

HEXCEL CORP /DE/
Form 10-K
February 06, 2019

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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 Number 1-8472

Hexcel Corporation

(Exact name of registrant as specified in its charter)

Delaware

94-1109521

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(State of Incorporation) (I.R.S. Employer Identification No.)

281 Tresser Boulevard

Stamford, Connecticut 06901

(Address of principal executive offices and zip code)

Registrant's telephone number, including area code: (203) 969-0666

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

Title of each class Name of each exchange on which registered
COMMON STOCK NEW YORK STOCK EXCHANGE

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

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company", and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any or new 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 Act). Yes No

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The aggregate market value of the registrant's common stock held by non-affiliates was \$6,224,384,351 based on the reported last sale price of common stock on June 29, 2018, which is the last business day of the registrant's most recently completed second fiscal quarter.

The number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date.

Class	Outstanding as of January 31, 2019
COMMON STOCK	84,794,472

Documents Incorporated by Reference:

Proxy Statement for Annual Meeting of Stockholders (to the extent specified herein) — Part III.

PART I

ITEM 1. Business.

General Development of Business

Hexcel Corporation, founded in 1946, was incorporated in California in 1948, and reincorporated in Delaware in 1983. Hexcel Corporation and its subsidiaries (herein referred to as “Hexcel”, “the Company”, “we”, “us”, or “our”), is a leading advanced composites company. We develop, manufacture, and market lightweight, high-performance structural materials, including carbon fibers, specialty reinforcements, prepregs and other fiber-reinforced matrix materials, honeycomb, adhesives, engineered honeycomb and composite structures, for use in Commercial Aerospace, Space & Defense and Industrial markets. Our products are used in a wide variety of end applications, such as commercial and military aircraft, space launch vehicles and satellites, wind turbine blades, automotive, recreational products and other industrial applications. Our composite solutions enable our customers to improve the performance of their products by reducing weight while enhancing strength and durability.

We serve international markets through manufacturing facilities, sales offices and representatives located in the Americas, Asia Pacific, Europe, Russia, India and Africa. We also have a presence in Malaysia where we are a partner in a joint venture which manufactures composite structures for Commercial Aerospace applications.

On January 3, 2019, we acquired ARC Technologies, LLC, a leading supplier of custom RF/EMI and microwave absorbing composite materials for military, aerospace and industrial applications. The acquisition strengthens our existing advanced materials portfolio in structural composites and thermoplastics.

We are a manufacturer of products within a single industry: Advanced Composites. Hexcel has two reportable segments: Composite Materials and Engineered Products. The Composite Materials segment is comprised of our carbon fiber, specialty reinforcements, resins, prepregs and other fiber-reinforced matrix materials, and honeycomb core product lines and pultruded profiles. The Engineered Products segment is comprised of lightweight high strength composite structures, engineered core and honeycomb products with added functionality, and additive manufacturing.

The following summaries describe the ongoing activities related to the Composite Materials and Engineered Products segments as of December 31, 2018.

Composite Materials

The Composite Materials segment manufactures and markets carbon fibers, fabrics and specialty reinforcements, prepregs and other fiber-reinforced matrix materials, structural adhesives, honeycomb, molding compounds, tooling materials, polyurethane systems and laminates that are incorporated into many applications, including military and commercial aircraft, wind turbine blades, recreational products, transport (cars, boats, trains) and other industrial applications.

The following table identifies the principal products and examples of the primary end-uses from the Composite Materials segment:

SEGMENT	PRODUCTS	PRIMARY END-USES
COMPOSITE MATERIALS	Carbon Fibers	Raw materials for prepregs, fabrics and specialty reinforcements Filament winding for various aerospace, defense and industrial applications
	Fabrics, Multi-axials and Specialty Reinforcements	Raw materials for prepregs and honeycomb Composites and components used in aerospace, defense, wind energy, automotive, recreation, marine and other industrial applications
	Prepregs, Other Fiber-Reinforced Matrix Materials and Resins	Composite structures Commercial and military aircraft components Satellites and launchers Aero-engines Wind turbine and helicopter blades Cars, boats and trains Skis, snowboards, bicycles and hockey sticks
	Structural Adhesives	Bonding of metals, honeycomb and composite materials
	Honeycomb	Composite structures and interiors Impact and shock absorption systems Helicopter blades
	Pultruded Profiles	Tubes Rods and flat sections for sporting goods Robotics Medical applications

Carbon Fibers: HexTow® carbon fibers are manufactured for sale to third-party customers as well as for our own use in manufacturing certain reinforcements and composite materials. Carbon fibers are also woven into carbon fabrics,

used as reinforcement in conjunction with a resin matrix to produce pre-impregnated composite materials (referred to as “prepregs”). Carbon fiber is also used in filament winding to produce finished composite components. Key product applications include structural components for commercial and military aircraft, space launch vehicles, and certain other applications such as recreational and industrial equipment.

Fabrics, Multi-axials and Specialty Reinforcements: HexForce® fabrics, multi-axials and specialty reinforcements are made from a variety of fibers, including carbon, glass, aramid and other high strength polymers, quartz, ceramic and other specialty fibers. These reinforcements are used in the production of prepregs and other matrix materials for third-party customers as well as for our own use. They are also used in the manufacture of a variety of industrial and recreational products such as wind energy blades, automotive components, oil exploration and production equipment, boats, surfboards, skis and other sporting goods equipment.

Prepregs: HexPly® prepregs are manufactured for sale to third-party customers and for internal use by our Engineered Products segment in manufacturing composite laminates and monolithic structures. Prepregs are used in primary and secondary structural aerospace applications such as wing components, horizontal and vertical stabilizer components, fairings, radomes and engine fan blades and cases, engine nacelles as well as overhead storage bins and other interior components. They are also used in many of the industrial and recreational products noted above. Prepregs are manufactured by combining high-performance reinforcement fabrics or unidirectional fibers with a resin matrix to form a composite material that, when cured, has exceptional structural properties not present in either of the constituent materials. Prepregs are applied via hand layup, automatic tape layup and advanced fiber placement to produce finished composite components. Prepreg reinforcements include glass, carbon, aramid, quartz, ceramic and other specialty fibers. Resin matrices include bismaleimide, cyanate ester, epoxy, phenolic, polyimide and other specialty resins.

Other Fiber-Reinforced Matrix Materials: Fiber reinforced matrix developments include HexMC®, a form of quasi-isotropic carbon fiber prepreg that enables small to medium sized, complex-shaped, composite components to be mass produced. HexTool® is a specialized form of HexMC® for use in the cost-effective construction of high temperature resistant composite tooling. HexFIT® film infusion material is a product that combines resin films and dry fiber reinforcements to save lay-up time in production and enables the manufacture of large contoured composite structures, such as wind turbine blades.

Resins: HexFlow® polymer matrix materials are sold in liquid and film form for use in direct process manufacturing of composite parts. Resins can be combined with fiber reinforcements in manufacturing processes such as resin transfer molding (“RTM”), resin film infusion (“RFI”) or vacuum assisted resin transfer molding (“VARTM”) to produce high quality composite components for both aerospace and industrial applications, without the need for customer investment in autoclaves.

Structural Adhesives: We manufacture and market a comprehensive range of Redux® and HexBond™ film and paste adhesives. These structural adhesives, which bond metal to metal and composites and honeycomb structures, are used in the aerospace industry and for many industrial applications.

Honeycomb: HexWeb® honeycomb is a lightweight, cellular structure generally composed of a sheet of nested hexagonal cells. It can also be manufactured in over-expanded and asymmetric cell configurations to meet special design requirements such as contours or complex curvatures. Honeycomb is primarily used as a lightweight core material and acts as a highly efficient energy absorber. When sandwiched between composite or metallic facing skins, honeycomb significantly increases the stiffness of the structure, while adding very little weight.

We produce honeycomb from a number of metallic and non-metallic materials. Most metallic honeycomb is made from aluminum and is available in a selection of alloys, cell sizes and dimensions. Non-metallic materials used in the manufacture of honeycomb include fiberglass, carbon fiber, thermoplastics, non-flammable aramid papers, aramid fiber and other specialty materials.

We sell honeycomb as standard blocks and in slices cut from a block. Honeycomb is also used in Acousti-Cap® where a non-metallic, permeable cap material is embedded into honeycomb core that is used in aircraft engine nacelles to dramatically reduce noise during takeoff and landing without adding a structural weight penalty. Aerospace is the largest market for honeycomb products. In addition, we produce honeycomb for our Engineered Products segment for use in manufacturing finished parts for airframe Original Equipment Manufacturers (“OEMs”).

Polyspeed® Pultruded profiles: Hexcel manufactures a wide range of pultruded sections including rods, flat sections, tubes and specific profiles that are usually made from carbon fiber but can also be made from glass, quartz, basalt or other fibers. The profile matrix is a Hexcel formulation of thermoset resin (epoxy or polyurethane). Hexcel pultruded profiles are used in a wide range of industrial applications.

The following table identifies the key customers and the major manufacturing facilities of the Composite Materials segment:

COMPOSITE MATERIALS
KEY CUSTOMERS

Aernnova	Daher	Sikorsky, a Lockheed Martin Company
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Airbus	Embraer	Solvay
AVIC	FACC	Spirit Aerosystems
Bell	General Electric	Toray
BMW	GKN	Triumph
The Boeing Company	Leonardo	United Technologies
Bombardier	Nordam	Vestas
CFAN	Northrop Grumman	
CTRM Aero Composites	Safran	

MAJOR MANUFACTURING FACILITIES

Casa Grande, Arizona	Neumarkt, Austria
Dagneux, France	Roussillon, France
Decatur, Alabama	Parla, Spain
Duxford, England	Salt Lake City, Utah
Illescas, Spain	Seguin, Texas
Leicester, England	Stade, Germany
Les Avenières, France	Tianjin, China
Nantes, France	Windsor, Colorado
Vert-Le-Petit, France	

Net sales for the Composite Materials segment to third-party customers were \$1,771 million in 2018, \$1,597 million in 2017 and \$1,610 million in 2016, which represented about 80%, of our net sales each year. Net sales for composite materials are highly dependent upon the number of large commercial aircraft produced as further discussed under the captions “Significant Customers”, “Markets” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations”. In addition, less than 5% of our total production of composite materials in 2018 was used internally by the Engineered Products segment.

Engineered Products

The Engineered Products segment manufactures and markets composite structures and precision machined honeycomb parts primarily for use in the aerospace industry. Composite structures are manufactured from a variety of composite and other materials, including prepregs, honeycomb, and structural adhesives, using such manufacturing processes as autoclave processing, multi-axis numerically controlled machining, heat forming, and other composite manufacturing techniques. Composite structures includes HexAM™ 3D printed parts, which offer significant weight cost and time-to-market reductions compared to incumbent metal or traditional composite technologies.

The following table identifies the principal products and examples of the primary end-uses from the Engineered Products segment:

SEGMENT	PRODUCTS	PRIMARY END-USES
ENGINEERED PRODUCTS	Composite Structures	Aircraft structures and finished aircraft components, including wing to body fairings, wing panels, flight deck panels, door liners, helicopter blades, spars and tip caps
	Engineered Honeycomb	Aircraft structural sub-components and semi-finished components used in helicopter blades, engine nacelles, and aircraft surfaces (flaps, wings, elevators and fairings)
	HexTool® Tooling	Mold tools made from carbon fiber and high temperature resistant BMI or epoxy resin. Used in the manufacture of composite aircraft structures, providing a lower weight, easier to handle alternative to traditional metal tooling.

Net sales for the Engineered Products segment to third-party customers were \$419 million in 2018, \$376 million in 2017, and \$394 million in 2016, which represented about 20% of our net sales each year.

The Engineered Products segment has a 50% ownership interest in a Malaysian joint venture, Aerospace Composites Malaysia Sdn. Bhd. (“ACM”) with Boeing Worldwide Operations Limited. Under the terms of the joint venture agreement, Hexcel and The Boeing Company (“Boeing”) have transferred the manufacture of certain semi-finished composite components to this joint venture. Hexcel purchases certain semi-finished composite components from the joint venture, and inspects and performs additional skilled assembly work before delivering them to Boeing. The joint venture also manufactures composite components for other aircraft component manufacturers. ACM had revenue of \$59 million in 2018, and \$62 million and \$58 million in 2017 and 2016, respectively.

The following table identifies the key customers and the major manufacturing facilities of the Engineered Products segment:

ENGINEERED PRODUCTS	
KEY CUSTOMERS	MAJOR MANUFACTURING FACILITIES
The Boeing Company	Alor Setar, Malaysia (JV)
Bell	Burlington, Washington
CTRM Aero Composites	Casablanca, Morocco
General Electric	Kent, Washington
GKN	Pottsville, Pennsylvania
Sikorsky, a Lockheed Martin Company	South Windsor, Connecticut
Spirit Aerosystems	Welkenraedt, Belgium
United Technologies	

Significant Customers

Approximately 41%, 44% and 41% of our 2018, 2017 and 2016 net sales, respectively, were to Airbus and its subcontractors. Of the 41% of overall sales to Airbus and its subcontractors in 2018, 38% related to Commercial Aerospace market applications and 3% related to Space & Defense market applications. Approximately 25% for each of 2018 and 2017 and 28% of our 2016 net sales, respectively, were to Boeing and related subcontractors. Of the 25% of overall sales to Boeing and its subcontractors in 2018, 23% related to Commercial Aerospace market applications and 2% related to Space & Defense market applications.

Markets

Our products are sold for a broad range of end-uses where durability, strength and weight are important factors to our customers. The following tables summarize our net sales to third-party customers by market and by geography for each of the three years ended December 31:

	2018	2017	2016
Net Sales by Market			
Commercial Aerospace	70 %	72 %	71 %
Space & Defense	17	17	16
Industrial	13	11	13
Total	100 %	100 %	100 %
Net Sales by Geography (a)			
United States	48 %	48 %	48 %
Europe and other	52	52	52
Total	100 %	100 %	100 %

(a) Net sales by geography based on the location in which the product sold was manufactured.

2018 2017 2016

Net Sales to External Customers (b)						
United States	42	%	41	%	42	%
Europe	41		42		41	
All Others	17		17		17	
Total	100	%	100	%	100	%

(b) Net sales to external customers based on the location to which the product sold was delivered

Commercial Aerospace

The Commercial Aerospace industry is our largest user of advanced composites. Commercial Aerospace represented 70% of our 2018 net sales. Approximately 87% of these revenues can be identified as sales to Airbus, Boeing and their subcontractors for the production of commercial aircraft. The remaining 13% of these revenues were for regional, and business and other commercial aircraft. The economic benefits airlines can obtain from weight savings in both fuel economy and aircraft range, combined with the

design enhancement that comes from the advantages of advanced composites over traditional materials, has resulted in the aerospace industry becoming the leader in the adoption and use of these materials. While military aircraft and spacecraft have championed the development of these materials, Commercial Aerospace has had the greater production volumes and has commercialized the use of these products. Accordingly, the demand for advanced structural material products is closely correlated to the demand for new commercial aircraft.

The use of advanced composites in Commercial Aerospace is primarily in the manufacture of new commercial aircraft. The aftermarket for these products is very small as many of these materials are designed to last for the life of the aircraft. The demand for new commercial aircraft is driven by two principal factors, the first of which is airline passenger traffic (the number of revenue passenger miles flown by the airlines) which affects the required size of airline fleets. The International Air Transport Association (IATA) estimates 2018 (as of November 2018) revenue passenger miles were 6.2% higher than 2017. Growth in passenger traffic requires growth in the size of the fleet of commercial aircraft operated by airlines worldwide.

A second factor, which is less sensitive to the general economy, is the replacement rates for existing aircraft. The rates of retirement of passenger and freight aircraft, resulting mainly from obsolescence, are determined in part by the regulatory requirements established by various civil aviation authorities worldwide as well as public concern regarding aircraft age, safety and noise. These rates may also be affected by the desire of the various airlines to improve operating costs with higher payloads and more fuel-efficient aircraft (which in turn is influenced by the price of fuel) and by reducing maintenance expense. In addition, there is expected to be increasing pressure on airlines to replace their aging fleet with more fuel efficient and quieter aircraft to be more environmentally responsible. When aircraft are retired from commercial airline fleets, they may be converted to cargo freight aircraft, used for parts or scrapped.

An additional factor that may cause airlines to defer or cancel orders is their ability to obtain financing, including leasing, for new aircraft orders. This will be dependent both upon the financial health of the airline operators, as well as the overall availability of financing in the marketplace.

Each new generation of commercial aircraft has used increasing quantities of advanced composites, replacing metals. This follows the trend previously seen in military fighter aircraft where advanced composites may now exceed 50% of the weight of the airframe. Early versions of commercial jet aircraft, such as the Boeing 707, which was developed in the early 1950's, contained almost no composite materials. One of the first commercial aircraft to use a meaningful amount of composite materials, the Boeing 767 entered into service in 1983, and was built with an airframe containing approximately 6% composite materials. The airframe of Boeing's 777 aircraft, which entered service in 1995, is approximately 11% composite. The Airbus A380, which was first delivered in 2007, has approximately 23% composite content by weight. Boeing's B787, which entered into service in 2011, has a content of more than 50% composite materials by weight. The Airbus A350 XWB ("A350") which has a composite content of 53% by weight was first delivered in December 2014. Both Airbus and Boeing have introduced new versions of their narrow body aircraft which have new engines. Airbus's A320neo had its first customer delivery in 2016 and Boeing's B737 MAX entered into service in 2017. In 2014, Airbus announced a new version of its A330, the A330neo, which have new engines, and Boeing announced the B777X, a new version of the B777 with composite wings and new engines. It is expected that new aircraft will offer more opportunities for composite materials than their predecessors, as the Commercial Aerospace industry continues to utilize a greater proportion of advanced composite materials with each new generation of aircraft. We refer to this steady expansion of the use of composites in aircraft as the "secular penetration of composites" as it increases our average sales per airplane over time.

The impact on Hexcel of Airbus and Boeing's production rate changes is typically influenced by two factors: the mix of aircraft produced and the inventory supply chain effects of increases or reductions in aircraft production. We have products on all Airbus and Boeing planes. The dollar value of our materials varies by aircraft type — twin aisle aircraft

use more of our materials than narrow body aircraft and newer designed aircraft use more of our materials than older generations. On average, for established programs, we deliver products into the supply chain about six months prior to aircraft delivery, with a range between one and eighteen months depending on the product. For aircraft that are in the development or ramp-up stage, such as the A330neo and the B777X, we will have sales as much as several years in advance of the delivery. Increased aircraft deliveries combined with the secular penetration of composites resulted in our Commercial Aerospace revenues increasing, year over year, by approximately 8.2% in 2018 and 11% in 2016. The slight decline in Commercial Aerospace revenues in 2017 was as a result of older wide body aircraft models being phased out as the new narrow body programs ramped up.

Set forth below are historical aircraft deliveries as announced by Airbus and Boeing:

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Airbus	378	434	453	483	498	510	534	588	626	629	635	688	730	800
Boeing	290	398	441	375	481	462	477	601	648	723	762	748	763	806
Total	668	832	894	858	979	972	1,011	1,189	1,274	1,352	1,397	1,436	1,493	1,606

Approximately 87% of our Commercial Aerospace revenues can be identified as sales to Airbus, Boeing and their subcontractors for the production of commercial aircraft. Airbus and Boeing combined deliveries in 2018 were 1,606 aircraft, surpassing the previous high of 1,493 in 2017. In 2018, the combined net orders reported by Airbus and Boeing were for 1,640 planes, bringing their backlog at December 31, 2018 to 13,528 planes or over eight years based on 2018 deliveries. The balance of our Commercial Aerospace sales is related to regional and business aircraft manufacture, and other commercial aircraft applications. These applications also exhibit increasing utilization of composite materials with each new generation of aircraft.

Space & Defense

The Space & Defense market has historically been an innovator in the use of, and source of significant demand for, advanced composites. The aggregate demand by Space & Defense customers is primarily a function of procurement of military aircraft that utilize advanced composites by the United States and certain European governments, including both commercial and military helicopters. We are qualified to supply materials to a broad range of helicopter, military aircraft and space programs, including the Lockheed Martin F-35 (joint strike fighter or JSF), Boeing V-22 (Osprey) tilt rotor aircraft, Black Hawk and Airbus A400M military transport. No one program accounts for more than 12% of our revenues in this market. The sales that we obtain from these programs will depend upon which are funded and the extent of such funding. Space applications for advanced composites include solid rocket booster cases, fairings and payload doors for launch vehicles, and satellite buss and solar arrays for military and commercial satellites.

Another trend providing positive growth for Hexcel is the further penetration of composites in helicopter blades. Numerous new helicopter programs in development, as well as upgrade or retrofit programs, have an increased utilization of Composite Materials products such as carbon fiber, prepregs, and honeycomb core to improve blade performance. In addition, our Engineered Products segment provides specialty value added services such as machining, sub-assembly, and even full blade manufacturing for rotocraft.

Contracts for military and some commercial programs may contain provisions applicable to both U.S. government contracts and subcontracts. For example, a prime contractor may flow down a “termination for convenience” clause to materials suppliers such as Hexcel. According to the terms of a contract, we may be subject to U.S. government Federal Acquisition Regulations, the Department of Defense Federal Acquisition Regulations Supplement, and associated procurement regulations.

Industrial

The revenue from this market includes wind turbine blades, automotive, a wide variety of recreational products and other industrial applications. A number of these applications represent emerging opportunities for our products. In developing new applications, we seek those opportunities where advanced composites technology offers significant benefits to the end user, often applications that demand high engineering performance. Within the Industrial markets, wind energy comprises the largest submarket and our primary customer is Vestas Wind Systems A/S (“Vestas”). The

Industrial markets also include sales to major end user sub-markets, in order of size based on our 2018 sales: general industrial applications (including those sold through distributors), transportation (e.g., automobiles, mass transit and high-speed rail, and marine applications) and recreational equipment (e.g., skis and snowboards, bicycles and hockey sticks). Our participation in Industrial applications complements our commercial and military aerospace businesses, and in many instances, technology or products now used in aerospace were started in Industrial. We are committed to pursuing the utilization of advanced structural material technology where it can generate significant value and we can maintain a sustainable competitive advantage.

Further discussion of our markets, including certain risks, uncertainties and other factors with respect to “forward-looking statements” about those markets, is contained under the captions “Management’s Discussion and Analysis of Financial Condition and Results of Operations”, “Forward Looking Statements” and “Risk Factors”.

Backlog

In recent years, our customers have demanded shorter order lead times and “just-in-time” delivery performance. While we have many multi-year contracts with our major aerospace customers and our largest Industrial customer, most of these contracts specify the proportion of the customers’ requirements that will be supplied by us and the terms under which the sales will occur, not the specific quantities to be procured or the specific dates for delivery. Our Industrial customers have always desired to order their requirements on as short a lead-time as possible. As a result, twelve-month order backlog is not a meaningful trend indicator for us. As noted above, our Commercial Aerospace sales to Airbus and Boeing and their subcontractors accounted for 61% of our total 2018 sales, and their airplane backlog is over eight years based on 2018 deliveries.

Raw Materials and Production Activities

Our manufacturing operations are in many cases vertically integrated. We produce and internally use carbon fibers, industrial fabrics, composite materials and composite structures as well as sell these materials to third-party customers for their use in the manufacture of their products.

We manufacture high performance carbon fiber from polyacrylonitrile precursor (“PAN”). The primary raw material for PAN is acrylonitrile. All of the PAN we produce is for internal carbon fiber production. We consume more than 75% by value of the carbon fiber we produce and sell the remainder of our output to third-party customers. However, as one of the world’s largest consumers of high performance carbon fiber, we also purchase significant quantities of carbon fiber from external sources for our own use. The sources of carbon fiber we can use in any product or application are generally dictated by customer qualifications or certifications. Otherwise, we select a carbon fiber based on performance, price and availability. With the increasing demand for carbon fiber, particularly in aerospace applications, in recent years we have significantly increased our PAN and carbon fiber capacity to serve the growing needs of our customers and our own downstream products. After a new production line starts operating, it can take up to a year to be certified for aerospace qualifications. However, these lines can start supplying carbon fiber for many industrial applications within a shorter time period.

We purchase glass yarn from a number of suppliers in the United States, Europe and Asia. We also purchase aramid and high strength fibers which are produced by only a few companies, and during periods of high demand, can be in short supply. In addition, epoxy and other specialty resins, aramid paper and aluminum specialty foils are used in the manufacture of composite products. A number of these products have only one or two sources qualified for use, so an interruption in their supply could disrupt our ability to meet our customer requirements. When entering into multi-year contracts with aerospace customers, we attempt to get back-to-back commitments from key raw material suppliers.

Our manufacturing activities are primarily based on “make-to-order”, or “demand pull” based on customer schedules, and to a lesser extent, “make-to-forecast” production requirements. We coordinate closely with key suppliers in an effort to avoid raw material shortages and excess inventories. However, many of the key raw materials we consume are available from relatively few sources, and in many cases the cost of product qualification makes it impractical to develop multiple sources of supply. The lack of availability of these materials could under certain circumstances have a material adverse effect on our consolidated results of operations.

Research and Technology; Patents and Know-How

Research and Technology (“R&T”) departments support our businesses worldwide. Through R&T activities, we maintain expertise in precursor and carbon fiber, chemical and polymer formulation and curatives, fabric forming and textile architectures, advanced composite structures, process engineering, application development, analysis and testing of composite materials, computational design, and other scientific disciplines related to our worldwide

business base.

Our products rely primarily on our expertise in materials science, textiles, process engineering and polymer chemistry. Consistent with market demand, we have been placing more emphasis on higher performing products and cost effective production processes while seeking to improve the consistency of our products and our capital efficiency. Towards this end, we have entered into formal and informal alliances, as well as licensing and teaming arrangements, with several customers, suppliers, external agencies and laboratories. We believe that we possess unique capabilities to design, develop, manufacture and qualify composite materials and structures, including trade secrets and extensive internal knowledge gained from decades of experience. We have more than 1,615 patents and pending applications worldwide, and have granted technology licenses and patent rights to several third parties primarily in connection with joint ventures and joint development programs. It is our policy to actively enforce our proprietary rights. We believe that the patents and know-how rights currently owned or licensed by Hexcel are adequate for the conduct of our business. We do not believe that our business would be materially affected by the expiration of any single patent or series of related patents, or by the termination of any single license agreement or series of related license agreements.

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We spent \$55.9 million, \$49.4 million and \$46.9 million for R&T in 2018, 2017 and 2016, respectively. Our spending, on a constant currency basis, in 2018 was more than 11% higher than 2017 and in 2017 was more than 6% higher than 2016. Our spending on a quarter to quarter basis fluctuates depending upon the amount of new product development and qualification activities, particularly in relation to commercial aircraft applications, that are in progress. These expenditures are expensed as incurred.

Environmental Matters

We are subject to various U.S. and international federal, state and local environmental and health and safety laws and regulations. We are also subject to liabilities arising under the Federal Comprehensive Environmental Response, Compensation and Liability Act (“CERCLA” or “Superfund”), the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, and similar state local and international laws and regulations that impose responsibility for the control, remediation and abatement of air, water and soil pollutants and the manufacturing, storage, handling and disposal of hazardous substances and waste. We believe that our policies, practices, and procedures are properly designed to prevent unreasonable risk of environmental damage and associated financial liability. To date, environmental control regulations have not had a significant adverse effect on our overall operations.

Our aggregate environmental related accruals at December 31, 2018 and 2017 were \$2.7 million and \$2.8 million, respectively. As of December 31, 2018 and December 31, 2017, \$0.8 million and \$0.9 million, respectively, were included in “Other current accrued liabilities”, with the remainder included in “Other non-current liabilities”. As related to certain of our environmental matters, our accruals were estimated at the low end of a range of possible outcomes since there was no better point within the range. If we had accrued, for those sites where we are able to estimate our liability, at the high end of the range of possible outcomes, our accruals would have been \$16 million higher at December 31, 2018 and 2017. Environmental remediation spending charged directly to our reserve balance for 2018, 2017 and 2016, was \$0.4 million, \$0.5 million and \$0.9 million, respectively. In addition, our operating costs relating to environmental compliance were \$15.6 million, \$9.9 million and \$10.1 million for 2018, 2017, and 2016, respectively, and were charged directly to expense. Capital expenditures for environmental matters approximated \$6.9 million, \$8.4 million and \$13.2 million for 2018, 2017 and 2016 respectively.

These accruals can change significantly from period to period due to such factors as additional information on the nature or extent of contamination, the methods of remediation required, changes in the apportionment of costs among responsible parties and other actions by governmental agencies or private parties, as well as the impact, if any, of Hexcel being named in a new matter. A discussion of environmental matters is contained in Item 3, “Legal Proceedings,” and in Note 15 to the accompanying consolidated financial statements included in this Annual Report on Form 10-K.

Sales and Marketing

A staff of salaried marketing managers, product managers and sales personnel, sell and market our products directly to customers worldwide. We also use independent distributors and manufacturer representatives for certain products, markets and regions. In addition, we operate various sales representation offices in the Americas, Europe, Asia Pacific, Russia and Africa.

Competition

In the production and sale of advanced composites, we compete with a number of U.S. and international companies on a worldwide basis. The broad markets for composites are highly competitive, and we have focused on both specific submarkets and specialty products within markets. In addition to competing directly with companies offering similar

products, we compete with producers of substitute composites such as structural foam, infusion technology, wood and metal. Depending upon the material and markets, relevant competitive factors include approvals, database of usage, technology, product performance, delivery, service, price, customer preference for sole sourcing and customer preferred processes.

Employees

As of December 31, 2018, we employed 6,626 full-time employees and contract workers, 3,567 in the United States and 3,059 in other countries. We employ a minimal number of contract workers. Of the 6,626 full-time employees, approximately 17% were represented by collective bargaining agreements. We believe that our relations with employees and unions are good. The number of full-time employees and contract workers as of December 31, 2017 and 2016 was 6,259 and 6,155, respectively.

Other Information

Our internet website is www.hexcel.com. We make available, free of charge through our website, our Form 10-Ks, 10-Qs and 8-Ks, and any amendments to these forms, as soon as reasonably practicable after filing with the Securities and Exchange Commission.

Forward-Looking Statements

This report contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended. These statements relate to analyses and other information that are based on forecasts of future results and estimates of amounts not yet determinable. These statements also relate to future prospects, developments and business strategies. These forward-looking statements are identified by their use of terms and phrases such as “anticipate”, “believe”, “could”, “estimate”, “expect”, “intend”, “may”, “plan”, “predict”, “project”, “should”, “would”, “will” and phrases, including references to assumptions. Such statements are based on current expectations, are inherently uncertain and are subject to changing assumptions.

Such forward-looking statements include, but are not limited to: (a) the estimates and expectations based on aircraft production rates made publicly available by Airbus, Boeing and others; (b) the revenues we may generate from an aircraft model or program; (c) the impact of the possible push-out in deliveries of the Airbus and Boeing backlog and the impact of delays in the startup or ramp-up of new aircraft programs or the final Hexcel composite material content once the design and material selection have been completed; (d) expectations of composite content on new commercial aircraft programs and our share of those requirements; (e) expectations of growth in revenues for space and defense applications, including whether certain programs might be curtailed or discontinued; (f) expectations regarding growth in sales for wind energy, recreation, automotive and other industrial applications; (g) expectations regarding working capital trends and expenditures; (h) expectations as to the level of capital expenditures and when we will complete the construction of capacity expansions and qualification of new products; (i) expectations regarding the outcome of legal matters or the impact of changes in laws or regulations; (k) our projections regarding the realizability of net operating loss and tax credit carryforwards; and (l) the anticipated impact of the above factors and various market risks on our expectations of financial results for 2019 and beyond.

Such forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause actual results to be materially different. Such factors include, but are not limited to, the following: reductions in sales to any significant customers, particularly Airbus, Boeing or Vestas; changes in sales mix; changes in current pricing and cost levels; changes in the aerospace delivery rates; changes in government defense procurement budgets; changes in military aerospace program technology; timely new product development or introduction; industry capacity; increased competition; availability and cost of raw materials; supply chain disruptions; inability to install, staff and qualify necessary capacity or achievement of planned manufacturing improvements; cybersecurity breaches or intrusions; currency exchange rates and fluctuations; changes in political, social and economic conditions, including but not limited to, the effect of change in U.S. trade policies and the exit of the U.K. from the European Union; work stoppages or other labor disruptions; and unexpected outcome of legal matters or impact of changes in laws or regulations.

Although we believe that these forward-looking statements are based on reasonable assumptions, you should be aware that many factors could affect our actual results of operations and could cause actual results to differ materially from those expressed in the forward-looking statements. As a result, the foregoing factors should not be construed as exhaustive and should be read together with other cautionary statements included in this and other reports we file with the Securities and Exchange Commission. For additional information regarding certain factors that may cause our actual results to differ from those expected or anticipated see the information under the caption “Risk Factors” which is located in Item 1A of Part I of this report. We do not undertake any obligation to update our forward-looking statements or risk factors to reflect future events or circumstances, except as otherwise required by law.

ITEM 1A. Risk Factors

You should consider carefully the following risk factors and all other information contained in this Annual Report on Form 10-K and the documents we incorporate by reference in this Annual Report on Form 10-K. Any of the following risks could materially and adversely affect our business financial condition results of operations and cash flows.

The markets in which we operate can be cyclical, and downturns in them may adversely affect the results of our operations.

Some of the markets in which we operate have been, to varying degrees, cyclical and have experienced downturns. A downturn in these markets could occur at any time as a result of events that are industry specific or macroeconomic and in the event of a downturn; we have no way of knowing if, when and to what extent there might be a recovery. Any deterioration in any of the cyclical markets we serve could adversely affect our financial performance and operating results.

At December 31, 2018, Airbus and Boeing had a combined backlog of 13,528 aircraft or over eight years of production at 2018 delivery rates. To the extent any significant deferrals, cancellations or reduction in demand results in decreased aircraft build rates, it would reduce net sales for our Commercial Aerospace products and as a result reduce our operating income. Approximately 70% of our net sales for 2018 were derived from sales to the Commercial Aerospace industry, which includes 87% from Airbus and Boeing aircraft and 13% from regional and business aircraft. Reductions in demand for commercial aircraft or a delay in deliveries could result from many factors, including delays in the startup or ramp-up of new programs, changes in the propensity for the general public to travel by air (including as a result of terrorist events and any subsequent military response), a significant change in the cost of aviation fuel, a change in technology resulting in the use of alternative materials, consolidation and liquidation of airlines, availability of funding for new aircraft purchases or leases, inventory corrections or disruptions throughout the supply chain and slower macroeconomic growth.

Our content on the A350 is approximately \$4.8 million per plane and it is our largest program and we expect significant sales from this program as Airbus reaches its projected buildrates of 10 per month. Both Airbus and Boeing have experienced various delays in the start and ramp up of several aircraft programs, including the A380, B787, B747-8, A400M, and A350. In the past, these have delayed our expected growth or our effective utilization of capacity installed for such growth. Future delays in these or other major new customer programs could similarly impact our results.

In addition, our customers continue to emphasize the need for cost reduction or other improvements in contract terms throughout the supply chain. In response to these pressures, we may be required to accept increased risk or face the prospects of margin compression on some products in the future. Where possible, we seek to offset or mitigate the impact of such pressures through productivity and performance improvements, index clauses, hedging and other actions.

A significant decline in business with Airbus, Boeing, Vestas, or other large customers could materially impact our business, operating results, prospects and financial condition.

We have concentrated customers in the Commercial Aerospace and wind energy markets. In the Commercial Aerospace market, approximately 87%, and in the Space & Defense market, approximately 28%, of our 2018 net sales were made to Airbus and Boeing and their related subcontractors. For the years ended December 31, 2018 and December 31, 2017, approximately 41% and 44% of our total consolidated net sales, respectively, were to Airbus, and its related subcontractors and approximately 25% for both years of our total consolidated net sales were to Boeing and its related subcontractors. In the wind energy market, our primary customer is Vestas. Significant changes in the demand for our customers' end products, program delays, the share of their requirements that is awarded to us or changes in the design or materials used to construct their products could result in a significant loss of business with these customers. The loss of, or significant reduction in, purchases by Airbus, Boeing or Vestas or any of our other large customers could materially impair our business, operating results, prospects and financial condition. The level of purchases by our customers is often affected by events beyond their control, including general economic conditions, demand for their products, disruptions in deliveries, business disruptions, strikes and other factors.

A decrease in supply, interruptions at key facilities or an increase in cost of raw materials could result in a material decline in our profitability.

Our profitability depends largely on the price and continuity of supply of raw materials, which may be supplied through a sole source or a limited number of sources. We purchase large volumes of raw materials, such as epoxy and phenolic resins, acrylonitrile, carbon fiber, fiberglass yarn, aluminum foil and aramid paper. Any restrictions on the supply, or an increase in the cost, of our raw materials could significantly reduce our profit margins. Efforts to mitigate restrictions on the supply or price increases of these raw materials by long-term purchase agreements, productivity improvements, hedging or by passing cost increases to our customers may not be successful.

The occurrence of material operational problems, including but not limited to failure of, or interruption to, key equipment or natural disasters, or inability to install, staff and qualify necessary capacity, achievement of planned manufacturing improvements, or inability to meet customer specifications, may have a material adverse effect on the productivity and profitability of a particular manufacturing facility. With respect to certain facilities, such events could have a material effect on our company as a whole.

Reductions in space and defense spending could result in a decline in our net sales.

Space and defense production that has occurred in recent years may not be sustained, individual programs important to Hexcel may be cancelled, production may not continue to grow and the increased demand for composite-intensive

programs may not continue. In addition, the production of military aircraft depends upon defense budgets and the related demand for defense and related equipment. Approximately 17% of our net sales in 2018 were to the Space & Defense market of which about 86% were related to military programs in the United States and other countries.

If we are unable to develop new products on a timely basis, it could adversely affect our business and prospects.

We believe that our future success depends, in part, on our ability to develop, on a timely basis, technologically advanced products that meet or exceed appropriate industry standards. Although we believe we have certain technological and other advantages over our competitors, maintaining such advantages will require us to continue investing in research and development and sales and marketing. There can be no assurance that we will be able to make the technological advances necessary to maintain such competitive advantages or that we can recover major research and development expenses.

We have substantial international operations subject to uncertainties which could affect our operating results.

We believe that revenue from sales outside the U.S. will continue to account for a material portion of our total revenue for the foreseeable future. In 2018, 52% of our production and 58% of our customer sales occurred outside of the United States. Additionally, we have invested significant resources in our international operations and we intend to continue to make such investments in the future. Our international operations are subject to numerous risks, including: (a) general economic and political conditions in the countries where we operate may have an adverse effect on our operations in those countries or not be favorable to our growth strategy; (b) the difficulty of enforcing agreements and collecting receivables through some foreign legal systems; (c) foreign customers may have longer payment cycles than customers in the U.S.; (d) cost of compliance with international trade laws of all of the countries in which we do business, including export control laws, relating to sales and purchases of goods and equipment and transfers of technology; (e) tax rates may vary and foreign earnings may be subject to withholding requirements or the imposition of tariffs, exchange controls or other restrictions; (f) governments may adopt regulations or take other actions that would have a direct or indirect adverse impact on our business and market opportunities, including, but not limited to, the exit of the U.K. from the European Union; and (g) the potential difficulty in enforcing our intellectual property rights in some foreign countries, and the potential for the intellectual property rights of others to affect our ability to sell product in certain markets. Any one of these could adversely affect our financial condition and results of operations. With respect to tariffs, the current policy of the U.S. Federal Government could potentially increase the costs of our materials, make our products sold from the U.S. more expensive to our non-U.S. customers, and increase our cost of production. In addition, we have production facilities within the United Kingdom that supply customers in the European Union and customers within the United Kingdom that are supplied by production facilities in the European Union, and any future tariffs or other disruptions to these trade flows related to the exit of the U.K. from the European Union could negatively impact our business.

Fluctuations in currency exchange rates may influence the profitability and cash flows of our business. For example, our European operations sell a majority of the products they produce in U.S. dollars, yet the labor, overhead costs and portions of material costs incurred in the manufacture of those products are primarily denominated in Euros, British pound sterling or U.S. dollars. As a result, the local currency margins of goods manufactured with costs denominated in local currency, yet sold in U.S. dollars, will vary with fluctuations in currency exchange rates, reducing when the U.S. dollar weakens against the Euro and British pound sterling. In addition, the reported U.S. dollar value of the local currency financial statements of our foreign subsidiaries will vary with fluctuations in currency exchange rates. While we enter into currency hedge agreements from time to time to mitigate these types of fluctuations, we cannot remove all fluctuations or hedge all exposures, and our earnings are impacted by changes in currency exchange rates.

We currently do not have political risk insurance in the countries in which we conduct business. While we carefully consider these risks when evaluating our international operations, we cannot provide assurance that we will not be materially adversely affected as a result of such risks.

Our business and operations may be adversely affected by cybersecurity breaches or other information technology system or network intrusions.

We depend heavily on information technology and computerized systems to communicate and operate effectively. We store sensitive data including proprietary business information, intellectual property and confidential employee or other personal data on our servers and databases. Attempts by others to gain unauthorized access to our information technology system have become more sophisticated. These attempts, which might be related to industrial or foreign government espionage, activism or other motivations, include covertly introducing malware to our computers and networks, performing reconnaissance, impersonating authorized users, stealing, corrupting or restricting our access to data, among other activities. We continue to update our infrastructure, security tools, employee training and processes to protect against security incidents, including both external and internal threats and to prevent their recurrence. While

company personnel have been tasked to detect and investigate such incidents, cybersecurity attacks could still occur and may lead to potential data corruption and exposure of proprietary and confidential information. The unauthorized use of our intellectual property and/or confidential business information could harm our competitive position, reduce the value of our investment in research and development and other strategic initiatives or otherwise adversely affect our business. Any intrusion may also cause operational stoppages, fines, penalties, litigation of governmental investigations and proceedings, diminished competitive advantages through reputational damages and increased operational costs. Additionally, we may incur additional costs to comply with our customers', including the U.S. Government's increased cybersecurity protections and standards.

We could be adversely affected by environmental and safety requirements.

Our operations require the handling, use, storage and disposal of certain regulated materials and wastes. As a result, we are subject to various laws and regulations pertaining to pollution and protection of the environment, health and safety. These requirements govern, among other things, emissions to air, discharge to waters and the generation, handling, storage, treatment and disposal of waste and remediation of contaminated sites. We have made, and will continue to make, capital and other expenditures in

order to comply with these laws and regulations. These laws and regulations are complex, change frequently and could become more stringent in the future.

We have been named as a “potentially responsible party” under Superfund or similar state laws at sites requiring clean up. These laws generally impose liability for costs to investigate and remediate contamination without regard to fault. Under certain circumstances liability may be joint and several, resulting in one responsible party being held responsible for the entire obligation. Liability may also include damages to natural resources. We have incurred and likely will continue to incur expenses to investigate and clean up certain of our existing and former facilities, for which we believe we have adequate reserves. The ongoing operation of our manufacturing plants also entails environmental risks, and we may incur material costs or liabilities in the future which could adversely affect us. Although most of our properties have been the subject of environmental site assessments, there can be no assurance that all potential instances of soil and groundwater contamination have been identified, even at those sites where assessments have been conducted. Accordingly, we may discover previously unknown environmental conditions and the cost of remediating such conditions may be material. See “Legal Proceedings” below and Note 15 to the consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

In addition, we may be required to comply with evolving environmental, health and safety laws, regulations or requirements that may be adopted or imposed in the future or to address newly discovered information or conditions that require a response. In particular, climate change is receiving increased attention worldwide, which has led to significant legislative and regulatory efforts to limit greenhouse gas emissions. The U.S. Congress has considered climate change-related legislation and may review the issue in the near future. Specific policy measures could include cap and trade provisions or a carbon tax. The European Union has instituted the Greenhouse Gas Emission Trading System (EU-ETS). Our manufacturing plants use energy, including electricity and natural gas, and some of our plants emit amounts of greenhouse gas that may in the future be affected by these legislative and regulatory efforts. Potential consequences could include increased energy, transportation and raw material costs and may require the Company to make additional investments in its facilities and equipment or limit our ability to grow.

Acquisitions, divestitures, mergers, business combinations or joint ventures may entail certain operational and financial risks.

Over the past several years we have completed several strategic acquisitions of complementary manufacturing companies, as well as strategic investments in companies. We expect to continue to explore complementary acquisitions, investments and joint ventures and may also pursue divestitures of business lines that do not fit with our core strategy. We may also engage in further vertical integration. We may face competition for attractive targets and may not be able to source appropriate acquisition targets at prices acceptable to us, if at all. In addition, these types of transactions may require significant liquidity, which may not be available on terms favorable to us, or at all.

There can be no assurance that we will realize the intended benefits from any such transactions. The process of integrating acquired businesses into our existing operations may result in unforeseen operating difficulties and may require additional financial resources and attention from management that would otherwise be available for the ongoing development or expansion of our existing operations. Even if successfully integrated the acquired business may not achieve the results we expect or produce expected benefits in the time frame planned.

ITEM 1B. Unresolved Staff Comments

None.

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ITEM 2. Properties

We own and lease manufacturing facilities and sales offices located throughout the United States and in other countries, as noted below. The corporate offices and principal corporate support activities are located in leased facilities in Stamford, Connecticut. Our research and technology administration and principal laboratories are located in Dublin, California; Duxford, England; Les Avenières, France; Salt Lake City, Utah and Decatur, Alabama.

The following table lists our manufacturing facilities by geographic location, related segment, and principal products manufactured. This table does not include manufacturing facilities owned by any of our joint ventures.

Manufacturing Facilities

Facility Location	Segment	Principal Products
United States:		
Burlington, Washington	Engineered Products	Engineered Honeycomb Parts
Casa Grande, Arizona	Composite Materials	Honeycomb and Honeycomb Parts
Decatur, Alabama	Composite Materials	PAN Precursor (used to produce Carbon Fibers)
Kent, Washington	Engineered Products	Composite structures
Pottsville, Pennsylvania	Engineered Products	Engineered Honeycomb Parts
Salt Lake City, Utah	Composite Materials	Carbon Fibers; Prepregs
Seguin, Texas	Composite Materials	Industrial Fabrics; Specialty Reinforcements
South Windsor, Connecticut	Engineered Products	3D printed parts
Windsor, Colorado	Composite Materials	Prepregs
International:		
Casablanca, Morocco	Engineered Products	Engineered Honeycomb Parts
Dagneux, France	Composite Materials	Prepregs
Duxford, England	Composite Materials	Prepregs; Adhesives; Honeycomb and Honeycomb Parts
Illescas, Spain	Composite Materials	Carbon Fibers
Leicester, England	Composite Materials	Lightweight Multiaxials Fabrics
Les Avenières, France	Composite Materials	Industrial Fabrics; Specialty Reinforcements
Nantes, France	Composite Materials	Prepregs
Neumarkt, Austria	Composite Materials	Prepregs
Parla, Spain	Composite Materials	Prepregs
Roussillon, France	Composite Materials	PAN Precursor and Carbon Fibers
Stade, Germany	Composite Materials	Prepregs
Tianjin, China	Composite Materials	Prepregs
Vert-le-Petit, France	Composite Materials	Pultruded profiles; Prepregs and Adhesives
Welkenraedt, Belgium	Engineered Products	Engineered Honeycomb Parts

We lease the land and buildings in Nantes, France and South Windsor, Connecticut and the land on which the Tianjin, China; Burlington, Washington and Roussillon, France facilities are located. We also lease portions of the facilities located in Casa Grande, Arizona; Pottsville, Pennsylvania; Parla, Spain and Leicester, England. We own all other remaining facilities. For further information, refer to “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and to Note 6 to the accompanying consolidated financial statements of this Annual Report on Form 10-K.

ITEM 3. Legal Proceedings

We are involved in litigation, investigations and claims arising out of the normal conduct of our business, including those relating to commercial transactions, environmental, employment and health and safety matters. While it is impossible to predict the ultimate resolution of litigation, investigations and claims asserted against us, we believe, based upon our examination of currently available information, our experience to date, and advice from legal counsel, that, after taking into account our existing insurance coverage and amounts already provided for, the currently pending legal proceedings against us will not have a material adverse impact on our consolidated results of operations, financial position or cash flows.

Environmental Matters

We have been named as a potentially responsible party (“PRP”) with respect to several hazardous waste disposal sites that we do not own or possess, which are included on, or proposed to be included on, the Superfund National Priority List of the U.S. Environmental Protection Agency (“EPA”) or on equivalent lists of various state governments. Because CERCLA allows for joint and

several liability in certain circumstances, we could be responsible for all remediation costs at such sites, even if we are one of many PRPs. We believe, based on the amount and nature of our waste, and the number of other financially viable PRPs, that our liability in connection with such matters will not be material.

Lower Passaic River Study

Hexcel together with approximately 48 other PRPs that comprise the Lower Passaic Cooperating Parties Group (the “CPG”) are subject to a May 2007 Administrative Order on Consent (“AOC”) with the EPA requiring the CPG to perform a Remedial Investigation/Feasibility Study of environmental conditions of a 17-mile stretch of the Passaic River in New Jersey (the “Lower Passaic River”). We were included in the CPG based on our operations at our former manufacturing site in Lodi, New Jersey.

In March 2016, the EPA issued a Record of Decision (“ROD”) setting forth the EPA’s selected remedy for the lower eight miles of the Lower Passaic River at an expected cost ranging from \$0.97 billion to \$2.07 billion. This estimate does not include any costs related to a future remedy for the upper nine miles of the Lower Passaic River. In August 2017, the EPA appointed an independent third party allocation expert to make recommendations on the relative liability of approximately 120 identified non-governmental PRP’s, which is not expected to be completed until 2020.

In October 2016, pursuant to a settlement agreement with the EPA, Occidental Chemical Corporation (“OCC”), one of the PRPs, commenced performance of the remedial design required by the ROD, reserving its right of cost contribution from all other PRPs. In June 2018, OCC filed suit against approximately 120 parties, including Hexcel, in the U.S. District Court for the District of New Jersey seeking cost recovery and contribution under CERCLA related to the Lower Passaic River. We do not know whether this new litigation will impact the EPA’s allocation process or the ultimate outcome of the matter.

The total accrued liability related to this matter was \$2.1 million at December 31, 2018 and \$2.0 million at December 31, 2017. Given the uncertainty associated with many elements of the Superfund process for the Lower Passaic River, the amounts accrued may not be indicative of the amounts for which we will ultimately be responsible.

Omega Chemical Corporation Superfund

We are a PRP at a former Omega Chemical Corporation (“Omega”) chemical waste site in Whittier, California. The PRPs at Omega have established The Omega Chemical Site PRP Organized Group (the “OPOG”), and are currently investigating and remediating soil and groundwater at the site pursuant to a Consent Decree with the EPA. OPOG has attributed approximately either 1.2 % or 2.1% of the waste tonnage sent to the site to Hexcel, based on different sections within the Omega site. In addition, the EPA is investigating the scope of regional groundwater contamination in the vicinity of the Omega site and issued a ROD finding that the OPOG will be required to remediate the regional groundwater contamination in that vicinity as well. As a member of OPOG, Hexcel will incur costs associated with the investigation and remediation of the Omega site and the regional groundwater remedy, though our ultimate liability, if any, in connection with this matter cannot be determined at this time. The total accrued liability relating to potential liability for both the Omega site and regional groundwater remedies was \$0.3 million at December 31, 2018 and \$0.6 million at December 31, 2017.

ITEM 4. Mine Safety Disclosure

Not applicable.

PART II

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

Hexcel common stock is traded on the New York Stock Exchange under the symbol HXL.

On January 23, 2019, the Board of Directors declared a \$0.15 quarterly dividend. The dividend will be payable to stockholders of record as of February 5, 2019, with a payment date of February 12, 2019. In 2018, the Company announced a program to repurchase common stock of \$500 million. During 2018, 2017 and 2016 the Company repurchased a total of \$358 million, \$150 million and \$111 million of shares, respectively. There was \$385 million remaining under the authorized 2018 share repurchase program at December 31, 2018.

On January 31, 2019, there were 536 holders of record of our common stock.

The following chart provides information regarding repurchases of Hexcel common stock:

Period	(a) Total Number of Shares (or Units) Purchased	(b) Average Price Paid per Share (or Unit)	(c) Total Number of Shares (or Units) Purchased as Part of Publicly Announced Plans or Programs		(d) Maximum Number (or Approximate Dollar Value) of Shares (or Units) that May Yet Be Purchased Under the Plans or Programs
October 1 — October 31, 2018	195,000	\$ 58.12	195,000		\$ 448,351,438
November 1 — November 30, 2018	368,000	\$ 59.15	368,000		\$ 426,584,180
December 1 — December 31, 2018	722,275	\$ 57.88	722,275		\$ 384,775,711
Total	1,285,275 (1)	\$ 58.28	1,285,275		\$ 384,775,711

(1) On May 7, 2018, we announced that our Board authorized us to repurchase an additional \$500 million of our outstanding common stock, of which \$384.8 million was still available at December 31, 2018.

ITEM 6. Selected Financial Data

The information required by Item 6 is contained on page 27 of this Annual Report on Form 10-K under the caption “Selected Financial Data” and is incorporated herein by reference.

ITEM 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations

The information required by Item 7 is contained on pages 28 to 35 of this Annual Report on Form 10-K under “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and is incorporated herein by reference.

ITEM 7A. Quantitative and Qualitative Disclosures about Market Risk

The information required by Item 7A is contained under the heading “Market Risks” on pages 38 to 40 of this Annual Report on Form 10-K and is incorporated herein by reference.

ITEM 8. Financial Statements and Supplementary Data

The information required by Item 8 is contained on pages 45 to 79 of this Annual Report on Form 10-K under “Consolidated Financial Statements and Supplementary Data” and is incorporated herein by reference. The Reports of Independent Registered Public Accounting Firms are contained on page 43 to 44 of this Annual Report on Form 10-K under the caption “Reports of Independent Registered Public Accounting Firms” and is incorporated herein by reference.

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

None.

ITEM 9A. Controls and Procedures

Our Chief Executive Officer and Chief Financial Officer have evaluated our disclosure controls and procedures as of December 31, 2018 and have concluded that these disclosure controls and procedures are effective to ensure that information required to be disclosed by us in the reports that we file or submit under the Securities Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms. These disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by us in the reports we file or submit is accumulated and communicated to management, including the Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

Our Chief Executive Officer and Chief Financial Officer have concluded that there have not been any changes in our internal control over financial reporting during the fourth quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Management's report on our internal control over financial reporting is contained on page 40 of this Annual Report on Form 10-K and is incorporated herein by reference.

ITEM 9B. Other Information

None.

PART III

ITEM 10. Directors, Executive Officers and Corporate Governance

The information required by Item 10 will be contained in our definitive proxy statement for the 2019 Annual Meeting of Stockholders, which will be filed with the Securities and Exchange Commission within 120 days after the close of the fiscal year ended December 31, 2018. Such information is incorporated herein by reference.

ITEM 11. Executive Compensation

The information required by Item 11 will be contained in our definitive proxy statement for the 2019 Annual Meeting of Stockholders, which will be filed with the Securities and Exchange Commission within 120 days after the close of the fiscal year ended December 31, 2018. Such information is incorporated herein by reference.

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

The information required by Item 12 will be contained in our definitive proxy statement for the 2019 Annual Meeting of Stockholders, which will be filed with the Securities and Exchange Commission within 120 days after the close of the fiscal year ended December 31, 2018. Such information is incorporated herein by reference.

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

The information required by Item 13 will be contained in our definitive proxy statement for the 2019 Annual Meeting of Stockholders, which will be filed with the Securities and Exchange Commission within 120 days after the close of the fiscal year ended December 31, 2018. Such information is incorporated herein by reference.

ITEM 14. Principal Accountant Fees and Services

The information required by Item 14 will be contained in our definitive proxy statement for the 2019 Annual Meeting of Stockholders, which will be filed with the Securities and Exchange Commission within 120 days after the close of the fiscal year ended December 31, 2018. Such information is incorporated herein by reference.

PART IV

ITEM 15. Exhibits and Financial Statement Schedules

(a) Financial Statements, Financial Statement Schedules and Exhibits

(1) Financial Statements:

Reports of Independent Registered Public Accounting Firms

Consolidated Balance Sheets as of December 31, 2018 and 2017

Consolidated Statements of Operations for each of the three years ended December 31, 2018, 2017, and 2016

Consolidated Statements of Comprehensive Income for each of the three years ended December 31, 2018, 2017 and 2016

Consolidated Statements of Stockholders' Equity for each of the three years ended December 31, 2018, 2017 and 2016

Consolidated Statements of Cash Flows for each of the three years ended December 31, 2018, 2017 and 2016

Notes to the Consolidated Financial Statements

(2) Financial Statement Schedule for the three years ended December 31, 2018, 2017 and 2016:

Schedule II — Valuation and Qualifying Accounts

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

(3) Exhibits:

The following list of exhibits includes exhibits submitted with this Form 10-K as filed with the SEC and those incorporated by reference to other filings.

Exhibit No.	Description
3.1	<u>Restated Certificate of Incorporation of Hexcel Corporation (incorporated herein by reference to Exhibit 1 to the Company's Registration Statement on Form 8-A dated July 9, 1996, Registration No. 1-08472).</u>

- 3.2 Certificate of Amendment of the Restated Certificate of Incorporation of Hexcel Corporation (incorporated herein by reference to Exhibit 3.2 to the Company's Annual Report on Form 10-K/A for the fiscal year ended December 31, 2002, filed on March 31, 2003).
- 3.3 Amended and Restated Bylaws of Hexcel Corporation (incorporated by reference to Exhibit 3 to the Company's Current Report on Form 8-K dated September 23, 2014).
- 4.1 Form of Indenture between Hexcel Corporation and U.S. Bank National Association (incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-3 dated October 21, 2014, Registration No. 333-199500)
- 4.2 Indenture, dated as of August 3, 2015, between Hexcel Corporation and U.S. Bank National Association, as Trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K dated August 3, 2015).
- 4.3 First Supplemental Indenture, dated as of August 3, 2015, between Hexcel Corporation and U.S. Bank National Association, as Trustee (incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K dated August 3, 2015).
- 4.4 Second Supplemental Indenture, dated as of February 16, 2017, between Hexcel Corporation and U.S. Bank National Association, as Trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K dated February 16, 2017).
- 4.5 Form of Note for 4.700% Senior Notes due 2025 (incorporated by reference to Exhibit 4.3 to the Company's Current Report on Form 8-K dated August 3, 2015).

- 4.6 Form of Note for 3.950% Senior Notes due 2027 (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K dated February 16, 2017).
- 10.1 Credit Agreement, dated as of June 9, 2016, by and among Hexcel Corporation, Hexcel Holdings Luxembourg S.à.r.l., and the financial institutions from time to time party thereto, Citizens Bank, National Association, as administrative agent for the lenders, Citizens Bank, National Association, Merrill Lynch, Pierce, Fenner & Smith Incorporated and Wells Fargo Securities, LLC, as joint book managers and joint lead arrangers, Bank of America, N.A. and Wells Fargo Bank, National Association, as syndication agents, and Sumitomo Mitsui Banking Corporation, SunTrust Bank, TD Bank, N.A. and U.S. Bank, National Association, as documentation agents (incorporated by reference to Exhibit 99.1 to the Company's Current Report on Form 8-K dated June 14, 2016).
- 10.2* Hexcel Corporation 2013 Incentive Stock Plan (incorporated herein by reference to Exhibit 4.4 to the Company's Registration Statement on Form S-8, Registration No. 333-188292, filed on May 2, 2013).
- 10.3* Hexcel Corporation 2003 Incentive Stock Plan, as amended and restated as of May 7, 2009 (incorporated herein by reference to Exhibit 10.4(d) to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2009).
- 10.4* Hexcel Corporation Management Incentive Compensation Plan, as Amended and Restated on December 8, 2016 (incorporated herein by reference to Exhibit 10.6 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2016).
- 10.5* Form of Employee Option Agreement (2014 - 2017) (incorporated herein by reference to Exhibit 10.8 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2016).
- 10.6* Form of Employee Option Agreement (2012 and 2013) (incorporated herein by reference to Exhibit 10.11 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2011).
- 10.7* Form of Restricted Stock Unit Agreement (incorporated herein by reference to Exhibit 99.1 to the Company's Current Report on Form 8-K dated January 27, 2014).
- 10.8* Form of Performance Based Award Agreement (2017-2018) (incorporated by reference to Exhibit 99.1 to the Company's Current Report on Form 8-K dated January 30, 2017).
- 10.9* Form of Performance Based Award Agreement (2015 and 2016) (incorporated by reference to Exhibit 99.1 to the Company's Current Report on Form 8-K dated January 26, 2015).
- 10.10* Hexcel Corporation Nonqualified Deferred Compensation Plan, Effective as of January 1, 2005, Amended and Restated as of December 31, 2008 (incorporated herein by reference to Exhibit 99.14 to the Company's Current Report on Form 8-K dated January 7, 2009).
- 10.11* Offer of Employment between Hexcel Corporation and Nick L. Stange dated July 22, 2013 (incorporated herein by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2013).
- 10.12*

Supplemental Executive Retirement Agreement dated October 28, 2009, between Nick L. Stange and Hexcel Corporation (incorporated herein by reference to Exhibit 99.1 to the Company's Current Report on Form 8-K dated October 28, 2009).

- 10.13* Hexcel Corporation Executive Severance Policy (incorporated herein by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2013).
- 10.14* Form of Executive Severance Agreement entered into between Hexcel Corporation and each of Patrick Winterlich and Gail Lehman, dated October 2, 2017 (incorporated herein by reference to Exhibit 99.1 to the Company's Current report on Form 8-K dated October 6, 2017).
- 10.15* Form of Executive Severance Agreement entered into between Hexcel Corporation and each of Michael Canario, Timothy Swords and Brett Schneider dated October 2, 2017 (incorporated herein by reference to Exhibit 99.2 to the Company's Current report on Form 8-K dated October 6, 2017).

- 10.16* Amended and Restated Executive Severance Agreement between Hexcel Corporation and Robert G. Hennemuth, dated December 31, 2008 (incorporated herein by reference to Exhibit 99.6 to the Company's Current Report on Form 8-K dated January 7, 2009).
- 10.17* Amended and Restated Executive Deferred Compensation Agreement between Hexcel Corporation and Robert G. Hennemuth, dated December 31, 2007 (incorporated herein by reference to Exhibit 99.4 to the Company's Current Report on Form 8-K dated January 7, 2008).
- 10.18* Amendment to the Offer of Employment Letter between Hexcel Corporation and Nick L. Stange, dated July 22, 2013 (incorporated herein by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2018).
- 10.19* Amendment to the Officer Severance Agreement between Hexcel Corporation and Patrick Winterlich, dated October 2, 2017 (incorporated herein by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2018).
- 10.20* Amendment to the Officer Severance Agreement between Hexcel Corporation and Gail E. Lehman, dated October 2, 2017 (incorporated herein by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2018).
- 10.21* Amendment to the Amended and Restated Executive Severance Agreement between Hexcel Corporation and Robert G. Hennemuth, dated December 31, 2008 (incorporated herein by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2018).
- 10.22* Director Compensation Program, as adopted on May 4, 2017 (incorporated herein by reference to Exhibit 10.20 to the Company's Annual Report on Form 10-K for the year ended December 31, 2017).
- 10.23* Form of Restricted Stock Unit Agreement for Non-Employee Directors (incorporated herein by reference to Exhibit 10.21 to the Company's Annual Report on Form 10-K for the year ended December 31, 2017).
- 10.24* Hexcel Corporation 2016 Employee Stock Purchase Plan (incorporated herein by reference to Annex B to the Company's Proxy Statement dated March 17, 2016).
- 21 Subsidiaries of the Company.
- 23.1 Consent of Ernst & Young LLP.
- 24 Power of Attorney (included on signature page).
- 31.1 Certification of Chief Executive Officer, Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- 31.2 Certification of Chief Financial Officer, Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- 32 Certification of Chief Executive Officer and Chief Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
- 101 The following materials from the Hexcel Corporation Annual Report on Form 10-K for the year ended December 31, 2018, formatted in Extensible Business Reporting Language (XBRL): (i) the Consolidated

Statements of Operations, (ii) Consolidated Statements of Comprehensive Income (iii), Consolidated Balance Sheets, (iv) Consolidated Statements of Cash Flows, and (v) related notes.

* Indicates management contract or compensatory plan or arrangement.

SIGNATURES

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

Hexcel Corporation

February 6, 2019 /s/ NICK L. STANAGE

(Date)

Nick L. Stanage

Chairman of the Board of Directors,

Chief Executive Officer and President

KNOWN TO ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints each of Nick L. Stanage, Patrick Winterlich and Gail Lehman, individually, his attorney-in-fact, with the power of substitution, for him or her in any and all capacities, to sign any amendments to this report, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each said attorney-in-fact, or his or her substitute or substitutes, may do or cause to be done by virtue hereof.

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

Signature	Title	Date
/s/ NICK L. STANAGE (Nick L. Stanage)	Chairman of the Board of Directors, Chief Executive Officer and President (Principal Executive Officer)	February 6, 2019
/s/ PATRICK WINTERLICH (Patrick Winterlich)	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	February 6, 2019
/s/ KIMBERLY HENDRICKS (Kimberly Hendricks)	Senior Vice President, Corporate Controller and Chief Accounting Officer (Principal Accounting Officer)	February 6, 2019
/s/ JOEL S. BECKMAN (Joel S. Beckman)	Director	February 6, 2019
/s/ LYNN BRUBAKER (Lynn Brubaker)	Director	February 6, 2019
/s/ JEFFREY C. CAMPBELL (Jeffrey C. Campbell)	Director	February 6, 2019
/s/ CYNTHIA M. EGNOTOVICH (Cynthia M. Egnotovich)	Director	February 6, 2019
/s/ THOMAS A. GENDRON	Director	February 6, 2019

(Thomas A. Gendron)

/s/ JEFFREY A. GRAVES Director February 6, 2019
(Jeffrey A. Graves)

/s/ GUY A. HACHEY Director February 6, 2019
(Guy A. Hachey)

/s/ DAVID L. PUGH Director February 6, 2019
(David L. Pugh)

/s/ CATHERINE A. SUEVER Director February 6, 2019
(Catherine A Suever)

Selected Financial Data

The following table summarizes selected financial data as of and for the five years ended December 31:

(In millions, except per share data)	2018	2017	2016	2015	2014
Results of Operations:					
Net sales	\$2,189.1	\$1,973.3	\$2,004.3	\$1,861.2	\$1,855.5
Cost of sales	1,608.3	1,421.5	1,439.7	1,328.4	1,346.7
Gross margin	580.8	551.8	564.6	532.8	508.8
Selling, general and administrative expenses	146.0	151.8	157.6	156.1	149.1
Research and technology expenses	55.9	49.4	46.9	44.3	47.9
Other expense (income), net	7.7	—	—	—	6.0
Operating income	371.2	350.6	360.1	332.4	305.8
Interest expense, net	37.7	27.4	22.1	14.2	8.0
Non-operating expense, net	—	—	0.4	—	0.5
Income before income taxes and equity in earnings	333.5	323.2	337.6	318.2	297.3
Provision for income taxes	62.5	42.5	90.3	83.0	89.3
Income before equity in earnings	271.0	280.7	247.3	235.2	208.0
Equity in earnings from affiliated companies	5.6	3.3	2.5	2.0	1.4
Net income	\$276.6	\$284.0	\$249.8	\$237.2	\$209.4
Basic net income per common share	\$3.15	\$3.13	\$2.69	\$2.48	\$2.16
Diluted net income per common share	\$3.11	\$3.09	\$2.65	\$2.44	\$2.12
Weighted-average shares outstanding:					
Basic	87.9	90.6	92.8	95.8	96.8
Diluted	89.0	91.9	94.2	97.2	98.7
Financial Position:					
Total assets	\$2,824.1	\$2,780.9	\$2,400.6	\$2,187.4	\$2,036.4
Working capital	\$349.1	\$394.6	\$335.1	\$341.2	\$371.1
Long-term notes payable and capital lease obligations	\$947.4	\$805.6	\$684.4	\$576.5	\$415.0
Dividends per share of common stock	\$0.55	\$0.47	\$0.44	\$0.40	\$—
Stockholders' equity	\$1,322.0	\$1,495.1	\$1,244.9	\$1,179.6	\$1,149.9
Other Data:					
Depreciation and amortization	\$123.1	\$104.5	\$93.3	\$76.4	\$71.2
Accrual basis capital expenditures	\$179.1	\$284.4	\$320.2	\$289.0	\$270.2
Shares outstanding at year-end, less treasury stock	84.8	89.6	91.4	93.5	95.5

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Business Overview

(In millions, except per share data)	Year Ended December 31,					
	2018		2017		2016	
Net sales	\$2,189.1		\$1,973.3		\$2,004.3	
Gross margin %	26.5	%	28.0	%	28.2	%
Other operating expense (income)	\$7.7		\$—		\$—	
Operating income	\$371.2		\$350.6		\$360.1	
Operating income %	17.0	%	17.8	%	18.0	%
Interest expense, net	\$37.7		\$27.4		\$22.1	
Non-operating expense	\$—		\$—		\$0.4	
Provision for income taxes	\$62.5		\$42.5		\$90.3	
Equity in earnings from investments in affiliated companies	\$5.6		\$3.3		\$2.5	
Net income	\$276.6		\$284.0		\$249.8	
Diluted net income per common share	\$3.11		\$3.09		\$2.65	

Reconciliations to adjusted operating income, adjusted net income, adjusted diluted net income per share and free cash flow are provided below:

(In millions)	Year Ended December 31,		
	2018	2017	2016
GAAP operating income	\$371.2	\$350.6	\$360.1
Other operating expense (2)	7.7	—	—
Adjusted operating income (Non-GAAP)	\$378.9	\$350.6	\$360.1

(In millions, except per diluted share data)	Year Ended December 31,								
	2018			2017			2016		
	Net		Tax	Net		Tax	Net		Tax
	Income	EPS	Rate	Income	EPS	Rate	Income	EPS	Rate
GAAP net income	\$276.6	\$3.11	18.8	\$284.0	\$3.09	13.2	\$249.8	\$2.65	26.8
Non-operating expense, net of tax (1)	—	—	—	—	—	—	0.3	—	—
Restructuring expense (2)	5.4	0.06	—	—	—	—	—	—	—
Discrete tax benefits (3)	(4.7)	(0.05)	1.4	(15.6)	(0.17)	4.8	(6.6)	\$(0.07)	1.8
New Tax Law (4)	(6.2)	(0.07)	1.8	(22.1)	(0.24)	6.8	—	—	—
Adjusted net income (Non-GAAP)	\$271.1	\$3.05	22.0	\$246.3	\$2.68	24.8	\$243.5	\$2.58	28.6

(In millions)	Year Ended December 31,		
	2018	2017	2016
Net cash provided by operating activities	\$421.4	\$428.7	\$401.4
Less: Capital expenditures	(184.1)	(278.1)	(327.9)
Free cash flow (Non-GAAP)	\$237.3	\$150.6	\$73.5

- (1) Non-operating expense, net of tax, in 2016 was primarily for the accelerated amortization of deferred financing costs related to repaying the term loan and refinancing our revolving credit facility in June 2016.
- (2) Other operating expense in 2018 was a restructuring charge at one of our European facilities.
- (3) The year ended December 31, 2018, 2017 and 2016 included benefits of \$4.7 million, \$15.6 million and \$6.6 million, respectively, primarily related to the release of reserves for uncertain tax positions and releases of valuation allowances in foreign jurisdictions.
- (4) The years ended December 31, 2018 and 2017, included benefits of a \$6.2 million tax accounting method change and \$22.1 million related to the U.S. Tax Cuts and Jobs Act, respectively.

The Company uses non-GAAP financial measures, including sales and expenses measured in constant dollars (prior year sales and expenses measured at current year exchange rates); operating income, net income and earnings per share adjusted for items included in operating expense and non-operating expenses; the effective tax rate adjusted for certain out of period items; and free cash flow.

Management believes these non-GAAP measures are meaningful to investors because they provide a view of Hexcel with respect to ongoing operating results and comparisons to prior periods. These adjustments represent significant charges or credits that are important to an understanding of Hexcel's overall operating results in the periods presented. Such non-GAAP measurements are not determined in accordance with generally accepted accounting principles and should not be viewed as an alternative to GAAP measures of performance.

Business Trends

The Company had total sales in 2018 of \$2.2 billion, a 10.9% increase as compared to 2017. Foreign exchange rates did not have a significant impact on sales in 2018 compared to 2017. We had sales increases across all of our markets as Commercial Aerospace sales increased 8.2%, Space & Defense sales 7.6% and our Industrial sales 33.8% from 2017. The Commercial Aerospace market represents 70% of our sales, followed by Space & Defense at 17% and Industrial at 13%.

In 2018, our Commercial Aerospace sales increased by 8.2%. Sales to Airbus and Boeing and their subcontractors, which comprised 87% of our Commercial Aerospace sales, increased about 5.9% as growth of the A350, B787 and the new narrow bodies offset declines in legacy programs. Sales for the Airbus and Boeing legacy aircraft declined about 38% driven by declines in legacy narrowbody production. Almost all of our Commercial Aerospace sales are for new aircraft production as we have only nominal aftermarket sales.

Airbus and Boeing combined deliveries in 2018 were a record 1,606 aircraft, compared to the previous record of 1,493 aircraft in 2017. The demand for new commercial aircraft is principally driven by two factors. The first is airline passenger traffic (measured by revenue passenger miles) and the second is the replacement rate for existing aircraft. The International Air Transport Association (IATA) estimates 2018 (as of November 2018) revenue passenger miles were 6.2% higher than 2017. Combined orders for Airbus and Boeing in 2018 were 1,640 planes, compared to 2,021 orders for 2017. Backlog at the end of 2018 increased to a record 13,528 planes, or eight years of backlog at the 2018 delivery pace.

Overall the Commercial Aerospace industry continues to utilize a greater proportion of advanced composite materials with each new generation of aircraft. Hexcel has been awarded a contract to supply carbon fiber composite materials for the major primary structures for the A350 and has total content of about \$4.8 million per plane. The A350 has about 53% composite content by weight. As of December 31, 2018, Airbus has 659 orders in backlog for the A350, which had its first customer delivery in December 2014. The B787 has more than 50% composite content by weight, including composite wings and fuselage, compared to the 11% composite content used in the construction of its B777 aircraft and 6% for the B767 the aircraft it is primarily replacing. The B787 entered into service in 2011 and Hexcel averages about \$1.4 million of content per plane. As of December 31, 2018, Boeing had a backlog of 622 orders for its B787 aircraft. Both Airbus and Boeing have introduced new versions of their narrowbody planes that have new engines. Airbus's A320neo had its first customer delivery in January 2016, with 386 planes delivered in 2018 and 5,891 orders in backlog at December 31, 2018. Hexcel's content on the A320neo is approximately 50% higher than the prior derivative of the A320. Boeing's B737 MAX entered service in 2017 with 330 planes delivered and 4,675 planes in backlog at December 31, 2018. Hexcel's content on the B737 MAX is approximately 33% higher than the B737. In November 2018, Airbus announced the first delivery of the A330neo, which have new engines. Airbus delivered three A330neo's in 2018 and at December 31, 2018 had a backlog of 235 planes. Boeing announced the B777X, a new version of the B777 with composite wings and new engines. Our sales on these new programs represent an increasing percentage of our Commercial Aerospace sales.

Other commercial aerospace includes regional business and other commercial aircraft sales, which account for 13% of Commercial Aerospace sales, increased approximately 27% compared to 2017, driven by higher business jet sales. Our Space & Defense sales were up about 7.6% from 2017. The increase was driven largely by strong sales across a broad range of rotorcraft programs as well as the F-35 Joint Strike Fighter. Rotorcraft accounted for about 50% of our Space & Defense sales, with more than 86% coming from military programs. New or retrofit rotorcraft programs have an increased reliance on composite materials. In addition, our Engineered Products segment provides specialty

value added services such as machining, sub-assembly, and even full blade manufacturing. We are on a wide range of helicopter, military aircraft and space programs, including the F-35 (joint strike fighter or JSF), V-22 (Osprey) tilt rotor aircraft, Black Hawk and the A400M military transport. No one program accounts for more than 12% of our revenues in this market.

Our Industrial sales increased 33.8% from 2017. Industrial sales include wind energy, recreation, transportation and general industrial applications. Wind energy is the largest submarket making up more than 50% of the Industrial market. More than 70% of our Industrial sales are outside of the U.S. The wind energy submarket sales increased 73% compared to 2017 as various legacy blades with lower composite content transition to longer, higher efficiency blades with higher composite content.

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Results of Operations

We have two reportable segments: Composite Materials and Engineered Products. Although these segments provide customers with different products and services, they often overlap within three end business markets: Commercial Aerospace, Space & Defense and Industrial. Therefore, we also find it meaningful to evaluate the sales of our segments through the three end business markets. Further discussion and additional financial information about our segments may be found in Note 18 to the accompanying consolidated financial statements of this Annual Report on Form 10-K.

Net Sales: Consolidated net sales of \$2,189.1 million for 2018 were \$215.8 million, or 10.9%, higher than the \$1,973.3 million of net sales for 2017. The sales increase in 2018 was the result of the ramp up of the new narrowbody programs as well as growth in A350 and B787 sales. Consolidated net sales in 2017 decreased 1.5% from the \$2,004.3 million of sales in 2016. The sales decline in 2017 reflects reductions in some legacy wide body aircraft sales partially offset by A350 sales and sales related to the ramp up of the new narrowbody programs. Had the same U.S. dollar, British pound sterling and Euro exchange rates applied in 2017 as in 2018 (“constant currency”), consolidated net sales for 2018 would have been 10.3% higher than 2017. In constant currency, consolidated net sales for 2017 would have been 1.6%, lower than 2016 net sales.

Composite Materials: Net sales of \$1,770.5 million for 2018 increased 10.8% from 2017 driven by strong growth across all markets. Industrial sales increased 34.0% over 2017 as wind energy blades transitioned to higher composite content. The 10.9% growth in Space & Defense sales was driven largely by strong sales for the F-35 Joint Strike Fighter (“JSF”). Net sales of \$1,597.1 million for 2017 decreased \$12.9 million from 2016 driven by a decline in Industrial sales partially offset by a 7.8% increase in Space & Defense sales. The decline in Industrial sales was the result of 2017 being a transition year for wind energy blades, as discussed previously. The growth in Space & Defense sales was driven largely by strong sales for the F-35 JSF, V-22 Osprey and Black Hawk helicopter programs.

Engineered Products: Net sales of \$418.6 million for 2018 increased \$42.4 million from 2017, driven by growth in the A320neo and 737MAX in the Commercial Aerospace market. Net sales of \$376.2 million for 2017 decreased \$18.1 million from 2016. The decrease in 2017 was largely related to the decline in legacy widebody sales. There are not significant sales to the Industrial market from this segment.

The following table summarizes net sales to third-party customers by segment and end market in 2018, 2017 and 2016:

(In millions)	Commercial Aerospace	Space & Defense	Industrial	Total
2018 Net Sales				
Composite Materials	\$ 1,183.0	\$ 293.3	\$ 294.2	\$ 1,770.5
Engineered Products	342.0	76.6	—	418.6
Total	\$ 1,525.0	\$ 369.9	\$ 294.2	\$ 2,189.1
	70	% 17	% 13	% 100
2017 Net Sales				
Composite Materials	\$ 1,101.1	\$ 276.5	\$ 219.5	\$ 1,597.1
Engineered Products	308.7	67.2	0.3	376.2
Total	\$ 1,409.8	\$ 343.7	\$ 219.8	\$ 1,973.3
	72	% 17	% 11	% 100
2016 Net Sales				

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Composite Materials	\$ 1,100.5	\$ 256.4	\$ 253.1	\$ 1,610.0
Engineered Products	328.8	65.3	0.2	394.3
Total	\$ 1,429.3	\$ 321.7	\$ 253.3	\$ 2,004.3
	71	% 16	% 13	% 100 %

Commercial Aerospace: Net sales to the Commercial Aerospace market increased \$115.2 million or 8.2% to \$1,525.0 million for 2018 as compared to net sales of \$1,409.8 million for 2017; 2017 net sales decreased by \$19.5 million as compared to net sales of \$1,429.3 million for 2016.

In 2018, sales for Airbus and Boeing aircraft increased about 5.9% as growth of the A350, B787 and the new narrowbodies offset declines in legacy programs. Sales for Airbus and legacy Boeing programs, in 2017, declined almost 20% driven by certain widebody programs, which were partially offset by an increase in narrow body programs. Sales for the regional and business aircraft market increased 27% as compared to 2017, driven by higher business jet sales.

Space & Defense: Net sales of \$369.9 million in 2018 were \$26.2 million higher than 2017; net sales of \$343.7 million in 2017 were \$22.0 million higher than 2016. The increase in 2018 was driven largely by strong sales across a broad range of rotorcraft programs as well as the F-35 JSF. The increase in 2017 was driven largely by strong sales for the F-35 JSF, V-22 Osprey and Black Hawk helicopter programs. In 2018, rotorcraft accounted for just above 50% of Space & Defense sales, with about 86% coming from military sales. Hexcel participates in a wide range of programs, in the U.S., Europe and Asia, including rotorcraft, transport, fixed wing and satellite programs.

Industrial: Net sales of \$294.2 million for 2018 increased by \$74.4 million from 2017, net sales of \$219.8 million for 2017 decreased by \$33.5 million, or 13.2% from 2016. The wind energy submarket sales increased 73% compared to 2017 as various legacy blades with lower composite content transition to longer, high efficiency blades with higher composite content. The rest of the Industrial sales were up about 3%. The wind energy submarket sales in 2017 were down about 30% compared to 2016 reflecting a challenging year as wind energy blades transition to a higher composite content blade in 2018. The rest of Industrial sales were up about 10% in constant currency, driven by growth in other industrial and automotive submarkets.

Gross Margin: Gross margin for 2018 was \$580.8 million or 26.5% of net sales as compared to \$551.8 million or 28.0% of net sales in 2017. Execution of our key business initiative of Operational Excellence partially mitigated headwinds, including higher acrylonitrile costs, wind energy resin prices and tariffs. The Company also incurred start-up costs for a new polyacrylonitrile (PAN) and carbon fiber facility in France, which now has aerospace qualification and is providing additional capacity beginning in early 2019. Depreciation expense for the year increased \$18.6 million over 2017, reflecting continued capital investment for future expected growth. Exchange rates had a nominal impact on gross margin percentages in 2018 and 2016 and about a 30 basis point favorable impact on 2017 gross margin. The 2017 gross margin reflected strong operating performance across the Company while offsetting about \$10 million in costs related to the startup and training for the greenfield sites in France and Morocco. Gross margin for 2016 was \$564.6 million, or 28.2% of net sales.

Selling, General and Administrative (“SG&A”) Expenses: SG&A expenses were \$146.0 million or 6.7% of net sales for 2018; \$151.8 million or 7.7% of net sales for 2017 and \$157.6 million or 7.9% of net sales for 2016. The decline across all three years was the result of maintaining tight control of discretionary spend.

Research and Technology (“R&T”) Expenses: R&T expenses for 2018 were \$55.9 million or 2.6% of net sales; for 2017 were \$49.4 million or 2.5% of net sales and in 2016 were \$46.9 million or 2.3% of net sales. On a constant currency basis, the expenses in 2018 and 2017 increased more than 11% and 6% over the prior year periods. We continued to invest in innovative composite products and solutions to support customers and next-generation applications.

Other operating expense (income): Restructuring expenses of \$7.7 million were recorded in 2018 primarily for employee related costs from an action taken at one of our European facilities to improve operational efficiency and productivity. During 2018, we also recorded \$7.3 million related to an environmental insurance recovery which was offset by the write-down of our investment in Carbon Conversions, Inc. (“CCI”), as well as an additional reserve related to the Lower Passaic River environmental matter.

Operating Income: Operating income for 2018 was \$371.2 million compared with operating income of \$350.6 million for 2017, and \$360.1 million for 2016. Operating income as a percent of sales was 17.0%, 17.8% and 18.0% in 2018, 2017 and 2016, respectively.

One of the Company’s performance measures is operating income adjusted for other (income) expense, which is a non-GAAP

measure. Adjusted operating income for the year ended December 31, 2018 was \$378.9 million, or 17.3% of net sales. A reconciliation from operating income to adjusted operating income is provided on page 26.

Almost all of the Company's sales and costs are either in U.S. dollars, Euros or British Pound sterling, with less than 20% of our sales in Euros or British Pound sterling. In addition, much of our European Commercial Aerospace business has sales denominated in dollars and costs denominated in all three currencies. The net impact is that as the dollar strengthens against the Euro and the British Pound sterling, sales will decrease while operating income will increase. We have an active hedging program to minimize the impact on operating income, but our operating income as a percentage of net sales is affected. Foreign exchange did not have a significant impact in 2018 and had approximately a 40 basis point favorable impact on both 2017 and 2016 operating margins.

Operating income for the Composite Materials segment increased \$14.4 million to \$373.8 million from \$359.4 million in 2017 driven by higher Commercial Aerospace and Industrial volume. Operating income for Composite Materials was \$368.3 million in 2016. In 2017, strong operating performance was partially offset by about \$10 million in costs related to the startup and training for the greenfield sites in France and Morocco. The overall decline in 2017 operating income was primarily related to lower volume as certain legacy wide body production declined. Operating income for the Engineered Products segment in 2018 increased by \$1.9 million to \$50.6 million compared with 2017 on higher Commercial Aerospace volumes. Excluding a restructuring charge of \$7.7

million, operating income for 2018 was \$58.3 million or 13.9% of net sales. Operating income for the year ended December 31, 2017 for the Engineered Products segment decreased \$1.3 million to \$48.7 million from 2016. There is a learning curve in this segment for new programs as they either start-up or ramp-up, so margins in Engineered Products will be unfavorably impacted as we transition through programs and work our way up the learning curve in making new parts and structures. Operating income margins for Engineered Products will be less than Composite Materials as it is not nearly as capital intensive. Accordingly, operating income margins in the 12% –14% range for Engineered Products are considered very good returns on invested capital.

We did not allocate corporate net operating expenses of \$53.2 million, \$57.5 million and \$58.2 million to segments in 2018, 2017 and 2016, respectively.

Interest Expense: Interest expense was \$37.7 million for 2018, \$27.4 million for 2017 and \$22.1 million for 2016. Higher debt levels in 2018 lead to higher interest expense as we completed \$358 million of share repurchases and paid \$48 million in dividends. Interest expense increased in both 2017 and 2016 due to a higher average interest rate on debt outstanding as a result of the Company issuing, in February 2017 and in August 2015, senior unsecured notes. In addition, debt increased as we completed \$150 million of share buybacks, invested \$76 million in business acquisitions and paid a total of \$43 million of dividends in 2017.

Non-operating Expense: As a result of the refinancing of the Senior Credit Facility in 2016, we accelerated the unamortized deferred financing costs related to the previous borrowings, incurring a cost of \$0.4 million (\$0.3 million after tax).

Provision for Income Taxes: Our 2018, 2017 and 2016 tax provision was \$62.5 million, \$42.5 million and \$90.3 million for an effective tax rate of 18.8%, 13.2% and 26.8%, respectively. The 2018 and 2017 effective tax rates included a \$6.2 million tax accounting method change benefit and a \$22.1 million benefit, respectively, related to the U.S. Tax Cuts and Jobs Act enacted in 2017. The 2018 and 2017 effective tax rates also included \$4.7 million and \$15.6 million of benefits related to the release of valuation allowances in foreign jurisdictions and the release of reserves for uncertain tax positions. The 2016 effective tax rate also included benefits of \$6.6 million related to the release of reserves for uncertain tax positions. Excluding the impact of these discrete items, the 2018, 2017 and 2016 effective tax rates were 22.0%, 24.8% and 28.6%, respectively. We believe the adjusted effective tax rate, which is a non-GAAP measure, is meaningful since it provides insight to the tax rate of ongoing operations.

Equity in Earnings from Affiliated Companies: Equity in earnings primarily represents our portion of the earnings from our joint venture in Malaysia.

Net Income: Net income was \$276.6 million or \$3.11 per diluted share for the year ended December 31, 2018 compared to net income of \$284.0 million or \$3.09 per diluted share for the year ended December 31, 2017 and \$249.8 million, or \$2.65 per diluted share for the year ended December 31, 2016. Net income and diluted earnings per share included benefits of \$6.2 million or \$0.07 per diluted share from a tax accounting method change and \$22.1 million or \$0.24 per diluted share in 2018 and 2017, respectively, both related to the new U.S. Tax law in 2017. The three years also benefited from the other discrete tax benefits of \$4.7 million, \$15.6 million and \$6.6 million. Strong sales volume, particularly in the Commercial Aerospace market, coupled with good cost control led the growth in earnings in 2018 and 2016. Good cost control led to the growth in earnings in 2017. Also see the table on page 27 for a reconciliation of GAAP net income from continuing operations to our adjusted “Non-GAAP” measure.

Significant Customers

Approximately 41%, 44% and 41% of our 2018, 2017 and 2016 net sales, respectively, were to Airbus and its subcontractors. Of the 41% of overall sales to Airbus and its subcontractors in 2018, 38% related to Commercial

Aerospace market applications and 3% related to Space & Defense market applications. Approximately 25% for each of our 2018 and 2017 and 28% of our 2016 net sales, respectively, were to Boeing and related subcontractors. Of the 25% of overall sales to Boeing and its subcontractors in 2018, 23% related to Commercial Aerospace market applications and 2% related to Space & Defense market applications.

Financial Condition

In 2018, we ended the year with total debt, net of cash, of \$924.1 million and generated \$421.4 million operating cash resulting in \$237.3 million of free cash flow (cash provided by operating activities less cash paid for capital expenditures). For 2019, we expect our capital spending to be in the range of \$170 million to \$190 million as we expand capacity in line with our outlook, resulting in additional positive free cash flow. We expect our typical use of cash in the first half of 2019, which will be funded by our available borrowings under our Senior Unsecured Revolving Facility (the "Facility").

We have a portfolio of derivatives related to currencies, interest rates and commodities. We monitor our counterparties and we only use those rated A- or better.

Liquidity

Our cash on hand at December 31, 2018 was \$32.7 million and we had \$498.0 million borrowings available under our Facility. Our total debt as of December 31, 2018 was \$956.8 million, an increase of \$146.9 million from the December 31, 2017 balance. The increase in debt primarily reflects \$357.7 million of stock repurchases and \$48.4 million of dividend payments partially offset by the free cash flow generated.

The level of available borrowing capacity fluctuates during the course of the year due to factors including capital expenditures, share repurchases and dividend payments, acquisitions, interest and variable compensation payments, changes to working capital, as well as timing of receipts and disbursements within the normal course of business.

In 2017, the Company issued \$400 million in aggregate principal amount of 3.95% Senior Unsecured Notes due in 2027. In 2015, the Company issued \$300 million in aggregate principal amount of 4.7% Senior Unsecured Notes due in 2025. The interest rate on these senior notes may be increased by 0.25% each time a credit rating applicable to the notes is downgraded. The maximum rate is 5.95% and 6.7%, respectively. The effective interest rates on these two note issuances at December 31, 2018 were 4.1% and 4.8%. The net proceeds of these issuances were initially used to repay, in part, our Facility, as well as for general purposes including share repurchases.

Short-term liquidity requirements consist primarily of normal recurring operating expenses and working capital needs, capital expenditures, acquisition costs, dividend payments and debt service requirements. We expect to meet our short-term liquidity requirements through net cash from operating activities, cash on hand and, if necessary, our Facility. As of December 31, 2018, long-term liquidity requirements consist primarily of obligations under our long-term debt obligations. We do not have any significant required debt repayments until June 2021 when the Facility expires.

Credit Facilities: The Company has a \$700 million Facility, which expires in June 2021. The interest rate for this Facility at year-end was LIBOR +1.25%. The interest rate ranges from LIBOR +0.875% to a maximum of LIBOR +1.875%, depending upon the Company's leverage ratio. At December 31, 2018, total borrowings under the Facility were \$202.0 million. The Facility permits us to issue letters of credit up to an aggregate amount of \$40 million. Outstanding letters of credit reduce the amount available for borrowing under our Facility. As of December 31, 2018, we had no letters of credit outstanding under the Facility resulting in undrawn availability under the Facility as of December 31, 2018 of \$498.0 million.

The Facility contains financial and other covenants, including, but not limited to, restrictions on the incurrence of debt and the granting of liens, as well as the maintenance of an interest coverage ratio and a leverage ratio. In accordance with the terms of the Facility, we are required to maintain a minimum interest coverage ratio of 3.50 (based on the ratio of EBITDA, as defined in the credit agreement, to interest expense) and may not exceed a maximum leverage ratio of 3.50 (based on the ratio of total debt to EBITDA) throughout the term of the Facility. In addition, the Facility contains other terms and conditions such as customary representations and warranties, additional covenants and customary events of default. The conditions and covenants related to the senior notes are less restrictive than those of our Facility. As of December 31, 2018, we were in compliance with all debt covenants and expect to remain in compliance.

In 2016, we also entered into a €60 million (\$67.4 million) term loan ("Euro loan"). The loan has two tranches of which the first tranche for €25 million, has a rate of +1.2% Euribor and a final maturity date of June 30, 2023. The second tranche for €35 million has a rate of Euribor +1.25% and a final maturity date of June 30, 2024. There is a zero percent floor on the Euribor. The loans are payable in annual installments, the first began on June 30, 2017 and the second tranche will begin on June 30, 2019. We had \$60.5 million (€52.9 million) outstanding under this loan at December 31, 2018.

We have a \$10.0 million borrowing facility for working capital needs in China with no outstanding balance at December 31, 2018. These funds can only be used locally and, accordingly, we do not include this facility in our borrowing capacity disclosures. The facility is guaranteed by Hexcel Corporation, but is uncommitted and can be cancelled at any time.

Operating Activities: We generated \$421.4 million in cash from operating activities during 2018, a decrease of \$7.3 million from 2017 primarily reflecting higher working capital usage as sales volumes increased. Cash generated from operating activities during 2017 was \$428.7 million, an increase of \$27.3 million from 2016, primarily reflecting improvement in accounts receivable through strong cash collections.

Investing Activities: Cash used for investing activities, primarily for capital expenditures, was \$187.5 million in 2018 compared to \$354.1 million in 2017 and \$366.5 million in 2016. 2017 includes \$76 million primarily for the acquisition of the Structil SA (“Structil”) and Oxford Performance Materials (“OPM”) aerospace and defense businesses, as discussed below. 2016 also includes \$30 million of investments in affiliates and \$8.6 million for the Formax (UK) Limited (“Formax”) acquisition as discussed below.

In 2017, we acquired Structil to enhance our technology portfolio with adhesive, prepreg and pultrusion technologies. We also acquired an additional interest in OPM, and purchased assets related to their Commercial Aerospace and Space & Defense applications business.

In 2016, we spent \$30 million on investments including an interest in OPM. We issued an 8% convertible secured promissory note to Luminati Aerospace LLC (“Luminati”). Luminati is an aerospace technology company focusing on research, development, testing, and manufacturing of next generation solar-electric unmanned aerial vehicles or UAVs. The note matures in 2023 and the principal and interest are convertible into Luminati stock. The note will convert upon Luminati achieving certain milestones or at Hexcel’s discretion. We also made an initial investment in CCI.

In January 2016, the Company acquired the remaining 50% ownership of Formax. The Company previously acquired a 50% interest in the privately-owned company in December 2014. Located in Leicester, U.K., Formax is a leading manufacturer of composite reinforcements, specializing in the production of lightweight carbon multi-axials and highly engineered glass fiber and aramid fiber fabrics.

Financing Activities: Financing activities were a use of cash of \$257.3 million in 2018 as compared to \$58.3 million in 2017 and \$46.8 million in 2016. In 2018, 2017 and 2016, we repurchased \$357.7 million, \$150.3 million and \$111.1 million of common stock, respectively. In 2017, we issued \$400 million of Unsecured Senior Notes of which \$315 million was used to repay the Facility. In 2016, we had borrowings, net of repayments, from our Facility of \$85 million. We also had \$33 million and \$26 million of borrowings net of repayments from our Euro loan in 2017 and 2016. We paid \$48 million, \$43 million and \$40 million in dividends in 2018, 2017 and 2016, respectively.

In 2017, the Company issued \$400 million aggregate principal amount of 3.95% Senior Unsecured Notes due in 2027. In 2015, the Company issued \$300 million aggregate principal amount of 4.7% Senior Unsecured Notes due in 2025. The interest rate on these senior notes may be increased by 0.25% each time a credit rating applicable to the notes is downgraded. The maximum rate is 5.95% and 6.7%, respectively. The net proceeds were initially used to repay, in part, our Facility. The Company also repurchased stock as described below.

In May 2018, our Board authorized the repurchase of \$500 million of the Company’s stock (“2018 Repurchase Plan”). In February 2017, our Board authorized the repurchase of a \$300 million of the Company’s stock (“2017 Repurchase Plan”). During 2018, 2017 and 2016, the Company spent \$357.7 million, \$150.3 million and \$111.1 million, respectively, to repurchase common stock. The 2018 repurchases included \$242.2 million to complete the 2017 Repurchase Plan. At December 31, 2018, we have \$384.8 million remaining under the 2018 Repurchase Plan.

Financial Obligations and Commitments: We had \$9.4 million of current debt maturities as of December 31, 2018. The next significant scheduled debt maturity will not occur until 2021, the year the Facility matures. In addition, certain sales and administrative offices, data processing equipment and manufacturing equipment, land and facilities are leased under operating leases.

Total letters of credit issued and outstanding were \$1.7 million as of December 31, 2018.

The following table summarizes the scheduled maturities as of December 31, 2018 of financial obligations and expiration dates of commitments for the years ended 2019 through 2023 and thereafter.

(In millions)	2019	2020	2021	2022	2023	Thereafter	Total
Senior unsecured credit facility due 2021	\$ —	\$ —	\$ 202.0	\$ —	\$ —	\$ —	\$ 202.0

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4.7% senior notes due 2025	—	—	—	—	—	300.0	300.0
3.95% senior notes due 2027	—	—	—	—	—	400.0	400.0
Euro term loan	9.1	9.1	9.1	9.1	14.1	10.0	60.5
Capital lease and other	0.3	0.3	0.2	0.2	—	0.1	1.1
Subtotal	\$9.4	\$9.4	\$211.3	\$9.3	\$14.1	\$ 710.1	\$963.6
Operating leases	9.2	8.6	7.7	3.0	3.8	7.9	40.2
Total financial obligations	\$18.6	\$ 18.0	\$ 219.0	\$12.3	\$ 17.9	\$ 718.0	\$ 1,003.8
Letters of credit	1.7	—	—	—	—	—	1.7
Interest payments	38.5	38.4	34.3	30.3	30.2	73.3	245.0
Estimated benefit plan contributions	5.9	8.2	9.8	7.1	7.9	54.3	93.2
Other (a)	0.8	—	—	—	—	1.9	2.7
Total commitments	\$65.5	\$ 64.6	\$263.1	\$ 49.7	\$ 56.0	\$ 847.5	\$ 1,346.4

(a) Other represents estimated spending for environmental matters at known sites.

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As of December 31, 2018, we had \$7.5 million of unrecognized tax benefits. This represents tax benefits associated with various tax positions taken, or expected to be taken, on domestic and international tax returns that have not been recognized in our financial statements due to uncertainty regarding their resolution. The resolution or settlement of these tax positions with the taxing authorities is at various stages. Additionally, included at December 31, 2018 is \$14.1 million in liabilities associated with the deemed repatriation transition tax as a result of the Tax Cuts and Jobs Act (“the Act”). The Act permits the Company to pay the net tax liability interest free over a period of up to eight years.

For further information regarding our financial obligations and commitments, see Notes 5, 6, 7 and 15 to the accompanying consolidated financial statements of this Annual Report on Form 10-K.

Critical Accounting Policies and Estimates

Our consolidated financial statements are prepared based upon the selection and application of accounting principles generally accepted in the United States of America, which require us to make estimates and assumptions about future events that affect amounts reported in our financial statements and accompanying notes. Future events and their effects cannot be determined with absolute certainty. Therefore, the determination of estimates requires the exercise of judgment. Actual results could differ from those estimates, and any such differences may be significant to the financial statements. The accounting policies below are those we believe are the most critical to the preparation of our financial statements and require the most difficult, subjective and complex judgments. Our other accounting policies are described in the accompanying notes to the consolidated financial statements of this Annual Report on Form 10-K.

Deferred Tax Assets and Liabilities

As of December 31, 2018, we had \$112.6 million in net deferred tax liabilities consisting of deferred tax assets of \$115.0 million offset by deferred tax liabilities of \$178.8 million and a valuation allowance of \$48.8 million. As of December 31, 2017, we had \$114.4 million in net deferred tax liabilities consisting of deferred tax assets of \$97.2 million offset by deferred tax liabilities of \$156.7 million and a valuation allowance of \$54.9 million.

The valuation allowance as of December 31, 2018 relates primarily to certain net operating loss carryforwards of our foreign subsidiaries for which we have determined, based upon historical results and projected future book and taxable income levels, that a valuation allowance should continue to be maintained.

The determination of the required valuation allowance and the amount, if any, of deferred tax assets to be recognized involves significant estimates regarding the timing and amount of reversal of taxable temporary differences, future taxable income and the implementation of tax planning strategies. In particular, we are required to weigh both positive and negative evidence in determining whether a valuation allowance is required. Positive evidence would include, for example, a strong earnings history, an event that will increase our taxable income through a continuing reduction in expenses, and tax planning strategies indicating an ability to realize deferred tax assets. Negative evidence would include, for example, a history of operating losses and losses expected in future years.

Uncertain Tax Positions

We had unrecognized tax benefits of \$7.5 million at December 31, 2018, of which \$6.1 million, that if recognized, would impact our annual effective tax rate. In addition, we recognize interest accrued related to unrecognized tax benefits as a component of interest expense and penalties as a component of income tax expense in the consolidated statements of operations. The Company recognized \$0.3 million and \$1.1 million of interest expense and penalties related to the above unrecognized tax benefits in 2017 and 2016, respectively, and did not recognize any interest expense in 2018. The Company had accrued interest of approximately \$0.2 million and \$0.8 million as of December

31, 2018 and 2017, respectively. During 2018 we reversed \$0.6 million of interest related to unrecognized tax benefits.

We are subject to taxation in the U.S. and various states and foreign jurisdictions. Foreign and U.S. state jurisdictions have statutes of limitations generally ranging from 3 to 5 years. Years in major jurisdictions that remain open to examination are the U.S. (2014 onward), Austria (2016 onward), Belgium (2013 onward), France (2016 onward), Spain (2013 onward) and the U.K. (2016 onward). We are currently under examination in the U.S. and certain foreign tax jurisdictions.

As of December 31, 2018, we had uncertain tax positions for which it is reasonably possible that amounts of unrecognized tax benefits could significantly change over the next year. These uncertain tax positions relate to our tax returns from 2010 onward, some of which are currently under examination by certain U.S. and European tax authorities. The Company believes it is reasonably possible that the total amount of unrecognized tax benefits as of December 31, 2018 may decrease approximately \$0.4 million to \$1.3 million in the fiscal year ending December 31, 2019. Such possible decrease relates primarily to audit settlements and the expiration of statutes of limitation.

Retirement and Other Postretirement Benefit Plans

We maintain qualified defined benefit retirement plans covering certain current and former European employees, as well as nonqualified defined benefit retirement plans and retirement savings plans covering certain eligible U.S. and European employees, and participate in a union sponsored multi-employer pension plan covering certain U.S. employees with union affiliations. In addition, we provide certain postretirement health care and life insurance benefits to eligible U.S. retirees.

Under the retirement savings plans, eligible U.S. employees can contribute up to 75% of their compensation to an individual 401(k) retirement savings account. We make matching contributions equal to 50% of employee contributions, not to exceed 3% of employee compensation.

We have defined benefit retirement plans in the United Kingdom, Belgium, France and Austria covering certain employees of our subsidiaries in those countries. The defined benefit plan in the United Kingdom (the "U.K. Plan"), the largest of the European plans, was terminated in 2011. As of December 31, 2018, 25% of the total assets in the U.K. Plan were invested each in equity and in diversified growth funds. Equity investments are made with the objective of achieving a return on plan assets consistent with the funding requirements of the plan, maximizing portfolio return and minimizing the impact of market fluctuations on the fair value of the plan assets. As a result of an annual review of historical returns and market trends, the expected long-term weighted average rate of return for the U.K. Plan for the 2019 plan year will be 4.75% and for the other European plans as a group will be 3.0%.

We use actuarial models to account for our pension and postretirement plans, which require the use of certain assumptions, such as the expected long-term rate of return, discount rate, rate of compensation increase, healthcare cost trend rates, and retirement and mortality rates, to determine the net periodic costs of such plans. These assumptions are reviewed and set annually at the beginning of each year. In addition, these models use an "attribution approach" that generally spreads individual events, such as plan amendments and changes in actuarial assumptions, over the service lives of the employees in the plan. That is, employees render service over their service lives on a relatively smooth basis and therefore, the income statement effects of retirement and postretirement benefit plans are earned in, and should follow, the same pattern.

We use our actual return experience, future expectations of long-term investment returns, and our actual and targeted asset allocations to develop our expected rate of return assumptions used in the net periodic cost calculations of our funded European defined benefit retirement plans. Due to the difficulty involved in predicting the market performance of certain assets, there will almost always be a difference in any given year between our expected return on plan assets and the actual return. Following the attribution approach, each year's difference is amortized over a number of future years. Over time, the expected long-term returns are designed to approximate the actual long-term returns and therefore result in a pattern of income and expense recognition that more closely matches the pattern of the services provided by the employees.

We annually set our discount rate assumption for retirement-related benefits accounting to reflect the rates available on high-quality, fixed-income debt instruments. The discount rate assumption used to calculate net periodic retirement related costs for the European funded plans was 2.80% for 2018, 2.73% for 2017 and 3.63% for 2016. The rate of compensation increase, which is another significant assumption used in the actuarial model for pension accounting, is determined by us based upon our long-term plans for such increases and assumed inflation. For the postretirement health care and life insurance benefits plan, we review external data and its historical trends for health care costs to determine the health care cost trend rates. Retirement and mortality rates are based primarily on actual plan experience.

Actual results that differ from our assumptions are accumulated and amortized over future periods and, therefore, generally affect the net periodic costs and recorded obligations in such future periods. While we believe that the assumptions used are appropriate, significant changes in economic or other conditions, employee demographics, retirement and mortality rates, and investment performance may materially impact such costs and obligations.

For more information regarding our pension and other postretirement benefit plans, see Note 7 to the accompanying consolidated financial statements of this Annual Report on Form 10-K.

Long-Lived Assets and Goodwill

We have significant long-lived assets. We review these assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. The assessment of possible impairment is based upon our ability to recover the carrying value of the assets from the estimated undiscounted future net cash flows, before interest and taxes, of the related operations. If these cash flows are less than the carrying value of such assets, an impairment loss is recognized for the difference between estimated fair value and carrying value. The measurement of impairment requires estimates of these cash flows and fair value. The calculation of fair value is determined based on discounted cash flows. In determining fair value, a considerable amount of judgment is required to determine discount rates, market premiums, financial forecasts, and asset lives.

In addition, we review goodwill for impairment at the reporting unit level at least annually, and whenever events or changes in circumstances indicate that goodwill might be impaired. We have four reporting units within the Composite Materials segment, each of which are components that constitute a business for which discrete financial information is available and for which appropriate management regularly reviews the operating results. Within the Engineered Products segment, the reporting unit is the segment as it comprises only a single component. In 2018, the Company performed a quantitative assessment and determined that the fair values of our reporting units were not less than their carrying values and that no impairment exists.

Commitments and Contingencies

We are involved in litigation, investigations and claims arising out of the normal conduct of our business, including those relating to commercial transactions, environmental, employment and health and safety matters. We estimate and accrue our liabilities resulting from such matters based upon a variety of factors, including the stage of the proceeding; potential settlement value; assessments by internal and external counsel; and assessments by environmental engineers and consultants of potential environmental liabilities and remediation costs. We believe we have adequately accrued for these potential liabilities; however, facts and circumstances may change, such as new developments, or a change in approach, including a change in settlement strategy or in an environmental remediation plan, that could cause the actual liability to exceed the estimates, or may require adjustments to the recorded liability balances in the future.

Our estimate of liability as a potentially responsible party and our remaining costs associated with our responsibility to remediate the Lower Passaic River in New Jersey and other sites, are accrued in the consolidated balance sheets. As of December 31, 2018 and 2017, our aggregate environmental related accruals were \$2.7 million and \$2.8 million, respectively. As of December 31, 2018 and 2017, \$0.8 million and \$0.9 million, respectively, were included in current other accrued liabilities, with the remainder included in other non-current liabilities. As related to certain environmental matters, the accruals were estimated at the low end of a range of possible outcomes since no amount within the range is a better estimate than any other amount. If we had accrued, for those sites where we are able to estimate our liability, at the high end of the range of possible outcomes, our accrual would have been \$16 million higher at December 31, 2018 and 2017.

These accruals can change significantly from period to period due to such factors as additional information on the nature or extent of contamination, the methods of remediation required, changes in the apportionment of costs among responsible parties and other actions by governmental agencies or private parties, or the impact, if any, of being named in a new matter.

Environmental remediation reserve activity for the three years ended December 31, 2018 was as follows:

(In millions)	2018	2017	2016
Beginning remediation accrual balance	\$2.8	\$3.2	\$2.9
Current period expenses	0.3	0.1	1.2
Cash expenditures	(0.4)	(0.5)	(0.9)
Ending remediation accrual balance	\$2.7	\$2.8	\$3.2
Capital expenditures for environmental matters	\$6.9	\$8.4	\$13.2

Market Risks

As a result of our global operating and financing activities, we are exposed to various market risks that may affect our consolidated results of operations and financial position. These market risks include, but are not limited to, fluctuations in currency exchange rates, which impact the U.S. dollar value of transactions, assets and liabilities denominated in foreign currencies and fluctuations in interest rates, which impact the amount of interest we must pay on certain debt instruments. Our primary currency exposures are in Europe, where we have significant business activities. To a lesser extent, we are also exposed to fluctuations in the prices of certain commodities, such as electricity, natural gas, aluminum, acrylonitrile and certain chemicals. In addition, we have several contracts with both suppliers and customers that contain pricing adjustments based on the price of oil outside of a specified band.

We attempt to net individual exposures, when feasible, taking advantage of natural offsets. In addition, we employ or may employ interest rate swap agreements, treasury rate lock agreements, cross-currency swap agreements and foreign currency forward exchange contracts for the purpose of hedging certain specifically identified interest rates and net currency exposures. The use of these financial instruments is intended to mitigate some of the risks associated with fluctuations in interest rates and currency exchange rates, but does not eliminate such risks. We do not use financial instruments for trading or speculative purposes.

Interest Rate Risks

A portion of our long-term debt bears interest at variable rates. From time to time we have entered into interest rate swap agreements to change the underlying mix of variable and fixed interest rate debt. These interest rate swap agreements have modified the percentage of total debt that is exposed to changes in market interest rates. Assuming a 10% favorable and a 10% unfavorable change in the underlying weighted average interest rates of our variable rate debt and swap agreements, interest expense for 2018 of \$37.7 million would have decreased to \$37.4 million and increased to \$38.0 million, respectively.

Interest Rate Swaps

At December 31, 2018, we had approximately \$50 million of interest rate swaps that swap the USD LIBOR on our bank loan for a fixed rate at a weighted average rate of 1.09%, and €53 million of interest rate swaps that swap the EURIBOR on our French Term Loan for a fixed rate at a weighted average of 0.5%. These interest rate swaps are designated as cash flow hedges to floating rate bank loans. The U.S. dollar swaps will expire in September 2019, and the Euro swaps will have a final maturity between June 2023 and June 2024. The fair value of interest rate swap agreements is recorded in other assets or other non-current liabilities with a corresponding amount to Other Comprehensive Income.

Foreign Currency Exchange Risks

We operate fourteen manufacturing facilities in Europe, Asia and Africa which generated approximately 52% of our 2018 consolidated net sales. Our European business activities primarily involve three major currencies — the U.S. dollar, the British pound sterling, and the Euro. We also conduct business and sell products to customers throughout the world. Most of the sales in these countries are denominated in U.S. dollars and they have local currency expenses. Currency risk for the Asia and Africa locations is not considered material.

In 2018, our European subsidiaries had third-party sales of \$1,094 million of which approximately 70% were denominated in U.S. dollars, 29% were denominated in Euros and 1% were denominated in British pounds sterling. While we seek to reduce the exposure of our European subsidiaries to their sales in non-functional currencies through the purchase of raw materials in the same currency as that of the product sale, the net contribution of these sales to cover the costs of the subsidiary in its functional currency will vary with changes in foreign exchange rates, and as a result, so will vary the European subsidiaries' percentage margins and profitability. For revenues denominated in the functional currency of the subsidiary, changes in foreign currency exchange rates increase or decrease the value of these revenues in U.S. dollars, but do not affect the profitability of the subsidiary in its functional currency. The value of our investments in these countries could be impacted by changes in currency exchange rates over time, and could impact our ability to profitably compete in international markets.

We attempt to net individual functional currency positions of our various European subsidiaries, to take advantage of natural offsets and reduce the need to employ foreign currency forward exchange contracts. We attempt to hedge some, but not necessarily all, of the net exposures of our European subsidiaries resulting from sales they make in non-functional currencies. The benefit of such hedges varies with time and the foreign exchange rates at which the hedges are set. For example, when the Euro strengthened against the U.S. dollar, the benefit of new hedges placed was much less than the value of hedges they replaced that were entered into when the U.S. dollar was stronger. We seek to place additional foreign currency hedges when the dollar strengthens against the Euro or British pound. We do not seek to hedge the value of our European subsidiaries' functional currency sales and profitability in U.S. dollars. We also enter into short-term foreign currency forward exchange contracts, usually with a term of ninety days or less, to hedge net currency exposures resulting from specifically identified transactions. Consistent with the nature of the economic hedge provided by such contracts, any unrealized gain or loss would be offset by corresponding decreases

or increases, respectively, of the underlying transaction being hedged.

We have performed a sensitivity analysis as of December 31, 2018 using a modeling technique that measures the changes in the fair values arising from a hypothetical 10% adverse movement in the levels of foreign currency exchange rates relative to the U.S. dollar with all other variables held constant. The analysis covers all of our foreign currency hedge contracts. The sensitivity analysis indicated that a hypothetical 10% adverse movement in foreign currency exchange rates would have about a \$2.8 million impact on our 2018 operating income. However, it should be noted that over time as the adverse movement (in our case a weaker dollar as compared to the Euro or the British pound sterling) continues and new hedges are layered in at the adverse rate, the impact would be more significant. For example, had we not had any hedges in place for 2018, a 10% adverse movement would have reduced our operating income by about \$26.2 million.

Foreign Currency Forward Exchange Contracts

A number of our European subsidiaries are exposed to the impact of exchange rate volatility between the U.S. dollar and the subsidiaries' functional currencies, being either the Euro or the British pound sterling. We entered into contracts to exchange U.S. dollars for Euros and British pound sterling through June 2021. The aggregate notional amount of these contracts was \$416.5 million and \$285.4 million at December 31, 2018 and 2017, respectively. The purpose of these contracts is to hedge a portion of the forecasted

transactions of European subsidiaries under long-term sales contracts with certain customers. These contracts are expected to provide us with a more balanced matching of future cash receipts and expenditures by currency, thereby reducing our exposure to fluctuations in currency exchange rates. For the three years ended December 31, 2018, hedge ineffectiveness was immaterial. Cash flows associated with these contracts are classified within net cash provided by operating activities of continuing operations.

The activity, net of tax, in “accumulated other comprehensive loss” related to foreign currency forward exchange contracts for the years ended December 31, 2018, 2017 and 2016 was as follows:

(In millions)	2018	2017	2016
Unrealized gains (losses) at beginning of period	\$8.6	\$(25.9)	\$(15.0)
Losses reclassified to net sales	0.9	8.9	14.4
(Decrease) increase in fair value	(20.1)	25.6	(25.3)
Unrealized (losses) gains at end of period	\$(10.6)	\$8.6	\$(25.9)

Unrealized losses of \$5.0 million recorded in “accumulated other comprehensive income,” net of tax of \$1.5 million, as of December 31, 2018 are expected to be reclassified into earnings over the next twelve months as the hedged sales are recorded. The impact of credit risk adjustments was immaterial for the three years.

In addition, non-designated foreign exchange forward contracts are used to hedge balance sheet exposures. The notional amounts outstanding at December 31, 2018 were U.S. \$17.5 million against the Euro and British pound sterling and at December 31, 2017 were U.S. \$117.0 million against Euro and British pound sterling. Changes in the fair value of these forward contracts are recorded in the consolidated statements of operations and were losses of \$4.3 million, gains of \$17.1 million and losses of \$0.9 million in 2018, 2017, and 2016, respectively.

Commodity and Utility Price Risks

We have exposure to commodity and utility price risks as a result of volatility in the cost and supply of raw materials and energy, including electricity and natural gas. To minimize the risk, from time to time we enter into fixed price contracts and hedges at certain of our manufacturing locations for a portion of our expected purchases of raw materials, electricity and natural gas. Although these contracts reduce and hedges the risk to us during the contract period, future volatility in the supply and pricing of energy and raw materials could have an impact on our future consolidated results of operations.

Recently Issued Accounting Standards

New Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (“FASB”) issued Accounting Standard Update No. 2014-09 (ASU 2014-09), Revenue from Contracts with Customers (“ASC 606”). The update clarified the principles for recognizing revenue and developed a common revenue standard for all industries. We adopted this new standard on January 1, 2018, using the modified retrospective method. As a result of adopting this guidance under the modified retrospective method we adjusted the opening balance of our retained earnings by approximately \$3.8 million, which represented the cumulative net earnings effect of revenue recognized over time prior to the date of adoption related to those contracts whose performance obligations were not fully satisfied by the adoption date.

In February 2016, the FASB issued Accounting Standards Update No. 2016-02 (ASU 2016-02), Leases (Topic 842). This ASU requires lessees to recognize a right of use asset and lease liability on the balance sheet for all leases, with the exception of short-term leases (those of a duration of one year or less). We adopted this standard on January 1, 2019 using the transition method which allows companies to recognize existing leases at the adoption date without requiring comparable presentation. We are in the process of finalizing our analysis and assessment of the impact this new standard will have on our financial statements.

In August of 2016, the FASB issued Accounting Standards Update No. 2016-15 (ASU 2016-15) Classification of Certain Cash Receipts and Cash Payments which clarifies the classification of certain types of cash flows. The Company adopted this standard during the quarter ended March 31, 2018. There was no material impact on the Company's Consolidated Statements of Cash Flows.

In March 2017, the FASB issued Accounting Standards Update No. 2017-07 (ASU 2017-07), Compensation-Retirement Benefits, that amends the presentation of net periodic pension cost and net periodic postretirement benefit cost. This amendment requires entities to disaggregate the service cost component from the other components of net periodic benefit cost, to report the service cost component in the same line item as other compensation costs and to report the other components of net periodic benefit cost separately as a line item below operating income on our statement of operations. In addition, capitalization of net periodic benefit

cost in assets is limited to the service cost component. We adopted this amendment on January 1, 2018. The adoption did not have a material impact to our financial statements or disclosures.

In August 2017, the FASB issued Accounting Standards Update No. 2017-12 (ASU 2017-12), Targeted Improvement to Accounting for Hedging Activities, which better align hedge accounting with an organization's risk management activities in the financial statements. In addition, the standard simplified the application of hedge accounting guidance in areas where practice issues exist. We adopted this standard on January 1, 2018, with no impact to our results of operations or financial position

In February 2018, the FASB issued Accounting Standards Update No. 2018-02 (ASU 2018-02), Income Statement-Reporting Comprehensive Income (Topic 220), which amends the previous guidance to allow for certain tax effects "stranded" in accumulated other comprehensive income, which are impacted by the Tax Cuts and Jobs Act (the "Act") to be reclassified from accumulated other comprehensive income into retained earnings. This amendment pertains only to those items impacted by the Act and will not apply to any future tax effects stranded in accumulated other comprehensive income. This standard is effective for fiscal years beginning after December 15, 2018 and allows for early adoption. The Company elected to early adopt this standard during the quarter ended March 31, 2018. As a result of the adoption of this standard, the Company reduced the opening balance of retained earnings by approximately \$1.6 million.

In August 2018 the FASB issued Accounting Standards Update No. 2018-14 (ASU 2018-14), Compensation-Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20), which amends the current disclosure requirements regarding defined benefit pensions and other post retirement plans and allows for the removal of certain disclosures, while adding certain new disclosure requirements. This standard is effective for fiscal years beginning after December 15, 2020 and allows for early adoption. We do not expect this new standard to have a significant impact to our disclosures.

Consolidated Financial Statements and Supplementary Data

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Management's Responsibility for Consolidated Financial Statements

Hexcel management has prepared and is responsible for the consolidated financial statements and the related financial data contained in this report. These financial statements, which include estimates, were prepared in accordance with accounting principles generally accepted in the United States of America. Management uses its best judgment to ensure that such statements reflect fairly the consolidated financial position, results of operations and cash flows of the Company.

The Audit Committee of the Board of Directors reviews and monitors the consolidated financial statements and accounting policies of Hexcel. These financial statements and policies are reviewed regularly by management and such financial statements are audited by our independent registered public accounting firm, Ernst & Young LLP. The Audit Committee, composed solely of outside directors, meets periodically, separately and jointly, with management and the independent registered public accounting firm.

Management's Report on Internal Control Over Financial Reporting

Hexcel management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934, as amended, as a process designed by, or under the supervision of, the company's principal executive and principal financial officers and effected by the company's board of directors, management and other personnel 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 and 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 the assets of the company;
- 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
- 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.

Hexcel management has assessed the effectiveness of our internal control over financial reporting as of December 31, 2018. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013). Based on our assessment, management concluded that, as of December 31, 2018, our internal control over financial reporting was effective.

The effectiveness of Hexcel's internal control over financial reporting, as of December 31, 2018, has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in their report that appears on page 43.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Hexcel Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Hexcel Corporation and subsidiaries (the “Company”) as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income, stockholders’ equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and financial statement schedule listed in the Index at Item 15(a)(2) (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (“PCAOB”), Hexcel Corporation’s internal control over financial reporting as of December 31, 2018 based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 6, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s 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 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 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2016.

Stamford, Connecticut

February 6, 2019

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Hexcel Corporation

Opinion on Internal Control over Financial Reporting

We have audited Hexcel Corporation and subsidiaries (the “Company”) internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (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 Hexcel Corporation and subsidiaries (the “Company”) as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income, stockholders’ equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes and financial statement schedule listed in the Index at Items 15(a)(2) (collectively referred to as the “financial statements”) of the Company and our report dated February 6, 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 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 the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit 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, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and 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/ Ernst & Young LLP

Stamford, Connecticut

February 6, 2019

Hexcel Corporation and Subsidiaries

Condensed Balance Sheets

As of December 31,

(In millions)	2018	2017
Assets		
Current assets:		
Cash and cash equivalents	\$32.7	\$60.1
Accounts receivable, net	260.9	248.7
Inventories	297.8	314.0
Contract assets	50.5	—
Prepaid expenses and other current assets	33.9	33.9
Total current assets	675.8	656.7
Property, plant and equipment	2,839.9	2,743.9
Less accumulated depreciation	(963.4)	(877.6)
Property, plant and equipment, net	1,876.5	1,866.3
Goodwill and other intangible assets	142.3	148.7
Investments in affiliated companies	48.7	47.7
Other assets	80.8	61.5
Total assets	\$2,824.1	\$2,780.9
Liabilities and Stockholders' Equity		
Current liabilities:		
Short-term borrowings	\$9.4	\$4.3
Accounts payable	161.9	144.1
Accrued compensation and benefits	75.8	73.0
Accrued liabilities	79.6	40.7
Total current liabilities	326.7	262.1
Commitments and contingencies (see Note 15)		
Long-term debt	947.4	805.6
Retirement obligations	42.0	45.4
Other non-current liabilities	186.0	172.7
Total liabilities	1,502.1	1,285.8
Stockholders' equity:		
Common stock, \$0.01 par value, 200.0 shares authorized, 108.5 shares and 107.8 shares		
issued at December 31, 2018 and 2017, respectively	1.1	1.1
Additional paid-in capital	798.3	774.3
Retained earnings	1,726.5	1,496.1
Accumulated other comprehensive loss	\$(108.0)	\$(45.0)

	2,417.9	2,226.5
Less – Treasury stock, at cost, 23.7 shares and 18.2 shares		
at December 31, 2018 and 2017, respectively	(1,095.9)	(731.4)
Total stockholders' equity	1,322.0	1,495.1
Total liabilities and stockholders' equity	\$2,824.1	\$2,780.9

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

Hexcel Corporation and Subsidiaries

Consolidated Statements of Operations

For the Years Ended December 31,

(In millions, except per share data)	2018	2017	2016
Net sales	\$2,189.1	\$1,973.3	\$2,004.3
Cost of sales	1,608.3	1,421.5	1,439.7
Gross margin	580.8	551.8	564.6
Selling, general and administrative expenses	146.0	151.8	157.6
Research and technology expenses	55.9	49.4	46.9
Other operating expense	7.7	—	—
Operating income	371.2	350.6	360.1
Interest expense, net	37.7	27.4	22.1
Non-operating expense	—	—	0.4
Income before income taxes, and equity in earnings of			
affiliated companies	333.5	323.2	337.6
Provision for income taxes	62.5	42.5	90.3
Income before equity in earnings of affiliated companies	271.0	280.7	247.3
Equity in earnings from affiliated companies	5.6	3.3	2.5
Net income	\$276.6	\$284.0	\$249.8
Basic net income per common share:	\$3.15	\$3.13	\$2.69
Diluted net income per common share:	\$3.11	\$3.09	\$2.65
Weighted-average common shares:			
Basic	87.9	90.6	92.8
Diluted	89.0	91.9	94.2

Hexcel Corporation and Subsidiaries

Consolidated Statements of Comprehensive Income

For the Years Ended December 31,

(In millions)	2018	2017	2016
Net Income	\$276.6	\$284.0	\$249.8

Currency translation adjustments	(45.5)	99.8	(54.5)
Net unrealized pension and other benefit actuarial			
losses and prior service credits (net of tax)	3.1	(3.9)	8.1
Net unrealized gains (losses) on financial instruments (net of tax)	(22.2)	33.5	(4.1)
Total other comprehensive income (loss)	(64.6)	129.4	(50.5)
Comprehensive income	\$212.0	\$413.4	\$199.3

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

Hexcel Corporation and Subsidiaries

Consolidated Statements of Stockholders' Equity

For the Years Ended December 31, 2018, 2017 and 2016

(In millions)	Common Stock		Accumulated Retained Earnings	Accumulated Other Comprehensive Income (Loss)		Treasury Stock	Total Stockholders' Equity
	Par	Additional Paid-In Capital					
Balance, December 31, 2015	\$1.1	\$ 715.8	\$ 1,044.4	\$ (123.9	)	\$(457.8	) \$ 1,179.6
Net income	—	—	249.8	—	—	—	249.8
Dividends paid on common stock	—	—	(39.8	)	—	—	(39.8
Change in other comprehensive income – net of tax	—	—	—	(50.5	)	—	(50.5
Stock based compensation	—	23.0	—	—	—	—	23.0
Adoption of ASU 2016-09	—	—	0.3	—	—	—	0.3
Acquisition of treasury stock	—	—	—	—	—	(117.5	) (117.5
Balance, December 31, 2016	\$1.1	\$ 738.8	\$ 1,254.7	\$ (174.4	)	(575.3	) \$ 1,244.9
Net income	—	—	284.0	—	—	—	284.0
Dividends paid on common stock	—	—	(42.6	)	—	—	(42.6
Change in other comprehensive income – net of tax	—	—	—	129.4	—	—	129.4
Stock based compensation	—	35.5	—	—	—	—	35.5
Acquisition of treasury stock	—	—	—	—	—	(156.1	) (156.1
Balance, December 31, 2017	\$1.1	\$ 774.3	\$ 1,496.1	\$ (45.0	)	\$(731.4	) \$ 1,495.1
Net income	—	—	276.6	—	—	—	276.6
Dividends paid on common stock	—	—	(48.4	)	—	—	(48.4
Change in other comprehensive income – net of tax	—	—	—	(64.6	)	—	(64.6
Stock based compensation	—	24.0	—	—	—	—	24.0
Adoption of ASU 2018-02	—	—	(1.6	)	1.6	—	—
Adoption of ASU 2014-09	—	—	3.8	—	—	—	3.8
Acquisition of treasury stock	—	—	—	—	—	(364.5	) (364.5
Balance, December 31, 2018	\$1.1	\$ 798.3	\$ 1,726.5	\$ (108.0	)	\$(1,095.9)	\$ 1,322.0

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

Hexcel Corporation and Subsidiaries

Consolidated Statements of Cash Flows

For the Years Ended December 31,

(In millions)	2018	2017	2016
Cash flows from operating activities			
Net income	\$276.6	\$284.0	\$249.8
Reconciliation to net cash provided by operating activities:			
Depreciation and amortization	123.1	104.5	93.3
Amortization of deferred financing costs and debt discount	1.6	0.7	1.7
Deferred income taxes	29.3	3.8	62.8
Restructuring Expense	7.7	—	—
Equity in earnings from affiliated companies	(5.6)	(3.3)	(2.5)
Stock-based compensation	16.2	17.6	16.1
Changes in assets and liabilities:			
(Increase) decrease in accounts receivable	(20.7)	20.2	(17.4)
(Increase) decrease in inventories	(25.2)	2.3	10.8
Increase in prepaid expenses and other current assets	(8.6)	(0.1)	(4.1)
Increase in other non-current assets	—	(8.0)	(13.7)
Increase (decrease) increase in accounts payable/accrued liabilities	23.3	(2.1)	(7.9)
Increase in other non-current liabilities	—	—	8.1
Other – net	3.7	9.1	4.4
Net cash provided by operating activities	421.4	428.7	401.4
Cash flows from investing activities			
Capital expenditures	(184.1)	(278.1)	(327.9)
Acquisitions and Investments in affiliated companies	(3.4)	(76.0)	(38.6)
Net cash used for investing activities	(187.5)	(354.1)	(366.5)
Cash flows from financing activities			
Proceeds from issuance of senior notes	—	398.3	—
Issuance costs related to senior notes	—	(3.7)	—
Proceeds from settlements of treasury locks	—	10.0	—
Proceeds from Euro term loan	—	37.4	26.4
Repayments of Euro term loan	(4.2)	(4.1)	—
Borrowing from senior unsecured credit facility	752.0	459.0	563.0
Repayment of senior unsecured credit facility	(600.0)	(774.0)	(485.0)
Change in capital lease obligations	(0.2)	—	—
Proceeds (repayment) of other debt, net	0.2	(0.5)	1.1
Deferred financing costs and discount related to long-term debt	—	—	(1.7)
Dividends paid	(48.4)	(42.6)	(39.8)
Repurchase of stock	(357.7)	(150.3)	(111.1)
Activity under stock plans	1.0	12.2	0.3
Net cash provided by (used for) financing activities	(257.3)	(58.3)	(46.8)

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Effect of exchange rate changes on cash and cash equivalents	(4.0)	8.6	(4.7)
Net (decrease) increase in cash and cash equivalents	(27.4)	24.9	(16.6)
Cash and cash equivalents at beginning of period	60.1	35.2	51.8
Cash and cash equivalents at end of period	\$32.7	\$60.1	\$35.2

Supplemental data:

Accrual basis additions to property, plant and equipment	\$179.1	\$284.4	\$320.2
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The accompanying notes are an integral part of these consolidated financial statements.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Note 1 — Significant Accounting Policies

Nature of Operations

Hexcel Corporation and its subsidiaries (herein referred to as “Hexcel”, “the Company”, “we”, “us”, or “our”), is a leading advanced composites company. We develop, manufacture, and market lightweight, high-performance structural materials, including carbon fibers, specialty reinforcements, prepregs and other fiber-reinforced matrix materials, honeycomb, adhesives, engineered honeycomb and composite structures, for use in Commercial Aerospace, Space & Defense and Industrial Applications. Our products are used in a wide variety of end applications, such as commercial and military aircraft, space launch vehicles and satellites, wind turbine blades, automotive, a wide variety of recreational products and other industrial applications.

We serve international markets through manufacturing facilities, sales offices and representatives located in the Americas, Europe, Asia Pacific, and Africa. We are also a partner in a joint venture in Malaysia, Aerospace Composites Malaysia Sdn. Bhd. (“ACM”), which manufactures composite structures for commercial aerospace applications.

Principles of Consolidation

The accompanying consolidated financial statements include the accounts of Hexcel Corporation and its subsidiaries after elimination of all intercompany accounts, transactions and profits. At December 31, 2018, we had a 50% equity ownership investment in the joint venture described above and a 25% equity investment in Hexcut Services. These investments are accounted for using the equity method of accounting.

Basis of Presentation

Within the Consolidated Statement of Cash Flows for the years ended December 31, 2017 and 2016, borrowings and repayments related to our revolving credit facility previously presented net within financing activities have been presented gross to conform to the current year presentation.

Use of Estimates

Preparation of the accompanying consolidated financial statements and related disclosures in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, 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. Actual results could differ from those estimates.

Cash and Cash Equivalents

Cash and cash equivalents include cash on hand and all highly liquid investments with an original maturity of three months or less when purchased. Our cash equivalents are held in prime money market investments with strong sponsor organizations which are monitored on a continuous basis.

Inventories

Inventories are stated at the lower of cost or net realizable value, with cost determined using the average cost methods. Inventory is reported at its estimated net realizable value based upon our historical experience with inventory becoming obsolete due to age, changes in technology and other factors.

Property, Plant and Equipment

Property, plant and equipment, including capitalized interest applicable to major project expenditures, is recorded at cost. Asset and accumulated depreciation accounts are eliminated for dispositions, with resulting gains or losses reflected in earnings. Depreciation of plant and equipment is provided generally using the straight-line method over the estimated useful lives of the various assets. The estimated useful lives range from 10 to 40 years for buildings and improvements and from 3 to 25 years for machinery and equipment. Repairs and maintenance are expensed as incurred, while major replacements and betterments are capitalized and depreciated over the remaining useful life of the related asset.

Goodwill and Other Intangible Assets

Goodwill represents the excess of the purchase price over the fair value of the identifiable net assets of an acquired business. Goodwill is tested for impairment at the reporting unit level annually, in the fourth quarter, or when events or changes in circumstances indicate that goodwill might be impaired. We performed a quantitative assessment utilizing a market approach that includes the use of multiples of publicly traded companies whose products are comparable to ours. We also reconciled the estimated fair values of the reporting units to our market capitalization and concluded that they provided a reasonable basis for fair value. Based on the results of the impairment test, we determined that the fair values of our reporting units were not less than their carrying values and that no impairment exists.

We amortize the cost of other intangibles over their estimated useful lives unless such lives are deemed indefinite. We have indefinite lived intangible assets which are not amortized but are tested annually for impairment during the fourth quarter of each year, or when events or changes in circumstances indicate the potential for impairment. If the carrying amount of the indefinite lived intangible exceeds the fair value, it is written down to its fair value, which is calculated using a discounted cash flow model.

Impairment of Long-Lived Assets

The Company reviews long-lived assets, including property, plant and equipment and definite-lived intangible assets, for impairment whenever changes in circumstances or events may indicate that the carrying amounts are not recoverable. These indicators include, but are not limited to: a significant decrease in the market price of a long-lived asset, a significant change in the extent or manner in which a long-lived asset is used or its physical condition, a significant adverse change in legal factors or business climate that could affect the value of a long-lived asset, an accumulation of costs significantly in excess of the amount expected for the acquisition or construction of a long-lived asset, a current period operating or cash flow loss combined with a history of losses associated with a long-lived asset and a current expectation that, more likely than not, a long-lived asset will be sold or otherwise disposed of significantly before the end of its previously estimated life.

Software Development Costs

Costs incurred to develop software for internal use are accounted for under ASC 350-40, "Internal-Use Software." All costs relating to the preliminary project stage and the post-implementation/operation stage are expensed as incurred. Costs incurred during the application development stage are capitalized and amortized over the useful life of the software, which ranges from three to ten years. The amortization of capitalized costs commences after the software has been tested and is placed into operations.

Debt Financing Costs

Debt financing costs are deferred and amortized to interest expense over the life of the related debt. We capitalize financing fees related to our revolving credit facility and record them as a non-current asset in our consolidated balance sheets. Financing fees related to our bonds and notes are capitalized and recorded as a non-current contra liability in our consolidated balance sheets. At December 31, 2018 and 2017, deferred financing costs, recorded as a non-current asset were \$2.2 million and \$3.1 million, respectively, and net deferred financing costs recorded as non-current contra liability were \$4.8 million, and \$5.5 million, respectively.

Share-Based Compensation

The fair value of Restricted Stock Units (“RSUs”) is equal to the market price of our stock at date of grant and is amortized to expense ratably over the vesting period. Performance restricted stock units (“PRSUs”) are a form of RSUs in which the number of shares ultimately received depends on the extent to which we achieve a specified performance target. The fair value of the PRSU is based on the closing market price of the Company’s common stock on the date of grant and is amortized straight-line over the total vesting period. A change in the performance measure expected to be achieved is recorded as an adjustment in the period in which the change occurs. We use the Black-Scholes model to calculate the fair value for all stock option grants, based on the inputs relevant on the date granted, such as the market value of our shares, prevailing risk-free interest rate, etc. The value of the portion of the award, after considering potential forfeitures, that is ultimately expected to vest is recognized as expense in our consolidated statements of operations on a straight-line basis over the requisite service periods. The value of RSUs, PRSUs and non-qualifying options awards for retirement eligible employees is expensed on the grant date as they are fully vested.

Currency Translation

The assets and liabilities of international subsidiaries are translated into U.S. dollars at year-end exchange rates, and revenues and expenses are translated at average exchange rates during the year. Cumulative currency translation adjustments are included in “accumulated other comprehensive loss” in the Stockholders’ Equity section of the consolidated balance sheets.

Revenue Recognition

On January 1, 2018 we adopted ASC 606 “Revenue from contracts with customers”. Revenue is predominately derived from a single performance obligation and pricing is fixed and determinable. Under ASC 606 we applied the five-step approach resulting in revenue being recognized over time for customer contracts that contain a termination for convenience clause (“T for C”) and the products produced don’t have an alternative use. For revenue recognized over time, we estimate the amount of revenue earned at a given point during the production cycle based on certain costs factors such as raw materials and labor, incurred to date, plus a reasonable profit. We believe this method, which is the cost-to-cost input method, best estimates the revenue recognizable for T for C Agreements. All other revenue is recognized at a point in time.

We have elected the following practical expedients allowed under ASC 606:

- Payment terms with our customers which are one year or less, are not considered a performance obligation.
- Shipping and handling fees and costs incurred in connection with products sold are recorded in cost of sales in our Consolidated Statements of Operations and are not considered a performance obligation to our customers.
- Our performance obligations on our orders are generally satisfied within one year from a given reporting date therefore we omit disclosure of the transaction price allocated to remaining performance obligations on open orders.

We adopted ASC 606 using the modified retrospective method, therefore we have not restated our revenues for 2017 and 2016 that were recognized under ASC 605, which was predominately at a point in time. Prior to adopting ASC 606, our revenue was recognized when persuasive evidence of an arrangement existed, title and risk of loss passed to the customer, the sales price was fixed or determinable, and collectability was reasonable assured. However, from time to time we entered into contractual arrangements for which other specific revenue recognition guidance was applied. Revenues derived from design and installation services were recognized when the service was provided.

Product Warranty

We provide for an estimated amount of product warranty at the point a claim is probable and estimable. This estimated amount is provided by product and based on current facts, circumstances and historical warranty experience.

Research and Technology

Significant costs are incurred each year in connection with research and technology (“R&T”) programs that are expected to contribute to future earnings. Such costs are related to the development and, in certain instances, the qualification and certification of new and improved products and their uses. R&T costs are expensed as incurred.

Income Taxes

We provide for income taxes using the asset and liability approach. Under this approach, deferred income tax assets and liabilities reflect tax net operating loss and credit carryforwards and the tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting and income tax purposes. Deferred tax assets require a valuation allowance when it is not more likely than not, based on the evaluation of positive and negative evidence, that the deferred tax assets will be realized. The realization of deferred tax assets is dependent upon the timing and magnitude of future taxable income prior to the expiration of the deferred tax assets’ attributes. When events and circumstances so dictate, we evaluate the realizability of our deferred tax assets and the need for a valuation allowance by forecasting future taxable income. Investment tax credits are recorded on a flow-through basis, which reflects the credit in net income as a reduction of the provision for income taxes in the same period as the credit

is realized for federal income tax purposes. In addition, we recognize interest accrued related to unrecognized tax benefits as a component of interest expense and penalties as a component of income tax expense in the consolidated statements of operations.

Concentration of Credit Risk

Financial instruments that potentially subject us to significant concentrations of credit risk consist primarily of trade accounts receivable. Two customers and their related subcontractors accounted for approximately 66% our annual net sales in 2018 and 69% in both 2017 and 2016. Refer to Note 18 for further information on significant customers. We perform ongoing credit evaluations of our customers' financial condition but generally do not require collateral or other security to support customer receivables. We establish an allowance for doubtful accounts based on factors surrounding the credit risk of specific customers, historical trends and other financial information. As of December 31, 2018 and 2017, the allowance for doubtful accounts was \$0.3 million. Bad debt expense was immaterial for all years presented.

Derivative Financial Instruments

We use various financial instruments, including foreign currency forward exchange contracts, commodity and interest rate agreements, to manage our exposure to market fluctuations by generating cash flows that offset, in relation to their amount and timing, the cash flows of certain foreign currency denominated transactions or underlying debt instruments. We mark our foreign exchange forward contracts to fair value. When the derivatives qualify, we designate our foreign currency forward exchange contracts as cash flow hedges against forecasted foreign currency denominated transactions and report the changes in fair value of the instruments in “accumulated other comprehensive loss” until the underlying hedged transactions affect income. We designate our interest rate agreements as fair value or cash flow hedges against specific debt instruments and recognize interest differentials as adjustments to interest expense as the differentials may occur; the fair value of the interest rate swaps is recorded in other assets or other long-term liabilities with a corresponding amount to “accumulated other comprehensive loss”. We do not use financial instruments for trading or speculative purposes.

In accordance with accounting guidance, we recognize all derivatives as either assets or liabilities on our balance sheet and measure those instruments at fair value.

Self-insurance

We are self-insured up to specific levels for certain medical and health insurance and workers’ compensation plans. Accruals are established based on actuarial assumptions and historical claim experience, and include estimated amounts for incurred but not reported claims.

New Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (“FASB”) issued Accounting Standard Update No. 2014-09 (ASU 2014-09), Revenue from Contracts with Customers (“ASC 606”). The update clarified the principles for recognizing revenue and developed a common revenue standard for all industries. We adopted this new standard on January 1, 2018, using the modified retrospective method. As a result of adopting this guidance under the modified retrospective method we adjusted the opening balance of our retained earnings by approximately \$3.8 million, which represented the cumulative net earnings effect of revenue recognized over time prior to the date of adoption related to those contracts whose performance obligations were not fully satisfied by the adoption date.

In February 2016, the FASB issued Accounting Standards Update No. 2016-02 (ASU 2016-02), Leases (Topic 842). This ASU requires lessees to recognize a right of use asset and lease liability on the balance sheet for all leases, with the exception of short-term leases (those of a duration of one year or less). We adopted this standard on January 1, 2019 using the transition method which allows companies to recognize existing leases at the adoption date without requiring comparable presentation. We are in the process of finalizing our analysis and assessment of the impact this new standard will have on our financial statements.

In August of 2016, the FASB issued Accounting Standards Update No. 2016-15 (ASU 2016-15) Classification of Certain Cash Receipts and Cash Payments which clarifies the classification of certain types of cash flows. The Company adopted this standard during the quarter ended March 31, 2018. There was no material impact on the Company’s Consolidated Statements of Cash Flows.

In March 2017, the FASB issued Accounting Standards Update No. 2017-07 (ASU 2017-07), Compensation-Retirement Benefits, that amends the presentation of net periodic pension cost and net periodic postretirement benefit cost. This amendment requires entities to disaggregate the service cost component from the other components of net periodic benefit cost, to report the service cost component in the same line item as

other compensation costs and to report the other components of net periodic benefit cost separately as a line item below operating income on our statement of operations. In addition, capitalization of net periodic benefit cost in assets is limited to the service cost component. We adopted this amendment on January 1, 2018. The adoption did not have a material impact to our financial statements or disclosures.

In August 2017, the FASB issued Accounting Standards Update No. 2017-12 (ASU 2017-12), Targeted Improvement to Accounting for Hedging Activities, which better align hedge accounting with an organization's risk management activities in the financial statements. In addition, the standard simplified the application of hedge accounting guidance in areas where practice issues exist. We adopted this standard on January 1, 2018, with no impact to our results of operations or financial position

In February 2018, the FASB issued Accounting Standards Update No. 2018-02 (ASU 2018-02), Income Statement-Reporting Comprehensive Income (Topic 220), which amends the previous guidance to allow for certain tax effects "stranded" in accumulated other comprehensive income, which are impacted by the Tax Cuts and Jobs Act (the "Act") to be reclassified from accumulated other comprehensive income into retained earnings. This amendment pertains only to those items impacted by the new tax law and will not apply to any future tax effects stranded in accumulated other comprehensive income. This standard is effective for fiscal years

beginning after December 15, 2018 and allows for early adoption. The company elected to early adopt this standard during the quarter ended March 31, 2018. As a result of the adoption of this standard, the Company reduced the opening balance of retained earnings by approximately \$1.6 million.

In August 2018 the FASB issued Accounting Standards Update No. 2018-14 (ASU 2018-14), Compensation-Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20), which amends the current disclosure requirements regarding defined benefit pensions and other post retirement plans and allows for the removal of certain disclosures, while adding certain new disclosure requirements. This standard is effective for fiscal years beginning after December 15, 2020 and allows for early adoption. We do not expect this new standard to have a significant impact to our disclosures.

Note 2 — Inventories

(In millions)	December 31,	
	2018	2017
Raw materials	\$ 131.4	\$ 126.7
Work in progress	43.6	52.1
Finished goods	122.8	135.2
Total inventory	\$ 297.8	\$ 314.0

Note 3 — Net Property, Plant and Equipment

(In millions)	December 31,	
	2018	2017
Land	\$ 105.0	\$ 96.7
Buildings	660.0	624.2
Equipment	1,919.5	1,698.5
Construction in progress	151.9	322.0
Capital lease	3.5	2.5
Property, plant and equipment	2,839.9	2,743.9
Less accumulated depreciation	(963.4)	(877.6)
Net property, plant and equipment	\$ 1,876.5	\$ 1,866.3

Depreciation expense related to property, plant and equipment for the years ended December 31, 2018, 2017 and 2016, was \$120.1 million, \$103.5 million and \$93.3 million, respectively. Capitalized interest of \$9.5 million and \$3.1 million for 2018 and 2017, respectively, was included in construction in progress. Capitalized costs associated with software developed for internal use were not material for 2018 and 2017.

Note 4 — Goodwill and Purchased Intangible Assets

Changes in the carrying amount of gross goodwill and other purchased intangibles for the years ended December 31, 2018 and 2017, by segment, are as follows:

(In millions)	Engineered		
	Composite Materials	Products	Total
Balance as of December 31, 2016	\$ 56.1	\$ 16.1	\$72.2
Amortization expense	(1.0)	—	(1.0)
Additions	41.2	28.9	70.1
Currency translation adjustments and other	7.4	—	7.4
Balance as of December 31, 2017	\$ 103.7	\$ 45.0	\$148.7
Amortization expense	(2.0)	(0.9)	(2.9)
Currency translation adjustments and other	(3.5)	—	(3.5)
Balance as of December 31, 2018	\$ 98.2	\$ 44.1	\$142.3

We performed our annual impairment review of goodwill as of November 30, 2018 and determined that the fair values of our reporting units are above their carrying values and that no impairment exists. The goodwill and intangible asset balances as of December 31, 2018 include \$4.2 million of indefinite-lived intangible assets, \$30.5 million of a definite-lived intangible asset and

\$107.7 million of goodwill. Of the \$107.7 million of goodwill, \$74.5 million is allocated to the Composite Materials segment and \$33.2 million to the Engineered Products segment.

Amortization related to the definite lived intangible assets for the next five years and thereafter is as follows: \$14.3 million for 2019 through 2023, and \$16.4 million thereafter.

Note 5 - Debt

(In millions)	December 31, 2018	December 31, 2017
Current portion of capital lease	\$ 0.3	\$ —
Current portion of Euro term loan	9.1	4.3
Current portion of debt	9.4	4.3
Non-current portion of Euro term loan	51.4	63.3
Senior unsecured credit facility – due 2021	202.0	50.0
4.7% senior notes — due 2025	300.0	300.0
3.95% senior notes — due 2027	400.0	400.0
Senior notes — original issue discount	(2.0)	(2.3)
Senior notes — deferred financing costs	(4.8)	(5.5)
Non-current portion of capital leases and other	0.8	0.1
Long-term debt	947.4	805.6
Total debt	\$ 956.8	\$ 809.9

3.95% Senior Notes

In 2017, the Company issued \$400 million in aggregate principal amount of 3.95% Senior Unsecured Notes due in 2027. The interest rate on these senior notes may be increased by 0.25% each time a credit rating applicable to the notes is downgraded. The maximum rate is 5.95%. The net proceeds of approximately \$394.6 million were initially used to repay, in part, \$350 million of our Senior Unsecured Revolving Credit Facility (the “Facility”) and the remainder was used for general purposes including share repurchases. The effective interest rate for 2018 was 3.88% inclusive of approximately a 0.25% benefit of treasury locks. The fair value of the senior notes due in 2027 based on quoted prices utilizing Level 2 inputs was \$386.6 million at December 31, 2018. The balance of unamortized deferred financing costs and debt discount related to the senior notes was \$4.4 million at December 31, 2018 and \$5.0 million at December 31, 2017.

Senior Unsecured Credit Facility

In 2016, the Company amended and extended its \$700 million Facility, which matures in June 2021. The amendment provided for a modest reduction in interest costs, as well as less restrictive covenants. The interest rate for the revolver at December 31, 2018 is LIBOR + 1.25%. The interest rate ranges from LIBOR + 0.875% to a maximum of LIBOR + 1.875%, depending upon the Company's leverage ratio.

The Facility contains financial and other covenants, including, but not limited to, restrictions on the incurrence of debt and the granting of liens, as well as the maintenance of an interest coverage ratio and a leverage ratio. In accordance with the terms of the Facility, we are required to maintain a minimum interest coverage ratio of 3.50 (based on the ratio of EBITDA, as defined in the Credit Agreement, to interest expense) and may not exceed a maximum leverage ratio of 3.50 (based on the ratio of total debt to EBITDA) throughout the term of the Facility. In addition, the Facility contains other terms and conditions such as customary representations and warranties, additional covenants and customary events of default.

As of December 31, 2018, total borrowings under our \$700 million Facility were \$202.0 million, which approximates fair value using Level 2 inputs. The Facility permits us to issue letters of credit up to an aggregate amount of \$40 million. Outstanding letters of credit reduce the amount available for borrowing under our Facility. As of December 31, 2018, there were no outstanding letters of credit under the Facility, resulting in undrawn availability under the Facility as of December 31, 2018 of \$498.0 million. The weighted average interest rate for the Facility was 3.42% during 2018.

4.7% Senior Notes

In 2015, the Company issued \$300 million in aggregate principal amount of 4.7% Senior Unsecured Notes due in 2025. The interest rate on these senior notes may be increased by 0.25% each time a credit rating applicable to the notes is downgraded. The maximum rate is 6.7% and the rate at December 31, 2018 remained at 4.7%. The net proceeds of approximately \$296.4 million were initially used to repay, in part, our Facility. The conditions and covenants related to the senior notes are less restrictive than those of our Facility. The effective interest rate for 2018 was 4.84%. The fair value of the senior notes based on quoted prices utilizing level 2 inputs was \$307.8 million at December 31, 2018. The balance for unamortized deferred financing costs and debt discount related to the senior notes was \$2.4 million at December 31, 2018 and \$2.8 million at December 31, 2017.

Other Credit Facilities

In June 2016, we also entered into a \$67.4 million European term loan. The loan has two tranches of which the first tranche for €25 million has a rate of Euribor +1.2% and a final maturity date of June 30, 2023. The second tranche for €35 million a rate of Euribor +1.25% and a final maturity date of June 30, 2024. There is a zero percent floor on the Euribor. The loans are payable in annual installments, that began on June 30, 2017 and beginning on June 30, 2019, respectively. We had \$60.5 million outstanding under this loan at December 31, 2018, which approximates fair value using level 2 inputs under the market approach. The facility is guaranteed by Hexcel Corporation. Required payments for the next five years and thereafter are as follows: \$9.1 million for 2019 through 2022, \$14.1 million for 2023 and \$10.0 million thereafter.

We have a \$10.0 million revolving credit line for working capital needs in China with no outstanding balance at December 31, 2018. These funds can only be used locally. The facility is guaranteed by Hexcel Corporation, but is uncommitted and cancellable by the lender at any time.

Note 6 — Leasing Arrangements

Certain sales and administrative offices, data processing equipment and manufacturing facilities are leased under operating leases. We recognize rental expense on operating leases straight-line over the term of a lease. Total rental expense was \$13.8 million in 2018, \$12.0 million in 2017 and \$11.4 million in 2016.

Scheduled future minimum lease payments as of December 31, 2018 were:

(In millions)	
Payable during the years ending December 31: Operating Leases	
2019	\$ 9.2
2020	8.6
2021	7.7
2022	3.0
2023	3.8
Thereafter	7.9
Total minimum lease payments	\$ 40.2

Note 7 — Retirement and Other Postretirement Benefit Plans

We maintain qualified defined benefit retirement plans covering certain current and former European employees, as well as nonqualified defined benefit retirement plans and retirement savings plans covering certain eligible U.S. and European employees, and participate in a union sponsored multi-employer pension plan covering certain U.S. employees with union affiliations. In addition, we provide certain postretirement health care and life insurance benefits to eligible U.S. retirees.

Accounting standards require the use of certain assumptions, such as the expected long-term rate of return, discount rate, rate of compensation increase, healthcare cost trend rates, and retirement and mortality rates, to determine the net periodic costs of such plans. These assumptions are reviewed and set annually at the beginning of each year. In addition, these models use an “attribution approach” that generally spreads individual events, such as plan amendments and changes in actuarial assumptions, over the service lives of the employees in the plan. That is, employees render service over their service lives on a relatively smooth basis and therefore, the income statement effects of retirement and postretirement benefit plans are earned in, and should follow, the same pattern.

We use our actual return experience, future expectations of long-term investment returns, and our actual and targeted asset allocations to develop our expected rate of return assumption used in the net periodic cost calculations of our funded European defined benefit retirement plans. Due to the difficulty involved in predicting the market performance of certain assets, there will be a difference in any given year between our expected return on plan assets and the actual return. Following the attribution approach, each

year's difference is amortized over a number of future years. Over time, the expected long-term returns are designed to approximate the actual long-term returns and therefore result in a pattern of income and expense recognition that more closely matches the pattern of the services provided by the employees.

We annually set our discount rate assumption for retirement-related benefits accounting to reflect the rates available on high-quality, fixed-income debt instruments. The rate of compensation increase for nonqualified pension plans, which is another significant assumption used in the actuarial model for pension accounting, is determined by us based upon our long-term plans for such increases and assumed inflation. For the postretirement health care and life insurance benefits plan, we review external data and its historical trends for health care costs to determine the health care cost trend rates. Retirement and termination rates are based primarily on actual plan experience. The mortality table used for the U.S. plans is based on the RP-2014 White Collar Healthy Annuitant Mortality Table with Improvement Scale MP-2017 and for the U.K. Plan the S2PXA base table with future improvements in line with the CMI 2016 projection model with a long term trend rate of 1.25% p.a.

Actual results that differ from our assumptions are accumulated and amortized over future periods and, therefore, generally affect the net periodic costs and recorded obligations in such future periods. While we believe that the assumptions used are appropriate, significant changes in economic or other conditions, employee demographics, retirement and mortality rates, and investment performance may materially impact such costs and obligations.

U.S. Defined Benefit Retirement Plans

We have nonqualified defined benefit retirement plans covering certain current and former U.S. employees that are funded as benefits are incurred. Under the provisions of these plans, we expect to contribute approximately \$0.9 million in 2019 to cover unfunded benefits.

Multi-Employer Plan

The Company is party to a multi-employer pension plan covering certain U.S. employees with union affiliations. The plan is the Western Metal Industry Pension Fund, ("the Plan"). The Plan's employer identification number is 91-6033499; the Plan number is 001. In 2018, 2017 and 2016 the Plan reported Hexcel Corporation as being an employer that contributed greater than 5% of the Plan's total contributions. The expiration date of the collective bargaining agreement is September 30, 2020. The Plan has been listed in "critical status" and has been operating in accordance with a Rehabilitation Plan since 2010. The Plan, as amended under the Rehabilitation Plan, reduced the adjustable benefits of the participants and levied a surcharge on employer contributions. The Company contributed \$2.1 million in 2018, \$1.9 million in 2017 and approximately \$2.1 million in 2016. We expect the Company's contribution to be about \$2.1 million in 2019 and remain at that level over the remaining term.

U.S. Retirement Savings Plan

Under the retirement savings plan, eligible U.S. employees can contribute up to 75% of their annual compensation to an individual 401(k) retirement savings account. The Company makes matching contributions equal to 50% of employee contributions, not to exceed 3% of employee compensation each year. We also contribute an additional 2% to 4% of each eligible U.S. employee's salary to an individual 401(k) retirement savings account. This increases the maximum contribution to individual U.S. employee savings accounts to between 5% and 7% per year, before any profit sharing contributions that are made when we meet or exceed certain performance targets that are set annually. These profit sharing contributions are made at the Company's discretion and are targeted at 3% of an eligible U.S. employee's pay, with a maximum of 4.5%.

U.S. Postretirement Plans

In addition to defined benefit and retirement savings plan benefits, we also provide certain postretirement health care and life insurance benefits to eligible U.S. retirees. Depending upon the plan, benefits are available to eligible employees who retire after meeting certain age and service requirements and were employed by Hexcel as of February 1996. Our funding policy for the postretirement health care and life insurance benefit plans is generally to pay covered expenses as they are incurred. Under the provisions of these plans, we expect to contribute approximately \$0.5 million in 2019 to cover unfunded benefits.

European Defined Benefit Retirement Plans

We have defined benefit retirement plans in the United Kingdom, Belgium, France and Austria covering certain employees of our subsidiaries in those countries. The defined benefit plan in the United Kingdom (the "U.K. Plan"), the largest of the European plans, was terminated in 2011 and replaced with a defined contribution plan. As of December 31, 2018, 25% of the total assets in the U.K. Plan were invested each in equities and in diversified growth funds and 18% were invested in liability driven investments. Equity

investments and growth fund investments are made with the objective of achieving a return on plan assets consistent with the funding requirements of the plan, maximizing portfolio return and minimizing the impact of market fluctuations on the fair value of the plan assets. Liability driven investments are made to reduce balance sheet volatility. As a result of an annual review of historical returns and market trends, the expected long-term weighted average rate of return for the U.K. Plan for the 2019 plan year will be 4.75% and 3.0% for the other European plans as a group.

U.K. Defined Contribution Pension Plan

Under the Defined Contribution Plan, eligible U.K. employees can belong to the Deferred Contribution Plan on a non-participatory basis or can elect to contribute 3%, 5% or 7% of their pensionable salary. The Company will contribute 5%, 9% and 13% respectively. The plan also provides life insurance and disability insurance benefits for members.

Retirement and Other Postretirement Plans - France

The employees of our French subsidiaries are entitled to receive a lump-sum payment upon retirement subject to certain service conditions under the provisions of the national chemicals and textile workers collective bargaining agreements. The amounts attributable to the French plans have been included within the total expense and obligation amounts noted for the European plans.

Net Periodic Pension Expense

Net periodic expense for our U.S. and European qualified and nonqualified defined benefit pension plans and our retirement savings plans for the three years ended December 31, 2018 is detailed in the table below.

(In millions)	2018	2017	2016
Defined benefit retirement plans	\$(1.6)	\$0.6	\$1.6
Union sponsored multi-employer pension plan	2.1	1.9	2.1
Retirement savings plans-matching contributions	10.2	9.7	7.9
Retirement savings plans-profit sharing contributions	10.2	9.2	10.6
Net periodic expense	\$20.9	\$21.4	\$22.2

Defined Benefit Retirement and Postretirement Plans

Net periodic cost of our defined benefit retirement and postretirement plans for the three years ended December 31, 2018, were:

(In millions)	U.S. Plans			European Plans		
	2018	2017	2016	2018	2017	2016
Defined Benefit Retirement Plans						
Service cost	\$1.2	\$1.3	\$1.2	\$1.1	\$1.0	\$0.8
Interest cost	0.6	0.6	0.6	4.4	4.6	5.4
Expected return on plan assets	—	—	—	(9.4)	(8.4)	(7.6)
Net amortization	0.2	0.4	0.3	0.3	0.3	0.6

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Termination benefits and settlement losses	—	0.7	0.2	—	0.1	0.1
Net periodic pension cost (income)	\$2.0	\$3.0	\$2.3	\$(3.6)	\$(2.4)	\$(0.7)

(In millions)

U.S. Postretirement Plans	2018	2017	2016
Interest cost	\$0.1	\$0.1	\$0.2
Net amortization and deferral	(1.0)	0.1	(0.7)
Net periodic postretirement benefit (income) loss	\$(0.9)	\$0.2	\$(0.5)

(In millions)	Defined Benefit Retirement Plans					
	U.S. Plans		European Plans		Postretirement Plans	
	2018	2017	2018	2017	2018	2017
Other Changes in Plan Assets and Benefit Obligations						
Recognized in Other Comprehensive Income						
Net (gain) loss	\$(0.7)	\$0.1	\$(5.0)	\$2.3	\$—	\$—
Amortization of actuarial (losses) gains	(0.3)	(0.8)	(0.4)	(0.4)	1.0	1.1
Prior service cost	—	—	1.3	—	—	—
Effect of foreign exchange	—	—	(1.2)	2.5	—	—
Total recognized in other comprehensive income (pre-tax)	\$(1.0)	\$(0.7)	\$(5.3)	\$4.4	\$ 1.0	\$ 1.1

The Company expects to recognize \$0.4 million of net actuarial loss and no net prior service cost as a component of net periodic pension cost in 2019 for its defined benefit plans. The amount of net actuarial gain recognized as a component of net periodic postretirement benefit cost in 2019 is expected to be \$1.1 million.

The benefit obligation, fair value of plan assets, funded status, and amounts recognized in the consolidated financial statements for our defined benefit retirement plans and postretirement plans, as of and for the years ended December 31, 2018 and 2017, were:

(In millions)	Defined Benefit Retirement Plans					
	U.S. Plans		European Plans		Postretirement Plans	
	2018	2017	2018	2017	2018	2017
Change in benefit obligation:						
Benefit obligation - beginning of year	\$21.4	\$19.7	\$189.5	\$164.1	\$ 4.1	\$ 4.4
Service cost	1.2	1.3	1.1	1.0	—	—
Interest cost	0.6	0.6	4.4	4.6	0.1	0.1
Plan participants' contributions	—	—	1.3	—	—	0.2
Actuarial (gain) loss	(0.7)	0.1	(20.4)	6.8	(0.7)	—
Plan amendments and Acquisitions	—	—	—	1.0	—	—
Termination benefits and settlements	—	0.2	(0.4)	(0.6)	—	—
Benefits and expenses paid	(4.3)	(0.5)	(5.2)	(4.6)	(0.2)	(0.6)
Currency translation adjustments	—	—	(9.4)	17.2	—	—
Benefit obligation - end of year	\$18.2	\$21.4	\$160.9	\$189.5	\$ 3.3	\$ 4.1
Change in plan assets:						
Fair value of plan assets - beginning of year	\$—	\$—	\$201.8	\$171.4	\$—	\$—
Actual return on plan assets	—	—	(6.0)	12.9	—	—
Employer contributions	4.3	0.5	5.0	5.3	0.2	0.5
Plan participants' contributions	—	—	—	—	—	0.2
Benefits and expenses paid	(4.3)	(0.5)	(5.2)	(4.6)	(0.2)	(0.7)
Termination benefits and settlements	—	—	(0.4)	(0.6)	—	—
Currency translation adjustments	—	—	(10.9)	17.4	—	—

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Fair value of plan assets - end of year	\$—	\$—	\$184.3	\$201.8	\$—	\$—
Amounts recognized in Consolidated Balance						
Sheets:						
Non-current Assets	\$—	\$—	\$42.6	\$32.2	\$—	\$—
Current liabilities	\$0.9	\$4.5	\$0.4	\$0.3	\$ 0.5	\$ 0.5
Non-current liabilities	17.2	16.9	18.8	19.6	2.8	3.6
Total Liabilities	\$18.1	\$21.4	\$19.2	\$19.9	\$ 3.3	\$ 4.1
Amounts recognized in Accumulated Other						
Comprehensive Loss:						
Actuarial net (loss) gain	\$(3.1)	\$(3.1)	\$(20.0)	\$(26.6)	\$ 3.0	\$ 3.3
Prior service cost	1.0	—	(1.4)	(0.1)	—	—
Total amounts recognized in accumulated other						
comprehensive loss	\$(2.1)	\$(3.1)	\$(21.4)	\$(26.7)	\$ 3.0	\$ 3.3

The measurement date used to determine the benefit obligations and plan assets of the defined benefit retirement and postretirement plans was December 31, 2018. All costs related to our pensions are included as a component of operating income in our consolidated statements of operations. For the years ended December 31, 2018, 2017 and 2016, amounts unrelated to service costs were a benefit of \$4.8 million, \$1.5 million and \$0.9 million, respectively.

The total accumulated benefit obligation (“ABO”) for the U.S. defined benefit retirement plans was \$17.8 million and \$21.0 million as of December 31, 2018 and 2017, respectively. Excluding the U.K. Plan, the European plans’ ABO exceeded plan assets as of December 31, 2018 and 2017, by \$14.1 million and \$14.3 million, respectively. These plans’ ABO was \$20.3 million and \$20.9 million as of December 31, 2018 and 2017, respectively. The U.K. Plan is overfunded; the ABO of this plan was \$135.5 million and \$163.1 million at December 31, 2018 and 2017, respectively. The fair value of the U.K. Plan assets was \$178.1 million and \$195.3 million at December 31, 2018 and 2017, respectively.

As of December 31, 2018 and 2017, the accrued benefit costs for the defined benefit retirement plans and postretirement benefit plans included within “accrued compensation and benefits” was \$1.8 million and \$5.3 million, respectively, and within “other non-current liabilities” was \$38.8 million and \$40.1 million, respectively, in the accompanying consolidated balance sheets.

Benefit payments for the plans are expected to be as follows:

(In millions)	U.S. Plans	European Plans	Postretirement Plans
2019	\$ 1.0	4.4	0.5
2020	3.2	4.5	0.5
2021	2.9	6.4	0.5
2022	1.2	5.5	0.4
2023	1.2	6.3	0.4
2024-2028	13.9	39.2	1.2
	\$ 23.4	\$ 66.3	\$ 3.5

Fair Values of Pension Assets

The following table presents pension assets measured at fair value at December 31, 2018 and 2017 utilizing the fair value hierarchy discussed in Note 22:

(In millions)	December 31, 2018	Fair Value Measurements at December 31, 2018		
Description	2018	Level 1	Level 2	Level 3
Equity funds	\$ 44.4	\$ —	\$ 44.4	\$ —
Diversified growth funds	44.5	—	44.5	—
Insurance contracts	4.2	—	—	4.2
Liability driven investments	31.7	—	31.7	—
Index linked gilts	57.0	—	57.0	—

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Diversified investment funds	2.0	—	—	2.0
Cash and cash equivalents	0.5	0.5	—	—
Total assets	\$ 184.3	\$0.5	\$177.6	\$ 6.2

Description	December 31, 2017	Fair Value Measurements at December 31, 2017		
		Level 1	Level 2	Level 3
Equity funds	\$ 56.3	—	\$56.3	—
Diversified growth funds	48.0	—	48.0	—
Insurance contracts	4.2	—	—	4.2
Liability driven investments	38.7	—	38.7	—
Index linked gilts	52.1	—	52.1	—
Diversified investment funds	2.3	—	—	2.3
Cash and cash equivalents	0.2	0.2	—	—
Total assets	\$ 201.8	\$0.2	\$195.1	\$ 6.5

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The U.K. plan invests funds which are not exchange listed and are, therefore, classified as Level 2.

(In millions)	Balance at January 1, 2018	Actual return on plan assets	Purchases, sales and settlements	Changes due to exchange rates	Balance at December 31, 2018
Reconciliation of Level 3 Assets					
Diversified investment funds	\$ 2.3	\$ —	\$ (0.2)	\$ (0.1)	\$ 2.0
Insurance contracts	4.2	0.2	—	(0.2)	4.2
Total level 3 assets	\$ 6.5	\$ 0.2	\$ (0.2)	\$ (0.3)	\$ 6.2

	Balance at January 1, 2017	Actual return on plan assets	Purchases, sales and settlements	Changes due to exchange rates	Balance at December 31, 2017
Reconciliation of Level 3 Assets					
Diversified investment funds	\$ 2.1	\$ 0.1	\$ (0.2)	\$ 0.3	\$ 2.3
Insurance contracts	3.6	0.2	(0.1)	0.5	4.2
Total level 3 assets	\$ 5.7	\$ 0.3	\$ (0.3)	\$ 0.8	\$ 6.5

Plan assets are invested in a number of unit linked pooled funds by an independent asset management group. Equity funds are split 40/60 between U.K. and overseas equity funds (North America, Japan, Asia Pacific and Emerging Markets). The asset management firm uses quoted prices in active markets to value the assets.

Diversified growth funds are invested in a broad spectrum of return seeking asset classes with reduced dependency on any particular asset class. This approach targets growth asset returns with lower risk resulting from the diversification across different asset classes.

The index-linked gilt allocation provides a partial interest rate and inflation rate hedge against the valuation of the liabilities.

The liability driven investments' allocation aims to hedge against the exposure to interest rate risk through the use of interest rate swaps.

Insurance contracts contain a minimum guaranteed return. The fair value of the assets is equal to the total amount of all individual technical reserves plus the non-allocated employer's financing fund reserves at the valuation date. The individual technical and financing fund reserves are equal to the accumulated paid contributions taking into account the insurance tariffication and any allocated profit sharing return.

The diversified investment funds represent plan assets invested in a Pensionskasse (an Austrian multi-employer pension fund). The main holdings consist of equity, bonds, real estate and bank deposits.

The actual allocations for the pension assets at December 31, 2018 and 2017, and target allocations by asset class, are as follows:

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Asset Class	Percentage of Plan Assets 2018	Target Allocations 2018	Percentage of Plan Assets 2017	Target Allocations 2017
Diversified growth funds	24.1	% 28.0	% 23.8	% 28.1
Index linked gilts	30.9	12.6	25.8	12.6
Liability driven investments	17.2	23.2	19.2	23.2
All Other Regions Equity Fund	14.4	19.7	16.6	19.6
U.K. Equity Fund	9.7	13.2	11.2	13.3
Diversified Investment Funds	1.1	1.1	1.2	1.2
Insurance Contracts	2.3	2.2	2.1	2.0
Cash and cash equivalents	0.3	—	0.1	—
Total	100	% 100	% 100	% 100

Assumptions

The assumed discount rate for pension plans reflects the market rates for high-quality fixed income debt instruments currently available. A third party provided standard Yield Curve was used for the U.S. non-qualified and postretirement plans. For the U.K. plan, cash flows were not available and therefore we considered the derived yield to market on a representative bond of suitable duration taken from the third party provider's synthetic bond yield curve. We believe that the timing and amount of cash flows related to these instruments is expected to match the estimated defined benefit payment streams of our plans. The assumed discount rate for the U.S. non-qualified plans uses individual discount rates for each plan based on their associated cash flows.

Salary increase assumptions are based on historical experience and anticipated future management actions. For the postretirement health care and life insurance benefit plans, we review external data and our historical trends for health care costs to determine the health care cost trend rates. Retirement rates are based primarily on actual plan experience and on rates from previously mentioned mortality tables. Actual results that differ from our assumptions are accumulated and amortized over future periods and, therefore, generally affect the net periodic costs and recorded obligations in such future periods. While we believe that the assumptions used are appropriate, significant changes in economic or other conditions, employee demographics, retirement and mortality rates, and investment performance may materially impact such costs and obligations.

Assumptions used to estimate the actuarial present value of benefit obligations at December 31, 2018, 2017 and 2016 are shown in the following table. These year-end values are the basis for determining net periodic costs for the following year.

	2018	2017	2016
U.S. defined benefit retirement plans:			
Discount rates	2.8% - 3.2%	2.8% - 3.2%	3.1% - 3.6%
Rate of increase in compensation	3.0%	3.0%	3.0%
European defined benefit retirement plans:			
Discount rates	1.25% - 3.05%	1.20% - 2.55%	1.25% - 2.95%
Rates of increase in compensation	2.75% - 3.0%	2.75% - 3.0%	2.75% - 3.0%
Expected long-term rates of return on plan assets	2.0% - 4.75%	2.0% - 4.75%	3.0% - 4.75%
Postretirement benefit plans:			
Discount rates	3.7%	3.0%	3.3%

The following table presents the impact that a one-percentage-point increase and a one-percentage-point decrease in the expected long-term rate of return and discount rate would have on the 2018 pension expense, and the impact on our retirement obligation as of December 31, 2018 for a one-percentage-point change in the discount rate:

(In millions)	Non-Qualified Pension Plans	U S	U.K.
		Retiree Medical Plans	Retirement Plan
U.S. Periodic pension expense			

One-percentage-point increase:			
Expected long-term rate of return	\$ N/A	\$ N/A	\$ (1.8)
Discount rate	\$ —	\$ —	\$ 0.5
One-percentage-point decrease:			
Expected long-term rate of return	\$ N/A	\$ N/A	\$ 1.8
Discount rate	\$ —	\$ —	\$ 0.1
Retirement obligation			
One-percentage-point increase in discount rate	\$ (0.8)	\$ (0.2)	\$ (20.8)
One-percentage-point decrease in discount rate	\$ (0.9)	\$ 0.2	\$ 26.5

The annual rate of increase in the per capita cost of covered health care benefits is assumed to be 7.0% for medical and 5.0% for dental and vision for 2018. The medical rates are assumed to gradually decline to 4.75% by 2028, whereas dental and vision rates are assumed to remain constant at 5.0%. A one-percentage-point increase and a one-percentage-point decrease in the assumed health care cost trend would have an insignificant impact on the total of service and interest cost components, and would have an immaterial impact on the postretirement benefit obligation for both 2018 and 2017.

Note 8 — Income Taxes

Income before income taxes and the provision for income taxes, for the three years ended December 31, 2018, were as follows:

(In millions)	2018	2017	2016
Income before income taxes:			
U.S.	\$222.9	\$155.5	\$149.1
International	110.6	167.7	188.5
Total income before income taxes	\$333.5	\$323.2	\$337.6
Provision for income taxes:			
Current:			
U.S.	\$18.3	\$18.9	\$(9.5)
International	14.9	20.3	37.1
Current provision for income taxes	33.2	39.2	27.6
Deferred:			
U.S.	26.8	(1.9)	54.3
International	2.5	5.2	8.4
Deferred provision for income taxes	29.3	3.3	62.7
Total provision for income taxes	\$62.5	\$42.5	\$90.3

A reconciliation of the provision for income taxes at the U.S. federal statutory income tax rate of 21% to the effective income tax rate, for the year ended December 31, 2018 and 35% for the two years ended December 31, 2017 and 2016, is as follows:

(In millions)	2018	2017	2016
Provision for taxes at U.S. federal statutory rate	\$70.0	\$113.1	\$118.2
State and local taxes, net of federal benefit	7.2	0.2	3.1
Foreign effective rate differential	4.6	(14.4)	(26.8)
Tax credits	(7.8)	(16.0)	(10.1)
Change in valuation allowance	(3.4)	(9.1)	10.4
Remeasurement of deferred taxes	(9.0)	(67.8)	—
Transition tax on undistributed foreign earnings	1.6	45.7	—
Excess tax benefits on stock based compensation	(4.6)	(7.6)	(2.8)
Other	(0.5)	4.9	4.9
Release of reserves for uncertain tax positions	(1.3)	(6.5)	(6.6)
Global intangible low taxed income	5.7	—	—
Total provision for income taxes	\$62.5	\$42.5	\$90.3

The Act was enacted on December 22, 2017. The Act reduces the US federal corporate tax rate from 35% to 21% in 2018, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and creates new taxes on certain foreign-sourced earnings. At December 31, 2018, we have

completed our accounting for the tax effects of enactment of the Act, without any material adjustments to our previous estimate of the one-time transition tax.

Deferred tax assets and liabilities: As of December 31, 2018 we remeasured certain U.S. deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future, which is generally 21%. The provisional amount recorded in 2017 related to the remeasurement of our deferred tax balance resulted in a tax benefit of \$67.8 million partially offset by a \$45.7 million increase in income tax expense related to our one-time transition tax liability for all of our controlled foreign corporations, resulting in an increase in provisional tax benefit of \$22.1 million. The tax due on unremitted earnings will be paid over 8 years, as permitted by the Act. As of December 31, 2018, we recorded a benefit of \$7.8 million for the remeasurement of certain deferred tax balances, which is included as a component of income tax expense. The adjustment of our deferred tax balances reduced our effective tax rate for 2018 by 2.3% and 2017 by 6.8%.

As of December 31, 2018 and 2017, no additional income or withholding taxes have been provided for any undistributed foreign earnings. We do not currently have any specific plans to repatriate funds from our international subsidiaries; however, we may do so in the future if a dividend can be remitted with no material tax impact. As of December 31, 2018, we have approximately \$947 million

of unremitted foreign earnings that we intend to keep indefinitely reinvested. Additionally, due to withholding tax, basis computations and other tax related considerations, it is not practicable to estimate any taxes to be provided on outside basis differences at this time.

Deferred Income Taxes

Deferred income taxes result from tax attributes including foreign tax credits, net operating loss carryforwards and temporary differences between the recognition of items for income tax purposes and financial reporting purposes. Principal components of deferred income taxes as of December 31, 2018 and 2017 are:

(In millions)	2018	2017
Assets		
Net operating loss carryforwards	\$67.8	\$65.1
Unfunded pension liability and other postretirement obligations	1.7	0.5
ASC 606 - revenue from contracts with customers	9.3	—
Tax credit carryforwards	8.1	10.8
Stock based compensation	8.4	7.1
Other comprehensive income	4.1	0.2
Reserves and other	15.6	13.5
Subtotal	115.0	97.2
Valuation allowance		