

3D SYSTEMS CORP
Form 10-K
February 28, 2019

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

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

For the fiscal year ended December 31, 2018

OR

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

For the transition period from _____ to _____

Commission File No. 001-34220

3D SYSTEMS CORPORATION
(Exact Name of Registrant as Specified in Its Charter)

DELAWARE	95-4431352
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
333 THREE D SYSTEMS CIRCLE	29730
ROCK HILL, SOUTH CAROLINA	
(Address of Principal Executive Offices)	(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	Name of each exchange on which registered
Common stock, par value \$0.001 per share	The 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

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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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

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

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

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

APPLICABLE ONLY TO CORPORATE ISSUERS:

The aggregate market value of the registrant’s common stock held by non-affiliates of the registrant on June 30, 2018 was \$1,466,778,357. 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.

Indicate the number of shares outstanding of each of the issuer’s classes of common stock, as of the latest practicable date.

Shares of Common Stock, par value \$0.001, outstanding as of February 15, 2019 was 114,340,207.

DOCUMENTS INCORPORATED BY REFERENCE: Portions of the registrant’s definitive proxy statement for its 2019 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, 2018

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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”) is a holding company incorporated in Delaware in 1993 that markets our products and services through subsidiaries 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 region (“APAC”). We provide comprehensive 3D printing solutions, including 3D printers for plastics and metals, materials, software, on demand manufacturing services and digital design tools. Our solutions support advanced applications in a wide range of industries and verticals, including healthcare, aerospace, automotive and durable goods.

Customers can use our 3D solutions to design and manufacture complex and unique parts, eliminate expensive tooling, produce parts locally or in small batches and reduce lead times and time to market. A growing number of customers are shifting from prototyping applications to also using 3D printing for production. We believe this shift will be further driven by our continued advancement and innovation of 3D printing solutions that improve durability, repeatability, productivity and total cost of operations.

Our precision healthcare capabilities include simulation; Virtual Surgical Planning (“VSP™”); and printing of medical and dental devices, anatomical models, and surgical guides and instruments. We have over 30 years of experience and expertise which have proven vital to our development of end-to-end solutions that enable customers to optimize product designs, transform workflows, bring innovative products to market and drive new business models.

Products

We offer a comprehensive range of 3D printers, materials, software, haptic design tools, 3D scanners and virtual surgical simulators.

3D Printers and Materials

Our 3D printers transform digital data input generated by 3D design software, 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. We offer a broad range of 3D printing technologies including Stereolithography (“SLA”), Selective Laser Sintering (“SLS”), Direct Metal Printing (“DMP”), MultiJet Printing (“MJP”) and ColorJet Printing (“CJP”), which are discussed in more detail below.

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 Class IV bio-compatible 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 and highly specialized materials 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, 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.

SLA Printers

Our SLA 3D printers cure liquid resin materials with light or a laser to produce durable plastic parts with surface smoothness, high resolution, edge definition and tolerances that rival the accuracy of machined or molded plastic parts. We offer SLA printers with a wide range of materials, sizes and price points, which are designed for prototyping, end-use part production, casting patterns, molds, tooling, fixtures and medical models.

Figure 4™, a light-based SLA platform, also sometimes referred to as digital light processing ("DLP"), is an ultra-fast additive manufacturing technology with a discrete module design. This design allows a range of products and configurations to meet customer needs from a stand-alone product to modular products to fully-automated solutions. Figure 4 is capable of manufacturing parts in hybrid materials (multi-mode polymerization) that offer toughness, durability, biocompatibility, high temperature deflection and elastomeric properties. Figure 4 is also the first additive manufacturing product which can achieve six sigma repeatability. These capabilities enable new end-use applications in healthcare, dental, durable goods, automotive, aerospace and other verticals.

For SLA printers, we offer a variety of liquid resin materials, primarily under the Accura® brand name. The resins are designed to mimic specific, engineered thermoplastics and provide a wide range of characteristics, including tough, durable, clear, castable, polypropylene-like, ABS-like, high-temperature resistant and Class IV bio-compatible materials. We also offer dental materials for light-based SLA 3D printers under our NextDent™ brand name.

SLS Printers

Our SLS 3D printers use a laser beam to melt and fuse powder-based nylon, engineered plastic and composite materials to produce very strong and durable parts. Customer uses of our SLS printers include functional test models and end-use parts, such as housings, machinery components, ducting, tooling, jigs and fixtures and medical devices and personalized surgery kits and guides.

Our proprietary SLS materials include a range of flexible and rigid plastics, nylons and composite materials marketed under the DuraForm®, LaserForm® and CastForm™ brand names. These materials are available in a variety of lightweight, tough, versatile, high temperature, flexible and durable formulations.

DMP Printers

Our DMP solutions use a laser beam to sinter powders in a variety of metals to produce fully dense parts with outstanding purity, surface finish and resolution. We offer DMP solutions that can process a wide range of materials and powders, including materials with very fine granularity and proven manufacturing applications. We sell DMP systems in various sizes and configurations. Certain models are optimized for specific metals, including titanium,

stainless steel and nickel super alloys. Our DMP printers are used in medical and dental implants, aerospace, automotive and hi-tech and industrial applications, such as conformal cooling, enhanced fluid flow and other complex, lightweight parts.

We offer metal powder materials for our DMP printers, including titanium, stainless steels, tool steels, super alloys, non-ferrous alloys, precious metals and aluminum.

MJP Printers

Our MJP 3D printers utilize jetting head technology to deliver precise, tough parts with exceptional resolution in plastic, wax, elastomeric and engineered materials that we sell under the VisiJet® brand name. Our MJP printers offer the capability to print in real wax as well as rigid and flexible plastics and multiple materials in one build, making them ideal for mechanical functional testing, rapid tooling, jigs and fixtures, casting and foundry patterns and medical models.

CJP Printers

Our CJP 3D printers produce parts from our VisiJet branded, powder-based ceramic-like materials. CJP printers build high-definition, full-color parts that can be sanded, drilled, infiltrated, painted and electroplated, which further expands the options available for finished part characteristics. CJP printers are ideal for producing models used in mechanical design, healthcare, architecture, education, entertainment and packaging applications.

Software and Related Products

We provide digital design tools, including software, scanners and haptic devices. We offer solutions for product design, mold and die design, 3D scan-to-print, reverse engineering, production machining, metrology and inspection. These products are designed to enable a seamless workflow for customers, and are marketed under our Geomagic®, Cimatron® and GibbsCAM® brand names. 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 and print queue management capabilities.

Other Products

We offer 3D virtual reality simulators and simulator modules for medical applications. These 3D simulators are sold under our Symbionix™ brand name and offer clinicians a realistic, hands-on experience to master critical skills, prepare for upcoming procedures and create patient specific simulations and operating room environments through augmented reality and virtual reality. We also provide digitizing scanners for medical and mechanical applications.

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 are continuing 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. Our service engineers provide regularly scheduled preventive maintenance visits to customer sites, we provide training to our partners to enable them to perform these services, and we are adding remote monitoring and maintenance capabilities through our 3DConnect software.

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.

On Demand Solutions

We provide on demand manufacturing services through facilities worldwide in the Americas, EMEA and APAC. We provide a broad range of prototyping, production and finishing capabilities for precision plastic and metal parts and tooling with a wide range of additive and traditional manufacturing processes.

In addition to the sales of parts to customers, we, and our partners, utilize our on demand services as a sales and lead generation tool. Third party preferred service providers also use our on demand manufacturing service as their comprehensive order-fulfillment center, and customers can use our facilities as fulfillment centers in disaster recovery plans. We also provide professional 3D scanning, printing and parts production related to the entertainment industry through our Gentle Giant™ brand.

Software Services

In addition to our software license products described above, we offer software maintenance, which includes updates and support for our software products. Our software is sold with 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.

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 virtual surgical planning, VSP™. We also provide service and maintenance for our surgical simulator products.

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 sales and marketing strategy focuses on an integrated approach that is directed at providing comprehensive solutions designed to meet customer needs. We use a full range of marketing and lead generation tools to promote our products and services on a worldwide basis. Our marketing department supports our global sales organization and distribution channels by providing marketing materials, targeted marketing campaigns, sales leads and demand generation activities.

We sell our solutions globally through a direct sales force, partner channel and in certain geographies, appointed distributors. Our go-to-market and sales organization includes regional general managers, channel managers, direct sales people and application engineers and other support staff throughout the Americas, EMEA and APAC, who are responsible for the sale of products and services and for the management of our network of channel partners.

Additionally, our application engineers provide pre-sales and post-sales support, assist customers with leveraging our latest solutions and production techniques and help identify new applications and sales opportunities. Our on demand manufacturing service also expands our customer relationships and enables lead generation for future sales.

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 and others. For the year ended December 31, 2018, one customer accounted for approximately 13% of our consolidated revenue. We expect to maintain our relationship with this customer. No single customer accounted for more than 10% of our consolidated revenue for the years ended December 31, 2017 or 2016.

Production and Supplies

At our Rock Hill, South Carolina location, we assemble MJP, SLS, CJP and certain models of our SLA 3D printers, as well as other equipment related to these printers. We assemble certain models of our DMP printers in our Leuven, Belgium and Riom, France facilities. We produce our Symbionix branded 3D simulators in Airport City, Israel.

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We outsource certain SLA and DMP printer assembly and refurbishment activities to selected design, engineering and manufacturing companies in the U.S., Belgium and Taiwan. 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. 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 materials from third parties for resale to our customers.

Our equipment assembly and materials blending activities, on demand 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.

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, customers, suppliers, assembly and design firms, engineering companies, materials companies and other 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, 2018 and 2017 we held 1,250 and 1,171 patents worldwide, respectively. At December 31, 2018 and 2017, we had 295 and 271 pending patent applications worldwide, respectively. The principal issued patents covering aspects of our various technologies will expire at varying times through the year 2027.

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 our results of operations or financial position for the three-year period ended December 31, 2018.

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. We also compete with businesses and service bureaus that use such equipment to produce models, prototypes, molds and end-use

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parts. 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. Additionally, certain of our competitors are well established and may have greater financial resources than us.

We believe principal competitive factors include technology capabilities, materials, process and application know-how, total cost of operation of solution, product reliability and the ability to provide a full range of products and services 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.

Employees

At December 31, 2018, we had 2,620 full-time and part-time employees, compared to 2,666 at December 31, 2017. None of our U.S. employees are covered by collective bargaining agreements, however, some of our 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.

Available Information

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.

Executive Officers

The information appearing in the table below sets forth the position or positions held by each of our executive officers and his age as of February 28, 2019. 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 February 28, 2019
Vyomesh I. Joshi President and Chief Executive Officer	64
Charles W. Hull Executive Vice President and Chief Technology Officer	79
Andrew M. Johnson Executive Vice President, Chief Legal Officer and Secretary	44
Herbert Koeck Executive Vice President, Global Go To Market	58
Kevin P. McAlea	

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Executive Vice President and General Manager, Metals and Healthcare	60
John N. McMullen	
Executive Vice President, Chief Financial Officer	60
Philip C. Schultz	
Executive Vice President, Operations	56

Mr. Joshi was appointed the Company's President and Chief Executive Officer, effective April 1, 2016. Prior to joining the Company, Mr. Joshi worked at Hewlett-Packard Company ("HP") from 1980 until his retirement on March 21, 2012. From 2001 to 2012, he was Executive Vice President of HP's Imaging and Printing Group, following two decades of research, engineering and management in HP's imaging and printing systems. In addition to his service on our Board of Directors, Mr. Joshi currently serves on the Board of Directors of Harris Corporation and formerly served on the Board of Directors at Yahoo! Inc. and Wipro Ltd.

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 and as Executive Vice President since 2000. He 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.

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.

Mr. Koeck currently serves as Executive Vice President, Global Go To Market. He joined the Company in September 2016 as General Manager for 3D Systems Europe, Middle East, Africa and India. Mr. Koeck worked at HP from 1987 to 2016, where he served as Managing Director Hewlett-Packard Europe/Middle East and Africa and Senior Vice President for HP's combined Printing and PC business in the same region from 2013 to 2016.

Dr. McAlea currently serves as Executive Vice President and General Manager, Metals & Healthcare. Dr. McAlea joined the Company in 2001 and has served in various executive positions since that time.

Mr. McMullen joined the Company as Executive Vice President, Chief Financial Officer in July 2016. From 2014 to 2016, he was Chief Financial Officer of Eastman Kodak Company, a technology company focused on imaging. Before that, Mr. McMullen had a 32 year career at HP and its acquired companies, including positions as Senior Vice President of Finance and Corporate Treasurer of HP, Chief Financial Officer of HP's Imaging and Printing Group and Vice President of Finance and Strategy for Compaq's Worldwide Sales and Services Group.

Mr. Schultz has served as Executive Vice President, Operations, since December 2018. He served as Senior Vice President, On Demand Solutions from September 2016 to December 2018. From 2014 to 2016, Mr. Schultz served as the Business Administrator for a non-profit, Grace Lutheran Church and Christian School. Previously, he served as Senior Vice President and General Manager of FoxConn from 2009 to 2014. Prior to that, Mr. Schultz held multiple roles at HP during a 25-year career.

Item 1A. Risk Factors

The risks and uncertainties described below are not the only risks that we face. Additional risks not currently known to us or that we currently deem not to be material also may impair our business operations, results of operations and financial condition. If any of the risks described below or if any other risks not currently known to us or that we currently deem not to be material actually occurs, our business, results of operations and financial condition could be materially adversely affected. In that event, the trading price of our common stock could decline, and you could lose all or part of your investment in our common stock.

We face significant competition in many aspects of our business, which could cause our revenue and gross profit margins to decline. Competition could also cause us to reduce sales prices or to incur additional marketing or production costs, which could result in decreased revenue, increased costs and reduced margins.

We compete for customers with a wide variety of producers of equipment and software for models, prototypes, other three-dimensional objects and end-use parts as well as producers of materials and services for this equipment. Some of our existing and potential competitors are researching, designing, developing and marketing other types of competitive equipment and software, materials and services. Certain of these competitors may have financial, marketing, manufacturing, distribution and other resources substantially greater than ours.

We also expect that future competition may arise from the development of allied or related techniques for equipment and materials that are not encompassed by our patents, from the issuance of patents to other companies that may inhibit our ability to develop certain products and from improvements to existing materials and equipment technologies.

Some of our patents have recently expired and others will expire in coming years. Upon expiration of those patents, our competitors may introduce products using the technology previously protected by the expired patents and those products may have lower prices than those of our products. To compete, we may need to reduce our prices for those products, which could adversely affect our revenues, margins and profitability. Additionally, the expiration of our patents could reduce barriers to entry into additive manufacturing, which could result in the reduction of our sales and earnings potential. If competitors using technology previously protected by our expired patents were to introduce products of inferior quality, our potential customers may view the technology negatively, which would have an adverse effect on our image and reputation and on our ability to compete with systems using other additive fabrication technologies.

We intend to follow a strategy of continuing product development to enhance our position to the extent practicable. We cannot assure you that we will be able to maintain our current position in the field or continue to compete successfully against current and future sources of competition. If we do not keep pace with technological change and introduce new products, we may lose revenue and demand for our products. We also incur significant costs associated with the investment in our product development activities in furtherance of our strategy that may not result in increased revenue or demand for our products and that could negatively affect our operating results.

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.

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 generate cash from operations or 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 enhance our cyber security safeguards. We have implemented additional security measures and processes in the last year 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. Despite the implementation of these new 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 be required 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.

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 and joint venture relationships 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 sanctions 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.

The costs and effects of litigation, investigations or similar matters involving us or our subsidiaries, or adverse facts and developments related thereto, could materially affect our business, operating results and financial condition.

We may be involved from time to time in a variety of litigation, investigations, inquiries or similar matters arising out of our business, including those described in Note 22 to the Consolidated Financial Statements. We cannot predict the outcome of these or any other legal matters. In the future, we may need to record litigation reserves with respect to these matters because our insurance may not cover all claims that may be asserted against us. Should the ultimate judgments or settlements in any litigation or investigation significantly exceed our insurance coverage, they could have a material adverse effect on our business, financial condition and results of operations.

We disclosed potential violations of U.S. export controls laws to BIS and DDTC, and the Company is reviewing its export control, trade sanctions, and government contracting compliance risks and potential violations.

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 Quickparts.com, Inc. subsidiary. In addition, while collecting information responsive to the above-referenced subpoena, we 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, which supplemented an initial notice of voluntary disclosure that we submitted to DDTC in February 2018. We are conducting an internal review of our export control, trade sanctions, and government contracting compliance risks and potential violations; implementing associated compliance enhancements; and cooperating with DDTC and BIS, as well as the U.S. Departments of Justice, Defense and Homeland Security. 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.

Throughout 2018, we implemented new compliance procedures to identify and prevent potential violations of export controls laws, trade sanctions, and government contracting laws and regulations. As a result of these compliance

enhancements, we identified additional potential violations of ITAR, and submitted related voluntary disclosures to DDTTC. As we continue to implement additional compliance enhancements throughout 2019, 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 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.

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 occurs towards the end of the quarter, in particular for sales of hardware. 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 cancelled. 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.

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; 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 depend on our supply chain for components and sub-assemblies used in our 3D printers and other products and for raw materials used in our materials. If these relationships were to terminate or be disrupted, our business could be disrupted while we locate alternative suppliers and our expenses may increase.

We have outsourced the assembly of certain of our printers to third party suppliers. In addition, we purchase components and sub-assemblies for our printers from third-party suppliers, and we purchase raw materials that are used in our materials, as well as certain of those materials, from third-party suppliers.

While there are several potential suppliers of the components, parts and sub-assemblies for our products, we currently choose to use only one or a limited number of suppliers for several of these components, 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:

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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.

While we believe that we can obtain all the components necessary for our products from other manufacturers, we require any new supplier to become “qualified” pursuant to our internal procedures, which could involve evaluation processes of varying durations. We generally have our printers and other products assembled based on our internal forecasts and the supply of raw materials, assemblies, components and finished goods from third parties, which are subject to various lead times. In addition, at any time, certain suppliers may decide to discontinue production of an assembly, component 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.

We have engaged selected design and manufacturing companies to assemble certain 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; and

The risk of insolvency of suppliers, as well as the risks that we face, as discussed above, in dealing with a limited number of suppliers.

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

Our success depends upon the continued service and 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. 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 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.

We rely on our management information systems for inventory management, distribution and other key functions. If our information systems fail to adequately perform these functions, or if we experience an interruption in their operation, our business and operating results could be adversely affected.

The efficient operation of our business is dependent on our management information systems. We rely on our management information systems to, among other things, effectively manage our accounting and financial functions, including maintaining our internal controls; to manage our manufacturing and supply chain processes; and to maintain our research and development data. The failure of our management information systems to perform properly could disrupt our business and product development, which may result in decreased sales, increased overhead costs, excess or obsolete inventory, and product shortages, causing our business and operating results to suffer. Although we take steps to secure our management information systems, including our computer systems, intranet and Internet sites, email and other telecommunications and data networks, the security measures we have implemented may not be effective and our systems may be vulnerable to theft, loss, damage and interruption from a number of potential sources and events, including unauthorized access or security breaches, natural or man-made disasters, cyber-attacks, computer viruses, power loss or other disruptive events. Our reputation and financial condition could be adversely affected if, as a result of a significant cyber event or otherwise, our operations are disrupted or shut down; our confidential, proprietary information is stolen or disclosed; we incur costs or are required to pay fines in connection with stolen customer, employee, or other confidential information; we must dedicate significant resources to system repairs or increase cyber security protection; or we otherwise incur significant litigation or other costs.

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.

Regulation in the areas of privacy, data protection and information security could increase our costs and affect or limit our business opportunities and how we collect and/or use personal information.

As privacy, data protection and information security laws, including data localization laws, are interpreted and applied, compliance costs may increase, particularly in the context of ensuring that adequate data protection and data transfer mechanisms are in place. In recent years, there has been increasing regulatory enforcement and litigation activity in the areas of privacy, data protection and information security in the U.S. and in various countries in which we operate.

In addition, state and federal legislators and/or regulators in the U.S. and other countries in which we operate are increasingly adopting or revising privacy, data protection and information security laws that potentially could have significant impact on our current and planned privacy, data protection and information security-related practices, our collection, use, sharing, retention and safeguarding of consumer and/or employee information, and some of our current or planned business activities. New legislation or regulation could increase our costs of compliance and

business operations and could reduce revenues from certain business initiatives. Moreover, the application of existing or new laws to existing technology and practices can be uncertain and may lead to additional compliance risk and cost.

Compliance with current or future privacy, data protection and information security laws relating to consumer and/or employee data could result in higher compliance and technology costs and could restrict our ability to provide certain products and services, which could materially and adversely affect our profitability. Our failure to comply with privacy, data protection and information security laws could result in potentially significant regulatory and/or governmental investigations and/or actions, litigation, fines, sanctions, ongoing regulatory monitoring, customer attrition, decreases in the use or acceptance of our products and services and damage to our reputation and our brand.

Global economic, political and social conditions and financial markets may harm our ability to do business, adversely affect our sales, costs, results of operations and cash flow.

We are subject to global economic, political and social conditions that may cause customers to delay or reduce technology purchases due to economic downturns, difficulties in the financial services sector and credit markets, geopolitical uncertainties, tariffs and other macroeconomic factors affecting spending behavior. We face risks that may arise from financial difficulties experienced by our suppliers, resellers or customers, including, among others, the following:

- Customers or partners to whom we sell our products and services may face financial difficulties or may become insolvent, which could lead to our inability to obtain payment of accounts receivable that those customers may owe;

- Customers and potential customers may experience deterioration of their businesses, which may result in the delay or cancellation of plans to purchase our products;

Key suppliers of raw materials, finished products or components used in the products that we sell may face financial difficulties or may become insolvent, which could lead to disruption in the supply of printers, materials or spare parts to our customers; and

- The inability of customers, including resellers, suppliers and contract manufacturers, to obtain credit financing to finance purchases of our products and raw materials used to build those products.

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 (“Tax Act”) is one such example of recent legislation that impacts the effective tax rate and tax posture of the Company. For additional details see Note 20 to the Consolidated Financial Statements.

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.

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

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

Goodwill is 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. We may experience 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.

We may be subject to product liability claims, which could result in material expense, diversion of management time and attention and damage to our business reputation.

The sale and support of our products entails the risk of product liability claims. From time to time, we may become subject to product liability claims that could lead to significant expenses. The risk may be heightened when we provide products into certain markets, such as healthcare, aerospace and automotive industries.

This risk of product liability claims may also be greater due to the use of certain hazardous chemicals used in the production of certain of our products, including irritants, harmful chemicals and chemicals dangerous to the environment. We may also be subject to claims that our products have been, or may be used to, create parts that are not in compliance with legal requirements or that infringe on the intellectual property rights of others.

We attempt to include provisions in our agreements with customers that are designed to limit our exposure to potential liability for damages arising from defects or errors in our products and other issues. However, the nature and extent of these limitations vary from customer to customer. Their effect is subject to a variety of legal limitations and it is possible that these limitations may not be effective as a result of unfavorable judicial decisions or laws enacted in the future.

Any claim brought against us, regardless of its merit, could result in significant expense, diversion of management time and attention, damage to our business reputation and failure to retain existing customers or to attract new customers. Although we maintain product liability insurance, such insurance is subject to deductibles and there is no guarantee that such insurance will be available or adequate to protect against all such claims. Costs or payments made in connection with product liability claims could adversely affect our financial condition and results of operations.

Our business involves the use of hazardous materials, and we must comply with environmental, health and safety laws and regulations, which can be expensive and restrict how we do business.

Our business involves the blending, controlled storage, use and disposal of hazardous materials. We and our suppliers are subject to federal, state, local and foreign laws and regulations governing the use, manufacture, storage, handling and disposal of these hazardous materials. Although we believe the safety procedures we utilized for handling and disposing of these materials comply with the standards prescribed by these laws and regulations, we cannot eliminate the risk of accidental contamination or injury from these materials. In the event of an accident, local, state, federal or foreign authorities may curtail the use of these materials and interrupt our business operations. If we are subject to any liability as a result of activities involving hazardous materials, our business and financial condition may be adversely affected and our reputation may be harmed.

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, 2017 and December 31, 2018, the trading price of our common stock has ranged from a low of \$7.92 per share to a high of \$23.70 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;

• Future sales of our common stock or other securities (including any shares issued in connection with earn-out obligations for any past or future acquisition);

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.

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Item 2. Properties

Our headquarters is located in Rock Hill, South Carolina. As of December 31, 2018, we owned minimal facilities and we leased approximately 1.1 million square feet, primarily located in the U.S., as summarized below.

Primary Function Category:	Square Feet (in thousands)							
	Americas		EMEA		APAC		TOTAL	
	Leased	Owned	Leased	Owned	Leased	Owned	Leased	Owned
Corporate headquarters	80	—	—	—	—	—	80	—
Manufacturing and warehouse	343	—	183	—	—	—	526	—
Research and development	167	—	—	—	28	—	195	—
Services	118	101	119	—	32	—	269	101
Sales, general and other administrative	—	—	12	—	—	—	12	—
Total square feet	708	101	314	—	60	—	1,082	101

Our headquarters also serves as a research and development site. Other major research and development locations include Cary, North Carolina; San Diego, California; Seoul, Korea; Tel Aviv, Israel; Valencia, California and Wilsonville, Oregon, among others. We believe our existing facilities and equipment are in good operating condition and are suitable for our business in the manner that it is currently conducted. We expect to continue to make investments in capital equipment as needed to meet anticipated demand for our products. See “Item 1. Business – Production and Supplies” and Notes 13 and 21 to the Consolidated Financial Statements for further discussion of our facilities.

Item 3. Legal Proceedings

Information relating to legal proceedings is included in Note 22 to the Consolidated Financial Statements in Item 8, 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."

For information regarding securities authorized for issuance under our equity compensation plans, see Note 15 to the Consolidated Financial Statements contained in Item 8. We did not make any unregistered sales of equity securities in 2018.

As of February 15, 2019, our outstanding common stock was held by approximately 1,100 stockholders of record. This figure does not reflect the beneficial ownership of shares held in the nominee 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, other than our \$200.0 million 5-year term and revolving senior secured credit facility, which limits the amount of cash dividends that we may pay in any one fiscal year to \$30.0 million.

Issuance of Unregistered Securities and Issuer Purchases of Equity Securities

We did not repurchase any of our equity securities during the year ended 2018, except for unvested restricted stock awards repurchased or forfeited pursuant to our 2004 and 2015 Incentive Stock Plans. 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" under Part III, Item 12 of this Form 10-K. Also see Note 15 to the Consolidated Financial Statements.

Issuer purchases of equity securities

	Total number of shares (or units) purchased	Average price paid per share (or unit)	Total number of shares (or units) purchased as part of publicly announced plans or programs	Maximum number (or approximate dollar value) of shares (or units) that may yet be purchased under the plans or programs
January 1, 2018 - January 31, 2018	12,433	9.69	—	\$ —
February 1, 2018 - February 28, 2018	98,456	9.11	—	—
March 1, 2018 - March 31, 2018	3,966	11.51	—	—
April 1, 2018 - April 30, 2018	29,165	11.14	—	—
May 1, 2018 - May 31, 2018	48,711	12.66	—	—
June 1, 2018 - June 30, 2018	1,990	13.60	—	—
July 1, 2018 - July 31, 2018	113,978	13.09	—	—
August 1, 2018 - August 31, 2018	121,424	18.93	—	—
September 1, 2018 - September 30, 2018	6,449	18.69	—	—
October 1, 2018 - October 31, 2018	18,100	15.80	—	—
November 1, 2018 - November 31, 2018	43,526	12.65	—	—
December 1, 2018 - December 30, 2018	63,582	12.12	—	—
Total	561,780	(a) \$ 13.25 (b)	—	\$ —

(a) Represents shares of common stock surrendered to the Company 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, 2018, the cumulative total return on an investment of \$100 assumed to have been made on December 31, 2013 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, (b) the S&P 500 Information Technology Index (c) the S&P Mid-Cap 400 Index and (d) the S&P Small-Cap 600 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.

COMPARISON OF 5-YEAR CUMULATIVE TOTAL RETURN*

* Fiscal years ending December 31.

	12/13	12/14	12/15	12/16	12/17	12/18
3D Systems Corporation	\$ 100	\$ 35	\$ 9	\$ 14	\$ 9	\$ 11
NYSE Composite Index	100	107	103	115	137	125
S&P 500 Information Technology Index	100	120	127	145	201	201
S&P Mid-Cap 400 Index	100	110	107	130	151	134
S&P Small-Cap 600 Index ^(a)	100	106	104	131	149	136

(a) The Company was moved from the S&P Mid-Cap 400 Index to the S&P Small-Cap 600 Index during the reporting period ending December 31, 2018 due the Company's change in market capitalization.

Item 6. Selected Financial Data

The selected consolidated financial data set forth below for the five years ended December 31, 2018 have been derived from our historical Consolidated Financial Statements. You should read this information together with Management's Discussion and Analysis of Financial Condition and Results of Operations, and our Consolidated Financial Statements and the notes thereto included in this Form 10-K.

(in thousands, except per share amounts)	Year ended December 31,				
	2018	2017	2016	2015	2014
Consolidated Statement of (Loss) Income Data:					
Consolidated Revenue:					
Products	\$259,124	\$222,750	\$238,011	\$271,078	\$297,781
Materials	170,091	168,846	156,839	150,740	158,859
Services	258,445	254,473	238,115	244,345	197,012
Total	687,660	646,069	632,965	666,163	653,652
Gross profit	324,394	304,839	309,751	291,809	317,434
Impairment of goodwill and other intangible assets ^(a)	—	—	—	537,179	—
(Loss) income from operations	(43,191)	(53,973)	(38,420)	(641,924)	26,315
Net (loss) income	(45,263)	(65,323)	(39,265)	(663,925)	11,946
Net (loss) income available to common stockholders	(45,505)	(66,191)	(38,419)	(655,492)	11,637
Net (loss) income available to common stockholders per share:					
Basic and diluted	\$(0.41)	\$(0.59)	\$(0.35)	\$(5.85)	\$0.11
Consolidated Balance Sheet Data:					
Working capital	\$233,414	\$231,293	\$302,545	\$286,996	\$432,864
Total assets	825,832	896,764	849,153	891,959	1,530,310
Current portion of debt and capitalized lease obligations	654	644	572	529	684
Long-term debt	25,000	—	—	—	—
Long-term portion of capitalized lease obligations	6,392	7,078	7,587	8,187	8,905
Total stockholders' equity	575,987	615,948	626,700	654,646	1,294,125
Other Data:					
Depreciation and amortization	\$59,293	\$62,041	\$60,535	\$83,069	\$55,188
Interest expense	1,188	919	1,282	2,011	1,227
Capital expenditures	40,694	30,881	16,567	22,399	22,727

During the year ended December 31, 2015, non-cash, non-tax deductible Goodwill impairment charges equal to \$382,271 and \$61,388 were recorded for the Americas and EMEA, respectively, resulting from the annual ^(a)impairment testing. Additionally during the year ended December 31, 2015, a non-cash Intangible asset charge equal to \$93,520 was recorded arising from the Company's other intangible asset impairment testing.

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 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.

Overview and Strategy

We provide comprehensive 3D printing solutions, including 3D printers, materials, software, on demand manufacturing services and digital design tools. Our solutions support advanced applications in a wide range of industries and key verticals including healthcare, aerospace, automotive and durable goods. Our precision healthcare capabilities include simulation, Virtual Surgical Planning ("VSP™"), and printing of medical and dental devices, models, surgical guides and instruments. Our experience and expertise have proven vital to our development of an ecosystem and end-to-end digital workflow solutions which enable customers to optimize product designs, transform workflows, bring innovative products to market and drive new business models.

We are pursuing a strategy focused on offering a comprehensive ecosystem that provides solutions aimed at healthcare, dental, aerospace, automotive and durable goods verticals to address professional and industrial applications. We believe a shift in 3D printing from prototyping to also using additive manufacturing for production is underway. We are focused on innovation and new products to drive expansion into 3D production through improving durability, reliability, repeatability and total cost of operations of 3D printing solutions.

We have launched new 3D printers with increased speeds and capabilities as well as introduced materials with improved strength, durability, elasticity and high temperature capabilities, developments we believe are well suited for advanced and demanding applications. We have also expanded and strengthened our software portfolio to help enhance our customers' workflows from digitize to design to simulate to manufacture, inspect and manage. We plan to continue to invest in development of hardware, software, materials and services to provide comprehensive solutions in plastics and metals to address significant market opportunities with a use-case by use-case approach, focusing on solving specific customer applications and needs within our targeted vertical markets.

To execute this strategy, we are focusing on an operating framework and go-to-market model that drives sustainable, long-term growth and profitability. We are balancing investments to support process improvements, infrastructure enhancements and focused innovation to transform the Company, while also driving an appropriate cost structure. We expect to be able to support growth by prioritizing and focusing our resources, leveraging our technology and domain expertise and maintaining and expanding strong customer and partner relationships. As with any growth strategy, there can be no assurance that we will succeed in accomplishing our strategic initiatives.

Recent Developments

Throughout 2018, we launched several next generation additive manufacturing solutions, a range of materials and new software releases. In February 2018, we introduced the NextDent 5100, a Figure 4-based 3D printer specifically designed for dental labs, which we believe is a breakthrough product for digital dentistry in terms of cost and capabilities. At the same time, we launched several new materials, bringing the total number to 30 dental-specific materials for the NextDent 5100. Additionally we launched the FabPro 1000, a low cost, high productivity DLP-based 3D printer designed for dental and jewelry production as well as high functionality and throughput, industrial prototyping. We began shipping our next generation SLS printer, the ProX SLS 6100, with six production-grade

materials to deliver superior part quality with greater efficiency and lower total cost of operation versus competitors. We launched the ProJet MJP 2500 IC designed to eliminate the cost and time of tooling and storage with 3D printed wax patterns that can be used seamlessly in existing foundry casting processes. We also commercialized Figure 4 stand alone and production solutions, innovative, high-speed production solutions capable of six sigma repeatability and matching injection molding part quality.

In June 2018, we announced a strategic partnership with GF Machining Solutions ("GF"), one of the world's leading providers of complete solutions to the precision machining industry and to manufacturers of precision components. We believe this partnership greatly enhances our metals printing distribution, scalability and automation. In September 2018, we debuted the DMP Factory 500, the first joint solution developed as part of our partnership with GF. The DMP Factory 500 is optimized for scalability, repeatable high quality parts, high throughput and low total cost of operation with the ability to print the largest part diameter available today. We also began shipping the DMP Flex 350 and DMP Factory 350, designed for volume production of critical

components for industrial applications such as aerospace, healthcare, and transportation. Our DMP solutions offer durable and removable print modules, powder management modules, a broad range of metals materials and fully integrated 3DXpert software to help streamline the production of parts. All of the new products above were commercially available by December 31, 2018.

2018 Summary

Total consolidated revenue for the year ended December 31, 2018 increased by 6.4%, or \$41.6 million, to \$687.7 million, compared to \$646.1 million for the year ended December 31, 2017. These results reflect an increase in printers, materials and services revenue, as further discussed below.

For the year ended December 31, 2018 revenue from printers increased 24.5% to \$153.7 million compared to \$123.4 million in the prior year.

Healthcare revenue includes sales of products, materials and services for healthcare-related applications, including simulation, training, planning, 3D printing of anatomical models, surgical guides and instruments and medical and dental devices. For the year ended December 31, 2018, healthcare revenue increased by 19.5%, to \$225.5 million, and made up 32.8% of total revenue, compared to \$188.7 million, or 29.2% of total revenue, for the year ended December 31, 2017. The increase in healthcare revenue is driven by growth in products, including printers, materials and services, including virtual surgical planning and contract manufacturing services.

For the year ended December 31, 2018, total software revenue, including haptics and scanners, from products and services increased 5.0% to \$96.3 million, and made up 14.0% of total revenue, compared to \$91.7 million, or 14.2% of total revenue for the year ended December 31, 2017.

Gross profit for the year ended December 31, 2018 increased by 6.4%, or \$19.6 million, to \$324.4 million, compared to \$304.8 million for the year ended December 31, 2017. Gross profit margin was 47.2% for the years ended December 31, 2018 and 2017.

Operating expenses for the year ended December 31, 2018 increased by 2.4%, or \$8.8 million, to \$367.6 million, compared to \$358.8 million for the year ended December 31, 2017. Selling, general and administrative expenses for the year ended December 31, 2018 increased by 3.1%, or \$8.1 million, to \$272.3 million, compared to \$264.2 million for the year ended December 31, 2017, predominantly due to our investments in new product launches, go-to-market and IT infrastructure.

Research and development expenses for the year ended December 31, 2018 increased by 0.7%, or \$0.7 million, to \$95.3 million, compared to \$94.6 million for the year ended December 31, 2017, predominantly due to investments related to the launch of several new products throughout 2018.

Our operating loss for the year ended December 31, 2018 was \$43.2 million, compared to an operating loss of \$54.0 million for the year ended December 31, 2017.

For the years ended December 31, 2018 and 2017, we generated \$4.8 million and \$26.1 million of cash from operations, respectively, as further discussed below. In total, our unrestricted cash balance at December 31, 2018 and 2017 was \$110.0 million and \$136.3 million, respectively. The lower cash balance was the result of our investments in go-to-market, IT infrastructure, new product launches, and higher legal expenses related to compliance and regulatory matters and payments related to previous litigation settlements.

Results of Operations for 2018, 2017 and 2016

Comparison of revenue by geographic region

2018 compared to 2017

The following table sets forth the change in revenue by geographic region for the years ended December 31, 2018 and 2017:

Table 1

(Dollars in thousands)	Americas		EMEA		Asia Pacific		Total	
Revenue – 2017	\$333,776	51.7 %	\$220,357	34.1 %	\$91,936	14.2 %	\$646,069	100 %
Change in revenue:								
Volume	28,915	8.7 %	18,458	8.4 %	10,995	12.0 %	58,368	9.0 %
Price/Mix	(20,978)	(6.3)%	(8,047)	(3.7)%	4,864	5.3 %	(24,161)	(3.7)%
Foreign currency translation	(948)	(0.3)%	6,694	3.0 %	1,638	1.8 %	7,384	1.1 %
Net change	6,989	2.1 %	17,105	7.7 %	17,497	19.1 %	41,591	6.4 %
Revenue – 2018	\$340,765	49.6 %	\$237,462	34.5 %	\$109,433	15.9 %	\$687,660	100 %

Consolidated revenue increased 6.4%, predominantly driven by higher sales volume across all geographic regions, including recently commercialized new 3D printers, partially offset by an unfavorable impact of price/mix in the Americas and EMEA regions, which was driven by product mix, and the unfavorable impact of foreign currency. The increased sales volume across all geographic regions is due to higher demand from healthcare customers as well as a range of customers across other key verticals. The negative price/mix impact across the Americas and EMEA regions is driven by higher sales of lower priced printer models and mix of materials sales.

For the years ended December 31, 2018 and 2017, revenue from operations outside the U.S., including Latin America, EMEA and APAC, was 51.6% and 50.1% of total revenue, respectively.

2017 compared to 2016

The following table sets forth the change in revenue by geographic region for the years ended December 31, 2017 and 2016:

Table 2

(Dollars in thousands)	Americas		EMEA		Asia Pacific		Total	
Revenue – 2016	\$340,885	53.9 %	\$193,141	30.5 %	\$98,939	15.6 %	\$632,965	100 %
Change in revenue:								
Volume	3,808	1.1 %	25,240	13.1 %	11,281	11.4 %	40,329	6.4 %
Price/Mix	(11,420)	(3.4)%	(2,515)	(1.3)%	(17,809)	(18.0)%	(31,744)	(5.0)%
Foreign currency translation	503	0.1 %	4,491	2.3 %	(475)	(0.5)%	4,519	0.7 %
Net change	(7,109)	(2.2)%	27,216	14.1 %	(7,003)	(7.1)%	13,104	2.1 %
Revenue – 2017	\$333,776	51.7 %	\$220,357	34.1 %	\$91,936	14.2 %	\$646,069	100 %

Consolidated revenue increased 2.1%, driven by higher sales volume in the EMEA and Asia Pacific regions as well as the favorable impact of foreign currency, offset by a shift in product mix and average selling price across all geographic regions. The increase in revenue in the EMEA region primarily reflects higher sales volume, including the addition of Vertex and NextDent branded dental materials, and the favorable impact of foreign currency, partially

offset by a shift in product mix and average selling price. The decrease in revenue in the Americas and Asia Pacific regions are primarily due to a shift in product mix and average selling price, partially offset by an increase in sales volume in the Asia Pacific region.

For the years ended December 31, 2017 and 2016, revenue from operations outside the U.S., including Latin America, EMEA and APAC, was 50.1% and 47.9% of total revenue, respectively.

Comparison of revenue by class

We earn revenue from the sale of products, materials and services. The products category includes 3D printers, healthcare simulators and digitizers, as well as software, 3D scanners and haptic devices. The materials category includes a wide range of materials to be used with our 3D printers, the majority of which are proprietary, as well as acquired conventional dental materials. The services category includes warranty and maintenance on 3D printers and simulators, software maintenance, on demand manufacturing solutions and healthcare services.

Due to the relatively high price of certain 3D printers and a corresponding lengthy selling cycle and 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. Revenue reported in any particular period is also affected by timing of revenue recognition under rules prescribed by U.S. generally accepted accounting principles (“GAAP”).

In addition to changes in sales volumes and the impact of revenue from acquisitions, there are two 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, sometimes referred to as price and mix effects, and (2) the impact of fluctuations in foreign currencies. 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.

2018 compared to 2017

The following table sets forth the change in revenue by class for the years ended December 31, 2018 and 2017.

Table 3

(Dollars in thousands)	Products		Materials		Services		Totals	
Revenue – 2017	\$222,750	34.5 %	\$168,846	26.1 %	\$254,473	39.4%	\$646,069	100.0 %
Change in revenue:								
Volume	43,208	19.4	13,870	8.2	1,290	0.5	58,368	9.0
Price/Mix	(8,656)	(3.9)	(15,505)	(9.2)	—	—	(24,161)	(3.7)
Foreign currency translation	1,822	0.8	2,880	1.7	2,682	1.1	7,384	1.1
Net change	36,374	16.3	1,245	0.7	3,972	1.6	41,591	6.4
Revenue – 2018	\$259,124	37.7 %	\$170,091	24.7 %	\$258,445	37.6%	\$687,660	100.0 %

Consolidated revenue increased 6.4%, predominantly driven by higher sales volume across all revenue categories, including the impact of new printers launched in 2018, and the favorable impact of foreign currency, partially offset by a shift in sales mix which impacted average selling price for both products and materials.

Products revenue increased due to higher demand from healthcare and a wide range of other key verticals and for products across our portfolio, including the recently commercialized new products; partially offset by changes in sales mix which impacted average selling prices, including the impact of higher sales of lower priced printers. Revenue from printers increased 24.5% to \$153.7 million for the year ended December 31, 2018 compared to \$123.4 million in the prior year. For the year ended December 31, 2018, software revenue included in the products category, including scanners and haptic devices, contributed \$51.7 million, an increase of 8.2%, compared to \$47.8 million for the year ended December 31, 2017.

The increase in materials revenue for the year ended December 31, 2018 primarily reflects demand for materials driven by healthcare and industrial customers for our core and new materials, coupled with a favorable impact from foreign currency. The unfavorable price/mix impact is primarily driven by mix of sales during the year, including the impacts of product mix, geographic sales mix and volume purchase pricing.

The increase in services revenue for the year ended December 31, 2018 was primarily driven by growth in healthcare, on demand manufacturing and software services revenue. Despite headwinds related to export compliance and changes in on demand outsourcing procedures and strategy in the second half of 2018, on demand manufacturing services revenue increased 2.2% to \$107.1 million for the year ended December 31, 2018, compared to \$104.7 million for the year ended December 31, 2017. For the years ended December 31, 2018 and 2017, software revenue included in the services category contributed \$44.6 million and \$43.9 million, respectively.

2017 compared to 2016

The following table sets forth the change in revenue by class for the years ended December 31, 2017 and 2016.

Table 4

(Dollars in thousands)	Products		Materials		Services		Totals	
Revenue – 2016	\$238,011	37.6 %	\$156,839	24.8 %	\$238,115	37.6%	\$632,965	100 %
Change in revenue:								
Volume	(2,316)	(1.0)	27,501	17.5	15,144	6.4	40,329	6.4
Price/Mix	(15,979)	(6.7)	(15,765)	(10.1)	—	—	(31,744)	(5.0)
Foreign currency translation	3,034	1.3	271	0.2	1,214	0.5	4,519	0.7
Net change	(15,261)	(6.4)	12,007	7.6	16,358	6.9	13,104	2.1
Revenue – 2017	\$222,750	34.5 %	\$168,846	26.1 %	\$254,473	39.4%	\$646,069	100 %

Consolidated revenue increased 2.1%, driven by increased sales volume in both materials and services as well as the favorable impact of foreign currency, offset by a shift in product mix and average selling prices.

Products revenue decreased due to changes in product mix and average selling prices, including a shift in demand for lower priced printers and a moderate decrease in sales volume. For the years ended December 31, 2017 and 2016, revenue from printers contributed \$123.4 million and \$133.3 million, respectively. Software revenue included in the products category, including scanners and haptic devices, contributed \$47.8 million and \$44.5 million for the years ended December 31, 2017 and 2016, respectively.

The increase in materials revenue reflects continued utilization by the installed base and demand from healthcare customers, including acquired Vertex and NextDent dental materials. This increased demand was partially offset by a decrease related to a shift in product mix and average selling prices.

Services revenue increased primarily due to higher demand for healthcare services. For the years ended December 31, 2017 and 2016, revenue from on demand manufacturing services contributed \$104.6 million and \$104.4 million, respectively. For the years ended December 31, 2017 and 2016, software services revenue contributed \$43.9 million and \$43.2 million, respectively.

Gross profit and gross profit margins

2018 compared to 2017

The following table sets forth gross profit and gross profit margins for the years ended December 31, 2018 and 2017.

Table 5

(Dollars in thousands)	Year Ended December 31,				Change in Profit		Change in Gross Profit Margin	
	2018		2017		\$	%	Percentage Points	%
	Gross Profit	Gross Profit Margin	Gross Profit	Gross Profit Margin				
Products	\$79,928	30.8 %	\$52,136	23.4 %	\$27,792	53.3 %	7.4	31.6 %
Materials	119,494	70.3 %	123,014	72.9 %	(3,520)	(2.9)%	(2.6)	(3.6)%
Services	124,972	48.4 %	129,689	51.0 %	(4,717)	(3.6)%	(2.6)	(5.1)%

Total \$324,394 47.2 % \$304,839 47.2 % \$19,555 6.4 % — — %

The increase in total consolidated gross profit is due to the increase in product sales, primarily higher sales of printers. In addition, the inventory adjustment discussed below had a negative impact on margins in the comparable period for the prior year.

Products gross profit margin increased, primarily due to inventory adjustments totaling \$12.9 million in 2017 that were a result of a comprehensive review of our portfolio and inventory and related primarily to legacy plastics printers, refurbished and used metals printers and parts having minimal or no use over extended periods, and a small increase in gross profit margin as a result of ongoing supply chain cost reduction efforts. Gross profit margin for materials decreased, reflecting the unfavorable impact of

mix driven by geographic sales mix and product mix. Gross profit margin for services decreased, driven by lower on demand manufacturing margin which was partially offset by improved margins for software and maintenance services. On demand manufacturing services gross profit margin decreased to 35.9% for the year ended December 31, 2018, compared to 43.1% for the year ended December 31, 2017 due to mix of sales and lower utilization as we invested in several facilities globally to upgrade and expand capacity while at the same time exiting certain other facilities.

2017 compared to 2016

The following table sets forth gross profit and gross profit margins for the years ended December 31, 2017 and 2016.

Table 6

(Dollars in thousands)	Year Ended December 31,				Change in Gross Profit		Change in Gross Profit Margin	
	2017		2016		\$	%	Percentage Points	%
	Gross Profit	Gross Profit Margin	Gross Profit	Gross Profit Margin				
Products	\$52,136	23.4 %	\$62,998	26.5 %	\$(10,862)	(17.2)%	(3.1)	(11.7)%
Materials	123,014	72.9 %	121,030	77.2 %	1,984	1.6 %	(4.3)	(5.6)%
Services	129,689	51.0 %	125,723	52.8 %	3,966	3.2 %	(1.8)	(3.4)%
Total	\$304,839	47.2 %	\$309,751	48.9 %	\$(4,912)	(1.6)%	(1.7)	(3.5)%

The decrease in total consolidated gross profit is predominantly driven by changes in product mix. Also contributing to the decrease were the inventory adjustments totaling \$12.9 million in 2017 versus adjustments of \$10.7 million in the same period of 2016. The 2017 inventory adjustment resulted from a comprehensive review of our portfolio and inventory during the year ended December 31, 2017. The 2017 inventory adjustment primarily related to legacy plastics printers, refurbished and used metals printers and parts that have shown little to no use over extended periods. The majority of this adjustment relates to the products category. Gross profit for materials decreased primarily due to the addition of Vertex's conventional dental materials, which are lower gross profit margin than 3D printing materials. Gross profit margin for services decreased due to lower gross profit margins in printer services as we invested in addressing legacy issues and building out our service model, which offset the benefit of higher demand for healthcare services. On demand manufacturing services gross profit margin remained flat at 43.1% for the year ended December 31, 2017, compared to 43.0% for the year ended December 31, 2016.

Operating expenses

2018 compared to 2017

The following table sets forth the components of operating expenses for the years ended December 31, 2018 and 2017.

Table 7

(Dollars in thousands)	Year Ended December 31				Change	
	2018		2017		\$	%
	Amount	% Revenue	Amount	% Revenue		
Selling, general and administrative expenses	\$272,287	39.6 %	\$264,185	40.9 %	\$8,102	3.1 %

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Research and development expenses	95,298	13.9	%	94,627	14.6	%	671	0.7%
Total operating expenses	\$367,585	53.5	%	\$358,812	55.5	%	\$8,773	2.4%

Selling, general and administrative expenses increased due to additional employee related costs, in particular to support selling & marketing activities incurred in connection with the launch of new products during 2018, continued investment in IT infrastructure, and higher legal expenses; partially offset by a reduction in outside services costs.

Research and development expenses remained relatively flat as our increased investment in our workforce was offset by a reduction in outside services costs and a reduced materials spend related to products which have been brought to market during 2018.

2017 compared to 2016

The following table sets forth the components of operating expenses for the years ended December 31, 2017 and 2016.

Table 8

(Dollars in thousands)	Year Ended December 31,				Change	
	2017		2016		\$	%
	Amount	% Revenue	Amount	% Revenue		
Selling, general and administrative expenses	\$264,185	40.9 %	\$259,776	41.0 %	\$4,409	1.7 %
Research and development expenses	94,627	14.6 %	88,395	14.0 %	6,232	7.1 %
Total operating expenses	\$358,812	55.5 %	\$348,171	55.0 %	\$10,641	3.1 %

Selling, general and administrative expenses increased primarily due to our investments in go-to-market and IT infrastructure and additional talent and resources, as well as repairs and maintenance costs, offset by lower stock compensation expense due to the impact of adopting a new accounting standard which resulted in a change in our policy for accounting for award forfeitures.

Research and development expenses increased due to focused innovation to drive customers' shift to 3D production, including investment in plastics, in particular our Figure 4 platform, metals, materials and software as well as the addition of talent and resources. Research and development for 2016 included \$4.6 million of expense related to charges and write-offs in connection with our updated strategy and project reprioritization.

Income (loss) from operations

The following table sets forth income (loss) from operations by geographic region for the years ended December 31, 2018, 2017 and 2016.

Table 9

(Dollars in thousands)	Year Ended December 31,		
	2018	2017	2016
Income (loss) from operations			
Americas	\$(69,081)	\$(79,429)	\$(64,377)
EMEA	5,283	7,483	6,016
Asia Pacific	20,607	17,973	19,941
Total	\$(43,191)	\$(53,973)	\$(38,420)

See "Gross profit and gross profit margins" and "Operating expenses" above.

Interest and other expenses, net

The following table sets forth the components of interest and other expenses, net, for the years ended December 31, 2018, 2017 and 2016.

Table 10

(Dollars in thousands)	Year Ended December 31,		
	2018	2017	2016
Interest and other expense, net:			
Foreign exchange (gain) loss	\$(3,011)	\$908	\$(94)
Interest expense, net	399	135	475
Other expense, net	2,649	2,505	1,011
Interest and other expense, net	\$37	\$3,548	\$1,392

The decrease for the year ended December 31, 2018, as compared to the year ended December 31, 2017, is primarily due to the favorable impact of foreign currency.

The increase for the year ended December 31, 2017, as compared to the year ended December 31, 2016, is attributable to impairment charges related to certain cost method investments and an unfavorable impact of foreign currency.

See Note 2 to the Consolidated Financial Statements.

Benefit and provision for income taxes

We recorded a \$2.0 million and \$7.8 million provision for income taxes for the years ended December 31, 2018 and 2017, respectively. In 2016, we recorded a benefit for income taxes of \$0.5 million.

In 2018, our provision reflected \$5.9 million in U.S. tax benefit and \$7.9 million in foreign jurisdictions tax expense. In 2017, our provision reflected \$1.8 million in U.S. tax expense and \$6.0 million in foreign jurisdictions tax expense. In 2016, the benefit primarily reflected a \$3.3 million U.S. tax benefit and \$2.8 million of tax expense in foreign jurisdictions.

During 2018 and 2017, 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 \$95.4 million and \$80.8 million as of December 31, 2018 and 2017, respectively.

For further discussion, see Notes 2 and 20 to the Consolidated Financial Statements.

Net loss attributable to 3D Systems

2018 compared to 2017

The following table sets forth the primary components of net loss attributable to 3D Systems for the years ended December 31, 2018 and 2017.

Table 11

(Dollars in thousands)	Year Ended		
	December 31,		
	2018	2017	Change
Operating loss	\$(43,191)	\$(53,973)	\$10,782
Less:			
Interest and other expense, net	37	3,548	3,511
Provision (benefit) for income taxes	2,035	7,802	5,767
Net loss attributable to noncontrolling interests	242	868	626
Net loss attributable to 3D Systems	\$(45,505)	\$(66,191)	\$20,686
Weighted average shares, basic and diluted	112,327	111,554	
Loss per share, basic and diluted	\$(0.41)	\$(0.59)	

The decrease for the year ended December 31, 2018 as compared to the year ended December 31, 2017 is primarily due to a decrease in loss from operations and interest and other expense. See “Gross profit and gross profit margins” and “Operating expenses” above.

2017 compared to 2016

The following table sets forth the primary components of net loss attributable to 3D Systems for the years ended December 31, 2017 and 2016.

Table 12

(Dollars in thousands)	Year Ended		
	December 31,		
	2017	2016	Change
Operating loss	\$(53,973)	\$(38,420)	\$(15,553)
Less:			
Interest and other expense, net	3,548	1,392	2,156
Provision (benefit) for income taxes	7,802	(547)	8,349
Net loss attributable to noncontrolling interests	868	(846)	1,714
Net loss attributable to 3D Systems	\$(66,191)	\$(38,419)	\$(27,772)
Weighted average shares, basic and diluted	111,554	111,189	
Loss per share, basic and diluted	\$(0.59)	\$(0.35)	

The increase for the year ended December 31, 2017 as compared to the year ended December 31, 2016, is primarily due to a decrease in gross profit, an increase in selling, general and administrative expenses due to investment in go to market and IT infrastructure, an increase in research and development expenses due to our continued investment in plastics, including our Figure 4 platform, metals, materials and software, and the effect of income taxes; which combined to offset the increase in revenue. See “Comparison of revenue by geographic region,” “Gross profit and gross

profit margins,” and “Operating expenses” above.

Liquidity and Capital Resources

Table 13

(Dollars in thousands)	For the Year Ended		Change	
	December 31,			
	2018	2017	\$	%
Cash and cash equivalents	\$ 109,998	\$ 136,344	\$(26,346)	(19.3)%
Accounts receivable, net	126,618	129,879	(3,261)	(2.5)%
Inventories	133,161	103,903	29,258	28.2%
	369,777	370,126	(349)	
Less:				
Current portion of capitalized lease obligations	654	644	10	1.6%
Accounts payable	66,722	55,607	11,115	20.0%
Accrued and other liabilities	59,265	65,899	(6,634)	(10.1)%
	126,641	122,150	4,491	
Operating working capital	\$ 243,136	\$ 247,976	\$(4,840)	(2.0)%

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 primarily consist of funding of working capital and funding of capital expenditures.

Cash flow from operations, cash and cash equivalents, and other sources of liquidity such as bank credit facilities and issuing equity or debt securities, are expected to be available and sufficient to meet foreseeable cash requirements. During the fourth quarter of 2018, we drew \$25 million on our revolving credit line to support working capital and general corporate purposes.

Cash held outside the U.S. at December 31, 2018 was \$73.3 million, or 66.7% of total cash and equivalents, compared to \$88.9 million, or 65.2% of total cash and equivalents at December 31, 2017. Cash held outside the U.S. is used in our foreign operations for working capital purposes and is considered to be permanently invested. 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”, “Credit facilities” and “Capitalized lease obligations” below.

We acquired one business, Vertex, in 2017 for consideration of approximately \$37.6 million, net of cash assumed, related to expanding our healthcare solutions portfolio, particularly within the dental vertical. Consideration consisted of approximately \$34.3 in cash, net of cash assumed, and approximately \$3.2 million in shares of the Company’s common stock.

Days sales outstanding was 69 days at December 31, 2018 compared to 73 days at December 31, 2017, while accounts receivable more than 90 days past due decreased to 8.9% of gross receivables at December 31, 2018, from 9.1% at December 31, 2017. We review specific receivables periodically to determine the appropriate reserve for accounts receivable.

The majority of our inventory consists of finished goods, including products, materials and service parts. Inventory also consists of raw materials for certain printers and service products.

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.

Cash Flow

The following tables set forth components of cash flow for the years ended December 31, 2018, 2017 and 2016.

Table 14

(Dollars in thousands)	Year Ended December 31,		
	2018	2017	2016
Net cash provided by operating activities	\$4,796	\$26,127	\$57,483
Net cash used in investing activities	(41,827)	(70,659)	(21,882)
Net cash provided by (used in) financing activities	14,264	(9,188)	(3,926)
Effect of exchange rate changes on cash and cash equivalents	(3,145)	5,303	(2,369)
Net (decrease) increase in cash and cash equivalents	\$(25,912)	\$(48,417)	\$29,306

Cash flow from operations

Table 15

(Dollars in thousands)	Year Ended December 31,		
	2018	2017	2016
Net loss	\$(45,263)	\$(65,323)	\$(39,265)
Non-cash charges	89,378	100,095	107,952
Changes in working capital and all other operating assets	(39,319)	(8,645)	(11,204)
Net cash provided by operating activities	\$4,796	\$26,127	\$57,483

Cash provided by operating activities for 2018, 2017 and 2016 was \$4.8 million, \$26.1 million and \$57.5 million, respectively. Excluding non-cash charges, net income provided cash of \$44.1 million in 2018, \$34.8 million in 2017 and \$68.7 million in 2016. Non-cash charges generally consist of depreciation, amortization, stock-based compensation and inventory adjustments.

Working capital requirements used cash of \$39.3 million in 2018, \$8.6 million in 2017 and \$11.2 million in 2016. Spend on inventory was the primary driver of the working capital outflows in all years and it was partially offset by other working capital items.

Cash flow from investing activities

Table 16

(Dollars in thousands)	Year Ended December 31,		
	2018	2017	2016
Cash paid for acquisitions, net of cash assumed	\$—	\$(34,291)	\$—
Purchases of property and equipment	(40,694)	(30,881)	(16,567)
Additions to license and patent costs	(970)	(1,159)	(1,132)
Purchase of noncontrolling interest	—	(2,250)	(3,533)
Proceeds from disposition of property and equipment	333	273	350
Other investing activities	(496)	(2,351)	(1,000)
Net cash used in investing activities	\$(41,827)	\$(70,659)	\$(21,882)

Cash used by investing activities was \$41.8 million in 2018, \$70.7 million in 2017 and \$21.9 million in 2016. The primary outflows of cash were acquisitions and capital expenditures.

Growth in capital expenditures is driven by our continued investment in our facilities for new product development efforts, including our Customer Innovation Centers, on demand facilities and IT infrastructure.

Acquisitions

As noted above, we acquired Vertex in 2017.

We made no acquisitions during the years ended December 31, 2018 and 2016.

Cash flow from financing activities

Table 17

(Dollars in thousands)	Year Ended December 31,		
	2018	2017	2016
Proceeds from borrowings	\$25,000	\$—	\$—
Payments related to net-share settlement of stock-based compensation	(7,367)	(5,545)	(2,871)
Payments on earnout consideration	(2,675)	(3,206)	—
Repayment of capital lease obligations	(694)	(437)	(1,055)
Net cash provided by (used in) financing activities	\$14,264	\$ (9,188)	\$ (3,926)

Cash provided by (used in) financing activities was \$14.3 million in 2018, \$(9.2) million in 2017 and \$(3.9) million in 2016. The primary source of cash was a \$25.0 million draw on our revolving credit line in the fourth quarter of 2018, offset by outflows of cash related to the settlement of stock-based compensation and payments on earnout provisions during the years ended 2018 and 2017. The primary outflows of cash in 2016 relate to the settlement of stock-based compensation and repayment of capital lease obligations.

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.

Contractual Obligations and Commercial Commitments

The table below summarizes our contractual obligations as of December 31, 2018.

Table 18

(Dollars in thousands)	Years Ending December 31,				Total
	2019	2020-2021	2022-2023	Later Years	
Capitalized lease obligations	\$ 1,099	\$ 1,747	\$ 1,504	\$ 5,990	\$ 10,340
Debt obligations	25,000	—	—	—	25,000
Non-cancelable operating leases ^(a)	15,123	16,150	10,942	7,707	49,922
Purchase commitments ^(b)	54,972	—	—	—	54,972
Total	\$96,194	\$ 17,897	\$ 12,446	\$ 13,697	\$ 140,234

^(a) We lease certain facilities under non-cancelable operating leases expiring through 2027. The leases are generally on a net-rent basis, under which we pay taxes, maintenance and insurance.

^(b) Includes amounts committed under legally enforceable agreements for goods and services with defined terms as to quantity, price and timing of delivery. For further discussion, see Note 22 to the Consolidated Financial Statements.

Other Contractual Commitments

Credit facilities

In October 2014, we entered into a \$150.0 million 5-year revolving, unsecured credit facility (the "Prior Credit Agreement"). As of December 31, 2018 there was \$25.0 million outstanding balance under the Prior Credit Agreement and no outstanding balance as of December 31, 2017. The Prior Credit Agreement contained customary covenants, some of which required the Company to

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maintain certain financial ratios that determined the amounts available and terms of borrowings and events of default. The Company was in compliance with all covenants at both December 31, 2018 and December 31, 2017. The Prior Credit Agreement was terminated on February 27, 2019. See Note 12 to the Consolidated Financial Statements.

On February 27, 2019, we entered into a 5-year \$100.0 million senior secured term loan facility (the “Term Facility”) and a 5-year \$100.0 million senior secured revolving credit facility (the “Revolving Facility” and, together with the Term Facility, the “Senior Credit Facility”), which replaced the Prior Credit Agreement. Borrowings under the Senior Credit Facility were used to refinance the existing indebtedness under the Prior Credit Agreement and will be used to support working capital and for general corporate purposes. For further discussion of the Senior Credit Facility, see Item 9B and Note 12 to the Consolidated Financial Statements.

Redeemable noncontrolling interests

The minority interest shareholders of a certain subsidiary have the right to require us to acquire either a portion of or all ownership interest under certain circumstances pursuant to a contractual arrangement, and we have a similar call option under the same contractual terms. The amount of consideration under the put and call rights is not a fixed amount, but rather is dependent upon various valuation formulas and on future events, such as revenue and gross margin performance of the subsidiary through the date of exercise, as described in Note 22 to the Consolidated Financial Statements. Management estimates, assuming that the subsidiary owned by us at December 31, 2018 performs at its forecasted earnings levels, that these rights, if exercised, could require us to pay an amount of approximately \$8.9 million to the owners of such put rights. This amount has been recorded as redeemable noncontrolling interests on the balance sheet at December 31, 2018 and 2017 and would be payable in 2019, if exercised.

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. We also, when we consider it to be appropriate, enter into foreign currency contracts to hedge exposures arising from those transactions. The Company had \$75.3 million and \$39.6 million in notional foreign exchange contracts outstanding as of December 31, 2018 and 2017, respectively. The fair value of these contracts was not material.

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. We have elected not to prepare and maintain the documentation to qualify for hedge accounting treatment under ASC 815, "Derivatives and Hedging," and therefore, we recognize all gains and losses (realized or unrealized) in interest and other expense, net in our Consolidated Statements of Operations and Other Comprehensive Loss.

Changes in the fair value of derivatives are recorded in interest and other expense, net, in our Consolidated Statements of Operations and Other Comprehensive Loss. Depending on their fair value at the end of the reporting period, derivatives are recorded either in prepaid and other current assets or in accrued liabilities in our Consolidated Balance Sheets.

See Note 11 to the Consolidated Financial Statements.

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.

Please see Notes to Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on 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 the Company expects to receive in exchange for those products or services. A majority of the Company's revenue is recognized at the point in time when products are shipped or services are delivered to customers.

The Company enters 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 its contracts with customers include multiple performance obligations. For such arrangements, the Company allocates 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, the Company estimates SSP using historical transaction data. The Company uses 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, the Company determines the SSP using information that may include market conditions and other observable inputs.

In some circumstances, the Company has 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, the Company 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 the Company's 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.

See Notes 2 and 4, "Revenue" to the Consolidated Financial Statements.

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.

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 Services ("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 5 to the Consolidated Financial Statements.

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. 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 is a two-step process to first identify potential goodwill impairment for each reporting unit by comparing the fair value of each of our reporting units to its respective carrying value and then, if necessary, measure the amount of the impairment loss. 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 consistent with our operating segments in Note 21 to the Consolidated Financial Statements in Item 8.

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 and geographic risks unique to each reporting unit.

We conducted our annual impairment testing for the years ended December 31, 2018, 2017 and 2016 in the fourth quarters. There was no goodwill impairment for the years ended December 31, 2018, 2017 and 2016.

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 22 to the Consolidated Financial Statements.

Recent Accounting Pronouncements

See Note 2 to the Consolidated Financial Statements included in this report 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 borrowings. At December 31, 2018, we had \$25.0 million outstanding debt subject to an interest rate of 3.56%. A hypothetical interest rate change of 10% would not have a material impact on annualized interest expense.

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 2018, approximately 51.6% of our net sales and a significant portion of our costs and 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 euro, Japanese yen, British pound, Korean won or other currencies in which we receive sale proceeds and the dollar have a direct impact on our operating results. 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, 2018, a hypothetical change of 10% in foreign currency exchange rates would cause a change in revenue of approximately \$29.9 million, assuming all other variables remained constant.

We enter into foreign currency forward contracts to minimize the effect of fluctuating foreign currencies. At December 31, 2018, we had notional forward exchange contracts outstanding of \$75.3 million. We believe these foreign currency forward contracts and the offsetting underlying commitments, when taken together, do not create material market risk.

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, 2018, a hypothetical 10% change in commodity prices for raw materials would cause a change to cost of sales of approximately \$3.4 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, 2018. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded as of December 31, 2018 that our disclosure controls and procedures were effective.

Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting. 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. Management assessed the effectiveness of our internal control over financial reporting and concluded that, as of December 31, 2018, such internal control was effective at the reasonable assurance level described above.

The effectiveness of our internal control over financial reporting as of December 31, 2018 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.

Changes in Internal Controls over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially effect, our internal control over financial reporting.

Item 9B. Other Information

Senior Credit Facility

On February 27, 2019, the Company, as borrower, and certain of its subsidiaries, as guarantors (“Guarantors”), entered into the Senior Credit Facility with HSBC Bank USA, National Association, as Administrative Agent, Sole Lead Arranger and Sole Bookrunner, and the other lenders party thereto (the “Lenders”). The Senior Credit Facility is comprised of (i) the 5-year \$100.0 million senior secured Term Facility and (ii) the 5-year \$100.0 million senior secured Revolving Facility. Borrowings under the Senior Credit Facility were used to refinance the existing indebtedness under the Prior Credit Agreement and will be used to support working capital and for general corporate purposes. Subject to certain terms and conditions contained in the Revolving

Facility, the Company has the right to request up to four increases to the amount of the Revolving Facility in an aggregate amount not to exceed \$100.0 million.

Pursuant to the Senior Credit Facility, the Guarantors guarantee, among other things, all of the obligations of the Company and each other Guarantor under the Senior Credit Facility. From time to time, the Company may be required to cause additional domestic subsidiaries to become guarantors under the Senior Credit Facility.

Generally, amounts outstanding under the Senior Credit Facility bear interest, at the Company's option, at either the Base Rate or the LIBOR Rate (as each is defined in the Senior Credit Facility), in each case, plus an applicable margin. Base Rate advances bear interest at a rate per annum equal to the sum of (i) the highest of (A) the Administrative Agent's prime rate, (B) the Federal Funds Effective Rate (as defined in the Senior Credit Facility) plus 0.5% or (C) the LIBOR Rate for a Loan under the LIBOR Rate Option (as defined in the Senior Credit Facility) with a one-month interest period commencing on such day plus 1.0% and (d) 0%, and (ii) an applicable margin that ranges from 0.75% to 1.50% based upon the Company's consolidated total leverage ratio. LIBOR Rate advances bear interest at a rate based upon the London interbank offered rate for the applicable interest period, plus an applicable margin that ranges from 1.75% to 2.50% based upon the Company's consolidated total leverage ratio. Under the terms of the Senior Credit Facility, (i) accrued interest on each loan bearing interest at the Base Rate is payable quarterly in arrears and (ii) accrued interest on each loan bearing interest at the LIBOR Rate is payable in arrears on the last day of each applicable interest payment date for each loan. The Company is required to make quarterly amortization payments on the Term Facility in accordance with the Senior Credit Facility. The Senior Credit Facility is scheduled to mature on February 26, 2024, at which time all amounts outstanding thereunder will be due and payable. However, the maturity date of the Revolving Facility may be extended at the election of the Company with the consent of the Lenders subject to the terms set forth in the Senior Credit Facility.

The Company is required to pay certain fees in connection with the Senior Credit Facility, including a quarterly commitment fee equal to the product of the amount of the average daily available commitments under the Senior Credit Facility multiplied by a percentage that ranges from 0.30% to 0.45% depending upon the Company's consolidated total leverage ratio, quarterly standby letter of credit and trade letter of credit fees equal to the product of the average daily amount available to be drawn under each letter of credit multiplied by a percentage that ranges from 1.75% to 2.50% depending on the Company's consolidated total leverage ratio, as well as customary and letter of credit administrative fees.

The Senior Credit Facility contains customary representations, warranties, covenants, and default provisions for a credit facility of this type, including financial covenants, limitations on liens, the incurrence of debt and distributions, covenants to preserve corporate existence and comply with laws, and covenants regarding the use of proceeds of the Senior Credit Facility. The financial covenants include (i) a maximum consolidated total leverage ratio, which is the ratio of consolidated total funded indebtedness to Consolidated EBITDA (as defined in the Senior Credit Facility) of (A) 3.50 to 1.00 for the fiscal quarter ending March 31, 2019 through and including the fiscal quarter ending December 31, 2020, (B) 3.25 to 1.00 for the fiscal quarter ending March 31, 2021 through and including the fiscal quarter ending December 31, 2021, and (C) 3.00 to 1.00 for each fiscal quarter thereafter, and (ii) if at any time there are loans outstanding during any fiscal quarter, a minimum interest coverage ratio, which is the ratio of Consolidated EBITDA to cash interest expense, of 3.50 to 1.0 for such quarter. The occurrence of an event of default under the Senior Credit Facility could result in all loans and other obligations becoming immediately due and payable and the Senior Credit Facility being terminated.

The Company and its affiliates regularly engage the Lenders to provide other banking services. All of these engagements are negotiated at arm's length.

The foregoing description of the Senior Credit Facility does not purport to be complete and is subject to, and qualified in its entirety by, the full text of the Senior Credit Facility attached hereto as Exhibit 10.10, which is incorporated herein by reference.

Security Agreement

On February 27, 2019, in connection with entering into the Senior Credit Facility, the Company and the Guarantors entered into a Security Agreement (the “Security Agreement”), pursuant to which the Company and the Guarantors granted a first priority security interest on substantially all of the assets of the Company and Guarantors, including the equity of their respective domestic subsidiaries and 65% of the equity of their first-tier foreign subsidiaries as security for indebtedness and obligations of the Company and the Guarantors under the Senior Credit Facility.

The foregoing description of the Security Agreement does not purport to be complete and is subject to, and qualified in its entirety by, the full text of the Security Agreement attached hereto as Exhibit 10.11, which is incorporated herein by reference.

Termination of Prior Credit Agreement

Concurrently with the Company's entry into the Senior Credit Facility, the Prior Credit Agreement was terminated.

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 2019 Annual Meeting of Stockholders ("Proxy Statement") under the captions "Proposal One - Election of Directors," "Corporate Governance Matters," "Section 16(a) Beneficial Ownership Reporting Compliance," "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, 2018. For a description of these plans, please see Note 15 to the Consolidated Financial Statements.

	Number of securities to be issued upon exercise of outstanding stock options, warrants and rights	Weighted average exercise price of outstanding options, warrants and rights ^(a)	Number of securities remaining available for future issuance under equity compensation plans ^(b)
Equity compensation plans approved by stockholders:			
Stock options	1,780	\$ 14.10	
Restricted stock units	1,340		
Total	3,120		4,878

(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 - 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:

- 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* Amended and Restated 2004 Incentive Stock Plan of 3D Systems Corporation (Incorporated by reference to Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed February 5, 2015.)
- 4.2* Form of Restricted Stock Purchase Agreement for Employees under the 2004 Incentive Stock Plan. (Incorporated by reference to Exhibit 4.2 to Registrant's Registration Statement on Form S 8, filed on May 19, 2004.)
- 4.3* Form of Restricted Stock Purchase Agreement for Officers under the 2004 Incentive Stock Plan. (Incorporated by reference to Exhibit 4.3 to Registrant's Registration Statement on Form S 8 (Registration No. 333-115642), filed on May 19, 2004.)
- 4.4* Form of Restricted Stock Purchase Agreement under the Amended and Restated 2004 Incentive Stock Plan. (Incorporated by reference to Exhibit 10.3 to Registrant's Current Report on Form 8-K (Registration No. 333-115642), filed on February 5, 2015.)
- 4.5* Form of Restricted Stock Unit Purchase Agreement under the Amended and Restated 2004 Incentive Stock Plan. (Incorporated by reference to Exhibit 10.2 to Registrant's Current Report on Form 8-K, filed on February 5, 2015.)

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4.6* Restricted Stock Plan for Non-Employee Directors of 3D Systems Corporation. (Incorporated by reference to Exhibit 4.4 to Registrant's Registration Statement on Form S-8 (Registration No. 333-115642), filed on May 19, 2004.)

4.7* Amendment No. 1 to Restricted Stock Plan for Non-Employee Directors. (Incorporated by reference to Exhibit 10.1 to Registrant's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2005, filed on August 1, 2005.)

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- 4.8* Form of Restricted Stock Purchase Agreement for Non Employee Directors. (Incorporated by reference to Exhibit 4.5 to Registrant's Registration Statement on Form S 8 (Registration No. 333-115642), filed on May 19, 2004.)
- 4.9 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.)
- 4.10* Appendix A to the Amended and Restated 2004 Incentive Stock Plan of 3D Systems Corporation effective March 11, 2015. (Incorporated by reference to Exhibit 10.1 to Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, filed on May 6, 2015.)
- 4.11* Amended and Restated 2015 Incentive Plan of 3D Systems Corporation effective May 16, 2017 (Incorporated by reference to Exhibit 4.14 to Registrant's Registration Statement on Form S-8 (Registration No. 333-219222), filed on July 11, 2017.)
- 4.12* 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.)
- 4.13* Form of Restricted Stock Award Agreement. (Incorporated by reference to Exhibit 4.2 to Registrant's Registration Statement on Form S-8 (Registration No. 333-204305), filed on May 19, 2015.)
- 4.14* Form of Restricted Stock Unit Award Agreement. (Incorporated by reference to Exhibit 4.3 to Registrant's Registration Statement on Form S-8 (Registration No. 333-204305), filed on May 19, 2015.)
- 4.15* Form of Stock Option Award Agreement (Incorporated by reference to Exhibit 10 to Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2016, filed on May 5, 2016.)
- 4.16* 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.)
- 4.17* Form of Stock Option Award Agreement with Share Price Vesting Conditions (Incorporated by reference to Exhibit 4.18 to Registrant's Annual Report on Form 10 K for the year ended December 31, 2016, filed on February 28, 2017.)
- 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.)

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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.)

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- 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* 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.)
- 10.8* Kevin P. McAlea severance arrangement (Incorporated by reference to Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2010, filed on July 29, 2010.)
- 10.9 Credit Agreement, dated as of October 10, 2014, among 3D Systems Corporation, the Guarantors party thereto, PNC Bank, National Association, as Administrative Agent, PNC Capital Markets LLC, as Sole Lead Arranger and Sole Bookrunner, HSBC Bank USA, N.A., as Syndication Agent, and the other lenders party thereto. (Incorporated by reference to Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed on October 14, 2014.)
- 10.10 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.
- 10.11 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.
- 10.12* Employment Agreement, dated April 1, 2016, between 3D Systems Corporation and Vyomesh I. Joshi. (Incorporated by reference to Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed on April 4, 2016.)
- 10.13* Employment Agreement, dated June 15, 2016, between 3D Systems Corporation and John N. McMullen. (Incorporated by reference to Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed on June 16, 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* First Amendment, dated June 15, 2016, to the Restricted Stock Purchase Agreement, dated February 4, 2014, by and between 3D Systems Corporation and Andy M. Johnson. (Incorporated by reference to Exhibit 10.3 to Registrant's Current Report on Form 8-K, filed on June 16, 2016.)
- 10.16* First Amendment, dated June 15, 2016, to the Restricted Stock Purchase Agreement, dated February 3, 2015, by and between 3D Systems Corporation and Andrew M. Johnson. (Incorporated by reference to Exhibit 10.4 to Registrant's Current Report on Form 8-K, filed on June 16, 2016.)
- 10.17* First Amendment, dated June 15, 2016, to the Restricted Stock Purchase Agreement, dated November 13, 2015, by and between 3D Systems Corporation and Andrew M. Johnson. (Incorporated by reference to Exhibit 10.5 to Registrant's Current Report on Form 8-K, filed on June 16, 2016.)

10.18* Employment Agreement, dated July 1, 2016, between 3D Systems Corporation and David R. Styka.
(Incorporated by reference to Exhibit 10.1 to Registrant's Current Report on Form 8-K, filed on July 5, 2016.)

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- 10.19* First Amendment, dated July 1, 2016, to the Restricted Stock Purchase Agreement, dated January 14, 2015, by and between 3D Systems Corporation and David R. Styka. (Incorporated by reference to Exhibit 10.2 to Registrant's Current Report on Form 8-K, filed on July 5, 2016.)
- 10.20* First Amendment, dated July 1, 2016, to the Restricted Stock Purchase Agreement, dated May 19, 2015, by and between 3D Systems Corporation and David R. Styka. (Incorporated by reference to Exhibit 10.3 to Registrant's Current Report on Form 8-K, filed on July 5, 2016.)
- 10.21* First Amendment, dated July 1, 2016, to the Restricted Stock Purchase Agreement, dated November 13, 2015, by and between 3D Systems Corporation and David R. Styka. (Incorporated by reference to Exhibit 10.4 to Registrant's Current Report on Form 8-K, filed on July 5, 2016.)
- 10.22* 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 on August 8, 2016.)
- 10.23* 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.)
- 10.24* Employment Agreement, dated September 5, 2016, between 3D Systems SA and Herbert Koeck.
- 10.25* Letter of Secondment, dated March 5, 2018, between 3D Systems Corporation and Herbert Koeck.
- 10.26* Employment Agreement, dated August 24, 2016, between 3D Systems Corporation and Philip Schultz.
- 21.1 Subsidiaries of Registrant.
- 23.1 Consent of Independent Registered Public Accounting Firm.
- 31.1 Certification of Principal Executive Officer Pursuant to Section 302 of the Sarbanes Oxley Act of 2002, dated February 28, 2019.
- 31.2 Certification of Principal Financial Officer Pursuant to Section 302 of the Sarbanes Oxley Act of 2002, dated February 28, 2019.
- 32.1 Certification of Principal Executive Officer pursuant to Section 906 of the Sarbanes Oxley Act of 2002, dated February 28, 2019.
- 32.2 Certification of Principal Financial Officer pursuant to Section 906 of the Sarbanes Oxley Act of 2002, dated February 28, 2019.
- 101.INS XBRL Instance Document
- 101.SCH XBRL Taxonomy Extension Scheme Document

101.CAL XBRL Taxonomy Extension Calculation Linkbase Document

101.DEF XBRL Taxonomy Extension Definition Linkbase Document

101.LAB XBRL Taxonomy Extension Label Linkbase Document

101.PRE XBRL Taxonomy Extension Presentation Linkbase Document

* Management contract or compensatory plan or arrangement

Item 16. Form 10-K Summary

None.

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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/ VYOMESH I. JOSHI
 Vyomesh I. Joshi
 Chief Executive Officer, President and
 Director
 Date: February 28, 2019

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.

Signature	Title	Date
/s/ VYOMESH I. JOSHI Vyomesh I. Joshi	Chief Executive Officer, President and Director (principal executive officer)	February 28, 2019
/s/ JOHN N. MCMULLEN John N. McMullen	Executive Vice President and Chief Financial Officer (principal financial and accounting officer)	February 28, 2019
/s/ CHARLES W. HULL Charles W. Hull	Executive Vice President, Chief Technology Officer and Director	February 28, 2019
/s/ CHARLES G. MCCLURE, JR Charles G. McClure, Jr.	Chairman of the Board of Directors	February 28, 2019
/s/ JIM D. KEVER Jim D. Kever	Director	February 28, 2019
/s/ KEVIN S. MOORE Kevin S. Moore	Director	February 28, 2019
/s/ WILLIAM E. CURRAN William E. Curran	Director	February 28, 2019
/s/ JOHN J. TRACY Dr. John J. Tracy	Director	February 28, 2019
/s/ WILLIAM D. HUMES William D. Humes	Director	February 28, 2019
/s/ JEFFREY WADSWORTH Dr. Jeffrey Wadsworth	Director	February 28, 2019

/s/ THOMAS W. ERICKSON Director
Thomas W. Erickson

February 28, 2019

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3D Systems Corporation
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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 Systems Corporation and its subsidiaries' (the "Company's") internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (the "COSO criteria"). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

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, 2018 and 2017, the related consolidated statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and our report dated February 28, 2019 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.

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

February 28, 2019

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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 and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive loss, stockholders’ equity, and cash flows for each of the three years in the period ended December 31, 2018, 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 and subsidiaries at December 31, 2018 and 2017, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

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, 2018, 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 February 28, 2019 expressed an unqualified 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.

/s/ BDO USA, LLP

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

Charlotte, North Carolina

February 28, 2019

3D Systems Corporation
Consolidated Balance Sheets

(in thousands, except par value)	December 31, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	\$109,998	\$136,344
Accounts receivable, net of reserves — \$8,423 (2018) and \$10,258 (2017)	126,618	129,879
Inventories	133,161	103,903
Insurance proceeds receivable	—	50,000
Prepaid expenses and other current assets	27,697	18,296
Total current assets	397,474	438,422
Property and equipment, net	107,718	97,521
Intangible assets, net	68,275	98,783
Goodwill	221,334	230,882
Deferred income tax asset	4,217	4,020
Other assets, net	26,814	27,136
Total assets	\$825,832	\$896,764
LIABILITIES AND EQUITY		
Current liabilities:		
Current portion of capitalized lease obligations	\$654	\$644
Accounts payable	66,722	55,607
Accrued and other liabilities	59,265	65,899
Accrued litigation settlement	—	50,000
Customer deposits	4,987	5,765
Deferred revenue	32,432	29,214
Total current liabilities	164,060	207,129
Long-term debt	25,000	—
Long-term portion of capitalized lease obligations	6,392	7,078
Deferred income tax liability	6,190	8,983
Other liabilities	39,331	48,754
Total liabilities	240,973	271,944
Redeemable noncontrolling interests	8,872	8,872
Commitments and contingencies (Note 22)		
Stockholders' equity:		
Common stock, \$0.001 par value, authorized 220,000 shares; issued 118,650 (2018) and 117,025 (2017)	117	115
Additional paid-in capital	1,355,503	1,326,250
Treasury stock, at cost — 2,946 shares (2018) and 2,219 shares (2017)	(15,572)	(8,203)
Accumulated deficit	(722,701)	(677,772)
Accumulated other comprehensive loss	(38,978)	(21,536)
Total 3D Systems Corporation stockholders' equity	578,369	618,854
Noncontrolling interests	(2,382)	(2,906)
Total stockholders' equity	575,987	615,948
Total liabilities, redeemable noncontrolling interests and stockholders' equity	\$825,832	\$896,764

See accompanying notes to Consolidated Financial Statements.

3D Systems Corporation
Consolidated Statements of Operations

(in thousands, except per share amounts)	Year Ended December 31,		
	2018	2017	2016
Revenue:			
Products	\$429,215	\$391,596	\$394,850
Services	258,445	254,473	238,115
Total revenue	687,660	646,069	632,965
Cost of sales:			
Products	229,793	216,446	210,822
Services	133,473	124,784	112,392
Total cost of sales	363,266	341,230	323,214
Gross profit	324,394	304,839	309,751
Operating expenses:			
Selling, general and administrative	272,287	264,185	259,776
Research and development	95,298	94,627	88,395
Total operating expenses	367,585	358,812	348,171
Loss from operations	(43,191)	(53,973)	(38,420)
Interest and other expense, net	(37)	(3,548)	(1,392)
Loss before income taxes	(43,228)	(57,521)	(39,812)
Provision (benefit) for income taxes	2,035	7,802	(547)
Net loss	(45,263)	(65,323)	(39,265)
Less: net income (loss) attributable to noncontrolling interests	242	868	(846)
Net loss attributable to 3D Systems Corporation	\$(45,505)	\$(66,191)	\$(38,419)
Net loss per share available to 3D Systems Corporation common stockholders - basic and diluted	\$(0.41)	\$(0.59)	\$(0.35)

See accompanying notes to Consolidated Financial Statements.

3D SYSTEMS CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS

(in thousands)	Year Ended December 31,		
	2018	2017	2016
Net loss	\$(45,263)	\$(65,323)	\$(39,265)
Other comprehensive income (loss), net of taxes:			
Pension adjustments	(92)	220	(902)
Gain on liquidation of non-US entity	—	50	288
Foreign currency translation	(17,068)	31,678	(12,958)
Total other comprehensive income (loss), net of taxes:	(17,160)	31,948	(13,572)
Total comprehensive loss, net of taxes	(62,423)	(33,375)	(52,837)
Comprehensive income attributable to noncontrolling interests	524	1,127	(741)
Comprehensive loss attributable to 3D Systems Corporation	\$(62,947)	\$(34,502)	\$(52,096)

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3D Systems Corporation
Consolidated Statements of Stockholders' Equity
Years Ended December 31, 2018, 2017 and 2016

(in thousands, except par value)	Common Stock			Accumulated (Deficit) Earnings	Other Comprehensive (Loss) Income	Total 3D Systems Corporation Stockholders' Equity	Equity Attributable to Noncontrolling Interests	Total Stockholders' Equity
	Par Value \$0.001	Additional Paid In Capital	Treasury Stock					
Balance at December 31, 2015	\$ 113	\$ 1,279,738	\$(1,026)	\$(583,368)	\$(39,548)	\$ 655,909	\$(1,263)	\$ 654,646
Issuance (repurchase) of stock	2	(1,241)	(1,632)	—	—	(2,871)	—	(2,871)
Acquisition of noncontrolling interest	—	(2,364)	—	—	—	(2,364)	(1,169)	(3,533)
Stock-based compensation expense	—	31,295	—	—	—	31,295	—	31,295
Net loss	—	—	—	(38,419)	—	(38,419)	(846)	(39,265)
Pension adjustment	—	—	—	—	(902)	(902)	—	(902)
Liquidation of non-US entity	—	—	—	—	288	288	—	288
Foreign currency translation adjustment	—	—	—	—	(13,063)	(13,063)	105	(12,958)
Balance at December 31, 2016	115	1,307,428	(2,658)	(621,787)	(53,225)	629,873	(3,173)	626,700
Issuance (repurchase) of stock	—	—	(5,545)	—	—	(5,545)	—	(5,545)
Issuance of stock for acquisitions	—	3,208	—	—	—	3,208	—	3,208
Acquisition of noncontrolling interest	—	(1,440)	—	—	—	(1,440)	(860)	(2,300)
Cumulative impact of change in accounting policy	—	(10,206)	—	10,206	—	—	—	—
Stock-based compensation expense	—	27,260	—	—	—	27,260	—	27,260
Net loss	—	—	—	(66,191)	—	(66,191)	868	(65,323)
Liquidation of non-US entity	—	—	—	—	50	50	—	50
Pension adjustment	—	—	—	—	220	220	—	220
	—	—	—	—	31,419	31,419	259	31,678

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Foreign currency translation adjustment									
Balance at December 31, 2017	115	1,326,250	(8,203)	(677,772)	(21,536)	618,854	(2,906)	615,948	
Issuance (repurchase) of stock	2	—	(7,369)	—	—	(7,367)	—	(7,367)	
Cumulative impact of change in accounting policy	—	—	—	576	—	576	—	576	
Stock-based compensation expense	—	29,253	—	—	—	29,253	—	29,253	
Net loss	—	—	—	(45,505)	—	(45,505)	242	(45,263)	
Pension adjustment	—	—	—	—	(92)	(92)	—	(92)	
Foreign currency translation adjustment	—	—	—	—	(17,350)	(17,350)	282	(17,068)	
Balance at December 31, 2018	\$ 117	\$ 1,355,503	\$(15,572)	\$(722,701)	\$(38,978)	\$ 578,369	\$(2,382)	\$ 575,987	

See accompanying notes to Consolidated Financial Statements

3D Systems Corporation
Consolidated Statements of Cash Flows

(in thousands)	Years ended December 31,		
	2018	2017	2016
Cash flows from operating activities:			
Net loss	\$(45,263)	\$(65,323)	\$(39,265)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Depreciation and amortization	59,293	62,041	60,535
Stock-based compensation	29,253	27,260	31,295
Lower of cost or market adjustment	—	12,883	11,053
Impairment of assets	1,998	2,427	8,618
Provision for bad debts	1,824	1,051	1,552
Provision for deferred income taxes	(2,990)	(5,567)	(6,566)
Loss on the disposition of property and equipment	—	—	1,465
Changes in operating accounts, net of acquisitions:			
Accounts receivable	599	3,987	26,255
Inventories	(34,035)	(17,716)	(20,656)
Prepaid expenses and other current assets	40,922	(49,834)	(3,895)
Accounts payable	11,559	12,448	(4,975)
Accrued and other current liabilities	(50,234)	50,209	(7,670)
All other operating activities	(8,130)	(7,739)	(263)
Net cash provided by operating activities	4,796	26,127	57,483
Cash flows from investing activities:			
Cash paid for acquisitions, net of cash assumed	—	(34,291)	—
Purchases of property and equipment	(40,694)	(30,881)	(16,567)
Additions to license and patent costs	(970)	(1,159)	(1,132)
Proceeds from disposition of property and equipment	333	273	350
Purchase of noncontrolling interest	—	(2,250)	(3,533)
Other investing activities	(496)	(2,351)	(1,000)
Net cash used in investing activities	(41,827)	(70,659)	(21,882)
Cash flows from financing activities:			
Proceeds from borrowings	25,000	—	—
Payments related to net-share settlement of stock-based compensation	(7,367)	(5,545)	(2,871)
Payments on earnout consideration	(2,675)	(3,206)	—
Repayment of capital lease obligations	(694)	(437)	(1,055)
Net cash provided by (used in) financing activities	14,264	(9,188)	(3,926)
Effect of exchange rate changes on cash and cash equivalents	(3,145)	5,303	(2,369)
Net (decrease) increase in cash and cash equivalents	(25,912)	(48,417)	29,306
Cash, cash equivalents and restricted cash at the beginning of the period ^(a)	136,831	185,248	155,942
Cash, cash equivalents and restricted cash at the end of the period ^(a)	\$110,919	\$136,831	\$185,248
Cash interest payments	\$542	\$503	\$839
Cash income tax payments, net	8,964	6,339	11,045
Transfer of equipment from inventory to property and equipment, net ^(b)	5,612	9,881	12,493
Transfer of equipment to inventory from property and equipment, net ^(c)	2,563	378	1,102
Stock issued for acquisitions of businesses	—	3,208	—

(a)

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The amounts for cash and cash equivalents shown above include restricted cash of \$921, \$487, \$301 and \$299 as of December 31, 2018, 2017, 2016 and 2015, respectively, which were included in other assets, net, in the Consolidated Balance Sheets.

- (b) Inventory is transferred from inventory to property and equipment at cost when the Company requires 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 the Company has identified a potential sale for a used machine.

See accompanying notes to Consolidated Financial Statements.

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Note 1 Basis of Presentation

The Consolidated Financial Statements include the accounts of 3D Systems Corporation and all majority-owned subsidiaries and entities in which a controlling interest is maintained (the “Company”). A non-controlling interest in a subsidiary is considered an ownership interest in a majority-owned subsidiary that is not attributable to the parent. The Company includes noncontrolling interests as a component of total equity in the Consolidated Balance Sheets and the net income (loss) attributable to noncontrolling interests are presented as an adjustment from net loss used to arrive at net loss attributable to 3D Systems Corporation in the consolidated statements of operations and comprehensive loss. The Company’s 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. Beginning in 2018, the Company classifies product warranty revenue and related expenses within the "Products" line items of the Consolidated Statements of Operations.

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

Note 2 Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management 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. The Company bases its 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

The Company accounts for revenue in accordance with ASC Topic 606, “Revenue from Contracts with Customers,” which it adopted on January 1, 2018, using the modified-retrospective method. See Recent Accounting Pronouncements in this Note 2 and Note 4 for further discussion of the adoption.

Cash and Cash Equivalents

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

Investments

Investments in non-consolidated affiliates (20-50 percent owned companies and joint ventures) are accounted for using the equity method. Investments through which we are not able to exercise significant influence over the investee and which we do not have readily determinable fair values are generally accounted for under the cost method.

The Company assesses 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, 2018 and 2017, the Company recorded impairment charges of \$1,373 and \$1,743, respectively, related to certain cost-method investments. The aggregate carrying amount of all investments accounted for under the cost method totaled \$8,483 and \$8,263 at December 31, 2018 and 2017, respectively, and is included in other assets, net, on the Company's Consolidated Balance Sheets.

Accounts Receivable and Allowances for Doubtful Accounts

Trade accounts receivable are recorded at the invoiced amount and do not bear interest. In evaluating the collectability of accounts receivable, the Company assesses 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, the Company may record a reserve for specific customers, as well as a general reserve and allowance for returns and discounts. If circumstances

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related to specific customers change, or economic conditions deteriorate such that the Company's past collection experience is no longer relevant, its estimate of the recoverability of accounts receivable could be further reduced from the levels provided for in the Consolidated Financial Statements.

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	Balance at end of year
2018	Allowance for doubtful accounts	\$ 10,258	\$ 1,824	\$(3,659)	\$ 8,423
2017	Allowance for doubtful accounts	12,920	1,051	(3,713)	10,258
2016	Allowance for doubtful accounts	14,139	1,552	(2,771)	12,920

Inventories

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

Long-Lived Assets and Goodwill

The Company reviews 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 as 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, 2018, 2017 and 2016.

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 in the fourth quarter 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.

The test for goodwill impairment is a two-step process to first identify potential goodwill impairment for each reporting unit and then, if necessary, measure the amount of the impairment loss. The Company's reporting units are consistent with our geographies in Note 21. The Company completed the required annual goodwill impairment test during the fourth quarter of 2018. The first step of the goodwill impairment test compares the fair value of each of our reporting units to its carrying value. The Company estimates the fair value of its reporting units based primarily on the discounted projected cash flows of the underlying operations. The estimated fair value for each of its reporting units was in excess of its respective carrying values as of December 31, 2018.

For a summary of our goodwill by reporting unit, see Note 8.

Redeemable Noncontrolling Interests

The minority interest shareholders of a certain subsidiary have the right in certain circumstances to require the Company to acquire either a portion of or all of the remaining ownership interests held by them. The owners' ability to exercise any such "put option" right is subject to the satisfaction of certain conditions, including conditions requiring notice in advance of exercise. In addition, these rights cannot be exercised prior to a specified exercise date. The exercise of these rights at their earliest contractual date would result in obligations of the Company to fund the related

amounts in 2019. See Note 22.

The Company has recorded the put option as mezzanine equity at their current estimated redemption amount. For the years ended December 31, 2018 and 2017, the balance of redeemable noncontrolling interests was \$8,872.

Contingencies

The Company follows 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.

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Foreign Currency Translation

Local currencies generally are considered the functional currencies outside the United States. Assets and liabilities for operations in local-currency environments are translated at month-end exchange rates of the period reported. Income and expense items are translated at average exchange rates of each applicable month. Cumulative translation adjustments are recorded as a component of accumulated other comprehensive income (loss) in shareholders' equity.

Derivative Financial Instruments

The Company is exposed to market risk from changes in interest rates and foreign currency exchange rates and commodity prices, which may adversely affect its results of operations and financial condition. The Company seeks to minimize these risks through regular operating and financing activities and, when the Company considers it to be appropriate, through the use of derivative financial instruments.

The Company does not purchase, hold or sell derivative financial instruments for trading or speculative purposes. The Company has 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) related to derivative instruments 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.

The Company and its subsidiaries conduct business in various countries using both their functional currencies and other currencies to effect cross border transactions. As a result, they 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, the Company endeavors to match assets and liabilities in the same currency on its U.S. balance sheet and those of its subsidiaries in order to reduce these risks. The Company, when it considers it to be appropriate, enters into foreign currency contracts to hedge the exposures arising from those transactions. See Note 11.

The Company is exposed to credit risk if the counterparties to such transactions are unable to perform their obligations. However, the Company seeks 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 on the weighted-average number of common shares outstanding during each period. Diluted earnings per share include shares issuable upon exercise of outstanding stock options and stock-based awards where the conversion of such instruments would be dilutive. See Note 17.

Advertising Costs

Advertising costs are expensed as incurred. Advertising costs, including trade shows, were \$13,562, \$13,683 and \$12,469 for the years ended December 31, 2018, 2017 and 2016, respectively.

Pension costs

The Company sponsors a retirement benefit for one of its 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 requires management to make assumptions and judgements that can significantly affect these measurements. Critical assumptions made by management 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 the Company's reported pension obligations and related pension expense. See Note 16.

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Equity Compensation Plans

The Company recognizes compensation expense for its stock-based compensation programs, which include stock options, restricted stock, restricted stock units ("RSU") and performance shares. For service-based awards, stock-based compensation is estimated at the grant date based on the fair value of the awards expected to vest and recognized as expense ratably over the requisite service period of the award. For stock options and awards with market conditions, compensation cost is determined at the individual tranche level. The Company recognizes forfeitures when they occur.

Income Taxes

The Company and the majority of its domestic subsidiaries file a consolidated U.S. federal income tax return while it has four entities that file separate U.S. federal tax returns. The Company's 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.

The Company establishes a valuation allowance for those jurisdictions in which the expiration date of tax benefit carryforwards or projected taxable earnings leads the Company 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 the Company's 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.

The Company includes interest and penalties accrued in the Consolidated Financial Statements as a component of income tax expense.

See Note 20 to the Consolidated Financial Statements.

Recent Accounting Pronouncements

Recently Adopted Accounting Standards

In May 2017, the FASB issued ASU No. 2017-09, "Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting" ("ASU 2017-09"), in an effort to reduce diversity and clarify what constitutes a modification, as it relates to the change in terms or conditions of a share-based payment award. According to ASU 2017-09, the Company should account for the effects of a modification unless all of the following are met: (1) the fair value of the modified award is the same as the fair value of the original award immediately before the original award is modified, (2) the vesting conditions of the modified award are the same as the vesting conditions of the original award immediately before the original award is modified, and (3) the classification of the modified award as an equity instrument or a liability instrument is the same as the classification of the original award immediately before the

original award is modified. The amendments in ASU 2017-09 are effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017, with early adoption permitted. The Company adopted ASU 2017-09 beginning January 1, 2018 and the implementation of this guidance did not have a material effect on its Consolidated Financial Statements.

In March 2017, the FASB issued ASU No. 2017-07, "Compensation - Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost" ("ASU 2017-07"), which standardizes the presentation of net benefit cost in the income statement and on the components eligible for capitalization in assets. ASU 2017-07 is effective for fiscal years beginning after December 15, 2017, including interim periods within those annual periods. The amendments in ASU 2017-07 should be applied retrospectively for the presentation of the service cost component and the other components of net periodic pension cost and net periodic postretirement benefit cost in the income statement and prospectively, on and after the effective date, for the capitalization of the service cost component of net periodic pension cost and net periodic postretirement

benefit in assets. The Company adopted ASU 2017-07 in the first quarter of 2018 and the implementation of this guidance did not have a material effect on its Consolidated Financial Statements.

On January 1, 2018, the Company adopted Accounting Standards Codification ("ASC") Topic 606, "Revenue from Contracts with Customers." The standard outlines a five-step model whereby revenue is recognized as performance obligations within a contract are satisfied. The standard also requires new, expanded disclosures regarding revenue recognition. The Company adopted the standard using the modified retrospective transition method and applied its guidance to contracts not completed at the adoption date. The cumulative effect of initial adoption was recorded as a \$576 decrease to the January 1, 2018 opening Accumulated Deficit balance and driven primarily by the timing of recognition related to marketing incentives. The effect of this adoption was immaterial to the Consolidated Financial Statements, and the Company does not expect a material effect to its Consolidated Financial Statements on an ongoing basis. Information for comparative periods has not been restated and continues to be reported under the previously applicable revenue accounting guidance ("ASC 605"). Had ASC 605 been applied to the twelve months ended December 31, 2018, the Consolidated Statements of Operations and Comprehensive Loss would have shown increased Revenue and a decrease in Net Loss Attributable to 3D Systems Corporation of \$332. On the Consolidated Balance Sheets, Other Assets would have been \$567 lower, Deferred Revenues would have been \$323 lower and the Accumulated Deficit would have increased by \$244.

Recently Issued Accounting Standards

In August 2018, the FASB issued ASU 2018-15, "Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40)," which aligns the requirements for capitalizing implementation costs incurred in a service contract hosting arrangement with those of developing or obtaining internal-use software. This standard is effective for interim and annual reporting periods beginning after December 15, 2019, and early adoption is permitted. The Company is currently evaluating the impact the new standard will have on its Consolidated Financial Statements.

In February 2018, the FASB issued ASU No. 2018-02, "Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income" (ASU 2018-02), which provides companies with an option to reclassify stranded tax effects resulting from the U.S. Tax Cuts and Jobs Act from accumulated other comprehensive income to retained earnings. ASU 2018-02 is effective for fiscal years beginning after December 15, 2018, with early adoption permitted. The Company elected not to early adopt the provisions of this ASU and expects there will not be a material impact on its Consolidated Financial Statements.

In August 2017, the FASB issued ASU No. 2017-12, "Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities" ("ASU 2017-12"), in order to create more transparency around how economic results are presented within both the financial statements and in the footnotes and to better align the results of cash flow and fair value hedge accounting with risk management activities. ASU 2017-12 is effective for fiscal years beginning after December 15, 2018, with early adoption permitted. The Company is currently in the process of evaluating when it will adopt ASU 2017-12 and its impact on its Consolidated Financial Statements.

In January 2017, the FASB issued ASU No. 2017-4, "Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment" ("ASU 2017-4"), 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 standard is effective for fiscal years beginning after December 15, 2019. Early adoption is permitted for interim or annual impairment tests performed on testing dates after January 1, 2017. The Company has elected not to early adopt the provisions of this ASU but will re-evaluate as part of performing our 2019 impairment analysis.

In June 2016, the FASB issued ASU 2016-13, "Measurement of Credit Losses on Financial Instruments" ("ASU 2016-13"), 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 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 guidance expands the disclosure requirements regarding credit losses, including the credit loss methodology and credit quality indicators. ASU 2016-13 will be effective for annual reporting periods, including interim reporting within those periods, beginning after December 15, 2019. Early adoption is permitted for annual reporting periods,

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including interim periods after December 15, 2018 and will be applied using a modified retrospective approach. The Company is currently evaluating the impact of adoption of this standard on its Consolidated Financial Statements.

In February 2016, the FASB issued ASU No. 2016-02, "Leases (Topic 842)" ("ASU 2016-02"). ASU 2016-02 requires lessees to recognize assets and liabilities on the balance sheet for all leases with terms longer than twelve months. The ASU also requires disclosure of key information about leasing arrangements. ASU 2016-02 is effective on January 1, 2019, using a modified retrospective method of adoption. In August 2018, the FASB issued ASU 2018-11, "Targeted Improvements to ASC 842", which includes an option to not restate comparative periods in transition and elect to use the effective date of ASC Topic 842, "Leases," as the date of initial application of transition. The Company adopted this ASU on January 1, 2019 and elected the transition option provided under ASU 2018-11 to recognize a cumulative-effect adjustment to the opening balance of retained earnings in the period of adoption. The Company also applied the package of practical expedients that allows it to avoid the reassessment of: (1) whether any expired or existing contracts are or contain leases, (2) lease classification for any expired or existing leases and (3) initial direct costs for any expired or existing leases. The Company also elected the practical expedient that allows it to treat the lease and non-lease components of its leases as a single component for its real estate leases. While the Company continues to review its population of leased assets, it expects to recognize operating lease liabilities ranging from \$40 to \$50 million, with corresponding right of use assets of the same amount based on the present value of the remaining lease payments over the lease term. Our accounting for capital leases will remain substantially unchanged. This standard is not expected to have a material impact on our results of operations or cash flows.

No other new accounting pronouncements, issued or effective during 2018, have had or are expected to have a significant impact on the Company's consolidated financial statements.

Note 3 Acquisitions

2018 Acquisitions

No acquisitions were made by the Company for the year ended December 31, 2018.

2017 Acquisitions

On January 31, 2017, the Company acquired 100 percent of the shares of Vertex-Global Holding B.V. ("Vertex"), a provider of dental materials worldwide under the Vertex and NextDent brands. The fair value of the consideration paid for this acquisition, net of cash acquired, was \$37,562, and consisted of cash and shares. The cash portion of the purchase price is included in cash paid for acquisitions, net of cash assumed, in the Consolidated Statement of Cash Flows. The share portion of the purchase price is included in issuance of stock for acquisitions in the Consolidated Statement of Equity. The operating results of Vertex have been included in the Company's reported results since the closing date. The purchase price of the acquisition has been allocated to the estimated fair value of net tangible and intangible assets acquired, with any excess purchase price recorded as goodwill.

2016 Acquisitions

No acquisitions were made by the Company for the year ended December 31, 2016.

Note 4 Revenue

The Company accounts for revenue in accordance with ASC Topic 606, "Revenue from Contracts with Customers," which it adopted on January 1, 2018, using the modified-retrospective method.

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, 2018, the Company had \$132,337 of outstanding performance obligations. The Company expects to recognize approximately 93 percent of its remaining performance obligations as revenue within the next twelve months, an additional 4 percent by the end of 2020 and the balance thereafter.

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Revenue Recognition

Revenue is recognized 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 enters 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 its contracts with customers include multiple performance obligations. For such arrangements, the Company allocates revenue to each performance obligation based on its relative standalone 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. The Company's marketing incentive programs take many forms, including volume discounts, trade-in allowances, rebates and other discounts.

A majority of the Company's 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 the Company has a present right to payment for the hardware. In limited circumstances when a 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 the Company has objective evidence that the criteria specified in the customer acceptance provisions have been satisfied.

Printers and certain other products include a warranty under which the Company provides 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

The Company also markets and sells software tools that enable our customers to capture and customize content using our printers, as well as 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.

Services

The Company offers training, installation and non-contract maintenance services for its products. Additionally, the Company offers maintenance contracts 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.

Terms of sale

Shipping and handling activities are treated as fulfillment costs rather than as an additional promised service. The Company accrues the costs of shipping and handling when the related revenue is recognized. Costs incurred by the Company 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 the Company's general

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credit terms. Creditworthiness is considered, among other things, in evaluating the Company's relationship with customers with past due balances.

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

See Note 21 for additional information related to revenue by reportable segment and major lines of business.

Significant Judgments

The Company's contracts with customers often include promises to transfer multiple products and services to a customer. For such arrangements, the Company allocates 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, the Company estimates SSP using historical transaction data. The Company uses 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, the Company determines the SSP using information that may include market conditions and other observable inputs.

In some circumstances, the Company has 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 the Company's 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. The Company records a receivable when revenue is recognized at the time of invoicing, or unbilled receivables when revenue is recognized prior to invoicing. For most of the Company's 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. In the Company's on demand manufacturing business, customers may be required to pay in full before work begins on their orders, resulting in customer deposits. The Company typically bills 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, 2018.

For the year ended December 31, 2018, the Company recognized revenue of \$37,206 related to our contract liabilities at January 1, 2018.

Practical Expedients and Exemptions

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

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Note 5 Inventories

Components of inventories, net, at December 31, 2018 and 2017 are as follows:

(in thousands)	2018	2017
Raw materials	\$49,624	\$37,660
Work in process	2,969	3,906
Finished goods and parts	80,568	62,337
Inventories, net	\$133,161	\$103,903

During the year ended December 31, 2018, inventory levels increased in support of new product launches and manufacturing ramp for those products, including certain parts which have long lead times. Additionally, during the year ended December 31, 2017, the Company recorded inventory adjustments totaling \$12.9 million resulting from its lower of cost or net realizable value analysis. The charge was effected because of ongoing efforts to focus and prioritize the Company's portfolio based on year-to-date demand, market trends and a better understanding of where the Company's offerings meet and will continue to meet customers' needs and demand. The inventory adjustments related primarily to legacy plastics printers, refurbished and used metals printers and parts which have shown little to no use over extended periods.

Note 6 Property and Equipment

Property and equipment at December 31, 2018 and 2017 are summarized as follows:

(in thousands)	2018	2017	Useful Life (in years)
Land	\$903	\$903	N/A
Building	12,408	11,276	25-30
Machinery and equipment	151,429	134,666	2-7
Capitalized software	18,357	8,834	3-5
Office furniture and equipment	4,955	4,677	1-5
Leasehold improvements	31,514	29,503	Life of lease ^(a)
Construction in progress	15,083	13,527	N/A
Total property and equipment	234,649	203,386	
Less: Accumulated depreciation and amortization	(126,931)	(105,865)	
Total property and equipment, net	\$107,718	\$97,521	

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

The Company includes 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 expense on property and equipment for the years ended 2018, 2017 and 2016 was \$29,302, \$25,561 and \$24,331, respectively.

For the years ended December 31, 2018, 2017 and 2016, the Company recognized impairment charges of \$625, \$636, and \$7,408, respectively, on property and equipment, net.

Note 7 Intangible Assets

Intangible assets other than goodwill at December 31, 2018 and December 31, 2017 are summarized as follows:

(in thousands)	2018			2017			Useful Life (in years)	Weighted Average Useful Life Remaining (in years)
	Gross	Accumulated Amortization	Net	Gross	Accumulated Amortization	Net		
Intangible assets with finite lives:								
Customer relationships	\$103,332	\$(67,129)	\$36,203	\$105,505	\$(57,796)	\$47,709	1-12	5
Acquired technology	52,691	(47,546)	5,145	54,716	(39,644)	15,072	1-2	2
Trade names	25,096	(17,669)	7,427	25,813	(15,552)	10,261	3-6	5
Patent costs	11,032	(8,382)	2,650	17,909	(7,338)	10,571	1-19	14
Trade secrets	19,374	(13,574)	5,800	19,431	(11,530)	7,901	2-4	3
Acquired patents	16,212	(13,160)	3,052	16,661	(11,969)	4,692	6-8	7
Other	26,551	(18,553)	7,998	20,012	(17,435)	2,577	1-2	1
Total intangible assets	\$254,288	\$(186,013)	\$68,275	\$260,047	\$(161,264)	\$98,783	1-19	5

The Company includes all amortization from assets attributable to the generation of revenue in the Cost of Sales line item in the Statement of Operations. Amortization 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. Amortization expense related to intangible assets was \$29,722, \$35,559 and \$35,124 for the years ended December 31, 2018, 2017 and 2016, respectively. Amortization of these intangible assets is calculated on a straight-line basis.

Annual amortization expense for intangible assets is expected to be \$20,411 in 2019, \$17,308 in 2020, \$12,859 in 2021, \$7,493 in 2022 and \$2,526 in 2023.

For discussion on intangible asset impairment testing, see Note 2.

Note 8 Goodwill

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

(in thousands)	Americas	EMEA	Asia Pacific	Total
Balance at December 31, 2016	\$	—\$144,971	\$36,259	\$181,230
Acquisitions and adjustments	—	31,438	41	31,479
Effect of foreign currency exchange rates	—	15,539	2,634	18,173
Balance at December 31, 2017	—	191,948	38,934	230,882
Acquisitions and adjustments	—	(331)	—	(331)
Effect of foreign currency exchange rates	—	(7,597)	(1,620)	(9,217)
Balance at December 31, 2018	\$	—\$184,020	\$37,314	\$221,334

The effect of foreign currency exchange in this table reflects 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.

For discussion on acquisitions, see Note 3. For discussion on goodwill impairment testing, see Note 2.

Note 9 Employee Benefits

The Company sponsors a Section 401(k) plan (the "Plan") covering substantially all its eligible U.S. employees. The Plan entitles eligible employees to make contributions to the Plan after meeting certain eligibility requirements. Contributions are limited to

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the maximum contribution allowances permitted under the Internal Revenue Code. The Company matches 50.0% of contributions on the first 6.0% of the participant's eligible compensation. The Company will give a minimum match of \$1,500 to participants who average a minimum 6.0% deferral contribution rate per plan year. In addition, the Company has several other U.S. and non-U.S. defined contribution plans covering eligible U.S. and non-U.S. employees, respectively.

For the years ended December 31, 2018, 2017 and 2016, the Company expensed \$2,606, \$2,360 and \$1,175, respectively, for matching contributions to defined contribution plans.

Note 10 Accrued and Other Liabilities

Accrued liabilities at December 31, 2018 and 2017 are summarized below:

(in thousands)	2018	2017
Compensation and benefits	\$23,787	\$20,432
Accrued taxes	17,246	13,861
Arbitration awards	2,256	11,282
Vendor accruals	6,895	7,044
Product warranty liability	3,788	5,564
Accrued earnouts related to acquisitions	—	2,772
Accrued other	2,108	2,485
Royalties payable	1,417	1,679
Accrued professional fees	1,657	742
Accrued interest	111	38
Total	\$59,265	\$65,899

Other liabilities at December 31, 2018 and 2017 are summarized below:

(in thousands)	2018	2017
Long term employee indemnity	\$13,609	\$13,887
Defined benefit pension obligation	8,518	8,290
Other long term liabilities	4,915	7,596
Long term deferred revenue	8,121	7,298
Long term tax liability	4,168	9,340
Long term earnouts related to acquisitions	—	2,343
Total	\$39,331	\$48,754

Changes in product warranty obligations, including deferred revenue on extended warranty contracts, for the years ended December 31, 2018, 2017 and 2016 are summarized below:

(in thousands)	Beginning Balance	Additional Accrual/ Revenue Deferred	Costs Incurred/ Deferred Revenue Amortization	Ending Balance
Year Ended December 31,				
2018	\$ 10,202	\$ 9,347	\$ (11,889)) \$ 7,660
2017	9,051	13,623	(12,472)) 10,202
2016	10,663	12,859	(14,471)) 9,051

Note 11 Hedging Activities and Financial Instruments

The Company had \$75,304, \$39,600 and \$0 in notional foreign exchange contracts outstanding as of December 31, 2018, 2017, and 2016, respectively. The fair values of these contracts were not material. Gains and losses (realized or unrealized) are recognized in “Interest and other expense, net” in the Consolidated Statements of Operations.

The Company translates foreign currency balance sheets from each international businesses' 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).

The Company does not hedge the fluctuation in reported revenue and earnings resulting from the translation of these international operations' results into U.S. dollars. The impact of translating the Company's non-U.S. operations' revenue and earnings into U.S. dollars was not material to the Company's results of operations for the years ended December 31, 2018, 2017 and 2016.

Note 12 Borrowings

Credit Facility

On October 10, 2014, the Company, as borrower, and certain of its subsidiaries, as guarantors, entered into a \$150,000 5-year revolving, unsecured credit facility (the “Prior Credit Agreement”). The Prior Credit Agreement comprised a revolving loan facility that provided for advances in the initial aggregate principal amount of up to \$150,000 (the “Prior Credit Facility”).

The Prior Credit Agreement was guaranteed by certain of the Company's material domestic subsidiaries.

The Prior Credit Facility contained customary covenants, some of which required the Company to maintain certain financial ratios that determined the amounts available and terms of borrowings and events of default. The Company was in compliance with all covenants at both December 31, 2018 and December 31, 2017.

There was \$25,000 outstanding balance under the Prior Credit Facility as of December 31, 2018, which was due on March 1, 2019. There was no outstanding balance as of December 31, 2017. The Prior Credit Agreement was terminated on February 27, 2019.

On February 27, 2019, the Company, as borrower, and certain of its subsidiaries, as guarantors, entered into a 5-year \$100,000 senior secured term loan facility (the “Term Facility”) and a 5-year \$100,000 senior secured revolving credit facility (the “Revolving Facility”) and, together with the Term Facility, the “Senior Credit Facility”) which replaced the Prior Credit Agreement. The proceeds of the Senior Credit Facility were used to refinance the existing indebtedness under the Prior Credit Agreement and will be used to support working capital and for general corporate purposes. Subject to certain terms and conditions contained in the Revolving Facility, the Company has the right to request up to four increases to the amount of the Revolving Facility in an aggregate amount not to exceed \$100,000. The Senior Credit Facility is scheduled to mature on February 26, 2024, at which time all amounts outstanding thereunder will be due and payable. However, the maturity date of the Revolving Facility may be extended at the election of the Company with the consent of the lenders subject to the terms set forth in the Senior Credit Facility.

Pursuant to the Senior Credit Facility, the guarantors guarantee, among other things, all of the obligations of the Company and each other guarantor under the Senior Credit Facility. From time to time, the Company may be required to cause additional domestic subsidiaries to become guarantors under the Senior Credit Facility.

The payment of dividends on the Company's common stock is restricted under provisions of the Senior Credit Facility, which limits the amount of cash dividends that the Company may pay in any one fiscal year to \$30,000. The Company currently does not pay, and has not paid, any dividends on its common stock, and currently intends to retain any future earnings for use in its business.

Interest Income and Expense

Interest income totaled \$789, \$784 and \$807 for the years ended December 31, 2018, 2017 and 2016, respectively.

Interest expense totaled \$1,188, \$919 and \$1,282 for the years ended December 31, 2018, 2017 and 2016, respectively.

Note 13 Lease Obligations

The Company leases certain of its facilities and equipment under capitalized leases and other facilities and equipment under non-cancelable operating leases. The leases are generally on a net-rent basis, under which the Company pays taxes, maintenance and insurance. Leases that expire at various dates through 2028 are expected to be renewed or replaced by leases on other properties.

Rent expense for the years ended December 31, 2018, 2017 and 2016 was \$15,809, \$14,899 and \$13,232, respectively.

The Company's future minimum lease payments as of December 31, 2018 under capitalized leases and non-cancelable operating leases, with initial or remaining lease terms in excess of one year, were as follows:

(in thousands)	Capitalized Leases	Operating Leases
Years ending December 31:		
2019	\$ 1,099	\$ 15,123
2020	1,011	9,153
2021	736	6,997
2022	752	5,847
2023	752	5,095
Later years	5,990	7,707
Total minimum lease payments	10,340	\$ 49,922
Less: amounts representing imputed interest	(3,294)	
Present value of minimum lease payments	7,046	
Less: current portion of capitalized lease obligations	(654)	
Capitalized lease obligations, excluding current portion	\$ 6,392	

Capital Lease Obligations

The Company leases its headquarters and research and development facility located in Rock Hill, SC, pursuant to a lease agreement with 3D Fields, LLC. After its initial term ending January 31, 2021, the lease provides the Company with the option to renew the lease for two additional 5-year terms. The lease also grants the Company the right to cause 3D Fields, LLC, subject to certain terms and conditions, to expand the leased premises during the term of the lease, in which case the term of the lease would be extended. The lease is a triple net lease and provides for the payment of base rent of \$710 in 2019 through 2020 and \$723 in 2021. Under the terms of the lease, the Company is obligated to pay all taxes, insurance, utilities and other operating costs with respect to the leased premises. This lease is recorded as a capitalized lease obligation under ASC 840, "Leases." The implicit interest rate was 6.93% as of December 31, 2018 and 2017.

The Company leases certain equipment with lease terms through February, 2021. In accordance with ASC 840, the Company has recorded these leases as capitalized leases. The implicit interest rate ranged from 1.75% to 8.06% at December 31, 2018 and 2017.

Note 14 Preferred Stock

The Company had \$5,000 shares of preferred stock that were authorized but unissued at December 31, 2018 and 2017.

Note 15 Stock-Based Compensation

Effective May 19, 2004, the Company adopted its 2004 Incentive Stock Plan, as further amended and restated on February 3, 2015 (the “2004 Stock Plan”), and its 2004 Restricted Stock Plan for Non-Employee Directors, as further amended and restated on April 1, 2013 (the “Director Plan”). On May 19, 2015, the Company’s stockholders approved the 2015 Incentive Plan of 3D Systems Corporation, as further amended and restated on May 16, 2017 (the “2015 Plan” and, together with the 2004 Stock Plan, the “Incentive Plans”).

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The 2015 Plan authorizes shares of restricted stock, RSUs, stock appreciation rights, cash incentive awards and the grant of options to purchase shares of the Company's common stock. The 2015 Plan also designates measures that may be used for performance awards. The Director Plan authorizes shares of restricted stock for non-employee directors of the Company. The 2004 Stock Plan authorized shares of restricted stock, RSUs, stock appreciation rights and the grant of options to purchase shares of the Company's common stock. The 2004 Stock Plan also designated measures that may be used for performance awards. The 2004 Stock Plan was superseded by the 2015 Plan and, as of December 31, 2018, there were no outstanding awards under the 2004 Stock Plan as the final vesting of awards granted under the 2004 Stock Plan occurred during 2018.

Generally, awards granted prior to November 13, 2015 become fully-vested on the 3-year anniversary of the grant date and awards granted on or after November 13, 2015 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:

(in thousands)	Year Ended December 31,		
	2018	2017	2016
Restricted Stock	\$24,933	\$22,920	\$28,612
Stock Options	4,320	4,340	2,683
Total stock-based compensation expense	\$29,253	\$27,260	\$31,295

Restricted Stock

The Company determines the fair value of restricted stock and RSUs based on the closing price of its stock on the date of grant. The Company generally recognizes compensation expense related to restricted stock and RSUs on a straight-line basis over the period during which the restriction lapses. Forfeitures are recognized in the period in which they occur. A summary of restricted stock and RSU activity during 2018 follows:

(in thousands, except per share amounts)	Number of Shares/Units	Weighted
		Average Grant Date Fair Value
Outstanding at beginning of period — unvested	4,267	\$ 13.12
Granted	1,957	16.08
Cancelled	(252)	11.98
Vested	(2,141)	14.22
Outstanding at end of period — unvested	3,831	\$ 14.03

Included in the outstanding balance above are 369 shares of restricted stock that vest under specified market conditions and 396 shares of restricted stock that vest under specified Company performance measures. The specified market condition shares were awarded to certain employees in 2017 and 2016 and were generally awarded in two equal tranches of market condition restricted stock that immediately vests when the Company's common stock trades at either \$30 or \$40 per share for ninety consecutive calendar days.

Some RSUs are granted with a performance measure derived from non-GAAP-based management targets. Depending on the Company's performance with respect to this metric, 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.

At December 31, 2018, there was \$1,049 of unrecognized pre-tax stock-based compensation expense related to non-vested restricted stock awards with market conditions, which the Company expects to recognize over a weighted-average period of 1.0 year.

At December 31, 2018, there was \$37,828 of unrecognized pre-tax stock-based compensation expense related to all other non-vested restricted stock award shares and units, which the Company expects to recognize over a weighted-average period of 2.0 years.

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Stock Options

During the year ended December 31, 2016, the Company 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 the Company's common stock trades at either \$30 or \$40 per share for ninety consecutive calendar days.

The Company recognizes 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. The weighted-average fair value and the assumptions used to measure fair value were as follows:

	Year Ended December 31,			
	2018	2017	2016	
Stock option assumptions:				
Weighted-average fair value	\$—	\$—	\$ 7.80	
Expected volatility	—%	—%	60.0	%
Risk-free interest rate	—	—	0.76-1.46%	
Expected dividend yield	—%	—%	—	%
Derived term in years	—	—	3-4	

Stock option activity for the year ended December 31, 2018 was as follows:

	Year Ended Year Ended December 31, 2018			
(in thousands, except per share amounts)	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Stock option activity:				
Outstanding at beginning of period	1,820	\$ 14.08	—	—
Granted	—	—	—	—
Exercised	—	—	—	—
Forfeited and expired	(40)	13.25	—	—
Outstanding at end of period	1,780	\$ 14.10	7.5	—

In the table above, intrinsic value is calculated as the excess, if any, between the market price of the Company's stock on the last trading day of the year and the exercise price of the options. Because the market price was lower than the exercise price, the intrinsic value is zero.

At December 31, 2018, there was \$2,796 of unrecognized pre-tax stock-based compensation expense related to stock options, which the Company expects to recognize over a weighted-average period of 1.0 years.

Note 16 International Retirement Plan

The Company sponsors a non-contributory defined benefit pension plan for certain employees of a non-U.S. subsidiary initiated by a predecessor of the subsidiary. The Company maintains 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, 2018 and 2017:

(in thousands)	2018	2017
Reconciliation of benefit obligations:		
Obligations as of January 1	\$8,434	\$7,727
Service cost	155	184
Interest cost	148	131
Actuarial loss (gain)	453	(555)
Benefit payments	(145)	(136)
Effect of foreign currency exchange rate changes	(387)	1,083
Benefit obligations as of December 31	8,658	8,434
Fair value of assets as of December 31 ^(a)	3,224	3,207
Funded status as of December 31, net of tax benefit	\$(5,434)	\$(5,227)

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

The following table provides a reconciliation of the amounts recognized in “Accumulated other comprehensive income (loss)” in accordance with ASC 715, “Compensation – Retirement Benefits” for the years ended December 31, 2018 and 2017:

(in thousands)	2018	2017
Amounts recognized as accumulated other comprehensive income (loss):		
Current year actuarial gain (loss)	\$ 276	\$ 555
Amortization of prior years' unrecognized loss	177	244
Tax benefit (provision)	88	(247)
Total recognized as accumulated other comprehensive income (loss)	\$ 188	\$ 552

The Company has recognized the following amounts in the Consolidated Balance Sheets at December 31, 2018 and 2017:

(in thousands)	2018	2017
Other assets	\$3,224	\$3,207
Accrued liabilities	(140)	(144)
Other liabilities	(8,518)	(8,290)
Net liability	\$(5,434)	\$(5,227)

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The following projected benefit obligation and accumulated benefit obligation were estimated as of December 31, 2018 and 2017:

(in thousands)	2018	2017
Projected benefit obligation	\$8,658	\$8,434
Accumulated benefit obligation	\$7,587	\$7,570

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The following table shows the components of net periodic benefit costs and other amounts recognized in Other Comprehensive Income (Loss):

(in thousands)	2018	2017
Net periodic benefit cost:		
Service cost	\$ 155	\$ 184
Interest cost	148	131
Amortization of actuarial loss	177	244
Total	\$ 480	\$ 559
Other changes in plan assets and benefit obligations recognized in other comprehensive income:		
Net loss (gain)	276	(555)
Total expense recognized in net periodic benefit cost and other comprehensive income	\$ 756	\$ 4

The following assumptions are used to determine benefit obligations as of December 31:

	2018	2017
Discount rate	1.80%	1.80%
Rate of compensation	3.50%	3.00%

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

(in thousands)

Estimated future benefit payments:

2019	\$ 142
2020	170
2021	177
2022	183
2023	187
2024-2028	1,162

Note 17 Computation of Net Loss per Share

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

(in thousands, except per share amounts)	2018	2017	2016
Numerator for basic and diluted net loss per share:			
Net loss attributable to 3D Systems Corporation	\$(45,505)	\$(66,191)	\$(38,419)

Denominator for basic and diluted net loss per share:

Weighted average shares	112,327	111,554	111,189
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Net loss per share, basic and diluted	\$(0.41)	\$(0.59)	\$(0.35)
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For the years ended December 31, 2018, 2017 and 2016, the effect of dilutive securities, including non-vested stock options, restricted stock awards and RSUs, was excluded from the denominator for the calculation of diluted net loss per share because the Company recognized a net loss for each period and their inclusion would be anti-dilutive. Dilutive securities excluded were 5,015, 5,341 and 5,284 shares for the years ended December 31, 2018, 2017 and 2016, respectively.

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Note 18 Noncontrolling Interests

As of December 31, 2018, the Company owned approximately 70% of the capital and voting rights of Robtec, a service bureau and distributor of 3D printing and scanning products in Brazil which were originally acquired on November 25, 2014.

As of December 31, 2018, the Company owned approximately 70% of the capital and voting rights 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 \$2.3 million. The remaining 30% of the capital and voting rights of Easyway were acquired on January 21, 2019 for \$13.5 million to be paid in installments over four years.

Note 19 Fair Value Measurements

ASC 820, "Fair Value Measurements and Disclosures," defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. ASC 820 also establishes a fair value hierarchy that requires an entity to maximize the use of observable inputs that may be used to measure fair value:

Level 1 - Quoted prices in active markets for identical assets or liabilities;

Level 2 - Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities; or

Level 3 - Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

For the Company, the above standard applies to cash equivalents and earnout consideration. The Company utilizes the market approach to measure fair value for its 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:

(in thousands)	Fair Value Measurements as of December 31, 2018			Total
	Level 1	Level 2	Level 3	
Description				
Cash equivalents ^(a)	\$6,141	\$	—	\$6,141
Earnout consideration ^(b)	\$—	\$	—	\$—

(in thousands)	Fair Value Measurements as of December 31, 2017	
	Level 1	Total

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Description	Level 2		Level 3	
Cash equivalents ^(a)	\$20,244	\$ —	\$ —	\$20,244
Earnout consideration ^(b)	\$ —	\$ —	-\$5,115	\$5,115

Cash equivalents include funds held in money market instruments and are reported at their current carrying value, (a) 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.

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The fair value of the earnout consideration, which is based on the present value of the expected future payments to be made to the sellers of the acquired businesses, was derived by analyzing the future performance of the acquired businesses using the earnout formula and performance targets specified in each purchase agreement and adjusting (b) those amounts to reflect the ability of the acquired entities to achieve the stated targets. Given the significance of the unobservable inputs, the valuations are classified in Level 3 of the fair value hierarchy. The change in earnout consideration from December 31, 2017 to December 31, 2018 reflects a payment of \$2,675, accretion of \$268 and adjustments of \$2,708.

The Company did not have any transfers of assets and liabilities between levels of the fair value measurement hierarchy during the year ended December 31, 2018.

In addition to the assets and liabilities included in the above table, certain of our assets and liabilities are to be initially measured at fair value on a non-recurring basis. This includes goodwill and other intangible assets measured at fair value for impairment assessment. For further discussion on the valuation techniques and inputs used in the fair value measurement of goodwill and other intangible assets, see Notes 2, 7 and 8.

Note 20 Income Taxes

The U.S. Tax Cuts and Jobs Act (“Tax Act”) was enacted in December 2017. The Tax Act significantly changed U.S. tax law by, among other things, lowering the U.S. corporate income tax rate from 35% to 21% effective January 1, 2018, extending the carryforward period for newly generated net operating losses, implementing a territorial tax system, and imposing a one-time transition tax on deemed repatriated earnings of foreign subsidiaries.

The SEC staff issued Staff Accounting Bulletin No. 118 (“SAB 118”) to address the application of U.S. GAAP in situations when a registrant did not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Act and allowed the registrant to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. The Company applied this guidance when accounting for the enactment date effects of the Tax Act in 2017, and at December 31, 2017, the Company provided for provisional amounts related to the Tax Act, including, re-measurement of deferred tax assets and liabilities, one-time transition tax, and tax on global intangible low-taxed Income Inclusion (“GILTI”). At December 31, 2018, we have completed our accounting for all of the enactment date income tax effects of the Tax Act, and we recorded an adjustment of a \$1,524 tax benefit, which was offset by an adjustment to the Company’s valuation allowance of \$1,524 tax expense.

The Tax Act provides for a modified territorial tax system with GILTI provisions effective in 2018, which applies an incremental tax on low taxed foreign income. The GILTI provisions require the Company to include in its U.S. income tax return any foreign subsidiary earnings in excess of an allowable return on the foreign subsidiary’s tangible assets.

The components of the Company’s income before income taxes are as follows:

	2018	2017	2016
Loss before income taxes:			
Domestic	\$(59,233)	\$(75,965)	\$(53,868)
Foreign	16,005	18,444	14,056
Total	\$(43,228)	\$(57,521)	\$(39,812)

The components of income tax provision for the years ended December 31, 2018, 2017 and 2016 are as follows:

	2018	2017	2016
Current:			
U.S. federal	\$(5,882)	\$(83)	\$(2,110)
State	286	741	30
Foreign	10,621	12,711	8,099
Total	5,025	13,369	6,019
Deferred:			
U.S. federal	(322)	—	(1,245)
State	3	1,097	—
Foreign	(2,671)	(6,664)	(5,321)
Total	(2,990)	(5,567)	(6,566)
Total income tax provision (benefit)	\$2,035	\$7,802	\$(547)

The overall effective tax rate differs from the statutory federal tax rate for the years ended December 31, 2018, 2017 and 2016 as follows:

	% of Pretax Income		
	2018	2017	2016
Tax provision based on the federal statutory rate	21.0 %	35.0 %	35.0 %
Increase in valuation allowances	(34.8)	48.8	(58.5)
Global intangible low-taxed income inclusion	(6.6)	—	—
One-Time transition tax	(2.8)	(16.5)	—
Nondeductible expenses	(2.3)	(3.3)	(1.1)
Taxes related to distributions	(2.3)	—	—
Foreign income tax rate differential	(1.5)	—	3.1
Deemed income related to foreign operations	(1.5)	(4.1)	(8.4)
Foreign tax rate change	(1.4)	2.2	—
Employee share-based payments	0.1	(13.2)	—
Other	0.6	2.9	1.7
Deferred tax adjustments	0.9	(1.1)	13.0
State taxes, net of federal benefit, before valuation allowance	2.4	1.0	3.9
Return to provision adjustments	2.7	2.0	18.8
Foreign tax credits related to above	—	—	6.5
Other tax credits	5.1	—	—
U.S. Tax Cuts and Jobs Act - rate change adjustment	6.4	(65.9)	—
Uncertain tax positions and audit settlements	9.4	(1.4)	(25.1)
Foreign exchange loss	—	—	9.4
Impairment of definite lived intangibles	—	—	3.1
Effective tax rate	(4.6)%	(13.6)%	1.4 %

The difference between the Company's effective tax rate for 2018 and the federal statutory rate was 25.6 percentage points. The difference in the effective rate is primarily due to the impact of the Tax Act, including adjustments related to the Tax Act, the new provisions for GILTI, tax credits, adjustments to uncertain tax positions related to statute of limitations expiration, as well as change in valuation allowances.

The difference between the Company's effective tax rate for 2017 and the federal statutory rate was 48.6 percentage points. The difference in the effective rate is due primarily to the impact of the Tax Act, change in valuation

allowances that were recorded

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during the year, as well as the Company's foreign income inclusions and employee share-based payments that were previously recognized through other comprehensive income.

The difference between the Company's effective tax rate for 2016 and the federal statutory rate was 33.6 percentage points. The Company recorded nondeductible expenses, including non-deductible goodwill impairment charges and a valuation allowance in the U.S. and certain foreign jurisdictions, which contributed to a difference in the effective tax rate.

In 2018, there were no changes to the Company's 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.

During the third quarter of 2017, the Company determined that it is more likely than not that the deferred tax assets related to Phenix Systems would not be realized based on the Company's review of results from operations and other evidence. During the fourth quarter of 2017, it was determined that it was more likely than not that Layerwise, located in Belgium, would realize benefits based on results from operations and utilization of existing net operating losses. There were no other changes to the Company's valuation allowance assertions.

In 2016, there were no changes to the Company's valuation allowance assertions. During the fourth quarter of 2015, based upon the Company's review of results of operations and forecast estimates in connection with the assessment of deferred tax benefits, the Company determined that it is more likely than not that the deferred tax assets in the US and certain foreign jurisdictions will not be realized.

The components of the Company's net deferred income tax assets and net deferred income tax liabilities at December 31, 2018 and 2017 are as follows:

(in thousands)	2018	2017
Deferred income tax assets:		
Intangibles	\$22,530	\$24,232
Stock options and restricted stock awards	5,916	5,988
Reserves and allowances	15,656	11,308
Net operating loss carryforwards	41,356	35,004
Tax credit carryforwards	13,669	10,908
Accrued liabilities	3,040	3,011
Deferred revenue	5,036	4,629
Valuation allowance	(95,398)	(80,796)
Total deferred income tax assets	11,805	14,284
Deferred income tax liabilities:		
Intangibles	6,994	11,301
Property, plant and equipment	5,265	7,304
Liabilities related to distributions	997	—
Other	522	642
Total deferred income tax liabilities	13,778	19,247
Net deferred income tax liabilities	\$(1,973)	\$(4,963)

At December 31, 2018, \$41,356 of the Company's deferred income tax assets was attributable to \$288,959 of gross net operating loss carryforwards, which consisted of \$156,685 of loss carryforwards for U.S. federal income tax purposes, \$122,497 of loss carryforwards for U.S. state income tax purposes and \$9,777 of loss carryforwards for foreign

income tax purposes.

At December 31, 2017, \$35,004 of the Company's deferred income tax assets was attributable to \$237,186 of gross operating loss carryforwards, which consisted of \$115,846 of loss carryforwards for U.S. federal income tax purposes, \$101,563 of loss carryforwards for U.S. state income tax purposes and \$19,777 of loss carryforwards for foreign income tax purposes.

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The net operating loss carryforwards for U.S. federal income tax purposes begin to expire in 2035. The net operating loss carryforwards for U.S. state income tax purposes begin to expire in 2019. In addition, certain loss carryforwards for foreign income tax purposes begin to expire in 2019 and certain other loss carryforwards for foreign purposes do not expire.

At December 31, 2018, tax credit carryforwards included in the Company's deferred income tax assets consisted of \$2,934 of research and experimentation credit carryforwards for U.S. federal income tax purposes, \$4,049 of research and experimentation tax credit carryforwards for U.S. state income tax purposes, \$4,026 of foreign tax credits for U.S. federal income tax purposes, \$474 of other U.S. federal tax credits, \$915 of research and experimentation tax credit carryforwards for foreign income tax purposes and \$729 of other state tax credits. Certain state research and experimentation and other state credits begin to expire in 2021. The Company has recorded a valuation allowance related to the U.S. federal and state tax credits.

At December 31, 2017, tax credit carryforwards included in the Company's deferred income tax assets consisted of \$2,845 of research and experimentation credit carryforwards for U.S. federal income tax purposes, \$3,745 of research and experimentation tax credit carryforwards for U.S. state income tax purposes, \$3,549 of foreign tax credits for U.S. federal income tax purposes, \$474 of other U.S. federal tax credits, \$170 of research and experimentation tax credit carryforwards for foreign income tax purposes and \$600 of other state tax credits. Certain state research and experimentation and other state credits begin to expire in 2024. The Company has recorded a valuation allowance related to the U.S. federal and state tax credits.

Due to the one time transition tax, the Company's previously unremitted earnings have now been subjected to U.S. federal income tax, although, other additional taxes such as, withholding tax, could be applicable. The Company intends to permanently reinvest its earnings outside the U.S. and as such, it has not provided for any additional taxes on approximately \$92,876 of unremitted earnings. The Company believes the unrecognized deferred tax liability related to these earnings is approximately \$14,000.

Including interest and penalties, the Company decreased its unrecognized benefits by \$8,272 for the year ended December 31, 2018 and increased its unrecognized tax benefits by \$2,993 for the year ended December 31, 2017. The decrease was primarily related to the release of unrecognized tax benefits due to the expiration of statute of limitations. The Company does not anticipate any additional unrecognized tax benefits during the next 12 months that would result in a material change to its consolidated financial position. The Company includes interest and penalties in the Consolidated Financial Statements as a component of income tax expense.

(in thousands)	Unrecognized Tax Benefits		
	2018	2017	2016
Balance at January 1	\$(18,310)	\$(18,251)	\$(8,296)
Increases related to prior year tax positions	(1,400)	(4,104)	(2,658)
Decreases related to prior year tax positions	8,272	4,045	—
Increases related to current year tax positions	(1,593)	—	(7,297)
Balance at December 31	\$(13,031)	\$(18,310)	\$(18,251)

Tax years 2013 and 2014 remain subject to examination by the U.S. Internal Revenue Service for certain credit carryforwards, while 2015 through 2017 remain subject to examination by the U.S. Internal Revenue Service. State income tax returns are generally subject to examination for a period of three to four years after filing the respective tax returns. The impact on such tax returns of any federal changes remains subject to examination by various states for a period of up to one year after formal notification to the states. The Company files income tax returns (which are open to examination beginning in the year shown in parentheses) in Australia (2014), Belgium (2015), Brazil (2013), China (2016), France (2015), Germany (2015), India (2014), Israel (2014), Italy (2013), Japan (2013), Korea (2013), Mexico (2013), Netherlands (2013), Switzerland (2013), the United Kingdom (2017) and Uruguay (2013).

The following presents the changes in the balance of the Company's 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
2018	Deferred income tax asset valuation allowance	\$ 80,796	\$ 14,602	\$ —	\$95,398
2017	Deferred income tax asset valuation allowance	109,913	(28,071)	(1,046)	80,796
2016	Deferred income tax asset valuation allowance	107,312	20,450	(17,849)	109,913

Note 21 Segment Information

The Company operates as one segment and conducts its business through various offices and facilities located throughout the Americas region (United States, Canada, Brazil, Mexico and Uruguay), EMEA region (Belgium, France, Germany, Israel, Italy, the Netherlands, Switzerland and the United Kingdom), and Asia Pacific region (Australia, China, India, Japan and South Korea). The Company has historically disclosed summarized financial information for the geographic areas of operations as if they were segments in accordance with ASC 280, "Segment Reporting." Financial information concerning the Company's geographical locations is based on the location of the selling entity.

For the year ended December 31, 2018, one customer accounted for approximately 13% of our consolidated revenue. No single customer accounted for more than 10% of our consolidated revenue for the years ended December 31, 2017 or 2016.

Summarized financial information concerning the Company's geographical operations is shown in the following tables:

(in thousands)	2018	2017	2016
Revenue from unaffiliated customers:			
United States	\$332,611	\$322,399	\$329,553
Other Americas	8,154	11,377	11,332
EMEA	237,462	220,357	193,141
Asia Pacific	109,433	91,936	98,939
Total revenue	\$687,660	\$646,069	\$632,965
(in thousands)	2018	2017	2016
Revenue by class of product and service:			
Products	\$259,124	\$222,750	\$238,011
Materials	170,091	168,846	156,839
Services	258,445	254,473	238,115
Total revenue	\$687,660	\$646,069	\$632,965

Year Ended December 31, 2018

Intercompany Sales to

(in thousands)	Americas	EMEA	Asia Pacific	Total
Americas	\$2,342	\$59,206	\$22,962	\$84,510
EMEA	75,875	28,075	7,209	111,159
Asia Pacific	4,633	32	3,570	8,235
Total	\$82,850	\$87,313	\$33,741	\$203,904

Year Ended December 31, 2017

Intercompany Sales to

(in thousands)	Americas	EMEA	Asia Pacific	Total
Americas	\$2,169	\$51,689	\$20,388	\$74,246
EMEA	70,709	19,098	4,945	94,752
Asia Pacific	2,790	174	3,936	6,900
Total	\$75,668	\$70,961	\$29,269	\$175,898

Year Ended December 31, 2016

Intercompany Sales to

(in thousands)	Americas	EMEA	Asia Pacific	Total
Americas	\$3,013	\$39,839	\$21,639	\$64,491
EMEA	65,209	12,286	6,091	83,586
Asia Pacific	3,046	369	3,959	7,374
Total	\$71,268	\$52,494	\$31,689	\$155,451

(in thousands)	2018	2017	2016
Income (loss) from operations:			
Americas		\$(69,081)	\$(79,429)
EMEA		5,283	7,483
Asia Pacific		20,607	17,973
Total		\$(43,191)	\$(53,973)

(in thousands)	2018	2017	2016
Depreciation and amortization:			
Americas		\$25,005	\$25,484
EMEA		30,191	31,135
Asia Pacific		4,097	5,422
Total		\$59,293	\$62,041

(in thousands)	2018	2017	2016
Capital expenditures:			
Americas	\$19,668	\$23,925	\$8,172
EMEA	20,057	5,227	5,947
Asia Pacific	969	1,729	2,448
Total	\$40,694	\$30,881	\$16,567

(in thousands)	At December 31,		
	2018	2017	2016
Assets:			
Americas	\$284,676	\$329,550	\$345,412
EMEA	433,326	454,319	382,163
Asia Pacific	107,830	112,895	121,578
Total	\$825,832	\$896,764	\$849,153

(in thousands)	At December 31,		
	2018	2017	2016
Cash and cash equivalents:			
Americas	\$39,316	\$51,475	\$105,750
EMEA	41,581	52,642	44,877
Asia Pacific	29,101	32,227	34,320
Total	\$109,998	\$136,344	\$184,947

Note 22 Commitments and Contingencies

The Company leases certain of its facilities and equipment under non-cancelable operating leases. See Note 13.

Supply commitments totaled \$54,972 and \$83,305 as of December 31, 2018 and 2017, respectively. Commitments for printer assemblies and inventory items at December 31, 2018 and 2017 were \$27,851 and \$57,592, respectively. Commitments for operating costs and capital expenditures at December 31, 2018 and 2017 were \$27,121 and \$25,713, respectively.

Certain of the Company's acquisitions contain earnout provisions under which the sellers of the acquired businesses can earn additional amounts. The total liability recorded for these earnouts as of December 31, 2018 and 2017 was \$0 and \$5,115, respectively.

Put Options

Owners of interests in the Robtec subsidiary have the right in certain circumstances to require the Company to acquire either a portion of or all of the remaining ownership interests held by them. The owners' ability to exercise any such "put option" right is subject to the satisfaction of certain conditions, including conditions requiring notice in advance of exercise. In addition, these rights cannot be exercised prior to a specified exercise date. The exercise of these rights at their earliest contractual date would result in obligations of the Company to fund the related amounts in 2019.

Management estimates, assuming that the subsidiary owned by the Company at December 31, 2018, performs over the relevant future periods at its forecasted earnings levels, that these rights, if exercised, could require the Company, in future periods, to pay approximately \$8,872 to the owners of such rights to acquire such ownership interests in the relevant subsidiary. This amount has been recorded as redeemable noncontrolling interests on the Consolidated Balance Sheet at December 31, 2018 and 2017. The ultimate amount payable relating to this transaction will vary because it is dependent on the future results of operations of the subject business.

Indemnification

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

To the extent permitted under Delaware law, the Company indemnifies its directors and officers for certain events or occurrences while the director or officer is, or was, serving at the Company's request in such capacity, subject to limited exceptions. The maximum potential amount of future payments the Company could be required to make under these indemnification obligations is unlimited; however, the Company has directors and officers insurance coverage that may enable the Company 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

Derivative Litigation

Nine related derivative complaints have been filed by purported Company stockholders against certain of the Company's former executive officers and members of its Board of Directors. The Company is named as a nominal defendant in all nine actions. The derivative complaints are styled as follows: (1) Steyn v. Reichental, et al., Case No. 2015-CP-46-2225, filed on July 27, 2015 in the Court of Common Pleas for the 16th Judicial Circuit, County of York, South Carolina ("Steyn"); (2) Piguig v. Reichental, et al., Case No. 2015-CP-46-2396, filed on August 7, 2015 in the Court of Common Pleas for the 16th Judicial Circuit, County of York, South Carolina ("Piguig"); (3) Booth v. Reichental, et al., Case No. 15-692-RGA, filed on August 6, 2015 in the United States District Court for the District of Delaware; (4) Nally v. Reichental, et al., Case No. 15-cv-03756-MGL, filed on September 18, 2015 in the United States District Court for the District of South Carolina ("Nally"); (5) Gee v. Hull, et al., Case No. BC-610319, filed on February 17, 2016 in the Superior Court for the State of California, County of Los Angeles ("Gee"); (6) Foster v. Reichental, et al., Case No. 0:16-cv-01016-MGL, filed on April 1, 2016 in the United States District Court for the District of South Carolina ("Foster"); (7) Lu v. Hull, et al., Case No. BC629730, filed on August 5, 2016 in the Superior Court for the State of California, County of Los Angeles ("Lu"); (8) Howes v. Reichental, et al., Case No. 0:16-cv-2810-MGL, filed on August 11, 2016 in the United States District Court for the District of South Carolina ("Howes"); and (9) Ameduri v. Reichental, et al., Case No. 0:16-cv-02995-MGL, filed on September 1, 2016 in the United States District Court for the District of South Carolina ("Ameduri"). Steyn and Piguig were consolidated into one action styled as In re 3D Systems Corp. Shareholder Derivative Litig., Lead Case No. 2015-CP-46-2225 in the Court of Common Pleas for the 16th Judicial Circuit, County of York, South Carolina. Gee and Lu were consolidated into one action styled as Gee v. Hull, et al., Case No. BC610319 in the Superior Court for the State of California, County of Los Angeles. Nally, Foster, Howes, and Ameduri were consolidated into one action in the United States District Court for the District of South Carolina with Nally as the lead consolidated case.

The derivative complaints allege claims for breach of fiduciary duty, abuse of control, gross mismanagement, waste of corporate assets and unjust enrichment and seek, among other things, monetary damages and certain corporate governance actions.

All of the derivative complaints listed above have been stayed.

The Company disputes these allegations and intends to defend the Company and its officers and directors vigorously.

Ronald Barranco and Print3D Corporation v. 3D Systems Corporation, et. al.

On August 23, 2013, Ronald Barranco, a former Company employee, filed two lawsuits against the Company and certain officers in the United States District Court for the District of Hawaii. The first lawsuit (“Barranco I”) is captioned Ronald Barranco and Print3D Corporation v. 3D Systems Corporation, 3D Systems, Inc., and Damon Gregoire, Case No. CV 13-411 LEK RLP, and alleges seven causes of action relating to the Company’s acquisition of Print3D Corporation (of which Mr. Barranco was a 50% shareholder) and the subsequent employment of Mr. Barranco by the Company. The second lawsuit (“Barranco II”) is captioned Ronald Barranco v. 3D Systems Corporation, 3D Systems, Inc., Abraham Reichental, and Damon Gregoire, Case No. CV 13-412 LEK RLP, and alleges the same seven causes of action relating to the Company’s acquisition of certain website domains from Mr. Barranco and the subsequent employment of Mr. Barranco by the Company. Both Barranco I and Barranco II allege the Company breached certain purchase agreements in order to avoid paying Mr. Barranco additional monies pursuant to royalty and earn out provisions in the agreements.

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With regard to Barranco I, the Hawaii district court, on February 28, 2014, denied the Company's motion to dismiss and its motion to transfer venue to South Carolina for the convenience of the parties. However, the Hawaii court recognized that Barranco's claims were all subject to mandatory and binding arbitration in Charlotte, North Carolina. The parties selected an arbitrator and arbitration took place in September 2015 in Charlotte, North Carolina.

On September 28, 2015, the arbitrator issued a final award in favor of Barranco with respect to two alleged breaches of contract and implied covenants arising out of the contract. The arbitrator found that the Company did not commit fraud or make any negligent misrepresentations to Barranco. Pursuant to the award, the Company was directed to pay approximately \$11,282, which includes alleged actual damages of \$7,254, fees and expenses of \$2,318 and prejudgment interest of \$1,710.

On August 3, 2018, following an unsuccessful appeal to the federal court in the Western District of North Carolina and the United States Court of Appeals for the Fourth Circuit, the Company paid \$9,127 of the Barranco I judgment, net setoff. On September 28, 2018, the parties filed a Consent Stipulation Resolving Motion for Setoff of Judgment, stipulating that subject only to vacatur or amendment reducing the Barranco II judgment in Barranco's appeal to the Ninth Circuit related to the Barranco II action discussed below, the Barranco II judgment in the amount of \$2,182 was setoff against the Barranco I judgment ("Stipulated Setoff"). The Company paid Barranco the \$101 balance remaining due after the Stipulated Setoff.

With regard to Barranco II, the case was tried to a jury in Hawaii district court in May 2016, and on May 27, 2016 the jury found that the Company was not liable for either breach of contract or breach of the implied covenant of good faith and fair dealing. Additionally, the jury found in favor of the Company on its counterclaim against Barranco and determined that Barranco violated his non-competition covenant with the Company. On March 30, 2018, the court entered Findings of Fact and Conclusions of Law and Order requiring Barranco to disgorge, and the Company recover, \$523, representing all but four months of the full amount paid to Barranco as salary during his employment with the Company as well as a portion of the up front and buyout payments made to Barranco in connection with the purchase of certain web domains. In addition, the court ordered Barranco to pay pre-judgment interest to the Company to be calculated beginning as of his first breach of the non-competition covenant in August 2011. Judgment entered thereafter on April 2, 2018.

On September 13, 2018, the Hawaii district court entered its Amended Judgment in a Civil Case, awarding the Company a final amended judgment of \$2,182. On September 19, 2018, Barranco filed an Amended Notice of Appeal. On January 13, 2019, Barranco filed Appellant's Opening Brief in the Ninth Circuit. The Company's Answering Brief is due March 15, 2019. Appellant's optional Reply Brief is due 21 days thereafter. The Company intends to defend the appeal vigorously.

Export Controls and Government Contracts Compliance Matter

In October 2017 the Company 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 its Quickparts.com, Inc. subsidiary. In addition, while collecting information responsive to the above-referenced subpoena, the Company identified potential violations of the International Traffic in Arms Regulations ("ITAR") 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, the Company submitted voluntary disclosures to BIS and DDTC identifying numerous potentially unauthorized exports of technical data, which supplemented an initial notice of voluntary disclosure that the Company submitted to DDTC in February 2018. The Company is conducting an internal review of its export control, trade sanctions, and government contracting compliance risks and potential violations; implementing

associated compliance enhancements; and cooperating with DDTC and BIS, as well as the U.S. Departments of Justice, Defense and Homeland Security. Although the Company cannot predict the ultimate resolution of these matters, the Company has incurred and expects to continue to incur significant legal costs and other expenses in connection with responding to the U.S. government agencies.

Other

The Company is involved in various other legal matters incidental to its business. Although the Company cannot predict the results of the litigation with certainty, the Company believes that the disposition of all these various other legal matters will not have a material adverse effect, individually or in the aggregate, on its consolidated results of operations, consolidated statement of cash flows or consolidated financial position.

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Note 23 Accumulated Other Comprehensive Income (Loss)

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

(in thousands)	Foreign currency translation adjustment	Defined benefit pension plan	Liquidation of non-US entity and purchase of non-controlling interests	Total
Balance at December 31, 2016	\$ (50,738)	\$ (2,775)	\$ 288	\$ (53,225)
Other comprehensive income (loss)	31,419	220	50	31,689
Balance at December 31, 2017	(19,319)	(2,555)	338	(21,536)
Other comprehensive income	(18,751)	(92)	—	(18,843)
Amounts reclassified from accumulated other comprehensive income	1,401	—	—	1,401
Balance at December 31, 2018	\$ (36,669)	\$ (2,647)	\$ 338	\$ (38,978)

Amounts reclassified out of accumulated other comprehensive loss are as follows:

(in thousands)	2018	2017	Statement of Operations	Caption
Currency translation adjustments:				
Gain on dissolution	\$ 1,401	\$ —	Interest and other expense, net	

The amounts presented above are in other comprehensive loss and are net of taxes. For additional information about foreign currency translation, see Note 11. For additional information about the pension plan, see Note 16.

Note 24 Selected Quarterly Financial Data (unaudited)

The following tables set forth unaudited selected quarterly financial data:

(in thousands, except per share amounts)	2018			
	Quarter Ended			
	December 31	September 30	June 30	March 31
Consolidated revenue	\$ 180,712	\$ 164,511	\$ 176,568	\$ 165,869
Gross profit	82,553	77,810	86,162	77,869
Total operating expenses	89,572	88,794	93,884	95,335
Loss from operations	(7,019)	(10,984)	(7,722)	(17,466)
Provision for income taxes	(4,051)	1,593	2,539	1,954
Net loss attributable to 3D Systems	(4,136)	(11,550)	(8,862)	(20,957)
Basic and diluted net loss per share	\$ (0.04)	\$ (0.10)	\$ (0.08)	\$ (0.19)

(in thousands, except per share amounts)	2017			
	Quarter Ended			
	December 31	September 30	June 30	March 31
Consolidated revenue	\$ 177,264	\$ 152,907	\$ 159,467	\$ 156,431
Gross profit	85,458	58,522	80,673	80,186
Total operating expenses	91,161	90,857	87,537	89,257
Loss from operations	(5,703)	(32,335)	(6,864)	(9,071)
Provision for income taxes	971	3,723	2,067	1,041

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Net loss attributable to 3D Systems	(10,134)	(37,670)	(8,416)	(9,971)
Basic and diluted net income (loss) per share	\$(0.08)	\$(0.34)	\$(0.08)	\$(0.09)

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(in thousands, except per share amounts)	2016			
	Quarter Ended			
	December 31	September 30	June 30	March 31
Consolidated revenue	\$165,937	\$156,362	\$158,111	\$152,555
Gross profit	82,890	68,937	80,411	77,513
Total operating expenses	78,817	90,954	84,128	94,272
Income (loss) from operations	4,073	(22,017)	(3,717)	(16,759)
Provision (benefit) for income taxes	(1,212)	(2,214)	1,700	1,179
Net income (loss) attributable to 3D Systems	5,230	(21,213)	(4,648)	(17,788)
Basic and diluted net income (loss) per share	\$0.05	\$(0.19)	\$(0.04)	\$(0.16)

The sum of per share amounts for each of the quarterly periods presented does not necessarily equal the total presented for the year because each quarterly amount is independently calculated at the end of each period based on the net income (loss) available to common stockholders for such period and the weighted average shares of outstanding common stock for such period.

Note 25 Subsequent Events

There are no subsequent events except as disclosed within Note 12, Note 18 and Note 22.