired assets or the strategy for our overall business;
- long-term negative industry or economic trends;
- technological changes or developments;
- changes in competition;

- loss of key customers or personnel;
- adverse judicial or legislative outcomes or political developments;
- significant declines in our stock price for a sustained period of time; and
- the decline of our market capitalization below net book value as of the end of any reporting period.

The occurrence of any of these events or any other unforeseeable events or circumstances that materially affect future operating results or cash flows may cause an impairment that is material to our results of operations or financial position in the reporting period in which it occurs or is identified.

The most recent annual goodwill and indefinite-lived intangible asset impairment test was performed as of the beginning of the second quarter of 2018, using a qualitative assessment, noting no impairment. As of December 31, 2018, there were no indicators of impairment of our long-lived assets.

We have a significant amount of goodwill, intangible assets and other long-lived assets. The following table shows the breakdown of goodwill, intangible assets and property, plant and equipment by reportable segment as of December 31, 2018 (in thousands):

	Goodwill	Intangible Assets, net	Property, Plant & Equipment, net
Photonics	$66,494	$45,689	$ 17,850
Vision	123,295	82,829	33,003
Precision Motion	27,873	14,402	10,131
Unallocated Corporate and Shared Services	—	—	4,480
Total	$217,662	$142,920	$ 65,464

Pension Plans. Our subsidiary located in the U.K. maintains a defined benefit pension plan (the “U.K. Plan”). The U.K. Plan was closed to new membership in 1997 and stopped accruing for additional pension benefits for existing members in 2003, limiting our obligation to benefits earned through that date. Benefits under this plan were based on the employees’ years of service and compensation as of the date the plan was frozen, adjusted for inflation. At December 31, 2018, the fair market value of the plan assets was $33.1 million, which was $3.8 million, or 10.2%, less than the projected benefit obligation of $36.9 million.

The cost and obligations of our U.K. Plan are calculated using many assumptions. Major assumptions used in the accounting for this pension plan include the discount rate, rate of inflation, mortality rate and expected return on plan assets. Assumptions are determined each year based on data and appropriate market indicators in consultation with a third-party actuary. Should any of these assumptions change, they would have an effect on net periodic pension cost and the unfunded benefit obligation as of the end of the year. The most sensitive assumption affecting the determination of our U.K. Plan pension obligation is the discount rate. A 50 basis point decrease in the discount rate as of December 31, 2018 would change the pension obligation by $3.2 million.

Accounting for Income Taxes. As part of the process of preparing our consolidated financial statements, we are required to calculate our income tax provision (benefit) in each of the jurisdictions in which we operate. This process involves estimating our current income tax provision (benefit) together with assessing temporary differences resulting from differing treatment of items for tax and accounting purposes. These differences result in deferred tax assets and liabilities, which are reported on our consolidated balance sheet.

Judgment is required in determining our worldwide income tax provision. In the ordinary course of a global business, there are many transactions and calculations where the ultimate outcome is uncertain. Although we believe our estimates are reasonable, no assurance can be given that the final outcome of these matters will not be different from that which is reflected in our historical income tax provisions and accruals. Such differences could have a material impact on our income tax provision and net income in the period in which such determination is made.

We record a valuation allowance on our deferred tax assets when it is more likely than not that they will not be realized. We have considered future taxable income and ongoing prudent and feasible tax planning strategies in assessing the need for a valuation allowance. In the event we determine that we are able to realize our deferred tax assets in the future in excess of their net recorded amount, an adjustment to the valuation allowance for the deferred tax assets would be recorded and would increase our net income in the period such determination is made. Likewise, should we determine that we will not be able to realize all or part of our net deferred tax assets in the future, an adjustment to the valuation allowance for the deferred tax assets will be recorded and will reduce our net income in the period such determination is made.

In conjunction with our ongoing review of our actual results and anticipated future earnings, we continuously reassess the adequacy of the valuation allowance currently in place on our deferred tax assets. In 2018, we released valuation allowance of $0.3 million recorded on net operating losses and other timing items in certain tax jurisdictions. The decrease of our valuation allowance was determined in accordance with the provisions of ASC 740, “Income Taxes,” which requires an assessment of both positive and negative evidence when determining whether it is more likely than not that deferred tax assets are recoverable. Such assessment is required on a jurisdiction by jurisdiction basis.

The amount of income taxes we pay is subject to audits by federal, state and foreign tax authorities, which may result in proposed assessments. We believe that we have adequately provided for any reasonably foreseeable outcome related to these matters. However, our future results may include favorable or unfavorable adjustments to our tax liabilities in the period that the assessments are made or

resolved, or when the statute of limitations for certain periods expires. As of December 31, 2018, the total amount of gross unrecognized tax benefits was $4.7 million, of which $3.6 million would favorably affect our effective tax rate, if recognized. Over the next twelve months, we may need to record up to $0.5 million of previously unrecognized tax benefits in the event of statute of limitations closures.

Income and foreign withholding taxes have not been recognized on the excess of the amount for financial reporting purposes over the tax basis of investments in foreign subsidiaries that are essentially permanent in nature. This amount becomes taxable upon a repatriation of assets from a subsidiary or a sale or liquidation of a subsidiary. The amount of undistributed earnings of foreign subsidiaries totaled $135.6 million as of December 31, 2018. The estimated unrecognized income and foreign withholding tax liability on this temporary difference is approximately $0.3 million.

On December 22, 2017, the President of the United States signed into law the Tax Reform Act. The Tax Reform Act significantly changed U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system, providing a one-time transition Toll Charge on foreign earnings, creating a new limitation on deductible interest expense and modifying the officer's compensation limitation. The Tax Reform Act permanently reduced the U.S. corporate income tax rate from a maximum of 35% to a flat 21% rate, effective January 1, 2018.

As a result of the Tax Reform Act, we revalued our deferred tax assets and liabilities at the newly enacted 21% U.S. corporate income tax rate. Because of the ownership structure of the Company, our foreign entities outside the U.S. are not considered controlled foreign corporations of the U.S. company, as defined under U.S. tax principles, and accordingly, the accumulated earnings of these foreign subsidiaries are not subject to the one-time transition Toll Charge under the Tax Reform Act.

During the year ended December 31, 2018, there were no changes made to the provisional amounts recognized in 2017 in connection with the enactment of the Tax Reform Act. The accounting for the income tax effects of the Tax Reform Act is complete as of December 31, 2018.

Loss Contingencies. We are subject to legal proceedings, lawsuits and other claims relating to labor, service and other matters arising in the ordinary course of business. We review the status of each significant matter and assess our potential financial exposure on a quarterly basis. If the potential loss from any claim or legal proceeding is considered probable and the amount can be reasonably estimated, we accrue a liability for the estimated loss. Significant judgment is required in both the determination of probability and the determination as to whether an exposure is reasonably estimable. Because of uncertainties related to these matters, accruals are based only on the best information available as of the date of the financial statement. As additional information becomes available, we will reassess the potential liability related to our pending claims and litigation and may revise our estimates. Such revisions in the estimates of the potential liabilities could have a material impact on our results of operations and financial position. We expense legal fees as incurred.

Recent Accounting Pronouncements

See Note 2 to Consolidated Financial Statements for recent accounting pronouncements that could have an effect on us.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

We are exposed to market risk from changes in foreign currency exchange rates and interest rates, which could affect our operating results, financial position and cash flows. We manage our exposure to these market risks through our regular operating and financing activities. We address market risks from changes in foreign currency exchange rates through a risk management program that includes the use of derivative financial instruments to mitigate certain foreign currency transaction exposures from future settlement of non-functional currency monetary assets and liabilities as of the end of a period.

Foreign Currency Exchange Rate Risk and Sensitivity

We are exposed to changes in foreign currency exchange rates which could affect our operating results as well as our financial position and cash flows. The foreign currencies to which we have the most significant exchange rate exposure are the Euro, British Pound and Japanese Yen. The Company manages its foreign currency exposures on a consolidated basis, which allows the Company to analyze exposures globally and take into account offsetting exposures in certain balances. The primary foreign currency denominated transactions include revenue and expenses and the resulting accounts receivable and accounts payable balances reflected on our consolidated balance sheet and with intercompany trading partners that are eliminated in consolidation.

In the ordinary course of business, we enter into foreign currency contracts for periods consistent with our committed exposures to mitigate the effect of foreign currency movements on transactions denominated in foreign currencies. We do not enter into or hold

foreign currency derivative financial instruments for trading or speculative purposes, nor do we enter into derivative financial instruments to hedge future cash flows or forecasted transactions. The intent of these economic hedges is to offset gains and losses on the underlying exposures from these currencies with gains and losses resulting from the foreign currency contracts that hedge these exposures.

We had foreign currency contracts with notional amounts totaling $31.2 million and a fair value of $0.2 million as of December 31, 2018. A hypothetical 10% strengthening of the U.S. dollar against other currencies would result in an approximately $2.5 million increase in the fair value of our foreign currency contracts as of December 31, 2018. By contrast, a hypothetical 10% weakening of the U.S. dollar against other currencies would result in an approximately $2.5 million decrease in the fair value of our foreign currency contracts as of December 31, 2018.

Interest Rates

Our exposure to market risk associated with changes in interest rates relates primarily to our debt obligations. We have $209.6 million of outstanding variable rate debt as of December 31, 2018. A 100 basis point increase in interest rates at December 31, 2018 would increase our annual pre-tax interest expense by approximately $2.1 million.

Item 8. Financial Statements and Supplementary Data

NOVANTA INC.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Novanta Inc.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Novanta Inc. and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, and the related consolidated statements of operations, comprehensive income, stockholders’ equity and cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 3 to the consolidated financial statements, the Company changed the manner in which it accounts for revenues from contracts with customers in 2018.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Annual Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company's internal control over financial reporting 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 audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements 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. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

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

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

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts

February 27, 2019

We have served as the Company's auditor since 2013.

NOVANTA INC.

CONSOLIDATED BALANCE SHEETS

(In thousands of U.S. dollars or shares)

	December 31, 2018	December 31, 2017
ASSETS		
Current Assets		
Cash and cash equivalents	$ 82,043	$ 100,057
Accounts receivable, net of allowance of $321 and $554, respectively	83,955	81,482
Inventories	104,764	91,278
Prepaid income taxes and income taxes receivable	1,852	4,387
Prepaid expenses and other current assets	9,155	10,675
Total current assets	281,769	287,879
Property, plant and equipment, net	65,464	61,718
Deferred tax assets	9,492	7,052
Other assets	2,269	4,018
Intangible assets, net	142,920	155,048
Goodwill	217,662	210,988
Total assets	$ 719,576	$ 726,703
LIABILITIES, NONCONTROLLING INTEREST AND STOCKHOLDERS' EQUITY		
Current Liabilities		
Current portion of long-term debt	$ 4,535	$ 9,119
Accounts payable	50,733	39,793
Income taxes payable	2,633	5,942
Accrued expenses and other current liabilities	46,295	43,314
Total current liabilities	104,196	98,168
Long-term debt	202,843	225,500
Deferred tax liabilities	22,632	25,672
Income taxes payable	4,463	3,754
Other liabilities	17,187	15,141
Total liabilities	351,321	368,235
Commitments and Contingencies (Note 17)		
Redeemable noncontrolling interest	—	46,923
Stockholders' Equity:		
Common shares, no par value; Authorized shares: unlimited;		
Issued and outstanding: 34,886 and 34,595, respectively	423,856	423,856
Additional paid-in capital	46,018	33,309
Accumulated deficit	(79,092)	(127,740)
Accumulated other comprehensive loss	(22,527)	(17,880)
Total stockholders' equity	368,255	311,545
Total liabilities, noncontrolling interest and stockholders' equity	$ 719,576	$ 726,703

The accompanying notes are an integral part of these consolidated financial statements.

NOVANTA INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands of U.S. dollars or shares, except per share amounts)

	Year Ended December 31,		
	2018	2017	2016
Revenue	$614,337	$521,290	$384,758
Cost of revenue	352,809	300,759	222,306
Gross profit	261,528	220,531	162,452
Operating expenses:			
Research and development and engineering	51,024	41,673	32,002
Selling, general and administrative	115,900	101,654	81,299
Amortization of purchased intangible assets	15,550	12,096	8,251
Restructuring, acquisition and divestiture related costs	8,041	7,542	7,945
Total operating expenses	190,515	162,965	129,497
Operating income	71,013	57,566	32,955
Interest income (expense), net	(9,814)	(7,165)	(4,559)
Foreign exchange transaction gains (losses), net	147	(447)	2,317
Other income (expense), net	(44)	(229)	1,809
Gain on acquisition of business	—	26,409	—
Income before income taxes	61,302	76,134	32,522
Income tax provision	10,207	13,827	10,519
Consolidated net income	51,095	62,307	22,003
Less: Net income attributable to noncontrolling interest	(1,986)	(2,256)	—
Net income attributable to Novanta Inc.	$49,109	$60,051	$22,003
Earnings per common share attributable to Novanta Inc. (Note 10):			
Basic	$1.46	$1.14	$0.63
Diluted	$1.43	$1.13	$0.63
Weighted average common shares outstanding—basic	34,913	34,817	34,694
Weighted average common shares outstanding—diluted	35,473	35,280	34,914

The accompanying notes are an integral part of these consolidated financial statements.

NOVANTA INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(In thousands of U.S. dollars)

	Year Ended December 31,		
	2018	2017	2016
Consolidated net income	$51,095	$62,307	$22,003
Other comprehensive income (loss):			
Foreign currency translation adjustments, net of tax (1)	(4,172)	8,909	(7,524)
Pension liability adjustments, net of tax (2)	(475)	926	(1,361)
Total other comprehensive income (loss)	(4,647)	9,835	(8,885)
Total consolidated comprehensive income	46,448	72,142	13,118
Less: Comprehensive income attributable to noncontrolling interest	(1,986)	(2,256)	—
Comprehensive income attributable to Novanta Inc.	$44,462	$69,886	$13,118

(1) The tax effect on this component of comprehensive income was ($93), ($94) and $36 in 2018, 2017 and 2016, respectively.
(2) The tax effect on this component of comprehensive income was ($153), $277 and ($462) in 2018, 2017 and 2016, respectively.

The accompanying notes are an integral part of these consolidated financial statements.

NOVANTA INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(In thousands of U.S. dollars or shares)

	Novanta Inc. Stockholders					
	Common Shares		Additional Paid-In	Accumulated Other Comprehensive	Accumulated	
	# of Shares	Amount	Capital	Income (Loss)	Deficit	Total
Balance at December 31, 2015	34,345	$423,856	$ 29,225	$ (18,830)	$ (189,550)	$244,701
Net income	—	—	—	—	22,003	22,003
Common stock issued under stock plans	351	—	181	—	—	181
Shares withheld for taxes on vested stock awards	(129)	—	(1,789)	—	—	(1,789)
Repurchases of common stock	(109)	—	(1,634)	—	—	(1,634)
Share-based compensation	—	—	4,293	—	—	4,293
Other comprehensive loss, net of tax	—	—	—	(8,885)	—	(8,885)
Balance at December 31, 2016	34,458	423,856	30,276	(27,715)	(167,547)	258,870
Net income	—	—	—	—	60,051	60,051
Redeemable noncontrolling interest redemption value adjustment (Note 5)	—	—	—	—	(20,244)	(20,244)
Common stock issued under stock plans	228	—	—	—	—	—
Shares withheld for taxes on vested stock awards	(77)	—	(2,090)	—	—	(2,090)
Repurchases of common stock	(14)	—	(370)	—	—	(370)
Share-based compensation	—	—	5,493	—	—	5,493
Other comprehensive loss, net of tax	—	—	—	9,835	—	9,835
Balance at December 31, 2017	34,595	423,856	33,309	(17,880)	(127,740)	311,545
Net income	—	—	—	—	49,109	49,109
Redeemable noncontrolling interest redemption value adjustment (Note 5)	—	—	—	—	1,781	1,781
Acquisition of noncontrolling interest	213	—	14,401	—	—	14,401
Common stock issued under stock plans	231	—	—	—	—	—
Shares withheld for taxes on vested stock awards	(64)	—	(3,556)	—	—	(3,556)
Repurchases of common stock	(89)	—	(5,850)	—	—	(5,850)
Share-based compensation	—	—	7,714	—	—	7,714
Adoption of ASU 2016-16 (Note 2)	—	—	—	—	(2,242)	(2,242)
Other comprehensive income, net of tax	—	—	—	(4,647)	—	(4,647)
Balance at December 31, 2018	34,886	$423,856	$ 46,018	$ (22,527)	$ (79,092)	$368,255

The accompanying notes are an integral part of these consolidated financial statements.

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NOVANTA INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands of U.S. dollars)

	Year Ended December 31,		
	2018	2017	2016
Cash flows from operating activities:			
Consolidated net income	$51,095	$62,307	$22,003
Adjustments to reconcile consolidated net income to net cash provided by operating activities:			
Depreciation and amortization	37,052	30,758	20,357
Provision for inventory excess and obsolescence	1,898	1,421	3,091
Share-based compensation	7,714	5,493	4,293
Deferred income taxes	(6,076)	(2,560)	(1,766)
Earnings from equity-method investment	—	(104)	(2,191)
Dividend from equity-method investment	—	—	2,341
Gain on acquisition of business	—	(26,409)	—
(Gain) loss on sale of fixed assets	106	36	(1,707)
Contingent consideration adjustments	—	425	1,267
Inventory acquisition fair value adjustment	—	4,754	173
Non-cash interest expense	955	825	882
Other non-cash items	(165)	283	813
Changes in assets and liabilities which provided/(used) cash, excluding effects from businesses acquisitions:			
Accounts receivable	(1,156)	(2,077)	(6,394)
Inventories	(15,603)	(13,587)	(2,917)
Prepaid expenses and other current assets	1,350	(2,169)	(1,729)
Prepaid income taxes and income taxes receivable	2,165	(2,282)	462
Accounts payable, income taxes payable, accrued expenses and other current liabilities	11,238	8,993	10,590
Other non-current assets and liabilities	(926)	(2,729)	(1,780)
Cash provided by operating activities	89,647	63,378	47,788
Cash flows from investing activities:			
Purchases of property, plant and equipment	(14,658)	(9,094)	(8,462)
Acquisition of businesses, net of cash acquired and working capital adjustments	(29,600)	(168,332)	(8,958)
Acquisition of assets	(1,599)	—	(3,980)
Release of escrow from sale of business	—	—	1,498
Proceeds from sale of property, plant and equipment	267	46	7,037
Cash used in investing activities	(45,590)	(177,380)	(12,865)
Cash flows from financing activities:			
Borrowings under revolving credit facility	55,253	176,769	—
Repayments of term loan and revolving credit facility	(74,648)	(26,925)	(16,250)

Payments of debt issuance costs	—	(655)	(2,523)
Payments of withholding taxes from stock-based awards	(3,556)	(2,090)	(1,789)
Payments of contingent considerations	—	(2,546)	—
Repurchases of common stock	(5,850)	(370)	(1,634)
Acquisition of noncontrollling interest	(30,800)	—	—
Other financing activities	(563)	(853)	(993)
Cash provided by (used in) financing activities	(60,164)	143,330	(23,189)
Effect of exchange rates on cash and cash equivalents	(1,907)	2,621	(3,585)
Increase (decrease) in cash and cash equivalents	(18,014)	31,949	8,149
Cash and cash equivalents, beginning of year	100,057	68,108	59,959
Cash and cash equivalents, end of year	$82,043	$100,057	$68,108
Supplemental disclosure of cash flow information:			
Cash paid for interest	$8,924	$5,832	$2,917
Cash paid for income taxes	$20,323	$21,121	$14,058
Income tax refunds received	$3,011	$337	$932
Supplemental disclosure of non-cash investing activity:			
Accrual for capital expenditures	$1,187	$1,601	$1,253

The accompanying notes are an integral part of these consolidated financial statements.

NOVANTA INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

AS OF DECEMBER 31, 2018

1. Organization and Presentation

Novanta Inc. and its subsidiaries (collectively referred to as “Novanta”, the “Company”, “we”, “us”, “our”) is a leading global supplier of core technology solutions that give medical and advanced industrial original equipment manufacturers (“OEMs”) a competitive advantage. Novanta combines deep proprietary technology expertise and competencies in photonics, vision and precision motion with a proven ability to solve complex technical challenges. This enables Novanta to engineer core components and sub-systems that deliver extreme precision and performance, tailored to the customers’ demanding applications.

Basis of Presentation

These consolidated financial statements have been prepared by the Company in United States (“U.S.”) dollars and in accordance with accounting principles generally accepted in the U.S., applied on a consistent basis.

The consolidated financial statements include the accounts of Novanta Inc. and its subsidiaries. Intercompany accounts and transactions have been eliminated.

Prior to January 10, 2017, the Company had an approximately 41% ownership interest in Laser Quantum Limited (“Laser Quantum”), a privately held company located in the United Kingdom, which was accounted for under the equity method of accounting. During the years ended December 31, 2017 and 2016, the Company recognized income from its equity method investment amounting to $0.1 million and $2.2 million, respectively, which was included in other income (expense) in the accompanying consolidated statements of operations.

On January 10, 2017, the Company acquired an additional approximately 35% of the outstanding shares of Laser Quantum. As a result of this transaction, the Company’s ownership position in Laser Quantum increased from approximately 41% to approximately 76%. Since January 10, 2017, Laser Quantum has been consolidated in the Company’s consolidated financial statements. On September 27, 2018, the Company acquired the remaining approximately 24% of the outstanding shares of Laser Quantum for an aggregate consideration of $45.1 million in cash and restricted stock.

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the dates of the financial statements, and the reported amounts of revenue and expenses during the reporting periods. Estimates and assumptions are reviewed on an on-going basis and the effects of revisions are reflected in the period in which they are deemed to be necessary. The Company evaluates its estimates based on historical experience, current conditions and various other assumptions that it believes are reasonable under the circumstances. Actual results could differ significantly from those estimates.

Foreign Currency Translation

The financial statements of the Company and its subsidiaries outside the U.S. have been translated into U.S. dollars. Assets and liabilities of foreign operations are translated from foreign currencies into U.S. dollars at the exchange rates in effect as of the balance sheet date. Revenue and expenses are translated at the weighted average exchange rates for the period. Accordingly, gains and losses resulting from translating foreign currency financial statements are reported as cumulative translation adjustments, a separate component of other comprehensive income (loss) in stockholders' equity. Foreign currency transaction gains and losses, from transactions denominated in currencies other than the functional currencies, are included in the accompanying consolidated statements of operations.

Cash Equivalents

Cash equivalents are highly liquid investments with original maturities of three months or less. These investments are carried at cost, which approximates fair value.

NOVANTA INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

AS OF DECEMBER 31, 2018

Accounts Receivable and Allowance for Doubtful Accounts

Accounts receivable are recorded at the invoiced amounts, net of an allowance for doubtful accounts based on the Company's best estimate of probable credit losses resulting from the inability of the Company's customers to make required payments. The Company determines the allowance based on a variety of factors, including the age of amounts outstanding relative to their contractual due date, specific customer factors, and other known risks and economic trends. Charges related to the allowance for doubtful accounts are included as selling, general and administrative expenses and are recorded in the period that the outstanding receivables are determined to be uncollectible. Account balances are charged off against the allowance when the Company believes it is certain that the receivable will not be recovered.

For the years ended December 31, 2018, 2017 and 2016, changes in the allowance for doubtful accounts were as follows (in thousands):

	2018	2017	2016
Balance at beginning of year	$554	$565	$500
Provision charged to selling, general and administrative expenses	66	283	135
Allowance resulting from acquisitions	—	52	15
Write-offs, net of recoveries of amounts previously reserved	(295)	(358)	(82)
Exchange rate changes	(4)	12	(3)
Balance at end of year	$321	$554	$565

Inventories

Inventories, which include materials and conversion costs, are stated at the lower of cost or net realizable value, using the first-in, first-out method. Cost includes the cost of purchased materials, inbound freight charges, external and internal processing and applicable labor and overhead costs. Net realizable value is the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation. The Company periodically reviews quantities of inventories on hand and compares these amounts to the expected use of each product. The Company records a charge to cost of revenue for the amount required to reduce the carrying value of inventory to the net realizable value.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost, adjusted for any impairment, less accumulated depreciation. The Company uses the straight-line method to calculate the depreciation of its property, plant and equipment over their

estimated useful lives. Estimated useful lives range from 3 to 30 years for buildings and building improvements and 3 to 10 years for machinery and equipment. Leasehold improvements are depreciated over the lesser of their useful lives or the lease terms, including any renewal period options that are reasonably assured of being exercised. Repairs and maintenance costs are expensed as incurred. Certain costs to develop software for internal use are capitalized when the criteria under Accounting Standards Codification ("ASC") 350-40, "Internal-Use Software," are met. Lease arrangements meeting the criteria of ASC 840-30, "Leases – Capital Leases," are capitalized based on the present value of future minimum lease payments and depreciated over the term of the lease.

Goodwill, Intangible Assets and Long-Lived Assets

Goodwill represents the excess of the purchase price over the tangible assets, identifiable intangible assets and assumed liabilities acquired in a business combination. Allocations of the purchase price are based upon a valuation of the fair value of assets acquired and liabilities assumed as of the acquisition date. Goodwill and indefinite-lived intangibles are not amortized but are assessed for impairment at least annually to ensure their current fair values exceed their carrying values.

The Company's most significant intangible assets are customer relationships, patents and developed technologies, trademarks and trade names. The fair values of intangible assets are based on valuations using an income approach, with estimates and assumptions provided by management of the acquired companies and the Company. The process for estimating the fair values of identifiable intangible assets requires the use of significant estimates and assumptions, including estimating future cash flows and developing appropriate discount rates. All definite-lived intangible assets are amortized over the periods in which their economic benefits are expected to be realized. The Company reviews the useful life assumptions, including the classification of certain intangible assets as "indefinite-lived", on a periodic basis to determine if changes in circumstances warrant revisions to them. Costs associated with patent and intellectual property applications, renewals or extensions are expensed as incurred.

NOVANTA INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

AS OF DECEMBER 31, 2018

The Company evaluates its goodwill, intangible assets and other long-lived assets for impairment at the reporting unit level which is at least one level below our reportable segments.

Impairment Charges

Impairment analyses of goodwill and indefinite-lived intangible assets are conducted in accordance with ASC 350, "Intangibles —Goodwill and Other." During the second quarter of 2018, the Company adopted Accounting Standards Update ("ASU") 2017-14, "Simplifying the Test for Goodwill Impairment" ("ASU 2017-04"), which eliminates Step Two of the goodwill impairment test. The Company performs its goodwill impairment test annually as of the beginning of the second quarter or more frequently if indicators are present, or changes in circumstances suggest, that an impairment may exist.

The Company has the option of first performing a qualitative assessment to determine whether it is necessary to perform the quantitative impairment test. In performing the qualitative assessment, the Company reviews factors both specific to the reporting unit and to the Company as a whole, such as financial performance, macroeconomic conditions, industry and market considerations, and the fair value of each reporting unit at the last valuation date. If the Company elects this option and believes, as a result of the qualitative assessment, that it is more likely than not that the carrying value of the reporting unit exceeds its fair value, the quantitative impairment test is required; otherwise, no further testing is required.

Alternatively, the Company may elect to bypass the qualitative assessment and perform the quantitative impairment test. This approach requires a comparison of the carrying value of each of the Company's reporting units to the estimated fair value of these reporting units. The fair value of a reporting unit is estimated primarily using a discounted cash flow ("DCF") method with a weighted average cost of capital. If the carrying value of a reporting unit exceeds its fair value, an impairment charge is recorded for the difference.

The Company assesses indefinite-lived intangible assets for impairment on an annual basis as of the beginning of the second quarter, and more frequently if indicators are present, or changes in circumstances suggest, that an impairment may exist. The Company will also reassess the continuing classification of these indefinite-lived intangible assets as indefinite-lived when circumstances change such that the useful life may no longer be considered indefinite. The fair values of the Company's indefinite-lived intangible assets are determined using the relief from royalty method, based on forecasted revenues. If the fair value of an indefinite-lived intangible asset is less than its carrying value, an impairment charge is recorded for the difference between the carrying value and the fair value of the impaired asset.

The carrying amounts of definite-lived long-lived assets are reviewed for impairment whenever changes in events or circumstances indicate that their carrying values may not be recoverable. The recoverability of the carrying value is generally determined by comparison of the asset group's carrying value to its undiscounted future cash flows. When this test indicates a potential for impairment, a fair value assessment is performed. Once an impairment is determined and measured, an impairment charge is recorded for the difference between the carrying value and the fair value of the impaired asset.

Revenue Recognition

See Note 3 for the Company's revenue recognition policy.

Research and Development and Engineering Costs

Research and development and engineering ("R&D") expenses are primarily comprised of employee related expenses and cost of materials for R&D projects. These costs are expensed as incurred.

Share-Based Compensation

The Company records the expense associated with share-based compensation awards to employees and directors based on the fair value of awards as of the grant date. For share-based compensation awards that vest over time based on employment, the associated expenses are recognized in the consolidated statements of operations ratably over the vesting period, net of estimated forfeitures. The Company also grants two types of performance-based awards to certain members of the executive management team: non-GAAP

earnings per share performance-based restricted stock units (“EPS-PSUs”) and relative total shareholder return performance-based restricted stock units (“TSR-PSUs”).

Share-based compensation expense associated with EPS-PSUs is recognized ratably over the vesting period when it is probable that the performance targets are expected to be achieved based on management’s projections. Management’s projections are revised, if necessary, in subsequent periods when underlying factors change the evaluation of the probability of achieving the performance targets. When the estimated achievement levels are adjusted at a later date, a cumulative adjustment to the share-based compensation expense previously recognized would be required. Accordingly, share-based compensation expense associated with EPS-PSUs may differ significantly from period to period based on changes to the probability of achieving performance targets. Share-based compensation expense associated with TSR-PSUs is based on the fair value of the TSR-PSUs, determined using the Monte-Carlo valuation model, as of the grant date and is recognized on a straight-line basis from the grant date to the end of the performance period. Compensation expense will not be affected by the number of TSR-PSUs that will actually vest at the end of the performance period.

Advertising Costs

Advertising costs are expensed to selling, general and administrative expenses as incurred and were not material for 2018, 2017 and 2016.

Restructuring, Acquisition and Divestiture Related Costs

The Company accounts for its restructuring activities in accordance with the provisions of ASC 420, “Exit or Disposal Cost Obligations.” The Company makes assumptions related to the amounts of employee severance benefits and related costs, time period over which facilities will remain vacant, useful lives and residual value of long-lived assets, sublease terms, sublease rental rates and discount rates. Estimates and assumptions are based on the best information available at the time the obligation is recognized. These estimates are reviewed and revised as facts and circumstances dictate.

Acquisition related costs incurred to effect a business combination, including finders’ fees, legal, valuation and other professional or consulting fees, are expensed as incurred. Acquisition related costs also include expenses recognized under earn-out agreements in connection with acquisitions. Expenses associated with divestiture activities, including legal and professional fees directly related to the completion of a business divestiture, are expensed as incurred.

Accounting for Income Taxes

The asset and liability method is used to account for income taxes. Under the asset and liability method, deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to temporary differences between the financial statement carrying amounts of assets and liabilities and their respective tax bases. This method also requires the recognition of future tax benefits, such as net operating loss carryforwards, to the extent that it is more likely than not that such benefits will be realized. Deferred tax assets and liabilities are measured using enacted tax rates in effect for the year in which the temporary differences are expected to be recovered or settled. A valuation allowance is established to reduce the deferred tax assets if it is more likely than not that some or all of the related tax benefits will not be realized in the future. Valuation allowances are reassessed periodically to determine whether it is more likely than not that the tax benefits will be realized in the future and that any valuation allowance should be released.

The majority of the Company’s business activities are conducted through its subsidiaries outside of Canada. Earnings from these subsidiaries are generally indefinitely reinvested in the local businesses. Further, local laws and regulations may also restrict certain subsidiaries from paying dividends to their parents. As such, the Company generally does not accrue income taxes for the repatriation of such earnings in accordance with ASC 740, “Income Taxes.” To the extent that there are excess accumulated earnings that the Company intends to repatriate from any such subsidiaries, the Company recognizes deferred tax liabilities on such foreign earnings.

NOVANTA INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

AS OF DECEMBER 31, 2018

The Company assesses its income tax positions and records tax benefits for all years subject to examination based on the evaluation of the facts, circumstances, and information available at each reporting date. For those tax positions with a greater than 50 percent likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information, the Company records a tax benefit. For those income tax positions that are not likely to be sustained, no tax benefit is recognized in the consolidated financial statements. The Company recognizes interest and penalties related to uncertain tax positions as part of the provision for income taxes.

Foreign Currency Contracts

The Company uses foreign currency contracts as a part of its strategy to limit its exposures related to foreign currency denominated monetary assets and liabilities. The time duration of these foreign currency contracts approximates the underlying foreign currency transaction exposures, generally less than three months. These contracts are not designated as cash flow, fair value or net investment hedges. Changes in the fair value of these foreign currency contracts are recognized in income before income taxes.

NOVANTA INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

AS OF DECEMBER 31, 2018

Recent Accounting Pronouncements

Standard	Description	Effective Date	Effect on the Financial Statements or Other Significant Matters
In March 2018, the FASB issued ASU 2018-05, "Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118."	ASU 2018-05 allows SEC registrants to record provisional amounts in earnings for the year ended December 31, 2017 due to the complexities involved in accounting for the income tax effects of the U.S. Tax Cuts and Jobs Act (the "Tax Reform Act"). Companies have up to one year from the enactment of the Tax Reform Act (the "measurement period") to obtain, prepare, and analyze the information that is needed in order to complete the accounting under ASC Topic 740. Any provisional amounts or adjustments to provisional amounts during the measurement period should be included in income from operations as an adjustment to tax provision (benefit) in the reporting period in which the amounts are determined.	January 1, 2018.	The Company adopted ASU 2018-05 during the first quarter of 2018. The adoption of ASU 2018-05 did not have a material impact on the Company's consolidated financial statements. See Note 15.
In February 2018, the FASB issued ASU 2018-02, "Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income."	ASU 2018-02 allows an entity to reclassify the income tax effects of the Tax Reform Act on items within accumulated other comprehensive income to retained earnings. ASU 2018-02 shall be applied either in the period of adoption or retrospectively to each period (or periods) in which the effects of the change in the U.S. federal corporate income tax rate in the Tax Reform Act is recognized.	January 1, 2019. Early adoption is permitted.	The Company does not expect the adoption of ASU 2018-02 to have a material impact on its consolidated financial statements.

NOVANTA INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)

AS OF DECEMBER 31, 2018

Standard	Description	Effective Date	Effect on the Financial Statements or Other Significant Matters
In May 2017, the FASB issued ASU 2017-09, "Compensation – Stock Compensation (Topic 718)."	ASU 2017-09 requires that an entity account for the effects of a modification unless (i) the fair value of the modified award is the same as the fair value of the original award immediately before the original award is modified; (ii) the vesting conditions of the modified award are the same as the vesting conditions of the original award immediately before the original award is modified; and (iii) the classification of the modified award as an equity instrument or a liability instrument is the same as the classification of the original award immediately before the original award is modified. ASU 2017-09 should be applied prospectively to an award modified on or after the adoption date.	January 1, 2018.	The Company adopted ASU 2017-09 during the first quarter of 2018. The adoption of ASU 2017-09 did not have a material impact on the Company's consolidated financial statements.
In March 2017, the FASB issued ASU 2017-07, "Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost."	ASU 2017-07 requires employers that offer or maintain defined benefit plans to disaggregate the service component from the other components of net periodic benefit cost and provides guidance on the presentation of the service component and the other components of net periodic benefit cost in the statement of operations. ASU 2017-07 should be applied retrospectively for the presentation of net periodic benefit cost in the statement of operations.		