

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. 001-34220



3D SYSTEMS CORPORATION

(Exact name of Registrant as specified in its Charter)

Delaware

(State or Other Jurisdiction of
Incorporation or Organization)

95-4431352

(I.R.S. Employer
Identification No.)

**333 Three D Systems Circle
Rock Hill, South Carolina 29730**

(Address of Principal Executive Offices and Zip Code)

(Registrant's Telephone Number, Including Area Code): (803) 326-3900

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, par value \$0.001 per share	DDD	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

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

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

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

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

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

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
Emerging growth company	<input type="checkbox"/>		

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 Securities 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 Common Stock held by non-affiliates of the registrant on June 30, 2021 was \$4,883,584,523. For purposes of this computation, it has been assumed that the shares beneficially held by directors and executive officers of the registrant were “held by affiliates.” This assumption is not to be deemed an admission by these persons that they are affiliates of the registrant.

The number of shares of the registrant’s Common Stock outstanding as of February 23, 2022: 128,309,940

DOCUMENTS INCORPORATED BY REFERENCE: Portions of the registrant’s definitive proxy statement for its 2022 Annual Meeting of Stockholders are incorporated by reference into Part III of this Form 10-K.

3D SYSTEMS CORPORATION
Annual Report on Form 10-K
For the Year Ended December 31, 2021

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This Annual Report on Form 10-K ("Form 10-K") contains forward-looking statements, within the meaning of the Private Securities Litigation Reform Act of 1995, that involve risks and uncertainties. Many of the forward-looking statements are located in Part II, Item 7 of this Form 10-K under the heading "Management's Discussion and Analysis of Financial Condition and Results of Operations." Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from historical results or from any future results expressed or implied by such forward-looking statements. In many cases, you can identify forward-looking statements by terms such as "believes," "belief," "expects," "may," "will," "estimates," "intends," "anticipates," or "plans" or the negative of these terms or other comparable terminology. Forward-looking statements are based upon management's beliefs, assumptions and current expectations concerning future events and trends, using information currently available, and are necessarily subject to uncertainties, many of which are outside our control. Although we believe that the expectations reflected in the forward-looking statements are reasonable, forward-looking statements are not, and should not be relied upon as a guarantee of future performance or results, nor will they necessarily prove to be accurate indications of the times at or by which any such performance or results will be achieved. A number of important factors could cause actual results to differ materially from those expressed in or implied by the forward-looking statements. Factors that could cause such differences include, but are not limited to, those discussed in Part I, Item 1A of this Form 10-K under the heading "Risk Factors." All subsequent written and oral forward-looking statements attributable to the Company or to individuals acting on our behalf are expressly qualified in their entirety by this discussion. The Company assumes no obligation to revise or update any forward-looking statements for any reason, except as required by law.

PART I

Item 1. Business

General

3D Systems Corporation ("3D Systems" or the "Company" or "we" or "us") provides comprehensive 3D printing and digital manufacturing solutions, including 3D printers for plastics, metals, wax and bioinks, materials, software, advanced manufacturing services and digital design tools. Our solutions support advanced applications in two key industry verticals: Healthcare (which includes dental, medical devices, personalized health services and regenerative medicine) and Industrial (which includes aerospace, defense, transportation and general manufacturing). We market our products and services through subsidiaries and channel partners in North America and South America (collectively referred to as "Americas"), Europe, the Middle East, and Africa (collectively referred to as "EMEA") and Asia-Pacific and Oceania (collectively referred to as "APAC").

Business Strategy

Accelerating Additive Manufacturing Adoption

We partner with customers to enable them to adopt and scale additive manufacturing in their production environments. We believe that our additive manufacturing capabilities can help customers solve a number of design and manufacturing challenges – such as improved lead times, enhanced design freedom, part consolidation and the ability for mass customization. We believe we have both the scale and the breadth of technologies, encompassing hardware platforms, materials and software, that our customers require for the successful implementation of additive manufacturing into their design and manufacturing processes. Using a strong application focus in each of our two business segments, we integrate our printer, material and software technologies in unique combinations to solve a customer's product need. Once complete, we can scale the process for the customer to a certain production level through our Advanced Manufacturing solutions, and, with increasing demand, we can enable a customer to continue scaling to high volumes. This transfer of the workflow involves providing the printing systems, materials and software, along with the process definition, that results in a seamless transfer of capability to the manufacturer. We expect the result of this approach to drive recurring revenue streams as customers adopt additive manufacturing solutions and consume materials to produce parts, utilize software to manage the print process and manufacturing operations, and make use of our service offerings for maintenance and upgrades. Our proficiency in providing industry focused application and solution development for customers includes a number of internal assets and capabilities, including:

- a. A full range of additive manufacturing hardware technologies and materials to address needs in metals, plastics, wax and bioprinting
- b. A services infrastructure that includes industry and technology application experts, customer innovation and advanced manufacturing centers and post-sale service and support
- c. A software suite that enables end-to-end additive manufacturing including design, simulation, process management and manufacturing execution

- d. Scale that includes significant and diverse experience in production parts and applications combined with a global reach to service our customers worldwide

As part of our strategy to enable customers to adopt additive manufacturing, in November 2021 we acquired Oqton, a software company that is a leader in the creation of a new breed of intelligent, cloud-based Manufacturing Operating System (MOS) platform. This platform is tailored for flexible production environments that increasingly utilize a range of advanced manufacturing and automation technologies, including additive manufacturing solutions, in their production workflows. The cloud-based solution leverages the Industrial Internet of Things, artificial intelligence, and machine learning technologies to deliver solutions to customers seeking to automate their digital manufacturing workflows, scale their operations and enhance their competitive position. In addition, in May 2021, we announced the acquisition of Additive Works, a Germany-based software company focused upon simulation-based optimization and automation of the additive manufacturing print preparation and workflow. This highly automated simulation software increases productivity by reducing set-up time while improving product yield, throughput, and component performance.

Investing in Regenerative Medicine

As an early and continuing innovator in additive manufacturing, we have significant experience in bringing this technology to new markets. In 2021, we announced an expansion of our focus and investments in the application of additive manufacturing for regenerative medicine. Our approach in regenerative medicine involves three strategies. The first strategy is the use of additive manufacturing for human organ transplantation. Each year, end-stage organ failure kills millions of people. However, the supply of donated organs is insufficient to meet the needs of patients seeking transplantation. In 2021, we announced an expansion of our organ printing development program, including our work with a key strategic partner. This program was first established in 2017 and combines our 3D printing expertise with the regenerative medicine and biotechnology expertise of our partner. To date, our program has had a focus on developing the capability to print scaffolds for human lungs, with a long-term goal of allowing all patients with end-stage lung disease to receive transplants which will enable them to enjoy long and active lives. Based upon the progress made toward this goal, the program was expanded to include two additional human organs.

Our second strategy involves the application of our bio-printing technology to non-organ human applications. We are focused on internal development, often in conjunction with strategic or development partners, of applications that combine our bio-printing and materials expertise with the application expertise of our partners.

Our third regenerative medicine strategy extends our bio-printing technologies into research labs, providing advanced printing systems and unique biological materials to those that advance the science of medicine. We believe our ability to print high-precision, three-dimensional vascularized cellular structures can be used in a number of research areas such as the development of new, more effective drug therapies.

To support our regenerative medicine efforts, in December 2021 we acquired Volumetric, a biotech company whose mission is to develop the ability to manufacture human organs using bioprinting methods and the underlying technologies required to create these highly complex biological structures. This acquisition is expected to supplement and expand our existing capabilities in bioprinting and regenerative medicine. In addition, in May 2021, we announced the acquisition of Allevi, a developer of bioprinting solutions, comprising of bioprinters, biomaterials, and specialized laboratory software.

Products

We offer our customers a comprehensive range of 3D printers, materials, software, and digital design tools.

3D Printers and Materials

Our 3D printers transform digital data input generated by 3D design software, Computer Aided Design (“CAD”) software or other 3D design tools, into printed parts using several unique print engines that employ proprietary, additive layer by layer building processes with a variety of materials. As part of our solutions oriented strategy, we offer a broad range of 3D printing technologies including Stereolithography (SLA), Selective Laser Sintering, Direct Metal Printing, MultiJet Printing, ColorJet Printing and extrusion and SLA based bioprinting. Our printers utilize a wide range of materials, the majority of which are proprietary materials that we develop, blend, and market. Our comprehensive range of materials includes plastic, nylon, metal, composite, elastomeric, wax, polymeric dental materials and biocompatible materials. We augment and complement our portfolio of engineered materials with materials that we purchase or develop with third parties under private label and distribution arrangements.

We work closely with our customers to optimize the performance of our materials in their applications. Our expertise in materials science and formulation, combined with our processes, software and equipment, enables us to provide unique solutions and help our customers select the material that best meets their needs with optimal cost and performance results.

As part of our solutions approach, our currently offered printers, with the exception of direct metal printers and bioprinters, have built-in intelligence to make them integrated, closed systems. For these integrated printers, we furnish materials specifically designed for use in those printers, which are packaged in smart cartridges and utilize material delivery systems. These integrated materials are designed to enhance system functionality, productivity, reliability and materials' shelf life, in addition to providing our customers with a built-in quality management system and a fully integrated workflow solution.

For our bioprinting solutions, we also offer research protocols that include bioink, consumable and reagent recommendations. These protocols cover pre-print preparation of cells and biomaterials, 3D printing parameter setting, and post-print processes. Our protocols are utilized by research organizations to run experiments, share research findings, and enhance the utilization of our bioprinters.

Software and Related Products

We provide digital design tools, including software, scanners and haptic devices. We offer solutions for product design, simulation, mold and die design, 3D scan-to-print, reverse engineering, production machining, metrology, inspection and manufacturing workflows. These products are designed to enable a seamless workflow for customers and are marketed under brand names such as Geomagic®. We also offer 3D Sprint and 3DXpert, proprietary software to prepare and optimize CAD data and manage the additive manufacturing processes. These software products provide automated support building and placement, build platform management, print simulation and print queue management capabilities. The outcome is the ability to improve the quality of prints, optimize design structure, shorten design to manufacturing lead time and minimize manufacturing costs.

For our bioprinters, we offer Bioprint Pro as a software solution that allows researchers to design and bioprint repeatable experiments. Bioprint Pro includes experiment-based workflows, basic CAD modeling, and optimized biomaterial presets.

Services

Maintenance and Training Services

We provide a variety of customer services, local application support and field support on a worldwide basis for our products, including installation of new printers at customers' sites, maintenance agreements, periodic hardware upgrades and software updates. We also provide services to assist our customers and partners in developing new applications for our technologies, to facilitate the use of our technology for specific applications, to train customers on the use of our printers and to maintain our printers at customers' sites. We provide these services, spare parts and field support either directly or through a network of reseller partners. We employ customer-support sales engineers to support our worldwide customer base, and we seek to continue to strengthen and enhance our partner network and service offerings.

Our 3D printers are sold with a warranty period ranging from 90 days to one year. After the warranty period, we generally offer service contracts that enable our customers to continue service and maintenance coverage. These service contracts are offered with various levels of support and options, and are priced accordingly. One entitlement of our service contracts is our service engineers provide regularly scheduled preventive maintenance visits to customer sites. Additionally, we provide training to our partners to enable them to also perform these services. Another contract entitlement on select printer models is proactive remote troubleshooting capability through our 3DConnect Service IoT platform. From time to time, we also offer upgrade kits for certain of our printers that enable our existing customers to take advantage of new or enhanced printer capabilities. In some cases, we have discontinued upgrade support and maintenance agreements for certain of our older legacy printers.

Advanced Manufacturing

As part of our strategy to help customers adopt additive manufacturing, we offer advanced manufacturing services through facilities in the Americas and EMEA regions. These facilities supplement customer manufacturing environments by allowing them to test and ramp production using our solutions before transitioning production to their environment. This allows us to provide application and production expertise and refine the production process as part of our solutions approach. As the process is validated and volumes ramp, customers may choose to move production to their facilities using equipment, materials, software and services that they purchase from us. These facilities operate under stringent quality systems and are also utilized by customers in regulated industries such as healthcare and aerospace & defense for sustained outsourced production of

hundreds of thousands of parts per year.

Software Services

In addition to our software license products, we offer software maintenance and cloud-software subscriptions, which includes updates and support for our licensed software products. Our licensed software is sold with a maintenance service that generally covers a period of one year. After this initial period, we offer single and multi-year maintenance contracts that enable our customers to continue coverage. These software service contracts typically include free software updates and various levels of technical support. In addition, we offer Oqton as a cloud based-manufacturing operating system designed to automate digital production workflows, enable machine monitoring, end-to-end manufacturing visibility and production traceability. For our cloud subscription solutions, customer support and software updates are included as part of the solution.

Healthcare Services

As part of our precision healthcare services, we provide surgical planning, modeling, prototyping and manufacturing services. We offer printing and finishing of medical and dental devices, anatomical models and surgical guides and tools, as well as modeling, design and planning services, including VSP™ surgical planning solutions.

Global Operations

We operate in the Americas, EMEA and APAC regions, and market our products and services in those areas as well as to other parts of the world.

In maintaining operations outside the United States (the “U.S.”), we expose our business to risks inherent in such operations, including currency exchange rate fluctuations. Information on foreign exchange risk appears in Part I, Item 1A, “Risk Factors,” Part II, Item 7A, “Quantitative and Qualitative Disclosures about Market Risk” and Part II, Item 8, “Financial Statements and Supplementary Data,” of this Form 10-K.

Marketing and Customers

Our Go-to-Market strategy focuses on an integrated approach that is directed at providing comprehensive design to manufacturing solutions meeting the broad spectrum of our customer needs. We utilize a wide range of marketing tools to generate demand and create awareness for our products and services worldwide. Our marketing and communications teams support our demand generation activities by providing marketing campaigns, digital presence and outreach, and event and targeted vertical seminar engagements.

We promote and sell our solutions globally through a direct sales force, channel partners and, in certain geographies, appointed distributors. Our customer success organization includes sales professionals, application engineers, vertical specialists, and other support teams throughout the Americas, EMEA and APAC regions. These teams are responsible for providing complete service to our customers and channel partners, from a technical consultation to the sale of our software, printer, and services products.

Our application engineers collaborate closely with our customers to solve complex design and additive manufacturing challenges, leveraging our technology, software, materials and services to develop advanced applications across healthcare and industrial segments. Additionally, our Customer Innovation Centers provide access to the resources necessary to develop, validate, and commercialize customer applications.

We sell our software solutions, including our Oqton manufacturing operating system software, through a dedicated software sales team. Our software may be sold to customers with 3D printing equipment from competitive equipment manufacturers and, in some cases, we resell our software through these manufacturers.

Our customers include major companies as well as small and midsize businesses in a broad range of industries, including medical, dental, automotive, aerospace, durable goods, government, defense, technology, jewelry, electronics, education, consumer goods, energy, biotechnology and others. For the years ended December 31, 2021, 2020, and 2019, one customer accounted for approximately 22%, 13% and 11% of our consolidated revenue, respectively. We expect to maintain our relationship with this customer.

Production and Suppliers

We outsource our 3D printer assembly and refurbishment activities to selected design, engineering and manufacturing companies in the U.S., Switzerland and Belgium. We purchase finished printers from these suppliers pursuant to forecasts and customer orders that we supply to them. These suppliers also carry out quality control procedures on our printers prior to their shipment to customers. As part of these activities, these suppliers have responsibility for procuring the components and sub-assemblies either from us or third-party suppliers, which are sourced from a geographically diverse mix of countries. While the outsourced suppliers of our printers have responsibility for the supply chain and inventory of components for the printers they assemble, the components, parts and sub-assemblies that are used in our printers are generally available from several potential suppliers.

We produce materials at our facilities in Rock Hill, South Carolina, Marly, Switzerland and Soesterberg, Netherlands. We also have arrangements with third parties who blend certain materials according to our specifications that we sell under our own brand names, and we purchase certain complementary materials from third parties for resale to our customers.

Our equipment assembly and materials blending activities, advanced manufacturing services and certain research and development activities are subject to compliance with applicable federal, state and local provisions regulating the storage, use and discharge of materials into the environment. We believe that we are in compliance, in all material respects, with such regulations as currently in effect, and we expect continued compliance with them will not have a material adverse effect on our capital expenditures, results of operations or consolidated financial position.

As a company with global operations, we are subject to the laws of the U.S. and multiple foreign jurisdictions in which we operate and the rules and regulations of various governing bodies, which may differ among jurisdictions. Compliance with these laws, rules and regulations has not had, and is not expected to have, a material effect on our capital expenditures, results of operations or competitive position as compared to prior periods.

Research and Development

The 3D printing industry continues to experience rapid technological change and developments in hardware, software and materials. Consequently, we have ongoing research and development programs to develop new products and to enhance our portfolio of products and services, as well as to improve and expand the capabilities of our solutions. Our efforts are often augmented by development arrangements with research institutions, including universities, customers, suppliers, assembly and design firms, engineering companies, materials companies, governments and other partners.

We are also engaged in various research and development efforts related to regenerative medicine. These efforts include the application of 3D printing technologies to the development of transplantable organs and non-organ human applications. These efforts are expected to result in new products that we will market directly or in conjunction with development or channel partners.

In addition to our internally developed technology platforms, we have acquired products and technologies developed by others by acquiring business entities that held ownership rights to such products and technologies. In other instances, we have licensed or purchased the intellectual property rights of technologies developed by third parties through agreements that may obligate us to pay a license fee or royalty, typically based upon a dollar amount per unit or a percentage of the revenue generated by such products.

Intellectual Property

We regard our technology platforms and materials as proprietary and seek to protect them through copyrights, patents, trademarks and trade secrets. At December 31, 2021 and 2020 we held 1,332 and 1,269 patents worldwide, respectively. At December 31, 2021 and 2020, we had 261 and 312 pending patent applications worldwide, respectively. The principal issued patents covering aspects of our various technologies will expire at varying times through the year 2034.

In addition, we are a party to various licenses that have had the effect of broadening the range of the patents, patent applications and other intellectual property available to us.

We have also entered into licensing or cross-licensing arrangements with various companies in the U.S. and other countries that enable those companies to utilize our technologies in their products or that enable us to use their technologies in our products. Under certain of these licenses, we are entitled to receive, or we are obligated to pay, royalties for the sale of licensed products in the U.S. or in other countries. The amount of such royalties was not material to any of our annual results of operations or financial position for the three-year period ended December 31, 2021.

We believe that, while our patents and licenses provide us with a competitive advantage, our success also depends on our marketing, business development, applications know-how and ongoing research and development efforts. Accordingly, we believe the expiration of any of the patents, patent applications, or licenses discussed above would not be material to our business or financial position.

Competition

We compete with other suppliers of 3D printers, materials, software and healthcare solutions as well as with suppliers of conventional manufacturing solutions. We compete with these suppliers for customers as well as channel partners for certain of our products. Development of new technologies or techniques not encompassed by the patents that we own or license may result in additional future competition.

Our competitors operate both globally and regionally, and many of them have well-recognized brands and product lines.

We believe principal competitive factors include the functionality and breadth of our technology and materials, process and application know-how, total cost of operation of the solution, product reliability and the ability to provide a complete solution to meet customer needs. We believe that our future success depends on our ability to provide high-quality solutions, introduce new products and services to meet evolving customer needs and market opportunities, and extend our technologies to new applications. Accordingly, our ongoing research and development programs are intended to enable us to continue technology advancement and develop innovative new solutions for the marketplace.

Human Capital

At 3D Systems, our purpose is to deliver leading additive solutions for industrial and healthcare applications. In support of this purpose, our priority is to invest in our people by focusing on bringing in top talent, providing training and development opportunities to strengthen capabilities and skills, and ensuring a safe and healthy work environment. As of December 31, 2021, 1,721 full-time and part-time employees, compared to 1,995 full-time and part-time employees as of December 31, 2020, were employed at 3D Systems. None of our U.S. employees are covered by collective bargaining agreements; however, some employees outside the U.S. are subject to local statutory employment and labor arrangements. We have not experienced any material work stoppages and believe that our relations with our employees are satisfactory.

Talent Development & Engagement

Through our operating history and experience with technological innovation, we appreciate the importance of retention, growth, and development of our employees – our employees are key to achieving long-term success. Our goal is to foster a workplace culture and employee experience that drives innovation with purpose, profitable growth, and delivers ‘extraordinary’ to our customers. To do so, we have programs for acquiring strategic talent, developing our teams to build key capabilities and skills, and engaging, motivating, and retaining our employees to do their best work. We regularly survey our employees to seek their feedback in areas such as culture, career development, inclusivity, integrity, and employee success. To address the evolving needs of our business, we perform strategic workforce and succession planning as well as ongoing evaluation of our organizational design, culture, and values.

Diversity, Equity & Inclusion

Employees span the Americas (54%), Europe, Middle East and Africa (36%), and Asia-Pacific (10%) with approximately 819 employees located outside the U.S. This global representation promotes diversity of thought, experiences, culture, and backgrounds that enhances our ability to deliver innovative solutions to our customers, in support of our company value to ‘build great teams.’ We are committed to fostering an engaged, diverse, inclusive, safe, and purpose-driven culture where employees have equitable opportunities for success. As we execute our talent management strategy, diversity, equity, and inclusion is a key element that influences our measures of success. We monitor the representation of our global employees across the company.

Compensation & Benefits

We design our compensation programs to be competitive and equitable to support employees in sharing in the success of 3D Systems. We tailor our compensation programs to attract and retain top talent to drive success in our current business priorities and emerging strategies. Additionally, we recognize that employees thrive when they have the resources to meet their needs and the time and support to succeed in their professional and personal lives. In support of this, we offer a wide variety of market competitive benefits to employees around the world. Our Compensation Committee of the Board of Directors oversees the design of executive compensation and equity plans, which are designed to align executive pay to the delivery of long-term shareholder value.

Workplace Health & Safety

We are committed to creating a safe, secure, healthy, and injury-free work environment for our employees, customers, partners, and visitors. Our focus is on reducing significant safety risks and driving a strong safety culture through communication, awareness, and visible leadership. To assist in achieving this commitment, we provide substantial safety trainings and necessary equipment at all facilities, educating and encouraging our employees to proactively identify and eliminate unsafe actions and conditions. We have specific safety programs in place for those working in potentially high-hazard environments. We monitor injury and illness health and safety metrics across our organization to continually evaluate our safety programs to meet the needs of our teams.

COVID-19

Our top priority is the health and safety of our employees and their families and communities, as we continue to manage our business through the COVID-19 pandemic. Throughout the COVID-19 pandemic, our leadership regularly reviewed and adapted our COVID-19 protocols based on evolving research and guidance. We have reopened our offices and begun business travel, with safety measures in place and in accordance with local guidance. Additionally, we implemented a hybrid-work program globally, providing more flexibility for employees to work remotely. We continue to monitor local transmission rates and regulatory guidance, and remain committed to protecting our employees, delivering for our customers, and supporting our communities. We are subject to vaccination and workplace safety protocols of the United States Federal Government Executive Order on Ensuring Adequate COVID Safety Protocols for Federal Contractors, and the COVID-19 Workplace Safety Guidance for Federal Contractors and Subcontractors issued by the Safer Federal Workforce Task Force. In support of a safe work environment, we have a vaccine policy for our U.S. employees, and a visitor policy to ensure those visiting our sites are taking the necessary health and safety precautions.

Available Information

Refer to our website to learn more about our company culture, code of conduct, values, and sustainability initiatives. Our website address is www.3DSystems.com. The information contained on our website is neither a part of, nor incorporated by reference into, this Form 10-K or any other document that we file with or furnish to the Securities and Exchange Commission ("SEC"). We make available free of charge through our website our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, amendments to those reports and other documents that we file with the SEC, as soon as reasonably practicable after we electronically file them with, or furnish them to, the SEC.

Many of our corporate governance materials, including our Code of Conduct, Code of Ethics for Senior Financial Executives and Directors, Corporate Governance Guidelines, current charters of each of the standing committees of the Board of Directors and our corporate charter documents and by-laws are available on our website.

Information about our Executive Officers

The information appearing in the table below sets forth the position or positions held by each of our executive officers and his or her age as of March 1, 2022. All of our executive officers serve at the pleasure of the Board of Directors. There are no family relationships among any of our executive officers or directors.

Name and Current Position	Age as of March 1, 2022
Jeffrey A. Graves President and Chief Executive Officer	60
Jagtar Narula Executive Vice President and Chief Financial Officer	51
Charles W. Hull Executive Vice President and Chief Technology Officer for Regenerative Medicine	82
Andrew M. Johnson Executive Vice President, Chief Legal Officer and Secretary	47
Menno Ellis Executive Vice President, Healthcare Solutions	49
Reji Puthenveetil Executive Vice President, Industrial Solutions	53
David Leigh Executive Vice President, Chief Technology Officer For Additive Manufacturing	54
Phyllis Nordstrom Executive Vice President, Chief People and Culture Officer and Chief Compliance Officer	43

Jeffrey A. Graves, *President and Chief Executive Officer*. Dr. Graves was appointed the Company's President and Chief Executive Officer in May 2020. Prior to joining the Company, from 2012 to May 2020, Dr. Graves served as Chief Executive Officer, President and Director of MTS Systems Corporation, a global supplier of test, simulation, and measurement systems. From 2005 until 2012, Dr. Graves served as President and Chief Executive Officer of C&D Technologies, Inc. Dr. Graves also held leadership roles with Kemet Corporation, an electronic component manufacturing company, as Chief Operating Officer from 2001 to 2003 and Chief Executive Officer from 2003 to 2005. Previously, he held a number of leadership and technical roles with General Electric, Rockwell Automation and Howmet Corporation. In addition to serving on the Company's Board of Directors, Dr. Graves serves on the board of directors of Hexcel Corporation.

Jagtar Narula, *Executive Vice President and Chief Financial Officer*. Mr. Narula was appointed the Company's Executive Vice President and Chief Financial Officer in September 2020. Prior to joining the Company, Mr. Narula served as Senior Vice President of Corporate Strategy and Business Development for Blackbaud, Inc. where he also previously led investor relations and financial planning. Additionally, he held finance leadership positions of increasing responsibility at Xerox, General Electric and with private equity.

Charles W. Hull, *Executive Vice President, Chief Technology Officer for Regenerative Medicine*. Mr. Hull is a founder of the Company and has served on our Board of Directors since 1993. He has served as Chief Technology Officer since 1997, as Executive Vice President since 2000 and as Chief Technology Officer for Regenerative Medicine since 2021. Mr. Hull has also previously served in various other executive capacities at the Company since 1986, including Chief Executive Officer, Vice Chairman of the Board of Directors and President and Chief Operating Officer.

Andrew M. Johnson, *Executive Vice President, Chief Legal Officer and Secretary*. Mr. Johnson has served as Executive Vice President and Chief Legal Officer since November 2014. He served as Interim President and Chief Executive Officer, Chief Legal Officer and Secretary from October 2015 to April 2016 and as Vice President, General Counsel and Secretary from April 2012 to November 2014. Previously, he served as Assistant General Counsel and Assistant Secretary.

Menno Ellis, *Executive Vice President, Healthcare Solutions*. Mr. Ellis has served as Executive Vice President, Healthcare Solutions since July 2020. He joined the Company in December 2016 as Senior Vice President Strategy and Vertical Markets. He served as Senior Vice President and General Manager of the Plastics Business Unit, and is now responsible for the Healthcare Solutions group, which encompasses Dental, Medical and Simulations businesses. Prior to joining the Company, he spent 20 years in management and business consulting services with an emphasis on sustainable, long-term revenue growth.

Reji Puthenveetil, *Executive Vice President, Industrial Solutions*. Mr. Puthenveetil has served as Executive Vice President, Industrial Solutions since July 2020. Prior to joining the Company, Mr. Puthenveetil spent 25 years as a management consultant for Group Newhouse helping companies, such as Lockheed Martin, Xcel Energy, Kia Motors, and Thales Group. Mr. Puthenveetil's work across multiple industries led to the design of a clear strategy for growth and ensuring organizational capability and alignment for execution.

David Leigh, *Executive Vice President, Chief Technology Officer Additive Manufacturing*. Dr. Leigh has served as Executive Vice President, Chief Technology Officer for Additive Manufacturing since June 2021. He has more than 30 years of experience in the additive manufacturing industry. Prior to his role with 3D Systems, from January 2019 to May 2021 Dr. Leigh served as the Chief Technology Officer (global) and Chief Operations Officer (North America) for EOS GmbH, an additive manufacturing equipment vendor, and from August 2015 to December 2018 he served as Senior Vice President of Emerging Technologies for Vulcan Labs, a subsidiary of Stratasys, Ltd. Dr. Leigh also founded Harvest Technologies which was a pioneer in end-use parts applications in aerospace and established one of the first AS9100 certified additive manufacturing facilities.

Phyllis Nordstrom, *Executive Vice President, Chief People and Culture Officer and Chief Compliance Officer*. Ms. Nordstrom has served as Executive Vice President, Chief People and Culture Officer and Chief Compliance Officer since August 2021. Prior to joining 3D Systems, from May 2016 to July 2021, Ms. Nordstrom was Senior Vice President and Chief Risk & Compliance Officer at MTS Systems Corporation where she was the leader of corporate sustainability, business ethics, internal audit, and corporate compliance. Over her 22 year career, Ms. Nordstrom has also held multiple leadership roles at PricewaterhouseCoopers, Target, and US Bank.

Item 1A. Risk Factors

You should carefully read the following discussion of significant factors, events and uncertainties when evaluating our business and the forward-looking information contained in this Form 10-K. The events and consequences discussed in these risk factors could materially and adversely affect our business, operating results, liquidity and financial condition. While we believe we have identified and discussed below the key risk factors affecting our business, these risk factors do not identify all the risks we face, and there may be additional risks and uncertainties that we do not presently know or that we do not currently believe to be significant that may have a material adverse effect on our business, performance or financial condition in the future.

Operational & Financial Risk Factors

Our uneven sales cycle makes planning and inventory management difficult and future financial results less predictable.

Our quarterly sales often have reflected a pattern in which a disproportionate percentage of each quarter's total sales occur towards the end of the quarter, in particular for sales of hardware and software products. This uneven sales pattern makes predicting net revenue, earnings, cash flow from operations and working capital for each financial period difficult, increases the risk of unanticipated variations in our quarterly results and financial condition and places pressure on our inventory management and logistics systems. If predicted demand is substantially greater than orders, there may be excess inventory. Alternatively, if orders substantially exceed predicted demand, we may not be able to fulfill all of the orders received in each quarter and such orders may be canceled. Depending on when they occur in a quarter, developments such as an information systems failure, component pricing movements, component shortages or global logistics disruptions could adversely impact our inventory levels and results of operations in a manner that is disproportionate to the number of days in the quarter affected.

The variety of products that we sell could cause significant quarterly fluctuations in our gross profit margins, and those fluctuations in margins could cause fluctuations in operating income or loss and net income or loss.

We continuously work to expand and improve our products, materials and services offerings, geographic areas in which we operate and the distribution channels we use to reach various target product applications and customers. This variety of products, applications, channels and regions involves a range of gross profit margins that can cause substantial quarterly fluctuations in gross profit and gross profit margins depending upon the mix of product shipments from quarter to quarter. Additionally, the introduction of new products or services may further heighten quarterly fluctuations in gross profit and gross profit margins due to manufacturing ramp-up and start-up costs. We may experience significant quarterly fluctuations in gross profit margins or operating income or loss due to the impact of the mix of products, channels or geographic areas in which we sell our products from period to period.

Our products and services may experience quality problems from time to time that can result in decreased sales and operating margin, product returns, product liability, warranty or other claims that could result in significant expenses and harm to our reputation.

We sell complex hardware and software products, materials and services that can contain undetected design and manufacturing defects or errors when first introduced or as enhancements are released that, despite testing, are not discovered until after the product has been installed and used by customers. Sophisticated software and applications, such as those sold by us, may contain “bugs” that can unexpectedly interfere with the software’s intended operation. Defects may also occur in components and products we purchase from third parties. There can be no assurance we will be able to detect and fix all defects in the hardware, software, materials and services we sell. Failure to do so could result in lost revenue, product returns, product liability, delayed market acceptance of those products and services, claims from distributors, end-users or others, increased end-user service and support costs, and significant warranty claims and other expenses to correct the defects, diversion of management time and attention and harm to our reputation.

Changes in, or interpretation of, tax rules and regulations may impact our effective tax rate and future profitability.

We are a U.S. based, multinational company subject to taxation in multiple U.S. and foreign tax jurisdictions. Our future effective tax rates could be adversely affected by changes in statutory tax rates or interpretation of tax rules and regulations in jurisdictions in which we do business, changes in the amount of revenue or earnings in the countries with varying statutory tax rates, or by changes in the valuation of deferred tax assets and liabilities. The U.S. Tax Cuts and Jobs Act is one such example of legislation that impacts our effective tax rate and tax posture. For additional details see Note 22 to the consolidated financial statements in Item 8 of this Form 10-K.

In addition, we are subject to audits and examinations of previously filed income tax returns by the Internal Revenue Service and other domestic and foreign tax authorities. We regularly assess the potential impact of such examinations to determine the adequacy of our provision for income taxes and have reserved for potential adjustments that we expect may result from the current examinations. We believe such estimates to be reasonable; however, there is no assurance that the final determination of any examination will not have an adverse effect on our operating results and financial position.

Changes in business conditions may cause goodwill and other intangible assets to become impaired.

Goodwill and other intangible assets are subject to an impairment test on an annual basis and when circumstances indicate that an impairment is more likely than not. Such circumstances include a significant adverse change in the business climate or a decision to dispose of a business or product line. We face some uncertainty in our business environment due to a variety of challenges, including changes in customer demand. While we have not recorded an impairment to our goodwill since the third quarter of 2020, we may experience additional unforeseen circumstances that adversely affect the value of our goodwill or intangible assets and trigger an evaluation of the amount of the recorded goodwill and intangible assets. Future write-offs of goodwill or other intangible assets as a result of an impairment in the business could materially adversely affect our results of operations and financial condition.

The COVID-19 pandemic could materially adversely affect our financial condition and results of operations.

The novel strain of the coronavirus identified in China in late 2019 (“COVID-19”) has globally spread throughout other areas such as Asia, Europe, the Middle East, and North America and has resulted in authorities imposing, and businesses and individuals implementing, numerous unprecedented measures to try to contain the virus, such as travel bans and restrictions, quarantines, shelter-in-place/stay-at-home and social distancing orders, and shutdowns. These measures have impacted and may further impact our workforce and operations, the operations of our customers, and those of our respective vendors, suppliers, and partners. Each of the countries in which we operate has been affected by the outbreak and new variants and taken measures to try to contain it. The ultimate impact and efficacy of government measures and potential future measures is currently unknown.

There is continued uncertainty regarding the business impacts from such measures and potential future measures. While we have been able to continue our operations through a combination of work-from-home, social distancing and mandatory vaccinations in certain geographies – policies implemented to comply with government regulations and protect employees, these measures have resulted in reduced workforce availability at some of our sites. Restrictions on our access to customer facilities may impact our ability to meet customer demand and could have a material adverse effect on our financial condition and results of operations, particularly if prolonged. Our customers have experienced, and may continue to experience, disruptions in their operations, which can result in delayed, reduced, or canceled orders, or collection risks, and which may adversely affect our results of operations.

The pandemic has significantly increased economic and demand uncertainty. It is possible that the current outbreak and continued spread of COVID-19 and new variants will continue to cause an economic slowdown. There is a significant degree of uncertainty and lack of visibility as to the extent and duration of any such slowdown or recession. Risks related to a slowdown or recession may harm our long-term ability to do business, adversely affect our sales, costs, results of operations and cash flow. Given the significant economic uncertainty and volatility created by the pandemic, it is difficult to predict the nature and extent of impacts on demand for our products and services. These expectations are subject to change without warning and investors are cautioned not to place undue reliance on them.

The spread of COVID-19 has caused us to continuously evaluate and, in some cases, modify our business practices (including employee travel, employee work locations, cancellation of physical participation in meetings, events and conferences, and social distancing measures), and we may take further actions as may be required by government authorities or that we determine are in the best interests of our employees, customers, partners, vendors, and suppliers. Work-from-home and other measures introduce additional operational risks, including cybersecurity risks, and have affected the way we conduct our product development and testing, customer support, and other activities, which could have an adverse effect on our operations. There is no certainty that such measures will be sufficient to mitigate the risks posed by the virus, and illness and workforce disruptions could lead to unavailability of key personnel and harm our ability to perform critical functions.

We depend on external vendors, suppliers and outsourcing partners for the components, assembly and spare parts of our 3D printers and for chemicals and packaging used in our materials. The ongoing COVID-19 pandemic has caused supply and logistical disruptions for both our outsourcing partners and supply chain partners. If these relationships were to terminate or these disruptions worsen, our business could be disrupted while we locate alternative sources of supply and our expenses may increase.

We have outsourced to selected design and manufacturing companies the assembly of our printers. In carrying out these outsourcing activities, we face a number of risks, including, among others, the following:

- The risk that the parties that we retain to perform assembly activities may not perform in a satisfactory manner;
- The risk of disruption in the supply of printers or other products to our customers if such third parties either fail to perform in a satisfactory manner or are unable to supply us with the quantity of printers or other products that are needed to meet then current customer demand;
- The risk of work delays or supply chain disruptions stemming from governmental efforts to contain the COVID-19 pandemic; and
- The risk of insolvency of suppliers, as well as the risks that we face, as discussed below, in dealing with a limited number of suppliers.

We purchase components and sub-assemblies for our printers from third-party suppliers that we provide to our customers as spare parts. Additionally, we purchase raw chemicals and packaging that are used in our materials, as well as certain of those materials, from third-party suppliers.

While there are typically several potential suppliers of parts for our products, we currently choose to use only one or a limited number of suppliers for several of these items, including our lasers, materials and certain jetting components. Our reliance on a single or limited number of suppliers involves many risks, including, among others, the following:

- Potential shortages of some key components;
- Disruptions in the operations of these suppliers;
- Product performance shortfalls; and
- Reduced control over delivery schedules, assembly capabilities, quality and costs.

The COVID-19 pandemic has created sporadic delays on the inbound supply chain at our partners and our own facilities. Additional delays on both inbound and outbound logistics have also created challenges. We continue to identify alternative solutions, but an inability to source from alternative suppliers in a timely manner could impact on our ability to fulfill demand.

While we believe that, if necessary, we can obtain all the components necessary for our spare parts and materials from other manufacturers, we require any new supplier to become “qualified” pursuant to our internal procedures, which could involve evaluation processes of varying durations. Our spare parts and raw chemicals used in our materials production are subject to various lead times. In addition, at any time, certain suppliers may decide to discontinue production of a part or raw material that we use. Any unanticipated change in the sources of our supplies, or unanticipated supply limitations, could increase production or related costs and consequently reduce margins.

If our forecasts exceed actual orders, we may hold large inventories of slow-moving or unusable parts, which could have an adverse effect on our cash flow, profitability and results of operations. Inversely, we may lose orders if our forecast is low and we are unable to meet demand. There is considerable uncertainty on the business impact from current measures and potential future measures to contain the spread of the COVID-19 pandemic on our vendors, suppliers, and partners, especially if such measures are in effect for an extended period of time. If disruptions to global businesses from the pandemic continue or worsen, our business could face greater supply chain delays and difficulty shipping or receiving products and materials, which could have a material adverse effect on our financial condition and results of operations.

The loss of, continued reduction or substantial decline in revenue from larger clients could have a material adverse effect on our revenues, profitability and liquidity.

We experience revenue concentration with a large customer that represents over 20% of our consolidated revenue. Generally, our contracts do not contain guarantees of minimum duration, revenue levels, or profitability. This customer may terminate their contracts or materially reduce their requested levels of products or services at any time. The loss of, deterioration of the financial condition of, or a significant change to the business of this customer could have a material adverse effect on our business, financial condition, and results of operations. Additionally, this concentration exposes us to concentrated credit risk, as a significant portion of our accounts receivable may be from a single customer. If we are unable to collect our receivables, or are required to take additional reserves, our results and cash flows will be adversely affected.

If we do not generate net cash flow from operations and if we are unable to raise additional capital, our financial condition could be adversely affected and we may not be able to execute our growth strategy.

We cannot assure you that we will continue to generate cash from operations or identify and secure other potential sources to fund future working capital needs and meet capital expenditure requirements.

If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring or incurring additional debt or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to obtain additional capital or refinance any indebtedness will depend on, among other things, the capital markets, our financial condition at such time and the terms and conditions of any such financing or indebtedness. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

The lack of additional capital resulting from any inability to generate cash flow from operations or to raise equity or debt financing could force us to substantially curtail or cease operations and would, therefore, have an adverse effect on our business and financial condition. Furthermore, we cannot assure you that any necessary funds, if available, would be available on attractive terms or that they would not have a significantly dilutive effect on our existing stockholders. If our financial condition were to worsen and we become unable to attract additional equity or debt financing or enter into other strategic transactions, we would not be able to execute our growth strategy and we could become insolvent or be forced to declare bankruptcy.

Our business could be adversely impacted in the event of a failure of our information technology infrastructure or adversely impacted by a successful cyber-attack.

We have experienced cyber security threats, threats to our information technology infrastructure and unauthorized attempts to gain access to our sensitive information. Prior cyber-attacks directed at us have not had a material impact on our business or financial results; however, this may not continue to be the case in the future. Cyber security assessment analyses undertaken by us have identified and prioritized steps to fortify our cyber security safeguards. We have and will continue to implement additional security measures and processes which enhance our ability to detect and respond to a cyber-attack. We have increased our cyber breach insurance and implemented company-wide cyber security awareness training as well as dedicated certain personnel to address this threat. Despite the implementation of these safeguards, there can be no assurance that we will adequately protect our information or that we will not experience any future successful attacks. The threats we face vary from attacks common to most industries to more advanced and persistent, highly organized adversaries who target us because of the products and services we provide. If we are unable to protect sensitive information, our customers or governmental authorities could question the adequacy of our threat mitigation and detection processes and procedures. Due to the evolving nature of these security threats, however, the impact of any future incident cannot be predicted.

We may need to expend significant additional resources to modify our cyber security protective measures, to investigate and remediate vulnerabilities or other exposures or to make required notifications, and we may be subject to litigation and financial losses. These costs related to cyber or other security threats or disruptions may not be fully insured or indemnified by other means. Occurrence of any of these events could adversely affect our internal operations, the services we provide to our customers, our financial results or our reputation; or such events could result in the loss of competitive advantages derived from our research and development efforts or other intellectual property or early obsolescence of our products and services.

Our operations could suffer if we are unable to attract and retain key management or other key employees.

Our success depends upon the performance of our senior management and other key personnel. Our senior executive team is critical to the management of our business and operations, as well as to the development and execution of our strategy. When changes occur at our senior management level, as well as for key personnel, we typically incur incremental costs including search costs and relocation costs. High demand exists for senior management and other key personnel (including scientific, technical and sales personnel) in the 3D printing industry, and there can be no assurance that we will be able to attract and retain such personnel. We experience intense competition for qualified personnel.

While we intend to continue to provide competitive compensation packages to attract and retain key personnel and engage in regular succession planning for these positions, some of our competitors for these employees have greater resources and more experience, making it difficult for us to compete successfully for key personnel. If we cannot attract and retain sufficiently qualified technical employees for our research and development and manufacturing operations, we may be unable to develop and commercialize new products or new applications for existing products. Furthermore, possible shortages of key personnel, including engineers, in the regions surrounding our facilities could require us to pay more to hire and retain key personnel, thereby increasing our costs.

Servicing our debt may require a significant amount of cash, and we may not have sufficient cash or the ability to raise the funds necessary to settle conversions of the 0% convertible senior notes due 2026 ("the Notes") in cash, repay the Notes at maturity, or repurchase the Notes as required following a fundamental change.

As of December 31, 2021 we had \$460 million outstanding of the Notes. Our ability to refinance our indebtedness, including the Notes, or to make cash payments in connection with any conversions of the Notes, depends on our future performance, which is subject to economic, financial, competitive, and other factors beyond our control. Our business may not generate cash flow from operations in the future sufficient to service our debt and make necessary capital expenditures. If we are unable to generate such cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring debt, or obtaining additional debt financing or equity capital on terms that may be onerous or highly dilutive. Our ability to refinance our indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations. In addition, any of our future debt agreements may contain restrictive covenants that may prohibit us from adopting any of these alternatives. Our failure to comply with these covenants could result in an event of default which, if not cured or waived, could result in the acceleration of our debt.

In the event the conditional conversion feature of the Notes is triggered, holders of Notes will be entitled to convert the Notes at any time during specified periods at their option. If one or more holders elect to convert their Notes, we would be required to settle any converted principal through the payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert their Notes, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the Notes as a current rather than long-term liability, which would result in a material reduction of our net working capital.

In addition, holders of the Notes have the right to require us to repurchase all or a portion of their Notes upon the occurrence of a fundamental change (as defined in the applicable indenture governing the Notes) at a repurchase price equal to 100% of the principal amount of the Notes to be repurchased. If the Notes have not previously been converted or repurchased, we will be required to repay such Notes in cash at maturity.

Our ability to make required cash payments in connection with conversions of the Notes, repurchase the Notes in the event of a fundamental change, or to repay or refinance the Notes at maturity will depend on market conditions and our future performance, which is subject to economic, financial, competitive, and other factors beyond our control. We also may not use the cash proceeds we raised through the issuance of the Notes in an optimally productive and profitable manner. As a result, we may not have enough available cash or be able to obtain financing at the time we are required to repurchase or repay the Notes or pay cash with respect to Notes being converted.

Business Strategy Risk Factors

We have made, and may make in the future, strategic acquisitions and divestitures that may involve significant risks and uncertainties. We may not realize the anticipated benefits of past or future acquisitions and integration of these acquisitions may disrupt our business and divert management attention. Likewise, our potential future divestitures may be unsuccessful and negatively impact our business.

From time to time, we evaluate acquisition candidates that fit our business objectives. Acquisitions involve certain risks and uncertainties, including, among others, the following:

- Difficulty in integrating newly acquired businesses and operations in an efficient and cost-effective manner, which may also impact our ability to realize the potential benefits associated with the acquisition;
- The risk that significant unanticipated costs or other problems associated with integration may be encountered;
- The challenges in achieving strategic objectives, cost savings and other anticipated benefits;
- The risk that our marketplaces do not evolve as anticipated and that the technologies acquired do not prove to be those needed to be successful in the marketplaces that we serve;
- The risk that we assume significant liabilities that exceed the limitations of any applicable indemnification provisions or the financial resources of any indemnifying party;
- The inability to maintain a relationship with key customers, vendors and other business partners of the acquired businesses;
- The difficulty in maintaining controls, procedures and policies during the transition and integration;
- The potential loss of key employees of the acquired businesses;
- The risk of diverting management attention from our existing operations;
- Difficulties in coordinating geographically disparate organizations and corporate cultures and integrating management personnel with different business backgrounds;
- The potential failure of the due diligence process to identify significant problems, liabilities or other challenges of an acquired company or technology;
- The risk that we incur significant costs associated with such acquisition activity that may negatively impact our operating results before the benefits of such acquisitions are realized, if at all;
- The entry into marketplaces where we have no or limited direct prior experience and where competitors have stronger marketplace positions;
- The exposure to litigation or other claims in connection with our assuming claims or litigation risks from terminated employees, customers, former shareholders or other third parties; and
- The risk that historical financial information may not be representative or indicative of our results as a combined company.

Historically, we have grown organically and from acquisitions, and we intend to continue to grow in such manner. Our infrastructure will require, among other things, continued development of our financial and management controls and management information systems, management of our sales channel, continued capital expenditures, the ability to attract and retain qualified management personnel and the training of new personnel. We cannot be sure that our infrastructure, systems, procedures, business processes and managerial controls will be adequate to support the growth in our operations. Any delays in, or problems associated with, implementing, or transitioning to, new or enhanced systems, procedures, or controls to accommodate and support the requirements of our business and operations and to effectively and efficiently integrate acquired operations may adversely affect our ability to meet customer requirements, manage our product inventory, and record and report financial and management information on a timely and accurate basis. These potential negative effects could prevent us from realizing the benefits of an acquisition transaction or other growth opportunity.

Likewise, we have in the past, and may in the future, divest certain business operations. Divestitures involve a number of risks, including the diversion of management's attention, significant costs and expenses, goodwill and other intangible asset impairment charges, the loss of customer relationships and cash flow, and the disruption of operations in the affected business. Failure to timely complete or consummate a divestiture may negatively affect valuation of the affected business or result in restructuring charges.

In the event of an unsuccessful acquisition or divestiture, our competitive position, revenues, results of operations and financial condition could be adversely affected.

We believe that our future success depends on our ability to deliver products and services that meet changing technology and customer needs.

Our business may be affected by rapid technological change, changes in user and customer requirements and preferences, frequent new product and service introductions embodying new technologies and the emergence of new standards and practices, any of which could render our existing products and proprietary technology obsolete. Accordingly, our ongoing research and development programs are intended to enable us to maintain technological leadership. We believe that to remain competitive we must continually enhance and improve the functionality and features of our products, services and technologies. However, there is a risk that we may not be able to:

- Develop or obtain leading technologies useful in our business;
- Enhance our existing products;
- Develop new products, services and technologies that address the increasingly sophisticated and varied needs of prospective customers, particularly in the area of printer speeds and materials functionality;
- Respond to technological advances and emerging industry standards and practices on a cost-effective and timely basis; or
- Recruit or retain key technology employees.

If we are unable to meet changing technology and customer needs, our competitive position, revenue, results of operations and financial condition could be adversely affected.

The success of our regenerative medicine efforts depends on developing and commercializing products, either ourselves or in conjunction with development partners, that are subject to technical and market risks.

Our regenerative medicine business requires us to develop products that enable the application of additive manufacturing to human organ transplantation and other non-organ human applications. These initiatives may require significant investment and technical achievement of viable product candidates may not be achieved. Our development efforts remain subject to risks including but not limited to unanticipated technical or other hurdles to commercialization. Any products developed through our research efforts are subject to safety, regulatory and efficacy risks that may result in delays to commercialization, cause us to incur additional expenses or fail to achieve commercialization. In addition, any products that achieve commercialization and regulatory approval are subject to market risks including reimbursement from third-party payers and competition from existing or new products that aim to address similar indications.

Regulatory, Legislative and Legal Risk Factors

We are subject to U.S. and other anti-corruption laws, trade controls, economic sanctions and similar laws and regulations. Our failure to comply with these laws and regulations could subject us to civil, criminal and administrative penalties and harm our reputation.

Doing business on a worldwide basis requires us to comply with the laws and regulations of the U.S. government and various foreign jurisdictions. These laws and regulations place restrictions on our operations, trade practices, partners and investments.

In particular, our operations are subject to U.S. and foreign anti-corruption and trade control laws and regulations, such as the Foreign Corrupt Practices Act (“FCPA”) and United Kingdom Bribery Act (the “Bribery Act”), export controls and economic sanctions programs, including those administered by the U.S. Treasury Department’s Office of Foreign Assets Control (“OFAC”), the State Department’s Directorate of Defense Trade Controls (“DDTC”) and the Bureau of Industry and Security (“BIS”) of the Department of Commerce. As a result of doing business in foreign countries and with foreign customers, we are exposed to a heightened risk of violating anti-corruption and trade control laws and sanctions regulations.

As part of our business, we may deal with state-owned business enterprises, the employees of which are considered foreign officials for purposes of the FCPA’s prohibition on providing anything of value to foreign officials for the purposes of obtaining or retaining business or securing any improper business advantage. In addition, the provisions of the Bribery Act extend beyond bribery of foreign public officials and also apply to transactions with individuals that a government does not employ. Some of the international locations in which we operate lack a developed legal system and have higher than normal levels of corruption. Our continued expansion outside the U.S., including in Brazil, China, India and developing countries, and

our development of new partnerships worldwide, could increase the risk of FCPA, OFAC or Bribery Act violations in the future.

As an exporter, we must comply with various laws and regulations relating to the export of products and technology from the U.S. and other countries having jurisdiction over our operations. In the U.S., these laws include the International Traffic in Arms Regulations (“ITAR”) administered by the DDTC, the Export Administration Regulations (“EAR”) administered by the BIS and trade sanctions against embargoed countries and destinations administered by OFAC. The EAR governs products, parts, technology and software which present military or weapons proliferation concerns, so-called “dual use” items, and ITAR governs military items listed on the United States Munitions List. Prior to shipping certain items, we must obtain an export license or verify that license exemptions are available. Any failures to comply with these laws and regulations could result in fines, adverse publicity and restrictions on our ability to export our products, and repeat failures could carry more significant penalties.

Violations of anti-corruption and trade control laws and sanction regulations are punishable by civil penalties, including fines, denial of export privileges, injunctions, asset seizures, debarment from government contracts and revocations or restrictions of licenses, as well as criminal fines and imprisonment and could harm our reputation, create negative shareholder sentiment and affect our share value. We have established policies and procedures designed to assist our compliance with applicable U.S. and international anti-corruption and trade control laws and regulations, including the FCPA, the Bribery Act and trade controls and sanctions programs administered by OFAC, the DDTC and BIS, and have trained our employees to comply with these laws and regulations. However, there can be no assurance that all of our employees, consultants, agents or other associated persons will not take actions in violation of our policies and these laws and regulations. Additionally, there can be no assurance that our policies and procedures will effectively prevent us from violating these regulations in every transaction in which we may engage or provide a defense to any alleged violation. In particular, we may be held liable for the actions that our joint venture partners take inside or outside of the United States, even though our partners may not be subject to these laws. Such a violation, even if our policies prohibit it, could have an adverse effect on our reputation, business, financial condition and results of operations. In addition, various state and municipal governments, universities and other investors maintain prohibitions or restrictions on investments in companies that do business with sanctioned countries, persons and entities, which could adversely affect our reputation, business, financial condition and results of operations.

We disclosed potential violations of U.S. export controls laws to the U.S. federal government that resulted in multiple investigations. We have implemented compliance processes and procedures to identify and prevent potential future violations of export control laws, trade sanctions, and government contracting laws and regulations, and continue to review our government contracting compliance risks and potential violations. Failure to comply with the terms of the Administrative Agreement or the commencement of a separate action by another governmental agency would result in decreased revenues and additional harm to our reputation and otherwise adversely affect our business, operating results and financial condition.

In October 2017, we received an administrative subpoena from BIS requesting the production of records in connection with possible violations of U.S. export control laws, including with regard to our former Quickparts.com, Inc. subsidiary. In addition, while collecting information responsive to the above-referenced subpoena, our internal investigation identified potential violations of ITAR administered by DDTC and potential violations of the Export Administration Regulations administered by BIS.

On June 8, 2018 and thereafter, we submitted voluntary disclosures to BIS and DDTC identifying numerous potentially unauthorized exports of technical data. As part of our ongoing review of trade compliance risks and our cooperation with the government, on November 20, 2019, we submitted to OFAC an initial notice of voluntary disclosure regarding potential violations of economic sanctions related to Iran. We continued to investigate this issue and filed final disclosures with OFAC on May 20, 2020 and December 21, 2021. We have and will continue to implement compliance enhancements to our export controls, trade sanctions, and government contracting compliance program to address the issues identified through our ongoing internal investigation and will cooperate with DDTC and BIS, as well as the U.S. Departments of Justice, Defense, Homeland Security and Treasury in their ongoing reviews of these matters. In connection with these ongoing reviews, in August 2020, the Company received two federal grand jury subpoenas issued by the U.S. District Court for the Northern District of Texas. The Company responded to these two subpoenas and will continue to fully cooperate with the U.S. Department of Justice in the related investigation.

Although we cannot predict the ultimate resolution of these matters, we have incurred and expect to continue to incur significant legal costs and other expenses in connection with responding to the U.S. government agencies.

Since 2018, we have implemented new compliance procedures to identify and prevent potential violations of export controls laws, trade sanctions, and government contracting laws and regulations and created a Compliance Committee of the Board of Directors to further enhance board oversight of compliance risks. As we continue to implement additional compliance enhancements, we may discover additional potential violations of export controls laws, trade sanctions, and/or government contracting laws in the future. If we identify any additional potential violations, we will submit voluntary disclosures to the relevant agencies and cooperate with such agencies on any related investigations.

If the U.S. government finds that we have violated one or more export controls laws, trade sanctions, or government contracting laws, we could be subject to various civil or criminal penalties. By statute, these penalties can include but are not limited to fines, which by statute may be significant, denial of export privileges, and suspension or debarment from participation in U.S. government contracts. We may also be subject to contract claims based upon such violations. Any assessment of penalties or other liabilities incurred in connection with these matters could harm our reputation and customer relationships, create negative investor sentiment, and affect our share value. In connection with any resolution, we may also be required to undertake additional remedial compliance measures and program monitoring. We cannot at this time predict when the U.S. government agencies will conclude their investigations or determine an estimated cost, if any, or range of costs, for any penalties, fines or other liabilities to third parties that may be incurred in connection with these matters.

We derive a significant portion of our revenue from business conducted outside the U.S. and are subject to the risks of doing business outside the U.S.

We face many risks inherent in conducting business activities outside the U.S. that, unless managed properly, may adversely affect our profitability, including our ability to collect amounts due from customers. While most of our operations outside the U.S. are conducted in highly developed countries, our operations could be adversely affected by, among others, the following:

- Unexpected changes in laws, regulations and policies of non-U.S. governments relating to investments and operations, as well as U.S. laws affecting the activities of U.S. companies abroad;
- Changes in regulatory requirements, including export controls, tariffs and embargoes, other trade restrictions, competition, corporate practices and data privacy concerns;
- Political policies, political or civil unrest, terrorism or epidemics and other similar outbreaks;
- Fluctuations in currency exchange rates;
- Limited protection for the enforcement of contract and intellectual property rights in some countries;
- Difficulties in staffing and managing foreign operations;
- Operating in countries with a higher incidence of corruption and fraudulent business practices;
- Potentially adverse changes in taxation;
- The impact of public health epidemics on employees and the global economy; and
- Other factors, depending upon the specific country in which we conduct business.

These uncertainties may make it difficult for us and our customers to accurately plan future business activities and may lead our customers in certain countries to delay purchases of our products and services. More generally, these geopolitical, social and economic conditions could result in increased volatility in global financial markets and economies.

The consequences of terrorism or armed conflicts are unpredictable, and we may not be able to foresee events that could have an adverse effect on our market opportunities or our business. We are uninsured for losses and interruptions caused by terrorism, acts of war and similar events.

While the geographic areas outside the U.S. in which we operate are generally not considered to be highly inflationary, our foreign operations are sensitive to fluctuations in currency exchange rates arising from, among other things, certain intercompany transactions that are generally denominated, for example, in U.S. dollars rather than their respective functional currencies.

Moreover, our operations are exposed to market risk from changes in interest rates and foreign currency exchange rates and commodity prices, which may adversely affect our results of operations and financial condition. We seek to minimize these risks through regular operating and financing activities and, when we consider it to be appropriate, through the use of derivative financial instruments. However, our efforts to minimize our exposure to market risks from changes in interest rates, foreign currency exchange rates and commodity prices may prove to be insufficient or unsuccessful.

We may incur substantial costs enforcing or acquiring intellectual property rights and defending against third-party claims as a result of litigation or other proceedings.

In connection with the enforcement of our own intellectual property rights, the acquisition of third-party intellectual property rights or disputes related to the validity or alleged infringement of third-party intellectual property rights, including patent rights, we have been, and may in the future be, subject to claims, negotiations or complex, protracted litigation. Intellectual property disputes and litigation may be costly and can be disruptive to our business operations by diverting attention and energies of management and key technical personnel, and by increasing our costs of doing business. Although we have successfully defended or resolved past litigation and disputes, we may not prevail in any ongoing or future litigation and disputes, which could adversely affect our results of operations and financial condition.

Third-party intellectual property claims asserted against us could subject us to significant liabilities, require us to enter into royalty and licensing arrangements on unfavorable terms, prevent us from assembling or licensing certain of our products, subject us to injunctions restricting our sale of products, cause severe disruptions to our operations or the marketplaces in which we compete or require us to satisfy indemnification commitments with our customers, including contractual provisions under various license arrangements. In addition, we may incur significant costs in acquiring the necessary third-party intellectual property rights for use in our products. Any of these could seriously harm our business.

We may not be able to protect our intellectual property rights and confidential information, including our digital content, from third-party infringers or unauthorized copying, use or disclosure.

Although we defend our intellectual property rights and endeavor to combat unlicensed copying and use of our digital content and intellectual property rights through a variety of techniques, preventing unauthorized use or infringement of our rights (“piracy attacks”) is inherently difficult. If our intellectual property becomes subject to piracy attacks, our business may be harmed.

Additionally, we endeavor to protect the secrecy of our digital content, confidential information and trade secrets. If unauthorized disclosure of our trade secrets occurs, we could potentially lose trade secret protection. The loss of trade secret protection could make it easier for third parties to compete with our products by copying previously confidential features, which could adversely affect our business, results of operations, revenue and operating margins. We also seek to protect our confidential information and trade secrets through the use of non-disclosure agreements. However, there is a risk that our confidential information and trade secrets may be disclosed or published without our authorization, and in these situations it may be difficult and/or costly for us to enforce our rights.

Material weaknesses in our internal control over financial reporting could result in material misstatements in our financial statements not being prevented or detected, which could affect investor confidence in the accuracy and completeness of our financial statements and could negatively impact on our stock price and financial condition.

As a public company, we are required to comply with Section 404 of the Sarbanes-Oxley Act. If we fail to abide by the applicable requirements of Section 404, regulatory authorities, such as the SEC, could subject us to sanctions or investigation, and our independent registered public accounting firm may not be able to certify as to the effectiveness of our internal control over financial reporting pursuant to an audit of our controls. Even effective internal controls can provide only reasonable assurance with respect to the preparation and fair presentation of financial statements. Accordingly, our internal control over financial reporting may not prevent or detect misstatements because of their inherent limitations, including the possibility of human error, the circumvention or overriding of controls, or fraud.

During the preparation of our financial statements for the period ended December 31, 2020, management identified two material weaknesses in our internal control over financial reporting related to a lack of certain controls, or improper execution of designed control procedures, (1) for certain non-standard contracts and non-standard contract terms and (2) over the review of internally prepared reports and analyses utilized in the financial closing process. These combination of control deficiencies were partially related to employee turnover, resulting in a temporary shortage of personnel with appropriate knowledge or skills to perform an effective review during our financial statement close process. In addition, certain control deficiencies related to the completeness and review of transactions that were infrequent in nature. These control deficiencies could have resulted in a misstatement of accounts and disclosures that could have resulted in a material misstatement of our annual or interim consolidated financial statements that would not have been prevented or detected. Accordingly, management has determined that these control deficiencies constitute material weaknesses.

During the preparation of our financial statements for the period ended December 31, 2021, management completed its assessment of the effectiveness of our internal controls over financial reporting and concluded that the two previously identified material weaknesses had not been fully remediated, although the number of control deficiencies that resulted in these material weaknesses had been reduced. An additional material weakness was identified relating to the calculation of the Company's

provision for income taxes, including for material non-routine transactions. The control deficiencies outstanding at December 31, 2021 were partially related to employee training, resulting in a lack of knowledge or skill level to properly execute the designed controls or perform an effective review over certain manual controls related to the financial statement close process. In addition, certain control deficiencies related to the timely review of transactions that were infrequent in nature.

As further described in Item 9A, Management's Report on Internal Control over Financial Reporting, we began implementing a remediation plan in January 2021 designed to improve our internal control over financial reporting through the development and implementation of more formal policies, processes and documentation procedures relating to our financial reporting, the hiring of additional accounting personnel and the training of new personnel and existing personnel in new roles on proper execution of designed control procedures. In 2021, we engaged outside consultants to advise on changes in the design of our controls and procedures and to advise on technical accounting matters. In continuation of this remediation plan and to address the additional tax material weakness, in 2022, we plan to hire additional staff with appropriate accounting, finance, operational and technology knowledge and experience in the design and execution of controls, redesign ineffective controls or processes, implement software to enhance our financial close and reporting and tax processes as well as establish a formal controls governance committee.

While we believe our remediation plans described above should remediate the material weaknesses, we cannot provide assurance of when the material weaknesses will be remediated, nor can we be certain of whether additional actions will be required or the costs of any such actions. Moreover, we cannot provide assurance that additional material weaknesses will not arise in the future. While the material weaknesses discussed in Item 9A, Management's Report on Internal Control over Financial Reporting, did not result in material misstatements of our annual or interim consolidated financial statements, any failure to remediate the material weaknesses, or the identification of new material weaknesses in our internal control over financial reporting, could result in material misstatements in our financial statements that may continue undetected, negatively impacting the public perception of the Company and our securities and cause us to fail to meet our reporting and financial obligations or incur significant additional costs to remediate the material weaknesses, each of which could negatively affect our stock price, harm our ability to raise capital on favorable terms in the future or otherwise have a negative impact on our financial condition.

General Risk Factors

Our common stock price has been and may continue to be volatile.

The market price of our common stock has experienced, and may continue to experience, considerable volatility. Between January 1, 2020 and December 31, 2021, the trading price of our common stock has ranged from a low of \$4.60 per share to a high of \$56.50 per share. Numerous factors could have a significant effect on the price of our common stock, including those described or referred to in this "Risk Factors" section of this Form 10-K, as well as, among other things:

- Our perceived value in the securities markets;
- Overall trends in the stock market;
- Announcements of changes in our forecasted operating results or the operating results of one or more of our competitors;
- The impact of changes in our results of operations, our financial condition or our prospects;
- Market conditions for providers of products and services such as ours;
- Executive level management uncertainty or change;
- Changes in recommendations or revenue or earnings estimates by securities analysts; and
- Announcements of acquisitions by us or one of our competitors.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our headquarters are located in Rock Hill, South Carolina. As of December 31, 2021, we own minimal facilities and we lease approximately 1.0 million square feet, in the U.S (624 thousand square feet), EMEA (302 thousand square feet) and APAC (28 thousand square feet). The Healthcare segment accounted for approximately 252 thousand square feet, while the industrial segment accounted for approximately 457 thousand square feet. Approximately 300 thousand square feet are mixed use facilities.

Item 3. Legal Proceedings

Information relating to legal proceedings is included under the header "Litigation" in Note 23 to the consolidated financial statements in Item 8 of this Form 10-K, which is incorporated by reference into this Item 3.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Our common stock is listed on the New York Stock Exchange ("NYSE") under the trading symbol "DDD."

As of February 23, 2022, our outstanding common stock was held by approximately 1,503 stockholders of record. This figure does not reflect the beneficial ownership of shares held in a nominee's name.

Dividends

We do not currently pay, and have not paid, any dividends on our common stock, and we currently intend to retain any future earnings for use in our business. Any future determination as to the declaration of dividends on our common stock will be made at the discretion of the Board of Directors and will depend on our earnings, operating and financial condition, capital requirements and other factors deemed relevant by the Board of Directors, including the applicable requirements of the Delaware General Corporation Law, which provides that dividends are payable only out of surplus or current net profits.

The payment of dividends on our common stock may be restricted by the provisions of credit agreements or other financing documents that we may enter into or the terms of securities that we may issue from time to time. Currently, no such agreements or documents limit our declaration of dividends or payments of dividends.

Issuance of Unregistered Securities and Issuer Purchases of Equity Securities

We did not repurchase any of our equity securities in the open market during the year ended 2021, however, shares of common stock were surrendered to us for payment of tax withholding obligations in connection with the vesting of restricted stock awards pursuant to our 2015 Incentive Stock Plan. For information regarding the securities authorized for issuance under our equity compensation plans, see "Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters—Equity Compensation Plans" in Item 12 of this Form 10-K. Also see Note 18 to the consolidated financial statements in Item 8 of this Form 10-K. We did not engage in any unregistered sales of equity securities in 2021.

Issuer purchases of equity securities

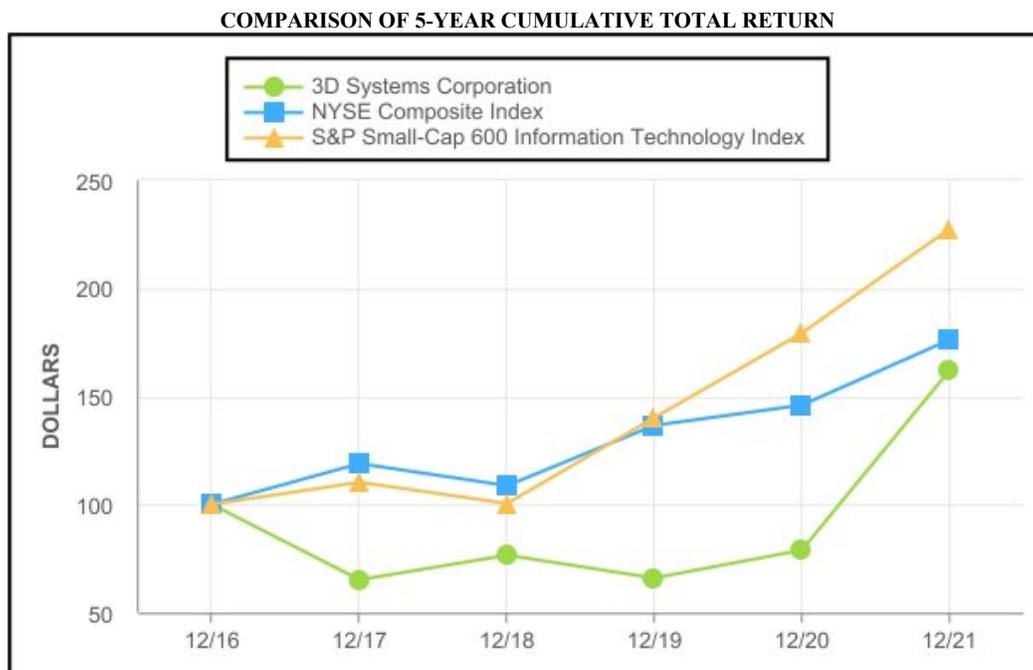
	Total number of shares (or units) purchased	Average price per share (or unit)
October 1, 2021 - October 31, 2021	14,885	\$ 27.
November 1, 2021 - November 30, 2021	15,650	24.
December 1, 2021 - December 31, 2021	67,252	21.
Total	97,787 ^a	\$ 22.

- a. Represents shares of common stock surrendered to us for payment of tax withholding obligations in connection with the vesting of restricted stock.
b. The average price paid reflects the average market value of shares withheld for tax purposes.

Stock Performance Graph

The graph below shows, for the five years ended December 31, 2021, the cumulative total return on an investment of \$100 assumed to have been made on December 31, 2016 in our common stock. For purposes of the graph, cumulative total return assumes the reinvestment of all dividends. The graph compares such return with those of comparable investments assumed to have been made on the same date in (a) the NYSE Composite Index, and (b) the S&P Small-Cap 600 Information Technology Index, which are published market indices with which we are sometimes compared.

Although total return for the assumed investment assumes the reinvestment of all dividends on December 31 of the year in which such dividends were paid, we paid no cash dividends on our common stock during the periods presented.



	December 31, 2016	December 31, 2017	December 31, 2018	December 31, 2019	December 31, 2020	December 31, 2021
3D Systems Corporation	\$ 100	\$ 65	\$ 77	\$ 66	\$ 79	\$ 146
NYSE Composite Index	100	119	108	136	146	179
S&P Small-Cap 600 Information Technology Index	100	110	100	140	179	230

Item 6. Reserved

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

The following discussion and analysis should be read together with the selected consolidated financial data and our consolidated financial statements and notes thereto included in Item 8 of this Form 10-K. Certain statements contained in this discussion may constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These statements involve a number of risks, uncertainties and other factors that could cause actual results to differ materially from those reflected in any forward-looking statements, as discussed more fully in this Form 10-K. See "Forward-Looking Statements" and "Risk Factors" in Part I, Item 1A. All amounts are in thousands, except share and per share amounts, or as otherwise indicated.

For discussion related to the results of operations and changes in financial condition for fiscal 2020 compared to fiscal 2019, refer to Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations in our fiscal 2020 Form 10-K, which was filed with the SEC on March 5, 2021.

Overview and Strategy

In May 2020, our Chief Executive Officer and President, Dr. Jeffrey Graves, was hired. Dr. Graves undertook an initial assessment of the Company and developed the purpose statement to be the leader in enabling additive manufacturing solutions for applications in growing markets that demand high reliability products. He announced a four-phased plan to enable this vision: reorganize into two key industry verticals (Healthcare and Industrial), restructure to gain efficiencies, divest non-core assets, and invest for future growth.

As part of our strategic plan, we have organized into two key verticals. This structure allows us to align our solution-oriented approach with deep industry and customer knowledge. Our two key verticals span a range of industries. Healthcare includes dental, medical devices, personalized health services and regenerative medicine. Our Industrial vertical includes aerospace, defense, transportation and general manufacturing. We architect solutions specific to customers' needs through a combination of materials, hardware platforms, software, professional services and advanced manufacturing – creating a path to integrating additive manufacturing into traditional production environments. As a result, manufacturers achieve design freedom, increase agility, scale production and improve overall total cost of operation. Our technologies and process knowledge enable hundreds of thousands of production parts to be made through additive manufacturing each day.

We completed our restructuring efforts in the second quarter of 2021. Cost reduction efforts have included reducing the number of facilities and examining every aspect of our manufacturing and operating costs.

Divestitures

In conjunction with our four-phased plan, we divested parts of our business that did not align with our strategic focus on additive manufacturing. In January 2021 we sold Cimatron Ltd., which operated our Cimatron integrated CAD/CAM software for the tooling business and its GibbsCAM CNC programming software business, for \$64.2 million. In August 2021 we sold our Symbionix line of surgical simulators for \$305.0 million, and in September 2021 we sold our On Demand Manufacturing ("ODM") business for \$82.0 million. All sale amounts are before customary closing adjustments.

We have now completed our planned divestitures of non-core assets and are focused on the strategic growth of our core additive manufacturing business.

Acquisitions

On November 1, 2021, we acquired Oqton, Inc. ("Oqton"), for \$188.2 million, excluding customary closing adjustments. We paid \$107.5 million in cash and issued 2,552,904 shares of the Company's Common Stock. The acquisition's near term impact on the Company's results of operations and cash flows are expected to be dilutive. Oqton's operating results will be reported in the Industrial segment.

On December 1, 2021, we acquired Volumetric Biotechnologies, Inc. ("Volumetric"), for \$40.2 million of which \$24.8 million was paid in cash and the remainder was paid via the issuance of 720,022 shares of the Company's common stock. Additional payments of up to \$355.0 million are possible which are linked to the attainment of several non-financial milestones through December 31, 2030 and 2035 and continued employment of certain key individuals from Volumetric. Any additional payments made will be paid approximately half in cash and half in shares of the Company's common stock. The additional payments are considered compensation expense which will be recorded ratably from the time a milestone is deemed is probable of achievement to the estimated date of achievement. Any compensation expense recorded will be reversed if the milestone is no longer probable of achievement. Volumetric will be part of the Healthcare reporting unit and segment. The acquisition's near-

term impact on the Company's results of operations and cash flows are expected to be dilutive.

COVID-19 Pandemic Response

Our top priority is the health and safety of our employees and their families and communities, as we continue to manage our business through the COVID-19 pandemic. Throughout this past year, our leadership regularly reviewed and adapted our COVID-19 protocols based on evolving research and guidance. We have reopened our offices and begun business travel, with safety measures in place and in accordance with local guidance. Additionally, we implemented a hybrid-work program globally, providing more flexibility for employees to work remotely. We continue to monitor local transmission rates and regulatory guidance, and remain committed to protecting our employees, delivering for our customers, and supporting our communities. We are subject to vaccination and workplace safety protocols of the United States Federal Government Executive Order on Ensuring Adequate COVID Safety Protocols for Federal Contractors, and the COVID-19 Workplace Safety Guidance for Federal Contractors and Subcontractors issued by the Safer Federal Workforce Task Force. In support of a safe work environment, we have a vaccine policy for our U.S. employees, and a visitor policy to ensure those visiting our sites are taking the necessary health and safety precautions.

2021 Summary

<i>(in thousands, except per share amounts)</i>	Year Ended December 31,	
	2021	2020
Revenue:		
Products	\$ 428,742	\$ 332,799
Services	186,897	224,441
Total revenue	615,639	557,240
Cost of sales:		
Products	245,169	220,415
Services	106,692	113,450
Total cost of sales	351,861	333,865
Gross profit	263,778	223,375
Operating expenses:		
Selling, general and administrative	227,697	219,895
Research and development	69,150	74,143
Impairment of goodwill	—	48,300
Total operating expenses	296,847	342,338
Loss from operations	\$ (33,069)	\$ (118,963)

On August 5, 2020, we announced, in connection with the new strategic focus and organizational realignment, a restructuring plan intended to align our operating costs with current revenue levels and better position the Company for future sustainable and profitable growth. See Note 25 in Item 8 of this Form 10-K.

Total consolidated revenue for the year ended December 31, 2021 increased 10.5% or \$58.4 million, despite divesting non-core businesses in 2021, to \$615.6 million, compared to \$557.2 million for the year ended December 31, 2020, driven by growth in the Healthcare segment.

Revenue from Healthcare increased 24.2% to \$306.2 million for the year ended December 31, 2021, compared to \$246.4 million for the year ended December 31, 2020, driven by strong demand for dental applications partly offset by the impact of 2021 divestitures. Industrial sales decreased 0.4% to \$309.5 million for the year ended December 31, 2021, compared to \$310.8 million for the year ended December 31, 2020, primarily due to the impact of 2021 divestitures, partly offset by continued strengthening of the economy in 2021.

Gross profit for the year ended December 31, 2021 increased by 18.1%, or \$40.4 million, to \$263.8 million, compared to \$223.4 million for the year ended December 31, 2020. Gross profit margin for the years ended December 31, 2021 and 2020 was 42.8% and 40.1%, respectively. The increase in gross profit margin was primarily a result of prior year end of life inventory charges and cost optimization expenses, as well as better absorption of supply chain overhead in 2021 resulting from higher production.

Operating expenses for the year ended December 31, 2021 decreased by 13.3%, or \$45.5 million, to \$296.8 million, compared to \$342.3 million for the year ended December 31, 2020 primarily due to significantly lower cost optimization expenses in 2021 and a goodwill impairment charge incurred in 2020, with no similar goodwill impairment in 2021. Selling, general and administrative ("SG&A") expenses for the year ended December 31, 2021 increased by 3.5%, or \$7.8 million, to \$227.7 million, compared to \$219.9 million for the year ended December 31, 2020, primarily due to higher incentive compensation resulting from better than expected performance in 2021 compared to internal targets, a one-time \$9.8 million bonus paid to Simbionix employees in connection with the divestiture, investments in the business, increase in stock compensation expenses, and expenses related to acquisitions, partially offset by a decrease in cost optimization expenses. Research and development ("R&D") expenses for the year ended December 31, 2021 decreased by 6.7%, or \$5.0 million, to \$69.2 million, compared to \$74.1 million for the year ended December 31, 2020, primarily due to divestitures and cost savings from the prior year restructuring program. In 2020, we recorded a non-cash goodwill impairment charge of \$48.3 million compared to no impairment charge in 2021. See Note 11 to the consolidated financial statements in Item 8 of this Form 10-K for additional discussion.

Our operating loss for the year ended December 31, 2021 was \$33.1 million, compared to an operating loss of \$119.0 million for the year ended December 31, 2020. The lower loss was driven by higher revenue and gross profit dollars, benefits from the 2020 cost optimization plan, and the absence of a goodwill impairment charge and reduced cost optimization expenses in 2021, partly offset by higher net SG&A expenses as noted above.

Results of Operations for 2021 and 2020

Comparison of revenue

Current year revenue has improved as the prior year was negatively impacted by the effects of the COVID-19 pandemic, most severely during the first half of 2020, as many of our customers were shutdown or on a significantly reduced level of activity, partially offset by the impact of divestitures. Additionally, given the relatively high price of certain 3D printers and a corresponding lengthy selling cycle, as well as relatively low unit volume of the higher priced printers in any particular period, a shift in the timing and concentration of orders and shipments from one period to another can affect reported revenue in any given period.

In addition to changes in sales volumes, there are three other primary drivers of changes in revenue from one period to another: (1) the combined effect of changes in product mix and average selling prices, (2) the impact of fluctuations in foreign currencies and (3) the impact of business divested in 2021. As used in this Management's Discussion and Analysis, the price and mix effects relate to changes in revenue that are not able to be specifically related to changes in unit volume, foreign exchange and divestitures.

We earn revenue from the sale of products and services through our Healthcare and Industrial segments. The products categories include 3D printers and corresponding materials, healthcare simulators (which was divested in the third quarter of 2021), digitizers, software licenses, 3D scanners and haptic devices. The services category includes maintenance contracts and services on 3D printers and simulators (which was divested in the third quarter of 2021), software maintenance and cloud-based software subscriptions, on-demand solutions (which was divested in the third quarter of 2021) and healthcare services.

The following table sets forth changes in revenue for the years ended December 31, 2021 and 2020.

Table 1

<i>(Dollars in thousands)</i>	Products		Services		Total	
Revenue — 2020	\$ 332,799	59.7 %	\$ 224,441	40.3 %	\$ 557,240	100.0 %
Change in revenue:						
Volume	137,856	41.4 %	16,386	7.3 %	154,242	27.7 %
Divestitures	(26,050)	(7.8)%	(57,134)	(25.5)%	(83,184)	(14.9)%
Price/Mix	(21,885)	(6.6)%	92	— %	(21,793)	(3.9)%
Foreign currency translation	6,022	1.8 %	3,112	1.4 %	9,134	1.6 %
Net change	95,943	28.8 %	(37,544)	(16.7)%	58,399	10.5 %
Revenue — 2021	\$ 428,742	69.6 %	\$ 186,897	30.4 %	\$ 615,639	100.0 %

Total consolidated revenue increased 10.5%. In addition to changes in sales volumes, there are three other primary drivers of changes in revenue from one period to another: (1) the combined effect of changes in product mix and average selling prices, (2) the impact of fluctuations in foreign currencies and (3) the impact of businesses divested in 2021. As used in this Management's Discussion and Analysis, the price and mix effects relate to changes in revenue that are not able to be specifically related to changes in unit volume, foreign exchange and divestitures. Recurring revenue, which includes service and materials, was \$396.9 million and \$381.6 million for the years ended December 31, 2021 and 2020, respectively. The increase in recurring revenue in 2021 was primarily due to an increase in material sales volume, partially offset by divestitures.

For the years ended December 31, 2021 and 2020, products revenue from Healthcare contributed \$217.7 million and \$159.6 million, respectively, and products revenue from Industrial contributed \$211.0 million and \$173.2 million, respectively. The higher products revenue in Healthcare was primarily due to continued strength in the dental market. The increased products revenue in Industrial was primarily due to higher volumes, favorable price/mix and foreign currency impact, partially offset by divestitures.

Services revenue for the year ended December 31, 2021 decreased primarily due to divestitures, partially offset by the impact of less severe COVID restrictions in 2021 and the favorable impact of foreign currency translation. For the years ended December 31, 2021 and 2020, services revenue from Healthcare contributed \$88.4 million and \$86.9 million, respectively, and services revenue from Industrial contributed \$98.5 million and \$137.6 million, respectively. The higher services revenue in Healthcare was due to strong sales in medical devices, partially offset by divestitures. The lower services revenue in Industrial was due to divestitures, partially offset by the impact of less severe COVID restrictions in 2021.

For the years ended December 31, 2021 and 2020, revenue from operations outside the U.S. was 44.6% and 50.6% of total revenue, respectively.

Gross profit and gross profit margins

The following table sets forth gross profit and gross profit margins for the years ended December 31, 2021 and 2020.

Table 2

<i>(Dollars in thousands)</i>	Year Ended December 31,				Change in Gross Profit		Change in Gross Profit Margin	
	2021		2020		\$	%	Percentage Points	%
	Gross Profit	Gross Profit Margin	Gross Profit	Gross Profit Margin				
Products	\$ 183,573	42.8 %	\$ 112,384	33.8 %	\$ 71,189	63.3 %	9.0	26.6 %
Services	80,205	42.9 %	110,991	49.5 %	(30,786)	(27.7)%	(6.6)	(13.3)%
Total	\$ 263,778	42.8 %	\$ 223,375	40.1 %	\$ 40,403	18.1 %	2.7	6.7 %

The increase in gross profit margin was primarily a result of prior year end of life inventory charges and cost optimization expenses, as well as better absorption of supply chain overhead in 2021 resulting from higher production, offset by the impact of divestitures. See Note 8 to the consolidated financial statements in Item 8 of this Form 10-K for additional discussion.

Products gross profit increased primarily due to higher sales volume as well as significantly improved capacity utilization and the end-of-life inventory charge of \$10.9 million recorded in 2020. Services gross profit decreased primarily due to the impact of divestitures.

Operating expenses

The following table sets forth the components of operating expenses for the years ended December 31, 2021 and 2020.

Table 3

<i>(Dollars in thousands)</i>	Year Ended December 31,						Change	
	2021		2020		\$	%	\$	%
	Amount	% Revenue	Amount	% Revenue				
Selling, general and administrative expenses	\$ 227,697	37.0 %	\$ 219,895	39.5 %	\$ 7,802	3.5 %		
Research and development expenses	69,150	11.2 %	74,143	13.3 %	(4,993)	(6.7)%		
Impairment of goodwill	—	— %	48,300	8.7 %	(48,300)	(100.0)%		
Total operating expenses	\$ 296,847	48.2 %	\$ 342,338	61.4 %	\$ (45,491)	(13.3)%		

SG&A expenses increased primarily due to higher incentive compensation resulting from better than expected performance in 2021 compared to internal targets, a one-time \$9.8 million bonus paid to Symbionix employees in connection with the divestiture, investments in the business, increase in stock compensation expenses, and expenses related to acquisitions, partially offset by a decrease in cost optimization expenses. SG&A expenses for 2020 included \$20.1 million of restructuring expenses related to our 2020 cost optimization program. See Note 25 to the consolidated financial statements for additional discussion regarding restructuring.

R&D expenses decreased primarily due to divestitures and cost savings from the prior year restructuring program.

For the year ended December 31, 2021, there were no impairment charges to goodwill. For the year ended December 31, 2020, we recorded a non-cash goodwill impairment charge of \$48.3 million, related to the EMEA reporting unit, that was ultimately

due to the negative impact on the business environment as a result of the COVID-19 pandemic. See Note 11 to the consolidated financial statements in Item 8 of this Form 10-K for additional discussion.

Loss from operations

The following table sets forth loss from operations for the years ended December 31, 2021, and 2020.

Table 4

<i>(Dollars in thousands)</i>	Year Ended December 31,	
	2021	2020
Loss from operations:	\$ (33,069)	\$ (118,963)

The decrease in loss from operations for the year ended December 31, 2021, as compared to the prior year period, was primarily driven by an increase in revenue and gross profit, cost savings from the prior year cost optimization program, the absence of a goodwill impairment charge and reduced restructuring expenses related to our 2020 cost optimization program and divestitures, partly offset by higher stock and incentive compensation expenses, as previously discussed.

See “*Comparison of Revenue*,” “*Gross profit and gross profit margins*” and “*Operating expenses*” above.

Interest and other income (expense), net

The following table sets forth the components of interest and other income (expense), net, for the years ended December 31, 2021 and 2020.

Table 5

<i>(Dollars in thousands)</i>	Year Ended December 31,	
	2021	2020
Interest and other income (expense), net		
Foreign exchange loss	\$ 1,681	\$ (4,762)
Interest expense, net	(1,902)	(3,991)
Other income (expense), net	352,830	(15,694)
Total interest and other expense, net	\$ 352,609	\$ (24,447)

Foreign exchange gain (loss), net, for the year ended December 31, 2021, as compared to the prior year period, improved due to the favorable movements in the EUR/USD and GBP/USD exchanges rates.

Interest expense, net, decreased for the year ended December 31, 2021, as compared to the prior year period primarily due to lower interest expense due to the repayment of the 5-year \$100 million senior secured term loan facility (the “Term Facility”) in the first quarter of 2021 and interest income related to cash proceeds from the Cimatron, ODM, and Symbionix divestitures as well as our \$460 million convertible notes offering. The year over year benefits for the year ended December 31, 2021 were partially offset by the realization of losses previously recognized in accumulated other comprehensive loss resulting from the termination of the interest rate swap in the first quarter of 2021.

Other income (expense), net, for the year ended December 31, 2021, as compared to the year ended December 31, 2020, increased primarily due to the \$350.9 million gain on the divestitures of Cimatron, ODM and Symbionix, including an \$8.9 million favorable foreign exchange gain related to the Cimatron and Symbionix divestitures.

Benefit and provision for income taxes

We recorded a \$2.5 million tax benefit and a \$6.2 million provision for income taxes for the years ended December 31, 2021 and 2020, respectively.

In 2021, our benefit reflected \$6.6 million in U.S. tax benefit and \$4.1 million of tax expense in foreign jurisdictions. In 2020, our provision reflected \$1.8 million in U.S. tax expense and \$4.4 million of tax expense in foreign jurisdictions.

During 2021 and 2020, we concluded that it is more likely than not that our deferred tax assets will not be realized in certain jurisdictions, including the U.S. and certain foreign jurisdictions; therefore, we have a valuation allowance recorded against our deferred tax assets on our consolidated balance sheets totaling \$91.2 million and \$123.1 million as of December 31, 2021 and 2020, respectively.

For further discussion, see Note 2 and Note 22 to the consolidated financial statements in Item 8 of this Form 10-K.

Net income (loss)

The following table sets forth the primary components of net income (loss) attributable to 3D Systems for the years ended December 31, 2021 and 2020.

Table 6

<i>(Dollars in thousands)</i>	Year Ended December 31,		Change
	2021	2020	
Loss from operations	\$ (33,069)	\$ (118,963)	\$ 85,894
Other non-operating items:			
Interest and other income (expense), net	352,609	(24,447)	377,056
Benefit (provision) for income taxes	2,512	(6,184)	8,696
Net income (loss)	\$ 322,052	\$ (149,594)	\$ 471,646
Weighted average shares, basic	122,867	117,579	
Weighted average shares, diluted	126,334	117,579	
Income (loss) per share, basic	\$ 2.62	\$ (1.27)	
Income (loss) per share, diluted	\$ 2.55	\$ (1.27)	

The net income for the year ended December 31, 2021, as compared to the net loss for year ended December 31, 2020, was primarily driven by a decrease in loss from operations and the gain on the divestitures of Cimatron, ODM and Symbionix, as previously discussed. See “*Gross profit and gross profit margins*”, “*Operating expenses*”, and Interest and other income (expense), net above.

Liquidity and Capital Resources

Table 7

<i>(Dollars in thousands)</i>	December 31, 2021	December 31, 2020	Change	
			\$	%
Cash and cash equivalents	\$ 789,657	\$ 75,010	\$ 714,647	952.7 %
Accounts receivable, net	106,540	114,254	(7,714)	(6.8)%
Inventories	92,887	116,667	(23,780)	(20.4)%
	989,084	305,931	683,153	
Less:				
Current portion of long term debt	—	2,051	(2,051)	(100.0)%
Current right of use liabilities	8,344	9,534	(1,190)	(12.5)%
Accounts payable	57,366	45,174	12,192	27.0 %
Accrued and other liabilities	76,994	69,812	7,182	10.3 %
	142,704	126,571	16,133	
Operating working capital	\$ 846,380	\$ 179,360	\$ 667,020	371.9 %

We assess our liquidity in terms of our ability to generate cash to fund our operating, investing and financing activities. In doing so, we review and analyze our current cash on hand, the number of days our sales are outstanding, inventory turns, capital expenditure commitments and accounts payable turns. Our cash requirements, excluding acquisitions, primarily consist of funding working capital and capital expenditures.

At December 31, 2021, cash on hand which includes; cash and cash equivalents and restricted cash totaled \$790.0 million, increased \$705.3 million since December 31, 2020. The higher cash balance resulted from proceeds of \$421.1 million from the Cimatron, ODM, and Simbionix divestitures, \$446.5 million of proceeds from the issuance of convertible notes, and \$48.1 million of cash flow from operations, partially offset by \$21.4 million for repayments of debt, \$18.8 million for capital expenditures, \$139.7 million for current acquisitions, \$12.6 million related to net settlement of stock-based compensation, and \$6.3 million of payments related to previously purchased non-controlling interests. Cash flow from operations was negatively impacted by withholding taxes of \$6.6 million related to the Cimatron divestiture.

We expect that cash flow from operations, cash and cash equivalents, and other sources of liquidity, such as issuing equity or debt securities subject to market conditions, will be available and sufficient to meet all foreseeable cash requirements.

Cash held outside the U.S. at December 31, 2021 was \$62.7 million, or 7.9% of total cash and cash equivalents, compared to \$49.7 million, or 66.2% of total cash and cash equivalents, at December 31, 2020. As our previously unremitted earnings have been subjected to U.S. federal income tax, we expect any repatriation of these earnings to the U.S. would not incur significant federal and state taxes. However, these dividends are subject to foreign withholding taxes that are estimated to result in the Company incurring tax costs in excess of the cost to obtain cash through other means. Cash equivalents are comprised of funds held in money market instruments and are reported at their current carrying value, which approximates fair value due to the short term nature of these instruments. We strive to minimize our credit risk by investing primarily in investment grade, liquid instruments and limit exposure to any one issuer depending upon credit quality. See “Cash flow” discussion below.

The changes that make up the other components of working capital not discussed above resulted from the ordinary course of business. Differences between the amounts of working capital item changes in the cash flow statement and the balance sheet changes for the corresponding items are primarily the result of foreign currency translation adjustments, acquisitions and divestitures.

Cash flow

Cash flow from operations

Cash provided by operating activities for the year ended December 31, 2021 was \$48.1 million and cash used in operating activities for the year ended December 31, 2020 was \$20.1 million.

Working capital used cash of \$0.7 million for the year ended December 31, 2021 and used cash of \$7.3 million for the year ended December 31, 2020. For the year ended December 31, 2021, working capital changes related to cash inflows were a decrease in inventory and an increase in accounts payable, partially offset by an increase in accounts receivable, and prepaid expenses and other current assets, and a decrease in deferred revenue, and other liabilities.

For the year ended December 31, 2020, drivers of working capital related to cash outflows were an increase in accounts receivable, inventory, and prepaid expenses and other current assets, and a decrease in accounts payable, partially offset by an increase in deferred revenue and customer deposits and accrued and other current liabilities.

Cash flow from investing activities

For the year ended December 31, 2021, cash flow provided from investing activities was \$260.6 million compared to \$11.7 million of cash used in investing activities for the year ended December 31, 2020. Cash inflows related to the net proceeds from the divestitures of Cimatron, ODM and Simbionix, partially offset by capital expenditures and payments related to current acquisitions. For the year ended December 31, 2020, the primary outflows of cash related to capital expenditures. Capital expenditures were \$18.8 million and \$13.6 million for the years ended December 31, 2021 and 2020, respectively.

Cash flow from financing activities

Cash provided by financing activities was \$405.8 million for the year ended December 31, 2021, while cash used in financing activities was \$19.5 million for the year ended December 31, 2020. The primary inflow of cash for the year ended December 31, 2021 related to proceeds from the issuance of the convertible note partially offset by the repayment of the Term Facility, the settlements of stock-based compensation and payments related to previously purchased non-controlling interests. The primary outflow of cash for the year ended December 31, 2020 related to partial repayment of the Term Facility, payments related to previously purchased non-controlling interests, and settlements of stock-based compensation, partially offset by proceeds from the issuance of common stock.

Off-Balance Sheet Arrangements

We have no off-balance sheet arrangements and do not utilize any “structured debt,” “special purpose” or similar unconsolidated entities for liquidity or financing purposes.

Material Cash Requirements

The Company's material cash requirements consist of the following contractual and other obligations:

Indebtedness

At December 31, 2021, we had \$460,000 of outstanding 0% convertible notes which mature in November of 2026. Management may consider pursuing additional long-term financing when it is appropriate in light of cash requirements for operations or other strategic opportunities, which could result in higher financing costs.

Purchase Commitments

We have purchase commitments under legally enforceable agreements for goods and services with defined terms as to quantity, price and timing of delivery.

Leases

The Company has operating and financing lease obligations of \$69,849 at December 31, 2021, primarily related to real estate and equipment leases, of which approximately \$11,000 in payments are expected over the next twelve months. Additionally, the Company has \$31,108 in lease obligations for which the leases have not commenced as the facilities are under construction by the landlord. For more information on the Company's leases, refer to Note 7 to the consolidated financial statements.

Sources of Funding to Satisfy Material Cash Requirements

The Company believes that it has the financial resources needed to meet its cash requirements and expects to have positive operating cash flow in 2022. Cash requirements for periods beyond the next twelve months will depend, among other things, on the Company's profitability and its ability to manage working capital requirements. The Company may also borrow from various sources as described above.

Other Contractual Commitments

Convertible Note

We were in compliance with all covenants of the Note as of December 31, 2021.

Indemnification

In the normal course of business we periodically enter into agreements to indemnify customers or suppliers against claims of intellectual property infringement made by third parties arising from the use of our products. Historically, costs related to these indemnification provisions have not been significant. We are unable to estimate the maximum potential impact of these indemnification provisions on our future results of operations.

To the extent permitted under Delaware law, we indemnify our directors and officers for certain events or occurrences while the director or officer is, or was, serving at our request in such capacity, subject to limited exceptions. The maximum potential amount of future payments we could be required to make under these indemnification obligations is unlimited; however, we have directors' and officers' insurance coverage that may enable us to recover future amounts paid, subject to a deductible and to the policy limits.

Financial Instruments

We conduct business in various countries using both the functional currencies of those countries and other currencies to effect cross border transactions. As a result, we are subject to the risk that fluctuations in foreign exchange rates between the dates that those transactions are entered into and their respective settlement dates will result in a foreign exchange gain or loss. When practicable, we endeavor to match assets and liabilities in the same currency on our balance sheet and those of our subsidiaries in order to reduce these risks. When appropriate, we enter into foreign currency contracts to hedge exposures arising from those transactions. We had \$43.0 million and \$101.8 million in notional foreign exchange contracts outstanding as of December 31, 2021 and 2020, respectively. The fair value of these contracts was not material. We have elected not to prepare and maintain the documentation to qualify for hedge accounting treatment under ASC 815, "Derivatives and Hedging," and therefore, all gains and losses (realized or unrealized) are recognized in Interest and other expense, net in the consolidated statements of operations and comprehensive income (loss). Depending on the fair value at the end of the reporting period, derivatives are recorded either in prepaid and other current assets or in accrued liabilities in the consolidated balance sheets.

We do not hedge for trading or speculative purposes, and our foreign currency contracts are generally short-term in nature, typically maturing in 90 days or less.

See Note 15 to the consolidated financial statements in Item 8 of this Form 10-K for further discussion.

Critical Accounting Policies and Significant Estimates

We prepare our consolidated financial statements in accordance with U.S. Generally Accepted Accounting Principles ("GAAP"). In doing so, we have to make estimates and assumptions that affect our reported amounts of assets, liabilities, revenues, expenses, gains and losses, as well as related disclosure of contingent assets and liabilities. In some cases, we could reasonably have used different accounting policies and estimates. In some cases, changes in the accounting estimates are reasonably likely to occur from period to period. Accordingly, actual results could differ materially from our estimates. To the extent that there are material differences between these estimates and actual results, our financial condition or results of operations will be affected. We base our estimates on past experience and other assumptions that we believe are reasonable under the circumstances, and we evaluate these estimates on an ongoing basis. We refer to accounting estimates of this type as critical accounting policies and estimates, which we discuss further below. We have reviewed our critical accounting policies and estimates with the audit committee of our board of directors.

See Note 2 to the consolidated financial statements in Item 8 of this Form 10-K for a summary of significant accounting policies and the effect on our financial statements.

Revenue recognition

Revenue is recognized when control of the promised products or services is transferred to customers in an amount that reflects the consideration we expect to receive in exchange for those products or services. A majority of our revenue is recognized at the point in time when products are shipped or services are delivered to customers.

We enter into contracts that can include various combinations of products and services, which are generally capable of being distinct and accounted for as separate performance obligations. Many of our contracts with customers include multiple performance obligations. For such arrangements, we allocate revenue to each performance obligation based on its relative standalone selling price ("SSP"). Judgment is required to determine the SSP for each distinct performance obligation in a contract. For the majority of items, we estimate SSP using historical transaction data. We use a range of amounts to estimate SSP when we sell each of the products and services separately and need to determine whether there is a discount to be allocated based on the relative SSP of the various products and services. In instances where SSP is not directly observable, such as when the product or service is not sold separately, we determine the SSP using information that may include market conditions and other observable inputs.

In some circumstances, we have more than one SSP for individual products and services due to the stratification of those products and services by customers, geographic region or other factors. In these instances, we may use information such as the size of the customer and geographic region in determining the SSP.

The determination of SSP is an ongoing process and information is reviewed regularly in order to ensure SSP reflects the most current information or trends.

The nature of our marketing incentives may lead to consideration that is variable. Judgment is exercised at contract inception to determine the expected value of the contract and resulting transaction price. Ongoing assessments are performed to determine if updates are needed to the original estimates.

See Note 2 and Note 5 to the consolidated financial statements in Item 8 of this Form 10-K for further discussion.

Allowance for doubtful accounts

In evaluating the collectability of our accounts receivable, we assess a number of factors, including specific customers' abilities to meet their financial obligations to us, the length of time receivables are past due and historical collection experience. Based on these assessments, we may record a reserve for specific customers, as well as a general reserve and allowance for returns and discounts. If circumstances related to specific customers change, or economic conditions deteriorate such that our past collection experience is no longer relevant, our estimate of the recoverability of our accounts receivable could be further reduced from the levels provided for in the consolidated financial statements. One customer represents significant concentration of credit risk, as they represent greater than 10% of our total accounts receivable.

We evaluate specific accounts for which we believe a customer may have an inability to meet their financial obligations (for example, aging over 90 days past due or bankruptcy). In these cases, we use our judgment, based on available facts and circumstances, and record a specific reserve for that customer to reduce the receivable to an amount we expect to collect. These specific reserves are re-evaluated and adjusted as additional information is received that impacts the amount reserved.

Income taxes

We are subject to income taxes in the U.S. and foreign jurisdictions. Significant judgment is required in evaluating our uncertain tax positions and determining our provision for income taxes.

Although we believe we have adequately reserved for our uncertain tax positions, no assurance can be given that the final tax outcome of these matters will not be different. We adjust these reserves in light of changing facts and circumstances, such as the closing of a tax audit or the refinement of an estimate. To the extent that the final tax outcome of these matters is different than the amounts recorded, such differences will affect the provision for income taxes and the effective tax rate in the period in which such determination is made.

The provision for income taxes includes the effect of reserve provisions and changes to reserves that are considered appropriate as well as the related net interest and penalties. In addition, we are subject to the continuous examination of our income tax returns by the Internal Revenue Service ("IRS") and other tax authorities which may assert assessments against us. We regularly assess the likelihood of adverse outcomes resulting from these examinations and assessments to determine the adequacy of our provision for income taxes.

Inventories

Inventories are stated at the lower of cost or net realizable value, with cost being determined using the first-in, first-out method.

The inventory reserve is a critical estimate as there is rapid technological change in our industry impacting the market for our products and there is significant judgment in estimating the amount of spare parts to keep on hand to service previously sold printers for periods of up to 10 or more years.

See Note 8 to the consolidated financial statements in Item 8 of this Form 10-K for further discussion.

Goodwill & Other Long-Lived Assets, Including Intangible Assets

We review long-lived assets, including intangible assets subject to amortization, for impairment whenever events or changes in circumstances indicate that the carrying value of the asset may not be recoverable. We assess the recoverability of the carrying value of assets held for use based on a review of undiscounted projected cash flows. Impairment losses, where identified, are measured as the excess of the carrying value of the long-lived asset over its estimated fair value as determined by discounted projected cash flows.

Goodwill represents the purchase price paid in excess of the fair value of net tangible and intangible assets acquired in a business combination. We review goodwill for impairment annually or when circumstances indicate that the likelihood of an impairment is greater than 50%. Such circumstances include a significant adverse change in the business climate for one of our reporting units or a decision to dispose of a reporting unit or a significant portion of a reporting unit. The test for goodwill impairment compares the fair value of each of reporting unit to its respective carrying value. The process requires a significant level of estimation and use of judgment by management, particularly the estimate of the fair value of our reporting units. Our reporting units are Healthcare and Industrial. Prior to January 1, 2021 our reporting units were the Americas, EMEA and APAC.

Long-lived assets (including ROU Assets) and amortizable intangible assets are reviewed for recoverability whenever events or changes in circumstances indicate that the carrying amount may not be recoverable.

We estimate the fair value of our reporting units based primarily on the discounted projected cash flows of the underlying operations, which requires us to make assumptions about estimated cash flows, including profit margins, long-term forecasts, discount rates and terminal growth rates. We developed these assumptions based on the market risks unique to each reporting unit.

As of December 31, 2021, we have approximately \$0.6 million of goodwill that is deductible for tax purposes.

As of September 30, 2020, we experienced a triggering event due to a drop in our stock price, which ultimately had been negatively impacted by the business environment as a result of the COVID-19 pandemic, and performed a quantitative analysis for potential impairment of our goodwill and long-lived asset balances. Based on available information and analysis as of September 30, 2020, we determined the carrying value of the EMEA reporting unit exceeded its fair value and recorded a non-cash goodwill impairment charge of \$48.3 million. We determined the fair value of the Americas and APAC reporting units exceeded their carrying values and the carrying value of our long-lived assets is recoverable for all reporting units.

Fair value was determined using a combination of an income approach, which estimates fair value based upon projections of future revenues, expenses, and cash flows discounted to its present value, and a market approach. The valuation methodology and underlying financial information included in the Company's determination of fair value required significant judgments by management. The principal assumptions used in the Company's discounted cash flow analysis consisted of (a) the long-term projections of future financial performance and (b) the weighted-average cost of capital of market participants, adjusted for the risk attributable to the Company and the industry in which it operates. Under the market approach, the principal assumption included an estimate of multiples of various financial metrics of comparable companies.

We conducted our annual goodwill impairment test for the years ended December 31, 2021 and 2020 as of November 30, 2021 and 2020, respectively. There was no goodwill impairment for the year ended December 31, 2021. We had an immaterial amount of other long lived asset impairment charges for the year ended December 31, 2021.

Contingencies

We record an estimated loss from a contingency when information indicates that it is probable that an asset has been impaired or a liability has been incurred at the date of the financial statements and the amount of the loss can be reasonably estimated. Accounting for contingencies requires us to use our judgment and the ultimate resolution of our exposure related to these matters may change as further facts and circumstances become known.

See Note 23 to the consolidated financial statements in Item 8 of this Form 10-K for further discussion.

Recent Accounting Pronouncements

See Note 2 to the consolidated financial statements in Item 8 of this Form 10-K for recently issued accounting standards, including the expected dates of adoption and expected impact to the consolidated financial statements upon adoption.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

We are exposed to market risks from fluctuations in interest rates, foreign currency exchange rates and commodity prices, which may adversely affect our results of operations and financial condition. We seek to minimize these risks through regular operating and financing activities and, when we consider it to be appropriate, through the use of derivative financial instruments. We do not purchase, hold or sell derivative financial instruments for trading or speculative purposes.

Interest rates

Our earnings exposure related to movements in interest rates is primarily derived from variable interest rate deposits. At December 31, 2021, we had \$585.4 million in variable-rate accounts. A hypothetical interest rate change of 10% would not have a material impact on annualized interest income.

Foreign exchange rates

Because we conduct our operations in many areas of the world involving transactions denominated in a variety of currencies, our results of operations as expressed in U.S. dollars may be significantly affected by fluctuations in rates of exchange between currencies. These fluctuations could be significant. In 2021, approximately 44.6% of our net sales and a significant portion of our costs were denominated in currencies other than the dollar. We generally are unable to adjust our non-dollar local currency sales prices to reflect changes in exchange rates between the dollar and the relevant local currency. As a result, changes in exchange rates between the U.S. Dollar and the Euro, Japanese Yen, British Pound, South Korean Won or other currencies in which we receive sale proceeds have a direct impact on our operating results. These impacts are partly offset by expenses incurred in the same currency as the sales. There is normally a time lag between our sales and collection of the related sales proceeds, exposing us to additional currency exchange rate risk.

When practicable, we endeavor to match assets and liabilities in the same currency on our U.S. balance sheet and those of our subsidiaries in order to reduce these risks. We also, when we consider it appropriate, enter into foreign currency contracts to hedge exposures arising from those transactions.

At December 31, 2021, a hypothetical change of 10% in foreign currency exchange rates would cause a change in revenue and expense of approximately \$27.5 million and \$15.7 million, respectively, assuming all other variables remained constant.

We enter into foreign currency forward contracts to reduce the effect of fluctuating foreign currencies. At December 31, 2021, we had notional forward exchange contracts outstanding of \$43.0 million. We believe these foreign currency forward contracts and the offsetting underlying commitments, when taken together, do not create material market risk.

For the year ended December 31, 2021 the aggregate foreign currency gain or loss included in net income was \$1.7 million.

Commodity prices

We are exposed to price volatility related to raw materials and energy products in conjunction with our printer assembly and print materials blending processes. Generally, we acquire such components at market prices and do not use financial instruments to hedge commodity prices. At December 31, 2021, a hypothetical 10% change in commodity prices for raw materials would cause a change to cost of sales of approximately \$7.1 million.

Item 8. Financial Statements and Supplementary Data

Our consolidated financial statements and the related notes, together with the Report of Independent Registered Public Accounting Firm thereon, are set forth below beginning on page F-1 and are incorporated herein by reference.

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

Not applicable.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Our management, including the Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness of our disclosure controls and procedures, pursuant to Exchange Act Rule 13a-15(e), as of December 31, 2021. Disclosure controls refer to controls and other procedures designed to ensure that information required to be disclosed in the reports we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in the rules and forms of the SEC, and to provide reasonable assurance that we accumulate and communicate such information to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions about required disclosure.

Based on this evaluation, our management, including our Chief Executive Officer and Chief Financial Officer, concluded that, as of December 31, 2021, our disclosure controls and procedures were not effective due to the material weaknesses in our internal control over financial reporting, as further described below.

Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f) and 15d-15(f). Our internal control framework and processes were designed to provide reasonable assurance to management and the Board of Directors regarding the reliability of financial reporting and the preparation of our consolidated financial statements for external purposes in accordance with GAAP. Our 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 the transactions and dispositions of our assets;
- Provide reasonable assurance that transactions are recorded properly to allow for the preparation of financial statements in accordance with GAAP 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 consolidated financial statements.

Because of its inherent limitations, a system of internal control over financial reporting can provide only reasonable assurance and may not prevent or detect misstatements. Further, because of changing conditions, effectiveness of internal control over financial reporting may vary over time.

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we performed an assessment of the effectiveness of our internal control over financial reporting based on the framework described in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, we concluded that we did not maintain effective internal control over financial reporting as of December 31, 2021, due to an aggregation of certain control deficiencies that resulted in three material weaknesses identified below, although the volume of control deficiencies that aggregated into our previously reported material weakness has been significantly reduced.

A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the annual or interim financial statements will not be prevented or detected on a timely basis.

The material weaknesses present relate to a lack of certain controls, or improper execution of designed control procedures (1) for certain non-standard contracts and non-standard contract terms; (2) over the review of internally prepared reports and analyses utilized in the financial closing process; and (3) for the calculation of the Company's provision for income taxes including for material non-routine transactions. The combination of control deficiencies that resulted in these material weaknesses were partially related to employee training, resulting in a lack of knowledge or skill level to properly execute the designed controls or perform an effective review over certain manual controls related to the financial statement close process. In addition, certain control deficiencies related to the timely review of transactions that were infrequent in nature.

The effectiveness of our internal control over financial reporting as of December 31, 2021 has been audited by BDO USA, LLP, an independent registered public accounting firm, as stated in their report included in Item 8 of this Form 10-K.

Remediation Plan for Material Weaknesses as of December 31, 2020

To address the two material weaknesses identified at December 31, 2020, we began implementing a remediation plan in January 2021 designed to improve our internal control over financial reporting and remediate the related control deficiencies that led to these material weaknesses. The remediation plan included the following remedial actions:

- a. Formally enhanced, developed, and implemented policies, procedures and processes relating to our financial reporting.
- b. Hired an experienced Chief Accounting Officer (CAO), along with additional accounting personnel some of whom possess public company accounting and reporting technical expertise.
- c. Engaged outside consultants to advise on changes in the design of our controls and procedures, implementation of our remediation activities and to advise on technical accounting matters.
- d. Enhanced the global control environment, including testing in 2021 of a significant number of additional business process and information technology controls.
- e. Trained new and existing accounting and finance personnel as well as key personnel in other functions such as, but not limited to, operations, sales, business development, human resources, legal and supply chain on the newly enhanced, developed and implemented policies and procedures.
- f. Trained personnel noted in the above bullet as to the proper design and execution of control procedures and noted the importance of the ongoing execution and maintenance of control process and procedures.
- g. Implemented software to manage and administer account reconciliations.
- h. Modified existing software to capture non-standard terms and conditions related to customer contracts.
- i. Enhanced the monthly close process to improve the timeliness of recording entries which permits more time to review and analyze financial statement accounts and to execute control procedures.
- j. Revamped and expanded our internal disclosure processes to provide greater representation across functions and improve opportunities to identify matters requiring accounting disposition or disclosures.

After an assessment of the impact of the remediation actions commenced in 2021, we determined that the two material weaknesses identified at December 31, 2020 were not fully remediated as of December 31, 2021, but the volume of control deficiencies that aggregated into the previously reported material weaknesses has been significantly reduced. To fully remediate these material weaknesses, we plan to continue enhancements to our internal controls over financial reporting in 2022. These additional remediation actions include:

- a. Hiring additional staff with appropriate accounting, finance, operational and technology knowledge and experience in the design and execution of controls,
- b. Re-designing ineffective controls or processes,
- c. Implementing software to enhance our financial close and reporting process, and
- d. Establishing a formal controls governance committee to manage and enhance the oversight and execution of internal controls.

Remediation Plan for Material Weaknesses as of December 31, 2021

In addition to the remediation plan for the two material weaknesses discussed above, to address the tax material weakness present at December 31, 2021, we plan to implement a number of remediation actions including:

- a. Implementing software enhancements, including a tax reporting solution for our tax provision process
- b. Redesigning controls related to the accounting for the income tax process
- c. Engaging a third party to review our quarterly and annual tax calculations
- d. Hiring additional experienced resources with backgrounds in income tax accounting

We are committed to the remediation of all material weaknesses and expect to successfully implement enhanced control processes and have a sufficient period of operational effectiveness to evidence material weakness remediation in 2022. However, as we continue to evaluate, and work to improve our internal control over financial reporting, management may determine that additional measures to address control deficiencies or modifications to the remediation plan are necessary. Therefore, we cannot assure you when we will remediate such weaknesses, nor can we be certain that additional actions will not be required or the costs of any such additional actions. Moreover, we cannot assure you that additional material weaknesses will not arise in the future.

Changes in Internal Control Over Financial Reporting

Other than the remediation efforts described above with respect to the two material weaknesses identified at December 31, 2020, there were no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2021, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. The tax material weakness described above was identified after December 31, 2021. Accordingly, we are in the process of implementing certain changes in our internal controls to remediate this tax material weakness as described above. The implementation of the material aspects of these additional remediation efforts began in the first quarter of fiscal year 2022.

Item 9B. Other Information

None.

Item 9c. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required in response to this Item will be set forth in our Proxy Statement for our 2022 Annual Meeting of Stockholders (“Proxy Statement”) under the captions “Proposal One: Election of Directors,” “Corporate Governance Matters,” “Delinquent Section 16(a) Reports,” “Corporate Governance Matters—Code of Conduct and Code of Ethics,” “Corporate Governance Matters—Corporate Governance and Nominating Committee,” and “Corporate Governance Matters—Audit Committee.”

Item 11. Executive Compensation

The information in response to this Item will be set forth in our Proxy Statement under the captions “Director Compensation,” “Executive Compensation,” “Corporate Governance Matters—Compensation Committee,” and “Executive Compensation—Compensation Committee Report.”

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

Except as set forth below, the information required in response to this Item will be set forth in our Proxy Statement under the caption “Security Ownership of Certain Beneficial Owners and Management.”

Equity Compensation Plans

The following table summarizes information about the equity securities authorized for issuance under our compensation plans as of December 31, 2021. For a description of these plans, please see Note 18 to the consolidated financial statements in Item 8 of this Form 10-K.

<i>(in thousands, except exercise price)</i>	<u>Number of securities to be issued upon exercise of outstanding stock options, warrants and rights</u>	<u>Weighted average exercise price of outstanding options, warrants and rights ^a</u>	<u>Number of securities remaining available for future issuance under equity compensation plans ^b</u>
Equity compensation plans approved by stockholders:			
Stock options	420	\$ 13.26	
Restricted stock units	1,914		
Total	2,334		4,258

a. The weighted-average exercise price is only applicable to stock options.

b. The number of securities remaining available for future issuance for stock options, restricted stock units, and stock awards for non-employee directors is approved in total and not individually with respect to these items.

Item 13. Certain Relationships and Related Transactions and Director Independence

The information required in response to this Item will be set forth in our Proxy Statement under the captions “Corporate Governance Matters—Director Independence” and “Corporate Governance Matters—Related Party Transaction Policies and Procedures.”

Item 14. Principal Accounting Fees and Services

The information in response to this Item will be set forth in our Proxy Statement under the caption “Proposal Three: Ratification of Selection of Independent Registered Accounting Firm—Fees of Independent Registered Public Accounting Firm.”

PART IV

Item 15. Exhibits, Financial Statement Schedules

(a)(3)

Exhibits

The following exhibits are included as part of this filing and incorporated herein by this reference:

- [2.1](#) Share Purchase Agreement, dated November 2, 2020, by and among 3D Systems, Inc., 3D Systems Corporation and ST Acquisition Co. (Incorporated by reference to Exhibit 2.1 of the Registrant's Current Report on Form 8-K filed November 4, 2020.)
- [2.2](#) First Amendment to Share Purchase Agreement, dated December 31, 2020, by and among ST Acquisition Co., 3D Systems, Inc. and 3D Systems Corporation (Incorporated by reference to Exhibit 2.1 to Registrant's Current Report on Form 8-K, filed January 4, 2021.)
- [2.3](#) Asset Purchase Agreement, dated June 1, 2021, by and among 3D Systems, Inc., Quickparts.com, Inc., 3D Systems Italia Srl, 3D Systems France Sarl, 3D Systems Europe Limited, 3D Systems GmbH, QP 3D Acquisition, Inc., and 3D Systems Corporation. (Incorporated by reference to Exhibit 2.1 of the Registrant's Current Report on Form 8-K files on June 2, 2021.)
- [2.4](#) First Amendment to the Asset Purchase Agreement, dated June 1, 2021, by and among 3D Systems, Inc., Quickparts.com Inc., 3D Systems Italia Srl, Sd Systems France Sarl, 3D Systems Europe Limited, 3D Systems GmbH, QP 3D Acquisition, Inc., and 3D Systems. (Incorporated by reference Exhibit 2.5 to Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2021, filed November 8, 2021.)
- [2.5†](#) Second Amendment to the Asset Purchase Agreement, dated June 1, 2021, by and among 3D Systems, Inc., Quickparts.com Inc., 3D Systems Italia Srl, Sd Systems France Sarl, 3D Systems Europe Limited, 3D Systems GmbH, QP 3D Acquisition, Inc., and 3D Systems Corporation.
- [2.6](#) Stock Purchase Agreement, dated July 28, 2021, by and between 3D Systems, Inc. and Surgical Science Sweden AB. (Incorporated by reference to Exhibit 2.1 of the Registrant's Current Report on Form 8-K files on July 30, 2021.)
- [2.7](#) Agreement and Plan of Merger, dated September 8, 2021, by and among 3D Systems Corporation, Oqton, Inc., 3DS Merger Sub 1, Inc., 3DS Merger Sub 2 Inc., and Shareholder Representative Services LLC, solely in its capacity as the representative, agent and attorney-in-fact of the Sellers. (Incorporated by reference to the Exhibit 2.1 of the Registrant's Current Report on Form 8-K filed on September 9, 2021.)
- [2.8](#) First Amendment to the Agreement and Plan of Merger, dated October 29, 2021, by and among 3D Systems Corporation, Oqton, Inc., 3DS Merger Sub 1, Inc., 3DS Merger Sub 2 Inc., and Shareholder Representative Services LLC, solely in its capacity as the representative, agent and attorney-in-fact of the Sellers.
- [2.9](#) Agreement and Plan of Merger, dated October 27, 2021, by and among 3D Systems Corporation, Volumetric Biotechnologies, Inc., Texans Merger Sub I, Inc., Texans Merger Sub II, Inc., and Fortis Advisors LLC, solely in its capacity as the Stockholders' Representative. (Incorporated by reference to Exhibit 2.1 of the Registrant's Current Report on Form 8-K filed on October 28, 2021.)
- [3.1](#) Certificate of Incorporation of Registrant. (Incorporated by reference to Exhibit 3.1 to Registrant's Form 8-B filed on August 16, 1993, and the amendment thereto, filed on Form 8-B/A on February 4, 1994.)
- [3.2](#) Amendment to Certificate of Incorporation filed on May 23, 1995. (Incorporated by reference to Exhibit 3.2 to Registrant's Registration Statement on Form S-2/A, filed on May 25, 1995.)
- [3.3](#) Certificate of Amendment of Certificate of Incorporation filed with Secretary of State of Delaware on May 19, 2004. (Incorporated by reference to Exhibit 3.1 to Registrant's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2004, filed on August 5, 2004.)
- [3.4](#) Certificate of Amendment of Certificate of Incorporation filed with Secretary of State of Delaware on May 17, 2005. (Incorporated by reference to Exhibit 3.1 to Registrant's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2005, filed on August 1, 2005.)
- [3.5](#) Certificate of Amendment of Certificate of Incorporation filed with the Secretary of State of Delaware on October 7, 2011. (Incorporated by reference to Exhibit 3.1 to Registrant's Current Report on Form 8-K filed on October 7, 2011.)
- [3.6](#) Certificate of Amendment of Certificate of Incorporation filed with the Secretary of State of Delaware on May 21, 2013. (Incorporated by reference to Exhibit 3.1 to Registrant's Current Report on Form 8-K filed on May 22, 2013.)

- [3.7](#) Amended and Restated By-Laws. (Incorporated by reference to Exhibit 3.1 to Registrant’s Current Report on Form 8-K, filed on March 15, 2018.)
- [4.1](#) Specimen Common Stock Certificate. (Incorporated by reference to Exhibit 4.1 to Registrant’s Registration Statement on Form S-3 (Registration No. 333-182065), filed on June 12, 2012.)
- [4.2](#) Description of Common Stock. (Incorporated by reference to Exhibit 4.2 to Registrant’s Annual Report on Form 10-K for the year ended December 31, 2020, filed on February 26, 2020.)
- [4.3*](#) Amended and Restated 2015 Incentive Plan of 3D Systems Corporation effective September 3, 2020. (Incorporated by reference to Exhibit 4.1 to Registrant’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, filed on November 5, 2020.)
- [4.4*](#) Appendix A to the 2015 Incentive Plan of 3D Systems Corporation effective May 19, 2015. (Incorporated by reference to Exhibit 10.3 to Registrant’s Quarterly Report on Form 10-Q for the quarter ended June 30, 2015, filed on August 6, 2015.)
- [4.5*](#) Form of Restricted Stock Award Agreement under the Amended and Restated 2015 Incentive Plan. (Incorporated by reference to Exhibit 4.5 to Registrant’s Annual Report on Form 10-K for the year ended December 31, 2020, filed on May 5, 2021.)
- [4.6*](#) Form of Restricted Stock Unit Award Agreement under the Amended and Restated 2015 Incentive Plan. (Incorporated by reference to Exhibit 4.6 to Registrant’s Annual Report on Form 10-K for the year ended December 31, 2020, filed on May 5, 2021.)
- [4.7*](#) Form of Stock Option Award Agreement under the Amended and Restated 2015 Incentive Plan. (Incorporated by reference to Exhibit 4.10 to Registrant’s Annual Report on Form 10-K for the year ended December 31, 2019, filed on February 26, 2020.)
- [4.8*](#) Form of Restricted Stock Award Agreement with Share Price Vesting Conditions (Incorporated by reference to Exhibit 4.17 to Registrant’s Annual Report on Form 10-K for the year ended December 31, 2016, filed on February 28, 2017.)
- [4.9*](#) Revised Form of Performance-Based Restricted Stock Unit Award Agreement under the Amended and Restated 2015 Incentive Plan. (Incorporated by reference to Exhibit 4.10 to Registrant’s Annual Report on Form 10-K for the year ended December 31, 2020, filed on May 5, 2021.)
- [4.10](#) Indenture, dated as of November 16, 2021, between 3D Systems Corporation and The Bank of New York Mellon Trust Company, N.A., as trustee. (Incorporated by reference to the Exhibit 4.1 of the Registrant’s Current Report on Form 8-K filed on November 17, 2021.)
- [4.11](#) Form of 0% Convertible Notes due 2026 (included in Exhibit 4.10). (Incorporated by reference to the Exhibit 4.2 of the Registrant’s Current Report on Form 8-K filed on November 17, 2021.)
- [10.1](#) Lease Agreement dated February 8, 2006 between the Registrant and KDC-Carolina Investments 3, LP. (Incorporated by reference to Exhibit 99.1 to Registrant’s Current Report on Form 8-K, filed on February 10, 2006.)
- [10.2](#) First Amendment to Lease Agreement dated August 7, 2006 between the Registrant and KDC-Carolina Investments 3, LP. (Incorporated by reference to Exhibit 10.1 to Registrant’s Current Report on Form 8-K, filed on August 14, 2006.)
- [10.3](#) Second Amendment to Lease Agreement effective as of October 6, 2006 to Lease Agreement dated February 8, 2006 between 3D Systems Corporation and KDC-Carolina Investments 3, LP. (Incorporated by reference to Exhibit 10.1 to Registrant’s Current Report on Form 8-K, filed on October 10, 2006.)
- [10.4](#) Third Amendment to Lease Agreement effective as of December 18, 2006 to Lease Agreement dated February 8, 2006 between 3D Systems Corporation and KDC-Carolina Investments 3, LP. (Incorporated by reference to Exhibit 10.1 to Registrant’s Current Report on Form 8-K, filed on December 20, 2006.)
- [10.5](#) Fourth Amendment to Lease Agreement effective as of February 26, 2007 to Lease Agreement dated February 8, 2006 between 3D Systems Corporation and KDC-Carolina Investments 3, LP. (Incorporated by reference to Exhibit 10.1 to Registrant’s Current Report on Form 8-K, filed on March 1, 2007.)
- [10.6](#) Fifth Amendment to Lease Agreement effective as of March 17, 2011 to Lease Agreement dated February 8, 2006 between 3D Systems Corporation and KDC-Carolina Investments 3, LP. (Incorporated by reference to Exhibit 10.1 to Registrant’s Form 8-K, filed on March 21, 2011.)

- [10.7](#) Amended and Restated Lease Agreement dated February 25, 2021 between 3D Systems Corporation and 3D Fields, LLC. (Incorporated by reference to Exhibit 10.7 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2020, filed on May 5, 2021.)
- [10.8](#) Credit Agreement, dated February 27, 2019, among 3D Systems Corporation, HSBC Bank USA, National Association, as Administrative Agent, Sole Lead Arranger and Sole Bookrunner, the guarantors party thereto, and the other lenders party thereto. (Incorporated by reference to Exhibit 10.10 of the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018, filed on February 28, 2019.)
- [10.9](#) Security Agreement, dated February 27, 2019, among 3D Systems Corporation, 3D Holdings, LLC, 3D Systems, Inc., and HSBC Bank USA, National Association, as Administrative Agent. (Incorporated by reference to Exhibit 10.11 of the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018, filed on February 28, 2019.)
- [10.10](#) First Amendment, dated September 30, 2019, to the Credit Agreement, dated February 27, 2019, among 3D Systems Corporation, HSBC Bank USA, National Association, as Administrative Agent, Sole Lead Arranger and Sole Bookrunner, the guarantors party thereto, and the other lenders party thereto. (Incorporated by reference to Exhibit 10.2 of the Registrant's Annual Report on Form 10-Q for the quarter ended September 30, 2019, filed on October 30, 2019.)
- [10.11](#) Second Amendment, dated October 9, 2020, to the Credit Agreement, dated February 27, 2019, among 3D Systems Corporation, HSBC Bank USA, National Association, as Administrative Agent, Swing Loan Lender and Issuing Lender, the guarantors party thereto, and the other lenders party thereto (Incorporated by reference to Exhibit 10.1 of the Registrant's Current Report on Form 8-K filed October 14, 2020.)
- [10.12*](#) Charles W. Hull Consulting Arrangement (Incorporated by reference to Exhibit 10.1 of the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2010, filed on July 29, 2010.)
- [10.13*](#) Employment Agreement, dated August 4, 2016, between 3D Systems Corporation and Charles W. Hull. (Incorporated by reference to Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed August 8, 2016.)
- [10.14*](#) Employment Agreement, dated June 15, 2016, between 3D Systems Corporation and Andrew M. Johnson. (Incorporated by reference to Exhibit 10.2 to Registrant's Current Report on Form 8-K, filed on June 16, 2016.)
- [10.15*](#) 3D Systems Corporation Change of Control Severance Policy (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed February 23, 2018.)
- [10.16*](#) Employment Agreement, dated May 11, 2020, between 3D Systems Corporation and Dr. Jeffrey A. Graves (Incorporated by reference to Exhibit 10.1 of the Registrant's Current Report on Form 8-K filed May 14, 2020.)
- [10.17*](#) Employment Agreement, dated August 21, 2020, between 3D Systems Corporation and Jagtar Narula (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed August 26, 2020.)
- [10.18*](#) Employment Agreement, dated November 21, 2016, between 3D Systems Corporation and Menno Ellis (Incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, filed November 5, 2020.)
- [10.19*](#) Employment Agreement, dated October 1, 2020, between 3D Systems Corporation and Reji Puthenveetil (Incorporated by reference to Exhibit 10.4 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, filed November 5, 2020.)
- [10.20*](#) Amendment No. 1 to the Employment Agreement, dated February 22, 2021, between 3D Systems Corporation and Reji Puthenveetil. (Incorporated by reference to Exhibit 10.30 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2020, filed on May 5, 2021.)
- [10.21*](#) Consulting Agreement, dated October 1, 2020, between 3D Systems Corporation and Reji Puthenveetil (Incorporated by reference to Exhibit 10.5 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2020, filed November 5, 2020.)
- [10.22*](#) Amended and Restated Employment Agreement, dated January 1, 2021, between 3D Systems Corporation and Jeff Blank. (Incorporated by reference to Exhibit 10.32 to Registrant's Annual Report on Form 10-K for the year ended December 31, 2020, filed on May 5, 2021.)
- [10.23*](#) Employment Agreement, dated June 28, 2021, between 3D Systems Corporation and David K. Leigh. (Incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2021, filed August 9, 2021.)

10.24*	Employment Agreement, dated August 30, 2021, by and between 3D Systems Corporation and Phyllis Nordstrom. (Incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2021, filed November 8, 2021.)
10.25	Equity Distribution Agreement, dated August 5, 2020, by and among 3D Systems Corporation and Truist Securities, Inc. and HSBC Securities (USA) Inc. (Incorporated by reference to Exhibit 1.1 of Registrant's Current Report on Form 8-K filed on August 5, 2020.)
21.1†	Subsidiaries of Registrant.
23.1†	Consent of Independent Registered Public Accounting Firm.
31.1†	Certification of Principal Executive Officer filed pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 dated March 1, 2022.
31.2†	Certification of Principal Financial Officer filed pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 dated March 1, 2022.
32.1†	Certification of Principal Executive Officer filed pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 dated March 1, 2022.
32.2†	Certification of Principal Financial Officer filed pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 dated March 1, 2022.
101.INS†	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data file because the its XBRL tags are embedded within the Inline XBRL document.In
101.SCH†	Inline XBRL Taxonomy Extension Scheme 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†	XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File - this data file does not appear in the Interactive Data file because its XBRL tags are embedded within the Inline XBRL document.

* Management contract or compensatory plan or arrangement

† Exhibits filed herein. All exhibits not so designated are incorporated by reference to a prior filing, as indicated.

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 our behalf by the undersigned, thereunto duly authorized.

3D Systems Corporation
By: /s/ DR. JEFFREY A. GRAVES
Dr. Jeffrey A. Graves
President, Chief Executive Officer and Director
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 registrant and in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ DR. JEFFREY A. GRAVES</u> Dr. Jeffrey A. Graves	Chief Executive Officer, President and Director (principal executive officer)	March 1, 2022
<u>/s/ JAGTAR NARULA</u> Jagtar Narula	Executive Vice President and Chief Financial Officer (principal financial officer)	March 1, 2022
<u>/s/ CHARLES W. HULL</u> Charles W. Hull	Executive Vice President, Chief Technology Officer and Director	March 1, 2022
<u>/s/ MICHAEL CRIMMINS</u> Michael Crimmins	Senior Vice President, Chief Accounting Officer (principal accounting officer)	March 1, 2022
<u>/s/ CHARLES G. MCCLURE, JR</u> Charles G. McClure, Jr.	Chairman of the Board of Directors	March 1, 2022
<u>/s/ MALISSIA R. CLINTON</u> Malissia R. Clinton	Director	March 1, 2022
<u>/s/ WILLIAM E. CURRAN</u> William E. Curran	Director	March 1, 2022
<u>/s/ CLAUDIA N. DRAYTON</u> Claudia N. Drayton	Director	March 1, 2022
<u>/s/ THOMAS W. ERICKSON</u> Thomas W. Erickson	Director	March 1, 2022
<u>/s/ WILLIAM D. HUMES</u> William D. Humes	Director	March 1, 2022
<u>/s/ JIM D. KEVER</u> Jim D. Kever	Director	March 1, 2022
<u>/s/ KEVIN S. MOORE</u> Kevin S. Moore	Director	March 1, 2022
<u>/s/ VASANT PADMANABHAN</u> Vasant Padmanabhan	Director	March 1, 2022
<u>/s/ JOHN J. TRACY</u> Dr. John J. Tracy	Director	March 1, 2022
<u>/s/ JEFFREY WADSWORTH</u> Dr. Jeffrey Wadsworth	Director	March 1, 2022

3D Systems Corporation
Index to Consolidated Financial Statements

Consolidated Financial Statements

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Report of Independent Registered Public Accounting Firm

Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors
3D Systems Corporation
Rock Hill, South Carolina

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of 3D Systems Corporation (the “Company”) as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive income (loss), stockholders’ equity, and cash flows for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at 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.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (“PCAOB”), 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”) and our report dated March 1, 2022 expressed an adverse opinion thereon.

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

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

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of the 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.

Revenue from Collaboration and Licensing Agreements

As described in Note 5 to the consolidated financial statements, the Company recognizes revenue when control of the promised products or services is transferred to customers in an amount that reflects the consideration the Company expects to receive in exchange for those products or services. The Company recognized approximately \$6.8 million related to collaboration arrangements with customers for the year ended December 31, 2021. The nature of the activities performed, and consideration exchanged through the Company’s collaborative agreements, varies such that certain agreements meet the definition of customer relationships for which revenue is recorded, while others do not meet this definition. The Company’s collaborative

revenue contracts may contain multiple performance obligations and may contain fees for licensing, research and development services, contingent milestone payments upon achievement of developmental contractual criteria, and/or royalty fees based on the licensees' product revenue.

We identified revenue recognition from collaborative agreements with customers as a critical audit matter. Management makes significant judgments in identifying customer relationships and in determining revenue recognition for its collaborative agreements with customers, including the evaluation of distinct performance obligations, the identification and evaluation of material rights, the estimation of variable consideration, and the determination of the pattern of transfer of control for each distinct performance obligation. Auditing management's judgments and estimates required significant audit effort and auditor subjectivity and in addition, as described in the "Opinion on Internal Control over Financial Reporting" section above, a material weakness was identified that encompasses this matter.

The primary procedures we performed to address this critical audit matter included:

- Assessing the completeness of collaboration arrangements that require assessment for proper accounting treatment by inspecting Company press releases, Committee meeting minutes, and credits within Research & Development expense general ledger accounts.
- Evaluating the reasonableness of management's judgments to determine whether customer relationships exist in its collaborative arrangements.
- Examining a sample of revenue contracts and other source documents to test management's identification of significant terms for completeness and assessing the appropriateness of the treatment for such terms, including the identification of distinct performance obligations, material rights, and variable consideration.
- Evaluating the reasonableness of management's judgments and estimates to calculate variable consideration, and the timing of recognizing the related revenue subject to any constraints.
- Evaluating the appropriateness of management's determination of whether identified performance obligations meet the criteria for over-time revenue recognition.
- Evaluating the appropriateness of the method used to recognize revenue and testing the relevant inputs and assumptions to the revenue recognition calculations.

We have served as the Company's auditor since 2003.

/s/ BDO USA, LLP

Charlotte, North Carolina

March 1, 2022

Report of Independent Registered Public Accounting Firm

Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors
3D Systems Corporation
Rock Hill, South Carolina

Opinion on Internal Control over Financial Reporting

We have audited 3D System Corporation's (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 (the "COSO criteria"). In our opinion, the Company did not maintain, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on the COSO criteria.

We do not express an opinion or any other form of assurance on management's statements referring to any corrective actions taken by the Company after the date of management's assessment.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated balance sheets of the Company as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive income (loss), stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as "the financial statements") and our report dated March 1, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying "Item 9A, Management's Report on Internal Control over Financial Reporting". Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit of internal control over financial reporting in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. Material weaknesses regarding management's failure to design and maintain controls over the identification and review of contracts with financial accounting implications, the financial reporting and close process, and accounting for income taxes, including non-routine transactions have been identified and described in management's assessment. These material weaknesses were considered in determining the nature, timing, and extent of audit tests applied in our audit of the 2021 financial statements, and this report does not affect our report dated March 1, 2022 on those financial statements.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ BDO USA, LLP

Charlotte, North Carolina

March 1, 2022

3D SYSTEMS CORPORATION
CONSOLIDATED BALANCE SHEETS

(In thousands, except par value)

	<u>December 31, 2021</u>	<u>December 31, 2020</u>
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 789,657	\$ 75,010
Accounts receivable, net of reserves — \$2,445 and \$4,392	106,540	114,254
Inventories	92,887	116,667
Prepaid expenses and other current assets	42,653	33,145
Current assets held for sale	—	18,439
Total current assets	<u>1,031,737</u>	<u>357,515</u>
Property and equipment, net	57,257	75,356
Intangible assets, net	45,835	28,083
Goodwill	345,588	161,765
Right of use assets	46,356	48,620
Deferred income tax asset	5,054	6,247
Assets held for sale	—	31,684
Other assets	17,272	23,785
Total assets	<u>\$ 1,549,099</u>	<u>\$ 733,055</u>
LIABILITIES AND EQUITY		
Current liabilities:		
Current portion of long term debt	\$ —	\$ 2,051
Current right of use liabilities	8,344	9,534
Accounts payable	57,366	45,174
Accrued and other liabilities	76,994	69,812
Customer deposits	7,281	7,750
Deferred revenue	28,027	30,302
Current liabilities held for sale	—	11,107
Total current liabilities	<u>178,012</u>	<u>175,730</u>
Long-term debt, net	—	19,218
Convertible notes payable, net	446,859	—
Long-term right of use liabilities	47,420	48,469
Deferred income tax liability	2,173	4,716
Liabilities held for sale	—	2,952
Other liabilities	32,254	51,247
Total liabilities	<u>706,718</u>	<u>302,332</u>
Commitments and contingencies (Note 23)		
Stockholders' equity:		
Common stock, \$0.001 par value, authorized 220,000 shares; issued 128,375 and 127,626	128	128
Additional paid-in capital	1,501,210	1,404,964
Treasury stock, at cost — 0 shares and 3,494 shares	—	(22,590)
Accumulated deficit	(621,251)	(943,303)
Accumulated other comprehensive loss	(37,706)	(8,476)
Total stockholders' equity	<u>842,381</u>	<u>430,723</u>
Total liabilities and stockholders' equity	<u>\$ 1,549,099</u>	<u>\$ 733,055</u>

See accompanying notes to consolidated financial statements.

3D SYSTEMS CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS

<i>(in thousands, except per share amounts)</i>	Year Ended December 31,		
	2021	2020	2019
Revenue:			
Products	\$ 428,742	\$ 332,799	\$ 389,337
Services	186,897	224,441	247,017
Total revenue	<u>615,639</u>	<u>557,240</u>	<u>636,354</u>
Cost of sales:			
Products	245,169	220,415	234,581
Services	106,692	113,450	121,232
Total cost of sales	<u>351,861</u>	<u>333,865</u>	<u>355,813</u>
Gross profit	263,778	223,375	280,541
Operating expenses:			
Selling, general and administrative	227,697	219,895	254,355
Research and development	69,150	74,143	83,290
Impairment of goodwill	—	48,300	—
Total operating expenses	<u>296,847</u>	<u>342,338</u>	<u>337,645</u>
Loss from operations	(33,069)	(118,963)	(57,104)
Interest and other income (expense), net	352,609	(24,447)	(7,996)
Income (loss) before income taxes	319,540	(143,410)	(65,100)
Benefit (provision) for income taxes	2,512	(6,184)	(4,532)
Net income (loss)	322,052	(149,594)	(69,632)
Less: net income attributable to noncontrolling interests	—	—	248
Net income (loss) attributable to 3D Systems Corporation	<u>\$ 322,052</u>	<u>\$ (149,594)</u>	<u>\$ (69,880)</u>
Net income (loss) per share available to 3D Systems Corporation common stockholders			
Basic	<u>\$ 2.62</u>	<u>\$ (1.27)</u>	<u>\$ (0.61)</u>
Diluted	<u>\$ 2.55</u>	<u>\$ 1.27</u>	<u>\$ (0.61)</u>

See accompanying notes to consolidated financial statements.

3D SYSTEMS CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

<i>(in thousands, except per share amounts)</i>	Year Ended December 31,		
	2021	2020	2019
Net income (loss)	\$ 322,052	\$ (149,594)	\$ (69,632)
Other comprehensive income (loss), net of taxes:			
Pension adjustments	682	783	(1,060)
Derivative financial instruments	721	(403)	(318)
Foreign currency translation	(39,546)	28,752	2,996
Foreign currency translation reclassification - sales of Cimatron and Simbionix	8,912	—	—
Total other comprehensive (loss) income, net of taxes:	(29,231)	29,132	1,618
Total comprehensive income (loss), net of taxes	292,821	(120,462)	(68,014)
Comprehensive income attributable to noncontrolling interests	—	—	191
Comprehensive income (loss) attributable to 3D Systems Corporation	\$ 292,821	\$ (120,462)	\$ (68,205)

See accompanying notes to consolidated financial statements.

3D SYSTEMS CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

<i>(in thousands)</i>	Year Ended December 31,		
	2021	2020	2019
Cash flows from operating activities:			
Net income (loss)	\$ 322,052	\$ (149,594)	\$ (69,632)
Adjustments to reconcile net income (loss) to net cash provided by (used in) operating activities:			
Depreciation and amortization	34,623	44,595	50,396
Stock-based compensation	55,153	17,725	23,587
Provision for inventory obsolescence and revaluation	(2,909)	12,373	—
Loss on hedge accounting de-designation and termination	721	1,235	—
Provision for bad debts	232	457	1,308
(Gain) Loss on the disposition of businesses, property, equipment and other assets	(350,846)	5,274	2,282
Provision for deferred income taxes and reserve adjustments	(11,679)	(1,206)	(3,354)
Impairment of goodwill and assets	1,676	55,484	1,728
Changes in operating accounts:			
Accounts receivable	(11,912)	(6,052)	15,071
Inventories	7,866	(9,901)	18,447
Prepaid expenses and other current assets	(8,106)	(16,218)	9,150
Accounts payable	27,159	(6,653)	(16,846)
Deferred revenue and customer deposits	(3,325)	3,231	677
Accrued and other liabilities	(12,389)	28,286	(1,346)
All other operating activities	(169)	843	113
Net cash provided by (used in) operating activities	48,147	(20,121)	31,581
Cash flows from investing activities:			
Purchases of property and equipment	(18,791)	(13,643)	(23,985)
Proceeds from sale of assets and businesses, net of cash	421,485	1,554	1,620
Business acquisitions, net of cash acquired	(139,685)	—	—
Other investing activities	(2,454)	356	(2,007)
Net cash provided by (used in) investing activities	260,555	(11,733)	(24,372)
Cash flows from financing activities:			
Proceeds from revolving credit facilities	—	20,000	—
Payments on revolving credit facilities	—	(20,000)	—
Proceeds from borrowings	460,000	—	100,000
Debt issuance costs	(13,466)	—	—
Repayment of borrowings/long-term debt	(21,392)	(26,840)	(76,768)
Proceeds from issuance of common stock	—	24,702	—
Purchase of noncontrolling interests	(6,300)	(12,500)	(2,500)
Payments related to net-share settlement of stock-based compensation	(12,619)	(5,138)	(3,194)
Other financing activities	(423)	296	(1,338)
Net cash provided by (used in) financing activities	405,800	(19,480)	16,200
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(9,243)	1,428	289
Net increase (decrease) in cash, cash equivalents and restricted cash	705,259	(49,906)	23,698
Cash, cash equivalents and restricted cash at the beginning of the year ^a	84,711	134,617	110,919
Cash, cash equivalents and restricted cash at the end of the year ^a	\$ 789,970	\$ 84,711	\$ 134,617

customer

Supplemental cash flow information

Lease assets obtained in exchange for new lease liabilities (excludes adoption)	\$ 4,502	\$ 23,309	\$ 8,662
Cash interest payments	1,138	2,109	3,715
Cash income tax payments (receipts), net	4,709	3,706	10,722
Transfer of equipment from inventory to property and equipment, net ^b	1,738	1,055	3,187
Transfer of equipment to inventory from property and equipment, net ^c	—	—	32
Stock issued for acquisition	99,044	—	—
Noncash financing activity			
Purchase of noncontrolling interest ^d	\$ —	\$ —	(11,000)

- (a) The amounts for cash and cash equivalents shown above include restricted cash of \$313, \$540 and \$921 as of December 31, 2021, 2020 and 2019, respectively, which were included in Other assets, net, and \$9,161 as of December 31, 2020, which was included in Current assets held for sale in the consolidated balance sheets.
- (b) Inventory is transferred from inventory to property and equipment at cost when we require additional machines for training or demonstration or for placement into on demand manufacturing services locations.
- (c) In general, an asset is transferred from Property and equipment, net, into inventory at its net book value when we have identified a potential sale for a used machine.
- (d) Purchase of noncontrolling interest to be paid in installments over a four-year period recorded to Accrued and other liabilities and Other liabilities on the consolidated balance sheets.

See accompanying notes to consolidated financial statements.

3D SYSTEMS CORPORATION
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
Years Ended December 31, 2021, 2020 and 2019

	<u>Common Stock</u>									
<i>(in thousands, except par value)</i>	Shares	Par Value \$0.001	Additional Paid In Capital	Treasury Stock	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Total 3D Systems Corporation Stockholders' Equity	Equity Attributable to Noncontrolling Interests	Total Stockholders' Equity	
December 31, 2018	118,650	\$ 117	\$ 1,355,503	\$ (15,572)	\$ (722,701)	\$ (38,978)	\$ 578,369	\$ (2,382)	\$ 575,987	
Issuance (repurchase) of stock	2,616	3	—	(3,197)	—	—	(3,194)	—	(3,194)	
Acquisition of non-controlling interest	—	—	(7,526)	—	—	256	(7,270)	(6,072)	(13,342)	
Adjustment of RNCI carrying value	—	—	—	—	(1,128)	—	(1,128)	—	(1,128)	
Stock-based compensation expense	—	—	23,587	—	—	—	23,587	—	23,587	
Net (loss)	—	—	—	—	(69,880)	—	(69,880)	248	(69,632)	
Pension adjustment	—	—	—	—	—	(1,060)	(1,060)	—	(1,060)	
Derivative financial instrument adjustment	—	—	—	—	—	(318)	(318)	—	(318)	
Foreign currency translation adjustment	—	—	—	—	—	3,053	3,053	(57)	2,996	
December 31, 2019	121,266	120	1,371,564	(18,769)	(793,709)	(37,047)	522,159	(8,263)	513,896	
Issuance (repurchase) of stock	6,360	8	23,377	(3,821)	—	—	19,564	—	19,564	
Acquisition of non-controlling interest	—	—	(7,702)	—	—	(561)	(8,263)	8,263	—	
Stock-based compensation expense	—	—	17,725	—	—	—	17,725	—	17,725	
Net (loss)	—	—	—	—	(149,594)	—	(149,594)	—	(149,594)	
Pension adjustment	—	—	—	—	—	783	783	—	783	
Derivative financial instrument adjustment	—	—	—	—	—	(1,638)	(1,638)	—	(1,638)	
De-designation of derivative instrument	—	—	—	—	—	1,235	1,235	—	1,235	
Foreign currency translation adjustment	—	—	—	—	—	28,752	28,752	—	28,752	
December 31, 2020	127,626	128	1,404,964	(22,590)	(943,303)	(8,476)	430,723	—	430,723	
Issuance (repurchase) of stock	813	—	(12,620)	—	—	—	(12,620)	—	(12,620)	
Shares issued to acquire assets and businesses	3,430	3	99,041	—	—	—	99,044	—	99,044	
Stock-based compensation expense	—	—	32,412	—	—	—	32,412	—	32,412	
Net income	—	—	—	—	322,052	—	322,052	—	322,052	
Pension adjustment	—	—	—	—	—	181	181	—	181	
Gain on pension plan - unrealized	—	—	—	—	—	501	501	—	501	
De-designation of derivative instrument	—	—	—	—	—	721	721	—	721	
Retirement of treasury shares	(3,494)	(3)	(22,587)	22,590	—	—	—	—	—	
Foreign currency translation adjustment	—	—	—	—	—	(30,633)	(30,633)	—	(30,633)	
December 31, 2021	128,375	\$ 128	\$ 1,501,210	\$ —	\$ (621,251)	\$ (37,706)	\$ 842,381	\$ —	\$ 842,381	

See accompanying notes to consolidated financial statements.

(1) Basis of Presentation

The consolidated financial statements include the accounts of 3D Systems Corporation and all majority and wholly-owned subsidiaries and entities in which a controlling interest is maintained ("3D Systems" or the "Company" or "we" or "us"). A non-controlling interest in a subsidiary is considered an ownership interest in a majority-owned subsidiary that is not attributable to the parent. We include noncontrolling interests as a component of total equity in the consolidated balance sheets and the net income (loss) attributable to noncontrolling interests is presented as an adjustment from net income (loss) used to arrive at net income (loss) attributable to 3D Systems Corporation in the consolidated statements of operations and comprehensive income (loss). Our annual reporting period is the calendar year.

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP"). All significant intercompany accounts and transactions have been eliminated in consolidation. Certain prior period amounts have been reclassified to conform to the current year presentation.

Our top priority is the health and safety of our employees and their families and communities, as we continue to manage our business through the COVID-19 pandemic. Throughout this past year, our leadership regularly reviewed and adapted our COVID-19 protocols based on evolving research and guidance. We have reopened our offices and begun business travel, with safety measures in place and in accordance with local guidance. Additionally, we implemented a hybrid-work program globally, providing more flexibility for employees to work remotely. We continue to monitor local transmission rates and regulatory guidance, and remain committed to protecting our employees, delivering for our customers, and supporting our communities. We are subject to vaccination and workplace safety protocols of the United States Federal Government Executive Order on Ensuring Adequate COVID Safety Protocols for Federal Contractors, and the COVID-19 Workplace Safety Guidance for Federal Contractors and Subcontractors issued by the Safer Federal Workforce Task Force. In support of a safe work environment, we have a vaccine policy for our U.S. employees, and a visitor policy to ensure those visiting our sites are taking the necessary health and safety precautions.

Our operations in North America and South America (collectively referred to as "Americas"), Europe and the Middle East (collectively referred to as "EMEA") and the Asia Pacific and Oceania regions (collectively referred to as "APAC") expose us to risks associated with public health crises and epidemics/pandemics, such as the COVID-19 pandemic. While the COVID-19 pandemic continued to impact our reported results for the years ended December 31, 2021 and 2020, we are unable to predict the longer-term impact that the pandemic may have on our business, results of operations, financial position or cash flows. The extent to which our operations may be impacted by the dynamic nature of the COVID-19 pandemic will depend largely on future developments, which are highly uncertain and cannot be accurately predicted, including the severity or resurgence of the outbreak and actions by government authorities to contain the outbreak or treat its impact. Furthermore, the impacts of uncertain global economic conditions, further supply chain disruptions, including the shortages of critical components, and the continued disruptions to, and volatility in, the financial markets remain unknown.

As of January 1, 2021, we determined the Company has two reportable segments, Healthcare and Industrial. The Company previously only reported its consolidated results in one segment. This change in segment reporting as of January 1, 2021 was the result of changes to how the chief operating decision maker ("CODM") assesses the financial performance of the Company and in the decision-making process driving future operating performance. As a result of this re-segmentation, the Company performed a quantitative analysis for potential impairment of our goodwill immediately following the re-segmentation, noting that we determined the fair value of the Healthcare and Industrial reporting segments exceeded their carrying values. See Note 6.

Fair value was determined using a combination of an income approach, which estimates fair value based upon projections of future revenues, expenses, and cash flows discounted to its present value, and a market approach. The valuation methodology and underlying financial information included in the Company's determination of fair value required significant judgments by management. The principal assumptions used in the Company's discounted cash flow analysis consisted of (a) the long-term projections of future financial performance and (b) the weighted-average cost of capital of market participants, adjusted for the risk attributable to the Company and the industry in which it operates. Under the market approach, the principal assumption included an estimate of multiples of various financial metrics of comparable companies.

All dollar and share amounts presented in the accompanying footnotes are presented in thousands, except for per share information.

During the first quarter ended March 31, 2021 we became aware that certain amounts previously presented within our statements of operations as products cost of sales related to services cost of sales. We note that the total cost of sales line item was not affected. We further note that this error did not affect our gross profit, loss from operations, net income (loss), consolidated balance sheets or statements of cash flows. We evaluated the materiality of this presentation-only error and concluded it was not material to any previously reported quarter or year-end financial statement. The following schedule depicts the effect on our previously reported statements of operations.

<i>(in thousands)</i>	Year Ended December 31, 2020		
	As reported	Change	Revised
Cost of sales:			
Products	\$ 227,681	\$ (7,266)	\$ 220,415
Services	106,184	7,266	113,450
Total cost of sales	<u>\$ 333,865</u>	<u>\$ —</u>	<u>\$ 333,865</u>

Revision of Previously Issued Financial Statements

During the fourth quarter ended December 31, 2021, we became aware that certain amounts previously presented as investing cash outflows should be reported as financing cash outflows within the statements of cash flows. The error affected the previously issued statements of cash flows for the three, six and nine month periods within the December 31, 2021 and 2020 annual periods as well as the annual periods ended December 31, 2020 and 2019. We note that this change did not impact the as reported net increase (decrease) in cash, cash equivalents and restricted cash within the annual 2020 and 2019 statements of cash flows or the interim statements of cash flows for the years ended December 31, 2021 and 2020. We further note that this reclassification did not affect our balance sheet, statements of operations, statements of comprehensive income (loss) and statements of stockholders' equity. We evaluated the materiality, including both quantitative and qualitative considerations, of this presentation-only error and concluded it was not material to any previously reported quarter or year-end financial statement. The following schedule depicts the effect on our previously reported interim and annual statements of cash flows.

	Year Ended December 31, 2020			Year Ended December 31, 2019		
	As Reported	Changed	Revised	As Reported	Changed	Revised
Net cash provided by (used in) operating activities	\$ (20,121)	\$ —	\$ (20,121)	\$ 31,581	\$ —	\$ 31,581
Net cash provided by (used in) investing activities	(24,233)	12,500	(11,733)	(26,872)	2,500	(24,372)
Net cash provided by (used in) financing activities	(6,980)	(12,500)	(19,480)	18,700	(2,500)	16,200
Effect of exchange rate changes on cash, cash equivalents and restricted cash	1,428	—	1,428	289	—	289
Net increase (decrease) in cash, cash equivalents and restricted cash	<u>\$ (49,906)</u>	<u>\$ —</u>	<u>\$ (49,906)</u>	<u>\$ 23,698</u>	<u>\$ —</u>	<u>\$ 23,698</u>

	Nine Months Ended September 30, 2021			Nine Months Ended September 30, 2020		
	As Reported	Changed	Revised	As Reported	Changed	Revised
Net cash provided by (used in) operating activities	\$ 62,652	\$ —	\$ 62,652	\$ (32,649)	\$ —	\$ (32,649)
Net cash (used in) investing activities	395,641	4,000	399,641	(22,459)	12,500	(9,959)
Net cash provided by (used in) financing activities	(32,202)	(4,000)	(36,202)	(3,773)	(12,500)	(16,273)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(7,737)	—	(7,737)	526	—	526
Net increase (decrease) in cash, cash equivalents and restricted cash	<u>\$ 418,354</u>	<u>\$ —</u>	<u>\$ 418,354</u>	<u>\$ (58,355)</u>	<u>\$ —</u>	<u>\$ (58,355)</u>

	Six Months Ended June 30, 2021			Six Months Ended June 30, 2020		
	As Reported	Changed	Revised	As Reported	Changed	Revised
Net cash provided by (used in) operating activities	\$ 41,976	\$ —	\$ 41,976	\$ (21,018)	\$ —	\$ (21,018)
Net cash (used in) investing activities	31,325	4,000	35,325	(19,584)	12,500	(7,084)
Net cash provided by (used in) financing activities	(28,444)	(4,000)	(32,444)	(27,270)	(12,500)	(39,770)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	2,902	—	2,902	(1,856)	—	(1,856)
Net increase (decrease) in cash, cash equivalents and restricted cash	<u>\$ 47,759</u>	<u>\$ —</u>	<u>\$ 47,759</u>	<u>\$ (69,728)</u>	<u>\$ —</u>	<u>\$ (69,728)</u>

	Three Months Ended March 31, 2021			Three Months Ended March 31, 2020		
	As Reported	Changed	Revised	As Reported	Changed	Revised
Net cash provided by (used in) operating activities	\$ 28,453	\$ —	\$ 28,453	\$ (2,285)	\$ —	\$ (2,285)
Net cash (used in) investing activities	46,563	4,000	50,563	(16,598)	12,500	(4,098)
Net cash provided by (used in) financing activities	(24,337)	(4,000)	(28,337)	1,229	(12,500)	(11,271)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(2,434)	—	(2,434)	(3,241)	—	(3,241)
Net increase (decrease) in cash, cash equivalents and restricted cash	<u>\$ 48,245</u>	<u>\$ —</u>	<u>\$ 48,245</u>	<u>\$ (20,895)</u>	<u>\$ —</u>	<u>\$ (20,895)</u>

(2) Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with GAAP requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. We base our estimates on historical experience, currently available information and various other assumptions that we believe are reasonable under the circumstances. Actual results could differ from these estimates.

Revenue Recognition

We account for revenue in accordance with Accounting Standard Codification ("ASC") Topic 606, "Revenue from Contracts with Customers." Collaborative revenue contracts in which the collaboration partner meets the definition of a customer are recorded in accordance with ASC Topic 606, otherwise the collaborative arrangements are recorded in accordance with ASC 808 - "Collaborative Arrangements". See Note 5 for further discussion.

Cash and Cash Equivalents

Cash and cash equivalents consist of cash and highly liquid investments with maturities of three months or less when acquired.

Investments

We assess declines in the fair value of investments to determine whether such declines are other-than-temporary. Other-than-temporary impairments of investments are recorded to interest and other expense, net, in the period in which they become impaired.

For the years ended December 31, 2021 and 2020, we recorded impairment charges of \$0 and \$2,361, respectively, related to certain cost-method investments. The aggregate carrying amount of all investments accounted for under the cost method totaled \$5,632 and \$5,016 at December 31, 2021 and 2020, respectively, and is included in other assets, on our consolidated balance sheets.

Accounts Receivable and Allowance for Doubtful Accounts

Trade accounts receivable are recorded at the invoiced amount and do not bear interest. In evaluating the collectability of accounts receivable, we assess a number of factors, including specific customers' ability to meet their financial obligations to us, the length of time receivables are past due and historical collection experience. Based on these assessments, we may record a reserve for specific customers, as well as a general reserve and allowance for returns and discounts. If circumstances related to specific customers change, or economic conditions deteriorate such that our past collection experience is no longer relevant, our estimate of the recoverability of accounts receivable could be further reduced from the levels provided for in the consolidated financial statements. One customer represents a significant concentration of credit risk, as they represent greater than 10% of our total accounts receivable.

The following presents the changes in the balance of our allowance for doubtful accounts:

Year Ended	Item	Balance at beginning of year	Additions charged to expense	Other ^(a)	Balance at en
2021	Allowance for doubtful accounts	\$ 4,392	\$ 232	\$ (2,179)	\$
2020	Allowance for doubtful accounts	8,762	457	(4,827)	
2019	Allowance for doubtful accounts	8,423	1,308	(969)	

^(a)Other includes the impact of subsequent collections or write-offs to the allowance for doubtful accounts.

Inventories

Inventories are stated at the lower of cost or net realizable value, with cost being standard cost, which approximates the first-in, first-out method.

Long-Lived Assets and Goodwill

We review long-lived assets, including intangible assets subject to amortization, for impairment whenever events or changes in circumstances indicate that the carrying value of the asset may not be recoverable. Recoverability is assessed for the carrying value of assets held for use based on a review of undiscounted projected cash flows. Impairment losses, where identified, are measured as the excess of the carrying value of the long-lived asset over its estimated fair value as determined by discounted projected cash flows. No impairment charges for intangible assets with finite lives were recorded for the years ended December 31, 2021 and 2020.

Goodwill is the excess of cost of an acquired entity over the amounts assigned to assets acquired and liabilities assumed in a business combination. Goodwill is not amortized. Goodwill is tested for impairment annually on November 30 of each year, and is tested for impairment between annual tests if an event occurs or circumstances change that would indicate the carrying amount may be impaired. Impairment testing for goodwill is done at a reporting unit level, with all goodwill assigned to a reporting unit.

Our reporting units are Healthcare and Industrial. We completed the required annual goodwill impairment test as of November 30, 2021. The goodwill impairment test compared the fair value of each reporting unit to their carrying value. We estimated the fair value of our reporting units based primarily on the discounted projected cash flows of the underlying operations and a market approach. The estimated fair value for each of our reporting units was in excess of their respective carrying values as of November 30, 2021.

For a summary of our goodwill by reporting unit and discussion of goodwill impairment, see Note 11.

Assets and Liabilities Held for Sale

Once management has committed to disposal of a component of the Company and it is probable of being completed within one year, the assets and liabilities are reclassified as held for sale and net income continues to be reported as from continuing operations, unless it meets requirements to be reclassified as a discontinued operation. See Note 4.

Contingencies

We follow the provisions of ASC 450, "*Contingencies*," which requires that an estimated loss from a loss contingency be accrued by a charge to income if it is both probable that an asset has been impaired or that a liability has been incurred and that the amount of the loss can be reasonably estimated.

Foreign Currency Translation

The local currency in which a subsidiary operates is generally considered its functional currency for those subsidiaries domiciled outside the United States. Assets and liabilities for non-U.S. subsidiaries are translated to the USD at month-end exchange rates of the period reported. Income and expense items are translated monthly using the monthly average exchange rate. Cumulative translation adjustments are recorded as a component of accumulated other comprehensive income (loss) in shareholders' equity.

For the Year Ended December 31, 2021, 2020, 2019 the aggregate foreign currency gain or (loss) was 1,681, (4,762), (2,287), respectively, and has been recorded as a component of interest and other income (expense) in the accompanying consolidated statements of operations.

Derivative Financial Instruments

We are exposed to market risk from changes in interest rates, foreign currency exchange rates and commodity prices, which may adversely affect our results of operations and financial condition. We seek to minimize these risks through regular operating and financing activities and, when we consider it to be appropriate, through the use of derivative financial instruments. We do not purchase, hold or sell derivative financial instruments for trading or speculative purposes.

We may use derivative financial instruments to manage our exposure to changes in interest rates on outstanding debt instruments. For those instruments that qualify and where we elect to prepare and maintain the documentation to qualify for hedge accounting treatment under ASC 815, "*Derivatives and Hedging*," related gains and losses (realized or unrealized) related to derivative instruments are recognized in accumulated other comprehensive income (loss) and are reclassified into earnings when the underlying transaction is recognized in net earnings and, depending on the fair value at the end of the reporting period, derivatives are recorded either in prepaid and other current assets or in accrued liabilities in the consolidated balance sheets.

We and our subsidiaries conduct business in various countries using both their functional currencies and other currencies to effect cross border transactions. As a result, we and our subsidiaries are subject to the risk that fluctuations in foreign exchange rates between the dates that those transactions are entered into and their respective settlement dates will result in a foreign exchange gain or loss. When practicable, we endeavor to match assets and liabilities in the same currency on our U.S. balance sheet and those of our subsidiaries in order to reduce these risks. If appropriate, we enter into foreign currency contracts to hedge the exposure arising from those transactions. See Note 15. For our hedges of foreign exchange rates and commodity prices, we have elected to not prepare and maintain the documentation to qualify for hedge accounting treatment under ASC 815, "*Derivatives and Hedging*," and therefore, changes in fair value are recognized in interest and other expense, net in the consolidated statements of operations and comprehensive loss and, depending on the fair value at the end of the reporting period, derivatives are recorded either in prepaid and other current assets or in accrued liabilities in the consolidated balance sheets.

We are exposed to credit risk if the counterparties to such transactions are unable to perform their obligations. However, we seek to minimize such risk by entering into transactions with counterparties that are believed to be creditworthy financial institutions.

Research and Development Costs

Research and development costs are expensed as incurred.

Earnings (Loss) per Share

Basic earnings (loss) per share are calculated using the weighted-average number of common shares outstanding during each period. Diluted earnings per share are calculated using dilutive shares which include shares issuable upon exercise of outstanding stock options, upon vesting of employee stock-based awards, upon the accrual of incentive compensation to be paid in shares, and to settle the portion of the convertible notes that may be settled in shares, where the conversion of such instruments would be dilutive. See Note 19.

Advertising Costs

Advertising costs are expensed as incurred and recorded in Selling General & Administrative expenses. Advertising costs, including trade shows, were \$5,486, \$7,561 and \$13,732 for the years ended December 31, 2021, 2020 and 2019, respectively.

Pension costs

We sponsor a retirement benefit for one of our non-U.S. subsidiaries in the form of a defined benefit pension plan. Accounting standards require the cost of providing this pension benefit be measured on an actuarial basis. Actuarial gains and losses resulting from both normal year-to-year changes in valuation assumptions and differences from actual experience are deferred and amortized. The application of these accounting standards require us to make assumptions and judgements that can significantly affect these measurements. Our critical assumptions in performing these actuarial valuations include the selection of the discount rate to determine the present value of the pension obligations that affects the amount of pension expense recorded in any given period. Changes in the discount rate could have a material effect on our reported pension obligations and related pension expense. See Note 12.

Equity Compensation Plans

We recognize compensation expense for our stock-based compensation programs, which include stock options, restricted stock, restricted stock units (“RSU”), performance shares and market based awards. The fair value for service-based awards, is estimated at the grant date and recognized as expense ratably over the requisite service period of the award. The fair value of performance-based awards are recognized on the grant date and expensed ratably over any implicit or explicit service period when the performance condition is deemed probable of achievement. Stock compensation recorded for performance shares is reversed if the performance condition is no longer deemed probable of achievement. The fair value for awards with market conditions is determined using a Monte Carlo valuation model and is expensed ratably over any implicit or explicit service period regardless if the market condition is probable of achievement or not. Stock compensation expense is not reversed if the market condition is not met. We recognize forfeitures when they occur.

Some RSUs are granted with a performance measure derived from non-GAAP-based management targets or non-financial targets. Depending on our performance with respect to these metrics, the number of RSUs earned may be less than, equal to or greater than the original number of RSUs awarded, subject to a payout range.

Income Taxes

We and the majority of our domestic subsidiaries file a consolidated U.S. federal income tax return, while four of our domestic entities file separate U.S. federal income tax returns. Our non-U.S. subsidiaries file income tax returns in their respective jurisdictions.

Income taxes are accounted for under the asset and liability method. Deferred income tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and tax benefit carryforwards. Deferred income tax liabilities and assets at the end of each period are determined using enacted tax rates.

We establish a valuation allowance for those jurisdictions in which the expiration date of tax benefit carryforwards or projected taxable earnings leads us to conclude that it is “more likely than not” that a deferred tax asset will not be realized. The evaluation process includes the consideration of all available evidence regarding historical results and future projections including the estimated timing of reversals of existing taxable temporary differences and potential tax planning strategies. Once a valuation allowance is established, it is maintained until a change in factual circumstances gives rise to sufficient income of the appropriate character and timing that will allow a partial or full utilization of the deferred tax asset.

In accordance with ASC 740, "Income Taxes," the impact of an uncertain tax position on our income tax returns is recognized at the largest amount that is more likely than not to be required to be recognized upon audit by the relevant taxing authority.

We include interest and penalties accrued in the consolidated financial statements as a component of income tax expense. These amounts were immaterial for 2021, 2020 and 2019.

See Note 22 for further discussion.

Operating and Finance Leases

We determine if an arrangement contains a lease at inception. Some leases include the options to purchase, terminate or extend for one or more years; these options are included in the right of use ("ROU") asset and liability lease term when it is reasonably certain an option will be exercised. Our leases do not contain any material residual value guarantees or material restrictive covenants.

Most of our leases do not provide an implicit rate, therefore we use our incremental borrowing rate based on the information available at the commencement date to determine the present value of the future lease payments.

Certain of our leases include variable costs. Variable costs include non-lease components that were incurred based upon actual terms rather than contractually fixed amounts. In addition, variable costs are incurred for lease payments that are indexed to a change in rate or index. Because the ROU asset recorded on the balance sheet was determined based upon factors considered at the commencement date, subsequent changes in the rate or index that were not contemplated in the ROU asset balances recorded on the balance sheet result in variable expenses being recorded when these expenses are incurred during the lease term. See Note 7.

Recent Accounting Pronouncements

Recently Adopted Accounting Standards

In October 2020, the FASB issued ASU 2021-08, "*Business Combinations (Topic 805) - Accounting for Contract Assets and Contract Liabilities from Contracts with Customers*", amends ASC 805 to add contract assets and contract liabilities to the list of exceptions to the recognition and measurement principles that apply to business combinations and to "require that an entity (acquirer) recognize and measure contract assets and contract liabilities acquired in a business combination in accordance with Topic 606." While primarily related to contract assets and contract liabilities that were accounted for by the acquiree in accordance with ASC 606, "the amendments also apply to contract assets and contract liabilities from other contracts to which the provisions of Topic 606 apply, such as contract liabilities from the sale of nonfinancial assets within the scope of Subtopic 610-20." For public business entities, the amendments in this Update are effective for fiscal years beginning after December 15, 2022, including interim periods within those fiscal years. Early adoption of the amendments is permitted. The Company expects to early adopt this standard in the first quarter of 2022, and does not expect it to be material to results of operations, cash flows or financial position.

In August 2020, the FASB issued ASU 2020-06, "*Debt - Debt with Conversion and Other Options (Subtopic 470-20)*," and "*Derivatives and Hedging - Contracts in Entity's Own Equity (Subtopic 815-40)*," which simplifies the accounting for convertible instruments by reducing the number of accounting models available for convertible instruments. This guidance also eliminates the treasury stock method to calculate diluted earnings per share for convertible instruments and requires the use of the if-converted method. For public companies, this guidance is effective for fiscal years beginning after December 15, 2021 and interim periods within those fiscal years. Early adoption is permitted. The Company early adopted the standard as of January 1, 2021 and applied this guidance to the convertible senior notes issued in November 2021. See Note 14.

In December 2019, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2019-12, "*Income Taxes (Topic 740) - Simplifying the Accounting for Income Taxes*," which simplifies the accounting for income taxes by eliminating some exceptions to the general approach in Accounting Standards Codification 740, Income Taxes. It also clarifies certain aspects of the existing guidance to promote more consistent application. This standard is effective for calendar-year public business entities in 2021 and interim periods within that year, and early adoption is permitted. The Company adopted this guidance during the first quarter of 2021. The implementation did not have a material effect on our financial position, results of operations or cash flows.

In June 2016, the FASB issued ASU 2016-13, "*Measurement of Credit Losses on Financial Instruments*" ("ASU 2016-13"), as revised in July 2018, which provides guidance regarding the measurement of credit losses for financial assets and certain other

instruments that are not accounted for at fair value through net income, including trade and other receivables, debt securities, net investment in sales type and direct financing leases, and off-balance sheet credit exposures. The new guidance requires companies to replace the current incurred loss impairment methodology with a methodology that measures all expected credit losses for financial assets based on historical experience, current conditions, and reasonable and supportable forecasts. The Company adopted this guidance during the first quarter of 2020. The implementation did not have a material effect on our financial position, results of operations or cash flows.

In January 2017, the FASB issued ASU No. 2017-04, "*Intangibles - Goodwill and Other (Topic 350), Simplifying the Test for Goodwill Impairment*" ("ASU 2017-04"), which eliminates the performance of Step 2 from the goodwill impairment test. In performing its annual or interim impairment testing, an entity will instead compare the fair value of the reporting unit with its carrying amount and recognize any impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value. Additionally, an entity should consider income tax effects from any tax-deductible goodwill on the carrying amount of the reporting unit when measuring the goodwill impairment loss. The Company adopted this guidance during the first quarter of 2020. The implementation did not have a material effect on our financial position, results of operations or cash flows.

In November 2018, the FASB issued ASU 2018-18, "*Collaborative Arrangements (ASC 808), Clarifying the Interaction between ASC 808 and ASC 606*" ("ASU 2018-18"). This ASU clarified when transactions between collaborative participants are in the scope of ASC 606. The ASU also provides some guidance on presentation of transactions not in the scope of ASC 606. After adoption during the fourth quarter of 2020 the Company determined it was appropriate to recast the presentation of our previously reported statement of operations for the years ended December 31, 2019. The Company acknowledges this standard should have been adopted January 1, 2020. The adoption of this standard did not change the Company's previously reported net loss or loss from operations for the years ended December 31, 2019 or any individual quarter therein and the effect on the individual quarters in 2020 was immaterial.

No other new accounting pronouncements, issued or effective during 2021, have had or are expected to have a significant impact on our consolidated financial statements.

(3) Acquisitions

On November 1, 2021, we acquired Oqton, Inc. ("Oqton"), for \$188,168, excluding customary closing adjustments. \$107,471 paid in cash and the issuance of 2,553 shares of the Company's common stock having a fair value at the date of issuance of \$80,697. The acquisition's near term impact on the Company's results of operations and cash flows are expected to be dilutive. Oqton's operating results will be reported in the Industrial segment. We incurred approximately \$1,458 of acquisition related expenses.

Oqton is a software company that creates an intelligent, cloud-based Manufacturing Operating System (MOS) platform tailored for flexible production environments that increasingly utilize a range of advanced manufacturing and automation technologies, including additive manufacturing (AM) solutions, in their production workflows. The cloud-based solution leverages the Industrial Internet of Things, artificial intelligence, and machine learning technologies to deliver a solution for customers to automate their digital manufacturing workflows, scale their operations and enhance their competitive position. The Oqton acquisition will allow the Company to expand its existing additive manufacturing software suite to the entire additive industry.

We accounted for the Acquisition using the acquisition method as prescribed by Accounting Standards Codification (ASC) 805 Business Combinations. In accordance with valuation methodologies described in ASC 820 Fair Value Measurement, the acquired assets and assumed liabilities were recorded at their estimated fair values at as of the date of acquisition.

Shown below is the preliminary purchase price allocation, which summarizes the fair value of the assets and liabilities assumed, at the date of acquisition:

Current assets, including cash acquired of \$3,454		\$	4,462
Intangible assets:			
Product technology	\$	11,200	
Trade name		6,800	
Total intangible assets			18,000
Goodwill			167,576
Other assets			855
Liabilities:			
Accounts payable and accrued liabilities	\$	2,235	
Deferred revenue		490	
Total liabilities			2,725
Net assets acquired		\$	<u>188,168</u>

On December 1, 2021, we acquired Volumetric Biotechnologies, Inc. (“Volumetric”), for \$40,172 of which \$24,814 was paid in cash and the remainder was paid via the issuance of 720 shares of the Company's common stock having a fair value on the date of issuance of \$15,358. Additional payments of up to \$355,000 are possible which are linked to the attainment of seven non-financial milestones through December 31, 2030 and 2035 and continued employment of certain key individuals from Volumetric. Any additional payments made will be paid approximately half in cash and half in shares of the Company's common stock. The additional payments are considered compensation expense which will be recorded ratably from the time a milestone is deemed probable of achievement to the estimated time of achievement. Any compensation expense recorded will be reversed if the milestone is no longer probable of achievement. As of December 31, 2021, one of the seven milestones are considered probable of achievement for which \$1,326 of expense was recorded in 2021. Volumetric will be part of the Healthcare reporting unit and segment. The acquisition's near-term impact on the Company's results of operations and cash flows are expected to be dilutive. The impact of potential share issuance related to the achievement of milestones is not included in dilutive shares until the milestone is met. We incurred approximately \$1,200 of acquisition related expenses.

Volumetric's mission is to develop the ability to manufacture human organs using bioprinting methods and the underlying technologies required to create these highly complex biological structures. With this acquisition, 3D Systems will expand our capabilities and capacity in 3D printing related to bio-printing and regenerative medicine. Combining 3D Systems regenerative medicine group with Volumetric's highly complementary skill sets of biological expertise and cellular engineering is expected to accelerate our core regenerative medicine strategies which include the bio-printing of human organs, additional non-organ applications and bio-printing technologies for research labs.

We accounted for the Acquisition using the acquisition method as prescribed by Accounting Standards Codification (ASC) 805 Business Combinations. In accordance with valuation methodologies described in ASC 820 Fair Value Measurement, the acquired assets and assumed liabilities were recorded at their estimated fair values at as of the date of acquisition.

Shown below is the preliminary purchase price allocation, which summarizes the fair value of the assets and liabilities assumed, at the date of acquisition:

Current assets, including cash acquired of \$389		\$	3,143
Intangible assets:			
Patents	\$	639	
Total intangible assets			639
Goodwill			38,620
Other assets			1,194
Liabilities:			
Accounts payable and accrued liabilities		3,424	
Total liabilities			3,424
Net assets acquired		\$	<u>40,172</u>

The Company has performed preliminary valuation analyses of the fair market value of acquired assets and liabilities of both Oqton and Volumetric. The final purchase price allocations will be determined when the Company has completed and fully reviewed the detailed valuations and determined the final purchase consideration for items such as but not limited to working capital adjustments. The final allocations could differ materially from the preliminary allocations. The final allocations may include changes in allocations to acquired intangible assets, changes to assets and liabilities including but not limited to deferred tax assets and liabilities and tax liabilities, as well as goodwill. The estimated useful lives of acquired intangible assets are also preliminary.

On May 6, 2021, we purchased Allevi, Inc. to expand regenerative medicine initiatives into medical and pharmaceutical research and development laboratories. Additionally, on June 15, 2021, we closed the acquisition of a German software firm, Additive Works GmbH (“Additive”). Additive expands the simulation capabilities for rapid optimization of industrial-scale 3D printing processes. The purchase price for both acquisitions, individually and combined, and the expected impacts on the Company’s financial position, results of operations and cash flows are not material.

Acquisitions of Noncontrolling Interests

We own 100% of the capital and voting rights of Robtec, a service bureau and distributor of 3D printing and scanning products in Brazil. Approximately 70% of the capital and voting rights of Robtec were acquired on November 25, 2014. On January 7, 2020, we made a payment equal to the redemption price of \$10,000 and acquired the remaining 30% of the capital and voting rights.

We own 100% of Easyway, a service bureau and distributor of 3D printing and scanning products in China. Approximately 65% of the capital and voting rights of Easyway were acquired on April 2, 2015, and an additional 5% of the capital and voting rights of Easyway were acquired on July 19, 2017 for \$2,300. The remaining 30% of the capital and voting rights of Easyway were acquired on January 21, 2019 for \$13,500 to be paid in installments over four years for which \$6,300 and \$2,500 were paid in 2021 and 2020, respectively.

(4) Dispositions

On January 1, 2021, we completed the sale of 100% of the issued and outstanding equity interests of Cimatron Ltd. (“Cimatron”), the subsidiary that operated the Company’s Cimatron integrated CAD/CAM software for tooling business and its GibbsCAM CNC programming software business, for approximately \$64,173, after certain adjustments and excluding \$9,476 of cash amounts transferred to the purchaser. We recorded a gain on the sale of \$32,047 included within Interest and other income (expense), net on the accompanying consolidated statements of operations for the year ended December 31, 2021. Additionally, at the time of the sale, we recognized a gain of \$6,481 for accumulated foreign currency translation gain previously included in Accumulated other comprehensive loss (“AOCL”), which is included within Interest and other income (expense), net. This disposed of business would have been included within the Industrial segment.

The components of Cimatron's assets and liabilities recorded as held for sale on the consolidated balance sheet at December 31, 2020 were as follows:

<i>(in thousands)</i>	December 31, 2020
Assets	
Cash and cash equivalents	\$ 9,161
Accounts receivable, net of reserves of \$1,154	5,361
Inventories	155
Prepaid expenses and other current assets	3,762
Total current assets held for sale	18,439
Property and equipment, net	202
Intangible assets, net	6,642
Goodwill	21,385
Right of use assets	898
Deferred income tax asset	560
Other assets	1,997
Total assets held for sale	\$ 50,123
Liabilities	
Current right of use liabilities	\$ 445
Accounts payable	654
Accrued and other liabilities	5,631
Customer deposits	25
Deferred revenue	4,352
Total current liabilities held for sale	11,107
Long-term right of use liabilities	518
Other liabilities	2,434
Total liabilities held for sale	\$ 14,059

In September 2021, we completed the sale of the Company's On Demand Manufacturing business ("ODM") for \$82,000, excluding certain adjustments. We recorded a gain on the sale of \$38,490 included within Interest and other income (expense), net on the accompanying consolidated statements of operations for the year ended December 31, 2021. ODM was primarily included within the Industrial segment. At closing, the Company and the purchaser entered into a supply agreement and a transition services agreement pursuant to which the Company will provide certain information technology, corporate finance, tax, treasury, accounting, human resources and payroll, sales and marketing, operations, facilities and other customary services to support the purchaser in the ongoing operation of ODM for a period of time post-closing.

On August 24, 2021, we completed the sale of 100% of the issued and outstanding equity interests of Simbionix USA Corporation, which owned our global medical simulation business ("Simbionix"), for \$305,000, excluding certain closing adjustments and excluding \$6,794 of cash transferred to the purchaser. We recorded a gain on the sale of \$271,404 included within Interest and other income (expense), net on the accompanying consolidated statements of operations for the year ended December 31, 2021. Additionally, we recognized a gain of \$2,431 for accumulated foreign currency translation gain previously included in AOCL, which is included within Interest and other income (expense), net. Simbionix was included within the Healthcare segment.

In November 2020, we sold our Australia ODM business in an asset sale for \$685. The carrying value of the assets, including net working capital and allocable goodwill, was \$1,482. In December 2020, we sold our Wuxi Easyway business in an asset sale for \$79. The carrying value of the assets, including net working capital and allocable goodwill, was \$3,806. Recognized losses of \$4,524 were included in 2020 interest and other expense, net on the consolidated statement of operations.

(5) Revenue

We account for revenue in accordance with ASC Topic 606, "Revenue from Contracts with Customers."

Performance Obligations

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account in ASC Topic 606. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied.

At December 31, 2021, we had \$143,169 of outstanding performance obligations, comprised of deferred revenue, customer order backlog and customer deposits. We expect to recognize approximately 77.0% of deferred revenue as revenue within the next twelve months, an additional 13.0% by the end of 2023 and the remaining balance thereafter.

Revenue Recognition

Revenue is recognized when control of the promised products or services is transferred to customers in an amount that reflects the consideration we expect to receive in exchange for those products or services. We enter into contracts that can include various combinations of products and services, which are generally capable of being distinct and accounted for as separate performance obligations. Many of our contracts with customers include multiple performance obligations. For such arrangements, we allocate revenue to each performance obligation based on its relative stand-alone selling price ("SSP"). Revenue is recognized net of allowances for returns and any taxes collected from customers, which are subsequently remitted to governmental authorities. The amount of consideration received and revenue recognized may vary based on changes in marketing incentive programs offered to our customers. Our marketing incentive programs take many forms, including volume discounts, trade-in allowances, rebates and other discounts.

A majority of our revenue is recognized at the point in time when products are shipped or services are delivered to customers. Please see below for further discussion.

Hardware and Materials

Revenue from hardware and material sales is recognized when control has transferred to the customer, which typically occurs when the goods have been shipped to the customer, risk of loss has transferred to the customer and we have a present right to payment for the hardware. In limited circumstances, when printer or other hardware sales include substantive customer acceptance provisions, revenue is recognized either when customer acceptance has been obtained, customer acceptance provisions have lapsed, or we have objective evidence that the criteria specified in the customer acceptance provisions have been satisfied.

Printers and certain other products include a warranty under which we provide maintenance for periods up to one year. For these initial product warranties, estimated costs are accrued at the time of the sale of the product. These cost estimates are established using historical information on the nature, frequency and average cost of claims for each type of printer or other product as well as assumptions about future activity and events. Revisions to expense accruals are made as necessary based on changes in these historical and future factors.

Software

We also market and sell software tools that enable our customers to capture and customize content using our printers, design optimization and simulation software, and reverse engineering and inspection software. Software does not require significant modification or customization and the license provides the customer with a right to use the software as it exists when made available. Revenue from these software licenses is recognized either upon delivery of the product or of a key code which allows the customer to download the software. Customers may purchase post-sale support. Generally, the first year is included but subsequent years are optional. This optional support is considered a separate obligation from the software and is deferred at the time of sale and subsequently recognized ratably over future periods.

Collaboration and Licensing Agreements

We enter into collaboration and licensing agreements with third parties. The nature of the activities to be performed and the consideration exchanged under the agreements varies on a contract by contract basis. We evaluate these agreements to determine whether they meet the definition of a customer relationship for which revenue is recorded. These contracts may contain multiple performance obligations and may contain fees for licensing, research and development services, contingent milestone payments upon the achievement of developmental contractual criteria and/or royalty fees based on the licensees' product revenue. We determine the revenue to be recognized for these agreements based on an evaluation of the distinct performance obligations, the identification and evaluation of material rights, the estimation of variable consideration and the determination of the pattern on transfer of control for each distinct performance obligation. The Company recognized \$6,804, \$6,953 and \$7,260 in revenue related to collaboration arrangements with customers for the years ended December 31, 2021, 2020 and 2019, respectively.

Services

We offer training, installation and non-contract maintenance services for our products. Additionally, we offer maintenance contracts that customers can purchase at their option. For maintenance contracts, revenue is deferred at the time of sale based on the stand-alone selling prices of these services and costs are expensed as incurred. Deferred revenue is recognized ratably over the term of the maintenance period on a straight-line basis. Revenue from training, installation and non-contract maintenance services is recognized at the time of performance of the service.

On demand manufacturing and healthcare service sales are included within services revenue and revenue is recognized upon shipment or delivery of the parts or performance of the service, based on the terms of the arrangement. We disposed of the majority of our service revenue businesses, including; Cimatron, Symbionix, and ODM, which were minimally offset by the purchase of Oqton. See Note 3 and Note 4.

Terms of sale

Shipping and handling activities are treated as fulfillment costs rather than as an additional promised service. We accrue the costs of shipping and handling when the related revenue is recognized. Our incurred costs associated with shipping and handling are included in product cost of sales.

Credit is extended, and creditworthiness is determined, based on an evaluation of each customer's financial condition. New customers are generally required to complete a credit application and provide references and bank information to facilitate an analysis of creditworthiness. Customers with a favorable profile may receive credit terms that differ from our general credit terms. Creditworthiness is considered, among other things, in evaluating our relationship with customers with past due balances.

Our terms of sale generally provide payment terms that are customary in the countries where we transact business. To reduce credit risk in connection with certain sales, we may, depending upon the circumstances, require significant deposits or payment in full prior to shipment. For maintenance services, we either bill customers on a time-and-materials basis or sell maintenance contracts that provide for payment in advance on either an annual or other periodic basis.

Significant Judgments

Our contracts with customers often include promises to transfer multiple products and services to a customer. For such arrangements, we allocate revenues to each performance obligation based on its relative SSP.

Judgment is required to determine the SSP for each distinct performance obligation in a contract. For the majority of items, we estimate SSP using historical transaction data. We use a range of amounts to estimate SSP when we sell each of the products and services separately and need to determine whether there is a discount to be allocated based on the relative SSP of the various products and services. In instances where SSP is not directly observable, such as when the product or service is not sold separately, we determine the SSP using information that may include market conditions and other observable inputs.

In some circumstances, we have more than one SSP for individual products and services due to the stratification of those products and services by customers, geographic region or other factors. In these instances, it may use information such as the size of the customer and geographic region in determining the SSP.

The determination of SSP is an ongoing process and information is reviewed regularly in order to ensure SSP reflects the most current information or trends.

The nature of our marketing incentives may lead to consideration that is variable. Judgment is exercised at contract inception to determine the most likely outcome of the contract and resulting transaction price. Ongoing assessments are performed to determine if updates are needed to the original estimates.

Contract Balances

The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled receivables (contract assets), and customer deposits and deferred revenues (contract liabilities) on the consolidated balance sheets. Timing of revenue recognition may differ from the timing of invoicing to customers. We record a receivable when revenue is recognized at the time of invoicing, or unbilled receivables when revenue is recognized prior to invoicing. For most of our contracts, customers are invoiced when products are shipped or when services are performed resulting in billed accounts receivables for the remainder of the owed contract price. Unbilled receivables generally result from items being shipped where the customer has not been charged, but for which revenue had been recognized or when certain performance milestones are deemed probable of achievement. In our on demand manufacturing business, which was sold in September of 2021, customers may be required to pay in full before work begins on their orders, resulting in customer deposits. We typically bill in advance for installation, training and maintenance contracts as well as extended warranties, resulting in deferred revenue. Changes in contract asset and liability balances were not materially impacted by any other factors for the period ended December 31, 2021. Contract assets with a remaining performance obligation are netted with contract liabilities.

Through December 31, 2021, we recognized revenue of 30,302 related to our contract liabilities at December 31, 2020. Through December 31, 2020, we recognized revenue of \$30,635 related to our contract liabilities at December 31, 2019. Through December 31, 2019, we recognized revenue of \$26,486 related to our contract liabilities at December 31, 2018.

Practical Expedients and Exemptions

We generally expense sales commissions when incurred because the amortization period would be one year or less. These costs are recorded within selling, general and administrative expenses.

Revenue Concentrations

For the years ended December 31, 2021, 2020, and 2019, one customer accounted for approximately 22%, 13% and 11% of our consolidated revenue, respectively. We expect to maintain our relationship with this customer.

Revenue by geographic region for the years ended December 31, 2021, 2020, and 2019 were as follows:

<i>(in thousands)</i>	Year Ended December 31,		
	2021	2020	2019
Americas	\$ 344,619	\$ 280,028	\$ 323,085
EMEA	201,684	213,575	240,403
APAC	69,336	63,637	72,866
Total	\$ 615,639	\$ 557,240	\$ 636,354
United States (Included in Americas above)	\$ 341,123	\$ 275,145	\$ 313,910

(6) Segment Information

Effective January 1, 2021, we changed our segment reporting under ASC 280 Segment Reporting. For periods prior to January 1, 2021, we operated under one operating segment, consistent with the information that was presented to our CODM. Effective January 1, 2021, we have identified two operating segments, Healthcare and Industrial.

This change in reportable segments was necessitated as a result of changes to our enterprise wide financial reporting to reflect the re-organization of the business into the Healthcare and Industrial verticals that were launched January 1, 2021 at the request of our CODM. These changes resulted in revisions to the financial information provided to the CODM on a recurring basis in his evaluation of financial performance of the Company and in the decision-making process driving future operating performance. The CODM does not review disaggregated assets on a segment basis; therefore, such information is not presented. In addition, the changes made to our enterprise wide financial reporting system were prospective and prevent historical financial information for the Healthcare and Industrial segments to be available other than for revenue which has been disclosed below. We have evaluated potential alternatives to generate comparative prior period financial information for the Healthcare and Industrial segments, and believe that the practicality exception as proscribed in ASC 280 Segment Reporting is applicable due to the high degree of difficulty involved and the significant expense associated with overhauling the structure of legacy financial systems.

The following table set forth our net sales and operating results by segment:

<i>(in thousands)</i>	Year Ended December 31,		
	2021	2020	2021
	Net Sales (a)		Operating Profit
Operations by segment:			
Healthcare	\$ 306,184	\$ 246,437	\$ 69,358
Industrial	309,455	310,803	48,555
Total	<u>\$ 615,639</u>	<u>\$ 557,240</u>	<u>117,913</u>
General corporate expense, net ^(b)			(150,982)
Operating loss, as reported			(33,069)
Interest and other income, net			352,609
Income before income taxes			<u>\$ 319,540</u>

a. Approximately 44.6% and 50.6% of sales for the year ended December 31, 2021 and 2020, respectively, were located outside of the U.S.

b. General corporate expense, net includes expenses not specifically attributable to our segments for functions such as corporate human resources, finance, and legal, including salaries, benefits, and other related costs.

(7) Leases

We have various lease agreements for our facilities, equipment and vehicles with remaining lease terms ranging from one to sixteen years. We determine if an arrangement contains a lease at inception. Some leases include the options to purchase, terminate or extend for one or more years; these options are included in the right-of-use ("ROU") asset and liability lease term when it is reasonably certain an option will be exercised. Our leases do not contain any material residual value guarantees or material restrictive covenants.

Most of our leases do not provide an implicit rate; therefore, we use our incremental borrowing rate based on the information available at the lease commencement date to determine the present value of the future lease payments.

Certain leases include variable costs. Variable costs include non-lease components incurred based upon actual terms rather than contractually fixed amounts. In addition, incremental lease payments that are indexed to a change in rate or index are considered variable costs. Because the ROU asset and lease liability recorded on the balance sheet was determined based upon factors considered at the commencement date, subsequent changes in the rate or index that were not contemplated, result in variable expenses being incurred when actual payments differ from estimated payments.

On February 25, 2021, the Company entered into an agreement to amend its lease for its corporate office and extended the term. As part of this agreement, the Company sold land owned adjacent to our corporate office for \$389 and entered into a lease with the buyer of the land for a new building, containing approximately 80,000 to 100,000 rentable square feet, to be constructed and funded by the lessor up to a certain amount. The lease terms, as amended, for both the existing building and the expansion site extend through August 2037. The lease for the new building will not commence until construction is substantially complete and the total estimated lease payments are \$16,875 which are not included in the lease information below as the lease has not commenced. Additionally, we entered into a lease for a new building in Littleton, CO containing approximately 50,000 rentable square feet to be constructed and funded by the lessor up to a certain amount. The lease term is for ten years upon commencement which is when construction is substantially complete. The total estimated lease payments are \$14,233 which are not included in the lease information below as the lease has not commenced.

Components of lease cost (income) were as follows:

<i>(in thousands)</i>	Year Ended December 31, 2021	Year Ended December 31, 2020
Operating lease cost	\$ 10,226	\$ 13,937
Finance lease cost - amortization expense	714	937
Finance lease cost - interest expense	238	664
Short-term lease cost	76	159
Variable lease cost	3,163	1,363
Sublease income	(569)	(615)
Total	\$ 13,848	\$ 16,445

Balance sheet classifications at December 31, 2021 and 2020 are summarized below:

<i>(in thousands)</i>	December 31, 2021			December 31, 2020		
	Right of use assets	Current right of use liabilities	Long-term right of use liabilities	Right of use assets	Current right of use liabilities	Long-term right of use liabilities
Operating Leases	\$ 42,502	\$ 7,711	\$ 43,359	\$ 40,586	\$ 8,562	\$ 38,296
Finance Leases	3,854	633	4,061	8,034	972	10,173
Total	\$ 46,356	\$ 8,344	\$ 47,420	\$ 48,620	\$ 9,534	\$ 48,469

On September 1, 2020, we closed two facilities in connection with our restructuring plan. These facilities occupied leased office space that terminates in 2024. In conjunction with these closings, we recorded impairment charges totaling \$1,627 related to our ROU assets and impairment charges totaling \$1,953 related to leasehold improvements.

During the 2020 fourth quarter, we recorded ROU assets and liabilities related to lease extensions and renewals that were entered into during the 2019 fourth quarter, 2020 second quarter and 2020 third quarter of approximately \$1,469, \$2,021, and \$3,467, respectively. There was not a material income statement impact from recording these lease extensions and renewals during the 2020 fourth quarter.

Our future minimum lease payments as of December 31, 2021 under operating lease and finance leases, with initial or remaining lease terms in excess of one year, were as follows:

<i>(in thousands)</i>	December 31, 2021	
	Finance Leases	Operating Leases
Years ending December 31:		
2022	\$ 828	\$ 10,199
2023	801	9,110
2024	753	7,518
2025	690	5,830
2026	649	5,153
Thereafter	1,799	26,519
Total lease payments (undiscounted)	5,520	64,329
Less: imputed interest	(826)	(13,259)
Present value of lease liabilities	\$ 4,694	\$ 51,070

Supplemental cash flow information related to our operating leases for the years ending December 31, 2021, and 2020 was as follows:

<i>(in thousands)</i>	December 31, 2021		December 31, 2020	
Cash paid for amounts included in the measurement of lease liabilities:				
Operating cash outflow from operating leases	\$ 11,108	\$ 13,151		
Operating cash outflow from finance leases	238	661		
Financing cash outflow from finance leases	\$ 721	\$ 496		

Weighted-average remaining lease terms and discount rate for our operating leases for the year ending December 31, 2021, were as follows:

	December 31, 2021	
	Finance	Operating
Weighted-average remaining lease term (in years)	7.4	8.7
Weighted-average discount rate	4.63%	5.45%

(8) Inventories

Components of inventories at December 31, 2021 and 2020 are summarized as follows:

<i>(in thousands)</i>	2021	2020
Raw materials	\$ 23,530	\$ 23,762
Work in process	5,173	5,912
Finished goods and parts	64,184	86,993
Inventories	\$ 92,887	\$ 116,667

We record a reserve to the carrying value of our inventory to reflect the rapid technological change in our industry that impacts the market for our products. The inventory reserve was \$16,509 and \$20,125 as of December 31, 2021 and 2020, respectively.

In June 2020, as part of our assessment of prospective sales and evaluation of inventory, we determined the end-of-life for certain product lines. The end-of-life determination for these products reflects management's plans to focus our resources that are better aligned with our new strategic focus, as further discussed in Note 25. As a result, for the year ended December 31, 2020, we recorded a charge of \$10,894 to products costs of sales, primarily attributable to inventory, accessories and inventory commitments for these products. We have ceased production for these items. There was no material product line life ended for year ended December 31, 2021.

(9) Property and Equipment

Property and equipment at December 31, 2021 and 2020 are summarized as follows:

<i>(in thousands)</i>	2021	2020	Useful Life (in ye
Land	\$ —	\$ 541	N/A
Building	84	5,422	25-30
Machinery and equipment	117,446	163,688	2-5
Capitalized software	24,149	24,814	3-5
Office furniture and equipment	5,188	5,106	1-5
Leasehold improvements	32,200	32,349	Life of lease
Construction in progress	12,051	4,910	N/A
Total property and equipment	191,118	236,830	
Less: Accumulated depreciation and amortization	(133,861)	(161,474)	
Total property and equipment, net	<u>\$ 57,257</u>	<u>\$ 75,356</u>	

- a. Leasehold improvements are amortized on a straight-line basis over the shorter of (i) their estimated useful life, or (ii) the estimated or contractual life of the related lease.

We include all depreciation from assets attributable to the generation of revenue in the cost of sales line item in the Statement of Operations. Depreciation related to assets that are not attributable to the generation of revenue are included in the research and development and selling and general administrative line items in the Statement of Operations. Depreciation on property and equipment is calculated on a straight-line basis. Depreciation expense on property and equipment for the years ended December 31, 2021, 2020 and 2019 was \$24,242, \$28,397 and \$29,982, respectively.

For the years ended December 31, 2021, 2020 and 2019, we recognized impairment charges of \$788, \$3,406 and \$181, respectively, on property and equipment, net included in the selling and general administrative line item in the Statement of Operations.

(10) Intangible Assets

Intangible assets, net, other than goodwill, at December 31, 2021 and 2020 are summarized as follows:

<i>(in thousands)</i>	2021			2020			Weighted Average Useful Life Remaining (in years)
	Gross ^a	Accumulated Amortization	Net	Gross ^a	Accumulated Amortization	Net	
Intangible assets with finite lives:							
Customer relationships	\$ 53,062	\$ (45,613)	\$ 7,449	\$ 71,123	\$ (56,682)	\$ 14,441	2.8
Acquired technology	17,518	(5,430)	12,088	42,472	(41,201)	1,271	5.2
Trade names	20,448	(10,438)	10,010	17,477	(16,506)	971	18.9
Patent costs	21,852	(11,812)	10,040	19,828	(10,999)	8,829	10.5
Trade secrets	19,924	(18,971)	953	20,188	(18,216)	1,972	1.1
Acquired patents	16,257	(15,945)	312	16,317	(15,723)	594	6.1
Other	12,982	(7,999)	4,983	19,793	(19,788)	5	9.4
Total intangible assets	<u>\$ 162,043</u>	<u>\$ (116,208)</u>	<u>\$ 45,835</u>	<u>\$ 207,198</u>	<u>\$ (179,115)</u>	<u>\$ 28,083</u>	8.5

- a. Change in gross carrying amounts primarily due to divestitures of Cimatron, Symbionix and ODM partially offset by the acquisition of Oqton and foreign currency translation.

Amortization expense related to intangible assets was \$10,469, \$15,810 and \$20,312 for the years ended December 31, 2021 2020 and 2019, respectively.

Annual amortization expense for intangible assets is expected to be \$10,767 in 2022, \$6,190 in 2023, \$5,395 in 2024, \$5,365 in 2025 and \$4,415 in 2026.

(11) Goodwill

The following are the changes in the carrying amount of goodwill by reporting unit:

<i>(in thousands)</i>	Year Ended December 31, 2021								
	Healthcare			Industrial			Consolidated		
	Gross Goodwill	Dispositions, Acquisitions and Impairments	Net Goodwill	Gross Goodwill	Dispositions, Acquisitions and Impairments	Net Goodwill	Gross Goodwill	Dispositions, Acquisitions and Impairments	Net Goodwill
Balance at beginning of year	\$101,767	\$(32,055)	\$69,712	\$134,382	\$(42,329)	\$92,053	\$236,149	\$(74,384)	\$161,765
Acquisition ^(a)	—	39,182	39,182	—	170,033	170,033	—	209,215	209,215
Dispositions ^(b)	—	(15,598)	(15,598)	—	(3,873)	(3,873)	—	(19,471)	(19,471)
Adjustments ^(c)	(900)	—	(900)	900	—	900	—	—	—
Foreign currency translation adjustments	(2,481)	—	(2,481)	(3,440)	—	(3,440)	(5,921)	—	(5,921)
Total goodwill	<u>\$98,386</u>	<u>\$(8,471)</u>	<u>\$89,915</u>	<u>\$131,842</u>	<u>\$123,831</u>	<u>\$255,673</u>	<u>\$230,228</u>	<u>\$115,360</u>	<u>\$345,588</u>

- The 2021 acquisition, for the Healthcare and Industrial segments in the table above relate to Allevi, Additive Works, Oqton and Volumetric. Approximately \$560 of goodwill related to Allevi will be deductible for tax purposes.
- The 2021 dispositions for the Healthcare and Industrial segments in the table above relate to of ODM and Simbionix
- The 2021 Adjustment, for the Healthcare and Industrial segments in the table above relate to reclassification within the segments.

The following are the changes in the carrying amount of goodwill by reporting unit for 2020. This presentation reflects the prior year reporting unit structure, which has been changed for 2021. Due to unnecessarily burdensome procedures to recast this information into our new segment structure, we have taken the practicability exception allowed and presented as in prior year

<i>(in thousands)</i>	Americas	EMEA	APAC	Total
Balance at December 31, 2019	\$ —	\$ 186,695	\$ 36,481	\$ 223,176
Dispositions and impairments ^a	—	(69,685)	(4,699)	(74,384)
Effect of foreign currency exchange rates	—	10,582	2,391	12,973
Balance at December 31, 2020	<u>\$ —</u>	<u>\$ 127,592</u>	<u>\$ 34,173</u>	<u>\$ 161,765</u>

- Includes \$21,385 of goodwill held for sale related to Cimatron in EMEA and \$4,699 of goodwill related to the sale of our Australia ODM and Wuxi Easyway businesses in APAC. See Note 4.

The effect of foreign currency exchange in the above tables reflect the impact on goodwill of amounts recorded in currencies other than the U.S. dollar on the financial statements of subsidiaries in these geographic areas resulting from the yearly effect of foreign currency translation between the applicable functional currency and the U.S. dollar.

Our reporting units are Healthcare and Industrial. We completed the required annual goodwill impairment test as of November 30, 2021. The goodwill impairment test compared the fair value of each reporting unit to their carrying value. We estimated the fair value of our reporting units based primarily on projections of future revenues, expenses, and cash flows discounted to its present value, and a market approach. The valuation methodology and underlying financial information included in the Company's determination of fair value required significant judgment by management. The principal assumptions used in the Company's discounted cash flow analysis consisted of (a) the long-term projections of future financial performance and (b) the weighted-average cost of capital of market participants, adjusted for the risk attributable to the Company and the industry in which it operates. Under the market approach, the principal assumption included an estimate of multiples for various financial metrics of comparable companies. The estimated fair value for each of our reporting units was in excess of their respective carrying values as of November 30, 2021.

As of September 30, 2020, we experienced a goodwill valuation triggering event due to a drop in our stock price, which was negatively impacted by the business environment as a result of the COVID-19 pandemic. Accordingly, we performed a quantitative analysis for potential impairment of our goodwill and long-lived asset balances. Based on available information and analysis as of September 30, 2020, we determined the carrying value of the EMEA reporting unit exceeded its fair value and recorded a non-cash goodwill impairment charge of \$48,300. We determined the fair value of the Americas and APAC reporting units exceeded their carrying values and the carrying value of our long-lived assets is recoverable for all reporting units.

(12) Employee Benefits

We sponsor a Section 401(k) plan (the "Plan") covering substantially all our eligible U.S. employees. The Plan entitles eligible employees to make contributions to the Plan after meeting certain eligibility requirements. Contributions are limited to the maximum contribution allowances permitted under the Internal Revenue Code. We match 50.0% of contributions on the first 6.0% of the participant's eligible compensation.

For the years ended December 31, 2021, 2020 and 2019, we expensed \$2,039, \$2,456 and \$2,688, respectively, for matching contributions to the defined contribution plan.

International Retirement Plan

We sponsor a non-contributory defined benefit pension plan for certain employees of a non-U.S. subsidiary initiated by a predecessor of the subsidiary. We maintain insurance contracts that provide an annuity that is used to fund the current obligations under this plan. The following table provides a reconciliation of the changes in the projected benefit obligation for the years ended December 31, 2021 and 2020:

<i>(in thousands)</i>	<u>2021</u>	<u>2020</u>
Reconciliation of benefit obligations:		
Obligations as of January 1	\$ 10,391	\$ 10,497
Service cost	187	204
Interest cost	130	84
Actuarial loss (gain)	(234)	(1,222)
Benefit payments	(627)	(151)
Effect of foreign currency exchange rate changes	(773)	979
Benefit obligations as of December 31	<u>9,074</u>	<u>10,391</u>
Fair value of assets as of December 31 ^a	<u>3,577</u>	<u>3,844</u>
Funded status as of December 31, net of tax benefit	<u>\$ (5,497)</u>	<u>\$ (6,547)</u>

a. No change in underlying asset value for the periods.

We recognized the following amounts in the consolidated balance sheets at December 31, 2021 and 2020:

<i>(in thousands)</i>	2021	2020
Other assets	\$ 3,577	\$ 3,844
Accrued liabilities	(163)	(163)
Other liabilities	(8,911)	(10,228)
Net liability	<u>\$ (5,497)</u>	<u>\$ (6,547)</u>

The following projected benefit obligation and accumulated benefit obligation were estimated as of December 31, 2021 and 2020:

<i>(in thousands)</i>	2021	2020
Projected benefit obligation	\$ 9,074	\$ 10,391
Accumulated benefit obligation	\$ 8,635	\$ 9,343

The following table shows the components of net periodic benefit costs and the amounts recognized in "Accumulated other comprehensive income (loss)" as of December 31, 2021, 2020 and 2019:

<i>(in thousands)</i>	2021	2020	2019
Net periodic benefit cost:			
Service cost	\$ 187	\$ 204	\$
Interest cost	130	84	
Amortization of actuarial loss	259	351	
Total net periodic pension cost	<u>576</u>	<u>639</u>	
Other changes in plan assets and benefit obligations recognized in other comprehensive income:			
Net (gain) loss	(234)	(1,223)	
Amortization of prior years' unrecognized loss	(259)	(351)	
Total recognized as accumulated other comprehensive income (loss), excluding tax	<u>(493)</u>	<u>(1,574)</u>	
Total expense recognized in net periodic benefit cost and other comprehensive income	<u>\$ 83</u>	<u>\$ (935)</u>	<u>\$</u>

The following assumptions are used to determine benefit obligations as of December 31, 2021 and 2020:

	2021	2020
Discount rate	1.2%	1.3%
Rate of compensation	3.0%	3.0%

The following benefit payments, including expected future service cost, are expected to be paid:

<i>(in thousands)</i>		
Estimated future benefit payments:		
2022	\$	175
2023		181
2024		185
2025		187
2026		189
2027 through 2031	\$	1,439

(13) Accrued and Other Liabilities

Accrued liabilities at December 31, 2021 and 2020 are summarized as follows:

<i>(in thousands)</i>	<u>2021</u>	<u>2020</u>
Compensation and benefits	\$ 39,846	\$ 24,629
Accrued taxes	19,836	14,952
Vendor accruals	9,045	18,762
Product warranty liability	3,585	2,348
Accrued professional fees	2,263	1,773
Accrued other	1,593	6,138
Royalties payable	826	1,210
Total	<u>\$ 76,994</u>	<u>\$ 69,812</u>

Other liabilities at December 31, 2021 and 2020 are summarized as follows:

<i>(in thousands)</i>	<u>2021</u>	<u>2020</u>
Long term employee indemnity	\$ 5,237	\$ 12,228
Long term tax liability	6,099	15,532
Defined benefit pension obligation	8,911	10,228
Long term deferred revenue	10,244	6,163
Other long term liabilities	1,763	7,096
Total	<u>\$ 32,254</u>	<u>\$ 51,247</u>

Changes in product warranty obligations, including deferred revenue on extended warranty contracts, for the years ended December 31, 2021, 2020 and 2019, are summarized below:

<i>(in thousands)</i>	<u>Beginning Balance</u>	<u>Additional Accrual/ Revenue Deferred</u>	<u>Costs Incurred/ Deferred Revenue Amortization</u>	<u>Ending Balance</u>
Year Ended December 31,				
2021	\$ 6,380	\$ 8,670	\$ (8,784)	\$ 6,266
2020	6,192	6,454	(6,266)	6,380
2019	\$ 7,660	\$ 8,124	\$ (9,592)	\$ 6,192

(14) Borrowings

Convertible Notes

On November 16, 2021 the Company issued \$460,000 in aggregate principal amount of its 0% Convertible Senior Notes due November 15, 2026 (the “Notes”) pursuant to an Indenture, dated November 16, 2021 (the “Indenture”), between the Company and The Bank of New York Mellon, N.A., as trustee. The net proceeds from the offering of the Notes were \$446,534 after deducting the initial purchasers’ discounts and commissions and offering expenses payable by the Company in the amount of \$13,466 for which \$13,141 is unamortized at December 31, 2021. The annual effective interest rate of the Notes is 0.594% when including purchasers’ discounts and commissions and offering expenses incurred by the Company. The Notes are senior, unsecured obligations of the Company, will not bear regular interest and the principal amount of the Notes will not accrete. The Notes will mature on November 15, 2026, unless earlier redeemed, repurchased or converted in accordance with the terms of the Notes. The Notes will be convertible at the option of the holders at any time prior to the close of business on the business day immediately preceding August 15, 2026, only under the following circumstances: (1) during any calendar quarter commencing after the calendar quarter ending on March 31, 2022 (and only during such quarter), if the last reported sale price of the Company’s common stock, par value \$0.001 per share (the “Common Stock”), is greater than or equal to 130% of the conversion price for each of at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter on each applicable trading day; (2) during the five business day period after any five consecutive trading day period (the “measurement period”) in which the trading price (as defined in the Indenture) per \$1 principal amount of Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price per share of the Common Stock and the conversion rate on each such trading day; (3) if the Company calls such Notes for redemption, at any time prior to the close of business on the second scheduled trading day immediately preceding the redemption date; and (4) upon the occurrence of specified corporate events, including a Fundamental Change (as defined in the Indenture), or distributions of the Common Stock. On or after August 15, 2026, until the close of business on the second scheduled trading day immediately preceding the maturity date, holders may convert all or any portion of their Notes at any time, at the option of the holder regardless of the foregoing circumstances. Upon conversion, the Company will pay cash up to the aggregate principal amount of the Notes to be converted and pay or deliver, as the case may be, cash, shares of the Common Stock, or a combination of cash and shares of the Common Stock, at the Company’s election, in respect of the remainder, if any, of the Company’s conversion obligation in excess of the aggregate principal amount of the Notes being converted. The Notes have an initial conversion rate of 27.8364 shares of Common Stock per \$1 principal amount of Notes (which is subject to adjustment in certain circumstances). This is equivalent to an initial conversion price of approximately \$35.92 per share. The conversion rate is subject to customary adjustments under certain circumstances in accordance with the terms of the Indenture. Holders of the Notes have the right to require the Company to repurchase for cash all or a portion of their Notes at 100% of their principal amount, plus any accrued and unpaid special interest, upon the occurrence of a Fundamental Change. The Company is also required to increase the conversion rate for holders who convert their Notes in connection with a Fundamental Change or convert their Notes that are called for redemption, as the case may be, prior to the maturity date. The Company may not redeem the Notes prior to November 20, 2024. The Notes are redeemable, in whole or in part, for cash at the Company’s option at any time, and from time to time, on or after November 20, 2024 and before the 41st scheduled trading day immediately preceding the maturity date, but only if the last reported sale price per share of the Common Stock has been at least 130% of the conversion price then in effect for a specified period of time. The Notes are the Company’s senior unsecured obligations and will rank senior in right of payment to any of the Company’s existing and future indebtedness that is expressly subordinated in right of payment to the Notes; rank equal in right of payment to any of the Company’s future unsecured indebtedness that is not so subordinated; be effectively subordinated in right of payment to any of the Company’s existing and future secured indebtedness to the extent of the value of the collateral securing such indebtedness; and structurally subordinated to all existing and future indebtedness and other liabilities (including trade payables) of current or future subsidiaries of the Company. The Indenture also contains covenants, events of default and other provisions which are customary for offerings of convertible notes. We are in compliance with all covenants. At the December 31, 2021 the fair value of the Notes is \$436,600. This based on the quoted market price where the volume of activity is not active and thus this is deemed a level 2 fair value measurement.

The Company incurred \$324 of debt issuance cost amortization in 2021. Debt issuance cost accretion of \$2,663, \$2,679, \$2,695, \$2,711, and \$2,394 are expected to be incurred in 2022, 2023, 2024, 2025 and 2026, respectively.

Credit Facility

We had a 5-year \$100,000 senior secured revolving credit facility (the "Senior Credit Facility") to support working capital and general corporate purposes. The Senior Credit Facility also included a 5-year \$100,000 senior secured term loan facility (the "Term Facility") that was fully repaid and terminated in the first quarter of 2021, as discussed below. Effective August 24, 2021, we terminated the 5-year \$100,000 Senior Credit Facility. The Senior Credit Facility contained customary covenants, some of which required us to maintain certain financial ratios that determine the amounts available and terms of borrowings and events of default. We were in compliance with all covenants through the date of termination.

Borrowings under the Senior Credit Facility were subject to interest at varying spreads above quoted market rates and a commitment fee was paid on the total unused commitment. The interest rate at December 31, 2020 was 1.9%. We had a balance of \$21,392 outstanding on the Term Facility at December 31, 2020. On January 1, 2021, the Company completed the sale of Cimatron. A portion of the proceeds from the sale were used to repay the outstanding balance on the Term Facility. The Term Facility was fully repaid and terminated in the first quarter of 2021. Concurrent with the repayment of the Term Facility, we terminated the related interest rate swap, resulting in a marked-to-market payment of \$721. See Note 15 for additional information.

Interest Income and Expense

Interest income totaled \$438, \$400 and \$1,209 for the years ended December 31, 2021, 2020 and 2019, respectively.

Interest expense totaled \$2,340, \$4,391 and \$4,442 for the years ended December 31, 2021, 2020 and 2019, respectively.

(15) Hedging Activities and Financial Instruments

Derivatives Designated as Hedging Instruments

On July 8, 2019, we entered into a \$50,000 interest rate swap contract, designated as a cash flow hedge, to minimize the risk associated with the variability of cash flows in interest payments from variable-rate debt due to fluctuations in the one-month USD-LIBOR, subject to a 0% floor, through February 26, 2024. Changes in the interest rate swap are expected to offset the changes in cash flows attributable to fluctuations of the one-month USD-LIBOR for the interest payments associated with our Term Facility.

On June 30, 2020, we executed an amendment to the swap which reduced the notional amount to \$15,000 and resulted in de-designation as a cash flow hedge. The reduction required a mark-to-market settlement of \$1,253 paid in July 2020. Amounts previously recognized in Accumulated Other Comprehensive Loss ("AOCL") of \$1,235 were released and reclassified into Interest and other expense, net on the accompanying consolidated statements of operations and comprehensive loss for the year ended December 31, 2020. Subsequent to June 2020, changes in the swap's fair value are recognized currently in earnings and included in the Interest and other expense, net. The remaining \$721 in AOCL as of December 31, 2020 was expensed to Interest and other expense, net in 2021 when the Company terminated this agreement in connection with repayment of the Term Facility. See Note 14 for additional information.

We had no exposure to LIBOR rates as of December 31, 2021. The notional amount and fair value of the historical derivative on our balance sheet at December 31, 2021 and 2020 are disclosed below:

<i>(in thousands)</i>	Balance Sheet location	Notional amount	Fair value
December 31, 2021			
Interest rate swap contract	Other liabilities	\$ —	\$ —
December 31, 2020			
Interest rate swap contract	Other liabilities	\$ 15,000	\$ (700)

Derivatives Not Designated as Hedging Instruments

We conduct business in various countries using both the functional currencies of those countries and other currencies to effect cross border transactions. As a result, we are subject to the risk that fluctuations in foreign exchange rates between the dates that those transactions are entered into and their respective settlement dates will result in a foreign exchange gain or loss. When practicable, we endeavor to match assets and liabilities in the same currency on our balance sheet and those of our subsidiaries in order to reduce these risks. When appropriate, we enter into foreign currency contracts to hedge exposures arising from those transactions. We have elected not to prepare and maintain the documentation to qualify for hedge accounting treatment under ASC 815, "Derivatives and Hedging," and therefore, all gains and losses (realized or unrealized) are recognized in Interest and other expense, net in the consolidated statements of operations and comprehensive loss. Depending on their fair value at the end of the reporting period, derivatives are recorded either in prepaid expenses and other current assets or in accrued liabilities on the consolidated balance sheet.

We had \$43,000 and \$101,781 in notional foreign exchange contracts outstanding as of December 31, 2021 and 2020, respectively. The fair values of these contracts were not material.

We translate foreign currency balance sheets for each non-U.S. subsidiary's functional currency (generally the respective local currency) to U.S. dollars at end-of-period exchange rates and statements of earnings at average exchange rates for each period. The resulting foreign currency translation adjustments are a component of other comprehensive income (loss). We do not hedge the fluctuation in reported revenue and earnings resulting from the translation of these international operations' results into U.S. dollars.

(16) Inventory Financing Agreements

On December 1, 2018 and January 17, 2020, we entered into a Manufacturing Services Agreement and Amendment One to Manufacturing Services Agreement (together, the "Agreement"), with an assembling manufacturer to produce products on behalf of 3D Systems Corporation. During the quarter ended March 31, 2020, as part of the Agreement, we sold \$12,100 of inventory to the assembling manufacturer that we have an obligation to repurchase. At December 31, 2021, our obligation to repurchase inventory, included in Accrued and other liabilities on our consolidated balance sheets, was \$2,826, relating to the initial sale of inventory to the assembly manufacturer and adjusted for transactions. The inventory sold consisted of raw materials, packaging materials and consumables representing stock on hand related to certain product families for which the manufacturing has been outsourced to the assembling manufacturer. Although the assembling manufacturer holds legal title, we account for the inventory similar to a product financing arrangement; therefore, the inventories sold to the assembling manufacturer will continue to be included in Inventories on our consolidated balance sheets until processed into finished goods and sold back to us. At December 31, 2021, inventory held at assemblers was \$26.

Additionally, as part of the Agreement, we have a commitment to purchase certain materials and supplies that the assembling manufacturer purchased from third parties. At December 31, 2021, we had a commitment of \$5,187 with the assembling manufacturer.

(17) Preferred Stock

We had 5,000 shares of preferred stock that were authorized but unissued at December 31, 2021 and 2020.

(18) Stock-Based Compensation

The Company maintains the 2004 Restricted Stock Plan, as amended, for Non-Employee Directors and the 2015 Incentive Plan of 3D Systems Corporation. The 2015 Incentive Plan was amended and restated in May 2020 to, among other things, increase the number of shares reserved for issuance by 4,860 shares (as amended and restated, the "2015 Plan").

The 2015 Plan authorizes the granting of shares of restricted stock, RSUs, stock appreciation rights, cash incentive awards and the grant of options to purchase shares of our common stock. The 2015 Plan also designates measures that may be used for performance awards and market-based awards. The Director Plan authorizes shares of restricted stock for our non-employee directors.

The vesting period for awards under the Stock Plans is generally determined by the Board at the date of the grant and generally the awards vest one third each year over 3 years.

Stock-based compensation expense is included in selling, general and administrative expenses in the consolidated statements of operations and comprehensive income (loss). The following table details the components of stock-based compensation expense recognized in net earnings in each of the past three years:

<i>(in thousands)</i>	Year Ended December 31,		
	2021	2020	2019
Total stock-based compensation expense	\$ 55,153	\$ 17,725	\$

Included in the above expense for 2021 is \$22,057 pertaining to the annual incentive compensation awards that will be paid in company shares of which a \$1,914 liability was reduced and recorded as part of the divestiture gains. Additionally, the above expense includes \$683 related to the Volumetric contingent milestone payments as discussed in Note 3.

Restricted Stock

We determine the fair value of restricted stock and RSUs based on the closing price of our stock on the date of grant. We generally recognize compensation expense related to restricted stock and RSUs on a straight-line basis over the vesting period. Forfeitures are recognized in the period in which they occur. A summary of restricted stock and RSU activity for the year ended December 31, 2021 follows:

<i>(in thousands, except per share amounts)</i>	Number of Shares/Units	Weighted Average Grant Date Fair Value
Outstanding at beginning of year — unvested	3,540	\$
Granted	2,547	
Canceled	(462)	
Vested	(1,645)	
Outstanding at end of year — unvested	3,980	\$

Included in the outstanding balance above are 606 shares of restricted stock that vest under specified market conditions and 747 shares of restricted stock that vest under specified Company performance measures. Awards with specified market conditions were awarded to certain employees in 2016, 2020 and 2021. The fair value for awards with market conditions is determined using a binomial lattice Monte Carlo simulation model and is expensed ratably over any implicit or explicit service period regardless if the market condition is probable of achievement or not. Stock compensation expense is not reversed if the market condition is not met. We recognize forfeitures when they occur. The fair value of performance-based awards are recognized on the grant date and expensed ratably over any implicit or explicit service period when the performance condition is deemed probable of achievement. Stock compensation recorded for performance shares is reversed when the performance condition is no longer deemed probable of achievement.

Some RSUs are granted with a performance measure derived from non-GAAP-based management targets or based on non-financial metrics. Depending on our performance with respect to these metrics, the number of RSUs earned may be less than, equal to or greater than the original number of RSUs awarded, subject to a payout range.

On December 1, 2021, we issued Performance Share Units (PSUs) to employees of Volumetric as part of the acquisition agreement. Vesting of these shares is based on four non-financial milestones that involve various medical achievements. These awards were divided into four tranches, one tranche per milestone, and compensation expense is recognized only when a milestone is probable of achievement. As of December 31, 2021 one of the four milestones was deemed probable of achievement and the company recorded \$81 of expense in 2021 related to these awards.

At December 31, 2021, there was \$60,612 of unrecognized stock-based compensation expense related to all non-vested restricted stock award shares and units, which we expect to recognize over a weighted-average period of 2.8 years.

Stock Options

During the year ended December 31, 2016, we awarded certain employees market condition stock options under the 2015 Plan, included in the activity above, that vest under specified market conditions. Each employee was generally awarded two equal tranches of market condition stock options that immediately vest when our common stock trades at either \$30 or \$40 per share for ninety consecutive calendar days.

We recognize compensation expense related to stock options on a straight-line basis over the derived term of the awards. Forfeitures are recognized in the period in which they occur. The fair value of stock options with market conditions is estimated using a binomial lattice Monte Carlo simulation model. Expense for awards with a market condition are not reversed if the market condition is not met.

Stock option activity for the year ended December 31, 2021 was as follows:

<i>(in thousands, except per share amounts)</i>	Year Ended December 31, 2021			
	Number of Shares	Weighted Average Exercise	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Stock option activity:				
Outstanding at beginning of year	420	\$ 13.26	5.7	\$ —
Granted	—	—	—	—
Exercised	—	—	—	—
Forfeited and expired	—	—	—	—
Outstanding at end of year	<u>420</u>	\$ 13.26	4.7	\$ 3,479

In the table above, intrinsic value is calculated as the excess, if any, between the market price of our stock on the last trading day of the year and the exercise price of the options.

At December 31, 2021, there was no unrecognized pre-tax stock-based compensation expense related to stock options.

(19) Net Income (Loss) Per Share

We compute basic earnings (loss) per share using net income (loss) attributable to 3D Systems Corporation and the weighted average number of common shares outstanding during the applicable period. Diluted earnings (loss) per share incorporates the additional shares issuable upon assumed exercise of stock options and the assumed vesting of restricted stock and RSUs, except in such case when their inclusion would be anti-dilutive.

<i>(in thousands, except per share amounts)</i>	Year Ended December 31,		
	2021	2020	2019
Numerator for basic and diluted net earnings (loss) per share:			
Net income (loss) attributable to 3D Systems Corporation	\$ 322,052	\$ (149,594)	\$ (69,880)
Denominator for net earnings (loss) per share:			
Weighted average shares - basic	122,867	117,579	113,811
Dilutive effect of shares issuable under stock based compensation and other plans ⁽¹⁾	3,467	—	—
Weighted average shares - diluted	126,334	117,579	113,811
Anti-dilutive shares of restricted share awards which are excluded from the dilutive shares above ⁽²⁾	1,779	3,960	5,822
Net income (loss) per share - basic	\$ 2.62	\$ (1.27)	\$ (0.61)
Net income (loss) per share - diluted	\$ 2.55	\$ 1.27	\$ (0.61)

(1) The dilutive impact of share awards is 2,755 shares for which the calculation requires certain assumptions regarding assumed proceeds that will hypothetically repurchase unvested restricted shares and outstanding stock options and an estimate of 712 shares for the payment of accrued incentive compensation that will be settled in shares. The share estimate is based on the accrued incentive compensation balance at the end of the year divided by the average 2021 share price.

(2) Excludes the impact of shares contingently issuable upon the achievement of certain milestones in the Volumetric acquisition as discussed in Note 3. The 2020 and 2019 amounts represent outstanding equity awards that are anti-dilutive because we had a net loss in both years.

On November 16, 2021 the Company issued \$460.0 million in aggregate principal amount of its 0% Convertible Senior Notes due November 15, 2026 as discussed in Note 14. The Notes' impact to diluted shares will be calculated using the if-converted method as prescribed in ASU 2020-06. The Notes will increase the diluted share count when the average share price over a quarterly or annual reporting period is greater than \$35.92, the conversion price of the Notes. For the year ended December 31, 2021 the Notes were anti-dilutive.

On August 5, 2020, we entered into an Equity Distribution Agreement for an At-The-Market equity offering program ("ATM Program") where we may issue and sell, from time to time, shares of our common stock. Our ATM Program allowed for an aggregate gross sales price of up to a total of \$150,000, depending upon market conditions and our liquidity requirements, through Truist Securities, Inc. and HSBC Securities (USA) Inc. For the year ended December 31, 2020, we sold 4,616 shares of our common stock under our ATM Program for net proceeds of \$24,664, net of \$849 in fees, commissions and other costs. As of December 31, 2020, we had \$124,487 in availability remaining under the ATM Program. On January 6, 2021, we terminated the ATM Program.

(20) Noncontrolling Interests

As of December 31, 2020, we owned 100% of the capital and voting rights of Robtec, a service bureau and distributor of 3D printing and scanning products in Brazil. Approximately 70% of the capital and voting rights of Robtec was acquired on November 25, 2014. On January 7, 2020, we made a payment equal to the redemption price of \$10,000 and acquired the remaining 30% of the capital and voting rights.

(21) Fair Value Measurements

Fair value is the exchange price to sell an asset or transfer a liability (an exit price) in an orderly transaction between market participants at the measurement date. Fair value measurements use market data or assumptions market participants would use in pricing the asset or liability, including assumptions about risk and the risks inherent in the inputs to the valuation technique. These inputs may be readily observable, corroborated by market data, or generally unobservable. Valuation techniques maximize the use of observable inputs and minimize use of unobservable inputs.

Cash equivalents, Israeli severance funds and derivatives are valued utilizing the market approach to measure fair value for financial assets and liabilities. The market approach uses prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities.

Assets and liabilities measured at fair value on a recurring basis are summarized below:

<i>(in thousands)</i>	Fair Value Measurements as of December 31, 2021			
	Level 1	Level 2	Level 3	Total
Description				
Cash equivalents ^a	\$ 485,521	\$ —	\$ —	\$ 485,521
Israeli severance funds ^b	—	2,070	—	2,070

<i>(in thousands)</i>	Fair Value Measurements as of December 31, 2020			
	Level 1	Level 2	Level 3	Total
Description				
Cash equivalents ^a	\$ 199	\$ —	\$ —	\$ 199
Israeli severance funds ^b	—	6,422	—	6,422
Derivative financial instruments ^c	\$ —	\$ (700)	\$ —	\$ (700)

- Cash equivalents include funds held in money market instruments and are reported at their current carrying value, which approximates fair value due to the short-term nature of these instruments and are included in cash and cash equivalents in the consolidated balance sheet.
- We partially fund a liability for our Israeli severance requirement through monthly deposits into fund accounts, the value of these contributions are recorded to non-current assets on the consolidated balance sheet.
- Derivative instruments are reported based on published market prices for similar assets or are estimated based on published market prices for similar assets or are estimated based on observable inputs such as interest rates, yield curves, credit risks, spot and future commodity prices and spot and future exchange rates. See Note 15 for additional information on our derivative financial instruments.

We did not have any transfers of assets and liabilities between Level 1, Level 2 and Level 3 of the fair value measurement hierarchy during the year ended December 31, 2021.

In addition to the assets and liabilities included in the above table, certain of our assets and liabilities are measured at fair value on a non-recurring basis. This includes goodwill and other intangible assets which are measured at fair value at acquisition and adjusted to fair value only if their fair value falls below the initial fair value. For further discussion on the valuation techniques and inputs used in the fair value measurement of goodwill and other intangible assets, see Notes 2, 3, 10 and 11.

(22) Income Taxes

The components of our income before income taxes are as follows:

	2021	2020	2019
Income (Loss) before income taxes:			
Domestic	\$ 308,514	\$ (45,973)	\$ (
Foreign	11,026	(97,437)	(
Total	\$ 319,540	\$ (143,410)	\$ (

The components of income tax provision for the years ended December 31, 2021, 2020 and 2019 are as follows:

	2021	2020	2019
Current:			
U.S. federal	\$ (8,675)	\$ 1,294	\$
State	2,097	451	
Foreign	6,861	5,645	
Total	<u>283</u>	<u>7,390</u>	
Deferred:			
U.S. federal	—	67	
State	—	—	
Foreign	(2,795)	(1,273)	
Total	<u>(2,795)</u>	<u>(1,206)</u>	
Total income tax (benefit) provision	<u>\$ (2,512)</u>	<u>\$ 6,184</u>	<u>\$</u>

The overall effective tax rate differs from the statutory federal tax rate for the years ended December 31, 2021, 2020 and 2019 as follows:

	% of Pretax Loss		
	2021	2020	2019
Tax provision based on the federal statutory rate	21.0 %	21.0 %	21.0 %
Increase in valuation allowances	(10.4)	(8.5)	(21.3)
Dividends not taxable	—	9.5	—
Net operating loss carryback claim	—	6.2	—
Change in carryforward attributes	(0.7)	(3.2)	—
Global intangible low-taxed income inclusion	1.2	(0.3)	(7.0)
Nondeductible expenses	1.4	(13.5)	(1.8)
Taxes related to distributions	—	—	(0.8)
Foreign income tax rate differential	—	(3.3)	1.0
Deemed income related to foreign operations	—	(1.6)	(0.5)
Tax rate change	(0.7)	(0.3)	(1.1)
Employee share-based payments	(1.3)	(1.4)	—
Other	—	(0.4)	(0.9)
Deferred and payable adjustments	1.4	(2.6)	3.3
ASU 842 adoption	—	—	(0.1)
State taxes, net of federal benefit, before valuation allowance	1.0	0.5	2.8
Return to provision adjustments	(0.1)	0.9	(2.5)
Other tax credits	(0.5)	0.2	(1.9)
Uncertain tax positions and audit settlements	(3.0)	(7.5)	2.8
Divestitures	(10.1)	—	—
Effective tax rate	<u>(0.8)%</u>	<u>(4.3)%</u>	<u>(7.0)%</u>

The difference between our effective tax rate for 2021 and the federal statutory rate was 21.8 percentage points. The difference in the effective rate is primarily due to differences in book and stock bases related to the divestitures of Cimatron and Symbionix, valuation allowance changes, and adjustments to uncertain tax positions, provisions for GILTI, and non-deductible expenses.

The difference between our effective tax rate for 2020 and the federal statutory rate was 25.3 percentage points. The difference in the effective rate is primarily due to valuation allowance changes, nondeductible impairment charges, dividends not taxable, net operating loss carryback claim, and adjustments to uncertain tax positions.

The difference between our effective tax rate for 2019 and the federal statutory rate was 28.0 percentage points. The difference in the effective rate is primarily due to valuation allowance changes, provisions for Global Intangible Low Taxed Income ("GILTI"), prior period adjustments and adjustments to uncertain tax positions.

In 2021, 2020 and 2019, there were no significant changes to our valuation allowance assertions. We continue to review results of operations and forecast estimates to determine if it is more likely than not that the deferred tax assets will be realized.

The components of our net deferred income tax assets and net deferred income tax (liabilities) at December 31, 2021 and 2020 are as follows:

<i>(in thousands)</i>	<u>2021</u>	<u>2020</u>
Deferred income tax assets:		
Intangibles	\$ 10,950	\$
Stock options and restricted stock awards	8,005	
Reserves and allowances	8,692	
Net operating loss carryforwards	38,394	
Tax credit carryforwards	19,967	
Accrued liabilities	2,893	
Deferred revenue	8,141	
Lease Tax Asset	10,362	
163(j) Limitation Carryforward	—	
Valuation allowance	(91,165)	(1
Total deferred income tax assets	<u>16,239</u>	
Deferred income tax liabilities:		
Intangibles	2,356	
Property, plant, and equipment	2,110	
Lease Tax Liability	8,458	
Other	434	
Total deferred income tax liabilities	<u>13,358</u>	
Deferred income tax asset held for sale	\$ —	\$
Net deferred income tax assets	<u>\$ 2,881</u>	<u>\$</u>

At December 31, 2021, \$38,394 of our deferred income tax assets was attributable to \$279,684 of gross net operating loss carryforwards, which consisted of \$84,869 of loss carryforwards for U.S. federal income tax purposes, \$144,455 of loss carryforwards for U.S. state income tax purposes and \$50,360 of loss carryforwards for foreign income tax purposes. \$23,797 of gross net operating loss carryforwards for U.S. federal income tax purposes are acquisition related and are subject to potential measurement period adjustments under ASC 805.

\$1,304 of gross net operating loss carryforwards for U.S. federal income tax purposes will expire in 2037. All other loss carryforwards for U.S. federal income tax purposes do not expire. The net operating loss carryforwards for U.S. state income tax purposes begin to expire in 2022. In addition, certain loss carryforwards for foreign income tax purposes begin to expire in 2024 and certain other loss carryforwards for foreign purposes do not expire.

At December 31, 2021, tax credit carryforwards included in our deferred income tax assets consisted of \$8,411 of research and experimentation credit carryforwards for U.S. federal income tax purposes, \$4,201 of research and experimentation tax credit carryforwards for U.S. state income tax purposes, \$6,629 of foreign tax credits for U.S. federal income tax purposes, and \$729 of other state tax credits. Certain state research and experimentation and other state credits began to expire in 2021. We have recorded a valuation allowance related to the U.S. federal and state tax credits.

Due to the one time transition tax, our previously unremitted earnings have been subjected to U.S. federal income tax, although, other additional taxes such as, withholding tax, could be applicable. We intend to permanently reinvest its earnings outside the U.S. and as such, have not provided for any additional taxes on approximately \$121,509 of unremitted earnings. We believe the unrecognized deferred tax liability related to these earnings is approximately \$5,210.

Including interest and penalties, we decreased our unrecognized benefits by \$10,300 for the year ended December 31, 2021 and increased our unrecognized tax benefits by \$1,659 for the year ended December 31, 2021. The decrease was primarily related to the release of unrecognized tax benefits due to the receipt of two favorable U.S. private letter rulings and the settlement of an audit in a foreign jurisdiction. We do not anticipate any additional unrecognized tax benefits during the next 12 months that would result in a material change to our consolidated financial position. The total amount of unrecognized tax benefits that, if recognized, would affect the effective tax rate is \$5,596. We include interest and penalties in the consolidated financial statements as a component of income tax expense.

<i>(in thousands)</i>	Unrecognized Tax Benefits*		
	2021	2020	2019
Balance at January 1	\$ (25,902)	\$ (15,467)	\$ (13,031)
Increases related to prior year tax positions	(467)	(10,426)	(2,684)
Decreases related to prior year tax positions	8,886	788	857
Decreases related to prior year tax positions as a result of lapse of statute	371	—	—
Decreases related to settlement	1,043	—	—
Increases related to current year tax positions	(553)	(797)	(609)
Increases related to acquired tax positions	(639)	—	—
Balance at December 31	\$ (17,261)	\$ (25,902)	\$ (15,467)

* The unrecognized tax benefit balance includes an insignificant amount of interest and penalties.

Tax years 2013 through 2020 remain subject to examination by the U.S. Internal Revenue Service (“IRS”). State income tax returns are generally subject to examination for a period of three to four years after filing the respective tax returns. The tax years 2016 through 2020 remain open to examination by the various foreign taxing jurisdictions to which the Company is subject.

The following presents the changes in the balance of our deferred income tax asset valuation allowance:

Year Ended	Item	Balance at beginning of year	Additions (reductions) charged to expense	Other	Balance at end of year
2021	Deferred income tax asset valuation allowance	\$ 123,113	\$ (31,948)	\$ —	\$ 91,165
2020	Deferred income tax asset valuation allowance	109,643	13,470	—	123,113
2019	Deferred income tax asset valuation allowance	\$ 95,398	\$ 14,245	\$ —	\$ 109,643

(23) Commitments and Contingencies

We lease certain of our facilities and equipment under non-cancelable operating and finance leases. See Note 7.

We have an inventory purchase commitment with an assembling manufacturer. See Note 16.

Supply commitments totaled \$31,094 and \$55,317 as of December 31, 2021 and 2020, respectively. Commitments for printer assemblies and inventory items at December 31, 2021 and 2020 were \$29,916 and \$27,030, respectively. Commitments for operating costs and capital expenditures at December 31, 2021 and 2020 were \$1,179 and \$28,287, respectively.

Indemnification

In the normal course of business, we periodically enter into agreements to indemnify customers or suppliers against claims of intellectual property infringement made by third parties arising from the use of our products. Historically, costs related to these indemnification provisions have not been significant, and we are unable to estimate the maximum potential impact of these indemnification provisions on its future results of operations.

To the extent permitted under Delaware law, we indemnify our directors and officers for certain events or occurrences while the director or officer is, or was, serving at our request in such capacity, subject to limited exceptions. The maximum potential amount of future payments we could be required to make under these indemnification obligations is unlimited; however, we have directors and officers insurance coverage that may enable us to recover future amounts paid, subject to a deductible and the policy limits. There is no assurance that the policy limits will be sufficient to cover all damages, if any.

Litigation

Export Controls and Government Contracts Compliance Matter

In October 2017, we received an administrative subpoena from the Bureau of Industry and Security of the Department of Commerce (“BIS”) requesting the production of records in connection with possible violations of U.S. export control laws, including with regard to our Quickparts.com, Inc. subsidiary. In addition, while collecting information responsive to the above-referenced subpoena, our internal investigation identified potential violations of the International Traffic in Arms Regulations”) administered by the Directorate of Defense Trade Controls of the Department of State (“DDTC”) and potential violations of the Export Administration Regulations administered by the BIS. On June 8, 2018 and thereafter, we submitted voluntary disclosures to BIS and DDTC identifying numerous potentially unauthorized exports of technical data.

As part of our ongoing review of trade compliance risks and our cooperation with the government, on November 20, 2019, we submitted to the U.S. Treasury Department’s Office of Foreign Assets Control (“OFAC”) an initial notice of voluntary disclosure regarding potential violations of economic sanctions related to Iran. We continued to investigate this issue and filed final disclosures with OFAC on May 20, 2020 and December 21, 2021. We have and will continue to implement compliance enhancements to our export controls, trade sanctions, and government contracting compliance program to address the issues identified through our ongoing internal investigation and will cooperate with DDTC and BIS, as well as the U.S. Departments of Justice, Defense, Homeland Security and Treasury in their ongoing reviews of these matters. In connection with these ongoing reviews, in August 2020, the Company received two federal grand jury subpoenas issued by the U.S. District Court for the Northern District of Texas. The Company responded to these two subpoenas and will continue to fully cooperate with the U.S. Department of Justice in the related investigation.

In addition, on July 19, 2019, we received a notice of immediate suspension of federal contracting from the United States Air Force, pending the outcome of an ongoing investigation. The suspension applied to 3D Systems, its subsidiaries and affiliates, and was related to the potential export controls violations involving our ODM business described above. Under the suspension, we were generally prohibited from receiving new federal government contracts or subcontracts from any executive branch agency as described in the provisions of 48 C.F.R Subpart 9.4 of the Federal Acquisition Regulation. The suspension allowed us to continue to perform current federal contracts, and also to receive awards of new subcontracts for items under \$35 and for items considered commercially available off-the-shelf items. The Air Force lifted the suspension on September 6, 2019 following the execution of a two-year Administrative Agreement with us. We are now eligible to obtain and perform U.S. government contracts and subcontracts without restrictions. Under the Administrative Agreement, we were monitored and evaluated by independent monitors who reported to the Air Force on our compliance with the terms of the Company’s Ethics & Compliance Program, including its overall culture, government contracting compliance program, and export controls compliance program. The Air Force terminated the Administrative Agreement and associated monitorship early, on August 12, 2021, after the monitors found that we had satisfied the requirements of the Administrative Agreement.

Although we cannot predict the ultimate resolution of these matters, we have incurred and expect to continue to incur significant legal costs and other expenses in connection with responding to the U.S. government agencies.

Shareholder Suits

The Company and certain of its current and former executive officers have been named as defendants in a consolidated putative stockholder class action lawsuit pending in the United States District Court for the Eastern District of New York. The action is styled In re 3D Systems Securities Litigation, No. 1:21-cv-01920-NGG-TAM (E.D.N.Y.) (the “Securities Class Action”). On July 14, 2021, the Court appointed a Lead Plaintiff for the putative class and approved his choice of Lead Counsel. Lead Plaintiff filed his Consolidated Amended Complaint (the “Amended Complaint”) on September 13, 2021, alleging that defendants violated the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and SEC Rule 10b-5 promulgated thereunder by making false and misleading statements and omissions, and that the current and former executive officers named as defendants are control persons under Section 20(a) of the Exchange Act. The Amended Complaint was filed on behalf of stockholders who purchased shares of the Company’s common stock between May 6, 2020 and March 5, 2021, and seeks monetary damages on behalf of the purported class. Defendants moved to dismiss the Amended Complaint on February 15, 2022, and the motion will be fully briefed in May 2022.

The Company has been named as a nominal defendant and certain of its current and former executive officers have been named as defendants in derivative lawsuits pending in the United States District Court for the Eastern District of New York and the South Carolina Court of Common Pleas for the 16th Circuit, York County. The actions are styled Nguyen v. Joshi, et al., No. 21-cv-03389-DG-CLP (E.D.N.Y.) (the “New York Derivative Action”), Lesar v. Graves, et al., No. 2021CP4602308 (S.C., Ct. of Common Pleas for the 16th Judicial Cir., Cty. of York) (the “Lesar Action”), and Scanlon v. Graves, et al., No. 2021CP4602312 (S.C., Ct. of Common Pleas for the 16th Judicial Cir., Cty. of York) (the “Scanlon Action”). The Complaint in the New York Derivative Action, which was filed on June 15, 2021, asserts breach of fiduciary duty claims against all defendants and claims for contribution under the federal securities laws against certain of the defendants. The Complaints in the Lesar Action and the Scanlon Action, which were filed on July 26, 2021, assert breach of fiduciary duty and unjust enrichment claims against defendants. On August 27, 2021, the New York Derivative Action was stayed until 30 days after the earlier of: (i) the close of discovery in the Securities Class Action, or (ii) the deadline for appealing a dismissal of the Securities Class Action with prejudice. On October 26, 2021, the Lesar Action and the Scanlon Action were consolidated into a single stockholder derivative action, styled as In Re 3D Systems Corp. Shareholder Derivative Litigation, No. 2021CP4602308 (S.C., Ct. of Common Pleas for the 16th Judicial Cir., Cty. Of York) (the “South Carolina Derivative Action”).

The Company believes the claims alleged in the putative securities class action and derivative lawsuits are without merit and the Company intends to defend itself and its current and former officers vigorously.

Other

We are involved in various other legal matters incidental to our business. Although we cannot predict the results of the litigation with certainty, we believe that the disposition of all these various other legal matters will not have a material adverse effect, individually or in the aggregate, on our consolidated results of operations, consolidated cash flows or consolidated financial position.

(24) Accumulated Other Comprehensive Loss

The changes in the balances of accumulated other comprehensive loss by component are as follows:

<i>(in thousands)</i>	Foreign currency translation adjustment	Defined benefit pension plan	Derivative financial instruments	Liquidation of non-US entity and purchase of non-controlling interests	Total
Balance at December 31, 2019	\$ (33,616)	\$ (3,707)	\$ (318)	\$ 594	\$ (37,047)
Other comprehensive income (loss)	28,752	783	(1,638)	(561)	27,336
Amounts reclassified from accumulated other comprehensive income (loss) ^a	—	—	1,235	—	1,235
Balance at December 31, 2020	(4,864)	(2,924)	(721)	33	(8,476)
Other comprehensive income (loss)	(30,633)	682	—	—	(29,951)
Amounts reclassified from accumulated other comprehensive income (loss) ^a	—	—	721	—	721
Balance at December 31, 2021	<u>\$ (35,497)</u>	<u>\$ (2,242)</u>	<u>\$ —</u>	<u>\$ 33</u>	<u>\$ (37,706)</u>

a. Amount reclassified into Interest and other expense, net on the statement of operations. See Note 15.

The amounts presented in the table above are in other comprehensive loss and are net of taxes. For additional information about foreign currency translation and derivative financial instruments, see Note 15. For additional information about the pension plan, see Note 12.

(25) Restructuring and Exit Activity Costs

On August 5, 2020, we announced, in connection with the new strategic focus, a restructuring plan intended to align our operating costs with current revenue levels and better position the Company for future sustainable and profitable growth. The restructuring plan included a reduction of nearly 20% of our workforce, with the majority of the workforce reduction completed by December 31, 2020. We completed the restructuring efforts in the second quarter of 2021. Cost reduction efforts included reducing the number of facilities and examining every aspect of our manufacturing and operating costs. We incurred cash charges for severance, facility closing and other costs, primarily in the second half of 2020, and continued to incur additional charges through the second quarter of 2021, when we finalized all the actions to be taken. Non-cash charges related to these actions were \$6,400 and are included in facility closing costs. We also divested parts of the business that did not align with this strategic focus. See Note 4.

In connection with the restructuring plan, we recorded pre-tax costs during the years ended December 31, 2021 and 2020, included within selling, general and administrative in the consolidated statement of operations as follows:

<i>(in thousands)</i>	<u>Costs Incurred during 2020</u>	<u>Costs Incurred during 2021</u>	<u>Total Costs Incurred</u>
Severance, termination benefits and other employee costs	\$ 12,914	\$ 660	\$ 13,574
Facility closing costs	6,470	640	7,110
Other costs	668	(179)	489
Total	<u>\$ 20,052</u>	<u>\$ 1,121</u>	<u>\$ 21,173</u>

The liabilities at December 31, 2020 related to these costs were principally recorded in accrued expenses in the consolidated balance sheets and consisted of severance, termination benefits and other employee costs of \$7,173. There were no liabilities at December 31, 2021.

(26) Subsequent Events

We have agreed to acquire Kumovis GmbH and Titan Additive LLC for a combined purchase price of \$80 million, before customary closing adjustments. Titan is a pellet-based extrusion platform that addresses customer applications requiring large build volumes, superior performance, and improved productivity at significantly lower cost, opens up new markets in the Industrial segment. Kumovis, servicing the Healthcare segment, utilizes polyether ether keton or PEEK materials, which has properties that lend it to many medical applications, including many implant applications, that fit perfectly into our personalized healthcare operations. These are expected to close in the second quarter of 2022 and the combined impact of both acquisitions are not expected to have a near-term material impact to the Company's financial position, statement of operations or cash flows, other than the use of cash for the purchase price and the potential increase in goodwill and intangible assets.

ASSET PURCHASE AGREEMENT

SECOND AMENDMENT TO

This Second Amendment (the "Amendment") to the Asset Purchase Agreement, dated June 1, 2021, by and among (i) 3D Systems, Inc., a California corporation ("3D US"); (ii) Quickparts.com, Inc., a Delaware corporation ("3D QP"), (iii) 3D Systems Italia Srl, an Italian private limited company ("3D IT"); (iv) 3D Systems Sarl, a French private limited company ("3D FR"); (v) 3D Systems Europe Limited, a United Kingdom private company limited by shares ("3D UK"); (vi) 3D Systems GmbH, a German limited liability company ("3D DE" and, together with 3D US, 3D QP, 3D IT, 3D FR, and 3D DE, each, a "Seller" and, collectively, the "Sellers"; (vii) QP 3D Acquisition, Inc., a Delaware corporation (the "US Buyer"); and (viii) 3D Systems Corporation, a Delaware corporation ("DDD"), as previously amended by that First Amendment effective as of September 9, 2021 (as so amended, the "Original Agreement"), is entered into effective December ___, 2021. Capitalized terms used but not defined herein shall have the meanings set forth in the Original Agreement.

For good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. Amendment to Exhibit C. Exhibit C is hereby amended to include the following additional item (v) as an Assumed Liability:

(v) All pre-Closing Liabilities for the Specified Employees in France for (i) accrued vacation or paid time off and (ii) accrued pension obligations.

2. Assumed Liability Amount. The Parties acknowledge and agree that the aggregate amount of all Liabilities included in new item (v) on Exhibit C pursuant to Section 1 above shall be included in the calculation of the Closing Assumed Liability Amount for purposes of the Closing Statement and the calculation of the Final Purchase Price pursuant to Section 2.03 of the Original Agreement.

3. Acknowledgment and Survival; Miscellaneous. Except as specifically set forth herein, all other terms and provisions of the Original Agreement shall remain unaffected by the terms of this Amendment, and shall continue in full force and effect. In the event of any conflict between the terms of the Original Agreement and this Amendment, the terms of this Amendment shall govern. The execution and delivery of this Amendment shall not, except as expressly provided herein, constitute a waiver or amendment of (a) any provision of the Original Agreement, or (b) any right, power, or remedy of any party under the Original Agreement. The headings in this Amendment are for reference only and do not affect the interpretation of this Amendment. This Amendment be deemed a part of, and construed in accordance with, the Original Agreement. This Amendment may be executed in several counterparts, each of which shall be deemed an original, but such counterparts shall together (when executed and delivered) constitute but one and the same instrument. This Amendment may be executed and delivered in counterpart signature pages executed and delivered via facsimile transmission or by email transmission in Adobe portable document format (also known as "PDF"), and any such counterpart executed and delivered via facsimile transmission or by email transmission in Adobe portable document format (also known as "PDF") shall be deemed an original for all intents and purposes. This Amendment shall be governed, construed and enforced in accordance with the Laws of the State of Delaware, without giving effect to provisions thereof regarding conflicts of laws (whether of the State of Delaware or any other jurisdiction) that would cause the application of any law other than the State of Delaware.

[Signature Page to Follow]

IN WITNESS WHEREOF, the parties have executed this Second Amendment as of the day and year first above written.

US BUYER:

QUICKPARTS ACQUISITION, INC. f/k/a
QP 3D ACQUISITION, INC.

By: /s/Charles Fleischmann
Name: Charles Fleischmann
Title: Authorized Signatory

DDD:

3D SYSTEMS CORPORATION

By: /s/Andrew M. Johnson
Name: Andrew M. Johnson
Title: EVP, Chief Legal Officer and Secretary

SUBSIDIARIES AND OTHER INVESTMENTS OF THE COMPANY

The following table sets forth the name and state or other jurisdiction of incorporation of our subsidiaries as of December 31, 2021. Except as otherwise indicated, each subsidiary is owned, directly or indirectly, by us. Some subsidiaries have been dissolved or merged during the year.

Name	Jurisdiction of Incorporation
3D Canada Company	Canada
3D Holdings, LLC	Delaware
3D Systems S.A.	Switzerland
3D Systems, Inc.	California
3D European Holdings Ltd.	United Kingdom
3D Latam LLC	Delaware
3D Systems Asia-Pacific Pty Ltd	Australia
3D Systems Benelux B.V.	The Netherlands
3D Systems Corporation	Delaware
3D Systems Europe Ltd.	United Kingdom
3D Systems France SARL	France
3D Systems GmbH	Germany
3D Systems Hong Kong Co., Limited	Hong Kong
3D Systems India, Inc.	Delaware
3D Systems Italia S.r.l.	Italy
3D Systems Industria E Comercio LTDA	Brazil
3D Systems Japan K.K.	Japan
3D Systems Korea, Inc.	Korea
3D Systems, S.A. de C.V.	Mexico
3DS Additive Israel Ltd	Israel
Additive Works GmbH	Germany
AMT, Inc.	Delaware
Geomagic (Shanghai) Software Co., Ltd.	Shanghai, China
Geomagic, Inc.	Delaware
LayerWise NV	Belgium
LayerWise, Inc.	Delaware
Medical Modeling Inc.	Colorado
Medical Precision Parts (MPP)	Belgium
NextDent B.V.	The Netherlands
Oqton, Inc.	Delaware
Oqton Belgium NV	Belgium
Oqton Denmark Aps	Denmark
Oqton Shanghai Ltd.	China
Oqton Singapore Pte. Ltd.	Singapore
OptoForm LLC(a)	Delaware
Phenix Systems	France
Product Development Group LLC	Delaware
Quickparts.com, Inc.	Delaware
Rapidform, Inc.	California

Robtec Ltda
Shanghai Forever Technology & Development Co., Ltd.
Sint-Tech SARL
Three D Sycode India Private Limited

Uruguay
China
France
India

Vertex-Dental B.V.	The Netherlands
Vertex-Dental Asia PTE Ltd	The Netherlands
Vertex-Global Holding B.V.	The Netherlands
Vertex International B.V.	The Netherlands
VIDAR Systems LLC	Virginia
Volumetric Biotechnologies, Inc.	Delaware
Wuxi Easyway Model Design & Manufacture Co, Ltd.	China
Wuxi Hengxinda Science and Technology Development Co., Ltd.(b)	China
Z Corporation	Massachusetts

(a) We directly or indirectly own 60% of the outstanding interests.

Consent of Independent Registered Public Accounting Firm

3D Systems Corporation
Rock Hill, South Carolina

We hereby consent to the incorporation by reference in the Registration Statement on Form S-3 (No. 333-239803) and Form S-8 (No. 333-204305, No. 333-219222 and No. 333-238794) of 3D Systems Corporation of our report dated March 1, 2022, relating to the consolidated financial statements, and the effectiveness of 3D Systems Corporation's internal control over financial reporting, which appears in this Form 10-K. Our report on the effectiveness of internal control over financial reporting expresses an adverse opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2021.

/s/ BDO USA, LLP

Charlotte, North Carolina

March 1, 2022

Exhibit 31.2

**Certification of
Principal Executive Officer of
3D Systems Corporation**

I, Jagtar Narula, certify that:

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

By: /s/ Jagtar Narula

Jagtar Narula

Title: Chief Financial Officer

(principal financial officer)

Date: March 1, 2022

Exhibit 32.1

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

This certification is provided pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 and accompanies the Annual Report on Form 10-K (the "Form 10-K") for the year ended December 31, 2021 of 3D Systems Corporation (the "Issuer").

I, Dr. Jeffrey A. Graves, President, Chief Executive Officer and Director (principal executive officer) of the Issuer, certify that, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, to the best of my knowledge:

- (i) the Form 10-K fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934; and
- (ii) The information contained in the Form 10-K fairly presents, in all material respects, the financial condition and results of operations of the Issuer.

Date: March 1, 2022

/s/ Dr. Jeffrey A. Graves

Name: Dr. Jeffrey A. Graves
(principal executive officer)

Exhibit 32.2

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

This certification is provided pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 and accompanies the Annual Report on Form 10-K (the "Form 10-K") for the year ended December 31, 2021 of 3D Systems Corporation (the "Issuer").

I, Jagtar Narula, the Chief Financial Officer (principal financial officer) of the Issuer, certify that, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, to the best of my knowledge:

- (i) the Form 10-K fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934; and
- (ii) The information contained in the Form 10-K fairly presents, in all material respects, the financial condition and results of operations of the Issuer.

Date: March 1, 2022

/s/ Jagtar Narula

Name: Jagtar Narula

(principal financial officer)