

**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, 2019

or

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

For the transition period from _____ to _____

Commission File No. 001-35083

NOVANTA INC.

(Exact name of registrant as specified in its charter)

New Brunswick, Canada
(State or other jurisdiction
of incorporation or organization)

125 Middlesex Turnpike
Bedford, Massachusetts, USA
(Address of principal executive offices)

98-0110412
(I.R.S. Employer
Identification No.)

01730
(Zip Code)

(781) 266-5700

(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common shares, no par value	NOVT	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 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 28, 2019) was \$3,166,216,052. 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 20, 2020, there were 35,091,195 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 14, 2020 to be filed with the Securities and Exchange Commission are incorporated by reference in answers to Part III of this Annual Report on Form 10-K.

NOVANTA INC.
FORM 10-K
YEAR ENDED DECEMBER 31, 2019

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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 the Company are used in this report: Cambridge Technology, Lincoln Laser, Synrad, Laser Quantum, ARGES, WOM, NDS, NDSsi, Med X Change, Reach Technology, JADAK, ThingMagic, Photo Research, General Scanning, Celera Motion, MicroE, Applimotion, Zettlex, Ingenia 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,” “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. 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 our customers' demanding applications.

The Company 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 components and sub-systems 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, laser additive manufacturing, 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, 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;
- expanding sales and marketing channels to reach new target customers;
- improving our existing operations to expand profit margins and improve customer satisfaction by implementing lean manufacturing principles, strategic sourcing across our major production sites, and optimizing and limiting the growth of our fixed cost base; 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 July 2019, the Company acquired ARGES GmbH (“ARGES”), a Wackersdorf, Germany-based manufacturer of innovative laser scanning subsystems used in industrial materials processing and medical applications, for a total purchase price of €65.5 million (\$72.9 million), subject to customary working capital adjustments.

In June 2019, the Company acquired Med X Change, Inc. (“Med X Change”), a Bradenton, Florida-based provider of medical grade, high definition and 4K video recording and documentation solutions to OEMs in the medical market, for a total purchase price of \$21.9 million.

In April 2019, the Company acquired Ingenia-CAT, S.L. (“Ingenia”), a Barcelona, Spain-based provider of high-performance servo drives and control software to OEMs in the medical and advanced industrial markets, for a total purchase price of €14.3 million (\$16.2 million).

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 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, 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 2012, we have executed a series of divestitures and product rationalizations in line with our strategy, and we may divest additional product lines that we do not consider to be core to our business in the future.

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.

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, 2019 (dollars in thousands):

	<u>Revenue</u>	<u>Gross Profit Margin</u>	<u>Operating Profit</u>
Photonics	\$ 230,457	45.9%	\$ 41,990
Vision	\$ 271,407	38.8%	\$ 21,007
Precision Motion	\$ 124,235	42.9%	\$ 22,339

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, solid state laser, 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 Lines	Key End Markets	Brand Names	Description
<i>Laser Beam Delivery Components</i>	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.
<i>Laser Beam Delivery Solutions</i>	Advanced Industrial and Medical	Cambridge Technology, Synrad, Laser Quantum, ARGES	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 multi-axis scan heads, highly integrated 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.
<i>CO₂ Lasers</i>	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.
<i>Solid State and Ultrafast Lasers</i>	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, recorder and video integration technologies for operating room integrations; 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.

The Vision segment has nine product lines:

Product Lines	Key End Markets	Brand Names	Description
<i>Medical Insufflators, Pumps and Accessories</i>	Medical	WOM	Insufflators, pumps, light sources and video couplers, gamma probes and related accessories and consumables for minimally invasive surgery.
<i>Visualization Solutions</i>	Medical	NDS, NDSsi	High definition, 4K and 4K 3D visualization solutions for minimally invasive surgery and robotic surgery.
<i>Video Processing, Streaming and Capture</i>	Medical	NDS, NDSsi, Med X Change	Imaging management for visual information, including real-time distribution, documentation, control, recording, 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.
<i>Touch Panel Displays</i>	Medical and Advanced Industrial	Reach Technology	Embedded capacitive and resistive touch panel technology that delivers high-performance solutions.
<i>Machine Vision</i>	Medical and Advanced Industrial	JADAK	Camera-based machine vision products and solutions performing image analysis within medical devices.
<i>Radio Frequency Identification (RFID)</i>	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.
<i>Barcode Identification</i>	Medical and Advanced Industrial	JADAK	Embedded and handheld data collection products for barcode identification.
<i>Thermal Chart Recorders</i>	Medical	JADAK	Rugged thermal chart recorders for patient monitoring, defibrillator equipment, blood gas analyzers, and pulse oximeters.
<i>Light and Color Measurement</i>	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 motor and motion control sub-assemblies, servo drives, air bearings, and air bearing spindles 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.

The Precision Motion segment includes six product lines:

Product Lines	Key End Markets	Brand Names	Description
<i>Optical Encoders</i>	Advanced Industrial and Medical	Celera Motion, MicroE	Optical encoders for precision motion control and sensing in semiconductor and electronics manufacturing, industrial and medical robotics, metrology, satellite communications, medical devices, and laboratory and diagnostics equipment.
<i>Inductive Encoders</i>	Advanced Industrial and Medical	Celera Motion, Zettlex	Inductive encoders for precision motion control and sensing in satellite communications, surveillance, medical devices, industrial and medical robotics, autonomous vehicles, and laboratory and diagnostics equipment.
<i>Precision Motors</i>	Advanced Industrial and Medical	Celera Motion, Applimotion	Direct drive motor components for 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.
<i>Servo drives and motion control solutions</i>	Advanced Industrial and Medical	Celera Motion, Ingenia	Precision motion servo drives and control software used in industrial robotics, medical robotics, autonomous vehicles, satellite communications, and medical devices.
<i>Integrated Motion Control Solutions</i>	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.
<i>Air Bearing Spindles</i>	Advanced Industrial	Celera Motion, Westwind	High-speed and precision air bearings and air bearing spindles. 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 medical market and the advanced industrial market.

Medical Market

For the year ended December 31, 2019, the medical market accounted for approximately 55% 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, growth rates of surgical procedures, changes in regulatory requirements and laws, aggregation of purchasing by healthcare networks, changes in technology requirements, timing of OEM customers’ product development and new product launches, changes in customer or patient preferences, and general demographic trends.

Advanced Industrial Market

For the year ended December 31, 2019, the advanced industrial market accounted for approximately 45% 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.

Working Capital Requirements

There are no special inventory stocking 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, 2019, 2018 or 2017.

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 a very small portion of our products 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 are impacted in the first quarter by the seasonal spending patterns of our customers due to their annual capital budgeting cycles.

Backlog

As of December 31, 2019 and 2018, our consolidated backlog was approximately \$243.1 million and \$234.4 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; Wackersdorf, Germany; 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; Bradenton, Florida; and Ludwigsstadt, Germany. Products offered by our Precision Motion segment are primarily manufactured at facilities in Bedford, Massachusetts; Rocklin, California; Poole and Cambridge, United Kingdom; and Suzhou, China.

Many of our products are produced in manufacturing facilities certified under ISO 9001 certification, while the majority of our products manufactured for the medical market are produced in factories under ISO 13485 certification. The manufacturing facilities for our medical insufflators, pumps, cameras and accessories products are ISO 14001 certified. Certain visualization solutions, thermal chart recorders, imaging informatics and medical insufflators, pumps, cameras and accessories products are manufactured under current good manufacturing practices (cGMPs), which is a requirement of their medical device classification by the United States Food and Drug Administration (the "FDA"). In addition, if these medical devices are classified as Class II devices, a 510(k) premarket notification to the FDA and approval by the FDA is required.

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 service and application centers in the United States, Europe and Asia.

Competition

The markets in which we compete are dynamic and highly competitive. While no single company competes with us across the breadth of our product offerings, we face a fragmented competitive landscape, with competitors for particular product categories and individual application areas. 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 private firms, which produce a limited number of goods or services for specialized market segments.

Competitors for our products are fragmented by particular product category, and the individual markets in which we operate are highly competitive. Our major competitors by reportable segments include, among others:

Photonics: SCANLAB, Coherent, and Cobolt.

Vision: Barco, Omron Microscan, FSN Medical Technologies, and HID Global.

Precision Motion: Renishaw, HEIDENHAIN, Physik Instrument, and Allied Motion Technologies.

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 and our overall reputation. We believe that our products offer a number of competitive advantages, and the breadth of technologies we offer give us deep market application knowledge to better serve our customers' needs and distinguish us from our competitors. Ultimately, our ability to deliver high-quality products timely when the customer needs them presents the biggest threat to our competitiveness.

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, 2019 and 2018, we employed 2,290 and 2,262 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. Such rules and regulations are subject to change by the governing agencies and we monitor those changes closely.

Environmental Regulations

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.

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 Regulations

Certain products manufactured by us are integrated into systems by our customers that are subject to regulation by 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 Regulations

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;
- 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, proxy and information statements, 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,

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, economic and political uncertainty in Europe as Britain negotiates the terms of its withdrawal from the EU, and ongoing related negotiations, as well as political and economic uncertainty in the U.S. adversely impacted our customers' financial condition and ability to maintain product order levels, and have reduced the demand for our products in 2019. Continued or worsening conditions in these or other markets could further 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. It is difficult to predict the timing, length and severity of these downturns and their impact on our business. 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 have experienced significant cyclical end market fluctuations in the past. For example, in 2019, our sales into the advanced industrial end market declined as a result of a wide spread downturn in this end market that is continuing. 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 may 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 received in the past, and may receive in the future, 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.

Delays in shipments 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. Like other global companies, we have experienced threats to data and systems, including by perpetrators of random or targeted malicious cyberattacks, computer viruses, malware, worms, bot attacks or other destructive or disruptive software and attempts to misappropriate customer information and cause system failures and disruptions. Certain other events could also result in the disruption of our systems, including power outages, 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.

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 EU. 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 EU jurisdictions where we have business operations or are 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 as potential civil claims, including class action type litigation where individuals suffered harm. Similarly, California has enacted the California Consumer Privacy Act, or CCPA, which took effect on January 1, 2020. The CCPA creates individual privacy rights for California consumers and increases the privacy and security obligations of entities handling certain personal data. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. The CCPA may increase our compliance costs and potential liability. Many similar laws have been proposed at the federal level and in other states. Any liability from our failure to comply with the requirements of these laws could adversely affect our financial condition and results of operations.

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 to 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., the 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, 2019, approximately 59% of our revenues were from 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, wars, health epidemics 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.

Our facilities or operations could be adversely affected by events outside of our control, such as health epidemics.

We may be impacted by health epidemics or other events outside of our control. For example, beginning in late 2019, a strain of novel coronavirus surfaced in China. In January 2020, the World Health Organization declared the novel coronavirus outbreak a “Public Health Emergency of International Concern,” prompting precautionary government-imposed travel restrictions and temporary closures of business operations. We have manufacturing, sales, and service offices in China and has significant direct and indirect customer exposure and supply chain exposure to the China market. Our facility in Suzhou, China was closed for a brief period of time as a result of a local government mandate, before it reopened in February 2020. The business interruption has negatively impacted our near-term results and may negatively impact our long-term results, depending on the length of the disruption. These disruptions have come in the form of part shortages related to our supply chain, labor shortages, and disruptions in demand from our customers in and outside of China, which will negatively affect our revenue and profitability. At this point in time, there is significant uncertainty

relating to the extent of the impact of the novel coronavirus on our business and potential impacts on our business in the future. Infections may become more widespread, including to other countries where we have operations, and factory closures and travel restrictions may remain or worsen, all of which would worsen the negative impact on our business, financial condition and results of operations.

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, Southeast Asia and elsewhere overseas in order to reduce our manufacturing cost. However, economic, political or trade problems with foreign countries and public health crises 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, 2019, approximately 59% of our revenues were from 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 other countries have escalated in recent years. U.S. tariff impositions against Chinese exports have been followed by retaliatory Chinese tariffs on U.S. exports to China. Certain of the raw materials and components we purchase from China are or were 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 and may in the future be subject to retaliatory tariffs in China, which increases our cost and makes our products less competitive than those of our competitors whose products are not subject to such retaliatory tariffs. In addition, the U.S. administration previously 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 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 other foreign markets could also become subject to similar retaliatory tariffs, making our products uncompetitive to similar products not subjected to such import tariffs. Although a temporary agreement has been reached between the U.S. and Chinese governments to cease further escalation of trade tariffs, there is no guarantee that any of the existing tariffs will be repealed or reduced. 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 condition.

The U.K.'s withdrawal from the EU 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 in the U.K., Germany and China. Following a national referendum and enactment of legislation by the U.K. government, the U.K. withdrew from the European Union on January 31, 2020 and entered into a transition period during which it will continue its ongoing and complex negotiations with the European Union relating to the future trading relationship between the parties. Significant political and economic uncertainty remains about whether the terms of the relationship will differ materially from the terms before the withdrawal, as well as about the possibility that a so-called “no deal” separation will occur if negotiations are not completed by the end of the transition period. These developments in turn may increase our costs and 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 ARGES, Med X Change, Ingenia, Zettlex, WOM, Laser Quantum and ThingMagic, 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 acquired businesses 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 multiple 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, health epidemic, and act of terrorism 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 key 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 EU, 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 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. As the MDR becomes effective on May 25, 2020, new medical devices will have to meet requirements of the MDR in order to be placed in the European market after the effective date. Devices holding a certificate from a European Notified Body under the Medical Device Directive (93/42/EEC) have an additional grace period and may continue to be placed on the market until May 26, 2024. Unlike directives, which must be implemented into the national laws of the EU member states, the regulations are directly applicable (i.e., without the need for adoption of EU member state laws implementing them) in all EU member states and are intended to eliminate current differences in the regulation of medical devices among EU member states. The MDR, among other things, is intended to establish a uniform, transparent, predictable and sustainable regulatory framework across the European Economic Area (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 EU; 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 EU 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 result 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 changes. From time to time, legislation is drafted and introduced in Congress that could significantly change the statutory provisions governing the regulation of medical devices. The FDA may also change its clearance and approval policies, adopt additional regulations or revise existing regulations, or take other actions that may prevent or delay approval or clearance of our future products under development or impact our ability to modify our currently cleared products on a timely basis. Over the last several years, the FDA has proposed reforms to its 510(k) clearance process, and such proposals could include increased requirements for clinical data and a longer review period, or could make it more difficult for manufacturers to utilize the 510(k) clearance process for their products. In addition, FDA regulations and guidance are often revised or reinterpreted by the FDA in ways that may significantly affect our business and our

products. Any new statutes, regulations, or revisions or reinterpretations of existing regulations may impose additional costs, lengthen regulatory review time for, or make it more difficult to obtain approval for, the manufacturing, marketing or distribution of our products. Such changes could, among other things, require additional testing prior to obtaining clearance or approval, changes to manufacturing methods, recall, replacement or discontinuance of our products, or require additional record keeping.

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 and 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 and 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, sale, 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 HIPAA, 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 for Economic 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 Act” requirements under PPACA, which requires manufacturers of drugs, devices, biologics, and medical supplies to report annually to Centers for Medicare & Medicaid Services (the “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 payors, 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 occurs, 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. Various elements of healthcare reforms, 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 have material adverse impact on numerous aspects of our business, results of operations and financial condition.

Changes in government 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 could reduce demand for our products or increase our expenses, which in turn could adversely affect our business, financial condition and results of operations.

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 or 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, 2019, we had \$440.9 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, royalties and certain types of interest.

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, and/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, 2019, we had outstanding debt of \$224.6 million under our amended and restated senior secured credit agreement (the “Third Amended and Restated Credit Agreement”) and \$226.6 million available to be drawn under the revolving credit facility. If we are unable to satisfy the conditions in the Third 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 Third 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.

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

As of December 31, 2019, we had \$224.6 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, results of operations and financial condition.

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 Third 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, political 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.

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, 2019, 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, 2019 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
Suzhou, People's Republic of China	Manufacturing, R&D, Marketing, Sales and Administration	Photonics, Vision & Precision Motion	55,000	Leased; expires in 2023
Berlin, Germany	R&D, Marketing, Sales and Administration	Vision	51,000	Leased; expires in 2026

Additional manufacturing, research and development, sales, service and logistics sites are located in California, Washington, Florida, New York, Arizona and Oregon within the United States, and in Germany, United Kingdom, Czech Republic, Japan, China, Spain and Italy. These additional facilities cover approximately 540,000 square feet, of which approximately 374,000 square feet are leased and approximately 166,000 square feet are owned, and are used by our Photonics, Vision and Precision Motion segments.

We consider our facilities suitable and adequate for the purposes for which they are used and do not anticipate difficulty in renewing existing leases as they expire or in finding alternative facilities. We believe all of our properties have been properly-maintained.

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 20, 2020, 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 2018, the Company's Board of Directors authorized a share repurchase plan (the "2018 Repurchase Plan") for the repurchase of up to an aggregate of \$25.0 million of the Company's 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. Since the adoption of the share repurchase plan, the Company repurchased 119 thousand shares for an aggregate purchase price of \$10.0 million at an average price of \$83.71 per share.

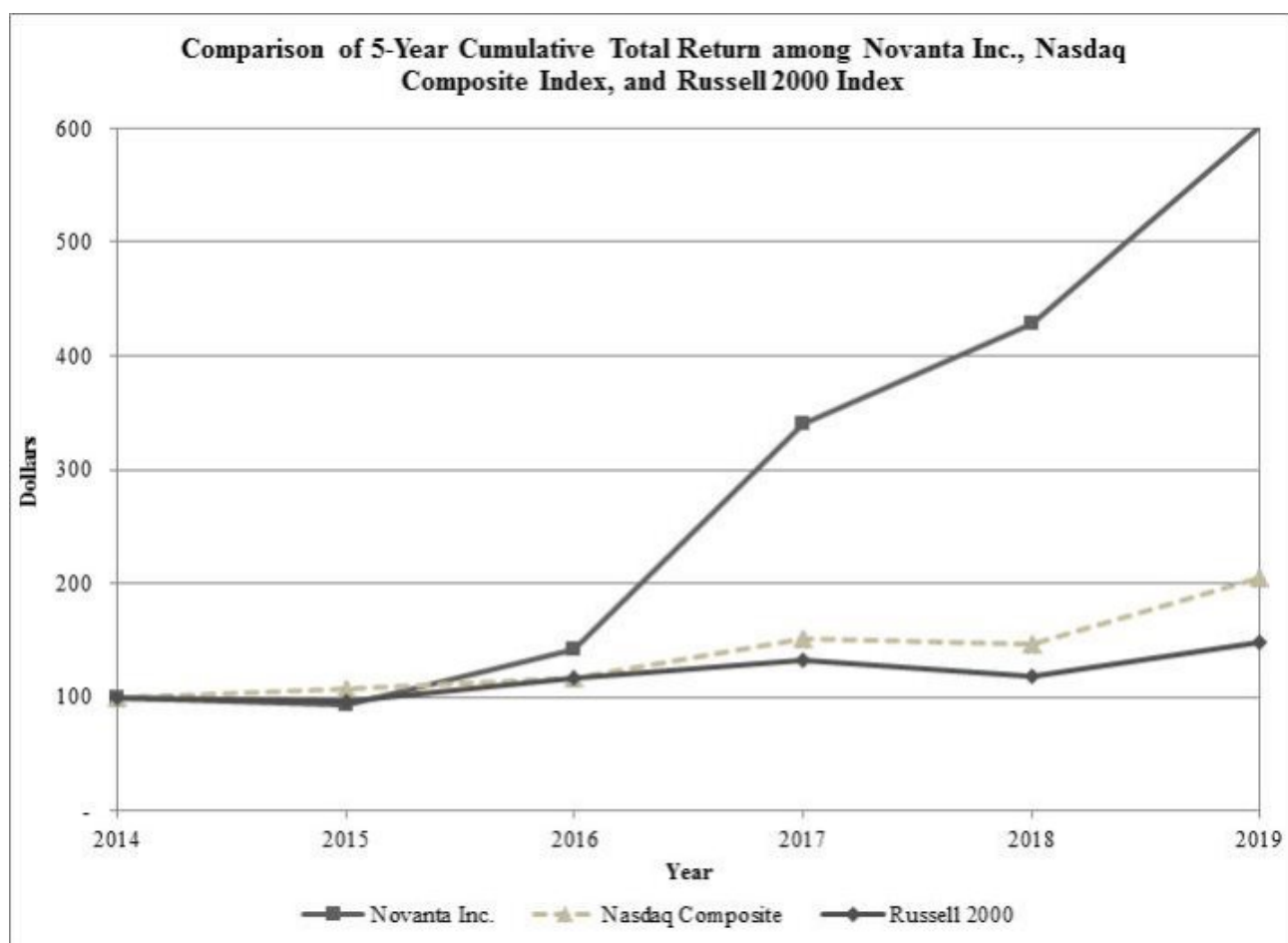
In February 2020, the Company's Board of Directors authorized a new share repurchase plan for the repurchase of up to an aggregate of \$50.0 million of the Company's common shares (the "2020 Repurchase Plan"), following the completion of the 2018 Repurchase Plan. While the 2020 Repurchase Plan is intended to generally offset dilution from equity awards to the Company's employees and directors, the 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 2020 Repurchase Plan, and the plan may be suspended or discontinued at any time.

The following table sets forth certain information with respect to repurchases of the Company's common shares under the 2018 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
September 28 - November 1, 2019	15,600	\$ 83.47	15,600	\$ 17,012,575
November 2 - November 29, 2019	13,200	\$ 84.07	13,200	\$ 15,902,877
November 30 - December 31, 2019	9,964	\$ 90.61	9,964	\$ 15,000,088
Total	38,764		38,764	

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, 2014 through December 31, 2019. The comparison assumes an investment of \$100 is made on December 31, 2014 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, 2014	December 31, 2015	December 31, 2016	December 31, 2017	December 31, 2018	December 31, 2019
Novanta Inc.	\$ 100.00	\$ 92.53	\$ 142.66	\$ 339.67	\$ 427.99	\$ 600.82
Nasdaq Composite Index	\$ 100.00	\$ 106.96	\$ 116.45	\$ 150.96	\$ 146.67	\$ 205.27
Russell 2000 Index (1)	\$ 100.00	\$ 95.59	\$ 115.95	\$ 132.98	\$ 118.30	\$ 148.49

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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, 2019, 2018 and 2017 and the consolidated balance sheet data as of December 31, 2019 and 2018 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, 2016 and 2015 and the consolidated balance sheet data as of December 31, 2017, 2016 and 2015 are derived from our audited consolidated financial statements that are not included in this Annual Report on Form 10-K.

	Year Ended December 31,				
	2019	2018	2017 (1)	2016	2015
(In thousands, except per share data)					
Consolidated Statement of Operations Data:					
Revenue	\$ 626,099	\$ 614,337	\$ 521,290	\$ 384,758	\$ 373,598
Gross profit	262,085	261,528	220,531	162,452	157,890
Operating expenses (2)	206,803	190,515	162,965	129,497	128,586
Operating income from continuing operations (2)	55,282	71,013	57,566	32,955	29,304
Income from continuing operations before income taxes (3) (4)	45,766	61,302	76,134	32,522	46,022
Income tax provision	4,993	10,207	13,827	10,519	10,394
Income from continuing operations	40,773	51,095	62,307	22,003	35,628
Loss from discontinued operations, net of tax	—	—	—	—	(13)
Consolidated net income	40,773	51,095	62,307	22,003	35,615
Less: Net income attributable to noncontrolling interest	—	(1,986)	(2,256)	—	—
Net income attributable to Novanta Inc.	\$ 40,773	\$ 49,109	\$ 60,051	\$ 22,003	\$ 35,615
Earnings per common share from continuing operations. (5):					
Basic	\$ 1.16	\$ 1.46	\$ 1.14	\$ 0.63	\$ 1.03
Diluted	\$ 1.15	\$ 1.43	\$ 1.13	\$ 0.63	\$ 1.02
Earnings per common share attributable to Novanta Inc. (5):					
Basic	\$ 1.16	\$ 1.46	\$ 1.14	\$ 0.63	\$ 1.03
Diluted	\$ 1.15	\$ 1.43	\$ 1.13	\$ 0.63	\$ 1.02
Weighted average common shares outstanding—basic	35,030	34,913	34,817	34,694	34,579
Weighted average common shares outstanding—diluted	35,546	35,473	35,280	34,914	34,827

- (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 2018, the Company adopted 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. Amounts prior to 2018 have been retrospectively revised to conform with this presentation.
- (3) In 2017, the Company acquired an additional approximately 35% of the outstanding shares of Laser Quantum and recorded a non-taxable 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.
- (4) In 2015, the Company sold its JK Lasers business and recorded a gain on disposal of \$19.6 million.
- (5) 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,				
	2019	2018	2017 (2)	2016	2015
	(in thousands)				
Consolidated Balance Sheet Data:					
Cash and cash equivalents	\$ 78,944	\$ 82,043	\$ 100,057	\$ 68,108	\$ 59,959
Total assets (1)	869,736	719,576	726,703	425,637	416,045
Debt, current	5,031	4,535	9,119	7,366	7,385
Debt, long-term	215,334	202,843	225,500	70,554	88,426
Long-term liabilities, excluding debt (1)	102,384	44,282	44,567	25,717	25,965
Redeemable noncontrolling interest (3)	—	—	46,923	—	—
Total stockholders' equity	417,172	368,255	311,545	258,870	244,701

- (1) In 2019, the Company adopted ASU 2016-02, "Leases (Topic 842)," using the modified retrospective approach. ASU 2016-02 requires a lessee to recognize on the balance sheet a liability to make lease payments and a right-of-use asset representing its right to use the underlying asset for the lease term for both finance and operating leases. The Company reported operating lease right-of-use ("ROU") assets and operating lease liabilities of approximately \$35.2 million and \$39.2 million, respectively, as of December 31, 2019.
- (2) 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.
- (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 from the noncontrolling interest shareholders.

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 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," "could," "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 medical market and the advanced industrial market.

Medical Market

For the year ended December 31, 2019, the medical market accounted for approximately 55% of our revenue. Revenue from our products sold to the medical market is generally affected by hospital and other healthcare provider capital spending, growth rates of surgical procedures, changes in regulatory requirements and laws, aggregation of purchasing by healthcare networks, changes in technology requirements, timing of OEM customers' product development and new product launches, changes in customer or patient preferences, and general demographic trends.

Advanced Industrial Market

For the year ended December 31, 2019, the advanced industrial market accounted for approximately 45% 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.

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 components and sub-systems 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, laser additive manufacturing, 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, 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;
- expanding sales and marketing channels to reach new target customers;
- improving our existing operations to expand profit margins and improve customer satisfaction by implementing lean manufacturing principles, strategic sourcing across our major production sites, and optimizing and limiting the growth of our fixed cost base; and
- attracting, retaining, and developing world-class talented and motivated employees.

Significant Events and Updates

Third Amended and Restated Credit Agreement

On December 31, 2019, we entered into an amended and restated credit agreement (the “Third Amended and Restated Credit Agreement”), which provides for an aggregate credit facility of \$450.0 million, comprised of a \$100.0 million U.S. dollar equivalent euro-denominated (approximately €90.2 million) 5-year term loan facility and a \$350.0 million 5-year revolving credit facility (collectively, the “Senior Credit Facilities”). The Third Amended and Restated Credit Agreement amended and restated our previous senior credit facilities that had a maturity date of May 19, 2021. The new Senior Credit Facilities will mature in December 2024 and include an uncommitted “accordion” feature pursuant to which the commitments thereunder may be increased by an additional \$200.0 million in aggregate, subject to the satisfaction of certain customary conditions.

Acquisition of ARGES GmbH

On July 31, 2019, we acquired 100% of the outstanding shares of ARGES GmbH (“ARGES”), a Wackersdorf, Germany-based manufacturer of innovative laser scanning subsystems used in industrial materials processing and medical applications, for a total purchase price of €65.5 million (\$72.9 million), subject to customary working capital adjustments. The purchase price consists of €24.0 million (\$26.7 million) cash paid at closing, 124,461 Novanta common shares issued at closing (with a fair market value of €9.8 million, or \$10.9 million, based on the closing market price of \$87.58 per share on July 30, 2019), €7.1 million (\$7.9 million) estimated fair value of contingent consideration and €24.7 million (\$27.4 million) deferred cash consideration which is expected to be paid on June 29, 2020. The contingent consideration will be payable annually based on actual revenue achievement against certain revenue targets from August 2019 through December 2026, with the first payment due in the first quarter of 2021. The initial cash purchase price was financed with borrowings under our revolving credit facility. We expect that the addition of ARGES will complement and expand our existing portfolio of lasers and laser beam steering solutions capabilities within the Photonics reportable segment.

Acquisition of Med X Change, Inc.

On June 5, 2019, we acquired 100% of the outstanding stock of Med X Change, Inc. (“Med X Change”), a Bradenton, Florida-based provider of medical grade, high definition and 4K video recording and documentation solutions to OEMs in the medical market,

for a total purchase price of \$21.9 million, net of working capital adjustments. The acquisition was financed with cash on hand and a \$21.0 million borrowing under our revolving credit facility. We expect that the addition of Med X Change will complement and expand the technology capabilities within our Vision reportable segment to provide our medical OEM customers with more integrated operating room solutions.

Acquisition of Ingenia-CAT, S.L.

On April 16, 2019, we acquired 100% of the outstanding stock of Ingenia-CAT, S.L. (“Ingenia”), a Barcelona, Spain-based provider of high-performance servo drives and control software to OEMs in the medical and advanced industrial markets, for a total purchase price of €14.3 million (\$16.2 million), net of working capital adjustments. The purchase price consists of €8.5 million (\$9.6 million) of cash consideration and €5.8 million (\$6.6 million) estimated fair value of contingent consideration. The initial cash purchase price was financed with cash on hand and borrowings under our revolving credit facility. The contingent consideration will be payable annually based on actual revenue achievement against certain revenue targets from April 2019 through March 2022, with the first payment due in the second quarter of 2020. We expect that the addition of Ingenia will enhance our strategic position in the precision motion control industry by enabling us to offer a broader range of motion control technologies and integrated solutions. Ingenia is included in our Precision Motion reportable segment.

2019 Restructuring

During the fourth quarter of 2018, we implemented a restructuring plan intended to realign operations, reduce costs, achieve operational efficiencies and focus resources on growth initiatives. We incurred costs amounting to \$7.5 million related to this restructuring plan in 2019. We anticipate completing the 2019 restructuring program in the first quarter of 2020 and expect to incur additional restructuring charges of \$0.1 million to \$0.2 million related to the 2019 restructuring program.

Overview of Financial Results

Total revenue for 2019 was \$626.1 million, an increase of \$11.8 million, or 1.9%, versus 2018. This increase was primarily due to increased demand in the medical market, partially offset by decreased demand in the advanced industrial market related to reductions in industrial manufacturing spending. The effect of our acquisitions in 2018 and 2019 resulted in an increase in revenue of \$17.4 million, or 2.8%. In addition, foreign exchange rates adversely impacted our revenue by \$9.8 million, or 1.6%, in 2019.

Operating income decreased \$15.7 million from \$71.0 million in 2018 to \$55.3 million in 2019. This decrease was primarily attributable to an increase in research and development and engineering (“R&D”) spending of \$4.9 million, an increase in selling, general and administrative (“SG&A”) expenses of \$2.5 million and an increase in restructuring and acquisition related costs of \$8.5 million.

Basic earnings per common share (“basic EPS”) of \$1.16 in 2019 decreased \$0.30 from the basic EPS of \$1.46 in 2018. Diluted earnings per common share (“diluted EPS”) of \$1.15 in 2019 decreased \$0.28 from the diluted EPS of \$1.43 in 2018. The decreases were primarily attributable to a decrease in operating income and the positive effect of a \$1.8 million Laser Quantum nontaxable redeemable noncontrolling interest redemption value adjustment in 2018 that is not applicable in 2019.

Specific components of our operating results for 2019, 2018 and 2017 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:

	2019	2018	2017
Revenue	100.0%	100.0%	100.0%
Cost of revenue	58.1	57.4	57.7
Gross profit	41.9	42.6	42.3
Operating expenses:			
Research and development and engineering	8.9	8.3	8.0
Selling, general and administrative	18.9	18.9	19.5
Amortization of purchased intangible assets	2.5	2.5	2.3
Restructuring and acquisition related costs	2.6	1.3	1.4
Total operating expenses	33.0	31.0	31.3
Operating income	8.8	11.6	11.0
Interest income (expense), net	(1.4)	(1.6)	(1.4)
Foreign exchange transaction gains (losses), net	(0.1)	0.0	(0.1)
Other income (expense), net	(0.0)	(0.0)	(0.0)
Gain on acquisition of business	—	—	5.1
Income before income taxes	7.3	10.0	14.6
Income tax provision	0.8	1.7	2.7
Consolidated net income	6.5	8.3	12.0
Less: Net income attributable to noncontrolling interest	—	(0.3)	(0.4)
Net income attributable to Novanta Inc.	6.5%	8.0%	11.5%

Revenue

The following table sets forth external revenue by reportable segment for 2019, 2018 and 2017 (dollars in thousands):

	2019	2018	2017	% Change	
				2019 vs. 2018	2018 vs. 2017
Photonics	\$ 230,457	\$ 249,339	\$ 232,359	(7.6)%	7.3%
Vision	271,407	232,902	183,074	16.5%	27.2%
Precision Motion	124,235	132,096	105,857	(6.0)%	24.8%
Total	\$ 626,099	\$ 614,337	\$ 521,290	1.9%	17.8%

Photonics

Photonics segment revenue in 2019 decreased by \$18.9 million, or 7.6%, versus 2018, primarily due to decreased demand in the advanced industrial market related to reductions in global industrial manufacturing spending, and a decrease in revenue from our optical light engine products, partially offset by \$4.9 million of revenue from the acquisition of ARGES in July 2019.

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.

Vision

Vision segment revenue in 2019 increased by \$38.5 million, or 16.5%, versus 2018. The increase was primarily due to an increase in revenue of \$28.4 million from our minimally invasive surgery products as a result of new product introductions and increased demand in the medical market and \$5.4 million of revenue from the acquisition of Med X Change in June 2019.

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.

Precision Motion

Precision Motion segment revenue in 2019 decreased by \$7.9 million, or 6.0%, versus 2018. The decrease was primarily due to decreased demand in the microelectronics and industrial market related to reductions in global industrial manufacturing spending, partially offset by increased demand in the medical market and the acquisitions of Ingenia in April 2019 and Zettlex Holdings Limited ("Zettlex") in May 2018.

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.

Gross Profit

The following table sets forth the gross profit and gross profit margin for each of our reportable segments for 2019, 2018 and 2017 (dollars in thousands):

	2019	2018	2017
Gross profit:			
Photonics	\$ 105,845	\$ 117,109	\$ 106,117
Vision	105,228	87,198	69,249
Precision Motion	53,326	59,477	46,564
Unallocated Corporate and Shared Services	(2,314)	(2,256)	(1,399)
Total	<u>\$ 262,085</u>	<u>\$ 261,528</u>	<u>\$ 220,531</u>
Gross profit margin:			
Photonics	45.9%	47.0%	45.7%
Vision	38.8%	37.4%	37.8%
Precision Motion	42.9%	45.0%	44.0%
Total	41.9%	42.6%	42.3%

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 2019 decreased \$11.3 million, or 9.6%, versus 2018, primarily due to a decrease in revenue. Photonics segment gross profit margin was 45.9% for 2019, compared with a gross profit margin of 47.0% for 2018. The decrease in gross profit margin was primarily attributable to changes in product mix. Amortization of inventory fair value adjustments and amortization of developed technologies increased \$1.1 million, which resulted in a 0.5 percentage point decrease in gross profit margin.

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.

Vision

Vision segment gross profit for 2019 increased \$18.0 million, or 20.7%, versus 2018, primarily due to an increase in revenue. Vision segment gross profit margin was 38.8% for 2019, compared with a gross profit margin of 37.4% for 2018. The increase in gross profit margin was primarily attributable to increased utilization of our German facility and cost reductions in our optical data collection products, partially offset by the cost of a redundant manufacturing facility in San Jose, California until the transfer of our manufacturing activities was substantially completed at the end of 2019.

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.

Precision Motion

Precision Motion segment gross profit for 2019 decreased \$6.2 million, or 10.3%, versus 2018, primarily due to a decrease in revenue and a decrease in gross profit margin. Precision Motion segment gross profit margin was 42.9% for 2019, compared with a gross profit margin of 45.0% for 2018. The decrease in gross profit margin was primarily attributable to business volume reductions that could not be fully compensated by cost reduction initiatives.

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.

Operating Expenses

The following table sets forth operating expenses for 2019, 2018 and 2017 (dollars in thousands):

	2019	2018	2017	% Change	
				2019 vs. 2018	2018 vs. 2017
Research and development and engineering	\$ 55,965	\$ 51,024	\$ 41,673	9.7%	22.4%
Selling, general and administrative	118,407	115,900	101,654	2.2%	14.0%
Amortization of purchased intangible assets	15,857	15,550	12,096	2.0%	28.6%
Restructuring and acquisition related costs	16,574	8,041	7,542	106.1%	6.6%
Total	<u>\$ 206,803</u>	<u>\$ 190,515</u>	<u>\$ 162,965</u>	8.5%	16.9%

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 \$56.0 million, or 8.9% of revenue, in 2019, versus \$51.0 million, or 8.3% of revenue, in 2018. R&D expenses increased in terms of total dollars and as a percentage of revenue primarily due to R&D expenses from acquisitions and higher investments in R&D.

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.

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 \$118.4 million, or 18.9% of revenue, in 2019, versus \$115.9 million, or 18.9% of revenue, in 2018. SG&A expenses increased in terms of total dollars primarily due to SG&A expenses from acquisitions and higher professional services spending, partially offset by lower variable compensation expense.

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 share-based compensation expense.

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, trade names, 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 \$15.9 million, or 2.5% of revenue, in 2019, versus \$15.6 million, or 2.5% of revenue, in 2018. The increase in terms of total dollars was the result of acquired intangible assets from acquisitions in 2018 and 2019.

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.

Restructuring and Acquisition Related Costs

Restructuring and acquisition 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 and acquisition related costs of \$16.6 million in 2019, versus \$8.0 million in 2018. The increase in restructuring and acquisition related costs versus 2018 was primarily due to an increase in restructuring charges of \$6.6 million as a result of the 2018 and 2019 restructuring programs and an increase in acquisition related costs of \$1.9 million primarily related to an increase in professional services fees, partially offset by a decrease in costs recognized under earn-out agreements.

We recorded restructuring and acquisition related costs of \$8.0 million in 2018, versus \$7.5 million in 2017. The increase in restructuring and acquisition 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.

Operating Income (Loss) by Segment

The following table sets forth operating income (loss) by segment for 2019, 2018 and 2017 (in thousands):

	2019	2018	2017
Operating Income (Loss)			
Photonics	\$ 41,990	\$ 59,285	\$ 51,660
Vision	21,007	8,991	7,883
Precision Motion	22,339	31,674	27,146
Unallocated Corporate and Shared Services	(30,054)	(28,937)	(29,123)
Total	<u>\$ 55,282</u>	<u>\$ 71,013</u>	<u>\$ 57,566</u>

Photonics

Photonics segment operating income was \$42.0 million, or 18.2% of revenue, in 2019, versus \$59.3 million, or 23.8% of revenue, in 2018. The decrease in operating income was primarily due to a decrease in gross profit of \$11.3 million, an increase in R&D expenses of \$2.1 million and restructuring related charges of \$5.0 million associated with the 2019 restructuring program, including a \$2.2 million impairment of operating lease right-of-use asset.

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.

Vision

Vision segment operating income was \$21.0 million, or 7.7% of revenue, in 2019, versus \$9.0 million, or 3.9% of revenue, in 2018. The increase in operating income was primarily due to an increase in gross profit of \$18.0 million, partially offset by an increase in R&D expenses of \$1.6 million and SG&A expenses of \$2.8 million. Vision segment operating income was negatively affected by a \$0.9 million net increase in amortization of inventory fair value adjustments and amortization of intangible assets.

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.

Precision Motion

Precision Motion segment operating income was \$22.3 million, or 18.0% of revenue, in 2019, versus \$31.7 million, or 24.0% of revenue, in 2018. The decrease in operating income was primarily due to a decrease in gross profit of \$6.2 million, an increase in R&D expenses of \$1.3 million and SG&A expenses of \$2.8 million, partially offset by a decrease in acquisition related earn-out costs of \$1.8 million associated with the Zettlex acquisition.

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.

Unallocated Corporate and Shared Services

Unallocated corporate and shared services costs primarily represent costs of corporate and shared SG&A 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 2019 increased by \$1.1 million, or 3.9%, from 2018, primarily due to an increase in restructuring and acquisition related costs of \$3.8 million, partially offset by a decrease in SG&A expenses of \$2.6 million primarily related to lower variable compensation expense.

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

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 2019, 2018 and 2017 (in thousands):

	2019	2018	2017
Interest income (expense), net	\$ (8,493)	\$ (9,814)	\$ (7,165)
Foreign exchange transaction gains (losses), net	(780)	147	(447)
Other income (expense), net	(243)	(44)	(229)
Gain on acquisition of business	—	—	26,409

Interest Income (Expense), Net

Net interest expense was \$8.5 million in 2019 versus \$9.8 million in 2018. The decrease in net interest expense was primarily due to a decrease in average debt levels and a decrease in the weighted average interest rate on our Senior Credit Facilities. The weighted average interest rate on our Senior Credit Facilities was 3.30% and 3.53% during 2019 and 2018, respectively. Included in net interest expense was non-cash interest expense of approximately \$1.1 million and \$1.0 million in 2019 and 2018, respectively, related to the amortization of deferred financing costs on our debt.

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.

Foreign Exchange Transaction Gains (Losses), Net

Foreign exchange transaction gains (losses), net, were \$0.8 million net losses in 2019 versus \$0.1 million net gains in 2018 primarily due to changes in the value of the U.S. Dollar against the British Pound and Euro, and net realized gains from foreign currency contracts.

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.

Other Income (Expense), Net

Net other expense was nominal in both 2019 and 2018, respectively.

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.

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 Tax Provision

We recorded a tax provision of \$5.0 million in 2019, as compared to a tax provision of \$10.2 million in 2018. The effective tax rate for 2019 was 10.9% of income before income taxes, compared to an effective tax rate of 16.7% of income before income taxes for 2018. Our effective tax rate for 2019 differed from the Canadian statutory rate of 29.0% primarily due to the mix of income earned in jurisdictions with varying tax rates, a \$2.0 million U.K. patent box deduction, a \$1.7 million benefit from share-based compensation, \$1.5 million of other tax credits, and \$0.8 million of estimated deductions for Foreign Derived Intangible Income; offset by \$0.3 million of non-deductible expenses recognized under earn-out agreements in connection with various acquisitions and \$0.2 million of non-deductible acquisition costs.

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 income taxes, compared to an effective tax rate of 18.2% of income before income taxes for 2017. Our effective tax rate in 2018 differed 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, 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.

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 Third 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. There is no assurance 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, 2019, \$57.2 million of our \$78.9 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 Senior Credit Facilities. Approximately \$189.6 million 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.

Share Repurchase Plans

Our Board of Directors may approve share repurchase plans from time to time. Under these repurchase plans, shares may be repurchased at our discretion based on ongoing assessment of the capital needs of the business, the market price of our common shares, and general market conditions. Shares may also be repurchased through an accelerated share 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 shares to be repurchased when we would otherwise be prohibited from doing so under insider trading laws. While the share repurchase plans are generally intended to offset dilution from equity awards granted to our employees and directors, the plans do not obligate us to acquire any particular amount of common shares. No time limit is typically set for the completion of the share repurchase plans, and the plans may be suspended or discontinued at any time. We expect to fund share repurchases through cash on hand and cash generated from operations.

In October 2018, our Board of Directors approved a share repurchase plan (the “2018 Repurchase Plan”) authorizing the repurchase of \$25.0 million worth of common shares. Share repurchases have been made under the 2018 Repurchase Plan pursuant to Rule 10b-18 under the Securities Exchange Act of 1934. During 2019, we repurchased 119 thousand shares for an aggregate purchase price of \$10.0 million at an average price of \$83.71 per share under the 2018 Repurchase Plan. We had \$15.0 million available for share repurchases under the 2018 Repurchase Plan as of December 31, 2019.

In February 2020, our Board of Directors approved a new share repurchase plan (the “2020 Repurchase Plan”) authorizing the repurchase of an additional \$50.0 million worth of common shares. We expect that share repurchases will be made under the 2020 Repurchase Plan pursuant to Rule 10b-18 under the Securities Exchange Act of 1934 after the 2018 Repurchase Plan is completed.

Senior Credit Facilities

In December 2019, we entered into the Third Amended and Restated Credit Agreement, consisting of a \$100.0 million U.S. dollar equivalent euro-denominated (approximately €90.2 million) 5-year term loan facility and a \$350.0 million 5-year revolving credit facility. The Senior Credit Facilities mature in December 2024. The term loan facility requires quarterly scheduled principal repayments of approximately €1.1 million beginning in March 2020 with the remaining principal balance due upon maturity. We may make additional principal payments at any time, which will reduce the next quarterly installment payment due. We may make payments to pay down our revolving credit facility with cash on hand and cash generated from future operations at anytime until maturity.

As of December 31, 2019, we had a €90.2 million euro-denominated term loan (approximately \$101.2 million) and \$123.4 million revolver borrowings outstanding under our Senior Credit Facilities. The borrowings outstanding under the Senior Credit Facilities bear interest at rates based on (a) the Base Rate, as defined in the Third Amended and Restated Credit Agreement, plus a margin ranging between 0.25% to 1.25% per annum, determined by reference to our consolidated leverage ratio, or (b) the Eurocurrency Rate, as defined in the Third Amended and Restated Credit Agreement, plus a margin ranging between 1.25% and 2.25% per annum, determined by reference to our consolidated leverage ratio. In addition, we are obligated to pay a commitment fee on the unused portion of the revolving credit facility, ranging between 0.20% and 0.40% per annum, determined by reference to our consolidated leverage ratio.

The Third 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 Third Amended and Restated Credit Agreement). The following table summarizes these financial covenants and our compliance therewith as of December 31, 2019:

	Requirement	Actual December 31, 2019
Maximum consolidated leverage ratio	3.50	1.88
Minimum consolidated fixed charge coverage ratio	1.50	5.35

In addition, the Third 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 \$78.9 million at December 31, 2019, versus \$82.0 million at December 31, 2018. The net decrease in cash and cash equivalents is primarily attributable to debt repayments of \$50.7 million, current year business acquisitions of \$53.1 million, capital expenditures of \$10.7 million, and repurchases of common shares of \$10.0 million. These cash outflows were offset by cash provided by operating activities of \$63.2 million and borrowings under our revolving credit facility of \$66.8 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):

	2019	2018	2017
Cash and cash equivalents, end of year	\$ 78,944	\$ 82,043	\$ 100,057
Net cash provided by operating activities	\$ 63,248	\$ 89,647	\$ 63,378
Net cash used in investing activities	\$ (63,844)	\$ (45,590)	\$ (177,380)
Net cash provided by (used in) financing activities	\$ (3,935)	\$ (60,164)	\$ 143,330
Unused borrowing capacity available under revolving credit facility, end of year	\$ 226,616	\$ 189,942	\$ 175,547

Operating Cash Flows

Cash provided by operating activities was \$63.2 million in 2019, versus \$89.6 million in 2018. Cash provided by operating activities in 2019 decreased from 2018 primarily due to increases in net working capital in 2019 which decreased cash provided by operating activities by \$27.4 million.

Cash provided by operating activities for 2019 was negatively impacted by an increase in our days sales outstanding which increased from 51 days at December 31, 2018 to 54 days at December 31, 2019 primarily due to poor sales linearity, a decrease in our outstanding payables and accrued expenses, excluding payables and accrued expenses assumed from acquisitions in 2019, and an increase in inventories. Our inventory turnover ratio decreased from 3.4 at December 31, 2018 to 3.1 at December 31, 2019.

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.

Investing Cash Flows

Cash used in investing activities was \$63.8 million during 2019, primarily driven by the Ingenia and Med X Change acquisitions and the initial cash purchase price for the ARGES acquisition. In connection with these acquisitions, we paid \$53.1 million cash considerations (net of cash acquired of \$4.2 million). We also paid \$10.7 million for capital expenditures during 2019.

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 for 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.

We have no material commitments to purchase property, plant and equipment as of December 31, 2019. We expect to use approximately \$18 million to \$21 million in 2020 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 \$3.9 million during 2019, primarily due to \$50.7 million repayment of term loan and revolving credit facility, \$6.9 million of payroll tax payments on share-based compensation awards, and \$10.0 million of repurchases of common shares, partially offset by \$66.8 million of borrowings under our revolving credit facility used to fund cash considerations paid for the Ingenia, Med X Change and ARGES acquisitions. We also paid \$2.7 million for debt issuance costs as a result of the Third Amended and Restated Credit Agreement entered into in December 2019.

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 share-based compensation awards, and \$5.9 million of repurchases of common shares, 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 share-based compensation awards, \$0.4 million of repurchases of our common shares and \$0.9 million of principal payments under our finance 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.

In 2020, we are contractually required to pay \$5.1 million in repayments under our term loan facility and \$1.3 million in principal payments under our finance 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.

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 the Company.

Our funding policy is to fund the U.K. Plan based on actuarial methods as permitted by the Pensions Regulator in the U.K. 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 assumptions). Each assumption used represents one estimate of many possible future outcomes. The final cost to us will be determined by events as they actually become known, including actual return on plan assets and pension payments to plan participants. As of December 31, 2019, the projected benefit obligation under the U.K. Plan exceeded the fair value of plan assets by \$1.5 million. Based on the results of the most recent funding valuation, our annual contributions are expected to be approximately \$1.0 million in 2020 and will increase by 2.9% per year thereafter.

Off-Balance Sheet Arrangements, Contractual Obligations

Contractual Obligations

The following table summarizes our contractual obligations at December 31, 2019 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 \$4.7 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	2020	2021 - 2022	2023 - 2024	Thereafter
	(In thousands)				
Senior Credit Facilities (1)	\$ 224,552	\$ 5,073	\$ 10,142	\$ 209,337	\$ —
Interest on Senior Credit Facilities (2)	25,169	5,293	10,319	9,557	—
Finance leases (3)	18,247	1,738	10,185	1,884	4,440
Operating leases (4)	53,416	6,157	11,936	9,182	26,141
Purchase commitments (5)	75,761	74,097	1,640	24	—
U.K. pension plan (6)	1,473	985	488	—	—
Deferred cash considerations (7)	28,873	28,873	—	—	—
Contingent considerations and earn-outs (8)	23,605	3,813	14,318	2,093	3,381
Total contractual obligations	\$ 451,096	\$ 126,029	\$ 59,028	\$ 232,077	\$ 33,962

- (1) As of December 31, 2019, a total of \$101.2 million term loan and \$123.4 million revolving credit facility were outstanding under the Senior Credit Facilities. The term loan is payable in quarterly installments of approximately €1.1 million (\$1.3 million) beginning in March 2020 with the final installment of €68.7 million (\$77.1 million) due upon maturity in December 2024. Borrowings under the revolving credit facility are due at maturity in December 2024.
- (2) For the purpose of this calculation, current interest rates on floating rate obligations (LIBOR plus applicable margin, as defined in the Third 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. Current commitment fee rate was used for the unused commitments under the revolving credit facility as of December 31, 2019.
- (3) Future minimum lease payments under finance leases include the exercise price of an option to purchase a facility for \$8.4 million in Germany in 2021.
- (4) These amounts primarily represent the gross amounts due for leased facilities. The amounts include payments due with respect to both active operating facilities and idle facilities that have been vacated.
- (5) Purchase commitments represent purchase obligations as of December 31, 2019.
- (6) Amounts shown represent funding obligations equivalent to \$1.0 million per year, increasing 2.9% through 2021, based on annual funding contributions in effect as of December 31, 2019 to achieve fully funded status where the market value of plan assets equals the projected benefit obligations. 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.
- (7) These amounts represent the deferred cash considerations for acquisitions in 2018 and 2019 that are expected to be paid in 2020.
- (8) These amounts represent the estimated contingent consideration and earn-out payments accrued in the consolidated balance sheet as of December 31, 2019 that are expected to be paid between 2020 and 2027. The undiscounted range of the possible contingent consideration and earn-out payments is \$3.8 million to \$36.7 million.

Off-Balance Sheet Arrangements

Through December 31, 2019, 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 accounting principles generally accepted in the U.S. 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, impairment assessment and valuation of goodwill, intangible assets and tangible long-lived assets, valuation of contingent consideration obligations, 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. Revenue recognition for arrangements within the scope of Topic 606 includes 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) a performance obligation is satisfied.

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 the costs to service 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 time period between the transfer of a promised good to a customer and the customer's payment for that good is 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 trailing historical 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 statement of operations ratably over the vesting period of the award, net of estimated forfeitures.

We typically 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 as well as the level of achievement. 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 both the

probability and the level of achievement against 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, regardless of whether the target relative total stockholder return is achieved.

The Monte Carlo simulation model utilizes multiple input variables that determine the probability of satisfying the performance conditions stipulated in the grant agreement in a large number of simulated scenarios. Key assumptions for the Monte Carlo simulation model include risk-free interest rate and expected stock price volatility of both the Company's common shares and the Russell 2000 index.

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. Key assumptions typically include revenue growth rates and projected cash flows, discount rates, royalty rates, technology obsolescence curves, 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." 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 as of 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 instead. 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 2019, using a qualitative assessment, noting no impairment. As of December 31, 2019, 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, 2019 (in thousands):

	Goodwill	Intangible Assets, net	Property, Plant & Equipment, net
Photonics	\$ 110,952	\$ 63,202	\$ 31,701
Vision	128,364	81,066	32,033
Precision Motion	35,394	21,907	9,783
Unallocated Corporate and Shared Services	—	—	4,039
Total	<u>\$ 274,710</u>	<u>\$ 166,175</u>	<u>\$ 77,556</u>

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 in which 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 2019, we utilized valuation allowance of \$0.5 million recorded on net operating losses and other timing items in certain tax jurisdictions due to taxable income generated in the current year.

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, 2019, the total amount of gross unrecognized tax benefits was \$4.9 million, of which \$4.8 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 \$168.4 million as of December 31, 2019. The estimated unrecognized income and foreign withholding tax liability on this temporary difference is approximately \$0.2 million.

Loss Contingencies. We are subject to legal proceedings, lawsuits and other claims relating to product quality, 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 exposures 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 \$12.4 million and a fair value of less than \$0.1 million as of December 31, 2019. A hypothetical 10% strengthening of the U.S. dollar against other currencies would result in an approximately \$0.1 million increase in the fair value of our foreign currency contracts as of December 31, 2019. By contrast, a hypothetical 10%

weakening of the U.S. dollar against other currencies would result in an approximately \$0.1 million decrease in the fair value of our foreign currency contracts as of December 31, 2019.

Interest Rates

Our exposure to market risk associated with changes in interest rates relates primarily to our debt obligations. We have \$224.6 million of outstanding variable rate debt as of December 31, 2019. A 100 basis point increase in interest rates at December 31, 2019 would increase our annual pre-tax interest expense by approximately \$2.2 million.

NOVANTA INC.

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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, 2019 and 2018, 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, 2019, 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, 2019, 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, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 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, 2019, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Changes in Accounting Principles

As discussed in Notes 2 and 3 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019 and 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.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Acquisitions of Med X Change, Inc., Ingenia-CAT, S.L., and ARGES GmbH – Valuation of Developed Technologies and Customer Relationships Intangible Assets

As described in Notes 2 and 4 to the consolidated financial statements, the Company completed the acquisitions of Med X Change, Inc., Ingenia-CAT, S.L., and ARGES GmbH in 2019 for purchase prices of \$21.9 million, \$16.2 million and \$72.9 million, respectively. The acquisition of Med X Change, Inc. resulted in \$9.9 million of customer relationships intangible assets being recorded, the acquisition of Ingenia-CAT, S.L. resulted in \$9.3 million of developed technologies intangible assets being recorded, and the acquisition of ARGES GmbH resulted in \$11.8 million of customer relationships intangible assets and \$11.4 million of developed technologies intangible assets being recorded. Assets acquired and liabilities assumed have been recorded by management at their estimated fair values as of the acquisition dates. The fair values of developed technologies for ARGES GmbH and Med X Change, Inc. were valued using the relief from royalty method. The fair values of developed technologies for Ingenia-CAT, S.L. were valued using the multi-period excess earnings method. The fair values of customer relationships were valued using the multi-period excess earnings method. The process for estimating the fair values of identifiable intangible assets requires the use of significant estimates and assumptions by management, including revenue growth rates, customer attrition rates, royalty rates, discount rates and projected future cash flows.

The principal considerations for our determination that performing procedures relating to the valuation of the developed technologies and customer relationships intangible assets as a result of the acquisitions of Med X Change, Inc., Ingenia-CAT, S.L., and ARGES GmbH is a critical audit matter are (i) there was a high degree of auditor judgment and subjectivity in applying procedures relating to the fair value measurements of developed technologies and customer relationships intangible assets acquired due to the significant judgment by management when developing the estimates, (ii) significant audit effort was required in evaluating the significant assumptions relating to the estimates, such as the revenue growth rates, customer attrition rates, and discount rates, and (iii) the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing procedures and evaluating the audit evidence obtained from these procedures.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the acquisition accounting, including controls over management's valuation of the developed technologies and customer relationships intangible assets and controls over the development of the assumptions related to the valuation of these intangible assets, including the revenue growth rates, customer attrition rates, and discount rates. These procedures also included, among others, (i) reading the purchase agreements, (ii) testing management's process for estimating the fair value of the developed technologies and customer relationships intangible assets, and (iii) testing management's assumptions used to estimate the fair value of the developed technologies and customer relationships intangible assets. Testing management's process included evaluating the appropriateness of the valuation methods, testing the completeness and accuracy of underlying data used in the relief from royalty and multi-period excess earnings methods, and assessing the reasonableness of significant assumptions used by management, including the revenue growth rates, customer attrition rates, and discount rates. Evaluating the reasonableness of the revenue growth rates, customer attrition rates, and discount rates involved considering the past performance of the acquired businesses, as well as economic and industry forecasts. Professionals with specialized skill and knowledge were used to assist in the evaluation of certain significant assumptions, including the discount rates. The discount rates were evaluated by considering the cost of capital of comparable businesses and other industry factors.

Fair Value Measurements of the Contingent Consideration for ARGES GmbH and Ingenia-CAT, S.L. Acquisitions

As described in Notes 4 and 7 to the consolidated financial statements, the Company had \$14.6 million of contingent consideration liabilities as of December 31, 2019 related to the acquisitions of ARGES GmbH and Ingenia-CAT, S.L. The contingent consideration payments will be payable annually based on the achievement of certain revenue targets by the Company from August 2019 through December 2026 for ARGES GmbH and from April 2019 through March 2022 for Ingenia-CAT, S.L. As of the acquisition dates, management determined the estimated fair value of contingent consideration liabilities using a Monte Carlo valuation method. The

following qualitative information was used by management to determine the fair value measurement of the contingent consideration liabilities: historical and projected revenues, revenue volatilities, cost of debt, and the discount rates.

The principal considerations for our determination that performing procedures relating to valuation of contingent consideration related to the ARGES GmbH and Ingenia-CAT, S.L. acquisitions is a critical audit matter are (i) there was significant judgment by management when determining the estimated fair value, which in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures and evaluating audit evidence relating to the Monte Carlo valuation method and assessing the significant assumptions used by management, including the projected revenues, revenue volatilities, and the discount rates, and (ii) the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing procedures and evaluating the audit evidence obtained from these procedures.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's fair value measurements of the contingent consideration, including controls over management's valuation method, significant assumptions and data. These procedures also included, among others, (i) reading the purchase agreements, (ii) testing management's process for developing the fair value measurements of the contingent consideration, (iii) evaluating the appropriateness of the Monte Carlo valuation method, (iv) testing the completeness and accuracy of underlying data used in the method, and (v) evaluating the significant assumptions used by management, including the projected revenues, revenue volatilities, and discount rates. Evaluating the assumptions related to projected revenues involved evaluating whether the assumptions used by management were reasonable considering current and past performance of the acquired businesses, consistency with external market data, and whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the Company's Monte Carlo valuation method and certain significant assumptions, including revenue volatilities and discount rates.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
February 26, 2020

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, 2019	December 31, 2018
ASSETS		
Current Assets		
Cash and cash equivalents	\$ 78,944	\$ 82,043
Accounts receivable, net of allowance of \$297 and \$321, respectively	91,078	83,955
Inventories	116,618	104,764
Prepaid income taxes and income taxes receivable	5,905	1,852
Prepaid expenses and other current assets	11,967	9,155
Total current assets	304,512	281,769
Property, plant and equipment, net	77,556	65,464
Operating lease assets	35,180	—
Deferred tax assets	8,890	9,492
Other assets	2,713	2,269
Intangible assets, net	166,175	142,920
Goodwill	274,710	217,662
Total assets	\$ 869,736	\$ 719,576
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities		
Current portion of long-term debt	\$ 5,031	\$ 4,535
Accounts payable	52,585	50,733
Income taxes payable	1,861	2,633
Current portion of operating lease liabilities	5,043	—
Accrued expenses and other current liabilities	70,326	46,295
Total current liabilities	134,846	104,196
Long-term debt	215,334	202,843
Operating lease liabilities	34,108	—
Deferred tax liabilities	26,676	22,632
Income taxes payable	4,713	4,463
Other liabilities	36,887	17,187
Total liabilities	452,564	351,321
Commitments and Contingencies (Note 17)		
Stockholders' Equity:		
Common shares, no par value; Authorized shares: unlimited; Issued and outstanding: 35,052 and 34,886, respectively	423,856	423,856
Additional paid-in capital	49,748	46,018
Accumulated deficit	(38,319)	(79,092)
Accumulated other comprehensive loss	(18,113)	(22,527)
Total stockholders' equity	417,172	368,255
Total liabilities and stockholders' equity	\$ 869,736	\$ 719,576

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,		
	2019	2018	2017
Revenue	\$ 626,099	\$ 614,337	\$ 521,290
Cost of revenue	364,014	352,809	300,759
Gross profit	262,085	261,528	220,531
Operating expenses:			
Research and development and engineering	55,965	51,024	41,673
Selling, general and administrative	118,407	115,900	101,654
Amortization of purchased intangible assets	15,857	15,550	12,096
Restructuring and acquisition related costs	16,574	8,041	7,542
Total operating expenses	206,803	190,515	162,965
Operating income	55,282	71,013	57,566
Interest income (expense), net	(8,493)	(9,814)	(7,165)
Foreign exchange transaction gains (losses), net	(780)	147	(447)
Other income (expense), net	(243)	(44)	(229)
Gain on acquisition of business	—	—	26,409
Income before income taxes	45,766	61,302	76,134
Income tax provision	4,993	10,207	13,827
Consolidated net income	40,773	51,095	62,307
Less: Net income attributable to noncontrolling interest	—	(1,986)	\$ (2,256)
Net income attributable to Novanta Inc.	\$ 40,773	\$ 49,109	\$ 60,051
Earnings per common share attributable to Novanta Inc. (Note 9):			
Basic	\$ 1.16	\$ 1.46	\$ 1.14
Diluted	\$ 1.15	\$ 1.43	\$ 1.13
Weighted average common shares outstanding—basic	35,030	34,913	34,817
Weighted average common shares outstanding—diluted	35,546	35,473	35,280

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,		
	2019	2018	2017
Consolidated net income	\$ 40,773	\$ 51,095	\$ 62,307
Other comprehensive income (loss):			
Foreign currency translation adjustments, net of tax (1)	3,267	(4,172)	8,909
Pension liability adjustments, net of tax (2)	1,147	(475)	926
Total other comprehensive income (loss)	4,414	(4,647)	9,835
Total consolidated comprehensive income	45,187	46,448	72,142
Less: Comprehensive income attributable to noncontrolling interest	—	(1,986)	(2,256)
Comprehensive income attributable to Novanta Inc.	\$ 45,187	\$ 44,462	\$ 69,886

- (1) The tax effect on this component of comprehensive income was \$3, (\$93) and (\$94) in 2019, 2018 and 2017, respectively.
- (2) The tax effect on this component of comprehensive income was \$267, (\$153) and \$277 in 2019, 2018 and 2017, 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)

	Common Shares		Additional	Accumulated	Accumulated Other	Total
	# of Shares	Amount	Paid-In Capital	Deficit	Loss	
Balance at December 31, 2016	34,458	\$ 423,856	\$ 30,276	\$ (167,547)	\$ (27,715)	\$ 258,870
Net income	—	—	—	60,051	—	60,051
Redeemable noncontrolling interest redemption value adjustment	—	—	—	(20,244)	—	(20,244)
Common shares issued under stock plans	228	—	—	—	—	—
Common shares withheld for taxes on vested stock awards	(77)	—	(2,090)	—	—	(2,090)
Repurchases of common shares	(14)	—	(370)	—	—	(370)
Share-based compensation	—	—	5,493	—	—	5,493
Other comprehensive income, net of tax	—	—	—	—	9,835	9,835
Balance at December 31, 2017	34,595	423,856	33,309	(127,740)	(17,880)	311,545
Net income	—	—	—	49,109	—	49,109
Redeemable noncontrolling interest redemption value adjustment	—	—	—	1,781	—	1,781
Acquisition of noncontrolling interest	213	—	14,401	—	—	14,401
Common shares issued under stock plans	231	—	—	—	—	—
Common shares withheld for taxes on vested stock awards	(64)	—	(3,556)	—	—	(3,556)
Repurchases of common shares	(89)	—	(5,850)	—	—	(5,850)
Share-based compensation	—	—	7,714	—	—	7,714
Adoption of ASU 2016-16	—	—	—	(2,242)	—	(2,242)
Other comprehensive loss, net of tax	—	—	—	—	(4,647)	(4,647)
Balance at December 31, 2018	34,886	423,856	46,018	(79,092)	(22,527)	368,255
Net income	—	—	—	40,773	—	40,773
Common shares issued for business combination	124	—	10,900	—	—	10,900
Common shares issued under stock plans	247	—	425	—	—	425
Common shares withheld for taxes on vested stock awards	(86)	—	(6,935)	—	—	(6,935)
Repurchases of common shares	(119)	—	(10,000)	—	—	(10,000)
Share-based compensation	—	—	9,340	—	—	9,340
Other comprehensive income, net of tax	—	—	—	—	4,414	4,414
Balance at December 31, 2019	35,052	\$ 423,856	\$ 49,748	\$ (38,319)	\$ (18,113)	\$ 417,172

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

NOVANTA INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands of U.S. dollars)

	Year Ended December 31,		
	2019	2018	2017
Cash flows from operating activities:			
Consolidated net income	\$ 40,773	\$ 51,095	\$ 62,307
Adjustments to reconcile consolidated net income to net cash provided by operating activities:			
Depreciation and amortization	38,280	37,052	30,758
Provision for inventory excess and obsolescence	3,188	1,898	1,421
Share-based compensation	9,340	7,714	5,493
Deferred income taxes	(4,332)	(6,076)	(2,560)
Earnings from equity-method investment	—	—	(104)
Gain on acquisition of business	—	—	(26,409)
Loss on disposal of fixed assets	756	106	36
Contingent consideration adjustments	100	—	425
Inventory acquisition fair value adjustment	1,270	—	4,754
Non-cash interest expense	1,055	955	825
Other non-cash items	259	(165)	283
Changes in assets and liabilities which provided/(used) cash, excluding effects from businesses acquisitions:			
Accounts receivable	(3,600)	(1,156)	(2,077)
Inventories	(7,397)	(15,603)	(13,587)
Prepaid expenses and other current assets	(1,526)	1,350	(2,169)
Prepaid income taxes, income taxes receivable and income taxes payable	(4,966)	(1,485)	(2,900)
Accounts payable, accrued expenses and other current liabilities	(14,800)	14,888	9,611
Other non-current assets and liabilities	4,848	(926)	(2,729)
Cash provided by operating activities	63,248	89,647	63,378
Cash flows from investing activities:			
Purchases of property, plant and equipment	(10,743)	(14,658)	(9,094)
Acquisition of businesses, net of cash acquired and working capital adjustments	(53,143)	(29,600)	(168,332)
Acquisition of assets	—	(1,599)	—
Proceeds from sale of property, plant and equipment	42	267	46
Cash used in investing activities	(63,844)	(45,590)	(177,380)
Cash flows from financing activities:			
Borrowings under revolving credit facilities	66,792	55,253	176,769
Repayments under term loan and revolving credit facilities	(50,694)	(74,648)	(26,925)
Payments of debt issuance costs	(2,655)	—	(655)
Payments of withholding taxes from share-based awards	(6,935)	(3,556)	(2,090)
Payments of contingent considerations	—	—	(2,546)
Repurchases of common shares	(10,000)	(5,850)	(370)
Acquisition of noncontrolling interest	—	(30,800)	—
Other financing activities	(443)	(563)	(853)
Cash provided by (used in) financing activities	(3,935)	(60,164)	143,330
Effect of exchange rates on cash and cash equivalents	1,432	(1,907)	2,621
Increase (decrease) in cash and cash equivalents	(3,099)	(18,014)	31,949
Cash and cash equivalents, beginning of year	82,043	100,057	68,108
Cash and cash equivalents, end of year	\$ 78,944	\$ 82,043	\$ 100,057
Supplemental disclosure of cash flow information:			
Cash paid for interest	\$ 8,389	\$ 8,924	\$ 5,832
Cash paid for income taxes	\$ 14,260	\$ 20,323	\$ 21,121
Income tax refunds received	\$ 767	\$ 3,011	\$ 337
Supplemental disclosure of non-cash investing activity:			
Accrual for capital expenditures	\$ 638	\$ 1,187	\$ 1,601

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

**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
AS OF DECEMBER 31, 2019****1. Organization and Basis of 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 year ended December 31, 2017, the Company recognized income from its equity method investment amounting to \$0.1 million, 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 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.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

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, 2019, 2018 and 2017, changes in the allowance for doubtful accounts were as follows (in thousands):

	2019	2018	2017
Balance at beginning of year	\$ 321	\$ 554	\$ 565
Provision charged to selling, general and administrative expenses	33	66	283
Allowance resulting from acquisitions	120	—	52
Write-offs, net of recoveries of amounts previously reserved	(179)	(295)	(358)
Exchange rate changes	2	(4)	12
Balance at end of year	<u>\$ 297</u>	<u>\$ 321</u>	<u>\$ 554</u>

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.

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 revenue growth rates, customer attrition rates, royalty rates, discount rates and projected future cash flows. 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

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

warrant revisions to them. Costs associated with patent and intellectual property applications, renewals or extensions are typically expensed as incurred.

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 the reportable segments.

Impairment Charges

Impairment analyses of goodwill and indefinite-lived intangible assets are conducted in accordance with ASC 350, “Intangibles — Goodwill and Other.” 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 instead. 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 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 and estimated royalty rates. 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.

Leases

The Company leases certain equipment and facilities. The Company determines if an arrangement is a lease at inception. Operating lease right-of-use assets are included in operating lease assets on the consolidated balance sheet. Operating lease liabilities are included in current portion of operating lease liabilities and operating lease liabilities on the consolidated balance sheet based on the timing of future lease payments. Finance lease assets are included in property, plant and equipment. Finance lease liabilities are included in accrued expenses and other current liabilities and other liabilities on the consolidated balance sheet based on the timing of future lease payments. Leases with an initial term of 12 months or less are not recognized on the balance sheet. The Company recognizes lease expense on a straight-line basis over the lease term. Many of the Company’s lease arrangements include both lease (e.g., fixed payments including rent) and non-lease components (e.g., common-area maintenance or other property management costs). The Company accounts for lease and non-lease components separately.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

Most leases held by the Company do not provide an implicit rate. The Company uses its incremental borrowing rate for the same jurisdiction and term as the associated lease based on the information available at the lease commencement date to determine the present value of future lease payments. The Company used the incremental borrowing rate as of January 1, 2019 for operating leases that commenced prior to that date. The Company has a centrally managed treasury function; therefore, the Company applies a portfolio approach for determining the incremental borrowing rate based on the applicable lease terms and the current economic environment.

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 as well as the level of achievement. 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 both the probability and the level of achievement against 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 2019, 2018 and 2017.

Restructuring and Acquisition 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, useful lives and residual value of long-lived assets, 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.

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

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

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 if any existing 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. Consequently, 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.

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.

Recent Accounting Pronouncements

The following table provides a brief description of recent Accounting Standards Updates ("ASU") issued by the Financial Accounting Standards Board ("FASB"):

Standard	Description	Effective Date	Effect on the Financial Statements or Other Significant Matters
In December 2019, the FASB issued ASU 2019-12, "Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes."	ASU 2019-12 simplifies the accounting for income taxes by removing certain exceptions to the general principles of ASC 740, including (i) the exception to the incremental approach for intraperiod tax allocation when there is a loss from continuing operations and income or a gain from other items; (ii) the exception to the requirement to recognize a deferred tax liability for equity method investments when a foreign subsidiary becomes an equity method investment (or vice-versa); and (iii) the exception for calculating income taxes in an interim period when a year-to-date loss exceeds the anticipated loss for the year. ASU 2019-12 also simplifies GAAP for other areas of ASC 740 by clarifying and amending the existing guidance.	January 1, 2021. Early adoption is permitted.	The Company is currently evaluating the impact of ASU 2019-12 on its consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

Standard	Description	Effective Date	Effect on the Financial Statements or Other Significant Matters
In August 2018, the FASB issued ASU 2018-15, “Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40): Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract.”	ASU 2018-15 aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). ASU 2018-15 should be applied either retrospectively or prospectively.	January 1, 2020. Early adoption is permitted.	The Company adopted ASU 2018-15 on a prospective basis during the first quarter of 2019. The adoption of ASU 2018-15 did not have a material impact on the Company’s consolidated financial statements.
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 U.S. Tax Cuts and Jobs Act (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 under the Tax Reform Act is recognized.	January 1, 2019.	The Company adopted ASU 2018-02 during the first quarter of 2019. The adoption of ASU 2018-02 did not have a material impact on the Company’s consolidated financial statements.
In June 2016, the FASB issued ASU 2016-13, “Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments.”	ASU 2016-13 requires the measurement of all expected credit losses of financial assets held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. Financial institutions and other organizations will now use forward looking information to better inform their credit loss estimates.	January 1, 2020. Early adoption is permitted.	The Company does not expect the adoption of ASU 2016-13 to have a material impact on its consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

Standard	Description	Effective Date	Effect on the Financial Statements or Other Significant Matters
In February 2016, the FASB issued ASU 2016-02, "Leases (Topic 842)."	ASU 2016-02 requires a lessee to recognize on the balance sheet a liability to make lease payments and a right-of-use ("ROU") asset representing its right to use the underlying asset for the lease term for both finance and operating leases and to disclose key information about leasing arrangements.	January 1, 2019.	The Company adopted ASU 2016-02 during the first quarter of 2019 using the modified retrospective approach. In addition, the Company elected the package of practical expedients permitted under the transition guidance. The adoption of ASU 2016-02 resulted in the recording of operating lease ROU assets and operating lease liabilities of approximately \$35.3 million and \$36.5 million, respectively, as of January 1, 2019. The adoption of ASU 2016-02 did not have an impact on the Company's accumulated deficit, consolidated statement of operations, or consolidated statement of cash flows.

3. Revenue

In May 2014, the FASB issued ASU 2014-09, "Revenue from Contracts with Customers (Topic 606)." ASU 2014-09 supersedes the revenue recognition requirements in ASC Topic 605, "Revenue Recognition," and requires entities to recognize revenue in a way that depicts the transfer of goods or services to customers at an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The Company adopted ASU 2014-09 during the first quarter of 2018 using the modified retrospective method. ASU 2014-09 has been applied to those contracts which had not been completed as of January 1, 2018 and all new contracts entered into by the Company subsequent to January 1, 2018. The adoption of ASU 2014-09 did not have an impact on the Company's Accumulated deficit.

The Company recognizes revenue when control of promised goods or services is transferred to the customer. The transfer of control generally occurs upon shipment when title and risk of loss pass to the customer. The vast majority of the Company's revenue is generated from the sale of distinct products. Revenue is measured as the amount of consideration the Company expects 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.

Performance Obligations

Substantially all of the Company's revenue is recognized at a point in time, upon shipment, rather than over time.

At the request of its customers, the Company 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 aggregate to less than 3% of the Company's 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.

The Company occasionally sells 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. The Company recognizes 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.

Shipping & Handling Costs

The Company accounts 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.

Warranties

The Company generally provides warranties for its products. The standard warranty period is typically 12 months to 24 months for the 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 the Company has the ability to ascertain the likelihood of the liability and can reasonably estimate the amount of the liability. A provision for the

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

estimated warranty cost is recorded in cost of revenue at the time revenue is recognized. The Company's estimate of costs to service the warranty obligations is based on historical experience and expectations of future conditions. To the extent that the Company's 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 adjustment to cost of revenue.

Practical Expedients and Exemptions

The Company expenses 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.

The Company does not adjust the promised amount of consideration for the effects of a financing component because the time period between the transfer of a promised good to a customer and the customer's payment for that good is typically one year or less. The Company does not disclose the value of the remaining performance obligation for contracts with an original expected length of one year or less.

Contract Liabilities

Contract liabilities consist of deferred revenue and advance payments from customers, including amounts that are refundable. These contract liabilities are classified as either current or long-term liabilities in the consolidated balance sheet based on the timing of when the Company expects to recognize the related revenue. As of December 31, 2019 and December 31, 2018, contract liabilities were \$3.6 million and \$4.7 million, respectively, and are included in accrued expenses and other current liabilities and other liabilities in the accompanying consolidated balance sheets. The decrease in the contract liability balance during the year ended December 31, 2019 is primarily due to \$4.1 million of revenue recognized during the year that was included in the contract liability balance at December 31, 2018, partially offset by cash payments received in advance of satisfying performance obligations.

Disaggregated Revenue

See Note 19 for the Company's disaggregation of revenue by segment, geography and end market.

4. Business Combinations

2019 Acquisitions

On July 31, 2019, the Company acquired 100% of the outstanding shares of ARGES GmbH ("ARGES"), a Wackersdorf, Germany-based manufacturer of innovative laser scanning subsystems used in industrial materials processing and medical applications, for a total purchase price of €65.5 million (\$72.9 million), subject to customary working capital adjustments. The purchase price consists of €24.0 million (\$26.7 million) cash paid at closing, 124,461 Novanta common shares issued at closing (with a fair market value of €9.8 million, or \$10.9 million, based on the closing market price of \$87.58 per share on July 30, 2019), €7.1 million (\$7.9 million) estimated fair value of contingent consideration and €24.7 million (\$27.4 million) deferred cash consideration which is expected to be paid on June 29, 2020. The initial cash purchase price was financed with borrowings under the Company's revolving credit facility. The contingent consideration will be payable annually based on actual revenue achievement against certain revenue targets from August 2019 through December 2026, with the first payment due in the first quarter of 2021. The undiscounted range of contingent consideration is zero to €10.0 million. The addition of ARGES complements and expands the Company's existing portfolio of lasers and laser beam steering solutions capabilities within the Photonics reportable segment.

On June 5, 2019, the Company acquired 100% of the outstanding stock of Med X Change, Inc. ("Med X Change"), a Bradenton, Florida-based provider of medical grade, high definition and 4K video recording and documentation solutions to OEMs in the medical market. The purchase price of \$21.9 million, net of working capital adjustments, was financed with cash on hand and a \$21.0 million borrowing under the Company's revolving credit facility. The addition of Med X Change complements and broadens the range of technology capabilities within the Company's Vision reportable segment by providing its medical OEM customers with more integrated operating room solutions.

On April 16, 2019, the Company acquired 100% of the outstanding stock of Ingenia-CAT, S.L. ("Ingenia"), a Barcelona, Spain-based provider of high-performance servo drives and control software to OEMs in the medical and advanced industrial

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
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markets, for a total purchase price of €14.3 million (\$16.2 million), net of working capital adjustments. The purchase price consists of €8.5 million (\$9.6 million) cash consideration and €5.8 million (\$6.6 million) estimated fair value of contingent consideration. The initial cash purchase price was financed with cash on hand and borrowings under the Company's revolving credit facility. The contingent consideration will be payable annually based on actual revenue achievement against certain revenue targets from April 2019 through March 2022, with the first payment due in the second quarter of 2020. The undiscounted range of contingent consideration is zero to €8.0 million. The Ingenia purchase and sale agreement requires €0.8 million (\$0.9 million) of the purchase price to be held back by the Company for indemnification of certain representations and warranties claims by the Company until the expiration of the holdback agreement in October 2021. The addition of Ingenia enhances the Company's strategic position in precision motion control industry by enabling it to offer a broader range of motion control technologies and integrated solutions. Ingenia is included in the Company's Precision Motion reportable segment.

The acquisitions of ARGES, Med X Change and Ingenia have been accounted for as business combinations. Purchase price allocation is based upon a valuation of assets acquired and liabilities assumed. Assets acquired and liabilities assumed have been recorded at their estimated fair values as of the acquisition dates. The fair values of intangible assets were based on valuation techniques with estimates and assumptions developed by management. The process for estimating the fair values of identifiable intangible assets requires the use of significant estimates and assumptions, including revenue growth rates, customer attrition rates, royalty rates, discount rates and projected future cash flows. The excess of the purchase price over the tangible assets, identifiable intangible assets and assumed liabilities was recorded as goodwill.

ARGES

The total purchase price for ARGES was allocated as follows (in thousands):

	Amount
Cash	\$ 3,159
Accounts receivable	1,430
Inventories	7,129
Property, plant and equipment	14,095
Intangible assets	24,713
Goodwill	43,045
Other assets	2,244
Total assets acquired	95,815
Accounts payable	2,598
Deferred tax liabilities	7,081
Other liabilities	13,207
Total liabilities assumed	22,886
Total assets acquired, net of liabilities assumed	72,929
Less: cash acquired	3,159
Total purchase price, net of cash acquired	69,770
Less: contingent consideration	7,870
Less: issuance of common shares	10,900
Less: deferred cash consideration	27,442
Initial cash purchase price, net of cash acquired	\$ 23,558

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The purchase price allocation is preliminary pending final settlement of net working capital adjustment and the deferred purchase price.

The fair value of intangible assets for ARGES is comprised of the following (dollar amounts in thousands):

	Estimated Fair Value	Weighted Average Amortization Period
Developed technologies	\$ 11,355	15 years
Customer relationships	11,800	15 years
Trademarks and trade names	1,225	10 years
Backlog	333	5 months
Total	\$ 24,713	

Customer relationships and backlog for ARGES were valued using the multi-period excess earnings method. Developed technology and trademarks and trade names for ARGES were valued using the relief-from-royalty method.

The purchase price allocation resulted in \$24.7 million of identifiable intangible assets and \$43.0 million of goodwill. As the ARGES acquisition was an acquisition of outstanding common shares, none of the resulting goodwill is expected to be deductible for income tax purposes. Intangible assets are being amortized over their weighted average useful lives primarily based upon the pattern in which anticipated economic benefits from such assets are expected to be realized. The goodwill recorded represents the anticipated incremental value of future cash flows potentially attributable to: (i) expected future benefits from advancing the Company's photonic-based product roadmap through the addition of R&D capabilities from ARGES; (ii) ARGES's ability to grow the business with existing and new customers, including leveraging the Company's customer base; (iii) ARGES's ability to grow the business through new product introductions; and (iv) cost improvements due to the integration of ARGES's operations into the Company's existing infrastructure.

The operating results of ARGES were included in the Company's results of operations beginning on July 31, 2019. ARGES contributed revenues of \$4.9 million and a loss before income taxes of \$3.5 million for the year ended December 31, 2019. Loss before income taxes for the year ended December 31, 2019 included amortization of inventory fair value adjustments and purchased intangible assets of \$2.2 million.

The pro forma financial information reflecting the operating results of ARGES, as if it had been acquired as of January 1, 2018, would not differ materially from the operating results of the Company as reported for the year ended December 31, 2018.

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Med X Change and Ingenia

The final purchase price for Med X Change and Ingenia is as follows (in thousands):

	Amount
Cash	\$ 1,000
Accounts receivable	1,739
Inventories	2,372
Property, plant and equipment	496
Intangible assets	22,376
Goodwill	13,388
Other assets	601
Total assets acquired	41,972
Accounts payable	604
Deferred tax liabilities	2,399
Other liabilities	910
Total liabilities assumed	3,913
Total assets acquired, net of liabilities assumed	38,059
Less: cash acquired	1,000
Total purchase price, net of cash acquired	37,059
Less: contingent consideration	6,569
Less: purchase price holdback	905
Net cash used for acquisition of businesses	\$ 29,585

The fair value of intangible assets for Med X Change and Ingenia is comprised of the following (dollar amounts in thousands):

	Estimated Fair Value		Weighted Average
	Med X Change	Ingenia	Amortization Period
Developed technologies	\$ 1,800	\$ 9,272	10 years
Customer relationships	9,900	565	15 years
Trademarks and trade names	300	339	9 years
Backlog	200	—	7 months
Total	\$ 12,200	\$ 10,176	

Customer relationships and backlog for both Med X Change and Ingenia were valued using the multi-period excess earnings method. Developed technology for Med X Change and Ingenia were valued using the relief from royalty and multi-period excess earnings methods, respectively. Trademarks and trade names for both Med X Change and Ingenia were valued using the relief-from-royalty method.

The Company recorded an aggregate fair value of \$22.4 million of identifiable intangible assets from the Med X Change and Ingenia acquisitions. Intangible assets are being amortized over their weighted average useful lives primarily based upon the pattern in which anticipated economic benefits from such assets are expected to be realized.

The Company recorded \$13.4 million of goodwill from these acquisitions. Goodwill amounting to \$6.2 million from the Med X Change acquisition is expected to be fully deductible for income tax purposes. Goodwill amounting to \$7.2 million from the Ingenia acquisition is not expected to be deductible for income tax purposes. The goodwill recorded represents the anticipated incremental value of future cash flows potentially attributable to: (i) the ability of Med X Change and Ingenia to grow the business with existing and new customers, including leveraging the Company's customer base; (ii) their ability to grow the businesses through new product introductions; and (iii) cost improvements due to the integration of Med X Change and Ingenia operations into the Company's existing infrastructure.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
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The operating results of Med X Change and Ingenia were included in the Company's results of operations beginning on the respective acquisition dates. These acquisitions contributed revenues of \$7.9 million and an income before income taxes of \$0.6 million for the year ended December 31, 2019. Income before income taxes for the year ended December 31, 2019 included amortization of inventory fair value adjustments and purchased intangible assets of \$1.5 million.

The pro forma financial information reflecting the operating results of Med X Change and Ingenia, as if they had been acquired as of January 1, 2018, would not differ materially from the operating results of the Company as reported for the year ended December 31, 2018.

2018 Acquisitions

During the year ended December 31, 2018, the Company acquired two businesses for total cash considerations of \$33.5 million, including the acquisition of Zettlex Holdings Limited ("Zettlex"). The consolidated statement of operations includes the operating results of the businesses from the dates of acquisition.

Zettlex

On May 1, 2018, the Company acquired 100% of the outstanding stock of 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 the Company's revolving credit facility.

The final purchase price allocation is as follows (in thousands):

	Amount
Cash	\$ 3,776
Accounts receivable	2,237
Inventories	928
Property, plant and equipment	2,590
Intangible assets	14,585
Goodwill	11,790
Other assets	145
Total assets acquired	36,051
Accounts payable	509
Accrued expenses and other liabilities	1,035
Deferred tax liabilities	2,481
Total liabilities assumed	4,025
Total assets acquired, net of liabilities assumed	32,026
Less: cash acquired	3,776
Total purchase price, net of cash acquired	\$ 28,250

The fair value of intangible assets is comprised of the following (dollar amounts in thousands):

	Estimated Fair Value	Weighted Average Amortization Period
Developed technologies	\$ 3,027	10 years
Customer relationships	9,494	15 years
Trademarks and trade names	550	10 years
Backlog	1,514	1 year
Total	\$ 14,585	

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
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The purchase price allocation resulted in \$14.6 million of identifiable intangible assets and \$11.8 million of goodwill. As the Zettlex acquisition was an acquisition of outstanding common shares, none of the resulting goodwill is deductible for income tax purposes. Intangible assets are being amortized over their weighted average useful lives primarily based upon the pattern in which anticipated economic benefits from such assets are expected to be realized. The goodwill recorded represents the anticipated incremental value of future cash flows potentially attributable to: (i) Zettlex's ability to grow its business with existing and new customers, including leveraging the Company's customer base; and (ii) cost improvements due to the integration of Zettlex operations into the Company's existing infrastructure.

The operating results of Zettlex were included in the Company's results of operations beginning on May 1, 2018. Zettlex contributed revenues of \$8.3 million and a loss before income taxes of \$1.8 million for the year ended December 31, 2018. Loss before income taxes for the year ended December 31, 2018 included amortization of purchased intangible assets of \$1.3 million and compensation expense of \$4.4 million recognized under earn-out agreements. Zettlex is included in the Company's Precision Motion reportable segment.

2017 Acquisitions*WOM*

On July 3, 2017, the Company acquired 100% of the outstanding shares of W.O.M. World of Medicine GmbH ("WOM"), a Berlin, Germany-based provider of medical insufflators, pumps, and related disposables for OEMs in the minimally invasive surgery market, for a total purchase price of €118.1 million (\$134.9 million). The acquisition was financed with a €118.0 million (\$134.8 million) draw-down on the Company's revolving credit facility.

The final purchase price allocation is as follows (in thousands):

	Amount
Cash	\$ 1,400
Accounts receivable	11,807
Inventories	14,549
Property, plant and equipment	21,940
Intangible assets	59,732
Goodwill	55,632
Other assets	2,660
Total assets acquired	167,720
Accounts payable	4,398
Other liabilities	8,681
Deferred tax liabilities	19,707
Total liabilities assumed	32,786
Total assets acquired, net of liabilities assumed	134,934
Less: cash acquired	1,400
Total purchase price, net of cash acquired	\$ 133,534

The fair value of intangible assets is comprised of the following (dollar amounts in thousands):

	Estimated Fair Value	Weighted Average Amortization Period
Developed technologies	\$ 21,586	10 years
Customer relationships	35,634	12 years
Trademarks and trade names	2,284	10 years
Backlog	228	1 year
Total	\$ 59,732	

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
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The purchase price allocation resulted in \$59.7 million of identifiable intangible assets and \$55.6 million of goodwill. As the WOM acquisition was an acquisition of outstanding common shares, none of the resulting goodwill is deductible for income tax purposes. Intangible assets are being amortized over their weighted average useful lives primarily based upon the pattern in which anticipated economic benefits from such assets are expected to be realized. The goodwill recorded represents the anticipated incremental value of future cash flows attributable to: (i) WOM's ability to grow its business with existing and new customers, including leveraging the Company's customer base; and (ii) cost improvements due to expansion in scale.

The operating results of WOM were included in the Company's results of operations beginning on July 3, 2017. WOM contributed revenues of \$49.4 million and a loss before income taxes of \$1.2 million for the year ended December 31, 2017. Loss before income taxes for the year ended December 31, 2017 included amortization of inventory fair value adjustments and amortization of purchased intangible assets of \$6.0 million. WOM is included in the Company's Vision reportable segment.

Laser Quantum

On January 10, 2017, the Company acquired an additional approximately 35% of the outstanding shares of 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 £25.5 million (\$31.1 million) in cash consideration. The purchase price was financed with cash on hand and a \$30.0 million draw-down on the Company's revolving credit facility. As a result of this transaction, the Company's ownership position in Laser Quantum increased from approximately 41% to approximately 76%.

In connection with the purchase price allocation, upon gaining control over Laser Quantum, the Company recognized a nontaxable gain of \$26.4 million in the consolidated statement of operations for the twelve months ended December 31, 2017. The gain represented the excess of the fair value of the Company's previously-held equity interest in Laser Quantum over its carrying value upon gaining control.

The fair value of the approximately 41% equity interest previously held by the Company before the acquisition and the fair value of the approximately 24% noncontrolling interest held by the remaining shareholders of Laser Quantum after the acquisition were determined using a combination of the discounted cash flow method (an income approach), the guideline public company method (a market approach), and the subject company transaction method (a market approach). The subject company transaction method was based on the purchase price paid by the Company for the acquisition of the additional approximately 35% of the outstanding shares, while giving consideration to the control and/or minority nature of the subject equity interests.

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The final purchase price allocation is as follows (in thousands):

	Amount
Cash	\$ 15,343
Accounts receivable	2,739
Inventories	6,264
Property, plant and equipment	2,286
Intangible assets	38,955
Goodwill	31,168
Other assets	717
Total fair value of assets	97,472
Accounts payable	796
Other liabilities	2,068
Deferred tax liabilities	7,337
Total fair value of liabilities	10,201
Total fair value of assets, net of fair value of liabilities	87,271
Less: fair value of equity interest previously held by Novanta	34,637
Less: fair value of noncontrolling interest	21,582
Total purchase price paid by Novanta	31,052
Less: cash acquired	15,343
Purchase price, net of cash acquired	\$ 15,709

The fair value of intangible assets is comprised of the following (dollar amounts in thousands):

	Estimated Fair Value	Weighted Average Amortization Period
Developed technologies	\$ 15,501	15 years
Customer relationships	19,990	15 years
Trademarks and trade names	1,964	15 years
Backlog	1,500	9 months
Total	\$ 38,955	

The purchase price allocation resulted in \$39.0 million of identifiable intangible assets and \$31.2 million of goodwill. As the Laser Quantum acquisition was an acquisition of outstanding common shares, none of the resulting goodwill is deductible for income tax purposes. Intangible assets are being amortized over their weighted average useful lives primarily based upon the pattern in which anticipated economic benefits from such assets are expected to be realized. The goodwill recorded represents the anticipated incremental value of future cash flow potential attributable to: (i) Laser Quantum's ability to grow its business with existing and new customers, including leveraging the Company's broader customer base; and (ii) cost improvements due to expansion in scale.

The operating results of Laser Quantum were included in the Company's results of operations beginning on January 10, 2017. Laser Quantum contributed revenues of \$44.7 million and income before income taxes of \$11.3 million for the year ended December 31, 2017. Income before income taxes for the year ended December 31, 2017 included \$7.1 million of expenses associated with the amortization of inventory fair value step-up and purchased intangible assets. Laser Quantum is included in the Company's Photonics reportable segment.

As part of the agreement to acquire the additional approximately 35% of the outstanding shares in January 2017, the Company and the remaining shareholders of Laser Quantum entered into a call and put option agreement for the purchase and sale, in 2020, of all the remaining Laser Quantum shares held by the remaining shareholders, subject to certain conditions. The purchase

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
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price for the remaining shares would be based on the proportionate share of the noncontrolling interest in Laser Quantum's cash on hand as of December 31, 2019 and a multiple of Laser Quantum's EBITDA for the twelve months ending December 31, 2019, as defined in the call and put option agreement. As a result of the put option held by the remaining shareholders, the noncontrolling interest was considered a redeemable equity instrument and was presented as temporary equity on the consolidated balance sheet. The proportionate share of the net income from Laser Quantum attributable to the noncontrolling interest was reported as a reduction to the consolidated net income in the Company's consolidated statement of operations and an increase to the carrying value of the redeemable noncontrolling interest on the consolidated balance sheet.

The Company reported the redeemable noncontrolling interest at the higher of (i) the carrying value without any redemption value adjustments or (ii) the estimated redemption value as of the end of each reporting period. The estimated redemption value was determined as of the end of the reporting period as if it were also the redemption date for the instrument. The resulting adjustments were recorded in retained earnings in shareholders' equity and did not affect net income attributable to Novanta Inc. However, these adjustments were included in the determination of earnings per common share for the periods in which such adjustments were required (See Note 9). The Company recorded a \$1.8 million reduction and a \$20.2 million addition to the noncontrolling interest redemption value for the years ended December 31, 2018 and 2017, respectively.

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, consisting of \$30.7 million of cash and 213,219 shares of the Company's restricted stock. The restricted stock will become fully vested upon achievement of certain milestones included in the restricted stock agreement. Restricted stock not otherwise vested as of December 31, 2025 will be subject to forfeiture. The acquisition was accounted for as a transaction among shareholders. No gain or loss was recognized in the consolidated statements of operations for the year ended December 31, 2018.

ThingMagic

On January 10, 2017, the Company acquired from Trimble Inc. certain assets and liabilities that constituted the business of 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. The acquisition was financed with cash on hand and a \$12.0 million draw-down on the Company's revolving credit facility.

The final purchase price allocation is as follows (in thousands):

	Amount
Inventories	\$ 1,832
Intangible assets	7,423
Goodwill	9,929
Total assets acquired	19,184
Other liabilities	95
Total liabilities assumed	95
Total purchase price	\$ 19,089

The fair value of intangible assets is comprised of the following (dollar amounts in thousands):

	Estimated Fair Value	Weighted Average Amortization Period
Developed technologies	\$ 4,600	10 years
Customer relationships	2,520	10 years
Trademarks and trade names	303	5 years
Total	\$ 7,423	

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The purchase price allocation resulted in \$7.4 million of identifiable intangible assets and \$9.9 million of goodwill. As the ThingMagic acquisition was treated as an acquisition of assets for income tax purposes, the goodwill acquired is fully deductible for income tax purposes. Intangible assets are being amortized over their weighted average useful lives primarily based upon the pattern in which anticipated economic benefits from such assets are expected to be realized. The goodwill recorded represents the anticipated incremental value of future cash flows potentially attributable to: (i) ThingMagic's ability to grow its business with existing and new customers, including leveraging the Company's customer base; (ii) cost synergies in combining the research and development capabilities from ThingMagic with the existing RFID capabilities within Novanta; and (iii) cost improvements due to the integration of ThingMagic operations into the Company's existing infrastructure.

The operating results of ThingMagic were included in the Company's results of operations beginning on January 10, 2017. ThingMagic contributed revenues of \$8.6 million and income before income taxes of \$0.4 million for the year ended December 31, 2017. Income before income taxes for the year ended December 31, 2017 included amortization of inventory fair value adjustments and amortization of purchased intangible assets of \$1.5 million. ThingMagic is included in the Company's Vision reportable segment.

Unaudited Pro Forma Information

The unaudited pro forma information presented below includes the effects of business combination accounting resulting from the acquisitions of WOM and Laser Quantum, including amortization of intangible assets, interest expense on borrowings in connection with the acquisitions, and elimination of the gain from the Laser Quantum acquisition and income from the Company's previous equity method investment in Laser Quantum, and the related tax effects, as though the acquisitions had been consummated as of January 1, 2016. The unaudited pro forma financial information is presented for comparative purposes only and is not necessarily indicative of the results of operations that actually would have been achieved if the acquisitions had taken place on January 1, 2017.

	Year Ended December 31, 2017
Revenue	\$ 562,818
Consolidated net income	\$ 39,630
Earnings per share attributable to Novanta Inc. - Basic (1)	\$ 0.49
Earnings per share attributable to Novanta Inc. - Diluted (1)	\$ 0.49

- (1) The computation of pro forma earnings per share attributable to Novanta Inc. included a \$20.2 million adjustment of redeemable noncontrolling interest to estimated redemption value for the year ended December 31, 2017.

Pro forma earnings for the year ended December 31, 2017 were adjusted to exclude non-recurring items such as amortization of inventory fair value adjustments of \$4.4 million, acquisition related costs of \$4.3 million, the gain on business acquisition of \$26.4 million and income from equity method investment of \$0.1 million. Pro forma earnings for the year ended December 31, 2017 were adjusted to include an increase in amortization of intangible assets of \$5.3 million and an increase in interest expense of \$1.4 million associated with borrowings under the Company's revolving credit facility used to fund the acquisitions.

Acquisition Costs

The Company recognized acquisition costs of \$1.6 million, \$1.1 million and \$4.4 million in the years ended December 31, 2019, 2018 and 2017, respectively, related to the acquisitions that occurred during these years. These costs consisted of finders' fees, legal, valuation and other professional or consulting fees. These amounts were included in restructuring and acquisition related costs in the consolidated statements of operations.

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5. Accumulated Other Comprehensive Loss

Comprehensive income (loss) is defined as net income (loss) and other changes in stockholders' equity that do not represent transactions with stockholders or in the Company's stock. Changes in accumulated other comprehensive loss were as follows (in thousands):

	Total Accumulated Other Comprehensive Loss	Cumulative Translation Adjustments	Pension Liability Adjustments
Balance at December 31, 2016	\$ (27,715)	\$ (17,222)	\$ (10,493)
Other comprehensive income (loss)	8,790	8,909	(119)
Amounts reclassified from accumulated other comprehensive loss (1)	1,045	—	1,045
Balance at December 31, 2017	(17,880)	(8,313)	(9,567)
Other comprehensive income (loss)	(5,473)	(4,172)	(1,301)
Amounts reclassified from accumulated other comprehensive loss (1)	826	—	826
Balance at December 31, 2018	(22,527)	(12,485)	(10,042)
Other comprehensive income (loss)	3,428	3,267	161
Amounts reclassified from accumulated other comprehensive loss (1)	986	—	986
Balance at December 31, 2019	<u>\$ (18,113)</u>	<u>\$ (9,218)</u>	<u>\$ (8,895)</u>

(1) The amounts reclassified from accumulated other comprehensive loss were included in other income (expense) in the consolidated statements of operations.

6. Goodwill, Intangible Assets and Impairment Charges**Goodwill**

The following table summarizes changes in goodwill during the year ended December 31, 2019 (in thousands):

	December 31, 2019
Balance at beginning of year	\$ 217,662
Goodwill acquired from acquisitions	56,433
Effect of foreign exchange rate changes	615
Balance at end of year	<u>\$ 274,710</u>

Goodwill by reportable segment as of December 31, 2019 was as follows (in thousands):

	Reportable Segment			
	Photonics	Vision	Precision Motion	Total
Goodwill	\$ 213,413	\$ 160,086	\$ 52,440	\$ 425,939
Accumulated impairment of goodwill	(102,461)	(31,722)	(17,046)	(151,229)
Total	<u>\$ 110,952</u>	<u>\$ 128,364</u>	<u>\$ 35,394</u>	<u>\$ 274,710</u>

Goodwill by reportable segment as of December 31, 2018 was as follows (in thousands):

	Reportable Segment			
	Photonics	Vision	Precision Motion	Total
Goodwill	\$ 168,955	\$ 155,017	\$ 44,919	\$ 368,891
Accumulated impairment of goodwill	(102,461)	(31,722)	(17,046)	(151,229)
Total	<u>\$ 66,494</u>	<u>\$ 123,295</u>	<u>\$ 27,873</u>	<u>\$ 217,662</u>

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Intangible Assets

Intangible assets as of December 31, 2019 and 2018, respectively, are summarized as follows (dollar amounts in thousands):

December 31, 2019				
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted Average Remaining Life (Years)
Amortizable intangible assets:				
Patents and developed technologies	\$ 159,217	\$ (97,523)	\$ 61,694	9.5
Customer relationships	161,807	(78,206)	83,601	11.9
Customer backlog	2,316	(2,316)	—	—
Trademarks and trade names	17,871	(10,018)	7,853	8.6
Amortizable intangible assets	341,211	(188,063)	153,148	10.7
Non-amortizable intangible assets:				
Trade names	13,027	—	13,027	
Total	\$ 354,238	\$ (188,063)	\$ 166,175	

December 31, 2018				
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted Average Remaining Life (Years)
Amortizable intangible assets:				
Patents and developed technologies	\$ 134,034	\$ (86,623)	\$ 47,411	9.0
Customer relationships	139,097	(64,174)	74,923	11.7
Customer backlog	1,738	(1,191)	547	0.4
Non-compete covenant	2,514	(2,493)	21	0.1
Trademarks and trade names	15,915	(8,924)	6,991	9.1
Amortizable intangible assets	293,298	(163,405)	129,893	10.5
Non-amortizable intangible assets:				
Trade names	13,027	—	13,027	
Total	\$ 306,325	\$ (163,405)	\$ 142,920	

Amortizable intangible assets included intangible assets of \$1.2 million recognized in conjunction with the acquisition of certain customer relationships in September 2018.

All definite-lived intangible assets are amortized either on a straight-line basis or an economic benefit basis over their remaining estimated useful life. Amortization expense for patents and developed technologies is included in cost of revenue in the accompanying consolidated statements of operations. Amortization expense for customer relationships and definite-lived trademarks, trade names and other intangibles is included in operating expenses in the accompanying consolidated statements of operations. Amortization expense was as follows (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Amortization expense – cost of revenue	\$ 10,588	\$ 10,060	\$ 8,824
Amortization expense – operating expenses	15,857	15,550	12,096
Total amortization expense	\$ 26,445	\$ 25,610	\$ 20,920

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Estimated future amortization expense for each of the five succeeding years and thereafter is as follows (in thousands):

Year Ending December 31,	Cost of Revenue	Operating Expenses	Total
2020	\$ 11,106	\$ 14,001	\$ 25,107
2021	11,301	13,689	24,990
2022	9,682	12,856	22,538
2023	8,506	11,176	19,682
2024	6,332	9,225	15,557
Thereafter	14,767	30,507	45,274
Total	<u>\$ 61,694</u>	<u>\$ 91,454</u>	<u>\$ 153,148</u>

Impairment Charges

The Company did not have any goodwill or indefinite-lived intangible asset impairment charges during 2019, 2018 or 2017.

7. Fair Value Measurements

ASC 820, “Fair Value Measurement,” establishes a fair value hierarchy based on three levels of inputs, of which the first two are considered observable and the third is considered unobservable:

Level 1: Quoted prices for identical assets or liabilities in active markets which the Company can access

Level 2: Observable inputs other than those described in Level 1

Level 3: Unobservable inputs

Current Assets and Liabilities

The Company’s cash equivalents are highly liquid investments with original maturities of three months or less, which represent an asset the Company measures at fair value on a recurring basis. The Company determines the fair value of cash equivalents using a market approach based on quoted prices in active markets. The fair values of cash, accounts receivable, income taxes receivable, accounts payable, income taxes payable and accrued expenses and other current liabilities approximate their carrying values because of their short-term nature.

Foreign Currency Contracts

The Company addresses 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 balance sheet foreign currency transaction exposures. The Company uses foreign currency forward contracts as a part of its strategy to manage exposures related to foreign currency denominated monetary assets and liabilities.

Contingent Considerations

On July 31, 2019, the Company acquired ARGES. Under the purchase and sale agreement for the ARGES acquisition, the former owner of ARGES is eligible to receive contingent consideration based on the achievement of certain revenue targets by the Company from August 2019 through December 2026. The undiscounted range of possible contingent consideration is zero to €10.0 million. If the revenue targets are achieved, the contingent consideration would be payable annually with the first payment due in the first quarter of 2021. The estimated fair value of the contingent consideration of €7.1 million (\$7.9 million) was determined based on the Monte Carlo valuation method and was recorded as part of the purchase price as of the acquisition date. Subsequent changes in the estimated fair value of the contingent consideration liability are recorded in the consolidated statement of operations in restructuring and acquisition related costs until the liability is fully settled. Based on revenue performance as of December 31, 2019 and the most recent revenue projections for fiscal years 2020 to 2026, the fair value of the contingent consideration was adjusted to €7.0 million (\$7.9 million), which is reported as a long-term liability in other liabilities on the consolidated balance sheet as of December 31, 2019.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
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On April 16, 2019, the Company acquired Ingenia. Under the purchase and sale agreement for the Ingenia acquisition, the former shareholders of Ingenia are eligible to receive contingent consideration based on the achievement of certain revenue targets by the Company from April 2019 through March 2022. The undiscounted range of possible contingent consideration is zero to €8.0 million. If the revenue targets are achieved, the contingent consideration would be payable in three annual installments from 2020 to 2022. The estimated fair value of the contingent consideration of €5.8 million (\$6.6 million) as of the acquisition date was determined based on the Monte Carlo valuation method and was recorded as part of the purchase price as of the acquisition date. Subsequent changes in the estimated fair value of the contingent consideration liability are recorded in the consolidated statement of operations in restructuring and acquisition related costs until the liability is fully settled. Based on revenue performance as of December 31, 2019 and the most recent revenue projections for fiscal years 2020 to 2022, the fair value of the contingent consideration was adjusted to €5.9 million (\$6.7 million) as of December 31, 2019.

On December 14, 2016, the Company acquired certain video signal processing and management technologies used in medical visualization solutions. Under the purchase and sale agreement, the owners are eligible to receive contingent consideration based on the achievement of certain revenue targets by the Company from 2018 to 2021 from products utilizing the acquired technologies. The undiscounted range of possible contingent consideration is zero to €5.5 million (\$6.6 million). If such targets are achieved, the contingent consideration would be payable in four installments from 2019 to 2022. As the acquired assets did not meet the definition of a business, the fair value of the contingent consideration is recognized when probable and estimable and is capitalized as part of the cost of the acquired assets. Subsequent changes in the estimated fair value of this contingent liability are recorded as adjustments to the carrying value of the asset acquired and amortized over the remaining useful life of the underlying asset. Based on revenue performance as of December 31, 2019 and the most recent revenue projections for fiscal years 2020 and 2021, the fair value of the contingent consideration was adjusted to \$5.8 million as of December 31, 2019. The first payment of \$2.6 million will be due in the first quarter of 2020.

The following table summarizes the fair values of the Company's assets and liabilities measured at fair value on a recurring basis as of December 31, 2019 (in thousands):

	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Other Unobservable Inputs (Level 3)
Assets				
Cash equivalents	\$ 9,262	\$ 9,262	\$ —	\$ —
Prepaid expenses and other current assets:				
Foreign currency forward contracts	50	—	50	—
	<u>\$ 9,312</u>	<u>\$ 9,262</u>	<u>\$ 50</u>	<u>\$ —</u>
Liabilities				
Accrued expenses and other current liabilities:				
Contingent considerations - Current	\$ 3,813	\$ —	\$ —	\$ 3,813
Foreign currency forward contracts	99	—	99	—
Other liabilities:				
Contingent considerations - Long-term	16,504	—	—	16,504
	<u>\$ 20,416</u>	<u>\$ —</u>	<u>\$ 99</u>	<u>\$ 20,317</u>

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AS OF DECEMBER 31, 2019

The following table summarizes the fair values of the Company's assets and liabilities measured at fair value on a recurring basis as of December 31, 2018 (in thousands):

	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Other Unobservable Inputs (Level 3)
Assets				
Cash equivalents	\$ 4,288	\$ 4,288	\$ —	\$ —
Prepaid expenses and other current assets:				
Foreign currency forward contracts	15	—	15	—
	<u>\$ 4,303</u>	<u>\$ 4,288</u>	<u>\$ 15</u>	<u>\$ —</u>
Liabilities				
Accrued expenses and other current liabilities:				
Foreign currency forward contracts	\$ 182	\$ —	\$ 182	\$ —
Other liabilities:				
Contingent considerations - Long-term	3,376	—	—	3,376
	<u>\$ 3,558</u>	<u>\$ —</u>	<u>\$ 182</u>	<u>\$ 3,376</u>

During the years ended December 31, 2019 and 2018, there were no transfers between fair value levels.

Changes in the fair value of Level 3 contingent considerations for the year ended December 31, 2019 were as follows (in thousands):

	Contingent Considerations
Balance at December 31, 2018	\$ 3,376
Acquisition of ARGES	7,870
Acquisition of Ingenia	6,569
Fair value adjustments	2,489
Effect of foreign exchange rates	13
Balance at December 31, 2019	<u>\$ 20,317</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

The following table provides qualitative information associated with the fair value measurement of the Company's Level 3 liabilities:

Liability	December 31, 2019 Fair Value (in thousands)	Valuation Technique	Unobservable Inputs	Percentage Applied
Contingent consideration (ARGES)	\$7,899	Monte Carlo method	Historical and projected revenues from July 2019 through December 2026	N/A
			Revenue volatility	36.0%
			Cost of debt	1.4%
			Discount rate	7.3%
Contingent consideration (Ingenia)	\$6,653	Monte Carlo method	Historical and projected revenues from April 2019 through March 2022	N/A
			Revenue volatility	36.0%
			Cost of debt	0.9%
			Discount rate	15.3%
Contingent consideration (Other)	\$5,765	Discounted cash flow method	Historical and projected revenues for fiscal years 2018 to 2021	N/A
			Discount rate	22.8%

See Note 11 for a discussion of the estimated fair value of the Company's outstanding debt and Note 14 for a discussion of the estimated fair value of the Company's pension plan assets.

8. Foreign Currency Contracts

The Company addresses 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. The Company does not enter into derivative transactions for speculative purposes. Gains and losses on derivative financial instruments substantially offset losses and gains on the underlying hedged exposures. Furthermore, the Company manages its exposure to counterparty risks on derivative instruments by entering into contracts with a diversified group of major financial institutions and by actively monitoring outstanding positions.

As of December 31, 2019, the notional amount and fair value of the Company's foreign currency forward contracts was \$12.4 million and a net loss of less than \$0.1 million, respectively. As of December 31, 2018, the notional amount and fair value of the Company's foreign currency forward contracts was \$31.2 million and a net loss of \$0.2 million, respectively.

For the years ended December 31, 2019, 2018 and 2017, the Company recognized aggregate net gains of \$0.8 million, \$1.5 million and \$0.2 million, respectively, from the settlement of foreign currency forward contracts, which were included in foreign exchange transaction gains (losses) in the consolidated statements of operations.

9. Earnings per Common Share

Basic earnings per common share is computed by dividing net income attributable to Novanta Inc., after redeemable noncontrolling interest redemption value adjustment, if any, by the weighted average number of common shares outstanding during the year. Prior to the acquisition of the remaining noncontrolling interest in Laser Quantum in September 2018, the Company recognized changes in the redeemable noncontrolling interest redemption value by adjusting the carrying amount of the redeemable noncontrolling interest as of the end of the period to the higher of: (i) the estimated redemption value assuming the end of the period was also the redemption date or (ii) the carrying value without any redemption value adjustments. Such adjustments were recorded in retained earnings in stockholders' equity instead of net income attributable to Novanta Inc. However, for both basic and diluted

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earnings per common share, such redemption value adjustments were included in the calculation of the numerator for 2018 and 2017.

For diluted earnings per common share, the denominator includes the dilutive effects of outstanding restricted stock units, stock options, total shareholder return performance-based restricted stock units and certain non-GAAP EPS performance-based restricted stock units, determined using the treasury stock method. The dilutive effects of market-based contingently issuable shares are included in the weighted average dilutive share calculation based on the number of shares, if any, that would be issuable as of the end of the reporting period assuming the end of the reporting period is also the end of the performance period. The dilutive effects of attainment-based contingently issuable shares granted to the former Laser Quantum noncontrolling interest shareholders and non-GAAP EPS performance-based restricted stock units are included in the weighted average dilutive share calculation after the performance targets have been achieved.

The following table sets forth the computation of basic and diluted earnings per common share (in thousands, except per share amounts):

	Year Ended December 31,		
	2019 ⁽¹⁾	2018 ⁽²⁾	2017 ⁽³⁾
Numerators:			
Consolidated net income	\$ 40,773	\$ 51,095	\$ 62,307
Less: Net income attributable to noncontrolling interest	—	(1,986)	(2,256)
Net income attributable to Novanta Inc.	40,773	49,109	60,051
Redeemable noncontrolling interest redemption value adjustment	—	1,781	(20,244)
Net income attributable to Novanta Inc. after adjustment for redeemable noncontrolling interest redemption value	<u>\$ 40,773</u>	<u>\$ 50,890</u>	<u>\$ 39,807</u>
Denominators:			
Weighted average common shares outstanding— basic	35,030	34,913	34,817
Dilutive potential common shares	516	560	463
Weighted average common shares outstanding— diluted	<u>35,546</u>	<u>35,473</u>	<u>35,280</u>
Antidilutive potential common shares excluded from above	41	4	—
Earnings per Common Share Attributable to Novanta Inc.:			
Basic	\$ 1.16	\$ 1.46	\$ 1.14
Diluted	\$ 1.15	\$ 1.43	\$ 1.13

- (1) For the year ended December 31, 2019, 46 non-GAAP EPS performance-based restricted stock units granted to certain members of the executive management team and 213 shares of restricted stock issued to Laser Quantum former non-controlling interest shareholders are considered contingently issuable shares and were excluded from the calculation of the denominator as the contingent conditions had not been met as of December 31, 2019.
- (2) For the year ended December 31, 2018, 54 non-GAAP EPS performance-based restricted stock units granted to certain members of the executive management team and 213 shares of restricted stock issued to Laser Quantum former non-controlling interest shareholders were considered contingently issuable shares and were excluded from the calculation of the denominator as the contingent conditions had not been met as of December 31, 2018.
- (3) For the year ended December 31, 2017, 59 non-GAAP EPS performance-based restricted stock units granted to certain members of the executive management team were excluded from the calculation of the denominator as the contingent conditions had not been met as of December 31, 2017.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

10. Supplementary Balance Sheet Information

The following tables provide the details of selected balance sheet items as of the dates indicated (in thousands):

Inventories

	December 31,	
	2019	2018
Raw materials	\$ 76,268	\$ 69,008
Work-in-process	15,096	15,982
Finished goods	23,431	17,337
Demo and consigned inventory	1,823	2,437
Total inventories	<u>\$ 116,618</u>	<u>\$ 104,764</u>

Property, Plant and Equipment, Net

	December 31,	
	2019	2018
Cost:		
Land, buildings and improvements	\$ 67,376	\$ 56,068
Machinery and equipment	<u>87,471</u>	<u>77,918</u>
Total cost	154,847	133,986
Accumulated depreciation	<u>(77,291)</u>	<u>(68,522)</u>
Property, plant and equipment, net	<u>\$ 77,556</u>	<u>\$ 65,464</u>

The Company capitalized software development costs of \$0.2 million, \$1.1 million and \$2.0 million in 2019, 2018 and 2017, respectively, in accordance with the guidance in ASC 350-40, "Internal-Use Software."

The following table summarizes depreciation expense on property, plant and equipment, including demo units and assets under finance leases (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Depreciation expense	<u>\$ 11,835</u>	<u>\$ 11,442</u>	<u>\$ 9,838</u>

Accrued Expenses and Other Current Liabilities

The following table summarizes accrued expenses and other current liabilities as of the dates indicated (in thousands):

	December 31,	
	2019	2018
Accrued compensation and benefits	\$ 15,359	\$ 24,545
Accrued warranty	5,756	4,510
Contract liabilities, current portion	3,219	4,165
Deferred purchase price for acquisitions	27,735	—
Other	<u>18,257</u>	<u>13,075</u>
Total	<u>\$ 70,326</u>	<u>\$ 46,295</u>

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
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Accrued Warranty

The following table summarizes changes in accrued warranty for the periods indicated (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Balance at beginning of year	\$ 4,510	\$ 4,835	\$ 3,142
Provision charged to cost of revenue	2,360	3,111	3,169
Warranty liabilities acquired from acquisitions	142	—	1,307
Use of provision	(1,282)	(3,341)	(2,857)
Foreign currency exchange rate changes	26	(95)	74
Balance at end of year	<u>\$ 5,756</u>	<u>\$ 4,510</u>	<u>\$ 4,835</u>

Other Long Term Liabilities

The following table summarizes other long term liabilities as of the dates indicated (in thousands):

	December 31,	
	2019	2018
Finance lease obligations	\$ 14,845	\$ 7,275
Accrued pension liabilities	1,473	3,758
Accrued contingent considerations	16,504	3,376
Other	4,065	2,778
Total	<u>\$ 36,887</u>	<u>\$ 17,187</u>

11. Debt

Debt consisted of the following (in thousands):

	December 31,	
	2019	2018
Senior Credit Facilities – term loan	\$ 5,073	\$ 4,600
Less: unamortized debt issuance costs	(42)	(65)
Total current portion of long-term debt	<u>5,031</u>	<u>4,535</u>
Senior Credit Facilities – term loan	96,095	69,925
Senior Credit Facilities – revolving credit facility	123,384	135,058
Less: unamortized debt issuance costs	(4,145)	(2,140)
Total long-term debt	<u>215,334</u>	<u>202,843</u>
Total Senior Credit Facilities	<u>\$ 220,365</u>	<u>\$ 207,378</u>

Senior Credit Facilities

On December 31, 2019, the Company entered into an amended and restated credit agreement (the “Third Amended and Restated Credit Agreement”) with existing lenders for an aggregate credit facility of \$450.0 million, consisting of a \$100.0 million U.S. dollar equivalent euro-denominated (approximately €90.2 million) 5-year term loan facility and a \$350.0 million 5-year revolving credit facility (collectively, the “Senior Credit Facilities”). The Senior Credit Facilities mature in December 2024. The Third Amended and Restated Credit Agreement amended and restated the Second Amended and Restated Credit Agreement dated as of May 19, 2016.

The borrowings outstanding under the Senior Credit Facilities bear interest at rates based on (a) the Base Rate, as defined in the Third Amended and Restated Credit Agreement, plus a margin ranging between 0.25% to 1.25% per annum, determined by reference to the Company’s consolidated leverage ratio, or (b) the Eurocurrency Rate, as defined in the Third Amended and Restated Credit Agreement, plus a margin ranging between 1.25% and 2.25% per annum, determined by reference to the

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

Company's consolidated leverage ratio. In addition, the Company is obligated to pay a commitment fee on the unused portion of the revolving credit facility, ranging between 0.20% and 0.40% per annum, determined by reference to the Company's consolidated leverage ratio.

The Third Amended and Restated Credit Agreement contains various customary representations, warranties and covenants applicable to the Company and its subsidiaries, including, among others: (i) limitations on restricted payments, including dividend payments and stock repurchases, provided that the Company and its subsidiaries may repurchase their equity interests so long as, immediately after giving effect to the repurchase, the Company's consolidated leverage ratio is no more than 3.25:1.00, with a step up to 3.75:1.00 for four consecutive quarters following an acquisition with an aggregate consideration greater than or equal to \$50.0 million, and the satisfaction of other customary conditions; (ii) limitations on fundamental changes involving the Company and its subsidiaries; (iii) limitations on the disposition of assets; and (iv) limitations on indebtedness, investments, and liens. The Third Amended and Restated Credit Agreement also requires the Company to satisfy certain financial covenants, such as maintaining a minimum consolidated fixed charge coverage ratio of 1.50:1.00 and a maximum consolidated leverage ratio of 3.50:1.00. The maximum consolidated leverage ratio will increase to 4.00:1.00 for four consecutive quarters following an acquisition with an aggregate consideration greater than or equal to \$50.0 million.

As of December 31, 2019, the outstanding principal under the Company's term loan facility is scheduled to be repaid as follows (in thousands):

	Principal Amount
2020	\$ 5,073
2021	5,071
2022	5,071
2023	5,071
2024	80,882
Total debt repayments	<u>\$ 101,168</u>

The outstanding principal balance under the term loan facility is payable in quarterly installments of €1.1 million beginning in March 2020, with the remaining due upon maturity. The Company may make additional principal payments at any time, which will reduce the next quarterly installment payment due. Borrowings under the revolving credit facility may be repaid at anytime through December 2024. The Company may be required to prepay outstanding loans under the Third Amended and Restated Credit Agreement with the net proceeds of certain asset dispositions and incurrences of certain debt. At the election of the Company, and so long as no default shall have occurred, the Company may reinvest all, or any portion of, the net proceeds from such asset dispositions or incurrences of debt within a year.

As of December 31, 2019, the Company had \$226.6 million available to be drawn under the revolving credit facility. Excluding commitment fees, the weighted average interest rate for the Senior Credit Facilities was approximately 2.34% as of December 31, 2019. The commitment fee rate for the unused commitments under the revolving credit facility was approximately 0.30% as of December 31, 2019.

Guarantees

The Senior Credit Facilities is guaranteed by Novanta Inc., Novanta Corporation, NDS Surgical Imaging LLC, Med X Change, Inc., Novanta Medical Technologies Corp., Novanta Europe GmbH, Novanta UK Investments Holding Limited and Novanta Technologies UK Limited (collectively, "Guarantors"). Each Guarantor, jointly and severally, unconditionally guarantees the due and punctual payment of the principal, interest and fees under the Senior Credit Facilities, when due and payable, whether at maturity, by required prepayment, by acceleration or otherwise. In addition, Guarantors guarantee the due and punctual payment, fees and interest on the overdue principal of the Senior Credit Facilities and the due and punctual performance of all obligations of the Company in accordance with the terms of the Third Amended and Restated Credit Agreement. Furthermore, each Guarantor, jointly and severally, unconditionally guarantees that in the event of any extension, renewal, amendment, refinancing or modification of any of the Senior Credit Facilities, amounts due will be promptly paid in full when due in accordance with the terms of the extension or renewal, at stated maturity, by acceleration or otherwise.

The obligations of each Guarantor are limited to the maximum amount, after giving effect to all other contingent and fixed liabilities or any collections from, or payments made by or on behalf of, any other Guarantor. Each Guarantor that makes a payment

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or distribution under a Guarantee is entitled to a contribution from each other Guarantor of its pro rata share based on the adjusted net assets of each Guarantor. If at any time any payment of any of the obligations of the Guarantors is rescinded or must otherwise be returned upon the insolvency, bankruptcy or reorganization of the Company, a Guarantor or otherwise, the Guarantees will continue to be effective or be reinstated, as the case may be, as though such payment had not been made.

Each Guarantor may be released from its obligations under its respective Guarantee and its obligations under the Third Amended and Restated Credit Agreement upon the occurrence of certain events, including, but not limited to: (i) the Guarantor ceasing to be a subsidiary; or (ii) payment in full of the principal and accrued and unpaid interest on the Senior Credit Facilities and all other obligations.

The maximum potential amount of future payments the Guarantors could be required to make under the Guarantee is the principal amount of the Senior Credit Facilities plus all accrued and unpaid interest thereon. However, as of December 31, 2019, the Guarantors were not expected to be required to perform under the Guarantee.

Liens

The Company's obligations under the Senior Credit Facilities are secured, on a senior basis, by a lien on substantially all of the assets of Novanta Inc. The Third Amended and Restated Credit Agreement also contains customary events of default.

Deferred Financing Costs

In connection with the execution of the Third Amended and Restated Credit Agreement, the Company capitalized an additional \$3.0 million of deferred financing costs. The Company allocated these costs between the term loan and the revolving credit facility based on the maximum borrowing capacity and amortizes the costs on a straight-line basis over the term of the Senior Credit Facilities. Previously unamortized deferred financing costs will continue to be amortized. Non-cash interest expense related to the amortization of the deferred financing costs was \$1.1 million, \$1.0 million and \$0.8 million in 2019, 2018 and 2017, respectively. Unamortized deferred financing costs are presented as a reduction to the debt balances on the consolidated balance sheets.

Fair Value of Debt

As of December 31, 2019 and 2018, the outstanding balance of the Company's debt approximated its fair value based on current rates available to the Company for debt of the same maturities. The fair value of the Company's debt is classified as Level 2 under the fair value hierarchy.

12. Leases

Most leases held by the Company expire between 2020 and 2034. In the U.K., where longer lease terms are more common, the Company has a land lease that extends through 2078. Certain leases include terms such as an option to purchase the property, one or more options to renew, with renewal terms that can extend the lease term from one to 10 years, and options to terminate the leases within one year. The exercise of lease renewal or termination option is at the Company's sole discretion; therefore, the majority of renewals to extend the lease terms are not included in the Company's right-of-use assets and operating lease liabilities as they are not reasonably certain of being exercised. The Company regularly evaluates the renewal options and includes the renewal periods in the lease term when they are reasonably certain of being exercised. The depreciable life of right-of-use assets and leasehold improvements is limited to the expected lease terms.

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The following table summarizes the components of lease costs during 2019 (in thousands):

	<u>Year Ended</u> <u>December 31, 2019</u>
Operating lease cost	\$ 7,638
Finance lease cost	
Amortization of right-of-use assets	831
Interest on lease liabilities	430
Variable lease cost	1,329
Total lease cost	<u>\$ 10,228</u>

During 2018 and 2017, the Company recorded operating lease expense of \$7.4 million and \$5.5 million, respectively.

The following table provides the details of balance sheet information related to leases as of December 31, 2019 (in thousands, except lease term and discount rate):

	<u>December 31,</u> <u>2019</u>
Operating leases	
Operating lease right-of-use assets	<u>\$ 35,180</u>
Current portion of operating lease liabilities	\$ 5,043
Operating lease liabilities	34,108
Total operating lease liabilities	<u>\$ 39,151</u>
Finance leases	
Property, plant and equipment, gross	\$ 19,748
Accumulated depreciation	(4,649)
Finance lease assets included in property, plant and equipment, net	<u>\$ 15,099</u>
Accrued expenses and other current liabilities	\$ 1,307
Other liabilities	14,845
Total finance lease liabilities	<u>\$ 16,152</u>
Weighted-average remaining lease term (in years)	
Operating leases	10.2
Finance leases	4.7
Weighted-average discount rate	
Operating leases	5.60%
Finance leases	3.09%

The following table provides a summary of leased properties under finance leases by major classes as of December 31, 2018:

	<u>December 31,</u> <u>2018</u>
Land, buildings and improvements	\$ 9,133
Machinery and equipment	4,404
Total gross assets under finance leases	13,537
Accumulated depreciation on assets under finance leases	6,901
Assets under finance leases included in property, plant and equipment, net	<u>\$ 6,636</u>

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The following table provides the details of cash flow information related to leases for the year ended December 31, 2019 (in thousands):

	<u>Year Ended</u> <u>December 31, 2019</u>
Cash paid for amounts included in lease liabilities:	
Operating cash flows from finance leases	\$ 430
Operating cash flows from operating leases	\$ 7,768
Financing cash flows from finance leases	\$ 868
Supplemental non-cash information:	
Right-of-use assets obtained in exchange for new operating lease liabilities	\$ 7,723
Right-of-use assets obtained in exchange for new finance lease liabilities	\$ 9,209

Future minimum lease payments under operating and finance leases expiring subsequent to December 31, 2019, including operating leases associated with facilities that have been vacated as a result of the Company's restructuring actions, are summarized as follows (in thousands):

<u>Year Ending December 31,</u>	<u>Operating Leases</u>	<u>Finance Leases⁽¹⁾</u>
2020	\$ 6,157	\$ 1,738
2021	6,485	9,278
2022	5,451	907
2023	4,762	930
2024	4,420	954
Thereafter	26,141	4,440
Total minimum lease payments	53,416	18,247
Less: interest	(14,265)	(2,095)
Present value of lease liabilities	<u>\$ 39,151</u>	<u>\$ 16,152</u>

- (1) Future minimum lease payments under finance leases include the exercise price of an option to purchase a facility in Germany in 2021.

13. Common Shares and Share-Based Compensation

Capital Shares

The authorized capital of the Company consists of an unlimited number of common shares without nominal or par value. Holders of common shares are entitled to one vote per share. Holders of common shares are entitled to receive dividends, if and when declared by the Board of Directors, and to share ratably in the Company's assets legally available for distribution to shareholders in the event of liquidation. Holders of common shares have no redemption or conversion rights.

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Common Share Repurchases

The Company's Board of Directors may approve share repurchase plans from time to time. Under these repurchase plans, shares may be repurchased at the Company's discretion based on ongoing assessment of the capital needs of the business, the market price of the Company's common shares, and general market conditions. Shares may also be repurchased through an accelerated share 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 shares to be repurchased when the Company would otherwise be prohibited from doing so under insider trading laws. While the share repurchase plans are generally intended to offset dilution from equity awards granted to the Company's employees and directors, the plans do not obligate the Company to acquire any particular amount of common shares. No time limit is typically set for the completion of the share repurchase plans, and the plans may be suspended or discontinued at any time. The Company expects to fund share repurchases through cash on hand and cash generated from operations.

In October 2013, the Company's Board of Directors approved a share repurchase plan (the "2013 Repurchase Plan") authorizing the repurchase of \$10.0 million worth of common shares. During 2018, the Company repurchased 89 thousand shares in the open market for an aggregate purchase price of \$5.9 million at an average price of \$65.43 per share. During 2017, the Company repurchased 14 thousand shares in the open market for an aggregate purchase price of \$0.4 million at an average price of \$26.41 per share. As of December 31, 2018, the Company had repurchased an aggregate of 385 thousand shares for an aggregate purchase price of \$10.0 million at an average price of \$25.97 per share. As of December 31, 2018, the Company had completed the 2013 Repurchase Plan.

In October 2018, the Company's Board of Directors approved a share repurchase plan (the "2018 Repurchase Plan") authorizing the repurchase of \$25.0 million worth of common shares. Share repurchases have been made under the 2018 Repurchase Plan pursuant to Rule 10b-18 under the Securities Exchange Act of 1934. During 2019, the Company repurchased 119 thousand shares for an aggregate purchase price of \$10.0 million at an average price of \$83.71 per share under the 2018 Repurchase Plan. The Company had \$15.0 million available for share repurchases under the 2018 Repurchase Plan as of December 31, 2019.

In February 2020, the Company's Board of Directors approved a new share repurchase plan (the "2020 Repurchase Plan") authorizing the repurchase of an additional \$50.0 million worth of common shares. The Company expects that share repurchases will be made under the 2020 Repurchase Plan after the 2018 Repurchase Plan is completed.

2010 Incentive Award Plan

In November 2010, the Company's shareholders approved the 2010 Incentive Award Plan under which the Company may grant share-based compensation awards to employees, consultants and directors. In May 2014, the Company's shareholders approved the amended and restated 2010 Incentive Award Plan and, in July 2016, the Company approved a further amended and restated 2010 Incentive Award Plan (as amended, the "Amended and Restated 2010 Incentive Plan"). The maximum number of shares which can be issued pursuant to the Amended and Restated 2010 Incentive Plan is 4,398,613, subject to adjustment as set forth in the Amended and Restated 2010 Incentive Plan. The Amended and Restated 2010 Incentive Plan provides for the grant of incentive stock options, non-qualified stock options, restricted stock, restricted stock units, stock appreciation rights, deferred stock, deferred stock units, dividend equivalents, performance awards and stock payments (collectively referred to as "Awards"). The Amended and Restated 2010 Incentive Plan provides for specific limits on the number of shares with respect to Awards that may be granted to any person during any calendar year and the amount of cash that can be paid with respect to Awards to any one person during any calendar year. The Amended and Restated 2010 Incentive Plan will expire and no further Awards may be granted after April 9, 2024. As of December 31, 2019, there were 840,889 shares available for future awards under the Amended and Restated 2010 Incentive Plan.

Shares subject to Awards that have expired, forfeited or settled in cash, or repurchased by the Company at the same price paid by the awardee may be added back to the number of shares available for grant under the Amended and Restated 2010 Incentive Plan and may be granted as new Awards. Notwithstanding the foregoing, the following shares will not be added back to the number of shares available for grant: (a) shares that are used to pay the exercise price for an option, (b) shares tendered or withheld to pay taxes with respect to any Award (other than options and stock appreciation rights) to the extent they exceed the number of shares with a fair market value equal to the tax liability based on minimum withholding rates, (c) shares tendered or withheld to pay taxes with respect to options and stock appreciation rights, (d) shares subject to a stock appreciation right that are not issued in connection with the stock settlement of the stock appreciation right on exercise thereof, and (e) shares purchased on the open market with the

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cash proceeds from the exercise of options. Shares issued to satisfy Awards under the Amended and Restated 2010 Incentive Plan may be previously authorized but unissued shares, treasury shares or shares repurchased on the open market.

Share-Based Compensation Expense

The table below summarizes share-based compensation expense recorded in operating income (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Selling, general and administrative	\$ 8,361	\$ 6,997	\$ 5,065
Research and development and engineering	497	438	221
Cost of revenue	482	211	207
Restructuring and acquisition related costs	—	68	—
Total share-based compensation expense	<u>\$ 9,340</u>	<u>\$ 7,714</u>	<u>\$ 5,493</u>

The expense recorded during each of the years ended December 31, 2019, 2018 and 2017 included \$0.9 million, \$0.5 million and \$0.5 million, respectively, related to restricted stock units and deferred stock units granted to the members of the Company's Board of Directors pursuant to the Company's Amended and Restated 2010 Incentive Plan.

As of December 31, 2019, the Company's outstanding equity awards for which compensation expense will be recognized in the future consisted of time-based restricted stock units and performance stock units granted under the Amended and Restated 2010 Incentive Plan. The Company expects to record an aggregate share-based compensation expense of \$15.5 million, net of estimated forfeitures, over a weighted average period of 1.12 years subsequent to December 31, 2019, for all outstanding equity awards as of December 31, 2019.

Restricted Stock Units and Deferred Stock Units

The Company's restricted stock units ("RSUs") have generally been issued to employees with vesting periods ranging from three years to five years and vest based solely on service conditions. Accordingly, the Company recognizes compensation expense on a straight-line basis over the requisite service period. The Company reduces the compensation expense by an estimated forfeiture rate which is based on anticipated forfeitures and actual experience.

Deferred stock units ("DSUs") are granted to the members of the Company's Board of Directors. The compensation expense associated with the DSUs is recognized in full on the respective date of grant, as DSUs are fully vested and non-forfeitable upon grant. There were 187 thousand and 179 thousand DSUs outstanding as of December 31, 2019 and December 31, 2018, respectively, which were included in the calculation of weighted average basic shares outstanding for the respective periods.

The table below summarizes activities during 2019 relating to restricted and deferred stock units issued and outstanding under the Amended and Restated 2010 Incentive Plan:

	Restricted and Deferred Stock Units (In thousands)	Weighted Average Grant Date Fair Value	Weighted Average Remaining Vesting Period (in years)	Aggregate Intrinsic Value (1) (In thousands)
Unvested at December 31, 2018	529	\$ 26.98		
Granted	139	\$ 77.37		
Vested	(172)	\$ 27.98		
Forfeited	(43)	\$ 49.20		
Unvested at December 31, 2019	<u>453</u>	\$ 39.74	1.38 years	\$ 40,057
Expected to vest as of December 31, 2019	<u>431</u>	\$ 38.35	1.38 years	\$ 38,079

(1) The aggregate intrinsic value is calculated based on the fair value of \$88.44 per share of the Company's common stock on December 31, 2019 due to the fact that the restricted stock units carry a \$0 purchase price.

The total fair value of restricted stock units and deferred stock units that vested in 2019, based on the market price of the underlying shares on the day of vesting, was \$13.4 million.

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Performance Stock Units

The Company typically grants two types of performance-based stock 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”). Both types of performance-based restricted stock units generally cliff vest on the first day following the end of a three-year performance period.

The number of common shares to be issued upon settlement following vesting of the EPS-PSUs is determined based on the Company’s cumulative non-GAAP EPS over the three-year performance period against the target established by the Company’s Board of Directors at the time of grant and will be in the range of zero to 200% of the target number of shares. The Company recognizes compensation expense ratably over the performance period based on the number of shares that are deemed probable of vesting at the end of the three-year performance cycle. This probability assessment is performed quarterly and the cumulative effect of a change in the estimated compensation expense, if any, is recognized in the consolidated statement of operations in the period in which such determination is made.

The number of common shares to be issued upon settlement following vesting of the TSR-PSUs is determined based on the relative market performance of the Company’s common stock compared to the Russell 2000 Index over the three-year performance period using a payout formula established by the Company’s Board of Directors at the time of grant and will be in the range of zero to 200% of the target number of shares. The Company recognizes the related compensation expense based on the fair value of the TSR-PSUs, determined using the Monte-Carlo valuation model as of the grant date, on a straight-line basis from the grant date to the end of the three-year performance period. Compensation expense will not be affected by the number of TSR-PSUs that will actually vest at the end of the three-year performance period.

The table below summarizes activities during 2019 relating to performance-based stock awards issued and outstanding under the Company’s Amended and Restated 2010 Incentive Plan:

	Performance Stock Units (1) (in thousands)	Weighted Average Grant Date Fair Value	Weighted Average Remaining Vesting Period (in years)	Aggregate Intrinsic Value (2) (in thousands)
Unvested at December 31, 2018	137	\$ 37.28		
Granted	47	\$ 92.14		
Performance adjustment (3)	29	\$ 14.13		
Vested	(58)	\$ 14.13		
Forfeited	(3)	\$ 79.26		
Unvested at December 31, 2019	152	\$ 57.95	0.92 years	\$ 13,477
Expected to vest as of December 31, 2019	269	\$ 43.50	0.92 years	\$ 23,769

- (1) The unvested PSUs are shown in this table at target, except for the number of shares vested, which reflects the number of shares earned and expected to be issued. As of December 31, 2019, the maximum number of PSUs available to be earned was approximately 305 thousand.
- (2) The aggregate intrinsic value is calculated based on the fair value of \$88.44 per share of the Company’s common stock on December 31, 2019 due to the fact that the performance stock units carry a \$0 purchase price.
- (3) The amount shown represents performance adjustments for performance-based awards granted on March 30, 2016. These units vested at 200% during 2019 based on the achievement of cumulative Non-GAAP EPS during the performance period of fiscal years 2016 through 2018.

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The total fair value of PSUs that vested in 2019, based on the market price of the underlying shares on the date of vesting, was \$5.0 million.

The fair value of the TSR-PSUs at the date of grant was estimated using the Monte-Carlo valuation model with the following assumptions:

	Year Ended December 31, 2019
Grant-date stock price	\$ 77.23
Expected volatility	32.54%
Risk-free interest rate	2.46%
Expected annual dividend yield	—
Weighted average fair value	\$ 108.58

Stock Options

On March 30, 2016, the Company granted 193 thousand stock options to certain members of the executive management team to purchase common shares of the Company at a price equal to the closing market price of the Company's common shares on the date of grant. The stock options vested ratably on the anniversary date of the grant date over a three-year period and expire on the tenth anniversary of the grant date. The fair value of these stock options was estimated using the Black-Scholes valuation model. Key input assumptions used to estimate the fair value of stock options included the expected option term, the expected volatility of the Company's common stock over the expected term of the options, the risk-free interest rate, and the expected dividend yield. The Company recognized the compensation expense of stock options on a straight-line basis in the consolidated statement of operations over the vesting period. No stock options were granted during 2019.

The following table shows stock options that were outstanding, exercisable and expected to vest as of December 31, 2019 and the related weighted average exercise price, weighted average remaining contractual term and aggregate intrinsic value:

	Number of Shares (In thousands)	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value (1) (In thousands)
Stock options outstanding	73	\$ 14.13	6.25	\$ 5,407
Stock options exercisable	73	\$ 14.13	6.25	\$ 5,407

- (1) The aggregate intrinsic value is calculated as the difference between the closing market price of \$88.44 per share of the Company's common stock on December 31, 2019 and the exercise price of the stock options.

The total intrinsic value of stock options exercised in 2019, based on the difference between the market price on the date of exercise and the date of grant, was \$2.4 million. The total amount of cash received from the exercise of these stock options was \$0.4 million. The Company did not record any income tax deductions from the stock options exercised in 2019 as these were non-qualified stock options.

14. Employee Benefit Plans

Defined Contribution Plans

The Company has defined contribution employee retirement savings plans in the U.S., the U.K. and Japan. The Company matches the contributions of participating employees on the basis of percentages specified in each plan. The Company's matching contributions to the plans were \$4.4 million, \$3.9 million and \$3.1 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Defined Benefit Plan

The Company maintains a frozen defined benefit pension plan in the U.K. (the "U.K. Plan"). The U.K. Plan was closed to new membership in 1997 and stopped accruing additional pension benefits for existing members in 2003. Benefits under the U.K.

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Plan were based on the participants' years of service and compensation as of the date the plan was frozen in 2003, adjusted for inflation. The Company continues to fund the plan in accordance with the pension regulations in the U.K.

The net periodic pension cost is included in other income (expense) in the consolidated statements of operations and consisted of the following components (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Components of the net periodic pension cost:			
Interest cost	\$ 971	\$ 939	\$ 991
Expected return on plan assets	(1,671)	(1,717)	(1,665)
Amortization of actuarial losses	957	826	1,045
Amortization of prior service cost	29	—	—
Net periodic pension cost	<u>\$ 286</u>	<u>\$ 48</u>	<u>\$ 371</u>

The actuarial assumptions used to compute the net periodic pension cost for the years ended December 31, 2019, 2018 and 2017, respectively, were as follows:

	Year Ended December 31,		
	2019	2018	2017
Weighted-average discount rate	2.7%	2.4%	2.6%
Weighted-average long-term rate of return on plan assets	5.1%	4.8%	5.2%

The actuarial assumptions used to compute the benefit obligations as of December 31, 2019 and 2018, respectively, were as follows:

	December 31,	
	2019	2018
Weighted-average discount rate	1.9%	2.7%
Rate of inflation	2.5%	2.8%

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The discount rates used are derived from (AA) corporate bonds that have maturities approximating the terms of the pension obligations under the U.K. Plan. In estimating the expected return on plan assets, the Company considered the historical performance of the major asset classes held by the U.K. Plan and current forecasts of future rates of return for these asset classes.

The following table provides a reconciliation of benefit obligations and plan assets of the U.K. Plan (in thousands):

	December 31,	
	2019	2018
Change in benefit obligation:		
Projected benefit obligation at beginning of year	\$ 36,882	\$ 40,329
Interest cost	971	939
Actuarial (gains) losses	3,005	(1,718)
Benefits paid	(1,696)	(1,301)
Prior service cost (1)	—	754
Foreign currency exchange rate changes	1,294	(2,121)
Projected benefit obligation at end of year	<u>\$ 40,456</u>	<u>\$ 36,882</u>
Accumulated benefit obligation at end of year	<u>\$ 40,456</u>	<u>\$ 36,882</u>
Change in plan assets:		
Fair value of plan assets at beginning of year	\$ 33,124	\$ 36,476
Actual return on plan assets	5,410	(1,083)
Employer contributions	894	941
Benefits paid	(1,696)	(1,301)
Foreign currency exchange rate changes	1,251	(1,909)
Fair value of plan assets at end of year	<u>\$ 38,983</u>	<u>\$ 33,124</u>
Funded status at end of year	<u>\$ (1,473)</u>	<u>\$ (3,758)</u>
Amounts included in accumulated other comprehensive loss not yet recognized in net periodic pension cost:		
Net actuarial losses at beginning of year	\$ (11,120)	\$ (10,493)
Net actuarial gains (losses) during the year	734	(1,083)
Prior service cost arising during the year (1)	—	(754)
Amounts reclassified from accumulated other comprehensive income to income before income taxes	986	826
Foreign currency exchange rate changes	(306)	384
Net actuarial losses	<u>\$ (9,706)</u>	<u>\$ (11,120)</u>
Amounts expected to be amortized from accumulated other comprehensive loss into net periodic pension cost over the next fiscal year consists of:		
Net actuarial losses	\$ 706	\$ 959
Prior service cost	30	29

- (1) On October 26, 2018, the High Court of Justice in the U.K. ruled that the Guaranteed Minimum Pensions (“GMPs”) provided by pension schemes need to equalize lifetime GMP benefits between genders. In order to meet the requirements set out by the High Court, the Company recorded an estimate of \$0.8 million additional benefit obligations based on the existing plan participants, the date the U.K. Plan was allowed to stop accruing additional benefits, the pension plan rules and the approach taken to equalize the benefits. The additional benefit obligations will be amortized and recognized as part of net periodic pension cost in the consolidated statement of operations over the average remaining life expectancy of the plan participants.

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The funded status of the U.K. Plan is included in other long term liabilities in the accompanying consolidated balance sheets.

The following table reflects the total expected benefit payments to plan participants and have been estimated based on the same assumptions used to measure the Company's benefit obligations as of December 31, 2019 (in thousands):

	Amount
2020	\$ 1,104
2021	1,181
2022	1,038
2023	1,137
2024	1,502
2025-2026	8,612
Total	\$ 14,574

In the U.K., funding valuations are conducted every three years in order to determine the future level of contributions. Based on the results of the most recent valuation, the Company's annual contributions will be approximately \$1.0 million in 2020 and will increase by 2.9% per year thereafter.

Fair Value of Plan Assets

The trustees of the U.K. Plan have the fiduciary responsibilities to manage the plan assets in consultation with the Company. The overall objective is to invest plan assets in a portfolio of diversified assets, primarily through the use of institutional collective funds, to achieve balanced growth through a combination of investments in equities for long-term growth and investments in debt instruments that match a portion of the expected future benefit payments and to maintain adequate liquidity to make pension payments to pensioners.

The following table summarizes the fair values of Plan assets by asset category as of December 31, 2019 (in thousands):

Asset Category	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Other Unobservable Inputs (Level 3)	Not Subject to Leveling
Mutual Funds:					
Balanced (1)	\$ 28,831	\$ —	\$ —	\$ —	\$ 28,831
Fixed income (2)	10,042	—	—	—	10,042
Cash	110	110	—	—	—
Total	\$ 38,983	\$ 110	\$ —	\$ —	\$ 38,873

- (1) This class comprises a diversified portfolio of global investments which seeks a balanced return between capital growth and fixed income and is allocated on a weighted average basis as follows: equities (32%), bonds (42%), other assets (19%) and cash (7%).
- (2) This class comprises a diversified portfolio of global investments which seeks fixed income growth and is allocated on a weighted average basis as follows: bonds (92%), other assets (5%) and cash (3%).

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The following table summarizes the fair values of Plan assets by asset category as of December 31, 2018 (in thousands):

Asset Category	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Other Unobservable Inputs (Level 3)	Not Subject to Leveling
Mutual Funds:					
Balanced (1)	\$ 24,564	\$ —	\$ —	\$ —	\$ 24,564
Fixed income (2)	8,451	—	—	—	8,451
Cash	109	109	—	—	—
Total	<u>\$ 33,124</u>	<u>\$ 109</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 33,015</u>

- (1) This class comprises a diversified portfolio of global investments which seeks a balanced return between capital growth and fixed income and is allocated on a weighted average basis as follows: equities (42%), bonds (19%), other assets (38%) and cash (1%).
- (2) This class comprises a diversified portfolio of global investments which seeks long-term capital growth and is allocated on a weighted average basis as follows: bonds (86%) and cash (14%).

15. Income Taxes

Components of the Company's income (loss) before income taxes are as follows (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Income (loss) before income taxes:			
Canada	\$ 78	\$ (796)	\$ (2,036)
U.S.	25,577	39,356	37,327
Other	20,111	22,742	40,843
Total	<u>\$ 45,766</u>	<u>\$ 61,302</u>	<u>\$ 76,134</u>

Components of the Company's income tax provision (benefit) are as follows (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Current			
Canada	\$ 100	\$ 75	\$ 146
U.S.	1,109	8,095	9,434
Other	8,116	8,113	6,807
	<u>9,325</u>	<u>16,283</u>	<u>16,387</u>
Deferred			
Canada	—	—	—
U.S.	703	(2,272)	2,396
Other	(5,035)	(3,804)	(4,956)
	<u>(4,332)</u>	<u>(6,076)</u>	<u>(2,560)</u>
Total	<u>\$ 4,993</u>	<u>\$ 10,207</u>	<u>\$ 13,827</u>

The Company is incorporated in Canada and therefore uses the Canadian statutory rate for income tax disclosure. The reconciliation of the statutory Canadian tax rate to the effective tax rate related to income before income taxes is as follows (in thousands, except percentage data):

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	Year Ended December 31,		
	2019	2018	2017
Statutory Canadian tax rate	29.00%	29.00%	29.00%
Expected income tax provision at Canadian statutory tax rate	\$ 13,272	\$ 17,778	\$ 22,079
International tax rate differences	(3,346)	(4,474)	(2,038)
U.S. state income taxes, net of federal benefits	386	831	674
Withholding and other taxes	364	550	484
Permanent differences and other	443	1,015	1,582
Section 199 deduction	—	—	(1,148)
Foreign-derived intangible income	(787)	(1,628)	—
Tax credits	(1,457)	(1,250)	(984)
Statutory tax rate changes	35	(285)	2,823
Uncertain tax positions	310	190	(1,607)
Change in valuation allowance	(482)	(262)	(354)
Acquisition contingent consideration adjustments	287	833	149
Transaction costs	247	172	1,011
Provision to return differences	(516)	(385)	225
Windfall benefit from share-based compensation	(1,717)	(931)	(837)
Gain on Laser Quantum acquisition	—	—	(6,586)
U.K. patent box	(2,046)	(1,947)	(1,646)
Reported income tax provision	<u>\$ 4,993</u>	<u>\$ 10,207</u>	<u>\$ 13,827</u>
Effective tax rate	<u>10.9%</u>	<u>16.7%</u>	<u>18.2%</u>

Deferred income taxes result principally from temporary differences in the recognition of certain revenue and expense items and operating loss and tax credit carryforwards for financial and tax reporting purposes. Significant components of the Company's deferred tax assets and liabilities as of December 31, 2019 and 2018 are as follows (in thousands):

	December 31,	
	2019	2018
Deferred tax assets:		
Losses	\$ 9,484	\$ 9,385
Operating lease liabilities	8,386	—
Compensation related deductions	3,932	4,780
Inventories	4,543	4,170
Tax credits	2,785	2,785
Restructuring related liabilities	324	202
Warranty	772	35
Other	146	885
Total deferred tax assets	30,372	22,242
Valuation allowance on deferred tax assets	(12,302)	(12,884)
Net deferred tax assets	<u>\$ 18,070</u>	<u>\$ 9,358</u>
Deferred tax liabilities:		
Depreciation	\$ (1,338)	\$ (1,867)
Amortization	(26,310)	(20,258)
Unrealized currency gains/losses	(194)	(373)
Operating lease right-of-use assets	(8,014)	—
Total deferred tax liabilities	<u>\$ (35,856)</u>	<u>\$ (22,498)</u>
Net deferred income tax assets (liabilities)	<u>\$ (17,786)</u>	<u>\$ (13,140)</u>

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In determining its income tax provisions, the Company calculated deferred tax assets and liabilities for each separate jurisdiction. The Company then considered a number of factors, including positive and negative evidence related to the realization of its deferred tax assets, to determine whether a valuation allowance should be recognized with respect to its deferred tax assets.

In 2019, the Company utilized valuation allowance of \$0.5 million recorded on net operating losses and other timing items in certain tax jurisdictions due to taxable income generated in the current year. In 2018, the Company recorded an additional \$0.4 million valuation allowance associated with an increase in deferred tax assets in Canada. In 2018, the Company utilized valuation allowance of \$0.3 million recorded on net operating losses and other timing items in certain tax jurisdictions due to taxable income generated during the year.

Valuation allowance continues to be provided on the remaining balances of certain U.S. state net operating losses and certain foreign tax attributes that the Company has determined that it is more likely than not that they will not be realized. In conjunction with the Company's ongoing review of its actual results and anticipated future earnings, the Company continuously reassesses the possibility of releasing the valuation allowance currently in place on its deferred tax assets.

As of December 31, 2019, the Company had net operating loss carryforwards of \$3.8 million (tax effected) available to reduce future taxable income. Of this amount, approximately \$0.3 million relates to the U.S. and expires through 2037; and \$3.5 million relates to Canada and expires starting in 2033. In addition, the Company had capital loss carryforwards of \$5.7 million, which had a full valuation allowance. Of this amount, \$5.2 million and \$0.5 million related to Canada and the U.K, respectively.

As of December 31, 2018, the Company had net operating loss carryforwards of \$3.7 million (tax effected) available to reduce future taxable income. Of this amount, approximately \$0.7 million relates to the U.S. and expires through 2037; and \$3.0 million relates to Canada and expires starting in 2033. In addition, the Company had capital loss carryforwards of \$5.7 million, which had a full valuation allowance. Of this amount, \$5.2 million and \$0.5 million related to Canada and the U.K, respectively.

As of December 31, 2019, the Company had tax credit carryforwards of approximately \$2.8 million available to reduce income taxes in future years. Approximately \$0.9 million relates to the U.S. state tax credits, of which \$0.8 million will expire through 2034 and \$0.1 million can be carried forward indefinitely. The remaining \$1.9 million tax credit carryforwards were related to Canada, of which \$1.2 million expires through 2022 and \$0.7 million can be carried forward indefinitely.

As of December 31, 2018, the Company had tax credit carryforwards of approximately \$2.8 million available to reduce income taxes in future years. Approximately \$0.9 million relates to the U.S. state tax credits, of which \$0.8 million will expire through 2033 and \$0.1 million can be carried forward indefinitely. The remaining \$1.9 million tax credit carryforwards were related to Canada, of which \$1.2 million expires through 2022 and \$0.7 million can be carried forward indefinitely.

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 \$168.4 million as of December 31, 2019. The estimated unrecognized income tax and foreign withholding tax liability on this temporary difference is approximately \$0.2 million.

As of December 31, 2019, the Company's total amount of gross unrecognized tax benefits was \$4.9 million, of which \$4.8 million would favorably affect the effective tax rate if benefited. Over the next twelve months, the Company may need to record up to \$0.5 million of previously unrecognized tax benefits due to statute of limitations closures. The Company believes there are no jurisdictions in which the outcome of unresolved issues or claims is likely to be material to its results of operations, financial position or cash flows. Furthermore, the Company believes that it has adequately provided for all significant income tax uncertainties.

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As of December 31, 2018, the Company's total amount of gross unrecognized tax benefits was \$4.7 million, of which \$3.6 million would favorably affect the effective tax rate if benefited.

The reconciliation of the total amounts of unrecognized tax benefits is as follows (in thousands):

Balance at December 31, 2016	\$ 4,962
Additions based on tax positions related to the current year	991
Additions for tax positions of prior years	496
Reductions to tax positions of prior years	(28)
Reductions to tax positions resulting from a lapse of the applicable statute of limitations	(1,577)
Settlements with tax authorities	(755)
Balance at December 31, 2017	4,089
Additions based on tax positions related to the current year	394
Additions for tax positions of prior years	655
Reductions to tax positions of prior years	(69)
Reductions to tax positions resulting from a lapse of the applicable statute of limitations	(239)
Settlements with tax authorities	(105)
Balance at December 31, 2018	4,725
Additions based on tax positions related to the current year	727
Additions for tax positions of prior years	5
Reductions to tax positions of prior years	(31)
Reductions to tax positions resulting from a lapse of the applicable statute of limitations	(497)
Settlements with tax authorities	—
Balance at December 31, 2019	<u>\$ 4,929</u>

The Company recognizes interest and penalties related to uncertain tax positions in income tax provision. As of December 31, 2019 and 2018, the Company had approximately \$0.5 million and \$0.5 million, respectively, of accrued interest and penalties related to uncertain tax positions. During the years ended December 31, 2019, 2018 and 2017, the Company recognized less than \$0.1 million of expense for an increase in interest and penalties related to uncertain tax positions.

The Company files income tax returns in Canada, the U.S., and various foreign jurisdictions. Generally, the Company is no longer subject to U.S. or foreign income tax examinations, including transfer pricing tax audits, by tax authorities for the years before 2010.

The Company's income tax returns may be reviewed by tax authorities in the following countries for the following periods under the appropriate statute of limitations:

United States	2016 - Present
Canada	2016 - Present
United Kingdom	2018 - Present
Germany	2015 - Present
The Netherlands	2013 - Present
China	2010 - Present
Japan	2014 - Present

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

16. Restructuring and Acquisition Related Costs

The following table summarizes restructuring and acquisition related costs recorded in the accompanying consolidated statements of operations (in thousands):

	Year Ended December 31,		
	2019	2018	2017
2019 restructuring	\$ 7,463	\$ 378	\$ —
2018 restructuring	1,177	1,647	—
2016 restructuring	—	—	332
2011 restructuring	—	—	14
Total restructuring related charges	\$ 8,640	\$ 2,025	\$ 346
Acquisition and related charges	7,934	6,016	7,196
Total restructuring and acquisition related costs	\$ 16,574	\$ 8,041	\$ 7,542

2019 Restructuring

During the fourth quarter of 2018, the Company implemented a restructuring plan intended to realign operations, reduce costs, achieve operational efficiencies and focus resources on growth initiatives. In 2019, the Company recorded \$3.8 million in severance and related costs, \$2.6 million in impairment of operating lease right-of-use assets and \$1.1 million in impairment of long-lived assets in connection with the 2019 restructuring plan. The Company anticipates completing the 2019 restructuring program in the first quarter of 2020 and expects to incur additional restructuring charges of \$0.1 million to \$0.2 million related to the 2019 restructuring program in the next twelve months.

The following table summarizes restructuring costs associated with the 2019 restructuring program by reportable segment (in thousands):

	Year Ended		Cumulative Costs as of
	December 31, 2019	December 31, 2018	December 31, 2019
Photonics	\$ 4,983	\$ —	\$ 4,983
Vision	1,422	324	1,746
Precision Motion	590	—	590
Unallocated Corporate and Shared Services	468	54	522
Total	\$ 7,463	\$ 378	\$ 7,841

2018 Restructuring

During the second quarter of 2018, the Company initiated a program to integrate manufacturing operations as a result of acquisition activities. In 2019, the Company recorded \$1.2 million in severance and related costs in connection with the 2018 restructuring plan. The Company anticipates completing the 2018 restructuring program during the first quarter of 2020 and expects to incur additional restructuring charges of \$0.1 million to \$0.2 million related to the 2018 restructuring program.

The following table summarizes restructuring costs associated with the 2018 restructuring program by reportable segment (in thousands):

	Year Ended		Cumulative Costs as of
	December 31, 2019	December 31, 2018	December 31, 2019
Photonics	\$ —	\$ —	\$ —
Vision	1,177	1,579	2,756
Precision Motion	—	—	—
Unallocated Corporate and Shared Services	—	68	68
Total	\$ 1,177	\$ 1,647	\$ 2,824

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

2016 Restructuring

During the third quarter of 2015, the Company initiated the 2016 restructuring program, which included consolidating certain manufacturing operations to optimize facility footprint and better utilize resources, and reducing redundant costs due to productivity cost savings and business volume reductions. As of December 31, 2017, the Company incurred cumulative costs related to this restructuring plan totaling \$6.5 million, net of the gain on the sale of the Chatsworth, California facility. The plan was completed in 2017.

The following table summarizes restructuring costs associated with the 2016 restructuring program by reportable segment (in thousands):

	Year Ended December 31, 2017	Cumulative Costs as of December 31, 2017
Photonics	\$ —	\$ 868
Vision	331	4,393
Precision Motion	—	939
Unallocated Corporate and Shared Services	1	329
Total	<u>\$ 332</u>	<u>\$ 6,529</u>

Rollforward of Accrued Expenses Related to Restructuring

The following table summarizes the accrual activities, by component, related to the Company's restructuring charges recorded in the accompanying consolidated balance sheets (in thousands):

	Total	Severance	Facility	Other ⁽¹⁾
Balance at December 31, 2017	\$ 806	\$ 39	\$ 763	\$ 4
Restructuring charges	2,025	1,862	—	163
Cash payments	(1,490)	(962)	(373)	(155)
Non-cash write-offs and other adjustments	(65)	(63)	(2)	—
Balance at December 31, 2018	1,276	876	388	12
Restructuring charges	8,640	4,065	3,798	777
Cash payments	(3,507)	(2,803)	—	(704)
Reclassification of reserves ⁽²⁾	(388)	—	(388)	—
Non-cash write-offs and other adjustments ⁽³⁾	(3,948)	(150)	(3,798)	—
Balance at December 31, 2019	<u>\$ 2,073</u>	<u>\$ 1,988</u>	<u>\$ —</u>	<u>\$ 85</u>

- (1) Other restructuring charges mainly related to consulting fees and relocation costs.
- (2) Accruals related to facilities exited prior to January 1, 2019 were reclassified to operating lease liabilities upon adoption of ASU 2016-02.
- (3) Non-cash write-offs included impairment of operating lease right-of-use assets amounting to \$2.6 million associated with the cessation of use of certain leased facilities.

The Company expects to make \$2.0 million in cash payments related to these restructuring plans during the twelve months ending December 31, 2020.

Acquisition and Related Charges

Acquisition related costs incurred in connection with business combinations, primarily including finders' fees, legal, valuation and other professional or consulting fees, totaled \$5.3 million, \$1.4 million, and \$6.8 million during 2019, 2018, and 2017, respectively. Acquisition related costs recognized under earn-out agreements in connection with acquisitions totaled \$2.6 million,

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

\$4.6 million, and \$0.4 million during 2019, 2018, and 2017, respectively. The majority of acquisition related costs for 2019 were included in the Company's Precision Motion and Unallocated Corporate and Shared Services reportable segments.

17. Commitments and Contingencies***Purchase Commitments***

As of December 31, 2019, the Company had purchase commitments primarily for inventory purchases of \$75.8 million. These purchase commitments are expected to be incurred as follows: \$74.2 million in 2020, \$0.8 million in 2021 and \$0.8 million in 2022.

Legal Proceedings

The Company is subject to various legal proceedings and claims that arise in the ordinary course of business. The Company reviews the status of each significant matter and assesses the 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, the Company accrues 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 consolidated balance sheet. As additional information becomes available, the Company reassesses the potential liability related to any pending claims and litigation and may revise its estimates. The Company does not believe that the outcome of these claims will have a material adverse effect upon its consolidated financial statements but there can be no assurance that any such claims, or any similar claims, would not have a material adverse effect upon its consolidated financial statements.

Guarantees and Indemnifications

In the normal course of its operations, the Company executes agreements that provide for indemnification and guarantees to counterparties in transactions such as business dispositions, sale of assets, sale of products and operating leases. Additionally, the by-laws of the Company require it to indemnify certain current or former directors, officers, and employees of the Company against expenses incurred by them in connection with each proceeding in which he or she is involved as a result of serving or having served in certain capacities. Indemnification is not available with respect to a proceeding as to which it has been adjudicated that the person did not act in good faith in the reasonable belief that the action was in the best interests of the Company. Certain of the Company's officers and directors are also a party to indemnification agreements with the Company. These indemnification agreements provide, among other things, that the director and officer shall be indemnified to the fullest extent permitted by applicable law against all expenses, judgments, fines and amounts paid in settlement actually and reasonably incurred by such officer or director in connection with any proceeding by reason of his or her relationship with the Company. In addition, the indemnification agreements provide for the advancement of expenses incurred by such director or officer in connection with any proceeding covered by the indemnification agreement, subject to the conditions set forth therein and to the extent such advancement is not prohibited by law. The indemnification agreements also set out the procedures for determining entitlement to indemnification, the requirements relating to notice and defense of claims for which indemnification is sought, the procedures for enforcement of indemnification rights, the limitations on and exclusions from indemnification, and the minimum levels of directors' and officers' liability insurance to be maintained by the Company.

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) of Novanta Technologies UK Limited, a wholly owned subsidiary of Novanta Inc.

Credit Risks and Other Uncertainties

The Company maintains financial instruments such as cash and cash equivalents and trade receivables. From time to time, certain of these instruments may subject the Company to concentrations of credit risk whereby one institution may hold a significant portion of the cash and cash equivalents, or one customer may represent a large portion of the accounts receivable balances.

There was no significant concentration of credit risk related to the Company's position in trade accounts receivable as no individual customer represented 10% or more of the Company's outstanding accounts receivable at December 31, 2019 and 2018. Credit risk with respect to trade accounts receivables is generally minimized because of the diversification of the Company's operations, as well as its large customer base and its geographic dispersion.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

Certain of the components and materials included in the Company's products are currently obtained from single source suppliers. There can be no assurance that a disruption of the supply of such components and materials would not create substantial manufacturing delays and additional cost to the Company.

The Company's operations involve a number of other risks and uncertainties including, but not limited to, the effects of general economic conditions, rapidly changing technologies, and international operations.

18. Related Party Transactions

As of March 29, 2019, certain members of the Company's board of directors served on the board of directors or as advisors of companies that are customers of the Company. All contracts with related parties were executed at arm's length in the ordinary course of business. As of the beginning of the second quarter of 2019, these customers were no longer considered to be related parties. The aggregate revenue from these customers was \$11.6 million and \$40.0 million in the three months ended March 29, 2019 and the twelve months ended December 31, 2018, respectively. There was \$0.6 million in accounts receivable due from these customers as of December 31, 2018. There were no material transactions with related parties in 2017.

19. Segment Information***Reportable Segments***

The Company's Chief Operating Decision Maker ("CODM") utilizes financial information to make decisions about allocating resources and assessing performance for the entire Company. The Company evaluates the performance of, and allocates resources to, its segments based on revenue, gross profit and operating profit. The Company's reportable segments have been identified based on commonality and adjacency of technologies, applications and customers amongst the Company's individual product lines. The Company determined that disclosing revenue by specific product was impracticable due to the highly customized and extensive portfolio of technologies offered to customers.

Based upon the information provided to the CODM, the Company has determined it operates in three reportable segments: Photonics, Vision, and Precision Motion. The reportable segments and their principal activities consist of the following:

Photonics

The Photonics segment designs, manufactures and markets photonics-based solutions, including laser scanning, laser beam delivery, CO2 laser, solid state laser, 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.

Vision

The Vision segment designs, manufactures and markets a range of medical grade technologies, including medical insufflators, pumps and related disposables; visualization solutions; wireless, recorder and video integration technologies for operating room integrations; 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.

Precision Motion

The Precision Motion segment designs, manufactures and markets optical and inductive encoders, precision motor and motion control sub-assemblies, servo drives, air bearings, and air bearing spindles 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.

NOVANTA INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

Reportable Segment Financial Information

Revenue, gross profit, operating income (loss), depreciation and amortization expenses, accounts receivable and inventories by reportable segments were as follows (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Revenue			
Photonics	\$ 230,457	\$ 249,339	\$ 232,359
Vision	271,407	232,902	183,074
Precision Motion	124,235	132,096	105,857
Total	<u>\$ 626,099</u>	<u>\$ 614,337</u>	<u>\$ 521,290</u>

	Year Ended December 31,		
	2019	2018	2017
Gross Profit			
Photonics	\$ 105,845	\$ 117,109	\$ 106,117
Vision	105,228	87,198	69,249
Precision Motion	53,326	59,477	46,564
Unallocated Corporate and Shared Services	(2,314)	(2,256)	(1,399)
Total	<u>\$ 262,085</u>	<u>\$ 261,528</u>	<u>\$ 220,531</u>

	Year Ended December 31,		
	2019	2018	2017
Operating Income (Loss)			
Photonics	\$ 41,990	\$ 59,285	\$ 51,660
Vision	21,007	8,991	7,883
Precision Motion	22,339	31,674	27,146
Unallocated Corporate and Shared Services	(30,054)	(28,937)	(29,123)
Total	<u>\$ 55,282</u>	<u>\$ 71,013</u>	<u>\$ 57,566</u>

	Year Ended December 31,		
	2019	2018	2017
Depreciation and Amortization Expenses			
Photonics	\$ 12,139	\$ 12,042	\$ 13,806
Vision	21,161	20,657	13,590
Precision Motion	4,712	3,627	2,308
Unallocated Corporate and Shared Services	268	726	1,054
Total	<u>\$ 38,280</u>	<u>\$ 37,052</u>	<u>\$ 30,758</u>

	December 31,	
	2019	2018
Accounts Receivable		
Photonics	\$ 31,046	\$ 31,536
Vision	43,941	34,414
Precision Motion	16,091	18,005
Total accounts receivable	<u>\$ 91,078</u>	<u>\$ 83,955</u>
Inventories		
Photonics	\$ 45,227	\$ 41,623
Vision	50,074	42,498
Precision Motion	21,317	20,643
Total inventories	<u>\$ 116,618</u>	<u>\$ 104,764</u>
Total segment assets	<u>\$ 207,696</u>	<u>\$ 188,719</u>

NOVANTA INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

	December 31,	
	2019	2018
Total Assets		
Total segment assets	\$ 207,696	\$ 188,719
Cash and cash equivalents	78,944	82,043
Prepaid income taxes and income taxes receivable	5,905	1,852
Prepaid expenses and other current assets	11,967	9,155
Property, plant and equipment, net	77,556	65,464
Operating lease assets	35,180	—
Deferred tax assets	8,890	9,492
Other assets	2,713	2,269
Intangible assets, net	166,175	142,920
Goodwill	274,710	217,662
Total	<u>\$ 869,736</u>	<u>\$ 719,576</u>

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (Continued)
AS OF DECEMBER 31, 2019

Geographic Information

The Company aggregates geographic revenue based on the customer location where products are shipped. Revenue from these customers is summarized as follows (in thousands, except percentage data):

	Year Ended December 31,					
	2019		2018		2017	
	Revenue	% of Total	Revenue	% of Total	Revenue	% of Total
United States	\$ 254,279	40.6%	\$ 242,243	39.4%	\$ 220,583	42.3%
Germany	82,032	13.1	88,027	14.3	68,003	13.0
Rest of Europe	129,643	20.7	105,608	17.2	81,001	15.5
China	59,512	9.5	66,414	10.8	56,128	10.8
Rest of Asia-Pacific	89,588	14.3	104,300	17.0	84,727	16.3
Other	11,045	1.8	7,745	1.3	10,848	2.1
Total	\$ 626,099	100.0%	\$ 614,337	100.0%	\$ 521,290	100.0%

Long-lived assets consist of property, plant and equipment, net, and are aggregated based on the location of the assets. A summary of these long-lived assets is as follows (in thousands):

	December 31,	
	2019	2018
United States	\$ 28,750	\$ 32,029
Germany	32,376	17,777
Rest of Europe	14,303	13,919
China	2,029	1,636
Rest of Asia-Pacific	98	103
Total	\$ 77,556	\$ 65,464

Revenue by End Market

The Company primarily operates in two end markets: the medical market and the advanced industrial market. Revenue by end market was approximately as follows:

	Year Ended December 31,		
	2019	2018	2017
Medical	55%	50%	50%
Advanced Industrial	45%	50%	50%
Total	100%	100%	100%

The majority of the revenue from the Photonics and Precision Motion segments is generated from sales to customers in the advanced industrial market. The majority of the revenue from the Vision segment is generated from sales to customers in the medical market.

Significant Customers

No customer accounted for greater than 10% of the Company's revenue during the years ended December 31, 2019, 2018 or 2017.

Supplementary Information
(Unaudited)

The Company's interim financial statements are prepared on a quarterly basis ending on the Friday closest to the end of the calendar quarter, with the exception of the fourth quarter which always ends on December 31.

The following tables reflect the Company's unaudited condensed consolidated statements of operations for each of the quarterly periods in 2019 and 2018 (in thousands except per share data):

	Three Months Ended			
	December 31, 2019	September 27, 2019	June 28, 2019	March 29, 2019
Revenue	\$ 159,702	\$ 154,066	\$ 155,145	\$ 157,186
Cost of revenue	93,742	90,012	89,363	90,897
Gross profit	65,960	64,054	65,782	66,289
Operating expenses:				
Research and development and engineering	14,769	13,811	13,388	13,997
Selling, general and administrative	29,430	27,926	29,204	31,847
Amortization of purchased intangible assets	4,117	3,970	3,772	3,998
Restructuring and acquisition related costs	4,661	5,546	4,313	2,054
Total operating expenses	52,977	51,253	50,677	51,896
Operating income	12,983	12,801	15,105	14,393
Interest income (expense), foreign exchange transaction gains (losses) and other income (expense), net	(3,428)	(1,814)	(2,203)	(2,071)
Income before income taxes	9,555	10,987	12,902	12,322
Income tax provision	338	2,064	2,522	69
Consolidated net income	9,217	8,923	10,380	12,253
Less: Net income attributable to noncontrolling interest	—	—	—	—
Net income attributable to Novanta Inc.	\$ 9,217	\$ 8,923	\$ 10,380	\$ 12,253
Earnings per common share attributable to Novanta Inc.				
Basic	\$ 0.26	\$ 0.25	\$ 0.30	\$ 0.35
Diluted	\$ 0.26	\$ 0.25	\$ 0.29	\$ 0.35

	Three Months Ended			
	December 31, 2018	September 28, 2018	June 29, 2018	March 30, 2018
Revenue	\$ 156,178	\$ 160,794	\$ 150,400	\$ 146,965
Cost of revenue	91,672	91,160	85,171	84,806
Gross profit	64,506	69,634	65,229	62,159
Operating expenses:				
Research and development and engineering	13,280	13,204	12,551	11,989
Selling, general and administrative	28,302	29,147	29,231	29,220
Amortization of purchased intangible assets	4,012	3,947	3,893	3,698
Restructuring and acquisition related costs	3,236	2,341	2,439	25
Total operating expenses	48,830	48,639	48,114	44,932
Operating income	15,676	20,995	17,115	17,227
Interest income (expense), foreign exchange transaction gains (losses) and other income (expense), net	(2,101)	(2,374)	(2,430)	(2,806)
Income before income taxes	13,575	18,621	14,685	14,421
Income tax provision	1,931	3,632	3,060	1,584
Consolidated net income	11,644	14,989	11,625	12,837
Less: Net income attributable to noncontrolling interest	—	(435)	(625)	(926)
Net income attributable to Novanta Inc.	\$ 11,644	\$ 14,554	\$ 11,000	\$ 11,911
Earnings per common share attributable to Novanta Inc.				
Basic	\$ 0.33	\$ 0.61	\$ 0.32	\$ 0.19
Diluted	\$ 0.33	\$ 0.60	\$ 0.32	\$ 0.18

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

None.

Item 9A. Controls and Procedures

The required certifications of our Chief Executive Officer and Chief Financial Officer are included in Exhibits 31.1 and 31.2 to this Annual Report on Form 10-K. The disclosures set forth in this Item 9A contain information concerning the evaluation of our disclosure controls and procedures, management's report on internal control over financial reporting and changes in internal control over financial reporting referred to in those certifications. Those certifications should be read in conjunction with this Item 9A for a more complete understanding of the matters covered by the certifications.

Evaluation of Disclosure Controls and Procedures as of December 31, 2019

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, conducted an evaluation of our disclosure controls and procedures, as such term is defined under Rule 13a-15(e) promulgated under the Securities Exchange Act of 1934, as amended (the "Exchange Act"). Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2019.

Changes in Internal Control Over Financial Reporting

There has been no change to our internal control over financial reporting during the fiscal quarter ended December 31, 2019 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Management's Annual Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) under the Exchange Act. Internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with generally accepted accounting principles. Internal control over financial reporting includes those policies and procedures that:

- pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect our transactions and dispositions of our assets;
- provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our 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 and that the degree of compliance with the policies or procedures may deteriorate.

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2019. In making their assessment, our management utilized the criteria set forth in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in 2013. Based on our evaluation under the framework in *Internal Control—Integrated Framework*, issued by COSO in 2013, our management concluded that our internal control over financial reporting was effective as of December 31, 2019.

The effectiveness of our internal control over financial reporting as of December 31, 2019 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is contained in Item 8 of this Annual Report on Form 10-K.

Item 9B. Other Information

None.

Certain information required by Part III is omitted from this Annual Report on Form 10-K and is incorporated herein by reference to the Company's Definitive Proxy Statement for the 2020 Annual Meeting of Shareholders to be filed with the Securities and Exchange Commission.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

All of the Company's directors, officers and employees must act in accordance with the Code of Ethics and Business Conduct, which has been adopted by the Company's Board of Directors. A copy of the Code of Ethics and Business Conduct is available on the Company's website at <https://www.novanta.com> in the "About Us" section. (This website address is not intended to function as a hyperlink, and the information contained in our website is not intended to be a part of this filing). The Company will provide to any person without charge, upon request, a copy of the Code of Ethics and Business Conduct. Such a request should be made in writing and addressed to Novanta Inc., Attention: Investor Relations, 125 Middlesex Turnpike, Bedford, MA 01730, United States. The Company intends to satisfy the disclosure requirement under Nasdaq rules regarding waivers or under Item 5.05 of Form 8-K regarding disclosure of an amendment to, or waiver from, a provision of this Code of Ethics and Business Conduct with respect to its principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, by posting such information on the Company's website at <https://www.novanta.com> in the "About Us" section, unless a Form 8-K is otherwise required by law or applicable listing rules.

The remainder of the response to this item is contained in the Proxy Statement for the Company's Annual Meeting of Shareholders scheduled to be held on May 14, 2020 and is incorporated herein by reference.

Item 11. Executive Compensation

The information required to be disclosed by this item is contained in the Proxy Statement for the Company's Annual Meeting of Shareholders scheduled to be held on May 14, 2020 and is incorporated herein by reference.

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

The information required to be disclosed by this item is contained in the Proxy Statement for the Company's Annual Meeting of Shareholders scheduled to be held on May 14, 2020 and is incorporated herein by reference.

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

The information required to be disclosed by this item is contained in the Proxy Statement for the Company's Annual Meeting of Shareholders scheduled to be held on May 14, 2020 and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

The information required to be disclosed by this item is contained in the Proxy Statement for the Company's Annual Meeting of Shareholders scheduled to be held on May 14, 2020 and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) Documents filed as part of this report:

1. List of Financial Statements

The financial statements required by this item are listed in Item 8, "Financial Statements and Supplementary Data" herein.

2. List of Financial Statement Schedules

All schedules are omitted because they are not applicable or not required or the required information is shown in the consolidated financial statements or notes thereto.

3. List of Exhibits

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed/ Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
2.1	Securities Purchase Agreement dated January 15, 2013, between NDSSI Holdings, LLC, NDS Surgical Imaging, Inc., GSI Group Inc. and GSI Group Limited UK	8-K	001-35083	2.1	1/15/2013	
2.2	Equity Purchase Agreement dated February 18, 2014, between JADAK, LLC, JADAK Technologies, Inc., Advanced Data Capture Corporation, GSI Group Inc. and GSI Group Corporation	8-K	001-35083	10.1	2/18/2014	
2.3	Asset and Equity Purchase Agreement, dated June 24, 2014, by and among GSI Group Inc., Excel Technology, Inc., Continuum Electro-Optics, Inc., GSI Europe GmbH, GSI Group France S.A.S., GSI Group Japan Corporation and Amplitude Laser, Inc. and Amplitude Technologies, S.A. (The registrant hereby agrees to furnish a copy of any omitted schedule to the Commission upon request.)	8-K	001-35083	2.1	7/21/2014	
2.4	Purchase Agreement, dated April 15, 2015, by and among GSI Group Limited, GSI Group Corporation, GSI Group Europe GmbH, GSI Group Japan Corporation, GSI Group Precision Technologies (Suzhou) Co., LTD., GSI Group Inc., JKL Newco Limited, and SPI Lasers UK Limited, SPI Lasers LLC, SPI Lasers (Shanghai) Co., Ltd. and Trumpf Corporation. (The registrant hereby agrees to furnish a copy of any omitted schedule to the Commission upon request.)	8-K	001-35083	10.1	4/20/2015	
2.5	Agreement on the Sale and Transfer of all Shares in W.O.M. World of Medicine GmbH, dated June 6, 2017, between Novanta Europe GmbH, Novanta Inc., and Aton GmbH	8-K	001-35083	2.1	6/9/2017	
3.1	Certificate and Articles of Continuance of the Registrant, dated March 22, 1999	S-3	333-202597	3.1	3/9/2015	
3.2	By-Laws of the Registrant, as amended	10-Q	000-25705	3.2	4/13/2010	
3.3	Articles of Reorganization of the Registrant, dated July 23, 2010	8-K	000-25705	3.1	7/23/2010	
3.4	Articles of Amendment of the Registrant, dated December 29, 2010	S-3	333-202597	3.2	3/9/2015	
3.5	Articles of Amendment of the Registrant, dated May 11, 2016	8-K	001-35083	10.1	5/12/2016	
4.1	Specimen Stock Certificate	10-K	001-35083	4.1	2/28/2018	
4.2	Form of Indenture, between the Registrant and Wilmington Trust, National Association	S-3	333-229912	4.3	2/27/2019	
4.3	Description of Common Shares					*
10.1†	Novanta Inc. 2010 Incentive Award Plan (Amended and Restated Effective July 27, 2016)	10-Q	001-35083	10.1	08/02/2016	
10.2†	Form of Deferred Stock Unit Award Agreement	10-K	001-35083	10.59	3/30/2011	
10.3†	Restricted Stock Unit Inducement Award Grant Notice	S-8	333-194557	99.1	3/14/2014	
10.4†	Form of Stock Option Grant Notice and Stock Option Agreement	10-Q	001-35083	10.2	8/2/2016	
10.5†	Form of U.S. Restricted Stock Unit Award Agreement	10-Q	001-35083	10.2	5/16/2011	

10.6†	Offer Letter, dated June 8, 2011, between GSI Group Inc. and Peter Chang	10-Q	001-35083	10.1	11/10/2011
10.7	Amended and Restated Lease, dated May 1, 2012, by and between GSI Group Inc. and 125 Middlesex Turnpike, LLC	8-K	001-35083	10.1	5/4/2012
10.8†	Form of Performance Stock Unit Award Grant Notice and Performance Stock Unit Award Agreement	10-Q	001-35083	10.3	8/2/2016
10.9†	Severance Agreement, dated as of August 15, 2012, between GSI Group Inc. and Peter Chang	10-Q	001-35083	10.7	11/7/2012
10.10	Third Amended and Restated Credit Agreement, dated as of December 31, 2019, by and among Novanta Corporation, Novanta Inc., Novanta UK Investments Holding Limited, Novanta Europe GmbH, Bank of America, N.A., as Administrative Agent, Swing Line Lender, L/C Issuer and lender, BofA Securities, Inc., as Joint Lead Arranger, JP Morgan Chase Bank, N.A., as Joint Lead Arranger, Co-Syndication Agent and lender, Wells Fargo Securities LLC, as Joint Lead Arranger, Wells Fargo Bank, National Association, as Co-Syndication Agent and lender, Silicon Valley Bank, as Co-Documentation Agent and lender, TD Bank, N.A., as Co-Documentation Agent and lender, Bank of Montreal, as Co-Documentation Agent and lender, and HSBC Bank USA, N.A and HSBC Bank UK., as lenders	8-K	001-35083	10.1	1/3/2020
10.11	Lease Agreement, dated as of May 31, 2013, by and between JADAK, LLC and Hancock Part Development, LLC	10-Q	001-35083	10.3	5/6/2014
10.12†	Amended and Restated Employment Agreement, dated April 21, 2017, between Novanta Inc. and Matthijs Glastra	8-K	001-35083	10.1	4/24/2017
10.13†	Amended and Restated Employment Agreement, dated April 21, 2017, between Novanta Inc. and Robert Buckley	8-K	001-35083	10.2	4/24/2017
10.14†	Employment Agreement, dated April 21, 2017, between Novanta Inc. and Brian Young	8-K	001-35083	10.3	4/24/2017
10.15†	Form of New Restricted Stock Unit Award Agreement	10-Q	001-35083	10.1	5/8/2017
10.16†	Form of New Performance Stock Unit Award Grant Notice and Performance Stock Unit Award Agreement	10-Q	001-35083	10.2	5/8/2017
10.17†	Form of Indemnification Agreement, by and between Novanta Inc. and certain officers and directors	10-Q	001-35083	10.2	11/1/2017
10.18†	Form of Indemnification Agreement, by and between Novanta Corporation and certain officers and directors	10-Q	001-35083	10.3	11/1/2017
10.19	First Amendment, dated May 7, 2018, to Amended and Restated Lease (dated as of May 1, 2012) by and between Novanta Corporation and 125 Middlesex Turnpike, LLC	10-Q	001-35083	10.2	5/8/2018
10.20†	Novanta Inc. Non-Employee Director Compensation Policy	10-Q	001-35083	10.1	11/6/2018
10.21†	Form of Director Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement	10-Q	001-35083	10.2	11/6/2018
21.1	Subsidiaries of the Registrant				*
23.1	Consent of Independent Registered Public Accounting Firm				*
31.1	Chief Executive Officer Certifications pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				*

31.2	Chief Financial Officer Certifications pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	*
32.1	Chief Executive Officer Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	**
32.2	Chief Financial Officer Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002	**
101.INS	Inline eXtensible Business Reporting Language (XBRL) Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.	
101.SCH	Inline XBRL Taxonomy Extension Schema Document	*
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document	*
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document	*
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document	*
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document	*
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).	*
†	This exhibit constitutes a management contract, compensatory plan, or arrangement.	
*	Filed herewith	
**	Furnished herewith	

Item 16. Form 10-K Summary

None.

SIGNATURES

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

Novanta Inc.

By: /s/ Matthijs Glastra

Matthijs Glastra

Chief Executive Officer

Date: February 26, 2020

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

Novanta Inc. (Registrant)

Name	Title	Date
<u>/s/ Matthijs Glastra</u> Matthijs Glastra	Director, Chief Executive Officer	February 26, 2020
<u>/s/ Robert J. Buckley</u> Robert J. Buckley	Chief Financial Officer	February 26, 2020
<u>/s/ Peter L. Chang</u> Peter L. Chang	Chief Accounting Officer and Corporate Controller	February 26, 2020
<u>/s/ Stephen W. Bershad</u> Stephen W. Bershad	Chairman of the Board of Directors	February 26, 2020
<u>/s/ Brian D. King</u> Brian D. King	Director	February 26, 2020
<u>/s/ Ira J. Lamel</u> Ira J. Lamel	Director	February 26, 2020
<u>/s/ Dominic A. Romeo</u> Dominic A. Romeo	Director	February 26, 2020
<u>/s/ Thomas N. Secor</u> Thomas N. Secor	Director	February 26, 2020
<u>/s/ Lonny J. Carpenter</u> Lonny J. Carpenter	Director	February 26, 2020
<u>/s/ Deborah DiSanzo</u> Deborah DiSanzo	Director	February 26, 2020

DESCRIPTION OF COMMON SHARES

General

We have authority to issue an unlimited number of common shares, no par value.

Terms

Each outstanding common share is entitled to one vote at all meetings of our shareholders, to participate ratably in any dividends that may be declared by the board of directors and, in the event of liquidation, dissolution or winding-up or other distribution of our assets or property, to a pro rata share of our assets after payment of all our liabilities and obligations. We have never declared or paid cash dividends on our common shares. We currently do not anticipate paying any cash dividends in the foreseeable future.

Shareholders have cumulative voting rights in the election of directors. Cumulative voting rights permit each shareholder entitled to vote at a meeting of shareholders called for the election of directors to cast a number of votes equal to the number of shares held by the shareholder multiplied by the number of directors to be elected. The shareholder is entitled to cast all such votes in favor of one candidate for director or distribute them among the candidates in any manner.

The common shares are not liable to any calls or assessments and are not convertible into any other securities. There are no redemption or sinking fund provisions applicable to the common shares, and there are no preemptive rights held by holders of the common shares.

All outstanding common shares are fully paid and nonassessable.

Anti-Takeover Considerations

Our Articles, By-laws and New Brunswick law contain provisions that may enable our board of directors to resist a change in control of our company. These provisions include:

- the ability to issue an unlimited number of common shares; and
- a limitation that stipulates that only holders of not less than 10 percent of the issued and outstanding shares of the Company carrying the right to vote at a meeting of shareholders are authorized to call a special meeting of shareholders.

These anti-takeover defenses could discourage, delay or prevent a transaction involving a change in control of our company. These provisions could also discourage proxy contests and make it more difficult for shareholders to elect directors of their choosing or cause us to take other corporate actions that shareholders desire.

Canadian Law Matters

There is no limitation imposed by Canadian law or by our Articles on the right of a non-resident to hold or vote common shares, other than as provided in the Investment Canada Act (the “ICA”). Unless a transaction falls within an available exemption, the ICA requires a non-Canadian making an investment that would result in the acquisition of control of a Canadian business or an investment to establish a new Canadian business, to identify, notify, or (if the value of the assets of the target Canadian business exceed a certain monetary threshold) file an application for review with the Investment Review Division of Industry Canada (“IRD”). The monetary threshold that will trigger an application for review varies depending on the status of the foreign investor (e.g., World Trade Organization (“WTO”) member state or non-WTO member state), and whether the business activity is related to Canada’s cultural heritage and national identity (for this type of business activity, the threshold is significantly lower, and the application for review is considered by Heritage Canada).

The notification procedure involves a brief statement of information about the investment on a prescribed form which is required to be filed with the IRD by the investor at any time up to 30 days following implementation of the investment. It is intended that investments requiring only notification will proceed without government intervention unless the investment is in a specific type of business activity related to Canada’s cultural heritage and national identity, in which case the government may initiate further review

with notice to the investor within 21 days following the receipt of a certified complete notification. Similarly, if the transaction is considered to be an investment that could be injurious to Canadian national security, it may also be referred by the Minister of Industry (“Minister”) (the Minister responsible for Investment Canada) for further review.

If an investment is reviewable under the ICA, an application for review in the form prescribed is normally required to be filed with the IRD prior to the investment taking place and the investment may not be implemented until the review has been completed and the Minister is satisfied that the investment is likely to be of net benefit to Canada (and, if applicable, is satisfied that the investment would not be injurious to Canadian national security). The Minister has up to 75 days to make this determination, though this period can be extended by agreement between the IRD and the investor (a national security review can take up to 130 days). If the Minister is not satisfied that the investment is likely to be of net benefit to Canada, the non-Canadian must not implement the investment or, if the investment has been implemented, may be required to divest himself of control of the business that is the subject of the investment. If the Governor in Council considers that it is advisable to protect national security, she may prohibit the investment, authorize it to proceed on conditions, or require divestiture.

Transfer Agent

The registrar and transfer agent for our common shares is Computershare Investor Services Inc.

Listing

Our common shares are listed on the Nasdaq Global Select Market under the symbol “NOVT.”

NOVANTA INC. SUBSIDIARIES

Subsidiary	Place of Incorporation
Novanta Corporation	Michigan
Novanta Japan Corporation	Japan
GSI Group Singapore Pte. Ltd	Singapore
Novanta Technologies UK Limited	United Kingdom
Novanta UK Investments Holding Limited	United Kingdom
Novanta Technologies (Suzhou) Co., Ltd.	China
GSI Lumonics Asia Pacific Ltd.	Hong Kong
Novanta Europe GmbH	Germany
Novanta Distribution (USD) GmbH	Germany
Novanta Italy SRL	Italy
NDS Surgical Imaging, LLC	Delaware
Novanta Holdings BV	Netherlands
Novanta EMEA BV	Netherlands
Novanta Česká republika s.r.o.	Czech Republic
Laser Quantum Limited	United Kingdom
Laser Quantum GmbH	Germany
Venteon Laser Technologies GmbH	Germany
W.O.M. World of Medicine GmbH	Germany
W.O.M. World of Medicine Produktions-GmbH	Germany
W.O.M. World of Medicine USA, Inc.	Florida
W.O.M. World of Medicine Asia Ltd.	Hong Kong
Zettlex (UK) Limited	United Kingdom
Ingenia-CAT S.L.	Spain
Med X Change Inc.	Florida
ARGES GmbH	Germany
Novanta Medical Technologies Corp.	Delaware

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (Nos. 333-229912) and Forms S-8 (No. 333-171260 and 333-202598) of Novanta Inc. of our report dated February 26, 2020 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
February 26, 2020

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

I, Matthijs Glastra, certify that:

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

February 26, 2020

/s/ Matthijs Glastra
Matthijs Glastra
Chief Executive Officer

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

I, Robert J. Buckley, certify that:

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

February 26, 2020

/s/ Robert J. Buckley

Robert J. Buckley

Chief Financial Officer

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

In connection with the Annual Report of Novanta Inc. (the “Company”) on Form 10-K for the period ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Matthijs Glastra, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

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

/s/ Matthijs Glastra

Matthijs Glastra

Chief Executive Officer

February 26, 2020

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

In connection with the Annual Report of Novanta Inc. (the “Company”) on Form 10-K for the period ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Robert J. Buckley, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

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

/s/ Robert J. Buckley

Robert J. Buckley

Chief Financial Officer

February 26, 2020