Novanta

ANNUAL REPORT 2021

Dear Fellow Shareholders,

Novanta delivered a landmark year in 2021. We achieved unprecedented levels of sales, bookings and profit, despite some significant disruptions in our supply chain and factory operations. As a result of continued investments during the pandemic, Novanta's long-term strategic positioning is as good as it has ever been. We booked record design wins, have a strong innovation pipeline with a continued high level of new product introductions, and enhanced our robotics exposure with the acquisition and integration of two great businesses (ATI and IMS).

Full year reported revenue was $707 million, a year-over-year increase of 20%, and our Organic Revenue Growth[(1)] was approximately 10%. Full year Adjusted EBITDA[(1)] was $153 million, which is up 26% year over year versus 2020; and, full year Adjusted Diluted Earnings Per Share[(1)] was $2.62, an increase of 34% versus 2020. We ended the year with record backlog of $569 million, and close to $1 billion of full year bookings.

We remain laser focused on growing faster than the market with proprietary motion, vision and photonics capabilities in high growth markets driven by secular industry 4.0, precision medicine and healthcare productivity trends. We continue to invest heavily in innovation and commercial capabilities to enhance our proprietary technology position and long-term sustainable growth potential in secular growth applications such as Robotic Surgery, Minimally Invasive Surgery, DNA Sequencing, Advanced Material Processing and Precision Automation & Robotics. We are also expanding into intelligent subsystems, resulting in higher content in these applications.

In 2021, we saw excellent momentum and success in our efforts to introduce new innovations to our customers. We are very excited about the 19 product launches in 2021, which will contribute meaningfully to our growth trajectory in future years. In 2021, Our vitality index[(2)] was above 25% of sales, versus mid-single digit percentages a few years ago. Design wins more than doubled year over year in 2021, which is a huge accomplishment for our commercial teams. We saw strong design wins in our minimally invasive surgery business, as well as our laser beam steering and precision motion businesses in high-growth application areas such as surgical robotics, laser-additive manufacturing, micromachining, and electric vehicle battery welding.

We also had success in 2021 by closing on two excellent acquisitions. In the third quarter we acquired ATI and IMS, both into our Precision Motion segment. These are both fantastic businesses which are excellent strategic additions to Novanta, expanding our positions in high growth markets. Both businesses are progressing very well with a strong market tailwind in robotics and automation demand. We are also very impressed by the performance and the engagement of the ATI and IMS teams and their strong pull for the Novanta Growth System tools. Acquisitions continue to be the primary focus of Novanta's capital deployment

Overall, this impressive year comes directly as a result of the tireless efforts of our dedicated teams. I remain incredibly impressed with how the Novanta team stuck together, continued innovating, and welcomed new coworkers into our family, all while working remotely and socially distanced. This year reminded me what an incredible team can achieve when adequately set up for success. The investments we have made over the past years – to refine the Novanta Growth System, our toolkit and set of practices to drive continuous improvement and accelerate innovations in high growth markets, and to build The Novanta Way, our culture which is based on collaboration, inclusion and trust – have paid dividends these last two years. They have been the glue that kept us motivated and mobilized behind our vision: to deliver innovations that matter.

So, in summary, we feel very good as we enter 2022 with record levels of backlog and continued strong demand from our customers. We continue to broaden our exposure to medical and industrial applications that have long-term secular trends, such as robotics and automation, healthcare productivity and precision medicine. And we continue to invest in the Novanta Way and our people as we believe a healthy culture with an engaged, diverse and aligned workforce is an integral part of building and sustaining our long term competitive advantage.

In closing, I would like to thank our customers, our employees, and you, our shareholders, for your ongoing support. I am particularly grateful for the dedication and strong contribution of our teams of committed Novanta employees that are showing tremendous agility and resilience during these times.

Yours truly,
/s/ *Matthijs Glastra*
Chairperson and Chief Executive Officer
April 8, 2022

(1) A non-GAAP financial measures. Reconciliations of GAAP to non-GAAP financial measures can be found beginning on page 111.
(2) We define vitality index as the percentage of total revenue from new products launched in the last 4 years.

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, 2021

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)**	**98-0110412** **(I.R.S. Employer Identification No.)**
125 Middlesex Turnpike **Bedford, Massachusetts, USA** **(Address of principal executive offices)**	**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 Section 15(d) of the Act. YES ☐ NO ☑

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☑

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 (July 2, 2021) was $4,835,362,420. 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 21, 2022, there were 35,628,671 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 12, 2022 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.

Auditor Firm Id: 238 Auditor Name: PricewaterhouseCoopers LLC Auditor Location: Boston, Massachusetts, United States

NOVANTA INC.
FORM 10-K
YEAR ENDED DECEMBER 31, 2021

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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, Synrad, Laser Quantum, ARGES, WOM, NDS, Med X Change, Reach Technology, JADAK, ThingMagic, Photo Research, General Scanning, ATI Industrial Automation, Celera Motion, IMS, 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 Securities and Exchange Commission ("SEC") from time to time. In this Annual Report on Form 10-K, the words "anticipates," "believes," "expects," "intends," "future," "estimates," "plans," "could," "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: the anticipated impacts of the COVID-19 pandemic on our business, financial results and financial condition; 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, social and governance 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 develops and supplies 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, intelligent end-of-arm robotic technology solutions, 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;
- 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.

Recent Developments

Acquisition of ATI Industrial Automation, Inc.

On August 30, 2021, we acquired 100% of the outstanding shares of ATI Industrial Automation, Inc. ("ATI"), an Apex, North Carolina-based leading supplier of intelligent end-of-arm technology solutions to OEMs for advanced industrial and surgical robots for an upfront cash purchase price of $169.2 million, net of cash acquired and estimated working capital adjustments, and $44.0 million estimated fair value of contingent consideration. The contingent consideration will be payable in 2022 based on a multiple of the standalone ATI Adjusted EBITDA, as defined in the purchase and sale agreement, for the fiscal year ended December 31, 2021. The initial cash purchase price was financed with borrowings under our revolving credit facility and cash available on hand. We expect that the addition of ATI will complement and add intelligent technology solutions to further expand our position in mission critical robotic applications within the Precision Motion reportable segment.

Acquisition of Schneider Electric Motion USA, Inc.

On August 31, 2021, we acquired 100% of the outstanding shares of Schneider Electric Motion USA, Inc. ("SEM"), a Marlborough, Connecticut-based manufacturer of integrated motion control solutions and electronic controls for automation equipment for a total cash purchase price of $114.7 million, inclusive of post-closing working capital adjustments and net of cash acquired. The acquisition was financed with borrowings under our revolving credit facility. We expect that the addition of SEM will complement and expand our presence in life science applications and solutions for industrial automation applications within the Precision Motion reportable segment.

Impact of COVID-19 on Our Business

In response to the COVID-19 pandemic, we have taken proactive, aggressive actions to protect the health and safety of our employees. We established steering committees at both the corporate level and at each of our major facilities to provide leadership for and manage our COVID-19 risk mitigation actions and countermeasures. We established rigorous safety measures in all of our facilities and have adapted our COVID-19 safety measures as the pandemic and related government mandates evolved over the past two years. We expect to continue some of these measures until we determine that the COVID-19 pandemic is adequately contained for purposes of our business. We may take further actions as government authorities require or recommend or as we determine to be in the best interest of our employees. In connection with our COVID-19 remediation actions, we have incurred additional costs to protect the health of our employees, including investments in technologies and monitoring equipment, weekly testing of unvaccinated employees for COVID-19 at certain locations and rearranging some of our facilities to accommodate social distancing and flexible post-pandemic work environment.

Even as governmental restrictions are relaxed and economies gradually, partially or fully, reopen, the ongoing economic impacts and health concerns associated with COVID-19 may continue to affect our business for the foreseeable future.

Through December 31, 2021, we have experienced disruptions to our supply chain as a result of the COVID-19 pandemic and global electronics and other raw material shortages. While we regularly monitor the manufacturing output of companies in our supply chain, disruptions to our suppliers and/or sub-suppliers caused by these events could further challenge our ability to obtain raw materials or components required to manufacture our products, adversely affecting our operations and customer relationships.

To mitigate the risk of any potential supply interruptions from the COVID-19 pandemic and the global electronics and other raw material shortages, we are identifying alternative suppliers and distributors, sourcing raw materials from different supplier and distributor locations, modifying our product designs to allow for alternative components to be used where feasible without compromising quality, performance or other requirements, in-sourcing production of parts where feasible, and taking other actions to ensure a sustainable supply of raw materials. Despite our mitigation actions, if certain suppliers cannot produce a key part or component for us, or if the receipt of certain materials is otherwise delayed, we may miss our scheduled shipment deadlines and our relationship with customers may be harmed.

Additionally, restrictions on or disruptions of transportation, such as reduced availability of air transports, port closures and backlogs, and increased border controls or closures, have resulted in higher costs and delays, both for obtaining raw materials from suppliers and for shipping finished products to customers.

The COVID-19 pandemic and the global electronics and other raw material shortages have caused inflationary pressures on the market prices for certain of our parts and primary raw materials as well as increases in the costs of labor, freight, packaging, energy and other consumables that are used in our manufacturing processes. We have generally been able to offset increases in these costs through various productivity and cost reduction initiatives, as well as adjusting our selling prices to pass through some of these higher costs to our customers; however, our ability to raise our selling prices depends on market conditions and competitive dynamics. Given the timing of our actions compared to the timing of these inflationary pressures, there may be periods during which we are unable to fully recover the increases in our costs.

Acquisitions

We continuously evaluate our business mix and financial performance. Since 2013, we have executed a series of acquisitions in line with our strategy. The following table summarizes significant acquisitions since 2013:

Company	Year of Acquisition	Total Purchase Price (in millions)
ATI Industrial Automation, Inc.	2021	$ 223.9
Schneider Electric Motion USA, Inc.	2021	$ 118.6
ARGES GmbH	2019	$ 73.2
Zettlex Holdings Limited	2018	$ 32.0
Laser Quantum Limited (24%)[(1)]	2018	$ 45.1
Laser Quantum Limited (35%)	2017	$ 31.1
W.O.M. World of Medicine GmbH	2017	$ 134.9
JADAK LLC	2014	$ 94.8
NDS Surgical Imaging LLC	2013	$ 75.4

(1) After the acquisition of the remaining (approximately 24%) noncontrolling interests of Laser Quantum Limited ("Laser Quantum") in September 2018, we owned 100% of the outstanding equity of Laser Quantum.

Segments

Our Chief Operating Decision Maker ("CODM") is our Chief Executive Officer. Our 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, 2021 (dollars in millions):

	Revenue	Gross Profit Margin	Operating Profit
Photonics	$ 232.5	46.5%	$ 46.8
Vision	$ 262.1	38.5%	$ 17.7
Precision Motion	$ 212.3	46.8%	$ 52.7

See Note 18 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, particularly ophthalmology applications. 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
Laser Beam Delivery Components	Advanced Industrial and Medical	Cambridge Technology	Galvanometer and polygon-based optical scanning components. These products provide precise control and delivery of laser beams through motorized manipulation of mirrors and optical elements and are integrated by OEM manufacturers with their controlling hardware and software. Advanced industrial applications include additive manufacturing, packaging converting, laser marking, micromachining and metrology. Medical applications include optical coherence tomography imaging, microscopy, and laser-based vision correction.
Laser Beam Delivery Solutions	Advanced Industrial and Medical	Cambridge Technology, Synrad, Laser Quantum, 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.
CO_2 Lasers	Advanced Industrial	Synrad	Continuous and pulsed CO_2 lasers with power ranges from 5 to 400 watts. Applications include coding, marking, engraving, cutting and trimming of non-metals, fine materials processing, additive manufacturing, packaging converting, and medical applications in dental and dermatology.
Solid State and Ultrafast Lasers	Medical and Advanced Industrial	Laser Quantum	Diode-pumped solid-state lasers and ultrafast lasers in the visible to near-infrared. Applications include DNA sequencing, microscopy, micromachining 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 technologies, video recorders, 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
Medical Insufflators, Pumps and Accessories	Medical	WOM	Insufflators, pumps, light sources and video couplers, gamma probes and related accessories and consumables for minimally invasive surgery.
Visualization Solutions	Medical	NDS	High definition, 4K and 4K 3D visualization solutions for minimally invasive surgery and robotic surgery.
Video Processing, Streaming and Capture	Medical	NDS, 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 in minimally invasive surgical equipment.
Touch Panel Displays	Medical and Advanced Industrial	Reach Technology	Embedded capacitive and resistive touch panel technology that delivers high-performance solutions.
Machine Vision	Medical	JADAK	Camera-based machine vision products and solutions performing image analysis within medical devices.
RFID	Medical and Advanced Industrial	JADAK, ThingMagic	RFID technologies via High-Frequency (HF) and Ultra-High Frequency (UHF) readers, writers and antennas for applications such as surgical part tracking and counterfeit detection.
Barcode Identification	Medical and Advanced Industrial	JADAK	Embedded and handheld data collection products for barcode identification.
Thermal Chart Recorders	Medical	JADAK	Rugged thermal chart recorders for patient monitoring, defibrillator equipment, blood gas analyzers, and pulse oximeters.
Light and Color Measurement	Advanced Industrial	Photo Research	Light and color measurement devices, including spectroradiometers, photometers, and color characterization software, used in research and development and quality control testing.

Precision Motion

The Precision Motion segment designs, manufactures and markets optical and inductive encoders, precision motors, servo drives and motion control solutions, integrated stepper motors, intelligent robotic end-of-arm technology solutions, 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 seven product lines:

Product Lines	Key End Markets	Brand Names	Description
Optical Encoders	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.
Inductive Encoders	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.
Precision Motors	Advanced Industrial and Medical	Celera Motion, Applimotion, IMS	Direct drive motor components and integrated motion sub-assemblies 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.
Servo drives and motion control solutions	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 equipment.
Integrated Stepper Motors	Advanced Industrial and Medical	IMS	Integrated motion control solutions and electronic controls for automation equipment, agricultural robotics, industrial robotics, medical and life science applications.
Intelligent robotic end-of-arm technology solutions	Advanced Industrial and Medical	ATI	Robotic accessories and end of arm tooling including tool changers, multi-axis force torque sensors, utility couplers, material removal tools, collision sensors, and compliance devices. Applications include advanced industrial and medical robotics.
Air Bearing Spindles	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, 2021, the medical market accounted for approximately 52% 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, 2021, the advanced industrial market accounted for approximately 48% 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 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, 2021 and December 31, 2019. For the year ended December 31, 2020, the Company recognized revenue from an OEM customer in the medical end market which accounted for approximately 11% of our consolidated revenue.

Our customers include many OEMs who integrate our products into their systems for sale 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 several 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 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 lower seasonal spending patterns of our customers due to their annual capital budgeting cycles.

Backlog

As of December 31, 2021 and 2020, our consolidated backlog was approximately $568.8 million and $239.6 million, respectively. Most 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 months. Orders included in backlog may be canceled or rescheduled by customers without significant penalty. Management believes that backlog typically 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 date should not be relied upon as indicative of our revenues for any future period. During 2021, we experienced notable increases in lead times for our customer orders, caused by higher customer demand and unprecedented raw materials shortages and supply chain disruptions caused by both the COVID-19 pandemic and other economic and geopolitical factors.

Manufacturing

Manufacturing functions are performed internally either when we choose to maintain control over critical portions of the production process, or for cost related reasons, while other portions of the manufacture of our products are outsourced to highly qualified third parties.

Products offered by our Photonics segment are manufactured at facilities in Bedford, Massachusetts; Mukilteo, Washington; Taunton and Manchester, United Kingdom; and Suzhou, China. Products offered by our Vision segment are manufactured at facilities in Syracuse, New York; Bradenton, Florida; Mukilteo, Washington, and Ludwigsstadt, Germany. Products offered by our Precision Motion segment are manufactured at facilities in Bedford, Massachusetts; Apex, North Carolina; Marlborough, Connecticut; Rocklin, California; Poole and Cambridge, United Kingdom; and Suzhou, China.

The majority of our products are produced in manufacturing facilities certified under ISO 9001 certification, while most of our products manufactured for the medical market are produced in factories under ISO 13485 certification. Our manufacturing facilities in

Ludwigsstadt, Germany, Stockport and Taunton, United Kingdom, and Suzhou, China 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").

Marketing, Sales and Distribution

We sell our products globally, primarily through our direct sales force. We also use 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

We encounter aggressive and strong competition in virtually all the markets, applications, and technologies we serve. Due to the wide and diverse range of products and technologies, we face many different types of competitors and competition. 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 organizations producing a limited number of highly specialized products or services for specialized market segments. The competitive climate of many of the markets we serve are characterized by rapidly evolving technology and customer demands that require continuing investments by us. Our competitive success requires advances in technology and performance, improved price for performance ratios, demonstrated increased throughput performance for our customers products, lower total cost of ownership, product quality, depth of our application knowledge and expertise, reputation amongst customers, customer service and technical support, speed to market, geographical presence, and deep customer relationships.

We believe that our products offer several competitive advantages for our customers, and the breadth of technologies we offer gives us deep applications knowledge to better serve our customers' needs

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 several 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 Capital

We believe that our employees are our most important asset. The Chief Human Resources Officer ("CHRO") is responsible for developing and executing our human capital strategy. This includes the acquisition, development, and retention of talent to deliver on our strategy as well as the design of employee compensation and benefits, and diversity, equity, and inclusion ("DEI") initiatives. The CHRO and the Chief Executive Officer ("CEO") regularly update our board of directors on the operation and status of these human capital activities, including, but not limited to, talent management, talent development, and succession planning. As of December 31, 2021, we employed approximately 2,700 people, of which approximately 46% were in the United States, 42% in Europe, and 12% in Asia. We win with our customers by delivering new technology innovations through our engineering teams of approximately 600 employees.

We believe that our employees have a meaningful role in helping us develop our culture. We utilize survey feedback mechanisms to measure employee engagement and organizational health. This enables us to gain insight into our current status and into areas where we can improve. We have conducted surveys of our entire employee population in each of last three years and we compare our employee engagement and organizational health scores against benchmark populations with our survey vendors. Following each survey cycle, we review the results across the company with our teams and develop specific action plans based on the feedback we receive. We execute on our action plans to improve our overall organizational health and employee engagement.

All employees are responsible for upholding the Novanta Code of Ethics and Business Conduct, which is important in delivering on our strategy. We maintain a compliance hotline for the confidential reporting of any suspected policy violations or unethical business conduct on the part of our businesses, employees, officers, directors, suppliers or customers and provide training and education to our global workforce with respect to our Code of Ethics and Business Conduct, anti-corruption and anti-bribery policies, data privacy regulations and workplace harassment.

Diversity and Inclusion

The Novanta Way defines our performance culture and begins with building cohesive teams based on trust, commitment, and accountability. Diversity, equity, and inclusion are an integral part of our culture and will be leader led and embedded into our ways of working. Our diversity will be reflected in our governance, leadership, influence, and technical expertise at all levels in the organization. We do not tolerate discrimination and harassment. We expect our teams to respect our core values and conduct themselves ethically at all times in accordance with the Novanta Code of Ethics and Business Conduct.

As of December 31, 2021, our board of directors was 67% comprised of men and 33% comprised of women. Women representation on our board of directors increased 8 percentage points in 2021 from 2020. As of March 1, 2022, our board of directors was 75% comprised of men and 25% of women. Underrepresented groups (defined as an individual who self-identifies as Black, African American, Hispanic or Latino, Asian, Native American, Alaskan Native, Native Hawaiian or Pacific Islander, or two or more races or ethnicities) represented 11% of our board of directors as of December 31, 2021.

As of December 31, 2021, our gender diversification efforts resulted in 36% of our workforce being women, which was an increase of one percentage point increase in women representation on our workforce from December 31, 2020. The proportion of women in management positions amounted to 25%, which is consistent with the prior year.

During 2021, in line with our strategic initiative of increasing representation of employees from underrepresented communities, we launched a series of diversity, equity and inclusion initiatives to accelerate the progress towards our goals by the year 2023.

Compensation and Benefits

We strive to provide market competitive compensation, benefits and services that help meet the varying needs of our employees. In addition to salaries and wages, these programs, which vary by country, can include annual bonuses, sales commissions, stock-based compensation awards, defined contribution retirement savings plans with company matching contributions, healthcare and other insurance benefits, flexible spending accounts, health savings account with company matching contributions, paid time off, paid family leave, and tuition assistance. Certain U.S. facilities have a dedicated medical professional on site to provide basic healthcare services to employees, provide general first aid, assess employee health risks and promote employee health. Additionally, all U.S. employees and their families have access to video and telephonic Telemedicine support twenty-four hours a day. Our bonus and commission payment programs allow for higher payouts when goals are exceeded and lower payouts when goals are not achieved as planned.

Growth and Development

We invest significant resources to develop the talent needed to remain at the forefront of innovation and make Novanta an employer of choice. In certain countries, we offer college tuition reimbursement for eligible employees for undergraduate and graduate studies. In 2019, we founded Novanta University as a primary instrument of company-wide learning management. A full-

time specialist and the Company's human resources department coordinate the onboarding of new employees and administer the regular training program for the entire workforce, including both internal and external training courses. In addition to Novanta University, we utilize our Novanta Growth System, which provides processes, tools, and trainings with a focus on continuous improvement. In 2021, further investment was made in leadership development and diversity, equity and inclusion initiatives with the creation of a department dedicated to deploying the Novanta Way culture through employee resource groups, learning initiatives for all employees and formal leadership development training programs.

Safety and Wellbeing of Our Employees

We provide mandatory safety trainings in our facilities, which are designed to focus on empowering our employees with the knowledge and tools they need to make safe choices and to mitigate risks. In further support of our employees, we launched the global health and wellness resource center, "NovantaWELL". The program is designed to give employees support, training, tools and coaching to help them stay healthy.

In response to the COVID-19 pandemic, we have taken proactive, aggressive actions to protect the health and safety of our employees. We established steering committees at both the corporate level and at each of our major facilities to provide leadership for and manage our COVID-19 risk mitigation actions and countermeasures. We have provided frequent employee communications that include guidance and updates to our employees with regards to COVID-19 safety procedures and status. We established rigorous safety measures in all of our facilities, including implementing social distancing protocols, working-from-home arrangements for those employees that do not need to be physically present on the manufacturing floor or in our facilities to perform their work, reducing travel, spreading production over more shifts, implementing temperature checks at the entrances to our facilities, frequently disinfecting our workspaces, and providing masks to those employees who must be physically present in our facilities. We expect to continue these measures until we determine that the COVID-19 pandemic is adequately contained for purposes of our business. We may take further actions as government authorities require or recommend or as we determine to be in the best interest of our employees.

Cybersecurity

We have adopted and are implementing the National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF). The NIST CSF integrates industry standards and best practices to help organizations manage their cybersecurity risks. The NIST CSF helps organizations understand their cybersecurity risks (threats, vulnerabilities and impacts) and how to reduce these risks with customized measures, such as organization-wide cybersecurity awareness training. Additionally, we maintain cybersecurity insurance to mitigate risks related to cyber-attacks and other security breaches; however, such insurance coverage may be unavailable or insufficient to cover all losses or all types of claims that may arise in the continually evolving areas of cyber risk.

The Company's Audit Committee is responsible for the oversight of cybersecurity risks. The Audit Committee reviews quarterly with management and internal audit the Company's cybersecurity program and related matters.

There have been no material information security breaches for the years ended December 31, 2021, 2020, and 2019, respectively. Expenses incurred in connection with information security breaches have been immaterial for the years ended December 31, 2021, 2020, and 2019, respectively.

Government Regulation

Our current and contemplated activities and the products and processes that will result from such activities are subject to substantial government rules and 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 that 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 Federal Food and Drug Administration ("the FDA") and foreign regulatory authorities. 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 other federal, state, local and foreign authorities as well as notified bodies. In the United States, 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 medical devices.

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 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 prepared by the manufacturer 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. In these circumstances, we may also 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 on devices and also requiring the submission of certain information about each device to the FDA's Global Unique Device Identification Database;
- 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.

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.

Regulation of Medical Devices in the European Union and U.K.

The European Union ("EU") has adopted specific directives and regulations regulating the design, manufacture, clinical investigation, conformity assessment, labeling and adverse event reporting for medical devices.

Until May 25, 2021, medical devices were regulated by the Council Directive 93/42/EEC ("Medical Devices Directive") which has been repealed and replaced by Regulation (EU) No 2017/745 ("Medical Devices Regulation"). Our current certificates have been granted and renewed under the Medical Devices Directive. However, as of May 26, 2021, some of the Medical Devices Regulation requirements apply in place of the corresponding requirements of the Medical Devices Directive with regard to registration of economic operators and of devices, post-market surveillance, market surveillance and vigilance requirements. Pursuing marketing of medical devices in the EU will notably require that our devices be certified under the new regime set forth in the Medical Devices Regulation when our current certificates expire. According to the Medical Devices Regulation several transitional provisions are in place (Article 120) to avoid market disruption and allow a smooth transition from the Medical Devices Directive to the Medical Devices Regulation. Some device certificates issued under the Medical Devices Directive ("MDD certificates") may remain valid until May 26, 2024, and some devices with MDD certificates may generally continue to be made available on the market or put into service until May 26, 2025, provided that the requirements of the transitional provisions are fulfilled. In particular, the certificate in question must still be valid. During the transition phase, products certified under the Medical Devices Directive and products certified under the Medical Devices Regulation will coexist on the market. Both will have equal status under the law, and no discrimination on eligibility criteria in public tenders may take place.

Medical Devices Directive

Under the Medical Devices Directive, all medical devices placed on the market in the EU must meet the relevant essential requirements in the Medical Devices Directive, including the requirement that a medical device must be designed and manufactured in such a way that it will not compromise the clinical condition or safety of patients, or the safety and health of users and others.

To demonstrate compliance with the requirements in the Medical Devices Directive, medical device manufacturers must undergo a conformity assessment procedure, which varies according to the type of medical device and its (risk) classification. Specifically, a manufacturer must demonstrate that the device achieves its intended performance during normal conditions of use, that the known and foreseeable risks and any adverse events, are minimized and acceptable when weighed against the benefits of its intended performance, and that any claims made about the performance and safety of the device are supported by suitable evidence. Except for low-risk medical devices (Class I non-sterile, non-measuring devices), where the manufacturer can self-declare the conformity of its products with the essential requirements (except for any parts which relate to sterility or metrology), a conformity assessment procedure requires the intervention of a notified body. If satisfied that a relevant product conforms to the relevant essential requirements, a notified body issues a certificate of conformity, which the manufacturer uses as a basis for its own declaration of conformity. The manufacturer may then apply the European Conformity ("CE") mark to the device, which allows the device to be placed on the market throughout the EU.

Throughout the term of the certificate of conformity, the manufacturer will be subject to periodic surveillance audits to verify continued compliance with the applicable requirements. In particular, there will be a new audit by the notified body before it will renew the relevant certificate(s).

Medical Devices Regulation

The recently effective Medical Devices Regulation establishes a uniform regulatory framework across the EU for medical devices. Unlike the Medical Devices Directive, the Medical Devices Regulation is directly applicable in EU member states without the need for member states to implement it into national law. The new Medical Devices Regulation, among other things, strengthens the rules on placing devices on the market and reinforces surveillance once they are available and establishes explicit provisions on manufacturers' responsibilities for the follow-up of the quality, performance and safety of devices placed on the market. As of May 26, 2021, regardless whether the devices are still marketed with MDD certificates, manufacturers must comply with a number of new or reinforced requirements set forth in the Medical Devices Regulation, including the obligations described below. All manufacturers placing medical devices into the market in the EU must comply with the EU medical device vigilance system. Under this system, serious incidents and Field Safety Corrective Actions ("FSCAs") required to be taken by manufacturers must be reported to the relevant authorities of the EU member states. FSCAs are defined as any corrective action for technical or medical reasons to prevent or reduce a risk of a serious incident associated with the use of a medical device that is made available on the market. An FSCA may include the recall, modification, exchange, destruction or retrofitting of the device.

The advertising and promotion of medical devices is subject to some general principles set forth in EU legislation. According to the Medical Devices Regulation, only devices that are CE marked may be marketed and advertised in the EU in accordance with their

intended purpose. Directive 2006/114/EC concerning misleading and comparative advertising and Directive 2005/29/EC on unfair commercial practices, while not specific to the advertising of medical devices, also apply to the advertising thereof and contain general rules, for example, requiring that advertisements are evidenced, balanced and not misleading. Specific requirements are defined at a national level. EU member states' laws related to the advertising and promotion of medical devices, which vary between jurisdictions, may limit or restrict the advertising and promotion of products to the general public and may impose limitations on promotional activities with healthcare professionals.

The aforementioned EU rules are generally applicable in the European Economic Area ("EEA"), which consists of the 27 EU member states plus Norway, Liechtenstein and Iceland.

United Kingdom

Since January 1, 2021, the Medicines and Healthcare Products Regulatory Agency ("MHRA") has become the sovereign regulatory authority responsible for Great Britain's (i.e. England, Wales and Scotland) medical device market under the Medical Devices Regulations 2002 ("SI 2002 No 618", as amended) whereas Northern Ireland continues to be governed by EU rules. By July 1, 2023, all medical devices will require a UK Conformity Assessed ("UKCA") mark in Great Britain, but CE marks issued by EU notified bodies will remain valid until this time. Compliance with this legislation is a prerequisite to be able to affix the UKCA mark to medical devices, without which they cannot be sold or marketed in Great Britain.

For further information regarding EU and U.K. healthcare laws and regulations that our operations are subject to, see "Item 1A. Risk Factors—Risks Relating to Our Business— We are subject to extensive and dynamic medical device regulations, which may impede or hinder the approval, certification or sale of our products and, in some cases, may ultimately result in an inability to obtain approval or certification of certain products or may result in the recall or seizure of previously approved or certified products."

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. The federal Anti-Kickback Statute 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 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 ("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 ("HITECH") and their implementing regulations, 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 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. In addition, state and foreign law equivalents of each of the above federal laws 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."

Data Privacy and Security Laws and Regulations

Numerous state, federal and foreign laws govern the collection, dissemination, use, access to, confidentiality, and security of personal information, including health-related information. In the United States, numerous federal and state laws and regulations, including data breach notification laws, health information privacy and security laws that govern the collection, use, disclosure, and protection of health-related and other personal information, including HIPAA, could apply to our operations or the operations of our customers. In addition, certain state and non-U.S. laws, such as the California Consumer Privacy Act ("CCPA"), the California Privacy Rights Act ("CPRA"), and the General Data Protection Regulation ("GDPR"), govern the privacy and security of personal information, including health-related information in certain circumstances, some of which are more stringent than HIPAA and many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts. Failure to comply with these laws, where applicable, can result in the imposition of significant civil and/or criminal penalties and private

litigation. Privacy and security laws, regulations, and other obligations are constantly evolving, may conflict with each other to make compliance efforts more challenging, and can result in investigations, proceedings, or actions that lead to significant penalties and restrictions on data processing.

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 for download, 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, our reports and other information are filed with securities commissions or other similar authorities in Canada and are available over the Internet at https://www.sedar.com.

Item 1A. ***Risk Factors***

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

Risks Relating to Our Business

Our results of operations could be adversely affected by economic and political conditions and the effects of these conditions on our customers' businesses, capital expenditures 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 our customers' capital expenditures or business activity. We have experienced significant cyclical end market fluctuations in the past. In particular, diminished growth expectations, economic and political uncertainty in regions across the globe and effects of the COVID-19 pandemic adversely impacted our customers' financial condition and ability to maintain product order levels and reduced the demand for our products in 2020 and, to a lesser extent, in 2021. In addition, certain sub-segments of the advanced industrial market that we serve, including the microelectronics and industrial capital equipment sector, 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 also faced increases in inflationary conditions in certain materials and components, and we expect these inflationary conditions to continue in 2022. These inflationary conditions have caused us to increase prices; however, such price increases may not be accepted by our customers or may not adequately offset the increases in our costs, thereby negatively affecting our results of operations. Changes in global economic conditions, including inflationary 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.

The COVID-19 pandemic has adversely impacted and is expected to have prolonged adverse impacts on our business and results of operations.

In 2020, a strain of novel coronavirus disease, COVID-19, was declared a pandemic and spread across the world. The pandemic and government measures taken in response have had a significant adverse impact, both direct and indirect, on our business and the economy. We have experienced weakened demand from certain customers in the advanced industrial and medical end-markets, which has adversely affected and is expected to continue to adversely affect our revenues. For example, healthcare providers have, at times, deferred elective medical procedures in order to focus on combatting the pandemic, which significantly reduced demand for certain of our medical products. Certain other customers have delayed their research and development programs, which has also negatively affected the demand for some of our products.

We also faced, and expect to continue to face, difficulty sourcing some materials and components necessary to fulfill production requirements and meeting scheduled shipments due to suppliers' capacity constraints and shipping and transportation disruptions. These disruptions have adversely affected our ability to manufacture our products and meet our customers' schedules. If we are not able to mitigate these disruptions effectively, our ability to manufacture our products or meet our customers' schedules would continue to be adversely affected, possibly materially, and our business would be harmed. Even if we are able to find alternate sources of supply for such materials or components, they may cost more or be of lower quality, which could affect our profitability, financial condition and business.

While the impact of the pandemic on our manufacturing capabilities and research and development activities has been limited to date, there can be no assurance that our ability to manufacture our products and to develop new products and technologies will not be disrupted in the future in case of a resurgence of the pandemic or related public health crisis from new mutations of the virus. The COVID-19 pandemic continues to evolve. The extent to which the pandemic impacts our business, liquidity and financial results will depend on future developments, such as the continued geographic spread of the disease, the duration of the pandemic, the location, duration and magnitude of future waves of infection, new mutations of the virus, the availability, the adoption and effectiveness of vaccines and treatments against the virus and its variants, travel restrictions and social distancing in the United States, the European Union ("EU"), China and other countries. If we or our customers experience prolonged shutdowns or other business disruptions in the future, our ability to conduct our business in the manner and within planned timelines could be materially adversely impacted, and our business and financial results may continue to be adversely affected.

Additionally, concerns over the economic impact of the COVID-19 pandemic have caused extreme volatility in financial and other capital markets. There is no assurance that future resurgence of COVID-19 infections and further economic downturns will not cause volatilities in the capital markets, which may adversely impact our stock price and our ability to access capital markets, such as what occurred in March and April 2020 and at various times in 2021 upon the discovery of new variants.

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 into 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 has prompted customers to look for alternative sources of supply and has left our customers without a supply, both of which events have harmed our reputation and made it difficult for us to retain our existing customers or to obtain new customers. If this inability to increase production continues or worsens, it could have a material adverse effect on our business.

In periods of weaker demand, such as the recent environment in 2020, we have been, and may in the future 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 inventories or manufacture products that we are unable to sell.

The success of our business depends on our ability to continuously innovate, to introduce new products in a timely manner, and to manage transitions to new product innovations effectively.

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. 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 also introduce new or improved products, processes or technologies that make our current or proposed products obsolete or less competitive. We may not manage the transition from older products effectively to minimize disruption in customer ordering patterns, avoid excess inventory and ensure adequate supplies of new products. New products may have fewer features than originally considered desirable, may have higher costs than initially estimated, may contain defects or perceived defects or have reliability, quality or compatibility problems or perceived problems. There have been, and may continue to be, difficulties in sourcing

components for new products and delays in starting volume production. New products may also not be commercially successful as we cannot predict how the market will react to new products introduced by us or to enhancements made to our existing products. Failure to develop and introduce new products, failed market acceptance of new products or problems associated with new product transitions could impede our revenue growth, lead to loss of market share, and negatively affect our results of operations and our competitiveness in the market.

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;
- decisions by customers to reduce their purchases of our products;
- timing and recognition of revenues from customer orders;
- timing and market acceptance of new products or enhancements introduced by us or our competitors;
- availability and pricing of parts from our suppliers and the manufacturing capacity of our subcontractors;
- 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 or our third-party providers' information technology systems, our business may be adversely affected.

We rely on information technology systems, software and services (collectively, "IT Systems") for internal and external operations. We operate some of these IT Systems ourselves and also rely on IT Systems provided by third parties to run our business, including to interact with our employees and our customers and suppliers. These interactions include, but are not limited to, ordering and managing materials from suppliers, converting materials to finished products, shipping product to customers, processing transactions, summarizing and reporting results of operations, complying with regulatory, legal and tax requirements, and other processes necessary to manage our business. We do not control our third-party service providers and we do not maintain redundant systems for some of such services, increasing our vulnerability to problems with such services. In addition, in the ordinary course of business, we and our third-party service providers collect, process and maintain confidential business information as well as personal information.

Like other global companies, there are constant cyber related threats and risks to our IT Systems and data, including by internal and external perpetrators of random or targeted malicious cyberattacks, computer viruses, malware, worms, bot attacks or other destructive or disruptive software (for example, ransomware) and attempts to misappropriate customer information and cause system failures and disruptions. Certain other events could also result in the disruption of our IT Systems, including power outages, catastrophes, hardware and software bugs, misconfigurations or failures, and other unforeseen events. We expect the frequency and magnitude of cyberattacks to accelerate as attackers are becoming more sophisticated, for example, by using techniques designed to circumvent controls, avoid detection, and obfuscate forensic evidence, such that we may be unable to timely or effectively detect, identify, investigate or remediate attacks in the future.

If we were to experience a significant period of disruption in IT 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 IT Systems could result in the misappropriation or unauthorized disclosure of confidential business or personal information belonging to us or to our employees, customers, suppliers or other business partners, which could result in significant financial or reputational damage to us, as well as litigation, regulatory enforcement actions, or other liabilities that could lead to substantial damages, fines, penalties and legal costs. We also expend substantial amounts to protect our IT Systems, and if we were to experience a significant breach in security of our IT Systems, we may need to materially increase such expenditures, which would adversely affect our results of operations.

Our insurance policies may or may not cover various cybersecurity risks and liabilities, and even if coverage exists, there can be no guarantee that any or all costs or losses incurred would be partially or fully insured.

Actual or perceived failures to comply with applicable data protection, privacy and security laws, regulations, standards, and other requirements 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") has caused more stringent data protection requirements in the EU and the European Economic Area ("EEA"). 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 data 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. Among other requirements, the GDPR regulates transfers of personal data subject to the GDPR to third countries that have not been found to provide adequate protection to such personal data, including the United States, and the efficacy and longevity of current transfer mechanisms between the EU and the United States remains uncertain. For example, in 2016, the EU and United States agreed to a transfer framework for data transferred from the EU to the United States, called the Privacy Shield. However, in July 2020, the Court of Justice of the EU ("CJEU") limited how organizations could lawfully transfer personal data from the EU/EEA to the United States by invalidating the Privacy Shield for purposes of international transfers and imposing further restrictions on use of the standard contractual clauses ("SCCs") (a standard form of contract approved by the European Commission as an adequate personal data transfer mechanism, and potential alternative to the Privacy Shield). These restrictions include a requirement for companies to carry out a transfer impact assessment which, among other things, assesses the laws governing access to personal data in the recipient country and considers whether supplementary measures that provide privacy protections additional to those provided under SCCs will need to be implemented to ensure an essentially equivalent level of data protection to that afforded in the EEA. The European Commission issued revised SCCs on June 4, 2021 to account for the decision of the CJEU and recommendations made by the European Data Protection Board. The revised SCCs must be used for relevant new data transfers from September 27, 2021 and existing standard contractual clauses arrangements must be migrated to the revised clauses by December 27, 2022. There is some uncertainty around whether the revised clauses can be used for all types of data transfers, particularly whether they can be relied on for data transfers to non-EEA entities subject to the GDPR.

Relatedly, following the United Kingdom's withdrawal from the EEA and the EU and the expiration of the transition period, since January 1, 2021, companies have had to comply with both the GDPR and the GDPR as incorporated into United Kingdom national law, the latter regime having the ability to separately fine up to the greater of £17.5 million or 4% of global revenue. The relationship between the United Kingdom and the EU in relation to certain aspects of data protection law remains unclear, and it is unclear how United Kingdom data protection laws and regulations will develop in the medium to longer term. The European Commission has adopted an adequacy decision in favor of the United Kingdom, enabling data transfers from EU member states to the United Kingdom without additional safeguards. However, the UK adequacy decision will automatically expire in June 2025 unless the European Commission re-assesses and renews/extends that decision.

In the United States, California has enacted the California Consumer Privacy Act (the "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. Additionally, the California Privacy Rights Act (the "CPRA") was recently enacted in California. The CPRA will impose additional data protection obligations on covered companies doing business in California, including additional consumer rights processes, limitations on data uses, new audit requirements for higher risk data, and opt-outs for certain uses of sensitive data. It will also create a new California data protection agency authorized to issue substantive

regulations and could result in increased privacy and information security enforcement. The majority of the provisions will go into effect on January 1, 2023, and additional compliance investment and potential business process changes may be required. The CCPA and CPRA may increase our compliance costs and potential liability. Similar laws have passed in Virginia and Colorado, and 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 and CCPA 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, CCPA or other applicable regimes.

Changes in 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 exposures, we cannot be certain that our efforts will be adequate to protect us against significant foreign currency rate fluctuations or that such efforts will not expose us to additional exchange rate risks.

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

During the year ended December 31, 2021, approximately 62% 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;
- political unrest and wars, such as the current situation with Ukraine and Russia, which could delay or disrupt our business, and if such political unrest escalates or spills over to or otherwise impacts additional regions, it could heighten many of the other risk factors included in this Item 1A; and
- natural disasters, 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.

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, increased frequency and severity of extreme weather conditions and natural disasters as a result of global warming, 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 results of operations.

Our sales channels and supply chain in the international marketplace make us subject to tariffs, trade restrictions and other taxes when the raw materials or components we purchase, and the products we sell, cross international borders. Trade tensions between the U.S. and China, as well as those between the U.S. and some other countries, have escalated in recent years. For example, U.S. tariff impositions against Chinese exports in recent years were 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 have increased our manufacturing costs and have made 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 increase our costs and make our products less competitive than those of our competitors whose products are not subject to such retaliatory tariffs. If heightened tariffs were to be imposed in the future, we may not be able to mitigate their impacts, and our business, results of operations and financial position could be materially adversely affected. Products we sell into certain other foreign markets could also become subject to retaliatory tariffs, making our products uncompetitive to similar products not subjected to such import tariffs. Further changes in U.S. trade policies, tariffs, taxes, export restrictions or other trade barriers, or restrictions on raw materials or components may limit our ability to produce products, increase our manufacturing costs, decrease our profit margins, reduce the competitiveness of our products, or inhibit our ability to sell products or purchase raw materials or components, which would have a material adverse effect on our business, results of operations and financial condition.

The U.K.'s withdrawal from the EU 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. The U.K. formally exited the EU, commonly referred to as Brexit, on January 31, 2020. On December 30, 2020, the U.K. and EU signed the Trade and Cooperation Agreement ("TCA"), which includes an agreement on free trade between the two parties and went into effect on May 1, 2021.While agreement on the terms of the TCA has avoided a "no deal" Brexit scenario and provides for, in principle, quota and tariff-free trading of goods, it is nevertheless expected that the TCA will result in the creation of non-tariff barriers (such as increased shipping and regulatory costs and complexities) to the trade in goods between the UK and the EU. Further, the TCA does not provide for the continued free movement of services between the UK and the EU and imposes additional restrictions on the free movement of people between the UK and the EU.

The TCA also grants to each of the UK and the EU the ability, in certain circumstances, to unilaterally impose tariffs on one another. In the event of such an imposition, any additional tariffs may have a material adverse impact on us as well as the stability of UK-EU trade more generally. Any uncertainty as to UK or EU government policies and, in particular, whether any such policy may result in the imposition of reciprocal tariffs, may depress economic activity or have an adverse impact on our business and operations.

It remains to be seen whether the initial implementation of, and adjustment of UK-EU trading processes for, the TCA could increase our costs or otherwise negatively impact sales of our products, mobility of our personnel and our access to capital.

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 the protection of 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 applications filed by us, or that the claims allowed, even if patents are issued, 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. 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 recent and future acquisitions or to grow the acquired businesses as planned.

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 ATI Industrial Automation, Inc., Schneider Electric Motion USA, Inc., ARGES GmbH, Med X Change, Inc., and Ingenia-CAT, S.L., and we expect to continue to make acquisitions in the future. We may fail to successfully 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 newly acquired operations into our existing businesses. We may fail to identify inherent weaknesses in acquired businesses or misinterpret market and technology trends and growth potentials during our acquisition due diligence process. 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 we may not be able to realize the expected return on our investments, 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. We have recently experienced increased turnover of key personnel, and the competition for skilled employees is intense. We have incurred increased expenses in connection with the retention of existing key personnel and hiring of new employees, and we expect these increased costs to continue. Additional losses 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 if the turnover rates for engineers and other key personnel increase

significantly or if we are unable to continue to attract qualified personnel. The costs to retain or hire employees could also increase more than we expect.

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 and cost 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 and cost structure in the future. Our ability to reduce operating expenses and improve gross margin is dependent upon the nature of the actions we take and our subsequent ability to implement those actions and realize the expected cost savings and gross margin improvements. We are taking, and may need to take in the future, additional restructuring actions, such as eliminating or consolidating certain of our facilities or operations, reducing our headcount, or eliminating certain positions. 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. We are also taking actions to improve our price realization, reduce our overhead and cost of poor quality, and improve our material productivity. Failure to successfully implement these actions could negatively impact our ability to achieve our gross margin goals.

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, have adversely affected 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 a single source of supply. Certain single source suppliers of key components for us have decided to stop producing some of these components. If we fail to find alternative sources, redesign our products or otherwise manage this transition effectively, our business would be adversely impacted. If additional single source suppliers decide 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 and our business could be adversely affected. 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. We have recently experienced factory disruptions at certain of our U.K. and China facilities. If our production activities at any of our manufacturing facilities were again disrupted, including by mandatory power consumption reductions, natural disasters or other weather events, health epidemics, acts of terrorism or otherwise, our operations would be negatively impacted until we could establish alternative production and service operations. Significant production difficulties could also 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 make decisions to consolidate or move certain of our manufacturing facilities, or otherwise move our production of certain products to another facility, including the ongoing move of our air bearing spindles manufacturing from one of our U.K. sites to our facility in China and the ongoing move of our beryllium mirror manufacturing operation to a new facility within the U.K. 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 and customs delays, travel and technology restrictions, tax issues, 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 regulations, which may impede or hinder the approval, certification or sale of our products and, in some cases, may ultimately result in an inability to obtain approval or certification of certain products or may result in the recall or seizure of previously approved or certified 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, medical devices must comply with the EU Medical Devices Regulation (Regulation (EU) No 2017/745). To demonstrate compliance with the general safety and performance requirements, medical devices must undergo a conformity assessment procedure, which varies according to the type of medical device and its risk classification. Except for low risk medical devices (Class I), where the manufacturer can self-assess the conformity of its products with the general safety and performance requirements (except for any parts which relate to sterility, metrology or reuse aspects), a conformity assessment procedure requires the intervention of a notified body. Compliance with these requirements is a prerequisite to be able to affix the European Conformity ("CE") mark to medical devices, without which they cannot be sold or marketed in the EU. The process of obtaining marketing approval, certification 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 or certified in order for us to continue selling our products in those countries. There can be no assurance that we will receive the required approvals or certification for new products or modifications to existing products on a timely basis or that any approval or certification will not be subsequently withdrawn or conditioned upon extensive post-market study requirements.

The FDA and other worldwide regulatory agencies actively monitor compliance with local laws and regulations through review, inspection and audit of design and manufacturing practices, recordkeeping, reporting of adverse events, labeling and promotional practices. The FDA and other regulatory agencies worldwide 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 and other worldwide regulatory agencies 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. Similar requirements apply in foreign jurisdictions. 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, approvals or certifications, 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. For instance, the landscape concerning medical devices in the EU recently evolved. On May 25, 2017, the EU Medical Devices Regulation entered into force, which repeals and replaces the EU Medical Devices Directive and the Active Implantable Medical Devices Directive. Unlike directives, which must be implemented into the national laws of the EU member states, 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 Medical Devices Regulation is intended to establish a uniform regulatory framework across the EU for medical devices. These modifications may have an effect on the way we intend to develop our business in the EU and EEA.

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, approvals or certification, 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 or certification on a timely basis, suspensions of regulatory clearances or certifications, seizures or recalls of products, physician advisories or other field actions, or the withdrawal of product approval or certification by the FDA or other 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. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it to be deemed to have committed a violation;
- federal civil and criminal false claims laws, including the False Claims Act, 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. In addition, the government may assert that a claim including items or services resulting from a violation of the U.S. federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act;
- 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. Similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it to be deemed to have committed a violation;
- 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, which require manufacturers of drugs, devices, biologics, and medical supplies to report annually to Centers for Medicare & Medicaid Services (the "CMS") information related to (i) payments and other transfers of value to physicians (as defined by statute), certain other healthcare providers (beginning in 2022), and teaching hospitals, and (ii) ownership and investment interests held by physicians and their immediate family members;
- state and foreign law equivalents of each of the above federal laws, such as (i) anti-kickback and false claims laws that may apply to items or services reimbursed by any third-party payors, including commercial insurers; (ii) 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 restricted payments that may be made to healthcare providers and other potential referral sources; (iii) 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 (iv) 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 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.

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

We rely on centralized information systems to keep financial records, process orders, manage inventory, process shipments to customers, and operate other critical functions. We often need to upgrade our information technology infrastructure, including implementing new or upgrading existing 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 proficient in 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 new or upgraded 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, 2021, we had $700.5 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.

Our reliance upon OEM customers subjects us to credit, inventory, business concentration, and business failure risks beyond our control.

Our sales 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.

Increasing scrutiny and changing expectations from investors, customers, and governments with respect to Environmental, Social and Governance ("ESG") policies and practices may cause us to incur additional costs or expose us to additional risks.

There has been increasing public focus and scrutiny from investors, governmental and nongovernmental organizations, and customers on corporate ESG practices. We are making efforts to respond to public expectations and to demonstrate our commitment to sustainability and sound ESG policies and practices. However, our ESG practices may not meet the standards of all of our stakeholders and advocacy groups may campaign for further changes. Many of our large, global customers are also committing to long-term targets to reduce greenhouse gas emissions within their supply chains. If we are unable to support customers in achieving these reductions, we may lose revenue if our customers find other suppliers who are better able to support such reductions. A failure, or perceived failure, to respond to expectations of all parties could cause harm to our business and reputation and have a negative impact on the market price of our common shares. New government regulations could also result in new environmental regulations and new or more stringent forms of ESG oversight and disclosures which may lead to increased expenditures for sustainability initiatives. In addition, concern over climate change and sustainability has led to foreign and domestic legislative and regulatory initiatives directed at limiting carbon dioxide and other greenhouse gas emissions. We may experience increased costs in order to execute upon our sustainability goals and comply with future climate-change related government mandates as well as environmental protection laws, which could have an adverse impact on our results of operations and financial condition. 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.

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.

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, the need to invest in cloud-based enterprise resource planning systems and other digital technology platforms to help accelerate the growth of our businesses, 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, 2021, we had outstanding debt of $438.6 million under our amended and restated senior secured credit agreement (as amended, the “Third Amended and Restated Credit Agreement”) and $348.4 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, 2021, we had $438.6 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, as amended, 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.

General Risk Factors

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;
- trading phenomena such as "short squeeze"; 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.

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 with varying tax rates, (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.

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.

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, 2021, it is possible that material weaknesses may be identified in the future.

As part of our growth strategy, we intend to 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. Additionally, we may need to improve our internal

control or those of any business we acquire. This could result in significant costs to us and could require us to divert substantial resources.

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, 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 our business and the trading price of our common shares. 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.

Item 1B. ***Unresolved Staff Comments***

None.

Item 2. ***Properties***

Our principal owned and leased properties as of December 31, 2021 are listed in the table below.

Location	Principal Use	Current Segment	Approximate Space (in 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
Apex, North Carolina United States	Manufacturing, R&D, Marketing, Sales and Administration	Precision Motion	138,000	Leased; expires in 2028
Ludwigsstadt Germany	Manufacturing	Vision	105,000	Owned
Wackersdorf Germany	Manufacturing, R&D, Marketing, Sales and Administration	Photonics	68,000	Owned
Mukilteo, Washington United States	Manufacturing, R&D, Marketing, Sales and Administration	Photonics	63,000	Owned
Syracuse, New York United States	Manufacturing, R&D, Marketing, Sales and Administration	Vision	55,000	Leased; expires in 2029
Suzhou, Jiangsu Province People's Republic of China	Manufacturing, R&D, Marketing, Sales and Administration	Photonics, Vision & Precision Motion	55,000	Leased; expires in 2023

Additional manufacturing, research and development, sales, service and logistics sites are located in California, Connecticut, Florida, Michigan, New York, and Oregon within the United States, and in China, Czech Republic, Germany, Italy, Japan, Mexico, Spain and United Kingdom. These additional facilities cover approximately 530,000 square feet, of which approximately 420,000 square feet are leased and approximately 110,000 square feet are owned. These facilities 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 or in finding alternative facilities. We believe all 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. See Note 17 to Consolidated Financial Statements for additional information about legal proceedings involving the Company.

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 ticker symbol "NOVT".

Holders

As of the close of business on February 21, 2022, there were approximately 32 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.

Recent Sales of Unregistered Securities

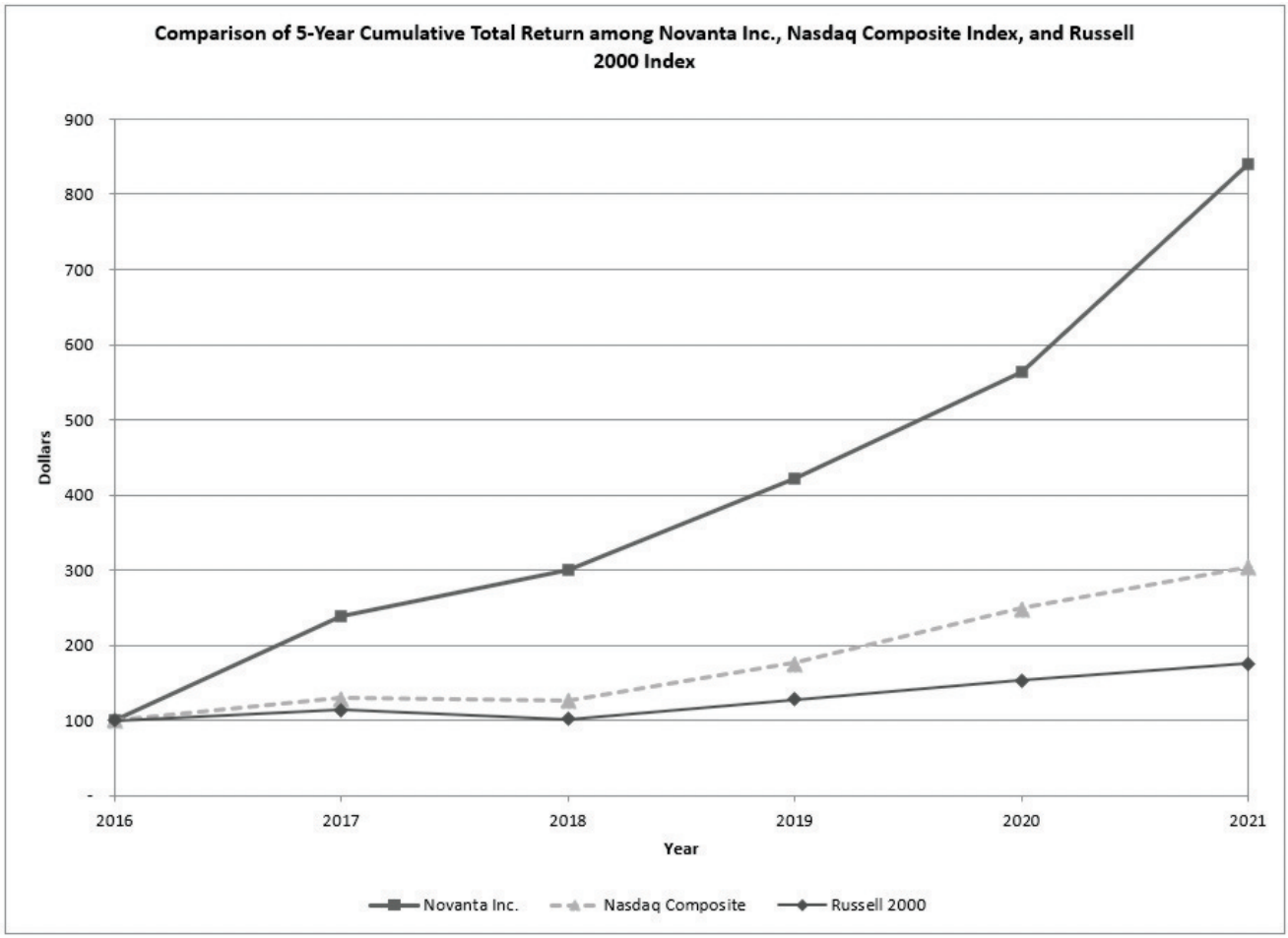
None

Purchases of Equity Securities by the Issuer and Affiliated Purchaser

In October 2018, the Company's Board of Directors approved a share repurchase plan (the "2018 Repurchase Plan"), authorizing the repurchase of up to $25.0 million worth of the Company's common shares. In February 2020, the Company's Board of Directors approved a new share repurchase plan (the "2020 Repurchase Plan"), authorizing the repurchase of up to an additional $50.0 million worth of the Company's common shares. While these share repurchase plans are intended to generally offset dilutions from equity awards granted to our employees and directors, we are not obligated to acquire any particular amount of our common shares. No time limit was set for the completion of these share repurchase plans, and the plans may be suspended or discontinued at any time. As of December 31, 2021, the Company had $59.5 million available for future share repurchases under these share repurchase plans. The Company did not repurchase any shares during the quarter ended December 31, 2021.

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, 2016 through December 31, 2021. The comparison assumes an investment of $100 was made on December 31, 2016 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, 2016	December 31, 2017	December 31, 2018	December 31, 2019	December 31, 2020	December 31, 2021
Novanta Inc.	$ 100.00	$ 238.10	$ 300.00	$ 421.14	$ 562.95	$ 839.67
Nasdaq Composite Index	$ 100.00	$ 129.64	$ 125.96	$ 176.28	$ 249.51	$ 304.85
Russell 2000 Index [1]	$ 100.00	$ 114.68	$ 102.02	$ 128.06	$ 153.62	$ 176.39

[1] Copyright © Russell Investments 2021. All rights reserved.

Item 6. ***[Reserved]***

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, anticipated impacts of the COVID-19 pandemic on our business, our financial results and our financial condition; 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, including supply chain disruptions and constraints and inflationary pressures; 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 and 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, including environmental requirements, and our compliance thereto; and other statements that are not historical facts. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of various important factors, including those set forth in Item 1A of this Annual Report on Form 10-K under the heading "Risk Factors." The words "anticipates," "believes," "expects," "intends," "future," "estimates," "plans," "could," "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, 2021, the medical market accounted for approximately 52% 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, 2021, the advanced industrial market accounted for approximately 48% 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 functionality to long life-cycle OEM customer platforms in attractive medical and advanced industrial niche markets;
- improving our business mix to increase medical sales as a percentage of total revenue by:
  - introducing new products aimed at attractive medical applications, such as minimally invasive and robotic surgery, ophthalmology, patient monitoring, drug delivery, clinical laboratory testing and life science equipment;
  - deepening our key account management relationships with and driving cross selling of our product offerings to leading medical equipment manufacturers; and
  - pursuing complementary medical technology acquisitions;
- increasing our penetration of high growth advanced industrial applications, such as laser materials processing, intelligent end-of-arm robotic technology solutions, 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;
- 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

Acquisition of ATI Industrial Automation, Inc.

On August 30, 2021, we acquired 100% of the outstanding shares of ATI Industrial Automation, Inc. ("ATI"), an Apex, North Carolina-based leading supplier of intelligent end-of-arm technology solutions to OEMs for advanced industrial and surgical robots for an upfront cash purchase price of $169.2 million, net of cash acquired and estimated working capital adjustments, and $44.0 million estimated fair value of contingent consideration. The contingent consideration will be payable in 2022 based on a multiple of the standalone ATI Adjusted EBITDA, as defined in the purchase and sale agreement, for the fiscal year ended December 31, 2021. The initial cash purchase price was financed with borrowings under our revolving credit facility and cash available on hand. We expect that the addition of ATI will complement and add intelligent technology solutions to further expand our position in mission critical robotic applications within the Precision Motion reportable segment.

Acquisition of Schneider Electric Motion USA, Inc.

On August 31, 2021, we acquired 100% of the outstanding shares of Schneider Electric Motion USA, Inc. ("SEM"), a Marlborough, Connecticut-based manufacturer of integrated motion control solutions and electronic controls for automation equipment for a total cash purchase price of $114.7 million, inclusive of post-closing working capital adjustments and net of cash acquired. The acquisition was financed with borrowings under our revolving credit facility. We expect that the addition of SEM will complement and expand our presence in life science applications and solutions for industrial automation applications within the Precision Motion reportable segment.

Impact of COVID-19 on Our Business

In response to the COVID-19 pandemic, we have taken proactive, aggressive actions to protect the health and safety of our employees. We established steering committees at both the corporate level and at each of our major facilities to provide leadership for and manage our COVID-19 risk mitigation actions and countermeasures. We established rigorous safety measures in all of our facilities and have adapted our COVID-19 safety measures as the pandemic and related government mandates evolved over the past two years. We expect to continue some of these measures until we determine that the COVID-19 pandemic is adequately contained for purposes of our business. We may take further actions as government authorities require or recommend or as we determine to be in the

best interest of our employees. In connection with our COVID-19 remediation actions, we have incurred additional costs to protect the health of our employees, including investments in technologies and monitoring equipment, weekly testing of unvaccinated employees for COVID-19 at certain locations and rearranging some of our facilities to accommodate social distancing and flexible post-pandemic work environment.

Even as governmental restrictions are relaxed and economies gradually, partially or fully, reopen, the ongoing economic impacts and health concerns associated with COVID-19 may continue to affect our business for the foreseeable future.

Through December 31, 2021, we have experienced disruptions to our supply chain as a result of the COVID-19 pandemic and global electronics and other raw material shortages. While we regularly monitor the manufacturing output of companies in our supply chain, disruptions to our suppliers and/or sub-suppliers caused by these events could further challenge our ability to obtain raw materials or components required to manufacture our products, adversely affecting our operations and customer relationships.

To mitigate the risk of any potential supply interruptions from the COVID-19 pandemic and the global electronics and other raw material shortages, we are identifying alternative suppliers and distributors, sourcing raw materials from different supplier and distributor locations, modifying our product designs to allow for alternative components to be used where feasible without compromising quality, performance or other requirements, in-sourcing production of parts where feasible, and taking other actions to ensure a sustainable supply of raw materials. Despite of our mitigation actions, if certain suppliers cannot produce a key part or component for us, or if the receipt of certain materials is otherwise delayed, we may miss our scheduled shipment deadlines and our relationship with customers may be harmed.

Additionally, restrictions on or disruptions of transportation, such as reduced availability of air transports, port closures and backlogs, and increased border controls or closures, have resulted in higher costs and delays, both for obtaining raw materials from suppliers and for shipping finished products to customers.

The COVID-19 pandemic and the global electronics and other raw material shortages have caused inflationary pressures on the market prices for certain of our parts and primary raw materials as well as increases in the costs of labor, freight, packaging, energy and other consumables that are used in our manufacturing processes. We have generally been able to offset increases in these costs through various productivity and cost reduction initiatives, as well as adjusting our selling prices to pass through some of these higher costs to our customers; however, our ability to raise our selling prices depends on market conditions and competitive dynamics. Given the timing of our actions compared to the timing of these inflationary pressures, there may be periods during which we are unable to fully recover the increases in our costs.

Overview of Financial Results

Total revenue for 2021 was $706.8 million, an increase of $116.2 million, or 19.7%, versus 2020. This increase was primarily due to increased demand in the advanced industrial market related to microelectronics and increases in industrial manufacturing spending as compared to 2020, which was impacted by COVID-19, as well as revenue from current year acquisitions. The effect of our current year acquisitions resulted in an increase in revenue of $43.2 million, or 7.3%. In addition, foreign exchange rates positively impacted our revenue by $12.5 million, or 2.1%, in 2021.

Operating income for 2021 was $64.1 million, an increase of $8.2 million, or 14.6%, versus 2020. This increase was primarily attributable to an increase in gross profit of $55.8 million mostly attributable to higher revenue, partially offset by an increase in research and development and engineering (“R&D”) expenses of $11.5 million, selling, general and administrative (“SG&A”) expenses of $19.3 million and restructuring, acquisition, and related charges of $14.2 million.

Basic earnings per common share (“basic EPS”) of $1.42 in 2021 increased $0.15 from the basic EPS of $1.27 in 2020. Diluted earnings per common share (“diluted EPS”) of $1.41 in 2021 increased $0.16 from the diluted EPS of $1.25 in 2020. The increase of basic EPS and diluted EPS was primarily attributable to an increase in operating income offset by the increase of income tax provision.

Specific components of our operating results for 2021 and 2020 are further discussed below.

Results of Operations

Information pertaining to fiscal year 2019 results of operations, including a year-over-year comparison with fiscal year 2020, was included in our Annual Report on Form 10-K for the year ended December 31, 2020 under Part II, Item 7, “Management’s Discussion and Analysis of Financial Position and Results of Operations,” which was filed with the SEC on March 1, 2021.

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

	2021	2020
Revenue	100.0%	100.0%
Cost of revenue	57.5	58.6
Gross profit	42.5	41.4
Operating expenses:		
Research and development and engineering	10.3	10.3
Selling, general and administrative	18.3	18.6
Amortization of purchased intangible assets	2.3	2.4
Restructuring and acquisition related costs	2.5	0.6
Total operating expenses	33.4	31.9
Operating income	9.1	9.5
Interest income (expense), net	(1.0)	(1.1)
Foreign exchange transaction gains (losses), net	(0.0)	(0.2)
Other income (expense), net	(0.1)	0.0
Income before income taxes	7.9	8.2
Income tax provision	0.8	0.7
Consolidated net income	7.1%	7.5%

Revenue

The following table sets forth external revenue by reportable segment for 2021 and 2020 (dollars in thousands):

	2021	2020	% Change 2021 vs. 2020
Photonics	$ 232,459	$ 199,613	16.5%
Vision	262,060	261,650	0.2%
Precision Motion	212,274	129,360	64.1%
Total	$ 706,793	$ 590,623	19.7%

Photonics

Photonics segment revenue in 2021 increased by $32.8 million, or 16.5%, versus 2020, primarily due to increased demand in the advanced industrial market as a result of increases in industrial manufacturing spending as compared to 2020, which was impacted by COVID-19 pandemic.

Vision

Vision segment revenue in 2021 increased by $0.4 million, or 0.2%, versus 2020, primarily flat due to consistent customer demand dynamics from our minimally invasive surgery (“MIS”) products as a result of deferrals of elective surgical procedures during the COVID-19 pandemic.

Precision Motion

Precision Motion segment revenue in 2021 increased by $82.9 million, or 64.1%, versus 2020, primarily due to an increase in demand in advanced industrial market and certain medical robotic applications as well as an aggregate of $43.2 million revenue contributions from the ATI and SEM acquisitions.

Gross Profit

The following table sets forth the gross profit and gross profit margin for each of our reportable segments for 2021 and 2020 (dollars in thousands):

	2021	2020
Gross profit:		
Photonics	$ 107,993	$ 89,060
Vision	100,890	100,267
Precision Motion	99,345	58,279
Unallocated Corporate and Shared Services	(7,900)	(3,089)
Total	$ 300,328	$ 244,517
Gross profit margin:		
Photonics	46.5%	44.6%
Vision	38.5%	38.3%
Precision Motion	46.8%	45.1%
Total	42.5%	41.4%

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 2021 increased $18.9 million, or 21.3%, versus 2020, primarily due to an increase in both revenue and gross profit margin. Photonics segment gross profit margin was 46.5% for 2021, versus a gross profit margin of 44.6% for 2020. The increase in gross profit margin was primarily attributable to higher factory utilization associated with higher production volumes.

Vision

Vision segment gross profit for 2021 increased $0.6 million, or 0.6%, versus 2020, primarily flat due to consistent customer demand dynamics from our MIS products as a result of deferrals of elective surgical procedures during the COVID-19 pandemic. Vision segment gross profit margin was 38.5% for 2021, compared with a gross profit margin of 38.3% for 2020.

Precision Motion

Precision Motion segment gross profit for 2021 increased $41.1 million, or 70.5%, versus 2020, primarily due to an increase in both revenue and gross profit margin. Precision Motion segment gross profit margin was 46.8% for 2021, compared with a gross profit margin of 45.1% for 2020. The increase in gross profit margin was primarily attributable to higher factory utilization associated with higher production volumes and favorable year over year comparison due to higher inventory obsolescence in the prior year, offset by higher purchased intangible asset amortization of $2.5 million and an increase in the amortization of acquisition inventory fair value adjustments of $1.4 million.

Operating Expenses

The following table sets forth operating expenses for 2021 and 2020 (dollars in thousands):

	2021	2020	% Change 2021 vs. 2020
Research and development and engineering	$ 72,522	$ 60,996	18.9%
Selling, general and administrative	129,155	109,853	17.6%
Amortization of purchased intangible assets	16,577	13,970	18.7%
Restructuring and acquisition related costs	18,020	3,810	373.0%
Total	$ 236,274	$ 188,629	25.3%

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 $72.5 million, or 10.3% of revenue, in 2021, versus $61.0 million, or 10.3% of revenue, in 2020. R&D expenses increased in terms of total dollars primarily due to higher compensation related expenses and R&D expenses from acquisitions.

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 $129.2 million, or 18.3% of revenue, in 2021, versus $109.9 million, or 18.6% of revenue, in 2020. SG&A expenses increased in terms of total dollars primarily due to the re-establishment of employee bonus plans in 2021 and other compensation related increases, and SG&A expenses from acquisitions.

Amortization of Purchased Intangible Assets

Amortization of purchased intangible assets is charged to our Photonics, Vision and Precision Motion segments. Amortization of developed 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 $16.6 million, or 2.3% of revenue, in 2021, versus $14.0 million, or 2.4% of revenue, in 2020. The increase in terms of total dollars was the result of more acquired intangible assets from current year acquisitions.

Restructuring, Acquisition, and Related Costs

Restructuring, acquisition, and 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 $18.0 million in 2021, versus $3.8 million in 2020. The increase in restructuring, acquisition, and related costs versus the prior year was primarily due to an increase in acquisition related professional service fees of $5.4 million, acquisition related contingent consideration increase of $4.9 million primarily as result of a reduction in the fair value of contingent considerations in 2020, and restructuring costs of $3.9 million primarily related to the 2020 restructuring plan.

Operating Income (Loss) by Segment

The following table sets forth operating income (loss) by segment for 2021 and 2020 (in thousands):

	2021	2020
Operating Income (Loss)		
Photonics	$ 46,792	$ 34,001
Vision	17,694	16,354
Precision Motion	52,676	31,663
Unallocated Corporate and Shared Services	(53,108)	(26,130)
Total	$ 64,054	$ 55,888

Photonics

Photonics segment operating income was $46.8 million, or 20.1% of revenue, in 2021, versus $34.0 million, or 17.0% of revenue, in 2020. The increase in operating income was primarily due to an increase in gross profit of $18.9 million, partially offset by increases in R&D spending of $2.2 million and restructuring, acquisition, and related charges of $4.7 million.

Vision

Vision segment operating income was $17.7 million, or 6.8% of revenue, in 2021, versus $16.4 million, or 6.3% of revenue, in 2020. The increase in operating income was primarily due to an increase in gross profit of $0.6 million, a decrease in SG&A expenses of $1.7 million, and a decrease in restructuring, acquisition, and related charges of $1.4 million, partially offset by an increase in R&D expenses of $2.6 million.

Precision Motion

Precision Motion segment operating income was $52.7 million, or 24.8% of revenue, in 2021, versus $31.7 million, or 24.5% of revenue, in 2020. The increase in operating income was primarily due to an increase in gross profit of $41.1 million, partially offset by an increase in restructuring, acquisition, and related charges of $5.8 million, R&D spending of $6.8 million, SG&A expense of $5.2 million and amortization of purchased intangible assets expense of $2.3 million.

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 2021 increased by $27.0 million, or 103.2%, from 2020, primarily due to an increase in SG&A spending of $17.1 million mostly related to the re-establishment of employee bonus plans in 2021 and other compensation related increases, an increase in acquisition related costs of $5.3 million and an increase in costs related to COVID-19 testing for employees of $3.3 million included in cost of revenue.

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 2021 and 2020 (in thousands):

	2021	2020
Interest income (expense), net	$ (7,387)	$ (6,564)
Foreign exchange transaction gains (losses), net	$ (127)	$ (942)
Other income (expense), net	$ (368)	$ 21

Interest Income (Expense), Net

Net interest expense was $7.4 million in 2021 versus $6.6 million in 2020. The increase in net interest expense was primarily due to an increase in average debt levels offset by a decrease in the weighted average interest rate on our senior credit facilities. The weighted average interest rate on our senior credit facilities was 2.16% and 2.32% during 2021 and 2020, respectively. Included in net interest expense was non-cash interest expense of approximately $1.2 million and $1.0 million in 2021 and 2020, respectively, related to the amortization of deferred financing costs on our debt.

Foreign Exchange Transaction Gains (Losses), Net

Foreign exchange transaction gains (losses), net, were $0.1 million of net losses in 2021 versus $0.9 million of net losses in 2020, primarily due to changes in the value of the U.S. Dollar against the British Pound and the Euro and net realized gains from foreign currency contracts.

Other Income (Expense), Net

Net other expense was nominal in both 2021 and 2020.

Income Tax Provision

We recorded a tax provision of $5.8 million in 2021, compared to a tax provision of $3.9 million in 2020. The effective tax rate for 2021 was 10.4% of income before income taxes, compared to an effective tax rate of 8.0% of income before income taxes for 2020. Our effective tax rate for 2021 differed from the Canadian statutory rate of 29.0% primarily due to the mix of income earned in jurisdictions with varying tax rates, $2.6 million benefit from U.K. patent box deductions, $5.1 million benefit from share-based compensation, $1.4 million benefit from R&D and other tax credits, and $1.2 million benefit for foreign derived intangible income, partially offset by $1.1 million detriment related to disallowed compensation, and a $0.9 million detriment on the establishment of a valuation allowance recorded on net operating losses and other timing items in certain tax jurisdictions.

Our effective tax rate for 2020 differed from the Canadian statutory rate of 29.0% primarily due to the mix of income earned in jurisdictions with varying tax rates, $1.3 million benefit from U.K. patent box deductions, $2.3 million benefit from share-based compensation, $0.7 million release of a portion of the valuation allowance on our deferred tax assets in Canada, $2.0 million of R&D and other tax credits, $1.1 million of estimated deductions for foreign derived intangible income, and $1.5 million benefit from the

reduction in fair value of non-deductible acquisition contingent consideration liabilities, offset by miscellaneous other items such as foreign withholding taxes and impact of changes in statutory tax rates on our deferred tax attributes.

On March 27, 2020, the U.S. federal government enacted the CARES Act in response to the COVID-19 pandemic. The CARES Act is an emergency economic stimulus package which, among other things, contains numerous provisions concerning income taxes. The CARES Act did not have a material impact on our income taxes or related disclosures.

Net Income

The consolidated net income was $50.3 million for the year ended December 31, 2021, compared to $44.5 million for the year ended December 31, 2020, reflecting the impact of the factors described above.

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 payments. 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 any future capital expenditures and other liquidity needs. In addition, we have the ability to expand our borrowing capacity by up to $200.0 million by exercising the accordion feature under our revolving credit agreement. We may seek to raise additional capital, which could be in the form of bonds, convertible debt or preferred or common 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. There is no assurance that such capital will be available on reasonable terms or at all.

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, risks associated with events outside of our control, such as economic consequences of the COVID-19 pandemic, worsening supply chain disruptions and electronics and other material shortages, 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, 2021, $77.3 million of our $117.4 million cash and cash equivalents was held by our subsidiaries outside of North America. 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 $164.6 million of our outstanding borrowings under our senior credit facilities were held in our subsidiaries outside of North America as of December 31, 2021. Additionally, we may use intercompany loans to address short-term cash flow needs from various subsidiaries.

We deferred $2.8 million of U.S. payroll tax payments in 2020 in accordance with relief provisions under the CARES Act. We paid $1.4 million of such deferred payroll tax payments during 2021. As permitted under the CARES Act, we expect to pay the remaining $1.4 million deferred U.S. payroll taxes by December 31, 2022.

In May 2021, our shareholders approved a special resolution to amend the Company’s articles to authorize up to 7.0 million preferred shares for future issuance. Our Board of Directors may designate and issue one or more series of preferred shares in order to raise additional capital, provided that no shares of any series may be entitled to more than one vote per share. As of December 31, 2021, no preferred shares were issued and outstanding.

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. We had $9.5 million available for share repurchases under the 2018 Repurchase Plan as of December 31, 2021. No Shares were purchased under the 2018 Repurchase Plan during the year ended December 31, 2021.

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, effective after the 2018 Repurchase Plan is completed. No shares have been repurchased under the 2020 Repurchase plan to date.

Senior Credit Facilities

In December 2019, we entered into the Third Amended and Restated Credit Agreement, originally 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 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.

On March 27, 2020, we entered into the First Amendment to the Third Amended and Restated Credit Agreement and exercised a portion of the uncommitted accordion feature. The First Amendment increased the revolving credit facility commitment under the Third Amended and Restated Credit Agreement by $145.0 million, from $350.0 million to $495.0 million, and reset the uncommitted accordion feature to $200.0 million for potential future expansion.

On June 2, 2020, we entered into the Second Amendment to the Third Amended and Restated Credit Agreement. The Second Amendment revised our consolidated leverage ratio definition (as defined in the Third amended and Restated Credit Agreement) allowing for the use of up to $25 million unrestricted cash and cash equivalents as a reduction to consolidated funded indebtedness (as defined in the Third amended and Restated Credit Agreement).

On October 5, 2021, we entered into the Fourth Amendment to the Third Amended and Restated Credit Agreement to exercise the accordion feature. The Fourth Amendment increased the revolving credit facility commitment under the Third Amended and Restated Credit Agreement by $200.0 million, from $495.0 million to $695.0 million, and reset the uncommitted accordion feature to $200.0 million for potential future expansion.

As of December 31, 2021, we had $92.0 (€81.1) million term loan and $346.6 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. As of December 31, 2021, we had outstanding borrowings under the Third Amended and Restated Credit Agreement denominated in Euro and U.S. Dollars of $164.6 million and $274.0 million, respectively.

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, 2021:

	Requirement	Actual December 31, 2021
Maximum consolidated leverage ratio	3.50	2.48
Minimum consolidated fixed charge coverage ratio	1.50	12.20

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 $117.4 million at December 31, 2021, versus $125.1 million at December 31, 2020. The net decrease in cash and cash equivalents is primarily attributable to cash considerations paid for the ATI and SEM acquisitions of $284.7 million (net of cash acquired of $14.6 million), $32.4 million of debt repayments, $30.8 million of employee payroll withholding tax payments upon vesting of share-based compensation awards, $20.0 million capital expenditures, and $8.7 million payment for the purchase of a building under a finance lease agreement. These cash outflows were partially offset by borrowings under our revolving credit facility of $280.0 million used to fund the cash considerations paid for the ATI and SEM acquisitions and cash provided by operating activities of $94.6 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):

	2021	2020
Cash and cash equivalents, end of year	$ 117,393	$ 125,054
Net cash provided by operating activities	$ 94,625	$ 140,239
Net cash used in investing activities	$ (306,704)	$ (13,156)
Net cash provided by (used in) financing activities	$ 204,753	$ (84,357)
Unused borrowing capacity available under revolving credit facility, end of year	$ 348,421	$ 395,239

Operating Cash Flows

Cash provided by operating activities was $94.6 million in 2021, versus $140.2 million in 2020. Cash provided by operating activities decreased from the prior year primarily due to an increase in accounts receivable and inventories due to increases in revenue and demand, and an $8.3 million payment in accordance with an acquisition earnout arrangement that was recorded as compensation, partially offset by an increase in days payables outstanding and substantially no bonus payout in 2021 as a result of the elimination of our 2020 annual employee cash bonus plan which was replaced with a special one-time restricted stock unit grant to employees in April 2020.

Cash provided by operating activities for 2020 was positively impacted by an increase in our inventory turnover ratio from 3.1 at December 31, 2019 to 3.7 at December 31, 2020 and a decrease in accounts receivable, offset by a decrease in our days payables outstanding which decreased from 53 days at December 31, 2019 to 45 days at December 31, 2020. During 2020, we paid the 2019 annual employee cash bonuses which had been accrued for as of December 31, 2019.

Investing Cash Flows

Cash used in investing activities was $306.7 million in 2021, primarily driven by the ATI and SEM acquisitions. In connection with these acquisitions, we paid cash considerations of $284.7 million (net of cash acquired of $14.6 million). We also paid capital expenditures of $20.0 million and a contingent consideration payment of $2.2 million related to our 2016 asset acquisition of video signal processing and management technologies.

Cash used in investing activities was $13.2 million in 2020, primarily driven by capital expenditures of $10.5 million and a contingent consideration payment of $2.6 million related to our 2016 asset acquisition of video signal processing and management technologies.

We have no material commitments to purchase property, plant and equipment as of December 31, 2021. We expect to use approximately $25 million to $30 million in 2022 for capital expenditures related to investments in new property, plant and equipment for our existing businesses.

Financing Cash Flows

Cash provided by financing activities was $204.8 million in 2021, primarily due to $280.0 million of borrowings under our revolving credit facility used to fund the cash considerations paid for the ATI and SEM acquisitions, partially offset by $32.4 million of term loan and revolving credit facility repayments, $30.8 million of payroll tax payments upon vesting of share-based compensation awards, an $8.7 million payment for the purchase of a building under a finance lease agreement, and $1.8 million of contingent consideration payments related to prior year acquisitions.

Cash used in financing activities was $84.4 million in 2020, primarily due to $35.4 million in repayments of borrowings under our Senior Credit Facilities, $31.0 million payments of deferred and escrowed purchase price related to prior year acquisitions, $8.6 million of employee payroll withholding tax payments upon vesting of share-based compensation awards, $5.5 million of repurchases of common shares, and $1.6 million of fees paid in connection with the First Amendment to our Third Amended and Restated Credit Agreement.

In 2022, we are contractually required to make $5.1 million in repayments under our term loan facility. In addition, we may make optional repayments under 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 (the "U.K. Plan") in Novanta Technologies UK Limited, a wholly owned subsidiary of the Company. 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 participants' 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.

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 rates, 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, 2021, the fair value of plan assets exceeded the projected benefit obligation under the U.K. Plan by $2.8 million. Based on the results of the most recent funding valuation, our annual funding contributions are expected to be approximately $1.1 million in 2022 and will increase by 2.9% per year until the next statutory funding valuation date in 2024.

Material Cash Requirements

Senior Credit Facilities

As of December 31, 2021, we had $92.0 million (€81.1 million) term loan and $346.6 million revolving credit facility borrowings outstanding under the Senior Credit Facilities. The term loan is payable in quarterly installments of approximately €1.1 million ($1.3 million) with the final installment of €68.7 million ($77.9 million) due upon maturity in December 2024. Borrowings under the revolving credit facility are due at maturity in December 2024.

As of December 31, 2021, the future interest payments under our Senior Credit Facilities are expected to be approximately $33.2 million, with $11.5 million payable within the next twelve months. These estimates are based on current interest rates on floating rate obligations, as defined in the Third Amended and Restated Credit Agreement, for the remainder of the contractual life of both the term loan and outstanding borrowings under the revolving credit facility, and the current commitment fee rate was used for the unused commitments under revolving credit facility as of December 31, 2021. See Note 11, "Debt," in the Consolidated Financial Statements for further details of our debt obligations and the timing of expected future payments.

Operating and Finance Leases

We entered into various lease agreements for office and manufacturing facilities, vehicles, and equipment used in the normal course of business. Undiscounted operating and finance lease obligations were $74.3 million, with $10.1 million payable within 12

months. See Note 12, "Leases," in the Consolidated Financial Statements for further details of our obligations and the timing of expected future payments.

Purchase Obligations

Purchase obligations represent an estimate of all open purchase orders and contractual obligations in the ordinary course of business for which we have not received the goods or services. As of December 31, 2021, we had $169.6 million of purchase obligations, with $167.1 million payable within the next twelve months.

Contingent Consideration and Earn-outs

As of December 31, 2021, total estimated payments for contingent considerations and earn-outs accrued for in the consolidated balance sheet amounted to $50.9 million, with $47.5 million estimated payments due within the next twelve months. See Note 7, "Fair Value Measurements", in the Consolidated Financial Statements for further information related to the fair values of our obligations under the contingent consideration and earn-out arrangements.

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. We recognize revenue in accordance with Accounting Standards Codification ("ASC") 606, "Revenue from Contracts with Customers". Under ASC 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 ASC 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 36 months. 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, customs duties and trade tariffs on imported materials and components, 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, storage, 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 operating income. If actual market conditions are more favorable than anticipated, inventory previously written down may be sold, resulting in lower cost of revenue and higher operating income 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. In addition to service-based awards granted to a wider employee base, we typically grant three types of performance-based awards to certain members of the executive management team: non-GAAP EPS performance-based restricted stock units ("EPS-PSUs"), operating cash flow performance-based restricted stock units ("OCF-PSUs"), and relative total shareholder return performance-based restricted stock units ("TSR-PSUs").

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 awards, net of estimated forfeitures.

For EPS-PSUs and OCF-PSUs, share-based compensation expenses are recognized ratably over the vesting period when it is probable that specified performance targets are expected to be achieved based on management's projections as of the end of each period. Management's projections are revised, if necessary, in subsequent periods when underlying factors change the estimated probability of achieving the performance targets as well as the levels 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 expenses associated with EPS-PSUs and OCF-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, share-based compensation expenses are recognized 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. Shared-based compensation expenses related to TSR-PSUs are 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 shareholder 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 estimated useful life assumptions for identifiable intangible assets, 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 levels 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 method 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 2021, using a quantitative assessment, noting no impairment. As of December 31, 2021, 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, 2021 (in thousands):

	Goodwill	Intangible Assets, net	Property, Plant & Equipment, net
Photonics	$ 112,103	$ 51,346	$ 38,102
Vision	128,953	51,992	29,942
Precision Motion	238,444	117,651	16,079
Unallocated Corporate and Shared Services	—	—	3,316
Total	$ 479,500	$ 220,989	$ 87,439

Contingent Considerations and Earnouts. We record contingent considerations and earnouts resulting from business combinations at fair value as of the acquisition date. Key assumptions used in the determination of the fair value of our contingent considerations include the following:

- future revenue projections and earnings before interest, depreciation, amortization and other agreed-upon adjustments as specified in the purchase and sale agreement ("Adjusted EBITDA");
- volatility of future revenue and Adjusted EBITDA; and
- discount rates used to present value the projected cash flows.

On a quarterly basis, we reassess these assumptions and record the necessary adjustments to fair value in the consolidated statement of operations. Changes to contingent consideration obligations can result from adjustments to future revenue and Adjusted EBITDA projections, volatility of future revenue and Adjusted EBITDA, and discount rates.

The assumptions used for the determination of the fair value of contingent considerations involve significant judgment, and changes in the underlying assumptions could have a material impact on the amount of contingent consideration expense recorded in any given period.

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 income tax return and financial 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, there is no assurance 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 2021, we recorded a valuation allowance of $0.9 million on net operating losses and other timing items in certain tax jurisdictions due to taxable income (losses) generated in both the current and future years.

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 outcomes 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, 2021, the total amount of unrecognized tax benefits was $4.8 million, of which $4.6 million would favorably affect the effective tax rate, if benefited. Over the next twelve months, we may need to reverse up to $0.5 million of previously recorded 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 recognized for financial reporting purposes over the tax basis of investments in foreign subsidiaries that are essentially permanent in nature. The excess 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 $266.1 million as of December 31, 2021. The estimated unrecognized income and foreign withholding tax liabilities on this temporary difference is approximately $4.0 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 statements. 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 a significant effect on us.

Item 7A. *Quantitative and Qualitative Disclosures about Market Risk*

We are exposed to market risks 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, Japanese Yen and Chinese Yuan. 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 $50.0 million and net fair value of less than $0.1 million as of December 31, 2021. A hypothetical 10% strengthening of the U.S. dollar against other currencies would result in an approximately $0.6 million increase in the net fair value of our foreign currency contracts as of December 31, 2021. By contrast, a hypothetical 10% weakening of the U.S. dollar against other currencies would result in an approximately $0.6 million decrease in the net fair value of our foreign currency contracts as of December 31, 2021.

Interest Rates

Our exposure to market risk associated with changes in interest rates relates primarily to our borrowings under our Senior Credit Facilities. We had $438.6 million of outstanding variable rate debt as of December 31, 2021. A 100 basis point increase in interest rates at December 31, 2021 would increase our annual pre-tax interest expense by approximately $4.4 million.

Item 8. ***Financial Statements and Supplementary Data***

NOVANTA INC.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Novanta Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Novanta Inc. and its subsidiaries (the "Company") as of December 31, 2021 and 2020, and the related consolidated statements of operations, of comprehensive income, of stockholders' equity and of cash flows for each of the three years in the period ended December 31, 2021, 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, 2021, 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, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021 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, 2021, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

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.

As described in Management's Annual Report on Internal Control over Financial Reporting, management has excluded ATI Industrial Automation, Inc. ("ATI") and Schneider Electric Motion USA, Inc. ("SEM") from its assessment of internal control over financial reporting as of December 31, 2021, because they were acquired by the Company in purchase business combinations during 2021. We have also excluded ATI and SEM from our audit of internal control over financial reporting. ATI and SEM are wholly-owned subsidiaries whose total assets and total revenues excluded from management's assessment and our audit of internal control over financial reporting represent approximately 5% and 1% of total assets, respectively and approximately 5% and 1% of total revenues, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2021.

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 ATI Industrial Automation, Inc. and Schneider Electric Motion USA, Inc. – Valuation of Developed Technologies and Customer Relationships Intangible Assets

As described in Note 4 to the consolidated financial statements, the Company completed the acquisitions of ATI Industrial Automation, Inc. (ATI) and Schneider Electric Motion USA, Inc. (SEM) in 2021. The acquisition of ATI resulted in a $23.9 million customer relationships intangible asset and a $19.8 million developed technologies intangible asset being recorded, and the acquisition of SEM resulted in a $41.7 million customer relationships intangible asset and a $9.1 million developed technologies intangible asset 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 intangible assets were based on valuations using an income approach, specifically the multi-period excess earnings method for customer relationships and the relief-from-royalty method for developed technologies. The process for estimating the fair values of these identifiable intangible assets requires the use of significant estimates and assumptions by management, including revenue growth rates, customer attrition rates, royalty rates, discount rates, technology obsolescence curves, and EBITDA margins.

The principal considerations for our determination that performing procedures relating to the valuation of the developed technologies and customer relationships intangible assets acquired in the ATI and SEM acquisitions is a critical audit matter are (i) the significant judgment by management when determining the fair value of the developed technologies and customer relationships assets, (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to revenue growth rates, royalty rates, discount rates, and technology obsolescence curves used in the valuation of the developed technologies intangible assets and the revenue growth rates, discount rates, customer attrition rates, and EBITDA margins used in the valuation of the customer relationships intangible assets, and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

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 (i) valuation of the developed technologies and customer relationships intangible assets and (ii) development of significant assumptions related to revenue growth rates, customer attrition rates, royalty rates, discount rates, technology obsolescence curves and EBITDA margins. These procedures also included, among others, (i) reading the purchase agreements and (ii) testing management's process for determining the fair value of the developed technologies and customer relationships intangible assets. Testing management's process included evaluating the appropriateness of the multi-period excess earnings and relief-from-royalty valuation methods, testing the completeness and accuracy of underlying data used by management, and evaluating the reasonableness of management's significant assumptions related to the revenue growth rates, royalty rates, discount rates, and technology obsolescence curves used in the valuation of the developed technologies intangible assets and the revenue growth rates, discount rates, customer attrition rates, and EBITDA margins used in the valuation of the customer relationships intangible assets. Evaluating the reasonableness of the revenue growth rates in the valuation of developed technologies and revenue growth rates, EBITDA margins, and customer attrition rates used in the valuation of the customer relationships involved considering the past performance of the acquired businesses, consistency with economic and industry forecasts, 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 appropriateness of the valuation methods and of the reasonableness of the royalty rates, discount rates, and technology obsolescence curves in the valuation of the developed technologies intangible assets and the customer attrition rates and discount rates used in the valuation of the customer relationships intangible assets.

Fair Value of the Contingent Consideration for ARGES GmbH Acquisition

As described in Notes 4 and 7 to the consolidated financial statements, the Company had $3.8 million of a contingent consideration liability as of December 31, 2021 related to the 2019 acquisition of ARGES GmbH. The contingent consideration payments are payable annually based on actual revenue achievement against certain revenue targets by the Company from August 2019 through December 2026. Management determines the estimated fair value of the contingent consideration liability using a Monte Carlo valuation method. The unobservable inputs used by management to determine the fair value of the contingent consideration liability included historical and projected revenues, revenue volatility, cost of debt, and the discount rate.

The principal considerations for our determination that performing procedures relating to the fair value of the contingent consideration for the ARGES GmbH acquisition is a critical audit matter are (i) the significant judgment by management when determining the fair value, (ii) a high degree of auditor judgment, subjectivity and effort in performing procedures and evaluating audit evidence relating to the Monte Carlo valuation method and evaluating management's significant assumptions related to the projected revenues, revenue volatility, and discount rate, and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

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 valuation of the contingent consideration, including controls over management’s valuation method and significant assumptions related to projected revenues, revenue volatility, and discount rate. These procedures also included, among others, (i) testing management’s process for determining the fair value of the contingent consideration, (ii) evaluating the appropriateness of the Monte Carlo valuation method, (iii) testing the completeness and accuracy of underlying data used by management, and (iv) evaluating the significant assumptions used by management related to the projected revenues, revenue volatility, and discount rate. Evaluating the assumptions related to projected revenues involved evaluating whether the assumptions used by management were reasonable considering the current and past performance of the acquired business, 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 the revenue volatility and discount rate assumptions.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
March 1, 2022

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, 2021	December 31, 2020
ASSETS		
Current Assets		
Cash and cash equivalents	$ 117,393	$ 125,054
Accounts receivable, net of allowance of $556 and $274, respectively	115,617	75,054
Inventories	125,657	92,737
Prepaid income taxes and income taxes receivable	1,997	3,203
Prepaid expenses and other current assets	13,161	8,125
Total current assets	373,825	304,173
Property, plant and equipment, net	87,439	78,676
Operating lease assets	48,338	34,444
Deferred tax assets	12,206	10,491
Other assets	5,586	2,894
Intangible assets, net	220,989	148,521
Goodwill	479,500	285,980
Total assets	$ 1,227,883	$ 865,179
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities		
Current portion of long-term debt	$ 5,097	$ 5,508
Accounts payable	68,514	42,966
Income taxes payable	4,514	5,787
Current portion of operating lease liabilities	7,334	6,188
Accrued expenses and other current liabilities	98,479	53,780
Total current liabilities	183,938	114,229
Long-term debt	429,361	194,927
Operating lease liabilities	45,700	32,802
Deferred tax liabilities	33,738	24,134
Income taxes payable	4,217	5,112
Other liabilities	9,638	17,166
Total liabilities	706,592	388,370
Commitments and Contingencies (Note 17)		
Stockholders' Equity:		
Preferred shares, no par value; Authorized shares: 7,000; No shares issued and outstanding	-	-
Common shares, no par value; Authorized shares: unlimited; Issued and outstanding: 35,601 and 35,163, respectively	423,856	423,856
Additional paid-in capital	53,768	58,992
Retained earnings	56,533	6,202
Accumulated other comprehensive loss	(12,866)	(12,241)
Total stockholders' equity	521,291	476,809
Total liabilities and stockholders' equity	$ 1,227,883	$ 865,179

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,		
	2021	2020	2019
Revenue	$ 706,793	$ 590,623	$ 626,099
Cost of revenue	406,465	346,106	364,014
Gross profit	300,328	244,517	262,085
Operating expenses:			
Research and development and engineering	72,522	60,996	55,965
Selling, general and administrative	129,155	109,853	118,407
Amortization of purchased intangible assets	16,577	13,970	15,857
Restructuring, acquisition and related costs	18,020	3,810	16,574
Total operating expenses	236,274	188,629	206,803
Operating income	64,054	55,888	55,282
Interest income (expense), net	(7,387)	(6,564)	(8,493)
Foreign exchange transaction gains (losses), net	(127)	(942)	(780)
Other income (expense), net	(368)	21	(243)
Income before income taxes	56,172	48,403	45,766
Income tax provision	5,841	3,882	4,993
Consolidated net income	$ 50,331	$ 44,521	$ 40,773
Earnings per common share (Note 9):			
Basic	$ 1.42	$ 1.27	$ 1.16
Diluted	$ 1.41	$ 1.25	$ 1.15
Weighted average common shares outstanding—basic	35,396	35,144	35,030
Weighted average common shares outstanding—diluted	35,781	35,654	35,546

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,		
	2021	2020	2019
Consolidated net income	$ 50,331	$ 44,521	$ 40,773
Other comprehensive income (loss):			
Foreign currency translation adjustments, net of tax [1]	(3,457)	6,922	3,267
Pension liability adjustments, net of tax [2]	2,832	(1,050)	1,147
Total other comprehensive income (loss)	(625)	5,872	4,414
Total consolidated comprehensive income	$ 49,706	$ 50,393	$ 45,187

(1) The tax effect on this component of comprehensive income was nominal in 2021, 2020 and 2019.

(2) The tax effect on this component of comprehensive income was $920, ($202) and $267 in 2021, 2020 and 2019, 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)

	Preferred Shares		Common Shares		Additional Paid-In	Retained Earning	Accumulated Other Comprehensive	
	# of Shares	Amount	# of Shares	Amount	Capital	(Deficit)	Loss	Total
Balance at December 31, 2018	—	—	34,886	$ 423,856	$ 46,018	$ (79,092)	$ (22,527)	$ 368,255
Consolidated 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 loss, net of tax	—	—	—	—	—	—	4,414	4,414
Balance at December 31, 2019	—	—	35,052	423,856	49,748	(38,319)	(18,113)	417,172
Consolidated net income	—	—	—	—	—	44,521	—	44,521
Common shares issued under stock plans	—	—	270	—	179	—	—	179
Common shares withheld for taxes on vested stock awards	—	—	(94)	—	(8,554)	—	—	(8,554)
Repurchases of common shares	—	—	(65)	—	(5,500)	—	—	(5,500)
Share-based compensation	—	—	—	—	23,119	—	—	23,119
Other comprehensive income, net of tax	—	—	—	—	—	—	5,872	5,872
Balance at December 31, 2020	—	—	35,163	423,856	58,992	6,202	(12,241)	476,809
Consolidated net income	—	—	—	—	—	50,331	—	50,331
Common shares issued under stock plans	—	—	660	—	—	—	—	—
Common shares withheld for taxes on vested stock awards	—	—	(222)	—	(30,830)	—	—	(30,830)
Share-based compensation	—	—	—	—	25,606	—	—	25,606
Other comprehensive income, net of tax	—	—	—	—	—	—	(625)	(625)
Balance at December 31, 2021	—	—	35,601	$ 423,856	$ 53,768	$ 56,533	$ (12,866)	$ 521,291

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,		
	2021	2020	2019
Cash flows from operating activities:			
Consolidated net income	$ 50,331	$ 44,521	$ 40,773
Adjustments to reconcile consolidated net income to net cash provided by operating activities:			
Depreciation and amortization	43,394	38,293	38,280
Provision for inventory excess and obsolescence	3,627	4,002	3,188
Share-based compensation	25,606	23,119	9,340
Deferred income taxes	(3,945)	(4,113)	(4,332)
Loss (gain) on disposal of fixed assets	65	120	756
Contingent consideration adjustments	(99)	(6,632)	100
Inventory acquisition fair value adjustments	1,411	188	1,270
Non-cash interest expense	1,170	1,045	1,055
Other non-cash items	74	157	259
Changes in assets and liabilities which provided/(used) cash, excluding effects from business acquisitions:			
Accounts receivable	(25,355)	18,026	(3,600)
Inventories	(19,078)	22,102	(7,397)
Prepaid expenses and other current assets	(3,117)	4,456	(1,526)
Prepaid income taxes, income taxes receivable and income taxes payable	(140)	6,015	(4,966)
Accounts payable, accrued expenses and other current liabilities	24,516	(14,484)	(14,800)
Other non-current assets and liabilities	(3,835)	3,424	4,848
Cash provided by operating activities	94,625	140,239	63,248
Cash flows from investing activities:			
Purchases of property, plant and equipment	(19,976)	(10,524)	(10,743)
Acquisition of businesses, net of cash acquired and working capital adjustments	(284,728)	—	(53,143)
Payment of contingent consideration related to acquisition of technology assets	(2,200)	(2,632)	—
Proceeds from sale of property, plant and equipment	200	—	42
Cash used in investing activities	(306,704)	(13,156)	(63,844)
Cash flows from financing activities:			
Borrowings under revolving credit facilities	280,000	—	66,792
Repayments under term loan and revolving credit facilities	(32,381)	(35,391)	(50,694)
Payments of debt issuance costs	(890)	(1,614)	(2,655)
Payments of withholding taxes from share-based awards	(30,830)	(8,554)	(6,935)
Payments of deferred and escrowed purchase price related to acquisitions	—	(31,021)	—
Payments of contingent considerations related to acquisitions	(1,836)	(1,135)	—
Repurchases of common shares	—	(5,500)	(10,000)
Purchase of building under finance lease	(8,743)	—	—
Other financing activities	(567)	(1,142)	(443)
Cash provided by (used in) financing activities	204,753	(84,357)	(3,935)
Effect of exchange rates on cash and cash equivalents	(335)	3,384	1,432
Increase (decrease) in cash and cash equivalents	(7,661)	46,110	(3,099)
Cash and cash equivalents, beginning of year	125,054	78,944	82,043
Cash and cash equivalents, end of year	$ 117,393	$ 125,054	$ 78,944
Supplemental disclosure of cash flow information:			
Cash paid for interest	$ 6,207	$ 5,529	$ 8,389
Cash paid for income taxes	$ 11,304	$ 5,879	$ 14,260
Income tax refunds received	$ 1,557	$ 4,833	$ 767
Supplemental disclosure of non-cash investing activity:			
Accruals for capital expenditures	$ 708	$ 166	$ 638

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

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.

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 such revisions are deemed to be necessary. The Company evaluates its estimates based on historical experience, current conditions, including estimated economic implications of the COVID-19 pandemic, and various other assumptions that it believes are reasonable under the circumstances. Actual results could differ significantly from these 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.

Accounts Receivable and Credit Losses

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. The Company is exposed to credit losses primarily through sales of its products. The Company assesses each customer's ability to pay by conducting a credit review which includes consideration of established credit rating or an internal assessment of the customer's creditworthiness based on an analysis of their payment history when a credit rating is not available. The Company monitors its credit exposure through active review of customer balances. The Company's expected loss methodology for accounts receivable is developed through consideration of factors including, but not limit to, historical collection experience, current customer credit ratings, current customer financial condition, current and future economic and market condition, and age of the receivables. Charges related to credit losses 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, 2021, 2020 and 2019, changes in the allowance for doubtful accounts were as follows (in thousands):

	2021	2020	2019
Balance at beginning of year	$ 274	$ 297	$ 321
Addition to credit loss expense	121	158	33
Credit loss resulting from acquisitions	216	—	120
Write-offs, net of recoveries of amounts previously reserved	(45)	(207)	(179)
Exchange rate changes	(10)	26	2
Balance at end of year	$ 556	$ 274	$ 297

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 and duties, 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, storage, 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 10 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 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 reporting unit to its estimated fair value. 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 carrying value of the asset group 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 twelve 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.

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. Upon adoption of ASC 842, "Leases", 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 expenses associated with share-based compensation awards to employees and directors based on the fair value of awards as of the grant date. For share-based compensation awards that vest over time based on employment, the associated expenses are recognized in the consolidated statements of operations ratably over the respective vesting periods, net of estimated forfeitures.

The Company also grants three 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"), operating cash flow performance-based restricted stock units ("OCF-PSUs"), and relative total shareholder return performance-based restricted stock units ("TSR-PSUs"). Share-based compensation expenses associated with EPS-PSUs and OCF-PSUs are recognized ratably over their vesting periods 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 estimated levels 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 recorded in the period such determination is made. Accordingly, share-based compensation expenses associated with EPS-PSUs and OCF-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 expenses associated with TSR-PSUs are based on the grant-date fair value, determined using the Monte-Carlo valuation model, and are recognized on a straight-line basis from the grant date to the end of the performance period. Compensation expenses associated with TSR-PSUs will not be affected by the number of common shares that will ultimately be issued upon vesting 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 2021, 2020 and 2019.

Restructuring, Acquisition and 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 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 to fluctuations in foreign currency exchange rates 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 foreign currency 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, "Income Taxes", 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.	The Company adopted ASU 2019-12 during the first quarter of 2021. The adoption of ASU 2019-12 did not have a material impact on the Company's consolidated financial statements.
In March 2020, the FASB issued ASU 2020-04, "Reference rate reform (Topic 848): Facilitation of the effects of reference rate reform on financial reporting."	ASU 2020-04 provides optional expedients and exceptions for applying GAAP to contracts, hedging relationships, and other transactions affected by reference rate reform if certain criteria are met.	Upon issuance. ASU 2020-04 is elective.	The Company does not expect the impact of ASU 2020-04 to be material to its consolidated financial statements.

Standard	Description	Effective Date	Effect on the Financial Statements or Other Significant Matters
In October 2021, the FASB issued ASU 2021-08, "Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers."	ASU 2021-08 requires that entities recognize and measure contract assets and liabilities acquired in a business combination in accordance with ASC 606, "Revenue from Contracts with Customers". ASU 2021-08 also applies to contract assets or liabilities from other contracts to which the provisions of ASC 606 apply. The amendments in ASU 2021-08 do not affect the accounting for other assets or liabilities that may arise from revenue contracts with customers in accordance with ASC 606, such as refund liabilities, or in a business combination, such as customer-related intangible assets and contract-based intangible assets.	January 1, 2023. Early adoption is permitted.	The Company is evaluating the impact of the adoption of ASU 2021-08 on its consolidated financial statements.

3. Revenue

The Company accounts for its revenue transactions in accordance with ASC 606, "Revenue from Contracts with Customers," which requires entities to recognize revenue in a way that depicts the transfer of control over 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 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 36 months. 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 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, 2021 and December 31, 2020, contract liabilities were $7.3 million and $6.5 million, respectively, and are included in accrued expenses and other current liabilities and other liabilities in the accompanying consolidated balance sheets. The increase in the contract liability balance during the year ended December 31, 2021 is primarily due to cash payments received in advance of satisfying performance obligations and acquired contract liabilities of $2.0 million from current year acquisitions, partially offset by $5.6 million of revenue recognized during the year that was included in the contract liability balance at December 31, 2020.

Disaggregated Revenue

See Note 18 for the Company's disaggregation of revenue by segment, geography and end market.

4. Business Combinations

2021 Acquisitions

On August 30, 2021, the Company acquired 100% of the outstanding shares of ATI Industrial Automation, Inc. ("ATI"), an Apex, North Carolina-based leading supplier of intelligent end-of-arm technology solutions to OEMs for advanced industrial and surgical robots for an initial cash purchase price of $169.2 million, net of cash acquired and estimated working capital adjustments, and $44.0 million estimated fair value of contingent consideration. The contingent consideration will be payable in 2022 based on a multiple of the standalone ATI Adjusted EBITDA, as defined in the purchase and sale agreement, for the fiscal year ended December 31, 2021. The initial cash purchase price was financed with borrowings under the Company's revolving credit facility and cash available on hand. The Company expects that the addition of ATI will complement and add intelligent technology solutions to further expand the Company's position in mission critical robotic applications within the Precision Motion reportable segment.

On August 31, 2021, the Company acquired 100% of the outstanding shares of Schneider Electric Motion USA, Inc. ("SEM"), a Marlborough, Connecticut-based manufacturer of integrated motion control solutions and electronic controls for automation equipment for a total purchase price of $114.7 million, net of cash acquired and working capital adjustments. The acquisition was financed with borrowings under the Company's revolving credit facility. The Company expects that the addition of SEM will complement and expand the Company's presence in life science applications and solutions for industrial automation applications within the Precision Motion reportable segment.

Allocation of Purchase Price

The acquisitions of ATI and SEM have been accounted for as business combinations. The purchase price for each acquisition is allocated based upon a valuation of the fair values 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 valuations using an income approach, specifically the multi-period excess earnings method for customer relationships and the relief-from-royalty method for developed technologies, trademarks and trade names. 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, technology obsolescence curves, and EBITDA margins. The excess of the purchase price over the fair values of tangible assets, identifiable intangible assets and assumed liabilities was recorded as goodwill for each acquisition. The Company's estimates and assumptions in determining the estimated fair values of certain assets and liabilities are subject to change within the measurement period (up to one year from the acquisition date) as a result of additional information obtained with regards to facts and circumstances that existed as of the acquisition date.

ATI

Based upon a preliminary valuation, the total purchase price, including measurement period adjustments, for ATI was allocated as follows (in thousands):

	Purchase Price Allocation
Cash	$ 10,709
Accounts receivable	12,596
Inventories	18,151
Property, plant and equipment	4,618
Operating lease assets	11,263
Intangible assets	52,800
Goodwill	134,420
Other assets	229
Total assets acquired	244,786
Accounts payable	5,135
Current portion of operating lease liabilities	1,740
Operating lease liabilities	9,525
Other liabilities	4,452
Total liabilities assumed	20,852
Total assets acquired, net of liabilities assumed	223,934
Less: cash acquired	10,709
Less: contingent consideration	44,000
Initial purchase price, net of cash acquired	$ 169,225

Subsequent to the preliminary valuation, additional information that existed as of the acquisition date became available that resulted in adjustments to certain inputs used for the determination of estimated fair value of the contingent consideration. These changes resulted in a $7.9 million decrease to the liability and a $0.4 million increase to identifiable intangible assets. Adjustments to the preliminary purchase price allocation resulted in a decrease to goodwill of $8.3 million. As of December 31, 2021, the working capital adjustments had not been finalized and were estimated to be a cash receipt of $0.8 million. The purchase price allocation is preliminary as the Company is in the process of collecting additional information for the valuation of inventories, other liabilities, contingent consideration and unrecognized tax benefits.

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

	Estimated Fair Value	Weighted Average Amortization Period
Developed technologies	$ 19,800	15 years
Customer relationships	23,900	15 years
Trademarks and trade names	5,600	15 years
Backlog	3,500	1 year
Total	$ 52,800	

The purchase price allocation resulted in $52.8 million of identifiable intangible assets and $134.4 million of goodwill. Goodwill amounting to $134.4 million is expected to be deductible for U.S. 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) ATI's ability to grow the business with existing and new customers, including leveraging the Company's customer base; (ii) ATI's ability to grow the business through new product introductions; and (iii) cost improvements due to the integration of ATI's operations into the Company's existing infrastructure.

The operating results of ATI were included in the Company's results of operations beginning on August 31, 2021. ATI contributed revenues of $34.0 million and a profit before income taxes of $3.4 million to the Company's operating results for the year ended December 31, 2021. ATI's profit before income taxes for the period from the acquisition date through December 31, 2021 included amortization of inventory fair value adjustments and amortization of purchased intangible assets of $3.5 million.

SEM

Based upon a preliminary valuation, the total purchase price for SEM was allocated as follows (in thousands):

	Purchase Price Allocation
Cash	$ 3,881
Accounts receivable	4,240
Inventories	2,499
Property, plant and equipment	452
Intangible assets	54,570
Goodwill	68,291
Other assets	776
Total assets acquired	134,709
Accounts payable	1,325
Deferred tax liabilities	12,400
Other liabilities	2,420
Total liabilities assumed	16,145
Total assets acquired, net of liabilities assumed	118,564
Less: cash acquired	3,881
Total purchase price, net of cash acquired	$ 114,683

The purchase price allocation is preliminary as the Company is in the process of collecting additional information for the valuation of other liabilities and unrecognized tax benefits.

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

	Estimated Fair Value	Weighted Average Amortization Period
Developed technologies	$ 9,110	15 years
Customer relationships	41,740	20 years
Trademarks and trade names	370	4 years
Backlog	3,350	1 year
Total	$ 54,570	

The purchase price allocation resulted in $54.6 million of identifiable intangible assets and $68.3 million of goodwill. As the SEM acquisition was structured as a stock acquisition for income tax purposes, the goodwill is not 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) SEM's ability to grow the business with existing and new customers, including leveraging the Company's customer base; (ii) SEM's ability to grow the business through new product introductions; and (iii) cost improvements due to the integration of SEM's operations into the Company's existing infrastructure.

The operating results of SEM were included in the Company's results of operations beginning on September 1, 2021. SEM contributed revenues of $9.1 million and a profit before income taxes of $0.3 million to the Company's operating results for the year ended December 31, 2021. SEM's profit before income taxes for the period from the acquisition date through December 31, 2021 included amortization of inventory fair value adjustments and amortization of purchased intangible assets of $1.8 million.

Unaudited Pro Forma Information

The pro forma information presented below includes the effects of business combination accounting resulting from the acquisitions of ATI and SEM, including amortization of inventory fair value adjustments, amortization of intangible assets, interest expense on borrowings in connection with the acquisitions, acquisition costs, and the related tax effects, assuming that the acquisitions had been consummated as of January 1, 2020. The 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, 2020.

	Year Ended December 31,	
	2021	2020
Revenue	$ 783,011	$ 682,626
Consolidated net income	$ 52,420	$ 33,376

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 €65.7 million ($73.2 million), including net working capital adjustments. The purchase price consists of €24.0 million ($26.7 million) cash paid at closing, 124 thousand 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 €24.8 million ($27.7 million) deferred cash consideration. The initial cash purchase price was financed with borrowings under the Company's revolving credit facility. The contingent consideration would 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. In 2020, the Company paid €25.0 million to the former owner of ARGES for the deferred cash consideration and to settle working capital. 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 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 would 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 required €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 2020. The Company released the indemnification holdback in the fourth quarter of 2020. 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 final 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	42,951
Other assets	2,244
Total assets acquired	95,721
Accounts payable	2,598
Deferred tax liabilities	5,510
Other liabilities	14,462
Total liabilities assumed	22,570
Total assets acquired, net of liabilities assumed	73,151
Less: cash acquired	3,159
Total purchase price, net of cash acquired	69,992
Less: contingent consideration	7,870
Less: issuance of common shares	10,900
Less: deferred cash consideration	27,664
Initial cash purchase price, net of cash acquired	$ 23,558

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 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.

Med X Change and Ingenia

The final purchase price allocation 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 Amortization Period
	Med X Change	Ingenia	
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.

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.

Acquisition Costs

The Company recognized acquisition costs of $5.0 million, zero and $1.6 million in the years ended December 31, 2021, 2020 and 2019, 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.

5. Accumulated Other Comprehensive Loss

Other comprehensive income (loss) is defined as 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 Income (Loss)	Cumulative Translation Adjustments	Pension Liability Adjustments
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	(18,113)	(9,218)	(8,895)
Other comprehensive income (loss)	5,157	6,922	(1,765)
Amounts reclassified from accumulated other comprehensive loss [1]	715	—	715
Balance at December 31, 2020	(12,241)	(2,296)	(9,945)
Other comprehensive income (loss)	(1,584)	(3,457)	1,873
Amounts reclassified from accumulated other comprehensive loss [1]	959	—	959
Balance at December 31, 2021	$ (12,866)	$ (5,753)	$ (7,113)

(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, 2021 (in thousands):

	December 31, 2021
Balance at beginning of year	$ 285,980
Goodwill from current year acquisitions	202,711
Effect of foreign exchange rate changes	(9,191)
Balance at end of year	$ 479,500

Goodwill by reportable segment as of December 31, 2021 was as follows (in thousands):

	Reportable Segment			
	Photonics	Vision	Precision Motion	Total
Goodwill	$ 214,564	$ 160,675	$ 255,490	$ 630,729
Accumulated impairment of goodwill	(102,461)	(31,722)	(17,046)	(151,229)
Total	$ 112,103	$ 128,953	$ 238,444	$ 479,500

Goodwill by reportable segment as of December 31, 2020 was as follows (in thousands):

	Reportable Segment			
	Photonics	Vision	Precision Motion	Total
Goodwill	$ 218,517	$ 165,195	$ 53,497	$ 437,209
Accumulated impairment of goodwill	(102,461)	(31,722)	(17,046)	(151,229)
Total	$ 116,056	$ 133,473	$ 36,451	$ 285,980

Intangible Assets

Intangible assets as of December 31, 2021 and 2020, respectively, are summarized as follows (dollar amounts in thousands):

	December 31, 2021			
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted Average Remaining Life (Years)
Amortizable intangible assets:				
Patents and developed technologies	$ 189,609	$ (122,130)	$ 67,479	10.7
Customer relationships	228,656	(104,386)	124,270	15.5
Customer backlog	6,862	(2,254)	4,608	0.7
Trademarks and trade names	23,976	(12,371)	11,605	10.5
Amortizable intangible assets	449,103	(241,141)	207,962	13.3
Non-amortizable intangible assets:				
Trade names	13,027	—	13,027	
Total	$ 462,130	$ (241,141)	$ 220,989	

	December 31, 2020			
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted Average Remaining Life (Years)
Amortizable intangible assets:				
Patents and developed technologies	$ 164,430	$ (110,572)	$ 53,858	8.8
Customer relationships	167,429	(92,892)	74,537	10.9
Trademarks and trade names	18,367	(11,268)	7,099	7.8
Amortizable intangible assets	350,226	(214,732)	135,494	9.9
Non-amortizable intangible assets:				
Trade names	13,027	—	13,027	
Total	$ 363,253	$ (214,732)	$ 148,521	

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,		
	2021	2020	2019
Amortization expense – cost of revenue	$ 13,288	$ 11,123	$ 10,588
Amortization expense – operating expenses	16,577	13,970	15,857
Total amortization expense	$ 29,865	$ 25,093	$ 26,445

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
2022	$ 13,749	$ 27,071	$ 40,820
2023	12,451	20,935	33,386
2024	10,100	17,575	27,675
2025	8,529	14,867	23,396
2026	7,108	12,659	19,767
Thereafter	15,542	47,376	62,918
Total	$ 67,479	$ 140,483	$ 207,962

Impairment Charges

The Company did not have any goodwill or indefinite-lived intangible asset impairment charges during 2021, 2020 or 2019.

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 equivalents, 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 August 30, 2021, the Company acquired ATI. Under the purchase and sale agreement for the ATI acquisition, the former shareholders of ATI are eligible to receive contingent consideration based on ATI's fiscal year 2021 Adjusted EBITDA, as defined in the purchase and sale agreement. The contingent consideration will be payable in 2022. The preliminary fair value of the contingent consideration was determined based on the Monte Carlo valuation method and was recorded as part of the purchase price as of the acquisition date. Once the fair value of the contingent consideration is finalized, subsequent changes in the estimated fair value are recorded in the consolidated statement of operations in restructuring, acquisition, and related costs until the liability is fully settled. The fair value of the contingent consideration was $44.0 million.

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 ($11.1 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, acquisition, and related costs until the liability is fully settled. During 2020, the fair value of the contingent consideration was adjusted to €4.1 million ($5.1 million). In March 2021, the Company made the first installment payment of €0.4 million ($0.4 million), which is included in cash flows from financing activities in the consolidated statement of cash flows for the year ended December 31, 2021. During 2021, the fair value of the contingent consideration was adjusted to €3.3 million ($3.8 million). There were no other changes in the fair value of the contingent consideration during the year ended December 31, 2021.

On April 16, 2019, the Company acquired Ingenia. Under the purchase and sale agreement for the Ingenia acquisition, the 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 ($9.0 million). If the revenue targets are achieved, the contingent consideration would be payable in cash in three annual

installments from 2020 to 2022. The estimated fair value of the contingent consideration of €5.8 million ($6.6 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, acquisition, and related costs until the liability is fully settled. The Company made the first installment payment of €1.0 million ($1.1 million) in May 2020 and the second installment payment of €1.2 million ($1.4 million) in May 2021. These installment payments are reported as cash outflows from financing activities in the consolidated statement of cash flows for the respective periods. During 2020, the fair value of the contingent consideration was adjusted to €2.3 million ($2.9 million). During 2021, the fair value of the contingent consideration was adjusted to €1.5 million ($1.7 million).

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 former 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 the revenue targets are achieved, the contingent consideration would be payable in cash 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 assets acquired and amortized over the remaining useful life of the underlying assets. The Company made the first installment payment of €2.4 million ($2.6 million) in February 2020 and the second installment payment of €1.8 million ($2.2 million) in February 2021. These installment payments are reported as cash flows from investing activities in the consolidated statement of cash flows for the respective periods. As of December 31, 2021, the Company recorded a current liability of €1.2 million ($1.4 million) for the third and last installment payment, which is expected to be paid in March 2022.

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, 2021 (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	$ 1,711	$ 1,711	$ —	$ —
Prepaid expenses and other current assets:				
Foreign currency forward contracts	137	—	137	—
	$ 1,848	$ 1,711	$ 137	$ —
Liabilities				
Accrued expenses and other current liabilities:				
Contingent considerations - Current	$ 47,522	$ —	$ —	$ 47,522
Foreign currency forward contracts	160	—	160	—
Other liabilities:				
Contingent considerations - Long-term	3,402	—	—	3,402
	$ 51,084	$ —	$ 160	$ 50,924

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, 2020 (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	$ 11,047	$ 11,047	$ —	$ —
Prepaid expenses and other current assets:				
Foreign currency forward contracts	27	—	27	—
	$ 11,074	$ 11,047	$ 27	$ —
Liabilities				
Accrued expenses and other current liabilities:				
Contingent considerations - Current	$ 4,280	$ —	$ —	$ 4,280
Foreign currency forward contracts	—	—	—	—
Other liabilities:				
Contingent considerations - Long-term	7,276	—	—	7,276
	$ 11,556	$ —	$ —	$ 11,556

During the years ended December 31, 2021 and 2020, there were no transfers between fair value levels.

Changes in the fair value of Level 3 contingent considerations for the year ended December 31, 2021 were as follows (in thousands):

	Contingent Considerations
Balance at December 31, 2020	$ 11,556
Acquisition of ATI	44,000
Fair value adjustments	(99)
Payments	(4,036)
Effect of foreign exchange rates	(497)
Balance at December 31, 2021	$ 50,924

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

Liability	December 31, 2021 Fair Value (in thousands)	Valuation Technique	Unobservable Inputs	Percentage Applied
Contingent consideration (ATI)	$44,000	Monte Carlo method	Historical and projected Adjusted EBITDA for the full year 2021	N/A
			EBITDA risk premium	7.2%
			EBITDA volatility	27.0%
			Credit spread	2.1%
Contingent consideration (ARGES)	$3,789	Monte Carlo method	Historical and projected revenues from July 2019 through December 2026	N/A
			Revenue volatility	14.0%
			Cost of debt	3.0%
			Discount rate	1.9%
Contingent consideration (Ingenia)	$1,736	Monte Carlo method	Historical and projected revenues from April 2019 through March 2022	N/A
			Revenue volatility	38.5%
			Cost of debt	3.1%
			Discount rate	9.6%
Contingent consideration (Other)	$1,399	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, 2021, the notional amount and fair value of the Company's foreign currency forward contracts was $50.0 million and a net loss of less than $0.1 million, respectively. As of December 31, 2020, the notional amount and fair value of the Company's foreign currency forward contracts was $28.5 million and a net gain of less than $0.1 million, respectively.

For the years ended December 31, 2021, 2020 and 2019, the Company recognized aggregate net gains of $1.3 million, $1.3 million and $0.8 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 consolidated net income by the weighted average number of common shares outstanding during the year.

For diluted earnings per common share, the denominator includes the dilutive effects of outstanding restricted stock units and stock options, 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 Limited noncontrolling interest shareholders and non-GAAP EPS performance-based restricted stock units and cumulative operating cash flow performance-based restricted stock units granted to certain members of the executive management team are included in the weighted average dilutive share calculation only when the performance targets have been achieved based on the cumulative achievement against the performance targets as of the end of each reporting period.

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,		
	2021[1]	2020[2]	2019[3]
Numerators:			
Consolidated net income	$ 50,331	$ 44,521	$ 40,773
Denominators:			
Weighted average common shares outstanding— basic	35,396	35,144	35,030
Dilutive potential common shares	385	510	516
Weighted average common shares outstanding— diluted	35,781	35,654	35,546
Antidilutive potential common shares excluded from above	13	13	41
Earnings per Common Share:			
Basic	$ 1.42	$ 1.27	$ 1.16
Diluted	$ 1.41	$ 1.25	$ 1.15

(1) For the year ended December 31, 2021, 45 shares of non-GAAP EPS performance-based restricted stock units and 37 shares of operating cash flow 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, 2021.

(2) For the year ended December 31, 2020, 45 shares of 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, 2020.

(3) For the year ended December 31, 2019, 46 shares of 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, 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,	
	2021	2020
Raw materials	$ 84,038	$ 55,657
Work-in-process	20,600	15,487
Finished goods	19,486	20,234
Demo and consigned inventory	1,533	1,359
Total inventories	$ 125,657	$ 92,737

Property, Plant and Equipment, Net

	December 31,	
	2021	2020
Cost:		
Land, buildings and improvements	$ 78,906	$ 71,341
Machinery and equipment	98,687	93,494
Total cost	177,593	164,835
Accumulated depreciation	(90,154)	(86,159)
Property, plant and equipment, net	$ 87,439	$ 78,676

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,		
	2021	2020	2019
Depreciation expense	$ 13,529	$ 13,200	$ 11,835

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,	
	2021	2020
Accrued compensation and benefits	$ 24,725	$ 12,510
Accrued contingent considerations and earn-outs	47,522	10,796
Finance lease obligations	599	9,720
Contract liabilities, current portion	6,995	6,173
Accrued warranty	4,783	4,919
Other	13,855	9,662
Total	$ 98,479	$ 53,780

Accrued Warranty

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

	Year Ended December 31,		
	2021	2020	2019
Balance at beginning of year	$ 4,919	$ 5,756	$ 4,510
Provision charged to cost of revenue	1,410	1,838	2,360
Warranty liabilities acquired from acquisitions	874	—	142
Use of provision	(2,326)	(2,805)	(1,282)
Foreign currency exchange rate changes	(94)	130	26
Balance at end of year	$ 4,783	$ 4,919	$ 5,756

Other Long Term Liabilities

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

	December 31,	
	2021	2020
Finance lease obligations	$ 5,309	$ 5,908
Accrued pension liabilities	—	1,511
Accrued contingent considerations and earn-outs	3,402	7,276
Other	927	2,471
Total	$ 9,638	$ 17,166

11. Debt

Debt consisted of the following (in thousands):

	December 31,	
	2021	2020
Senior Credit Facilities – term loan	$ 5,126	$ 5,545
Less: unamortized debt issuance costs	(29)	(37)
Total current portion of long-term debt	5,097	5,508
Senior Credit Facilities – term loan	86,879	99,534
Senior Credit Facilities – revolving credit facility	346,579	99,761
Less: unamortized debt issuance costs	(4,097)	(4,368)
Total long-term debt	429,361	194,927
Total Senior Credit Facilities	$ 434,458	$ 200,435

Senior Credit Facilities

On December 31, 2019, the Company entered into an amended and restated credit agreement (as amended, the "Third Amended and Restated Credit Agreement") with existing lenders for an aggregate credit facility of $450.0 million, originally 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.

On March 27, 2020, the Company entered into an amendment (the "First Amendment") to the Third Amended and Restated Credit Agreement and exercised a portion of the uncommitted accordion feature. The First Amendment increased the revolving credit facility commitment under the Third Amended and Restated Credit Agreement by $145.0 million, from $350.0 million to $495.0 million, and reset the uncommitted accordion feature to $200.0 million for potential future expansion.

On October 5, 2021, the Company entered into an amendment (the "Fourth Amendment") to the Third Amended and Restated Credit Agreement to exercise the accordion option. The Fourth Amendment increased the revolving credit facility commitment under the Third Amended and Restated Credit Agreement by $200.0 million, from $495.0 million to $695.0 million, and reset the uncommitted accordion feature to $200.0 million for potential future expansion.

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 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, 2021, the outstanding principal under the Company's term loan facility is scheduled to be repaid as follows (in thousands):

	Principal Amount
2022	$ 5,126
2023	5,126
2024	81,753
Total debt repayments	$ 92,005

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 balance 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, 2021, the Company had $348.4 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 2.33% as of December 31, 2021. The commitment fee rate for the unused commitments under the revolving credit facility was approximately 0.40% as of December 31, 2021.

Guarantees

The Senior Credit Facilities is guaranteed by Novanta Inc., Novanta Corporation, NDS Surgical Imaging LLC, Med X Change, Inc., Novanta Medical Technologies Corp., W.O.M. World of Medicine USA, Inc., 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 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 that 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, 2021, 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 First Amendment, and the Fourth Amendment, the Company capitalized an additional $5.2 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 $1.2 million, $1.0 million and $1.1 million in 2021, 2020 and 2019, 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, 2021 and 2020, 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 2022 and 2036. 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.

The following table summarizes the components of lease costs included in the statements of operations for the periods indicated (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Operating lease cost	$ 8,533	$ 7,693	$ 7,638
Finance lease cost			
Amortization of right-of-use assets	602	989	831
Interest on lease liabilities	340	432	430
Variable lease cost	1,074	1,336	1,329
Total lease cost	$ 10,549	$ 10,450	$ 10,228

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

	December 31,	
	2021	2020
Operating leases:		
Operating lease right-of-use assets	$ 48,338	$ 34,444
Current portion of operating lease liabilities	$ 7,334	$ 6,188
Operating lease liabilities	45,700	32,802
Total operating lease liabilities	$ 53,034	$ 38,990
Finance leases:		
Property, plant and equipment, gross	$ 9,582	$ 19,819
Accumulated depreciation	(5,068)	(4,934)
Finance lease assets included in property, plant and equipment, net	$ 4,514	$ 14,885
Accrued expenses and other current liabilities	$ 599	$ 9,720
Other liabilities	5,309	5,908
Total finance lease liabilities	$ 5,908	$ 15,628
Weighted-average remaining lease term (in years):		
Operating leases	9.0	9.3
Finance leases	7.5	3.5
Weighted-average discount rate:		
Operating leases	4.72%	5.50%
Finance leases	5.54%	3.00%

The following table provides the details of cash flow information related to leases for the periods indicated (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Cash paid for amounts included in lease liabilities:			
Operating cash flows from finance leases	$ 340	$ 432	$ 430
Operating cash flows from operating leases	$ 7,818	$ 6,760	$ 7,768
Financing cash flows from finance leases	$ 9,310	$ 1,321	$ 868
Supplemental non-cash information:			
Right-of-use assets obtained in exchange for new operating lease liabilities	$ 22,574	$ 4,290	$ 7,723
Right-of-use assets obtained in exchange for new finance lease liabilities	$ -	$ -	$ 9,209

During the year ended December 31, 2021, the Company paid $8.7 million upon the exercise of an option to purchase a building under a finance lease agreement in Germany. The cash payment is presented as a cash outflow from financing activities in the consolidated statement of cash flows.

Future minimum lease payments under operating and finance leases expiring subsequent to December 31, 2021, 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):

Year Ending December 31,	Operating Leases	Finance Leases
2022	$ 9,152	$ 907
2023	8,419	930
2024	7,711	954
2025	7,673	954
2026	6,585	979
Thereafter	27,577	2,508
Total minimum lease payments	67,117	7,232
Less: interest	(14,083)	(1,324)
Present value of lease liabilities	$ 53,034	$ 5,908

13. Stockholders' Equity and Share-Based Compensation

Preferred Shares

In May 2021, the Company's shareholders approved a special resolution to amend the Company's articles to authorize up to 7.0 million preferred shares for future issuance. The Company's Board of Directors is authorized to designate and issue one or more series of preferred shares, fix the rights, preferences and designation, as deemed necessary or advisable, relating to the preferred shares, provided that no shares of any series may be entitled to more than one vote per share. As of December 31, 2021, no preferred shares had been issued and outstanding.

Common Shares

The Company has an unlimited number of non-par value common shares authorized for issuance. 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.

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, market prices 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 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 2020, the Company repurchased 65 thousand shares for an aggregate purchase price of $5.5 million at an average price of $84.55 per share. 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 $9.5 million available for share repurchases under the 2018 Repurchase Plan as of December 31, 2021.

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, effective after the completion of the 2018 Repurchase Plan. No shares have been repurchased under the 2020 Repurchase Plan to date.

As of December 31, 2021, the Company had $59.5 million available under the 2018 and 2020 share repurchase plans for future share repurchases.

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 2021, the Company's shareholders approved an 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 6,148,613, 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 May 13, 2031. As of December 31, 2021, there were 2,242,880 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 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,		
	2021	2020	2019
Selling, general and administrative	$ 17,255	$ 14,550	$ 8,361
Research and development and engineering	2,294	3,301	497
Cost of revenue	3,008	4,684	482
Restructuring and acquisition related costs	3,049	584	—
Total share-based compensation expense	$ 25,606	$ 23,119	$ 9,340

The expense recorded during each of the three years ended December 31, 2021, 2020 and 2019 included $1.1 million, $1.0 million and $0.9 million, respectively, related to restricted stock units and deferred stock units granted to the members of the Company's Board of Directors.

As of December 31, 2021, 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 $31.4 million, net of estimated forfeitures, over a weighted average period of 1.05 years subsequent to December 31, 2021, for all outstanding equity awards as of December 31, 2021.

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 zero 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 91 thousand and 162 thousand DSUs outstanding as of December 31, 2021 and December 31, 2020, respectively, which were included in the calculation of weighted average basic shares outstanding for the respective periods.

The table below summarizes activities during 2021 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, 2020	625	$ 58.79		
Granted	176	$ 137.90		
Vested	(487)	$ 51.38		
Forfeited	(22)	$ 104.98		
Unvested at December 31, 2021	292	$ 115.42	0.95 years	$ 51,442
Expected to vest as of December 31, 2021	277	$ 115.17	0.95 years	$ 48,822

(1) The aggregate intrinsic value is calculated based on the fair value of $176.33 per share of the Company's common stock on December 31, 2021 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 2021, based on the market price of the underlying shares on the day of vesting, was $68.5 million.

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.

In February 2021, the Company granted operating cash flow performance-based restricted stock units ("OCF-PSUs") to certain members of the executive management team. Upon completion of the requisite service periods, the OCF-PSUs will vest in two tranches if the Company achieves the cumulative operating cash flow performance target for fiscal years 2021 through 2023 as approved by the Company's Compensation Committee as of the date of grant. The first fifty percent of the OCF-PSU grant will vest at the end of the four-year service period from the date of grant and the remaining fifty percent of the OCF-PSU grant will vest at the end of the five-year service period from the date of grant. The Company recognizes compensation expense ratably over the requisite service period based on the expectation that 100 percent of the OCF-PSUs are deemed probable of vesting. 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 table below summarizes activities during 2021 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, 2020	142	$ 88.99		
Granted	67	$ 150.89		
Performance adjustment [3]	28	$ 67.72		
Vested	(75)	$ 64.25		
Forfeited	—	$ —		
Unvested at December 31, 2021	162	$ 122.26	1.55 years	$ 28,461
Expected to vest as of December 31, 2021	197	$ 130.33	1.55 years	$ 34,749

(1) The unvested PSUs are shown in this table at target. The number of shares vested reflects the number of shares earned and issued during the year. As of December 31, 2021, the maximum number of PSUs available to be earned was approximately 286 thousand.

(2) The aggregate intrinsic value is calculated based on the fair value of $176.33 per share of the Company's common stock on December 31, 2021 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 February 22, 2018. These awards vested at 160% of target number of shares during 2021 based on the achievement of cumulative Non-GAAP EPS and applicable relative TSR performance conditions during the performance period of fiscal years 2018 through 2020.

The total fair value of PSUs that vested in 2021, based on the market price of the underlying shares on the date of vesting, was $9.3 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, 2021
Grant-date stock price	$ 138.23
Expected volatility	42.44%
Risk-free interest rate	0.22%
Expected annual dividend yield	—
Weighted average fair value	$ 166.64

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 2021.

The following table shows stock options that were outstanding and exercisable as of December 31, 2021 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 (In years)	Aggregate Intrinsic Value [1] (In thousands)
Stock options outstanding	60	$ 14.13	4.25	$ 9,753
Stock options exercisable	60	$ 14.13	4.25	$ 9,753

(1) The aggregate intrinsic value is calculated as the difference between the closing market price of $176.33 per share of the Company's common stock on December 31, 2021 and the exercise price of the 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, $4.2 million and $4.4 million for the years ended December 31, 2021, 2020 and 2019, 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. 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,		
	2021	2020	2019
Components of the net periodic pension cost:			
Interest cost	$ 554	$ 736	$ 971
Expected return on plan assets	(1,120)	(1,340)	(1,671)
Amortization of actuarial losses	928	686	957
Amortization of prior service cost	31	29	29
Net periodic pension cost	$ 393	$ 111	$ 286

The actuarial assumptions used to compute the net periodic pension cost for the years ended December 31, 2021, 2020 and 2019, respectively, were as follows:

	Year Ended December 31,		
	2021	2020	2019
Weighted-average discount rate	1.2%	1.9%	2.7%
Weighted-average long-term rate of return on plan assets	2.5%	3.6%	5.1%

The actuarial assumptions used to compute the benefit obligations as of December 31, 2021 and 2020, respectively, were as follows:

	December 31,	
	2021	2020
Weighted-average discount rate	1.8%	1.2%
Rate of inflation	3.2%	2.6%

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,	
	2021	2020
Change in benefit obligation:		
Projected benefit obligation at beginning of year	$ 47,200	$ 40,456
Interest cost	554	736
Actuarial (gains) losses [1]	(3,303)	5,410
Benefits paid	(2,679)	(1,111)
Prior service cost	36	—
Foreign currency exchange rate changes	(410)	1,709
Projected benefit obligation at end of year	$ 41,398	$ 47,200
Accumulated benefit obligation at end of year	$ 41,398	$ 47,200
Change in plan assets:		
Fair value of plan assets at beginning of year	$ 45,689	$ 38,983
Actual return on plan assets	592	5,170
Employer contributions	1,055	988
Benefits paid	(2,679)	(1,111)
Foreign currency exchange rate changes	(470)	1,659
Fair value of plan assets at end of year	$ 44,187	$ 45,689
Funded status at end of year	$ 2,789	$ (1,511)
Amounts included in accumulated other comprehensive loss not yet recognized in net periodic pension cost:		
Net actuarial losses at beginning of year	$ (10,958)	$ (9,706)
Net actuarial gains (losses) during the year	2,775	(1,580)
Prior service cost arising during the year	(36)	-
Amounts reclassified from accumulated other comprehensive income to income before income taxes	959	715
Foreign currency exchange rate changes	54	(387)
Net actuarial losses	$ (7,206)	$ (10,958)

[1] Actuarial (gains)/losses in the U.K. Plan for the years ended December 31, 2021 and 2020, respectively, primarily resulted from changes in the discount rate assumptions.

The funded status of the U.K. Plan was included in other long term assets on the accompanying consolidated balance sheet as of December 31, 2021 and in other long term liabilities as of December 31, 2020.

The following table reflects the total expected benefit payments to plan participants for each of the next five years and the following five years in aggregate and have been estimated based on the same assumptions used to measure the Company's benefit obligations as of December 31, 2021 (in thousands):

	Amount
2022	$ 1,090
2023	1,198
2024	1,567
2025	1,447
2026	1,677
2027-2031	9,765
Total	$ 16,744

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 $1.1 million in 2022 and will increase by 2.9% per year thereafter.

Fair Value of Plan Assets

The trustee of the U.K. Plan has 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, 2021 (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]	$ 30,774	$ —	$ —	$ —	$ 30,774
Fixed income [2]	13,250	—	—	—	13,250
Cash	163	163	—	—	—
Total	$ 44,187	$ 163	$ —	$ —	$ 44,024

(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 (35%), bonds (39%), other assets (21%) and cash (5%).

(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 (88%), other assets (6%), and cash (6)%.

The following table summarizes the fair values of Plan assets by asset category as of December 31, 2020 (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]	$ 31,572	$ —	$ —	$ —	$ 31,572
Fixed income [2]	13,251	—	—	—	13,251
Cash	866	866	—	—	—
Total	$ 45,689	$ 866	$ —	$ —	$ 44,823

(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 (35%), bonds (37%), other assets (19%) and cash (9%).

(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 (83%), other assets (16%) and cash (1%).

15. Income Taxes

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

	Year Ended December 31,		
	2021	2020	2019
Income (loss) before income taxes:			
Canada	$ (1,371)	$ (2,278)	$ 78
U.S.	19,168	16,875	25,577
Other	38,375	33,806	20,111
Total	$ 56,172	$ 48,403	$ 45,766

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

	Year Ended December 31,		
	2021	2020	2019
Current			
Canada	$ 95	$ 82	$ 100
U.S.	205	1,324	1,109
Other	9,486	6,589	8,116
	9,786	7,995	9,325
Deferred			
Canada	493	(493)	—
U.S.	(2,133)	(1,256)	703
Other	(2,305)	(2,364)	(5,035)
	(3,945)	(4,113)	(4,332)
Total	$ 5,841	$ 3,882	$ 4,993

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):

	Year Ended December 31,		
	2021	2020	2019
Statutory Canadian tax rate	29.00%	29.00%	29.00%
Expected income tax provision at Canadian statutory tax rate	$ 16,291	$ 14,037	$ 13,272
International tax rate differences	(3,621)	(3,483)	(3,346)
U.S. state income taxes, net	(249)	(108)	386
Withholding and other taxes	429	485	364
Permanent differences and other	921	259	443
Disallowed compensation	1,111	685	-
Foreign-derived intangible income	(1,211)	(1,063)	(787)
Tax credits	(1,408)	(2,016)	(1,457)
Statutory tax rate changes	489	429	35
Uncertain tax positions	(472)	(176)	310
Change in valuation allowance	918	(727)	(482)
Acquisition contingent consideration adjustments	87	(1,513)	287
Transaction costs	248	(23)	247
Provision to return differences	33	750	(516)
Windfall benefit from share-based compensation	(5,131)	(2,322)	(1,717)
UK patent box	(2,594)	(1,332)	(2,046)
Reported income tax provision	$ 5,841	$ 3,882	$ 4,993
Effective tax rate	10.4%	8.0%	10.9%

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, 2021 and 2020 are as follows (in thousands):

	December 31,	
	2021	2020
Deferred tax assets:		
Losses	$ 9,358	$ 8,524
Operating lease liabilities	12,200	10,216
Compensation related deductions	6,795	5,955
Inventories	6,594	5,090
Tax credits	2,786	2,958
Restructuring related liabilities	206	185
Warranty	700	720
Other	197	957
Total deferred tax assets	38,836	34,605
Valuation allowance on deferred tax assets	(12,608)	(11,561)
Net deferred tax assets	$ 26,228	$ 23,044
Deferred tax liabilities:		
Depreciation	$ (2,585)	$ (1,583)
Amortization	(32,117)	(24,772)
Unrealized currency gains/losses	-	(372)
Operating lease right-of-use assets	(11,667)	(9,960)
Deferred revenue	(1,391)	—
Total deferred tax liabilities	$ (47,760)	$ (36,687)
Net deferred income tax assets (liabilities)	$ (21,532)	$ (13,643)

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 2021, the Company recorded an additional $0.9 million valuation allowance. In 2020, the Company reversed valuation allowance of $0.7 million recorded on net operating losses and other timing items in certain tax jurisdictions due to current and forecast taxable income. In 2019, the Company reversed valuation allowance of $0.5 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 not more likely than not that they will 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, 2021, the Company had net operating loss carryforwards of $3.5 million (tax effected). Of this amount, approximately $2.9 million relates to Canada and begin to expire starting in 2033 and have a full valuation allowance. The remainder $0.6 million relates to various U.S. and other foreign jurisdictions, of which $0.2 million can be carried forward indefinitely and the remaining $0.4 million will begin to expire in 2022 through 2036. In addition, the Company had capital loss carryforwards of $5.9 million, which can be carried forward indefinitely and have a full valuation allowance. Of this amount, $5.1 million and $0.8 million related to Canada and the U.K, respectively.

As of December 31, 2020, the Company had net operating loss carryforwards of $3.1 million (tax effected) available to reduce future taxable income. Of this amount, approximately $0.9 million relates to the U.S. and expires through 2037; and $2.1 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, $5.1 million and $0.6 million related to Canada and the U.K, respectively.

As of December 31, 2021, the Company had tax credit carryforwards of approximately $3.8 million. Approximately $2.6 million relate primarily to the U.S. and other immaterial foreign jurisdictions and will expire through 2042. The remaining $1.2

million tax credit carryforwards were related to Canada, of which $0.5 million expires through 2022 and $0.7 million can be carried forward indefinitely.

As of December 31, 2020, the Company had tax credit carryforwards of approximately $3.3 million available to reduce income taxes in future years. Approximately $1.4 million relates to the U.S. state tax credits, of which $1.3 million will expire through 2035 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 recognized for financial reporting purposes over the tax basis of investments in foreign subsidiaries that are essentially permanent in nature. The excess 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 $266.1 million as of December 31, 2021. The estimated unrecognized income tax and foreign withholding tax liability on this temporary difference is approximately $4.0 million.

As of December 31, 2021, the Company's total amount of unrecognized tax benefits was $4.8 million, of which $4.6 million would favorably affect the effective tax rate if benefited. Over the next twelve months, the Company may need to reverse up to $0.5 million of previously recorded 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.

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

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	4,929
Additions based on tax positions related to the current year	476
Additions for tax positions of prior years	356
Reductions to tax positions of prior years	(5)
Reductions to tax positions resulting from a lapse of the applicable statute of limitations	(498)
Settlements with tax authorities	—
Balance at December 31, 2020	5,258
Additions based on tax positions related to the current year	1,162
Additions for tax positions of prior years	9
Reductions to tax positions of prior years	(41)
Reductions to tax positions resulting from a lapse of the applicable statute of limitations	(1,591)
Settlements with tax authorities	—
Balance at December 31, 2021	$ 4,797

The Company recognizes interest and penalties related to uncertain tax positions in income tax provision. As of December 31, 2021 and 2020, the Company had approximately $0.6 million and $0.7 million, respectively, of accrued interest and penalties related to uncertain tax positions. During the years ended December 31, 2021, 2020 and 2019, the Company recognized ($0.1) million, $0.2 million and $0.1 million, respectively, of expense for an increase (decrease) 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 2011.

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	2018 - Present
Canada	2017 - Present
United Kingdom	2020 - Present
Germany	2017 - Present
The Netherlands	2017 - Present
China	2012 - Present
Japan	2016 - Present

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,		
	2021	2020	2019
2020 restructuring	$ 8,133	$ 2,736	$ —
2019 restructuring	208	988	7,463
2018 restructuring	-	753	1,177
Total restructuring related charges	$ 8,341	$ 4,477	$ 8,640
Acquisition and related charges	$ 9,679	$ (667)	$ 7,934
Total restructuring and acquisition related costs	$ 18,020	$ 3,810	$ 16,574

2020 Restructuring

As a result of the Company's ongoing evaluations and efforts to reduce its operating costs, while improving efficiency and effectiveness, the Company initiated the 2020 restructuring program in the third quarter of 2020. This program is focused on reducing operating complexity in the Company, including reducing infrastructure costs and streamlining the Company's operating model to better serve its customers. In addition, the program has been focused on cost reduction actions that improve gross margins for the overall company. In 2021, the Company recorded $8.1 million in severance and other costs in connection with the 2020 restructuring program. The Company anticipates completing the 2020 restructuring program in the fourth quarter of 2022 and expects to incur additional restructuring charges between $3.5 million and $4.5 million related to the 2020 restructuring program in the next twelve months.

The following table summarizes restructuring costs associated with the 2020 restructuring program by reportable segment (in thousands):

	Year Ended December 31,		Cumulative Costs as of
	2021	2020	December 31, 2021
Photonics	$ 3,085	$ 740	$ 3,825
Vision	813	1,330	2,143
Precision Motion	4,206	524	4,730
Unallocated Corporate and Shared Services	29	142	171
Total	$ 8,133	$ 2,736	$ 10,869

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 2021, the Company recorded $0.2 million in severance and related costs in connection with the 2019 restructuring plan. As of December 31, 2021, the Company incurred cumulative costs related to this restructuring plan totaling $9.0 million. The 2019 restructuring program was completed in the first quarter of 2021.

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	Employee Related	Facility Related	Other
Balance at December 31, 2019	$ 2,073	$ 1,988	$ —	$ 85
Restructuring charges	4,477	3,506	503	468
Cash payments	(4,024)	(3,229)	(115)	(680)
Non-cash write-offs and other adjustments	(726)	(584)	(272)	130
Balance at December 31, 2020	1,800	1,681	116	3
Restructuring charges	8,341	6,462	1,309	570
Cash payments	(3,727)	(2,898)	(226)	(603)
Non-cash write-offs and other adjustments [(1)]	(3,728)	(3,138)	(649)	59
Balance at December 31, 2021	$ 2,686	$ 2,107	$ 550	$ 29

(1) Non-cash charges included stock-based compensation charges amounting to $3.0 million associated with severance agreements for certain employees.

Acquisition and Related Charges

Acquisition and related costs incurred in connection with business combinations, primarily including finders' fees, legal, valuation and other professional or consulting fees, totaled $5.9 million, $0.6 million, and $5.3 million during 2021, 2020, and 2019, respectively. The Company incurred $1.9 million and $1.7 million in legal costs related to a dispute involving a company that was acquired in 2019 during 2021 and 2020, respectively. Acquisition related costs recognized under earn-out agreements in connection with acquisitions totaled $1.9 million, $(3.0) million, and $2.6 million during 2021, 2020, and 2019, respectively. The acquisition related costs for 2021 were $(0.5) million, $2.5 million, $2.0 million and $5.7 million for Photonics, Vision, Precision Motion, and Unallocated Corporate and Shared Services reportable segments, respectively.

17. Commitments and Contingencies

Purchase Commitments

As of December 31, 2021, the Company had purchase commitments primarily for inventory purchases of $169.6 million. These purchase commitments are expected to be incurred as follows: $167.1 million in 2022 and $2.5 million in 2023.

Legal Proceedings

In April 2020, the Company received notification of an arbitration demand filed with the American Arbitration Association against a business acquired by the Company in June 2019. The arbitration demand was filed by a contract counterparty to a joint product development agreement entered into by the business before the Company acquired it. The arbitration demand alleged breach of contract and other claims arising out of allegations that the business failed to engage in required marketing activities for the product developed under the joint product development agreement. The claimant sought compensatory and punitive damages, lost profits and other relief. During the second quarter of 2021, the arbitrator formally closed the arbitration pursuant to a settlement between the parties. No financial damages payments were made by the Company.

The Company is subject to various other 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, 2021 and 2020. 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.

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. Segment Information

Reportable Segments

The Company's Chief Operating Decision Maker ("CODM") is our Chief Executive Officer. The 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 technologies, video recorder and video integration technologies for operating room integrations; optical data collection and machine vision technologies; radio frequency identification 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 motors, servo drives and motion control solutions, integrated stepper motors, intelligent robotic end-of-arm technology solutions, 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.

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,		
	2021	2020	2019
Revenue			
Photonics	$ 232,459	$ 199,613	$ 230,457
Vision	262,060	261,650	271,407
Precision Motion	212,274	129,360	124,235
Total	$ 706,793	$ 590,623	$ 626,099

	Year Ended December 31,		
	2021	2020	2019
Gross Profit			
Photonics	$ 107,993	$ 89,060	$ 105,845
Vision	100,890	100,267	105,228
Precision Motion	99,345	58,279	53,326
Unallocated Corporate and Shared Services	(7,900)	(3,089)	(2,314)
Total	$ 300,328	$ 244,517	$ 262,085

	Year Ended December 31,		
	2021	2020	2019
Operating Income (Loss)			
Photonics	$ 46,792	$ 34,001	$ 41,990
Vision	17,694	16,354	21,007
Precision Motion	52,676	31,663	22,339
Unallocated Corporate and Shared Services	(53,108)	(26,130)	(30,054)
Total	$ 64,054	$ 55,888	$ 55,282

	Year Ended December 31,		
	2021	2020	2019
Depreciation and Amortization Expenses			
Photonics	$ 11,600	$ 11,261	$ 12,139
Vision	20,812	21,374	21,161
Precision Motion	10,728	5,443	4,712
Unallocated Corporate and Shared Services	254	215	268
Total	$ 43,394	$ 38,293	$ 38,280

	December 31,	
	2021	2020
Accounts Receivable		
Photonics	$ 31,392	$ 27,328
Vision	44,078	33,194
Precision Motion	40,147	14,532
Total accounts receivable	$ 115,617	$ 75,054
Inventories		
Photonics	$ 49,146	$ 35,878
Vision	34,621	41,137
Precision Motion	41,890	15,722
Total inventories	$ 125,657	$ 92,737
Total segment assets	$ 241,274	$ 167,791

	December 31,	
	2021	2020
Total Assets		
Total segment assets	$ 241,274	$ 167,791
Cash and cash equivalents	117,393	125,054
Prepaid income taxes and income taxes receivable	1,997	3,203
Prepaid expenses and other current assets	13,161	8,125
Property, plant and equipment, net	87,439	78,676
Operating lease assets	48,338	34,444
Deferred tax assets	12,206	10,491
Other assets	5,586	2,894
Intangible assets, net	220,989	148,521
Goodwill	479,500	285,980
Total	$ 1,227,883	$ 865,179

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,					
	2021		2020		2019	
	Revenue	% of Total	Revenue	% of Total	Revenue	% of Total
United States	$ 270,833	38.4%	$ 225,760	38.2%	$ 254,279	40.6%
Germany	101,865	14.4	83,765	14.2	82,032	13.1
Rest of Europe	138,863	19.6	127,040	21.5	129,643	20.7
China	95,045	13.4	70,557	11.9	59,512	9.5
Rest of Asia-Pacific	89,198	12.6	74,334	12.6	89,588	14.3
Other	10,989	1.6	9,167	1.6	11,045	1.8
Total	$ 706,793	100.0%	$ 590,623	100.0%	$ 626,099	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,	
	2021	2020
United States	$ 27,587	$ 25,436
Germany	33,344	36,314
U.K.	15,059	9,447
Rest of Europe	4,754	5,312
China	6,521	1,809
Rest of Asia-Pacific	174	358
Total	$ 87,439	$ 78,676

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,		
	2021	2020	2019
Medical	52%	56%	55%
Advanced Industrial	48%	44%	45%
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 consolidated revenue during the years ended December 31, 2021 and December 31, 2019. For the year ended December 31, 2020, the Company recognized revenue from an OEM customer in the medical end market which accounted for approximately 11% of the Company's consolidated revenue.

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, 2021

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"), as of December 31, 2021. 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, 2021.

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, 2021 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, 2021. In making their assessment, our management utilized the criteria set forth in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). Our assessment of, and conclusion on, the effectiveness of internal control over financial reporting did not include ATI Industrial Automation, Inc ("ATI"). and Schneider Electric Motion USA, Inc.("SEM"), both acquired in purchase business combinations in 2021 and included in our 2021 consolidated financial statements. ATI and SEM, whose assets and revenues excluded from our assessment of internal control over financial reporting represent approximately 5% and 1% of total assets, respectively, and approximately 5% and 1% of total revenues, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2021. Based on our evaluation under the framework in *Internal Control—Integrated Framework* (2013*)*, issued by COSO, our management concluded that our internal control over financial reporting was effective as of December 31, 2021.

The effectiveness of our internal control over financial reporting as of December 31, 2021 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.

Item 9C. ***Disclosure Regarding Foreign Jurisdictions that Prevent Inspections***

Not applicable.

PART III

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 2022 Annual Meeting of Shareholders to be filed with the Securities and Exchange Commission.

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 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, including 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 12, 2022 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 12, 2022 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 12, 2022 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 12, 2022 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 12, 2022 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†	Stock Purchase Agreement dated July 9, 2021, between Novanta Corporation and Schneider Electric Holding, Inc.	10-Q	001-35083	2.1	11/09/2021	
2.2†	Stock Purchase Agreement dated July 9, 2021, between Novanta Corporation, Novanta Technologies (Suzhou) Co. Ltd, ATI Industrial Automation, Inc. and ATI Industrial Automation (Lang Fang) Co. Ltd	10-Q	001-35083	2.2	11/09/2021	
3.1	Certificate and Articles of Continuance of the Registrant, dated March 22, 1999	S-3	333-202597	3.1	03/09/2015	
3.2	By-Laws of the Registrant, as amended	10-K	001-35083	3.2	03/01/2021	
3.3	Articles of Reorganization of the Registrant, dated July 23, 2010	8-K	000-25705	3.1	07/23/2010	
3.4	Articles of Amendment of the Registrant, dated December 29, 2010	8-K	000-25705	3.1	12/29/2010	
3.5	Articles of Amendment of the Registrant, dated May 11, 2016	8-K	001-35083	10.1	05/12/2016	
3.6	Articles of Amendment of the Registrant, dated April 23, 2021	8-K	001-35083	3.1	05/14/2021	
4.1	Specimen Stock Certificate	10-K	001-35083	4.1	02/28/2018	
4.2	Form of Indenture, between the Registrant and Wilmington Trust, National Association	S-3	333-229912	4.3	02/27/2019	
4.3	Description of Common Shares	10-K	001-35083	4.3	02/26/2020	
10.1††	Novanta Inc. 2010 Incentive Award Plan (Amended and Restated Effective March 19, 2021), as amended	8-K	001-35083	10.1	05/14/2021	
10.2††	Form of Deferred Stock Unit Award Agreement	10-K	001-35083	10.59	03/30/2011	
10.3††	Restricted Stock Unit Inducement Award Grant Notice	S-8	333-194557	99.1	03/14/2014	
10.4††	Form of Stock Option Grant Notice and Stock Option Agreement	10-Q	001-35083	10.2	08/02/2016	
10.5††	Form of U.S. Restricted Stock Unit Award Agreement	10-Q	001-35083	10.2	05/16/2011	
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	05/04/2012	
10.8††	Form of Performance Stock Unit Award Grant Notice and Performance Stock Unit Award Agreement	10-Q	001-35083	10.3	08/02/2016	
10.9††	Severance Agreement, dated as of August 15, 2012, between GSI Group Inc. and Peter Chang	10-Q	001-35083	10.7	11/07/2012	

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed/ Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
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	01/03/2020	
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	05/06/2014	
10.12††	Amended and Restated Employment Agreement, dated April 21, 2017, between Novanta Inc. and Matthijs Glastra	8-K	001-35083	10.1	04/24/2017	
10.13††	Amended and Restated Employment Agreement, dated April 21, 2017, between Novanta Inc. and Robert Buckley	8-K	001-35083	10.2	04/24/2017	
10.14††	Employment Agreement, dated April 21, 2017, between Novanta Inc. and Brian Young	8-K	001-35083	10.3	04/24/2017	
10.15††	Form of New Restricted Stock Unit Award Agreement	10-Q	001-35083	10.1	05/08/2017	
10.16††	Form of New Performance Stock Unit Award Grant Notice and Performance Stock Unit Award Agreement	10-Q	001-35083	10.2	05/08/2017	
10.17††	Form of Indemnification Agreement, by and between Novanta Inc. and certain officers and directors	10-Q	001-35083	10.2	11/01/2017	
10.18††	Form of Indemnification Agreement, by and between Novanta Corporation and certain officers and directors	10-Q	001-35083	10.3	11/01/2017	
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	05/08/2018	
10.20††	Novanta Inc. Non-Employee Director Compensation Policy	10-Q	001-35083	10.1	11/06/2018	
10.21††	Form of Director Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement	10-Q	001-35083	10.2	11/06/2018	
10.22	First Amendment to Third Amended and Restated Credit Agreement, dated March 27, 2020	8-K	001-35083	10.1	03/31/2020	
10.23	Second Amendment to Third Amended and Restated Credit Agreement, dated June 2, 2020	10-Q	001-35083	10.1	08/06/2020	
10.24	Third Amendment to Third Amended and Restated Credit Agreement, dated September 22, 2021	10-Q	001-35083	10.1	11/09/2021	
10.25	Fourth Amendment to Third Amended and Restated Credit Agreement, Dated October 5, 2021	8-K	011-35083	10.1	10/07/2021	

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed/ Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
10.26††	Form of Restricted Stock Unit Award Grant Notice and Agreement	10-Q	011-35083	10.2	05/11/2021	
10.27††	Form of Operating Cash Flow Performance Stock Unit Award Grant Notice and Agreement	10-Q	011-35083	10.3	05/11/2021	
21.1	Subsidiaries of the Registrant					*
23.1	Consent of Independent Registered Public Accounting Firm					*
31.1	Chief Executive Officer Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					*
31.2	Chief Financial Officer Certification 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).					*

† Certain schedules or appendices to this exhibit have been omitted pursuant to Regulation S-K Item 601(a)(5). A copy of any omitted schedule will be furnished to the Securities and Exchange Commission or its staff upon request.

†† 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: March 1, 2022

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
/s/ Matthijs Glastra **Matthijs Glastra**	Chairperson of the Board of Directors, Chief Executive Officer	March 1, 2022
/s/ Robert J. Buckley **Robert J. Buckley**	Chief Financial Officer	March 1, 2022
/s/ Peter L. Chang **Peter L. Chang**	Chief Accounting Officer and Corporate Controller	March 1, 2022
/s/ Lonny J. Carpenter **Lonny J. Carpenter**	Lead Director	March 1, 2022
/s/ Brian D. King **Brian D. King**	Director	March 1, 2022
/s/ Ira J. Lamel **Ira J. Lamel**	Director	March 1, 2022
/s/ Maxine L. Mauricio **Maxine L. Mauricio**	Director	March 1, 2022
/s/ Katherine A. Owen **Katherine A. Owen**	Director	March 1, 2022
/s/ Thomas N. Secor **Thomas N. Secor**	Director	March 1, 2022
/s/ Frank A. Wilson **Frank A. Wilson**	Director	March 1, 2022

FACTORS AFFECTING FUTURE PERFORMANCE

Certain statements in this release are "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995 and are based on current expectations and assumptions that are subject to risks and uncertainties. All statements contained in this Annual Report that do not relate to matters of historical fact should be considered forward-looking statements, and are generally identified by words such as "expect," "intend," "anticipate," "estimate," "believe," "future," "could," "should," "plan," "aim," and other similar expressions. These forward-looking statements include, but are not limited to, statements regarding anticipated financial performance and financial position, including expectations regarding market conditions; statements regarding the COVID-19 pandemic; expectations regarding product launches; our ability to fund future acquisitions; and other statements that are not historical facts. These forward-looking statements are neither promises nor guarantees, but involve risks and uncertainties that may cause actual results to differ materially from those contained in the forward-looking statements. Our actual results could differ materially from those anticipated in these forward-looking statements for many reasons, including, but not limited to, the following: economic and political conditions and the effects of these conditions on our customers' businesses, capital expenditures and level of business activities; risks associated with the COVID-19 pandemic and other events outside our control; our dependence upon our ability to respond to fluctuations in product demand; our ability to continually innovate, introduce new products in a timely manner and successfully commercialize our innovations; customer order timing and other similar factors beyond our control; disruptions or breaches in security of our or our third-party providers' information technology systems; our failure to comply with data protection, privacy and security laws, regulations, standards and other requirements; changes in interest rates, credit ratings or foreign currency exchange rates; our reliance on international operations; our increased outsourcing of components manufacturing to manufacturers outside the U.S.; our exposure to increased tariffs, trade restrictions or taxes on our products; negative effects on global economic conditions, financial markets and our business as a result of the United Kingdom's withdrawal from the European Union; violations of our intellectual property rights and our ability to protect our intellectual property against infringement by third parties; risk of losing our competitive advantage; our failure to successfully integrate recent and future acquisitions into our business; our ability to attract and retain key personnel; our restructuring and realignment activities and disruptions to our operations as a result of consolidation of our operations; product defects or problems integrating our products with other vendors' products; disruptions in the supply of certain key components or other goods from our suppliers; our failure to accurately forecast component and raw material requirements leading to excess inventories or delays in the delivery of our products; production difficulties and product delivery delays or disruptions; our exposure to medical device regulations, 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; potential penalties for violating foreign, U.S. federal, and state healthcare laws and regulations; impact of healthcare industry cost containment and healthcare reform measures; changes in governmental regulations affecting our business or products; our failure to implement new information technology systems and software successfully; our failure to realize the full value of our intangible assets; increasing scrutiny and changing expectations from investors, customers, and governments with respect to environmental, social and governance policies and practices leading to higher costs and other risks, being subject to U.S. federal income taxation even though we are a non-U.S. corporation; any need for additional capital to adequately respond to business challenges or opportunities and repay or refinance our existing indebtedness, which may not be available on acceptable terms or at all; our existing indebtedness limiting our ability to engage in certain activities; and the important factors described in Item 1A of the Annual Report on Form 10-K for the year ended December 31, 2021 included in this Annual Report and in the Company's future filings with the Securities and Exchange Commission (the "SEC"). Such statements are based on management's beliefs and assumptions and on information currently available to the Company's management. The Company disclaims any obligation to update any forward-looking statements as a result of developments occurring after the date of this document except as required by law.

FORM 10-K

This Annual Report to Shareholders includes a copy of our Annual Report on Form 10-K for the fiscal year ended December 31, 2021, excluding exhibits, as filed with the SEC and available through our website at https://www.novanta.com. We will, upon written request and payment of an appropriate processing fee, provide our shareholders with copies of the exhibits to our Annual Report on Form 10-K. Please address your request to Novanta Inc., 125 Middlesex Turnpike, Bedford, MA 01730, Attention: Investor Relations.

RECONCILIATION OF NON-GAAP FINANCIAL MEASURES

This Annual Report contains the non-GAAP financial measures of Adjusted EBITDA, Organic Revenue Growth and Adjusted Diluted EPS. A tabular reconciliation of these non-GAAP financial measures to the most comparable GAAP measures are set forth below.

Adjusted EBITDA (Non-GAAP): [1]	**Year Ended December 31,**	
	2021	**2020**
(in thousands of U.S. dollars)	**(Unaudited)**	**(Unaudited)**
Consolidated Net Income (GAAP)	**$ 50,331**	**$ 44,521**
Interest (income) expense, net	7,387	6,564
Income tax provision	5,841	3,882
Depreciation and amortization	43,126	38,293
Share-based compensation	22,557	22,535
Restructuring and acquisition related costs	18,020	3,810
Acquisition inventory fair value adjustments	1,411	188
Employee COVID-19 testing costs	3,568	275
Other non-operating income (expense), net	495	921
Adjusted EBITDA (non-GAAP)	**$ 152,736**	**$ 120,989**
Adjusted EBITDA Margin (non-GAAP)	**21.6%**	**20.5%**

(1) The Company defines Adjusted EBITDA as the consolidated net income before deducting interest (income) expense, income taxes, depreciation, amortization, non-cash share-based compensation, restructuring, acquisition and divestiture related costs, acquisition fair value adjustments, costs directly related to employee COVID-19 testing, other non-operating income (expense) items, including foreign exchange gains (losses), and net periodic pension costs of the Company's frozen U.K. defined benefit pension plan. The Company defines Adjusted EBITDA Margin as Adjusted EBITDA as a percentage of Revenue. The Company believes Adjusted EBITDA and Adjusted EBITDA Margin provide useful and supplementary information to investors regarding the operating results of the Company because of the significant changes that have occurred outside of the Company's day-to-day business in accordance with the execution of the Company's strategy. This strategy includes streamlining the Company's existing operations through site and functional consolidations, strategic divestitures and product line closures, expanding the Company's business through significant internal investments, and broadening the Company's product and service offerings through acquisition of innovative and complementary technologies and solutions. The financial impact of certain elements of these activities, particularly acquisitions, divestitures, and site and functional restructurings, is often large relative to the Company's overall financial performance and can adversely affect the comparability of its operating results and investors' ability to analyze the business from period to period. Adjusted EBITDA is used by management to evaluate operating performance, communicate financial results to the Board of Directors, benchmark results against historical performance and the performance of peers, and evaluate investment opportunities, including acquisitions and divestitures. In addition, Adjusted EBITDA is used as one of the performance metrics to determine bonus payments for senior management and employees. Accordingly, the Company believes that these non-GAAP measures provide greater transparency and insight into management's method of analysis. In evaluating Adjusted EBITDA, you should be aware that, in the future, the Company may incur expenses that are the same as, or similar to, some of the adjustments listed above.

RECONCILIATION OF NON-GAAP FINANCIAL MEASURES (Continued)

Organic Revenue Growth/(Decline) (Non-GAAP): [1]	**Year Ended December 31, 2021 Compared to Year Ended December 31, 2020**
	(Unaudited)
Reported Revenue Growth/(Decline) (GAAP)	**19.7%**
Less: Change attributable to acquisitions	7.3%
Plus: Change due to foreign currency	(2.1%)
Organic Revenue Growth/(Decline) (non-GAAP)	**10.3%**

(1) The Company defines the term "organic revenue" as revenue excluding the impact from business acquisitions, divestitures, product line discontinuations, and the effect of foreign currency translation. The Company uses the related term "organic revenue growth/(decline)" to refer to the financial performance metric of comparing current period organic revenue with the reported revenue of the corresponding period in the prior year. The Company believes that this non-GAAP financial measure, when taken together with our GAAP financial measures, allows the Company and its investors to better measure the Company's performance and evaluate long-term performance trends. Organic revenue growth/(decline) also facilitates easier comparisons of the Company's performance with prior and future periods and relative comparisons to its peers. The Company excludes the effect of foreign currency translation from these measures because foreign currency translation is subject to volatility and can obscure underlying business trends. The Company excludes the effect of acquisitions and divestitures because these activities can vary dramatically between reporting periods and between the Company and its peers, which the Company believes makes comparisons of long-term performance trends difficult for management and investors. Organic Revenue Growth/(Decline) is also used as a performance metric to determine bonus payments for senior management and employees.

Adjusted Diluted EPS (Non-GAAP): [1]	**Year Ended December 31,**	
	2021	**2020**
(in thousands of U.S. dollars except per share amounts)	**(Unaudited)**	**(Unaudited)**
Net income (GAAP)	**$ 50,331**	**$ 44,521**
Diluted EPS (GAAP)	**$ 1.41**	**$ 1.25**
Non-GAAP adjustments:		
Amortization of intangible assets [2]	29,865	25,093
Restructuring costs [3]	8,341	4,477
Acquisition related costs [3]	9,679	(667)
Acquisition fair value adjustments [3]	1,411	188
Employee COVID-19 testing costs [4]	3,568	275
Foreign exchange transaction (gains) losses, net [5]	127	942
Total Non-GAAP adjustments before income taxes	52,991	30,308
Tax effect of non-GAAP adjustments [6]	10,815	5,482
Non-GAAP tax adjustments [6]	(1,370)	(35)
Adjusted net income (Non-GAAP)	**$ 93,877**	**$ 69,382**
Adjusted Diluted EPS (Non-GAAP)	**$ 2.62**	**$ 1.95**
Weighted-average shares outstanding - Diluted	**35,781**	**35,654**

(1) The Company believes Adjusted Diluted EPS provides useful and supplementary information to investors regarding the operating performance of the Company because Adjusted Diluted EPS is used by management to evaluate operating performance, communicate financial results to the Board of Directors, and benchmark results against historical performance and the performance of peers. The Company also uses Adjusted Diluted EPS as a measurement for performance-based restricted stock units issued to certain executives. Accordingly, the Company believes this non-GAAP measure provides greater transparency and insight into management's method of analysis. In evaluating Adjusted Diluted EPS, you should be aware that in the future the Company may incur expenses that are the same as, or similar to, some of the adjustments listed above.

(2) Amortization of acquired intangible assets and acquisition fair value adjustments are excluded from Adjusted Diluted EPS because (i) these amounts are non-cash; (ii) the Company cannot influence the timing and amount of future expense recognition; and (iii) excluding such expenses provides investors and management better visibility into the components of operating costs.

(3) These amounts relate to the Company's restructuring programs, business acquisitions, divestitures and related activities. Such expenses are excluded from the calculation of Adjusted Diluted EPS due to the significant changes that have occurred outside of the Company's day-to-day business as a result of the execution of the Company's strategy. The financial impact of certain elements of these activities, particularly acquisitions, divestures, and site and functional restructurings, is often large relative to the Company's overall financial performance and can adversely affect the comparability of its operating results and investors' ability to analyze the business from period to period.

(4) The Company excludes costs directly related to employee COVID-19 testing as these costs are unique to the current pandemic and had a significant impact on our operating results.

(5) The Company excludes foreign exchange transaction gains (losses) as the Company cannot fully influence the timing and amount of foreign currency transaction gains (losses).

(6) The Company excludes significant discrete income tax expenses (benefits) related to releases of valuation allowances, benefits or expenses associated with the completion of tax audits, effects of changes in tax laws, effects of acquisition related tax planning actions on our effective tax rate, and the income tax effect of non-GAAP adjustments above.

Non-GAAP financial measures should not be considered as substitutes for, or superior to, measures of financial performance prepared in accordance with GAAP. They are limited in value because they exclude charges that have a material effect on the Company's reported results and, therefore, should not be relied upon as the sole financial measures to evaluate the Company's financial results. The non-GAAP financial measures are meant to supplement, and to be viewed in conjunction with, GAAP financial measures.

CORPORATE INFORMATION

EXECUTIVE OFFICERS

Matthijs Glastra
Chairperson and Chief Executive Officer

Robert J. Buckley
Chief Financial Officer

Brian S. Young
Chief Human Resources Officer

BOARD OF DIRECTORS

Matthijs Glastra
Chairperson of the Board of Directors, Novanta Inc.

Lonny J. Carpenter, Lead Director
Former Group President, Stryker Corporation

Brian D. King
Former President and Chief Executive Officer,
Viant Medical, LLC

Ira J. Lamel
Former Executive Vice President and Chief Financial Officer, The Hain Celestial Group, Inc.

Maxine L. Mauricio
Executive Vice President, General Counsel and Secretary, EMCOR Group, Inc.

Katherine A. Owen
Former Vice President and Advisor to the CEO,
Stryker Corporation

Thomas N. Secor
Managing Director, Morningside Heights Capital,
an investment firm

SHAREHOLDER INFORMATION

CORPORATE HEADQUARTERS

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125 Middlesex Turnpike
Bedford, MA 01730
U.S.A.
Phone: 1-781-266-5700
Fax: 1-781-266-5114

WEBSITE
https://www.novanta.com

ANNUAL MEETING OF SHAREHOLDERS
Thursday, May 12, 2022 at 2:00 p.m. (ET)

Virtually at:
www.virtualshareholdermeeting.com/NOVT2022

An Annual Report, a Management Proxy Circular and a form of Proxy will be furnished to each shareholder as of the record date of March 31, 2022.

AUDITORS
PricewaterhouseCoopers LLP
101 Seaport Boulevard
Boston, MA 02210

TRANSFER AGENT
Computershare Investor Services
100 University Ave.
8th Floor, North Tower
Toronto, Ontario, M5J 2Y1, Canada
Phone: 1-800-564-6253

Fax: 1-888-453-0330
service@computershare.com

STOCK EXCHANGE
Novanta Inc.'s common shares are listed and traded on the Nasdaq Global Select Market under the ticker symbol "NOVT".

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