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

Form 10-K

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

For the fiscal year ended December 31, 2019

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from to

Commission File No. 1-11442

CHART INDUSTRIES, INC.
(Exact name of registrant as specified in its charter)

Delaware	**34-1712937**
State or other jurisdiction of incorporation or organization	(I.R.S. Employer Identification No.)

3055 Torrington Drive, Ball Ground, Georgia 30107
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code: **(770) 721-8800**

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.01	**GTLS**	**The NASDAQ Stock Market LLC**

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

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

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

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

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

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

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

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

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

The aggregate market value of the voting common equity held by non-affiliates computed by reference to the price of $76.88 per share at which the common equity was last sold, as of the last business day of the registrant's most recently completed second fiscal quarter, was $2,748,027,704.

As of February 10, 2020, there were 35,894,986 outstanding shares of the Company's common stock, par value $0.01 per share.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the following document are incorporated by reference into Part III of this Annual Report on Form 10-K: the definitive Proxy Statement to be used in connection with the Registrant's Annual Meeting of Stockholders to be held on May 12, 2020 (the "2020 Proxy Statement").

Except as otherwise stated, the information contained in this Annual Report on Form 10-K is as of December 31, 2019.

CHART INDUSTRIES, INC.

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PART I

Item 1. ***Business***

THE COMPANY

Overview

Chart Industries, Inc., a Delaware corporation incorporated in 1992 (the "Company," "Chart," "we," "us," or "our" as used herein refers to Chart Industries, Inc. and our consolidated subsidiaries, unless the context indicates otherwise), is a leading diversified global manufacturer of highly engineered equipment servicing multiple market applications in energy and industrial gas. Our unique product portfolio is used throughout the liquid gas supply chain in the production, storage, distribution and end-use of atmospheric, hydrocarbon, and industrial gases. Chart has domestic operations located across the United States and an international presence in Asia, Australia, Europe and the Americas. Our equipment and engineered systems are primarily used to cool gases often to cryogenic liquid temperatures and then to transport and store them as liquids utilizing our expertise in cryogenic systems and equipment. Our equipment often operates at temperatures approaching absolute zero (0 Kelvin; -273° Centigrade; -459° Fahrenheit). Our products include vacuum insulated containment vessels, heat exchangers, cold boxes, liquefaction process units, other cryogenic components, gas processing equipment, ambient temperature fans and after market services.

Our primary customers are large, multinational producers and distributors of hydrocarbon and industrial gases and their end-users. We sell our products and services to more than 2,000 customers worldwide. We have developed long-standing relationships with leading companies in the gas production, gas distribution, gas processing, liquefied natural gas or LNG, petroleum refining, chemical and industrial gas industries, including Air Products, Linde, Air Liquide, Bechtel Corporation, ExxonMobil, British Petroleum or BP, ConocoPhillips, PetroChina, CB&I, Toyo, JGC, Samsung, UOP, and Shell, some of whom have been purchasing our products for over 20 years.

We have attained this position by capitalizing on our technical expertise and know-how, broad product offering, reputation for quality, low-cost global manufacturing footprint, and by focusing on attractive, growing markets. We have an established sales and customer support presence across the globe and manufacturing operations in the United States, Europe, China and India. For the years ended December 31, 2019, 2018 and 2017, we generated sales of $1,299.1 million, $1,084.3 million, and $842.9 million, respectively.

On July 1, 2019, we completed the acquisition of Harsco Corporation's Industrial Air-X-Changers business ("AXC"). AXC is a leading supplier of custom engineered and manufactured air cooled heat exchangers ("ACHX") for the natural gas compression and processing industry and refining and petrochemical industry in the United States. AXC's results are included in our Energy & Chemicals FinFans ("E&C FinFans") segment from the date of the acquisition. For further discussion refer to Note 13, "Business Combinations", to our consolidated financial statements included under Item 15, "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K.

On November 15, 2018, we completed the acquisition of VRV S.r.l. and its subsidiaries (collectively "VRV"). VRV is a diversified multinational corporation with highly automated, purpose-built facilities for the design and manufacture of pressure equipment serving the industrial gas and energy end markets. VRV's results are included in our E&C Cryogenics and D&S East segments from the date of acquisition. For further discussion refer to "Note 13, Business Combinations," to our consolidated financial statements included under Item 15, "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K.

On December 20, 2018, we completed the divestiture of our oxygen-related business (the "CAIRE Divestiture") to NGK SPARK PLUG CO., LTD. A portion of our former Biomedical segment business related to cryogenic technological expertise (the "Cryobiological Business") was excluded from the CAIRE Divestiture. Our disclosure in "Item 1 – Business" reflects the CAIRE Divestiture and is presented on a continuing operations basis.

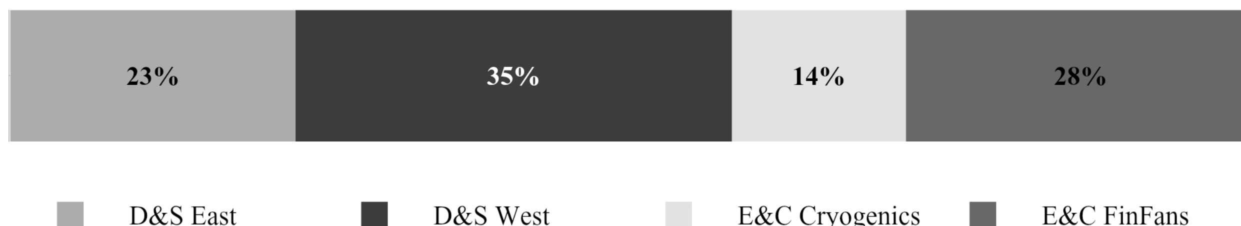
Segments, Applications and Products

Upon closing of our acquisition of AXC, we changed our reportable segments from three to four segments: Distribution & Storage Eastern Hemisphere ("D&S East"), Distribution & Storage Western Hemisphere ("D&S West"), Energy & Chemicals Cryogenics ("E&C Cryogenics"), and E&C FinFans. AXC was combined with Chart's Hudson Products and Cooler Service businesses from the prior E&C segment to create a new segment called E&C FinFans. The E&C FinFans segment is focused on our unique and broad product offering and capabilities in air cooled heat exchangers ("ACHX") and fans. E&C Cryogenics supplies mission critical engineered equipment and systems used in the separation, liquefaction, and purification of hydrocarbon and industrial gases that span gas-to-liquid applications. All prior period amounts presented have been reclassified based on our current reportable segments.

Further information about these segments is located in Note 4, "Segment and Geographic Information," of our consolidated financial statements included under Item 15, "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K.

The following charts show the proportion of our revenues generated by each business segment, as well as our estimate of the proportion of revenue generated by end-user application for the year ended December 31, 2019:

Sales by Segment



D&S East D&S West E&C Cryogenics E&C FinFans

Sales by End-User Application

Industrial Gas Energy

D&S East

D&S East (23% of sales for the year ended December 31, 2019) designs, manufactures, and services cryogenic solutions for the storage and delivery of cryogenic liquids used in industrial gas and LNG applications. D&S East includes distribution and storage operations in Europe and Asia and primarily serves the geographic regions of Europe, the Middle East, Africa, and Asia (including China and India).

Industrial Gas Applications

We design, manufacture, install, service, and maintain bulk and packaged gas cryogenic solutions for the storage, distribution, vaporization, and application of industrial gases, which accounted for 17.0%, 16.7%, and 18.0% of consolidated sales for the years ended December 31, 2019, 2018, and 2017, respectively. Industrial gas applications include any end-use of the major elements of air (nitrogen, oxygen, and argon), including manufacturing, welding, electronics, medical, nitrogen dosing, food processing, and beverage carbonation. Carbon dioxide, nitrous oxide, hydrogen, and helium applications also utilize our equipment. Our products span the entire spectrum of industrial gas demand from small customers requiring cryogenic packaged gases to large users requiring custom engineered cryogenic storage systems in both mobile and stationary applications. We also offer cryogenic components, including vacuum insulated pipe ("VIP"), engineered bulk gas installations, specialty liquid nitrogen, or LN2, end-use equipment, and cryogenic flow meters. Principal customers for industrial applications are global industrial gas producers and distributors.

Demand for industrial gas applications is driven primarily by the significant installed base of users of cryogenic liquids, as well as new applications and distribution technologies for cryogenic liquids. Our competitors tend to be regionally focused while we supply a broad range of systems on a worldwide basis. We also compete with several suppliers owned by the global industrial gas producers. From a technology perspective, we compete with compressed gas alternatives or on-site generated gas supply.

LNG Applications

We supply cryogenic solutions for the storage, distribution, regasification, and use of LNG. LNG may be utilized as an alternative to other fossil fuels such as diesel, propane, or fuel oil in transportation or off pipeline applications. Examples include heavy duty truck and transit bus transportation, locomotive propulsion, marine, and power generation in remote areas that often occurs in oil and gas drilling. We refer to our LNG distribution products as a "Virtual Pipeline," as the traditional natural gas pipeline is replaced with cryogenic distribution to deliver the gas to the end-user. We supply cryogenic trailers, ISO containers, railcars, bulk storage tanks, fuel stations, loading facilities, and regasification equipment specially configured for delivering LNG into Virtual Pipeline applications. LNG may also be used as a fuel for a variety of on and off-road vehicles and applications. Our LNG vehicle fueling applications primarily consist of LNG and liquefied/compressed natural gas refueling systems for heavy-duty truck and bus fleets. We sell LNG applications around the world from various D&S East and D&S West facilities to numerous end-users, energy companies, and gas distributors. Additionally, we supply large vacuum insulated storage tanks as equipment for purchasers of standard liquefaction plants sold by our E&C Cryogenics business.

Demand for LNG applications is driven by diesel displacement initiatives, environmental and energy security initiatives, and the associated cost of equipment. Our competitors tend to be regionally focused or product-specific, while we supply a broad range of solutions required by LNG applications. We compete with compressed natural gas (or CNG) or field gas in several of these applications and LNG is most highly valued where its energy density and purity are beneficial to the end-user.

Product lines within D&S East which represent significant consolidated sales in any of the three years ending December 31, 2019 are as follows:

- Cryogenic bulk storage systems (including LNG cryogenic systems and after market services) accounted for 17.3%, 16.4% and 18.0% of consolidated sales for the years ended December 31, 2019, 2018 and 2017 respectively.

After Market Services

D&S East operates multiple service locations in Europe and Asia. These service locations provide installation, service, repair, maintenance, and refurbishment of cryogenic products. We service Chart products, as well as our competitors mainly throughout Europe and Asia. We provide services for storage vessels, VIP, reconfigurations, relocation, trailers, ISO containers, vaporizers, and other gas to liquid equipment.

D&S West

D&S West (35% of sales for the year ended December 31, 2019) designs, manufactures, and services cryogenic solutions for the storage and delivery of cryogenic liquids used in industrial gas and LNG applications. D&S West includes distribution and storage operations in the United States and Latin America and primarily serves the Americas geographic region. D&S West also includes cryobiological storage manufacturing and distribution operations in the U.S., Europe and Asia, which serve customers around the world. Using sophisticated vacuum insulation technology, our cryogenic storage systems are able to store and transport liquefied industrial gases and hydrocarbon gases at temperatures from 0° Fahrenheit to temperatures nearing absolute zero. End-use customers for our cryogenic storage equipment include industrial gas producers and distributors, chemical producers, manufacturers of electrical components, health care organizations, food processors, and businesses in the oil and natural gas industries. D&S West utilizes the same technologies and product lines as those employed by and disclosed with respect to D&S East, except for a valves business acquired as part of the VRV acquisition and located within the D&S East and the Cryobiological Storage business in D&S West.

Product lines within D&S West which represent significant consolidated sales in any of the three years ending December 31, 2019 are as follows:

- Cryogenic bulk storage systems, which include LNG cryogenic systems and after market services, accounted for 13.0%, 15.0% and 18.8% of consolidated sales for the years ended December 31, 2019, 2018 and 2017 respectively.
- Cryogenic packaged gas systems, which include LNG cryogenic systems and after market services accounted for 16.1%, 19.5% and 19.6% of consolidated sales for the years ended December 31, 2019, 2018 and 2017 respectively.

Within Industrial Gas Applications

- We design, manufacture, install, service and maintain bulk and packaged gas cryogenic solutions for the storage, distribution, vaporization, and application of industrial gases, which accounted for 23.5%, 27.8% and 31.5% of consolidated sales for the years ended December 31, 2019, 2018 and 2017 respectively.

After Market Services

D&S West operates multiple service locations in the U.S. These service locations provide installation, service, repair, maintenance, and refurbishment of cryogenic products. We service Chart products, as well as numerous other manufacturers,

primarily in North America. We provide services for storage vessels, VIP, reconfigurations, relocation, trailers, ISO containers, vaporizers, and other gas to liquid equipment

Cryobiological Storage

Our cryobiological storage products include vacuum insulated containment vessels for the storage of biological materials. The primary applications for this product line include medical laboratories, biotech/pharmaceutical research facilities, blood and tissue banks, veterinary laboratories, large-scale repositories, and artificial insemination, particularly in the beef and dairy industry.

The competitors for cryobiological storage products include several companies worldwide. These products are sold through multiple channels of distribution specifically applicable to each industry sector. The distribution channels range from highly specialized cryogenic storage systems providers to general supply and catalogue distribution operations and breeding service providers. Competition in this field is focused on design, reliability, and price. Alternatives to vacuum insulated containment vessels include electrically powered mechanical refrigeration.

E&C Cryogenics

E&C Cryogenics (14% of sales for the year ended December 31, 2019) supports major natural gas, petrochemical processing, petroleum refining, power generation and industrial gas companies in the production of their products. E&C Cryogenics supplies highly engineered equipment and technology-driven process systems used in the separation, liquefaction, and purification of hydrocarbon and industrial gases that span gas-to-liquid applications. Our principal products include brazed aluminum heat exchangers, Core-in-Kettle® heat exchangers, cold boxes, shell & tube heat exchangers, high pressure reactors and vessels and process technology.

Natural Gas Processing (including Petrochemical) Applications

We provide natural gas processing solutions that facilitate the progressive cooling and liquefaction of hydrocarbon mixtures for the subsequent recovery or purification of component gases. Primary products used in these applications include brazed aluminum heat exchangers, cold boxes, pressure vessels, and Core-in-Kettle®. Our brazed aluminum heat exchangers allow producers to obtain purified hydrocarbon by-products, such as methane, ethane, propane, and ethylene, which are commercially marketable for various industrial or residential uses. Our cold boxes are highly engineered systems that incorporate brazed aluminum heat exchangers, pressure vessels, and interconnecting piping used to significantly reduce the temperature of gas mixtures to liquefy component gases so that they can be separated and purified for further use in multiple energy, industrial, scientific, and commercial applications. Our process technology includes standard and modular plant solutions and comprises detailed mechanical design, Chart manufactured proprietary equipment and all other plant items required to liquefy pipeline quality natural gas. Customers for our natural gas processing applications include large companies in the hydrocarbon processing industry, as well as engineering, procurement and construction (“EPC”) contractors.

Demand for these applications is primarily driven by the growth in the natural gas liquids (or NGLs) separation and other natural gas segments of the hydrocarbon processing industries, including LNG. In the future, management believes that continuing efforts by petroleum producing countries to better utilize stranded natural gas and associated gases which historically had been flared, present a promising source of demand. We have several competitors for our heat exchangers and cold boxes, including certain leading companies in the industrial gas and hydrocarbon processing industries and many smaller fabrication-only facilities around the world. Competition with respect to our more specialized brazed aluminum heat exchangers includes a small number of global (European and Asian) manufacturers.

LNG Applications

We provide process technology, liquefaction train, and independent mission critical equipment for the liquefaction of natural gas (LNG), including small to mid-scale facilities, floating LNG applications, and large base-load export facilities. We are a leading supplier to EPC firms where we provide equipment and process technology, providing an integrated and optimized approach to the project. These “Concept-to-Reality” process systems incorporate many of Chart’s core products, including brazed aluminum heat exchangers, Core-in-Kettle® heat exchangers, cold boxes, pressure vessels, and pipe work. These systems are used for global LNG projects, for both local LNG production as well as LNG export terminals. Our proprietary IPSMR® (Integrated Pre-cooled Single Mixed Refrigerant) liquefaction process technology offers lower capital expenditure rates than competing processes measured on a per ton of LNG produced basis, along with very competitive operating costs.

Demand for LNG applications is primarily driven by increased use and global trade in natural gas (transported as LNG) since natural gas offers significant cost and environmental advantages over other fossil fuels. Demand for LNG for fuel applications is also driven by diesel displacement and continuing efforts by petroleum producing countries to better utilize stranded natural gas and previously flared gases. We have several competitors for these applications, including leading industrial gas companies, other brazed aluminum heat exchanger manufacturers, and other equipment fabricators to whom we also act as a supplier of equipment, including heat exchangers and cold boxes.

Industrial Gas Applications

For industrial gas applications, our brazed aluminum heat exchangers and cold boxes are used to produce high purity atmospheric gases, such as oxygen, nitrogen, and argon, which have diverse industrial applications. Cold boxes, which incorporate our brazed aluminum heat exchangers, are used to separate air into its major atmospheric components, including oxygen, nitrogen, and argon, where the gases are used in a diverse range of applications such as metal production and heat treating, enhanced oil and gas production, coal gasification, chemical and oil refining, electronics, medical, the quick-freezing of food, wastewater treatment, and industrial welding. Our brazed aluminum heat exchangers and cold boxes are also used in the purification of helium and hydrogen.

Demand for industrial gas applications is driven by growth in manufacturing and industrial gas use. Other key global drivers involve developing Gas to Liquids, or GTL, clean coal processes including Coal to Liquids, or CTL, and Integrated Gasification Combined Cycle, or IGCC, power projects. In addition, demand for our products in developed countries is expected to continue as customers upgrade their facilities for greater efficiency and regulatory compliance. We have a number of competitors for these applications, including leading industrial gas companies and EPC firms, to whom we also act as a supplier of equipment, including heat exchangers and cold boxes.

After Market Services

To support the products and solutions we sell, our after market services group offers services through the entire lifecycle of our products, which is unique and unparalleled in the markets we serve. Our focus is to build relationships with plant stakeholders, from process and mechanical engineers to operations and maintenance personnel, focusing on the optimized performance and lifespan of Chart proprietary equipment. After market services include extended warranties, plant start-up, parts, 24/7 support, monitoring and process optimization, as well as repair, maintenance, and upgrades. We perform plant services on equipment, including brazed aluminum heat exchangers, cold boxes, etc.

E&C FinFans

E&C FinFans (28% of sales for the year ended December 31, 2019) facilitates major natural gas, petrochemical processing, petroleum refining, power generation and industrial gas companies in the production of their products. E&C FinFans supplies mission critical engineered equipment and systems used in the separation, liquefaction, and purification of hydrocarbon and industrial gases that span gas-to-liquid applications including natural gas processing, petrochemical, LNG, and petroleum refining . Our principal products include air cooled heat exchangers and axial cooling fans for power, HVAC, and refining end user applications.

Natural Gas Processing (including Petrochemical) Applications

We provide natural gas processing solutions that facilitate the progressive cooling and liquefaction of hydrocarbon mixtures for the subsequent recovery or purification of component gases, which accounted for 20.3%, 16.8%, and 9.2% of consolidated sales for the years ended December 31, 2019, 2018 and 2017, respectively. Primary products used in these applications are air cooled heat exchangers. Our air cooled heat exchangers are used to cool or condense fluids to allow for further processing and for cooling gas compression equipment. Customers for our natural gas processing applications include large companies in the hydrocarbon processing industry, as well as engineering, procurement and construction ("EPC") contractors.

Demand for these applications is primarily driven by the growth in the natural gas liquids (or NGLs) separation and other natural gas segments of the hydrocarbon processing industries, including LNG. In the future, management believes that continuing efforts by petroleum producing countries to better utilize stranded natural gas and associated gases which historically had been flared, present a promising source of demand. We have several competitors for our heat exchangers and fans, including certain leading companies in the industrial gas and hydrocarbon processing industries and many smaller fabrication-only facilities around the world.

LNG Applications

We provide air cooled heat exchangers for the liquefaction of LNG, including small to mid-scale facilities, floating LNG applications, and large base-load export facilities. In conjunction with our other business segments, we are a leading supplier to EPC firms where we provide equipment or design the process and provide equipment, providing an integrated and optimized approach to the project. These "Concept-to-Reality" process systems incorporate many of Chart's core products, including air cooled heat exchangers. These systems are used for global LNG projects, including projects in North America and China, for local LNG production and LNG export terminals.

Demand for LNG applications is primarily driven by increased use and global trade in natural gas (transported as LNG) since natural gas offers significant cost and environmental advantages over other fossil fuels. Demand for LNG applications is also driven by diesel displacement and continuing efforts by petroleum producing countries to better utilize stranded natural gas

and previously flared gases. We have a number of competitors for these applications, including leading industrial gas companies and other equipment fabricators to whom we also act as a supplier of equipment.

HVAC, Power and Refining Applications

Our Air Cooled Heat Exchangers (ACHX) and fans are used in HVAC, power and refining applications. Demand for HVAC is driven by growing construction activities and demand for energy efficient devices, and there is also positive impact from growing industrial production. Refining demand continues to be driven by United States shale production, benefiting from low cost shale crude and gas resulting in high utilization and increased investment. Our ACHX products are used in each phase of the refining process to condense and cool fluids. Worldwide power use is projected to grow 40% through 2035, with growth steady in the United States and Europe, while additional growth comes from emerging economies.

After Market Services

To support the products and solutions we sell, our after market services group offers services through the entire lifecycle of our products, which is unique and unparalleled in the markets we serve. Our focus is to build relationships with plant stakeholders, from process and mechanical engineers to operations and maintenance personnel, focusing on the optimized performance and lifespan of Chart proprietary equipment. After market services include extended warranties, plant start-up, parts, 24/7 support, monitoring and process optimization, as well as repair, maintenance, and upgrades. We perform plant services on equipment, including air cooled heat exchangers and fans.

Engineering and Product Development

Our engineering and product development activities are focused primarily on developing new and improved solutions and equipment for the users of cryogenic liquids and hydrocarbon and industrial gases across all industries served. Our engineering, technical, and marketing employees actively assist customers in specifying their needs and in determining appropriate products to meet those needs. Portions of our engineering expenditures typically are charged to customers, either as separate items or as components of product cost.

Competition

We believe we can compete effectively around the world and that we are a leading competitor in the industries we serve. Competition is based primarily on performance and the ability to provide the design, engineering, and manufacturing capabilities required in a timely and cost-efficient manner. Contracts are usually awarded on a competitive bid basis. Quality, technical expertise, and timeliness of delivery are the principal competitive factors within the industries we serve. Price and terms of sale are also important competitive factors. Although we believe we rank among the leaders in each of the markets we serve and because our equipment is specialized and independent third-party prepared market share data is not available, it is difficult to know for certain our exact position in our markets. We base our statements about industry and market positions on our reviews of annual reports and published investor presentations of our competitors and augment this data with information received by marketing consultants conducting competition interviews and our sales force and field contacts. For information concerning competition within a specific segment of our business, see the descriptions provided under segment captions in this Annual Report on Form 10-K.

Marketing

We market our products and services in each of our segments throughout the world primarily through direct sales personnel and independent sales representatives and distributors. The technical and custom design nature of our products requires a professional, highly trained sales force. We use independent sales representatives and distributors to market our products and services in certain foreign countries and in certain North American regions. These independent sales representatives supplement our direct sales force in dealing with language and cultural matters. Our domestic and foreign independent sales representatives earn commissions on sales, which vary by product type.

Backlog

The dollar amount of our backlog as of December 31, 2019, 2018 and 2017 was $762.3 million, $568.2 million, and $446.4 million, respectively. Backlog as of December 31, 2019 included $31.5 million related to our July 1, 2019 acquisition of AXC. Backlog as of December 31, 2018 included $81.6 million related to our November 15, 2018 acquisition of VRV. We expect to recognize revenue on approximately 83.4% of the remaining performance obligations over the next 12 months and 10% of the remaining performance obligations over the next 13 to 24 months, with the remaining balance recognized thereafter. Backlog is comprised of the portion of firm signed purchase orders or other written contractual commitments received from customers that we have not recognized as revenue under the percentage of completion method or based upon shipment. Backlog can be significantly

affected by the timing of orders for large products, particularly in the E&C Cryogenics segment, and the amount of backlog at December 31, 2019 described above is not necessarily indicative of future backlog levels or the rate at which backlog will be recognized as sales. Orders included in our backlog may include customary cancellation provisions under which the customer could cancel all or part of the order, potentially subject to the payment of certain costs and/or penalties. For further information about our backlog, including backlog by business segment, see Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Customers

We sell our products primarily to gas producers, distributors, and end-users across energy, industrial, cryobiological storage, power, HVAC and refining applications in countries throughout the world. Sales to our top ten customers accounted for 32%, 39%, and 38% of consolidated sales in 2019, 2018 and 2017, respectively. Sales to Praxair and Linde, which combined in 2018, exceeded 10% of consolidated sales in 2018 on a combined basis and represented approximately $121.6 million or 11.2% of consolidated sales in 2018 and is primarily attributable to the D&S West segment, along with D&S East, E&C Cryogenics and E&C FinFans.

Our sales to particular customers fluctuate from period to period, but the global producers and distributors of hydrocarbon and industrial gases and their suppliers tend to be a consistently large source of revenue for us. Our supply contracts are generally contracts for "requirements" only. While our customers may be obligated to purchase a certain percentage of their supplies from us, there are generally no minimum requirements. Also, many of our contracts may be canceled at any time, subject to possible cancellation charges. To minimize credit risk from trade receivables, we review the financial condition of potential customers in relation to established credit requirements before sales credit is extended and we monitor the financial condition of customers to help ensure timely collections and to minimize losses. In addition, for certain domestic and foreign customers, we require advance payments, letters of credit, bankers' acceptances, and other such guarantees of payment. Certain customers also require us to issue letters of credit or performance bonds, particularly in instances where advance payments are involved, as a condition to placing the order. We believe our relationships with our customers are generally good.

Intellectual Property

Although we have a number of patents, trademarks, and licenses related to our business, no one of them or related group of them is considered by us to be of such importance that its expiration or termination would have a material adverse effect on our business. In general, we depend upon technological capabilities, manufacturing quality control, and application of know-how, rather than patents or other proprietary rights, in the conduct of our business.

Raw Materials and Suppliers

We manufacture most of the products we sell. The raw materials used in manufacturing include aluminum products (including sheets, bars, plate, and piping), stainless steel products (including sheets, plates, heads, and piping), palladium oxide, carbon steel products (including sheets, plates, and heads), valves and gauges, and fabricated metal components. Most raw materials are available from multiple sources of supply. We have long-term relationships with our raw material suppliers and other vendors. Commodity components of our raw material (stainless steel and carbon steel) could experience some level of volatility during 2020 and may have a relational impact on raw material pricing. Subject to certain risks related to our suppliers as discussed under Item 1A. "Risk Factors," we foresee no acute shortages of any raw materials that would have a material adverse effect on our operations.

Employees

As of January 31, 2020, we had 5,743 employees, including 2,686 domestic employees and 3,057 international employees.

We are party to one collective bargaining agreement with the International Association of Machinists and Aerospace Workers ("IAM") covering 236 employees at our La Crosse, Wisconsin heat exchanger facility. Effective February 3, 2018, we entered into a three-year agreement with the IAM which expires on February 6, 2021.

Environmental Matters

Our operations have historically included and currently include the handling and use of hazardous and other regulated substances, such as various cleaning fluids used to remove grease from metal, that are subject to federal, state, local, and foreign environmental laws and regulations. These regulations impose limitations on the discharge of pollutants into the soil, air, and water and establish standards for their handling, management, use, storage, and disposal. We monitor and review our procedures and policies for compliance with environmental laws and regulations. Our management is familiar with these regulations and supports an ongoing program to maintain our adherence to required standards.

We are involved with environmental compliance, investigation, monitoring, and remediation activities at certain of our owned or formerly owned manufacturing facilities and at one owned facility that is leased to a third party. We believe that we are currently in substantial compliance with all known environmental regulations. We accrue for certain environmental remediation-related activities for which commitments or remediation plans have been developed or for which costs can be reasonably estimated. These estimates are determined based upon currently available facts regarding each facility. Actual costs incurred may vary from these estimates due to the inherent uncertainties involved. Future expenditures relating to these environmental remediation efforts are expected to be made over the next 7 years as ongoing costs of remediation programs. We do not believe that these regulatory requirements have had a material effect upon our capital expenditures, earnings, or competitive position. We are not anticipating any material capital expenditures in 2020 that are directly related to regulatory compliance matters. Although we believe we have adequately provided for the cost of all known environmental conditions, additional contamination, the outcome of disputed matters, or changes in regulatory posture could result in more costly remediation measures than budgeted, or those we believe are adequate or required by existing law. We believe that any additional liability in excess of amounts accrued which may result from the resolution of such matters will not have a material adverse effect on our financial position, liquidity, cash flows, or results of operations.

Available Information

Additional information about the Company is available at www.chartindustries.com. On the Investor Relations page of the website, the public may obtain free copies of our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as soon as reasonably practicable following the time that they are filed with, or furnished to, the Securities and Exchange Commission ("SEC"). Additionally, we have posted our Code of Ethical Business Conduct and Officer Code of Ethics on our website, which are also available free of charge to any shareholder interested in obtaining a copy. References to our website do not constitute incorporation by reference of the information contained on such website, and such information is not part of this Form 10-K.

Item 1A. *Risk Factors*

Investing in our common stock involves risk. You should carefully consider the risks described below, as well as the other information contained in this Annual Report on Form 10-K in evaluating your investment in us. If any of the following risks actually occur, our business, financial condition, operating results, or cash flows could be harmed materially. Additional risks, uncertainties, and other factors that are not currently known to us or that we believe are not currently material may also adversely affect our business, financial condition, operating results or cash flows. In any of these cases, you may lose all or part of your investment in us.

Risks Related to Our Business

The markets we serve are subject to cyclical demand and vulnerable to economic downturn, which could harm our business and make it difficult to project long-term performance.

Demand for our products depends in large part upon the level of capital and maintenance expenditures by many of our customers and end-users, in particular those customers in the global hydrocarbon and industrial gas markets. These customers' expenditures historically have been cyclical in nature and vulnerable to economic downturns. Decreased capital and maintenance spending by these customers could have a material adverse effect on the demand for our products and our business, financial condition, and results of operations. In addition, this historically cyclical demand limits our ability to make accurate long-term predictions about the performance of our company. Even if demand improves, it is difficult to predict whether any improvement represents a long-term improving trend or the extent or timing of improvement. There can be no assurance that historically improving cycles are representative of actual future demand.

The loss of, or significant reduction or delay in, purchases by our largest customers could reduce our sales and profitability.

While we sell to more than 2,000 customers, sales to our top ten customers accounted for 32%, 39%, and 38% of consolidated sales in 2019, 2018 and 2017, respectively, with sales to one customer of approximately 11.2% of consolidated sales in 2018; we expect that a similar number of customers will continue to represent a substantial portion of our sales for the foreseeable future. While our sales to particular customers fluctuate from period to period, the global producers and distributors of hydrocarbon and industrial gases and their suppliers tend to be a consistently large source of our sales.

The loss of any of our major customers, consolidation of our customers, or a decrease or delay in orders or anticipated spending by such customers could materially reduce our sales and profitability. Although order activity in 2019 increased year over year, we continued to experience energy price volatility and our customers' adjusted project timing. Delays in the anticipated timing of LNG infrastructure build out could materially reduce the demand for our products. Our largest customers could also engage in business combinations, which could increase their size, reduce their demand for our products as they recognize synergies or rationalize assets and increase or decrease the portion of our total sales concentration to any single customer. For example, four of our largest customers have combined in recent years, with Airgas and Air Liquide combining in 2016 and Praxair and Linde combining in 2018. Further industry consolidation could further exacerbate our customer concentration risk.

We may fail to successfully integrate companies that provide complementary products or technologies.

An important component of our recent business strategy has been the acquisition of businesses that complement our existing products and services. Such a strategy involves the potential risks inherent in assessing the value, strengths, weaknesses, contingent or other liabilities, and potential profitability of acquisition candidates and in integrating the operations of acquired companies. In addition, any acquisitions of businesses with foreign operations or sales may increase our exposure to risks inherent in doing business outside the United States.

As part of this acquisition strategy, we have closed on several acquisitions in the past three years. For example, we completed the acquisition of the Air-X-Changers business "AXC" in May 2019 for a purchase price of approximately $599.7 million. Furthermore, we acquired VRV in November 2018 for a purchase price of euro 125.0 million, or approximately $141.3 million in cash and assumed indebtedness of VRV, which was paid off immediately at closing or shortly thereafter, of euro 63.7 million (equivalent to $72.0 million), and net working capital and other agreed-upon purchase price adjustments finalized during the first half of 2019 of 3.7 million euros (equivalent to $4.2 million) which was settled early in the second quarter of 2019. In addition, we acquired Hudson in September 2017 for a purchase price of $419.5 million, net of cash acquired (including certain estimated net working capital adjustments and acquisition-related tax benefits acquired). The benefits that are expected to result from the AXC, VRV and Hudson acquisitions will depend, in part, on our ability to realize the anticipated growth opportunities and cost synergies from these acquisitions. Although we have already achieved certain of the anticipated disclosed synergies from these transactions, there can be no assurance that we successfully or cost-effectively integrate AXC, VRV and Hudson into our business and realize the remainder of these expected benefits. The failure to do so could have a material adverse effect on our business, financial condition and results of operations.

From time to time, we may have acquisition discussions with other potential target companies both domestically and internationally. If a large acquisition opportunity arises and we proceed, a substantial portion of our cash and surplus borrowing capacity could be used for the acquisition or we may seek additional debt or equity financing.

Potential acquisition opportunities become available to us from time to time, and we periodically engage in discussions or negotiations relating to potential acquisitions, including acquisitions that may be material in size or scope to our business. Any acquisition may or may not occur and, if an acquisition does occur, it may not be successful in enhancing our business for one or more of the following reasons:

- Any business acquired may not be integrated successfully and may not prove profitable;
- The price we pay for any business acquired may overstate the value of that business or otherwise be too high;
- Liabilities we take on through the acquisition may prove to be higher than we expected;
- We may fail to achieve acquisition synergies; or
- The focus on the integration of operations of acquired entities may divert management's attention from the day-to-day operation of our businesses.

Inherent in any future acquisition is the risk of transitioning company cultures and facilities. The failure to efficiently and effectively achieve such transitions could increase our costs and decrease our profitability.

If we are unable to successfully control our costs and efficiently manage our operations, it may place a significant strain on our management and administrative resources and lead to increased costs and reduced profitability.

We have implemented cost savings initiatives to align our business with current and expected economic conditions. Our ability to operate our business successfully and implement our strategies depends, in part, on our ability to allocate our resources optimally in each of our facilities in order to maintain efficient operations. Ineffective management could cause manufacturing inefficiencies, increase our operating costs, place significant strain on our management and administrative resources, and prevent us from being able to take advantage of opportunities as economic conditions improve. If we are unable to align our cost structure in response to prevailing economic conditions on a timely basis, or if implementation or failure to implement any cost structure adjustments has an adverse impact on our business or prospects, then our financial condition, results of operations, and cash flows may be negatively affected.

Similarly, it is critical that we appropriately manage our planned capital expenditures in this challenging economic environment. For example, we have invested or plan to invest approximately $35 to $40 million in new capital expenditures in 2020. If we fail to manage the projects related to these capital expenditures in an effective manner, we may lose the opportunity to obtain some new customer orders or the ability to operate our businesses efficiently. Even if we effectively implement these projects, the orders needed to support the capital expenditure may not be obtained, may be delayed, or may be less than expected, which may result in sales or profitability at lower levels than anticipated.

Changes in the energy industry, including pricing fluctuations and reductions and capital expenditures could harm our business, financial condition, and results of operations.

A significant amount of our sales is to customers in the energy production and supply industry. Our concentration of sales to the energy industry has increased as a result of our recent acquisitions and the divestiture of our oxygen-related products business in December 2018. We estimate that 52% of our sales for the year ended December 31, 2019 were generated by end-users in the energy industry, with many of our products sold for natural gas-related applications. Accordingly, demand for a significant portion of our products depends upon the level of capital expenditures by companies in the oil and gas industry, which depends, in part, on energy prices, as well as the price of oil relative to natural gas for some applications. Some applications for our products could see greater demand when prices for natural gas are relatively low compared to oil prices, but a sustained decline in energy prices generally and a resultant downturn in energy production activities could negatively affect the capital expenditures of our customers. Deterioration and significant decline in the capital expenditures of our customers, whether due to a decrease in the market price of energy or otherwise, may decrease demand for our products and cause downward pressure on the prices we charge. Accordingly, if there is a downturn in the energy production and supply industry, including a decline in the cost of oil relative to natural gas, our business, financial condition, and results of operations could be adversely affected.

We carry goodwill and indefinite-lived intangible assets on our balance sheet, which are subject to impairment testing and could subject us to significant non-cash charges to earnings in the future if impairment occurs.

As of December 31, 2019, we had goodwill and indefinite-lived intangible assets of $1,008.8 million, which represented approximately 40.7% of our total assets. Goodwill and indefinite-lived intangible assets are not amortized but are tested for impairment annually in the fourth quarter or more often if events or changes in circumstances indicate a potential impairment may

exist. Factors that could indicate that our goodwill or indefinite-lived intangible assets are impaired include a decline in our stock price and market capitalization, lower than projected operating results and cash flows, and slower growth rates in our industry. Our stock price historically has shown volatility and often fluctuates significantly in response to market and other factors. Declines in our stock price, lower operating results and any decline in industry conditions in the future could increase the risk of impairment. Impairment testing incorporates our estimates of future operating results and cash flows, estimates of allocations of certain assets and cash flows among reporting segments, estimates of future growth rates, and our judgment regarding the applicable discount rates used on estimated operating results and cash flows. If we determine at a future time that further impairment exists, it may result in a significant non-cash charge to earnings and lower stockholders' equity.

Our backlog is subject to modification, termination or reduction of orders, which could negatively impact our sales.

Our backlog is comprised of the portion of firm signed purchase orders or other written contractual commitments received from customers that we have not recognized as sales. The dollar amount of backlog as of December 31, 2019 was $762.3 million. Our backlog can be significantly affected by the timing of orders for large projects, particularly in our E&C Cryogenics segment, and the amount of our backlog at December 31, 2019 is not necessarily indicative of future backlog levels or the rate at which backlog will be recognized as sales. Although modifications and terminations of our orders may be partially offset by cancellation fees, customers can, and sometimes do, terminate or modify these orders. We cannot predict whether cancellations will accelerate or diminish in the future. Cancellations of purchase orders, indications that the customers will not perform or reductions of product quantities in existing contracts could substantially and materially reduce our backlog and, consequently, our future sales. For example, during 2015, D&S East segment backlog in China was reduced by approximately $150.0 million when circumstances suggested that our customers were not likely to take delivery in the future. Our failure to replace canceled orders could negatively impact our sales and results of operations. Included in the E&C Cryogenics backlog is approximately $40.0 million related to the previously announced Magnolia LNG order where production release is delayed into 2020. We did not have any significant cancellations in 2019, 2018 and 2017.

Due to the nature of our business and products, we may be liable for damages based on product liability and warranty claims.

Due to the high pressures and low temperatures at which many of our products are used, the inherent risks associated with concentrated industrial and hydrocarbon gases, and the fact that some of our products are relied upon by our customers or end users in their facilities or operations or are manufactured for relatively broad industrial, medical, transportation, or consumer use, we face an inherent risk of exposure to claims (which we have been subject to from time to time and some of which were substantial) in the event that the failure, use, or misuse of our products results, or is alleged to result, in death, bodily injury, property damage, or economic loss. We believe that we meet or exceed existing professional specification standards recognized or required in the industries in which we operate. During 2019, we were named in lawsuits (including purported class action lawsuits filed in the U.S. District Court for the Northern District of California) filed against Chart and other defendants with respect to the alleged failure of a stainless steel cryobiological storage tank at the Pacific Fertility Center in San Francisco, California, and we have also been named in a purported class action lawsuit filed in the Ontario Superior Court of Justice against Chart and other defendants with respect to the alleged failure of an aluminum cryobiological storage tank at The Toronto Institute for Reproductive Medicine in Etobicoke, Ontario. See Item 3. "Legal Proceedings," for further details. Although we currently maintain product liability coverage, which we believe is adequate for existing product liability claims and for the continued operation of our business, it includes customary exclusions and conditions, it may not cover certain specialized applications such as aerospace-related applications, and it generally does not cover warranty claims. Additionally, such insurance may become difficult to obtain or be unobtainable in the future on terms acceptable to us. A successful product liability claim or series of claims against us, including one or more consumer claims purporting to constitute class actions or claims resulting from extraordinary loss events, in excess of or outside our insurance coverage, or a significant warranty claim or series of claims against us, could materially decrease our liquidity, impair our financial condition, and adversely affect our results of operations.

Governmental energy policies could change or expected changes could fail to materialize which could adversely affect our business or prospects.

Energy policy can develop rapidly in the markets we serve, including the United States, Asia, Australia, Europe, and Latin America. Within the last few years, significant developments have taken place, primarily in international markets that we serve with respect to energy policy and related regulations. We anticipate that energy policy will continue to be an important regulatory priority globally, as well as on a national, state, and local level. As energy policy continues to evolve, the existing rules and incentives that impact the energy-related segments of our business may change. It is difficult, if not impossible, to predict whether changes in energy policy might occur in the future and the timing of potential changes and their impact on our business. The elimination or reduction of favorable policies for our energy-related business, or the failure to adopt expected policies that would benefit our business, could negatively impact our sales and profitability.

Our exposure to fixed-price contracts, including exposure to fixed pricing on long-term customer contracts and performance guarantees, could negatively impact our financial results.

A substantial portion of our sales has historically been derived from fixed-price contracts for large system projects which may involve long-term fixed price commitments to customers or guarantees of equipment or process performance and which are sometimes difficult to execute. To the extent that any of our fixed-price contracts are delayed, we fail to satisfy a performance guarantee, our subcontractors fail to perform, contract counterparties successfully assert claims against us, the original cost estimates in these or other contracts prove to be inaccurate or the contracts do not permit us to pass increased costs on to our customers, profitability from a particular contract may decrease or project losses may be incurred, which, in turn, could decrease our sales and overall profitability. The uncertainties associated with our fixed-price contracts make it more difficult to predict our future results and exacerbate the risk that our results will not match expectations, which has happened in the past.

We depend on the availability of certain key suppliers; if we experience difficulty with a supplier, we may have difficulty finding alternative sources of supply.

The cost, quality, and availability of raw materials, certain specialty metals and specialized components used to manufacture our products are critical to our success. The materials and components we use to manufacture our products are sometimes custom made and may be available only from a few suppliers, and the lead times required to obtain these materials and components can often be significant. We rely on sole suppliers or a limited number of suppliers for some of these materials, including special grades of aluminum used in our brazed aluminum heat exchangers and compressors included in some of our product offerings. While we have not historically encountered problems with availability, this does not mean that we will continue to have timely access to adequate supplies of essential materials and components in the future or that supplies of these materials and components will be available on satisfactory terms when needed. If our vendors for these materials and components are unable to meet our requirements, fail to make shipments in a timely manner, or ship defective materials or components, we could experience a shortage or delay in supply or fail to meet our contractual requirements, which would adversely affect our results of operations and negatively impact our cash flow and profitability.

Fluctuations in currency exchange or interest rates may adversely affect our financial condition and operating results.

A significant portion of our revenue and expense is incurred outside of the United States. We must translate revenues, income and expenses, as well as assets and liabilities into U.S. dollars using exchange rates during or at the end of each period. Fluctuations in currency exchange rates have had, and will continue to have an impact on our financial condition, operating results, and cash flow. While we monitor and manage our foreign currency exposure with limited use of derivative financial instruments to mitigate these exposures, fluctuations in currency exchange rates may materially impact our financial and operational results.

In addition, we are exposed to changes in interest rates. While our convertible notes have a fixed cash coupon, other instruments, primarily borrowings under our senior secured revolving credit facility (the "SSRCF") and a term loan (together, the "2019 Credit Facilities") are exposed to a variable interest rate. The impact of a 100 basis point increase in interest rates to our senior secured revolving credit facility is discussed in the "Quantitative and Qualitative Disclosures About Market Risk" section of this Annual Report.

As an increasingly global business, we are exposed to economic, political, and other risks in different countries which could materially reduce our sales, profitability or cash flows, or materially increase our liabilities.

Since we manufacture and sell our products worldwide, our business is subject to risks associated with doing business internationally. In 2019, 2018 and 2017, 47%, 44%, and 44%, respectively, of our sales occurred in international markets. Our future results could be harmed by a variety of factors, including:

- changes in foreign currency exchange rates;
- exchange controls and currency restrictions;
- changes in a specific country's or region's political, social or economic conditions, particularly in emerging markets;
- civil unrest, turmoil or outbreak of disease or illness, such as the novel coronavirus, in any of the countries in which we sell our products or in which we or our suppliers operate;
- tariffs, other trade protection measures, as discussed in more detail below, and import or export licensing requirements;
- potential adverse changes in trade agreements between the United States and foreign countries, including the recently enacted United States-Mexico-Canada Agreement (USMCA), among the United States, Canada and Mexico;
- uncertainty and potentially negative consequences relating to the implementation of the United Kingdom's decision to leave the European Union ("Brexit");
- potentially negative consequences from changes in U.S. and international tax laws;
- difficulty in staffing and managing geographically widespread operations;

- differing labor regulations;
- requirements relating to withholding taxes on remittances and other payments by subsidiaries;
- different regulatory regimes controlling the protection of our intellectual property;
- restrictions on our ability to own or operate subsidiaries, make investments or acquire new businesses in these jurisdictions;
- restrictions on our ability to repatriate dividends from our foreign subsidiaries;
- difficulty in collecting international accounts receivable;
- difficulty in enforcement of contractual obligations under non-U.S. law;
- transportation delays or interruptions;
- changes in regulatory requirements; and
- the burden of complying with multiple and potentially conflicting laws.

Our international operations and sales also expose us to different local political and business risks and challenges. For example, we are faced with potential difficulties in staffing and managing local operations and we have to design local solutions to manage credit and legal risks of local customers and distributors, which may not be effective. In addition, because some of our international sales are to suppliers that perform work for foreign governments, we are subject to the political risks associated with foreign government projects. For example, certain foreign governments may require suppliers for a project to obtain products solely from local manufacturers or may prohibit the use of products manufactured in certain countries.

Our operations in markets such as Asia, Australia, Europe, and Latin America, may cause us difficulty due to greater regulatory barriers than in the United States, the necessity of adapting to new regulatory systems, problems related to entering new markets with different economic, social and political systems and conditions, and significant competition from the primary participants in these markets, some of which may have substantially greater resources than us. In addition, unstable political conditions or civil unrest, including political instability in Eastern Europe, the Middle East, Hong Kong or elsewhere, could negatively impact our order levels and sales in a region or our ability to collect receivables from customers or operate or execute projects in a region. Likewise, any prolonged or widening exposure of the novel coronavirus now impacting China may cause production or delivery delays or reduction in product demand as a result of the unavailability of employees and temporary workers, the shortage of or delay in receiving certain raw materials or manufacturing supplies and the diminished availability or delay in transportation shipments.

Changes in U.S. trade policy, tariff and import/export regulations may have a material adverse effect on our business, financial condition and results of operations.

Our international operations and transactions also depend upon favorable trade relations between the United States and the foreign countries in which our customers and suppliers have operations. Changes in U.S. or international social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment in the territories or countries where we currently sell our products or conduct our business, as well as any negative sentiment toward the U.S. as a result of such changes, could adversely affect our business. The current U.S. presidential administration has instituted or proposed changes in trade policies that include the negotiation or termination of trade agreements, the imposition of higher tariffs on imports into the U.S., economic sanctions on individuals, corporations or countries, and other government regulations affecting trade between the U.S. and other countries where we conduct our business. It may be time-consuming and expensive for us to alter our business operations in order to adapt to or comply with any such changes.

As a result of recent policy changes of the U.S. presidential administration and recent U.S. government proposals, there may be greater restrictions and economic disincentives on international trade. The new tariffs and other changes in U.S. trade policy could trigger retaliatory actions by affected countries, and certain foreign governments have instituted or are considering imposing trade sanctions on certain U.S. goods. We do a significant amount of business that would be impacted by changes to the trade policies of the U.S. and foreign countries (including governmental action related to tariffs, international trade agreements, or economic sanctions). Such changes have the potential to adversely impact the U.S. economy or certain sectors thereof, our industry and the global demand for our products. We may not succeed in developing and implementing policies and strategies to counter the foregoing factors effectively in each location where we do business and the foregoing factors may cause a reduction in our sales, profitability or cash flows, or cause an increase in our liabilities.

Data privacy and data security considerations could impact our business.

The interpretation and application of data protection laws, including but not limited to the General Data Protection Regulation (the "GDPR") in Europe, are uncertain and evolving. It is possible that these laws may be interpreted and applied in a manner that is inconsistent with our data security practices. Complying with these various laws is difficult and could cause us to incur substantial costs or require us to change our business practices in a manner adverse to our business. Further, although we are implementing internal controls and procedures designed to ensure compliance with the GDPR and other privacy-related laws, rules and regulations (collectively, the "Data Protection Laws"), there can be no assurance that our controls and procedures will enable us to fully comply with all Data Protection Laws.

Despite our efforts to protect sensitive information and confidential and personal data, comply with applicable laws, rules and regulations and implement data security measures, our facilities and systems may be vulnerable to security breaches and other data loss, including cyber-attacks. In addition, it is not possible to predict the impact on our business of the future loss, alteration or misappropriation of information in our possession related to us, our employees, former employees, customers, suppliers or others. This could lead to negative publicity, legal claims, theft, modification or destruction of proprietary information or key information, damage to or inaccessibility of critical systems, manufacture of defective products, production downtimes, operational disruptions and other significant costs, which could adversely affect our reputation, financial condition and results of operations.

We are subject to potential insolvency or financial distress of third parties.

We are exposed to the risk that third parties to various arrangements who owe us money or goods and services, or who purchase goods and services from us, will not be able to perform their obligations or continue to place orders due to insolvency or financial distress. If third parties fail to perform their obligations under arrangements with us, we may be forced to replace the underlying commitment at current or above market prices or on other terms that are less favorable to us or we may have to write off receivables in the case of customer failures to pay. If this happens, whether as a result of the insolvency or financial distress of a third party or otherwise, we may incur losses, or our results of operations, financial position or liquidity could otherwise be adversely affected.

Failure to protect our intellectual property and know-how could reduce or eliminate any competitive advantage and reduce our sales and profitability, and the cost of protecting our intellectual property may be significant.

We rely on a combination of internal procedures, nondisclosure agreements and intellectual property rights assignment agreements, as well as licenses, patents, trademarks and copyright law to protect our intellectual property and know-how. Our intellectual property rights may not be successfully asserted in the future or may be invalidated, circumvented or challenged. For example, we frequently explore and evaluate potential relationships and projects with other parties, which often require that we provide the potential partner with confidential technical information. While confidentiality agreements are typically put in place, there is a risk the potential partner could violate the confidentiality agreement and use our technical information for its own benefit or the benefit of others or compromise the confidentiality. In addition, the laws of certain foreign countries in which our products may be sold or manufactured do not protect our intellectual property rights to the same extent as the laws of the United States. In addition, the United States has transitioned from a "first-to-invent" to a "first-to-file" patent system, which means that between two identical, pending patent applications, the first inventor no longer receives priority on the patent to the invention. As a result, the Leahy-Smith America Invents Act may require us to incur significant additional expense and effort to protect our intellectual property. Failure or inability to protect our proprietary information could result in a decrease in our sales or profitability.

We have obtained and applied for some U.S. and foreign trademark and patent registrations and will continue to evaluate the registration of additional trademarks and patents, as appropriate. We cannot guarantee that any of our pending applications will be approved. Moreover, even if the applications are approved, third parties may seek to oppose or otherwise challenge them. A failure to obtain registrations in the United States or elsewhere could limit our ability to protect our trademarks and technologies and could impede our business. Further, the protection of our intellectual property may require expensive investment in protracted litigation and the investment of substantial management time and there is no assurance we ultimately would prevail or that a successful outcome would lead to an economic benefit that is greater than the investment in the litigation. The patents in our patent portfolio are scheduled to expire from 2020 to 2039.

In addition, we may be unable to prevent third parties from using our intellectual property rights and know-how without our authorization or from independently developing intellectual property that is the same as or similar to ours, particularly in those countries where the laws do not protect our intellectual property rights as fully as in the United States. We compete in a number of industries (e.g., heat exchangers and cryogenic storage) that are small or specialized, which makes it easier for a competitor to monitor our activities and increases the risk that ideas will be stolen. The unauthorized use of our know-how by third parties could reduce or eliminate any competitive advantage we have developed, cause us to lose sales or otherwise harm our business or increase our expenses as we attempt to enforce our rights.

We may be required to make expenditures in order to comply with environmental, health and safety laws and climate change regulations, or incur additional liabilities under these laws and regulations.

We are subject to numerous environmental, health and safety laws and regulations that impose various environmental controls on us or otherwise relate to environmental protection and various health and safety matters, including the discharge of pollutants in the air and water, the handling, use, treatment, storage and clean-up of solid and hazardous materials and wastes, the investigation and remediation of soil and groundwater affected by hazardous substances and the requirement to obtain and maintain permits and licenses. These laws and regulations often impose strict, retroactive and joint and several liability for the costs and damages resulting from cleaning up our or our predecessors' facilities and third-party disposal sites. Compliance with these laws generally increases the costs of transportation and storage of raw materials and finished products, as well as the costs of storing and disposing waste, and could decrease our liquidity and profitability and increase our liabilities. Health and safety and other laws in the jurisdictions in which we operate impose various requirements on us including state licensing requirements that may benefit our customers. If we are found to have violated any of these laws, we may become subject to corrective action orders and fines or penalties, and incur substantial costs, including substantial remediation costs and commercial liability to our customers. Further, we also could be subject to future liability resulting from conditions that are currently unknown to us that could be discovered in the future.

We are currently remediating or developing work plans for remediation of environmental conditions involving certain current or former facilities. For example, the discovery of contamination arising from historical industrial operations at our Clarksville, Arkansas property, which is currently being leased to a third party business, has exposed us, and in the future may continue to expose us, to remediation obligations. We have also been subject to environmental liabilities for other sites where we formerly operated or at locations where we or our predecessors did or are alleged to have operated. To date, our environmental remediation expenditures and costs for otherwise complying with environmental laws and regulations have not been material, but the uncertainties associated with the investigation and remediation of contamination and the fact that such laws or regulations change frequently makes predicting the cost or impact of such laws and regulations on our future operations uncertain. Stricter environmental, safety and health laws, regulations or enforcement policies could result in substantial costs and liabilities to us and could subject us to more rigorous scrutiny. Consequently, compliance with these laws could result in significant expenditures, as well as other costs and liabilities that could decrease our liquidity and profitability and increase our liabilities.

There is a growing political and scientific consensus that emissions of greenhouse gases alter the composition of the global atmosphere in ways that are affecting the global climate. Various stakeholders, including legislators and regulators, stockholders and non-governmental organizations, as well as companies in many business sectors, are considering ways to reduce greenhouse gas emissions. New regulations could result in product standard requirements for our global businesses but because any impact is dependent on the design of the mandate or standard, we are unable to predict its significance at this time. Furthermore, the potential physical impacts of theorized climate change on our customers, and therefore on our operations, are speculative and highly uncertain, and would be particular to the circumstances developing in various geographical regions. These may include changes in weather patterns (including drought and rainfall levels), water availability, storm patterns and intensities, and temperature levels. These potential physical effects may adversely impact the cost, production, sales and financial performance of our operations.

Our pension plan is currently underfunded and we contribute to a multi-employer plan for collective bargaining U.S. employees, which is also underfunded.

Certain U.S. hourly and salaried employees are covered by our defined benefit pension plan. The plan has been frozen since February 2006. As of December 31, 2019, the projected benefit obligation under our pension plan was approximately $58.5 million, and the value of the assets of the plan was approximately $49.1 million, resulting in our pension plan being underfunded by approximately $9.4 million.

As part of the Hudson acquisition we acquired a noncontributory defined benefit plan covering certain employees of a Hudson subsidiary. The Hudson plan is closed to new participants. As of December 31, 2019, the projected benefit obligation of the Hudson plan was $2.9 million, and the fair value of plan assets were $2.0 million, resulting in the pension plan being underfunded by approximately $0.9 million.

We are also a participant in a multi-employer plan, which is underfunded. Among other risks associated with multi-employer plans, contributions and unfunded obligations of the multi-employer plan are shared by the plan participants and we may inherit unfunded obligations if other plan participants withdraw from the plan or cease to participate. Additionally, if we elect to stop participating in the multi-employer plan, we may be required to pay amounts related to withdrawal liabilities associated with the underfunded status of the plan. If the performance of the assets in our pension plan or the multi-employer plan does not meet expectations or if other actuarial assumptions are modified, our required pension contributions for future years could be higher than we expect, which may negatively impact our results of operations, cash flows and financial condition.

We operate in many different jurisdictions and we could be adversely affected by violations of the U.S. Foreign Corrupt Practices Act and similar worldwide anti-corruption laws.

The U.S. Foreign Corrupt Practices Act ("FCPA") and similar worldwide anti-corruption laws generally prohibit companies and their intermediaries from making improper payments for the purpose of obtaining or retaining business. Our internal policies mandate compliance with these anti-corruption laws. We operate in many parts of the world that have experienced corruption to some degree, and in certain circumstances, strict compliance with anti-corruption laws may conflict with local customs and practices. Despite our training and compliance programs, we cannot assure you that our internal control policies and procedures always will protect us from reckless or criminal acts committed by our employees or agents. Our continued expansion outside the U.S., including in developing countries, could increase the risk of such violations in the future. Violations of these laws, or allegations of such violations, could disrupt our business and result in a material adverse effect on our results of operations or financial condition.

Our operations could be impacted by the effects of severe weather.

Some of our operations, including our operations in New Iberia, Louisiana and Houston, Texas, are located in geographic regions and physical locations that are susceptible to physical damage and longer-term economic disruption from hurricanes or other severe weather. We also could make significant future capital expenditures in hurricane-susceptible or other severe weather locations from time to time. These weather events can disrupt our operations, result in damage to our properties and negatively affect the local economy in which these facilities operate. In September 2008, for example, our New Iberia, Louisiana facility was forced to close as a result of heavy rainfall, evacuations, strong winds and power outages resulting from Hurricane Gustav. Two weeks after Hurricane Gustav, winds and flooding from Hurricane Ike damaged our New Iberia, Louisiana, Houston, Texas and The Woodlands, Texas operations and offices, and those facilities were also closed for a period of time. Future hurricanes or other severe weather may cause production or delivery delays as a result of the physical damage to the facilities, the unavailability of employees and temporary workers, the shortage of or delay in receiving certain raw materials or manufacturing supplies and the diminished availability or delay of transportation for customer shipments, any of which may have an adverse effect on our sales and profitability. Additionally, the potential physical impact of theorized climate change could include more frequent and intense storms, which would heighten the risk to our operations in areas that are susceptible to hurricanes and other severe weather. Although we maintain insurance subject to certain deductibles, which may cover some of our losses, that insurance may become unavailable or prove to be inadequate.

We are subject to regulations governing the export of our products.

Due to our significant foreign sales, our export activities are subject to regulation, including the U.S. Treasury Department's Office of Foreign Assets Control's regulations. We believe we are in compliance with these regulations and maintain robust programs intended to maintain compliance. However, unintentional lapses in our compliance or uncertainties associated with changing regulatory requirements could result in future violations (or alleged violations) of these regulations. Any violations may subject us to government scrutiny, investigation and civil and criminal penalties and may limit our ability to export our products.

As a provider of products to the U.S. government, we are subject to federal rules, regulations, audits and investigations, the violation or failure of which could adversely affect our business.

We sell certain of our products to the U.S. government; and, therefore, we must comply with and are affected by laws and regulations governing purchases by the U.S. government. Government contract laws and regulations affect how we do business with our government customers and, in some instances, impose added costs on our business. For example, a violation of specific laws and regulations could result in the imposition of fines and penalties or the termination of our contracts or debarment from bidding on contracts. In some instances, these laws and regulations impose terms or rights that are more favorable to the government than those typically available to commercial parties in negotiated transactions.

Current economic and political conditions make tax rules in jurisdictions subject to significant change, and unanticipated changes in our effective tax rate could adversely affect our future results.

Our future results of operations could be affected by changes in the effective tax rate as a result of changes in tax laws, regulations and judicial rulings. In December 2017, the Tax Cuts and Jobs Act of 2017 was signed into law in the United States, which among other things, lowered the federal corporate income tax rate from 35% to 21% and moved the country towards a territorial tax system with a one-time mandatory tax on previously deferred foreign earnings of foreign subsidiaries. Although our effective tax rate decreased during 2018, there can be no assurances that any expected benefit from the Tax Cuts and Jobs Act will be maintained long-term given political and other uncertainties.

Also, further changes in the tax laws of foreign jurisdictions could arise, including as a result of the base erosion and profit shifting (BEPS) project undertaken by the Organisation for Economic Cooperation and Development (OECD). The OECD, which

represents a coalition of member countries, has issued recommendations that, in some cases, would make substantial changes to numerous long-standing tax positions and principles. These contemplated changes, to the extent adopted by OECD members and/or other countries, could increase tax uncertainty and may adversely affect our provision for income taxes.

Our effective tax rate could also be adversely affected by changes in the mix of earnings and losses in countries with differing statutory tax rates, certain non-deductible expenses arising from share-based compensation, the valuation of deferred tax assets and liabilities and changes in accounting principles. In addition, we are subject to income tax audits by many tax jurisdictions throughout the world. Although we believe our income tax liabilities are reasonably estimated and accounted for in accordance with applicable laws and principles, an adverse resolution of one or more uncertain tax positions in any period could have a material impact on the results of operations for that period.

Risks Related to Our Leverage

Our leverage and future debt service obligations could adversely affect our financial condition, limit our ability to raise additional capital to fund our operations, limit our ability to react to changes in the economy or our industry, impact the way we operate our business, expose us to interest rate risk to the extent of our variable rate debt and prevent us from fulfilling our debt service obligations.

We are leveraged and have future debt service obligations. Our financial performance could be affected by our leverage. As of December 31, 2019, our total indebtedness was $829.4 million. In addition, at that date, under our senior secured revolving credit facility, we had $71.5 million of letters of credit and bank guarantees outstanding and borrowing capacity of approximately $359.5 million. Through separate facilities, our subsidiaries had $12.6 million in bank guarantees outstanding at December 31, 2019.

Our level of indebtedness could have important negative consequences, including:

- difficulty in generating sufficient cash flow and reduced availability of cash for our operations and other business activities;
- difficulty in obtaining financing in the future;
- exposure to risk of increased interest rates due to variable rates of interest under our senior secured revolving credit facility;
- vulnerability to general economic downturns and adverse industry conditions;
- increased competitive disadvantage due to our debt service obligations;
- adverse customer reaction to our debt levels;
- inability to comply with covenants in, and potential for default under, our debt instruments; and
- failure to refinance any of our debt. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations — Liquidity and Capital Resources."

If our cash flows and capital resources are insufficient to fund our debt service obligations, we may be forced to sell assets, seek additional capital or seek to restructure or refinance our indebtedness. These alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations. We may be unable to consummate those asset sales to raise capital or sell assets at prices that we believe are fair and proceeds that we do receive may be inadequate to meet any debt service obligations then due.

We may still be able to incur substantially more debt. This could further exacerbate the risks that we face.

We may be able to incur substantial additional indebtedness in the future. The terms of our debt instruments do not fully prohibit us from doing so. In connection with our AXC acquisition, we entered into a $450.0 million term loan facility, furthermore, our senior secured revolving credit facility provides commitments of up to $550.0 million, approximately $359.5 million of which would have been available for future borrowings (after giving effect to letters of credit and bank guarantees outstanding) as of December 31, 2019. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations — Liquidity and Capital Resources — Debt Instruments and Related Covenants." We may also further increase the size of our senior secured revolving credit facility which includes an expansion option permitting us to add up to an aggregate of $450.0 million in additional borrowings, subject to certain conditions, or we could refinance with higher borrowing limits. If new debt is added to our current debt levels, the related risks that we now face could intensify.

The senior secured revolving credit facility contains a number of restrictive covenants which limit our ability to finance future operations or capital needs or engage in other business activities that may be in our interest.

The 2019 Credit Facilities impose, and the terms of any future indebtedness may impose, operating and other restrictions on us and our subsidiaries. Such restrictions affect or will affect, and in various circumstances limit or prohibit, among other things, our ability and the ability of our subsidiaries to:

- incur or guarantee additional indebtedness;
- create liens;
- pay dividends based on our leverage ratio and make other distributions in respect of our capital stock;
- redeem or buy back our capital stock based on our leverage ratio;
- make certain investments or certain other restricted payments;
- enter into a new line of business;
- sell or transfer certain kinds of assets;
- enter into certain types of transactions with affiliates; and
- effect mergers or consolidations.

The 2019 Credit Facilities also require us to achieve certain financial and operating results and maintain compliance with specified financial ratios. Our ability to comply with these ratios may be affected by events beyond our control.

The restrictions contained in the senior secured revolving credit facility could:

- limit our ability to plan for or react to market or economic conditions or meet capital needs or otherwise restrict our activities or business plans; and
- adversely affect our ability to finance our operations, acquisitions, investments or strategic alliances or other capital needs or to engage in other business activities that would be in our interest.

A breach of any of these covenants or our inability to comply with the required financial ratios could result in a default under our 2019 Credit Facilities. If an event of default occurs under our senior secured revolving credit facility, which includes an event of default under the indenture governing our 1.00% Convertible Senior Subordinated Notes due November 2024, the lenders could elect to:

- declare all borrowings outstanding, together with accrued and unpaid interest, to be immediately due and payable; or
- require us to apply all of our available cash to repay the borrowings,

either of which could result in an event of default under our convertible notes or prevent us from making payments on the convertible notes when due in 2024, as the case may be. The lenders will also have the right in these circumstances to terminate any commitments they have to provide further financing.

If we were unable to repay or otherwise refinance these borrowings when due, our lenders could sell the collateral securing the 2019 Credit Facilities, which constitutes substantially all of our and our domestic wholly-owned subsidiaries' assets.

Our 1.00% Convertible Senior Subordinated Notes due November 2024 have certain fundamental change and conditional conversion features which, if triggered, may adversely affect our financial condition.

If a fundamental change occurs under our 1.00% Convertible Senior Subordinated Notes due November 2024, the holders of the convertible notes may require us to purchase for cash any or all of the convertible notes. However, there can be no assurance that we will have sufficient funds at the time of the fundamental change to purchase all of the convertible notes delivered for purchase, and we may not be able to arrange necessary financing on acceptable terms, if at all. Likewise, if one of the conversion contingencies of our convertible notes is triggered, holders of convertible notes will be entitled to convert the convertible notes at any time during specified periods.

We are subject to counterparty risk with respect to the convertible note hedge and capped call transactions associated with our 1.00% Convertible Senior Subordinated Notes due November 2024.

The option counterparties for our convertible note hedging arrangements are financial institutions, and we will be subject to the risk that any or all of them might default under the convertible note hedge and capped call transactions. Our exposure to the credit risk of the option counterparties is not secured by any collateral. Global economic conditions during the 2008-2009 economic downturn resulted in the actual or perceived failure or financial difficulties of many financial institutions. If an option counterparty becomes subject to insolvency proceedings, we will become an unsecured creditor in those proceedings with a claim equal to our exposure at that time under the convertible note hedge and capped call transactions with that option counterparty. Our exposure will depend on many factors but, generally, the increase in our exposure will be correlated to the increase in the market price and

in the volatility of our common stock. In addition, upon a default by an option counterparty, we may suffer adverse tax consequences and more dilution than we currently anticipate with respect to our common stock. We can provide no assurances as to the financial stability or viability of the option counterparties.

Risks Related to the Trading Market for Our Common Stock

Our common stock has experienced, and may continue to experience, price volatility.

Our common stock has at times experienced substantial price volatility as a result of many factors, including the general volatility of stock market prices and volumes, changes in securities analysts' estimates of our financial performance, variations between our actual and anticipated financial results, fluctuations in order or backlog levels, fluctuations in energy prices, or uncertainty about current global economic conditions. For these reasons, among others, the price of our stock may continue to fluctuate.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws and other agreements and in Delaware law may discourage a takeover attempt.

Provisions contained in our amended and restated certificate of incorporation and amended and restated bylaws and Delaware law could make it more difficult for a third party to acquire us. Provisions of our amended and restated certificate of incorporation and amended and restated bylaws and Delaware law impose various procedural and other requirements, which could make it more difficult for stockholders to effect certain corporate actions. For example, our amended and restated certificate of incorporation authorizes our board of directors to determine the rights, preferences, privileges and restrictions of unissued series of preferred stock, without any vote or action by our stockholders. Therefore, our board of directors can authorize and issue shares of preferred stock with voting or conversion rights that could adversely affect the voting or other rights of holders of our common stock. These rights may have the effect of delaying or deterring a change of control of our company. These provisions could limit the price that certain investors might be willing to pay in the future for shares of our common stock.

In addition, the terms of our 1.00% Convertible Senior Subordinated Notes due November 2024 may require us to purchase these convertible notes for cash in the event of a takeover of our Company. The indentures governing the convertible notes also prohibit us from engaging in certain mergers or acquisitions unless, among other things, the surviving entity assumes our obligations under the convertible notes. These and other provisions applicable to the convertible notes may have the effect of increasing the cost of acquiring us or otherwise discourage a third party from acquiring us.

The issuance of common stock upon conversion of our 1.00% Convertible Senior Subordinated Notes due November 2024 could cause dilution to the interests of our existing stockholders.

As of December 31, 2019, we had $258.8 million aggregate principal amount of our 1.00% Convertible Senior Subordinated Notes due November 2024. Prior to the close of business on the business day immediately preceding August 15, 2024, the convertible notes will be convertible only upon satisfaction of certain conditions. Holders may convert their 1.00% convertible notes at their option at any time after August 15, 2024 until the close of business on the second scheduled trading day immediately preceding November 15, 2024. We currently intend to settle conversions of 1.00% convertible notes through a combination of the payment of cash and issuance of shares, with payments of cash up to the aggregate principal amount of the convertible notes to be converted and delivering shares of our common stock in respect of the remainder, if any, of our conversion obligation in excess of the aggregate principal amount of the notes being converted. The number of shares issued could be significant and such an issuance could cause significant dilution to the interests of the existing stockholders.

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

Not applicable.

Item 2. ***Properties***

We occupy 50 facilities totaling approximately 6.0 million square feet, including the locations listed below, with the majority devoted to manufacturing, assembly, and storage. Of these facilities, approximately 4.6 million square feet are owned and 1.4 million square feet are occupied under operating leases. One of our owned facilities, a 0.1 million square foot facility in Clarksville, Arkansas, is leased to a third party. We currently lease approximately 20 thousand square feet for our corporate office in Ball Ground, Georgia. Our major owned facilities in the United States are subject to mortgages securing our 2019 Credit Facilities.

The following table summarizes information about our principal plants and other materially important physical properties as of January 31, 2020:

Location	Segment	Ownership	Use
Ball Ground, Georgia, U.S.	Corporate	Leased	Office
Luxembourg, Luxembourg	Corporate	Leased	Office
Chennai, India	D&S East	Owned	Manufacturing/Office
Decin, Czech Republic	D&S East	Owned	Manufacturing/Office
Goch, Germany	D&S East	Owned	Manufacturing/Office
Kuala Lumpur, Malaysia	D&S East	Leased	Marketing & Sales/Office
Lery, France	D&S East	Owned	Manufacturing/Office
Changzhou, China	D&S East	Owned	Manufacturing/Office
Milan, Italy	D&S East and E&C Cryogenics	Leased/Owned	Manufacturing/Office
Canton, Georgia, U.S.	D&S West	Leased/Owned	Manufacturing/Office/Service
Chengdu, China	D&S West	Owned	Manufacturing/Office
New Prague, Minnesota, U.S.	D&S West	Leased/Owned	Manufacturing/Office/Service
Houston, Texas, U.S.	D&S West and E&C Cryogenics	Leased/Owned	Manufacturing/Office/Service
Franklin, Indiana, U.S.	E&C Cryogenics	Leased	Manufacturing/Office/Service
La Crosse, Wisconsin, U.S.	E&C Cryogenics	Owned	Manufacturing/Office
New Iberia, Louisiana, U.S.	E&C Cryogenics	Leased	Manufacturing
The Woodlands, Texas, U.S.	E&C Cryogenics	Leased	Office
Beasley, Texas, U.S.	E&C FinFans	Owned	Manufacturing/Office
Changshu, China (1)	E&C FinFans	Leased	Manufacturing/Office
Monterey, Mexico	E&C FinFans	Owned	Manufacturing/Office
Pombia, Italy	E&C FinFans	Leased	Manufacturing/Office
Tulsa, Oklahoma, U.S.	E&C FinFans	Leased/Owned	Manufacturing/Office

(1) This facility is designated for closure April 30, 2020.

Regulatory Environment

We are subject to federal, state, and local regulations relating to the discharge of materials into the environment, production and handling of hazardous and regulated materials, and the conduct and condition of our production facilities. We do not believe that these regulatory requirements have had a material effect upon our capital expenditures, earnings, or competitive position. We are not anticipating any material capital expenditures in 2020 that are directly related to regulatory compliance matters. We are also not aware of any pending or potential regulatory changes that would have a material adverse impact on our business.

Item 3. *Legal Proceedings*

Stainless Steel Cryobiological Tank Legal Proceedings

During the second quarter of 2018, Chart was named in lawsuits (including a class action lawsuit filed in the U.S. District Court for the Northern District of California) filed against Chart and other defendants with respect to the alleged failure of a stainless steel cryobiological storage tank (model MVE 808AF-GB) at the Pacific Fertility Center in San Francisco, California. We continue to evaluate the merits of such claims in light of the information available to date regarding use, maintenance and operation of the tank which has been out of our custody for the past six years when it was sold to the Pacific Fertility Center through an independent distributor. Accordingly, an accrual related to any damages that may result from the lawsuits has not been recorded because a potential loss is not currently probable or estimable.

We have asserted various defenses against the claims in the lawsuits, including a defense that since manufacture, we were not in any way involved with the installation, ongoing maintenance or monitoring of the tank or related fertility center cryogenic systems at any time since the initial delivery of the tank.

Aluminum Cryobiological Tank Legal Proceeding

Chart has been named in a purported class action lawsuits filed during the second quarter of 2018 in the Ontario Superior Court of Justice against the Company and other defendants with respect to the alleged failure of an aluminum cryobiological storage tank (model FNL XC 47/11-6 W/11) at The Toronto Institute for Reproductive Medicine in Etobicoke, Ontario. A settlement has been reached by the parties in the lawsuit with no material effect on the Company's financial position, results of operations or cash flows.

We are occasionally subject to various legal claims related to performance under contracts, product liability, environmental liability, taxes, employment, intellectual property, and other matters, several of which claims assert substantial damages in the ordinary course of our business. Based on our historical experience in litigating these claims, as well as our current assessment of the underlying merits of the claims and applicable insurance, if any, we believe the resolution of these legal claims will not have a material adverse effect on our financial position, liquidity, cash flows or results of operations. Future developments may, however, result in resolution of these legal claims in a way that could have a material adverse effect. See Item 1A. "Risk Factors."

Item 4. *Mine Safety Disclosures*

Not applicable.

Item 4A. *Executive Officers of the Registrant**

The name, age and positions of each Executive Officer of the Company as of February 14, 2020 are as follows:

Name	Age	Position
Jillian C. (Jill) Evanko	42	Chief Executive Officer, President, Chief Financial Officer and Treasurer
John Bishop	46	Chief Operating Officer
Gerald F. (Gerry) Vinci	54	Vice President, Chief Human Resources Officer
Herbert G. Hotchkiss	49	Vice President, General Counsel and Secretary

* Included pursuant to Instruction 3 to Item 401(b) of Regulation S-K.

Jillian C. (Jill) Evanko was appointed Chief Executive Officer and President on June 12, 2018 and served as Chief Financial Officer from March 1, 2017 until January 14, 2019 and more recently, since August 29, 2019, has also served as Chief Financial Officer and Treasurer. Ms. Evanko joined Chart on February 13, 2017 as Vice President of Finance. Prior to joining Chart, Ms. Evanko served as the Vice President and Chief Financial Officer of Truck-Lite Co., LLC, a manufacturer of lighting and specialty products for the truck and commercial vehicle industries, since October 2016. Prior to that, she held multiple executive positions at Dover Corporation, a diversified global manufacturer, and its subsidiaries, including the role of Vice President and Chief Financial Officer of Dover Fluids since January 2014. Prior to joining Dover in 2004, Ms. Evanko worked in valuation services at Arthur Andersen, LLP and also held audit and accounting roles for Honeywell and Sony Corporation of America. Ms. Evanko also serves as a director of Alliant Energy (NASDAQ: LNT).

John Bishop was appointed Chief Operating Officer on August 21, 2019. Prior to joining Chart, Mr. Bishop served as Head of Morgan Stanley's Global Oilfield Services and a member of the North American Upstream team. Mr. Bishop joined Morgan Stanley, a multinational investment bank and financial services company, in 2012. Prior to joining Morgan Stanley, Mr. Bishop spent 10 years with Citigroup's Global Energy Group. Prior to working for Citigroup, Mr. Bishop worked for Deloitte Consulting and Motorola.

Gerald F. (Gerry) Vinci was appointed our Vice President and Chief Human Resources Officer and has served in that capacity since December 5, 2016, when he joined Chart. Mr. Vinci was designated an executive officer of Chart on August 23, 2017. Prior to joining Chart, Mr. Vinci held various executive Human Resources roles at Dover Corporation, a diversified global manufacturer, from February 2013 to November 2016, including Vice President, Human Resources for Dover Engineered Systems and Dover Refrigeration and Food Equipment Segments. From 1997 to 2013, Mr. Vinci served in numerous Human Resources executive roles and as Senior Counsel for Harsco Corporation. Prior to that, Mr. Vinci was an attorney for Sunoco, Inc.

Herbert G. Hotchkiss was appointed Vice President, General Counsel and Secretary on March 3, 2019. Prior to joining Chart, Mr. Hotchkiss spent over 11 years at Truck-Lite Co., LLC, a manufacturer of lighting and specialty products for the truck and commercial vehicle industries, as Vice President and Corporate Counsel. Prior to joining Truck-Lite, Mr. Hotchkiss worked for Blair Corporation as its Vice President and General Counsel. Prior to joining Blair Corporation, Mr. Hotchkiss was employed as a Cleveland attorney, working as corporate associate at Calfee, Halter & Griswold LLP and Hahn, Loeser & Parks LLP.

PART II

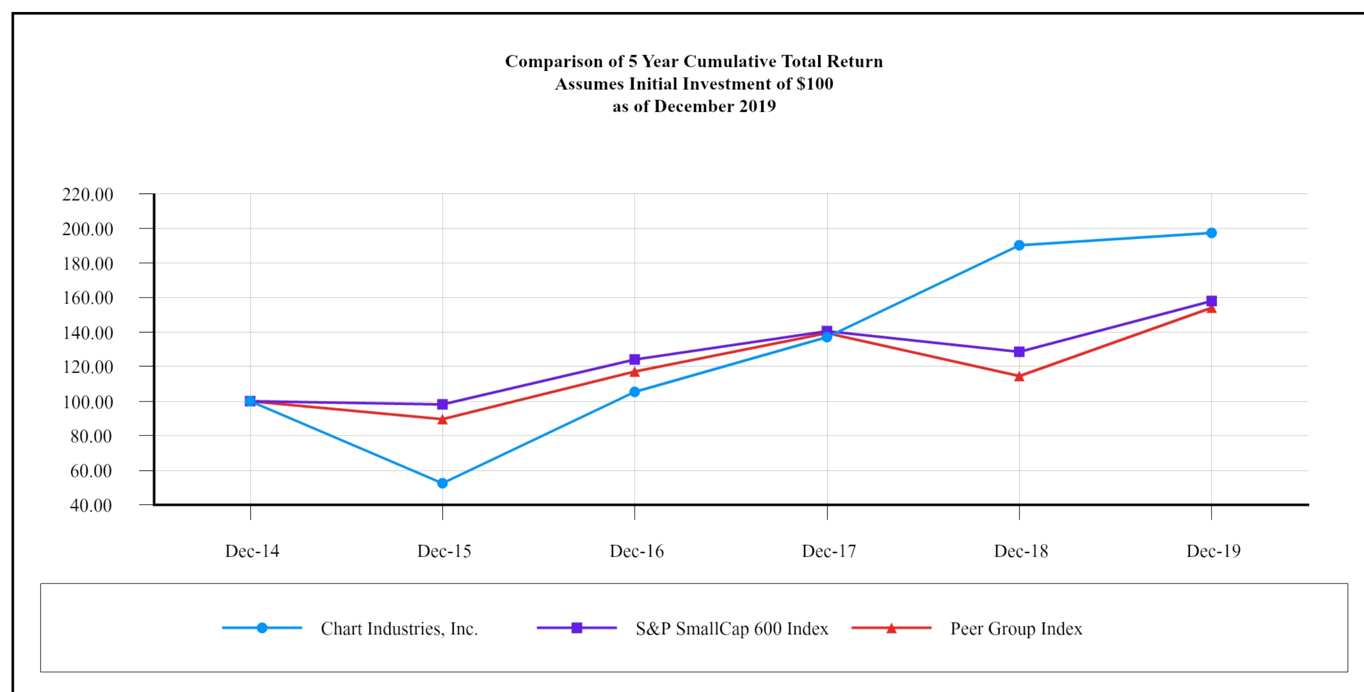
Item 5. ***Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities***

Chart's common stock is traded on the NASDAQ Global Select Market under the symbol "GTLS." As of February 1, 2020, there were 168 holders of record of our common stock. Since many holders hold shares in "street name," we believe that there are a significantly larger number of beneficial owners of our common stock than the number of record holders.

We do not currently intend to pay any cash dividends on our common stock, and instead intend to retain earnings, if any, for debt reduction, organic capital expenditures for productivity and capacity and potential acquisitions. The amounts available to us to pay future cash dividends may be restricted by our 2019 Credit Facilities to the extent our pro forma leverage ratio exceeds certain targets. Any decision to declare and pay dividends in the future will be made at the discretion of our board of directors and will depend on, among other things, our results of operations, financial condition, cash requirements, contractual restrictions, and other factors that our board of directors may deem relevant.

Cumulative Total Return Comparison

Set forth below is a line graph comparing the cumulative total return of a hypothetical investment in the shares of common stock of Chart with the cumulative return of a hypothetical investment in each of the S&P SmallCap 600 Index and our Peer Group Index based on the respective market prices of each such investment on the dates shown below, assuming an initial investment of $100 on December 31, 2014, including reinvestment of dividends, if any.



	December 31,					
	2014	2015	2016	2017	2018	2019
Chart Industries, Inc.	**$ 100.00**	**$ 52.51**	**$ 105.32**	**$ 137.02**	**$ 190.15**	**$ 197.34**
S&P SmallCap 600 Index	100.00	98.03	124.06	140.48	128.56	157.85
Peer Group Index	100.00	89.67	117.14	139.30	114.40	154.09

We select the peer companies that comprise the Peer Group Index solely on the basis of objective criteria. These criteria result in an index composed of oil field equipment/service and other comparable industrial companies. The Peer Group Index is comprised of Acuity Brands, Inc., Barnes Group Inc., Circor International, Inc., Colfax Corp., Enpro Industries Inc., Esco Technologies Inc., Graco Inc., Harsco Corporation, Idex Corp., Nordson Corporation, SPX Corporation and Worthington Industries, Inc.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

During the fourth quarter of 2019, 458 shares of common stock were surrendered to us by participants under our share-based compensation plans to satisfy tax withholding obligations relating to the vesting or payment of equity awards for an aggregate purchase price of approximately $26,400. The total number of shares repurchased represents the net shares issued to satisfy tax withholdings. All such repurchased shares were subsequently retired during the three months ended December 31, 2019.

	Issuer Purchases of Equity Securities					
Period	**Total Number of Shares Purchased**	**Average Price Paid Per Share**		**Total Number of Shares Purchased As Part of Publicly Announced Plans or Programs**	**Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs**	
October 1 — 31, 2019	138	$	59.99	—	$	—
November 1 — 30, 2019	154		57.56	—		—
December 1 — 31, 2019	166		55.85	—		—
Total	458	$	57.67	—	$	—

Item 6. *Selected Financial Data*

The following table sets forth selected historical consolidated financial information as of the dates and for each of the periods indicated. We selected historical financial consolidated data as of and for the years ended December 31, 2019, 2018 and 2017 derived from our audited financial statements for such periods incorporated by reference into Item 8 of this Annual Report on Form 10-K, which have been audited by Deloitte & Touche, LLP for the year ended December 31, 2019 and Ernst & Young LLP for the remaining years. We selected historical financial consolidated data as of and for the years ended December 31, 2016 and 2015 derived from our audited financial statements for such periods, which have been modified in order to conform to the discontinued operations presentation as further discussed in our consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K.

The following table should be read together with Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and related notes included under Item 15. "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K (all dollar amounts in millions, except per share data):

	Year Ended December 31,				
	2019	2018	2017	2016	2015
Statements of Operations Data:					
Sales [1] [2] [3]	$ 1,299.1	$ 1,084.3	$ 842.9	$ 722.0	$ 883.2
Cost of sales [4]	962.3	788.4	611.3	512.3	631.1
Gross profit	336.8	295.9	231.6	209.7	252.1
Operating expenses [5] [6] [7] [8] [9] [10]	255.9	203.8	193.1	167.5	174.8
Asset impairments	—	—	—	1.2	151.8
Operating income (loss) [1] [2] [3]	80.9	92.1	38.5	41.0	(74.5)
Interest expense, net (including deferred financing costs amortization)	28.3	22.7	18.6	16.4	13.9
Loss on extinguishment of debt [11]	—	—	4.9	—	—
Foreign currency (gain) loss	(0.2)	0.4	3.9	0.5	2.0
Other expenses, net	28.1	23.1	27.4	16.9	15.9
Income (loss) before income taxes	52.8	69.0	11.1	24.1	(90.4)
Income tax expense (benefit), net [12]	6.0	13.4	(16.6)	10.6	8.3
Net income (loss) from continuing operations	46.8	55.6	27.7	13.5	(98.7)
Income (loss) from discontinued operations, net of tax [13]	—	34.4	1.8	11.2	(105.8)
Net income (loss)	46.8	90.0	29.5	24.7	(204.5)
Less: Income (loss) attributable to noncontrolling interests, net of taxes	0.4	2.0	1.5	(3.5)	(1.5)
Net income (loss) attributable to Chart Industries, Inc.	$ 46.4	$ 88.0	$ 28.0	$ 28.2	$ (203.0)

	Year Ended December 31,				
	2019	2018	2017	2016	2015
Earnings Per Share Data:					
Basic earnings (loss) per common share attributable to Chart Industries, Inc.					
Income (loss) from continuing operations	$ 1.37	$ 1.73	$ 0.85	$ 0.55	$ (3.19)
Income (loss) from discontinued operations	—	1.10	0.06	0.37	(3.47)
Net income (loss) attributable to Chart Industries, Inc.	$ 1.37	$ 2.83	$ 0.91	$ 0.92	$ (6.66)
Diluted earnings (loss) per common share attributable to Chart Industries, Inc.					
Income (loss) from continuing operations	$ 1.32	$ 1.67	$ 0.84	$ 0.55	$ (3.19)
Income (loss) from discontinued operations	—	1.06	0.05	0.36	(3.47)
Net income (loss) attributable to Chart Industries, Inc.	$ 1.32	$ 2.73	$ 0.89	$ 0.91	$ (6.66)
Weighted-average shares — basic	33.91	31.05	30.74	30.58	30.49
Weighted-average shares — diluted [14]	35.17	32.20	31.34	30.98	30.49
Cash Flow Data:					
Cash provided by operating activities	$ 133.9	$ 119.0	$ 44.3	$ 169.3	$ 98.4
Cash used in investing activities	(642.7)	(260.6)	(477.8)	(17.0)	(70.2)
Cash provided by financing activities	511.6	38.2	275.2	7.7	0.4
Cash provided by (used in) discontinued operations	—	102.5	0.5	0.4	(0.7)
Other Financial Data:					
Depreciation and amortization, including deferred financing costs amortization [15]	$ 81.8	$ 52.1	$ 38.9	$ 34.4	$ 36.2

	As of December 31,				
	2019	2018	2017	2016	2015
Balance Sheet Data:					
Cash and cash equivalents	$ 119.0	$ 118.1	$ 122.6	$ 282.0	$ 123.7
Working capital [16]	192.6	177.0	73.0	60.4	139.1
Goodwill [17] [18] [19]	844.9	520.7	459.7	208.9	209.3
Identifiable intangible assets, net [17] [18] [19]	529.1	330.4	286.4	74.5	84.8
Total assets [17] [18] [19]	2,481.4	1,897.7	1,724.7	1,233.0	1,200.1
Long-term debt	761.0	533.2	439.2	233.7	213.8
Total debt [20]	777.3	544.4	498.1	240.2	220.0
Chart Industries, Inc. shareholders' equity	1,227.6	884.5	802.2	697.2	670.6

(1) Includes sales and operating income for AXC in the E&C FinFans segment results since the acquisition date, July 1, 2019 as follows:

- Sales were $103.1 for the year ended December 31, 2019, and
- Operating income was $4.6 for the year ended December 31, 2019, which included $18.4 of depreciation and amortization expense.

(2) Includes sales and operating (loss) income for VRV in the D&S East and E&C Cryogenics segments results since the acquisition date, November 15, 2018 as follows:

- Sales were $104.0 (D&S East: $57.1, E&C Cryogenics: $46.9) for the year ended December 31, 2019,
- Sales were $14.1 (D&S East: $10.3, E&C Cryogenics: $3.8) for the year ended December 31, 2018,
- Operating loss was $11.2 (D&S East: $9.7, E&C Cryogenics: $1.5) for the year ended December 31, 2019, and
- Operating (loss) income was $(2.0) (D&S East: $0.2, E&C Cryogenics: $(2.2)) for the year ended December 31, 2018, which included $1.5 of depreciation and amortization expense and $1.6 in expense recognized in the cost of sales related to inventory step-up.

(3) Includes sales and operating income for Hudson in the E&C FinFans segment results since the acquisition date, September 20, 2017 as follows:

- Sales were $180.3 and $58.0 for the years ended December 31, 2018 and 2017, respectively, and
- Operating income was $19.0 and $6.4 for the years ended December 31, 2018 and 2017, respectively.

(4) Cost of sales includes restructuring costs of $12.2, $0.8, $2.7, $3.5 and $2.9 for the years ended December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(5) Operating expenses include selling, general and administrative expenses and amortization expense. Amortization expense related to intangible assets was $39.8, $21.9, $12.2, $8.8 and $9.2 for the years ended December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(6) Includes an expense of $4.0 recorded to cost of sales related to the estimated costs of the aluminum cryobiological tank recall for the year ended December 31, 2018.

(7) Operating income (loss) includes restructuring costs of $15.6, $4.4, $11.2, $9.5 and $6.4 for the years ended December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(8) Includes transaction-related costs of $5.4 for the year ended December 31, 2019, which were mainly related to the AXC acquisition. Includes integration costs of $1.6 related to the AXC acquisition for the year ended December 31, 2019.

(9) Includes transaction-related costs of $2.1, $10.1, $0.4 and $0.7 for the years ended December 31, 2018, 2017, 2016 and 2015, respectively.

(10) During the year ended December 31, 2018, we recorded net severance costs of $2.3 primarily related to headcount reductions associated with the strategic realignment of our segment structure, which includes $1.8 in payroll severance costs partially offset by a $0.9 credit due to related share-based compensation forfeitures for 2018. Includes net severance costs of $1.4 related to the departure of our former CEO, which includes $3.2 in payroll severance costs partially offset by a $1.8 credit due to related share-based compensation forfeitures for 2018.

(11) During the year ended December 31, 2017, we recorded a $4.9 loss on extinguishment of debt associated with the repurchase of $192.9 principal amount of our $250.0 2.00% convertible notes due August 2018 and refinance of our senior secured revolving credit facility.

(12) Includes a one-time $22.5 net favorable tax benefit that was recorded during the fourth quarter of 2017, which resulted from the enactment of the Tax Cuts and Jobs Act. This benefit mainly consisted of a one-time, provisional benefit of $26.9 related to the remeasurement of certain of our deferred tax liabilities using the lower U.S. federal corporate tax rate of 21%. This was partially offset by (i) a one-time, provisional charge of $8.7 related to the deemed repatriation transition tax, which is a tax on previously untaxed accumulated earnings and profits of certain of our foreign subsidiaries, and (ii) a one-time tax expense and tax benefit of $4.5 and $8.7, respectively, related to our intent to amend pre-acquisition Hudson U.S. federal tax returns. We have completed our analysis to determine the effect of the Tax Cuts and Jobs Act, and as such, we have recorded an additional tax benefit of $1.8 million.

(13) Includes gain on sale of the CAIRE business of $34.3, net of taxes of $2.6, for the year ended December 31, 2018.

(14) Zero incremental shares from share-based awards are included in the computation of diluted net loss per share for periods in which a net loss occurs, because to do so would be anti-dilutive.

(15) Includes deferred financing costs amortization of $3.0 for the year ended December 31, 2019 and $1.3 for each of the years ended December 31, 2018, 2017 and 2016 and 2015.

(16) Working capital is defined as current assets excluding cash and cash equivalents minus current liabilities excluding short-term debt and current portion of long-term debt (including current convertible notes, if applicable).

(17) Total assets at December 31, 2017 included $572.8 related to Hudson of which $238.3 and $211.0 represented acquired goodwill and intangible assets, net, respectively. For further information, see Note 13, "Business Combinations," in the consolidated financial statements located elsewhere in this report.

(18) Total assets at December 31, 2018 included $327.8 related to VRV of which $64.0 and $66.4 represented acquired goodwill and identifiable intangible assets, net, respectively. For further information, see Note 13, "Business Combinations," in the consolidated financial statements located elsewhere in this report.

(19) Total assets at December 31, 2019 included $593.8 related to AXC of which $287.5 and $256.4 represented acquired goodwill and identifiable intangible assets, net, respectively. For further information, see Note 13, "Business Combinations," in the consolidated financial statements located elsewhere in this report.

(20) Total debt at December 31, 2019 includes $212.2 convertible notes due November 2024, net of unamortized discount and debt issuance costs, $560.7 senior secured revolving credit facility and term loan, net of debt issuance costs and $4.4 foreign facilities. At December 31, 2019 current maturities were $15.7.

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

The following discussion of our results of operations and financial condition should be read in conjunction with the "Selected Financial Data" section and our consolidated financial statements and related notes appearing elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements. Actual results may differ materially from those discussed below. See "Forward-Looking Statements" at the end of this discussion and Item 1A. "Risk Factors" for a discussion of the uncertainties, risks and assumptions associated with this discussion.

Overview

We are a leading diversified global manufacturer of highly engineered equipment servicing multiple market applications in energy and industrial gas. Our equipment and engineered systems are primarily used for low-temperature and cryogenic applications utilizing our expertise in cryogenic systems and equipment which operate at low temperatures sometimes approaching absolute zero (0 Kelvin; -273° Centigrade; -459° Fahrenheit).

Strategic Update

On July 1, 2019, we completed the acquisition of AXC pursuant to the previously disclosed Asset Purchase Agreement dated May 8, 2019 (the "AXC acquisition"). AXC is a leading supplier of custom-engineered and ACHX for the natural gas compression and processing industry and refining and petrochemical industry in the United States. The ACHX offered by AXC is used in conditioning natural gas during recovery, compression and transportation from underground reserves through major pipeline distribution channels. In addition to natural gas compression and processing, AXC's products are also used in the turbine lube oil cooling, landfill gas compression and liquids cooling industries. AXC's end markets include process industries, power generation and refineries. The acquisition of AXC reinforces our strategic focus on core cryogenic engineering and products for the industrial gas and energy spaces. We expect the acquisition of AXC to result in significant annual cost synergies. During our first six months of ownership, we have completed projects, which will achieve over $20 million of cost synergies. Furthermore, we have identified another $9 million of target cost synergies, which will be achieved in addition to the $20 million achieved in the first year. The AXC acquisition is further described in Note 13, "Business Combinations," to our consolidated financial statements included under Item 15, "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K.

The purchase price for AXC was $599.7 million, including post-closing purchase price adjustments with respect to working capital. We paid $592.0 million of the purchase price at closing and the final working capital adjustment of $7.7 million was paid during the third quarter of 2019. We incurred $5.4 million in transaction related costs related to the AXC acquisition which were recorded in selling, general and administrative expenses on the consolidated statement of income. We funded the purchase price for the AXC acquisition with proceeds from the Chart common stock public offering (the "2019 Equity Offering") and borrowings under the Fourth Amended and Restated Credit Agreement, which includes a senior secured revolving credit facility (the "SSRCF") and a term loan (together, the "2019 Credit Facilities") as further discussed in Liquidity and Capital Resources.

Upon closing of our acquisition of AXC, effective July 1, 2019, we changed our reportable segments from three segments to four segments: D&S East, D&S West, E&C Cryogenics and E&C FinFans. AXC was combined with Chart's Hudson Products and Cooler Service businesses from the prior E&C segment to create a new segment called E&C FinFans. The E&C FinFans segment is focused on our unique and broad product offering and capabilities in ACHX and fans. E&C Cryogenics supplies mission critical engineered equipment and systems used in the separation, liquefaction, and purification of hydrocarbon and industrial gases that span gas-to-liquid applications.

The financial information presented and discussion of results that follows is presented on a continuing operations basis. All prior period amounts presented below have been reclassified based on our current reportable segments.

2019 Highlights

Broad based global LNG infrastructure build-out, specialty markets and significant synergies from the combination of Chart, VRV and AXC contributed to our order strength and further margin expansion. Orders in 2019 of $1,412.9 million, a record for Chart, increased 23.7% compared to 2018 (10.8% organically) with each segments' orders increasing year-over-year.

Sales in 2019 of $1,299.1 million increased 19.8% compared to 2018 (2.0% organically), with increases across all segments including double-digit increases in our D&S East, E&C Cryogenics and E&C FinFans segments. Sales for AXC, included in the E&C FinFans segment results since the July 1, 2019 acquisition date, were $103.1 million for the year ended December 31, 2019. Sales for VRV, included in both the E&C Cryogenics and D&S East segment results since the November 15, 2018 acquisition date, were $104.0 million and $14.1 million for the years ended December 31, 2019 and 2018, respectively.

Outlook

Our 2020 full year outlook reflects a record backlog heading into 2020, which includes LNG infrastructure orders already booked. We continue to expect orders between $700 million and $1 billion related to additional large-scale LNG projects in 2020, in particular, Tellurian Inc.'s Driftwood LNG, previously announced, and Cheniere Energy Inc.'s Corpus Christi Stage Three LNG export terminal. A majority of upcoming projects for U.S. LNG export have transitioned from utilizing traditional single train baseload plants to multi-train mid-scale projects, with a modular approach to achieve baseload capacities. This is important to us because multi-train mid-scale projects, such as Driftwood LNG, may use Chart's patented IPSMR® technology as well as our brazed aluminum heat exchangers and cold boxes as the main liquefaction heat exchanger technology.

We continue to invest in our automation, process improvement, and productivity activities across Chart, with total anticipated 2020 capital investment of $35.0 million to $40.0 million. The total anticipated 2020 capital spend is inclusive of investment in expanding our India manufacturing capabilities and completing the LNG vehicle tank line in Italy.

Operating Results

The following table sets forth the percentage relationship that each line item in our consolidated statements of income represents to sales for the years ended December 31, 2019, 2018 and 2017 (dollars in millions):

	2019	2018	2017
Sales	100.0%	100.0%	100.0%
Cost of sales (1) (2)	74.1	72.7	72.5
Gross profit	25.9	27.3	27.5
Selling, general and administrative expenses (3) - (8)	16.6	16.8	21.5
Amortization expense	3.1	2.0	1.4
Operating income (9)	6.2	8.5	4.6
Interest expense, net (10) (11)	1.9	2.0	2.1
Loss on extinguishment of debt (12)	—	—	0.6
Financing costs amortization	0.2	0.1	0.2
Foreign currency loss	—	—	0.5
Income tax expense (benefit), net (9)	0.5	1.2	(2.0)
Net income from continuing operations	3.6	5.1	3.3
Income from discontinued operations, net of tax	—	3.2	0.2
Net income	3.6	8.3	3.5
Income attributable to noncontrolling interests, net of taxes	—	0.2	0.2
Net income attributable to Chart Industries, Inc.	3.6	8.1	3.3

(1) Cost of sales includes restructuring costs of $12.2, $0.8 and $2.7 for the years ended December 31, 2019, 2018 and 2017, respectively.

(2) Includes an expense of $4.0 recorded to cost of sales related to the estimated costs of the aluminum cryobiological tank recall for the year ended December 31, 2018.

(3) Selling, general and administrative expenses includes restructuring costs of $3.4, $3.6 and $8.5 for the years ended December 31, 2019, 2018 and 2017, respectively.

(4) Includes transaction-related costs of $5.4 for the year ended December 31, 2019, which were mainly related to the AXC acquisition. Includes integration costs of $1.6 related to the AXC acquisition for the year ended December 31, 2019.

(5) Includes transaction-related costs of $2.1 for the year ended December 31, 2018, which were mainly related to the VRV acquisition. Includes integration costs of $2.7 and $0.8 related to the VRV acquisition for the years ended December 31, 2019 and 2018 respectively.

(6) Includes transaction-related costs of $10.1 for the year ended December 31, 2017.

(7) During the year ended December 31, 2018, we recorded net severance costs of $2.3 primarily related to headcount reductions associated with the strategic realignment of our segment structure, which includes $1.8 in payroll severance costs partially offset by a $0.9 credit due to related share-based compensation forfeitures for 2018. Includes net severance costs of $1.4 related to the departure of our former CEO, which includes $3.2 in payroll severance costs partially offset by a $1.8 credit due to related share-based compensation forfeitures for 2018.

(8) Includes share-based compensation expense of $9.0, $4.9 and $10.6, representing 0.7%, 0.5% and 1.3% of sales, for the years ended December 31, 2019, 2018 and 2017, respectively.

(9) Includes a one-time $22.5 net favorable tax benefit that was recorded during the fourth quarter of 2017, which resulted from the enactment of the Tax Cuts and Jobs Act. This benefit mainly consisted of a one-time, provisional benefit of $26.9 related to the remeasurement of certain of our deferred tax liabilities using the lower U.S. federal corporate tax rate of 21%. This was partially offset by (i) a one-time, provisional charge of $8.7 related to the deemed repatriation transition tax, which is a tax on previously untaxed accumulated earnings and profits of certain of our foreign subsidiaries, and (ii) a one-time tax expense and tax benefit of $4.5 and $8.7, respectively, related to our intent to amend pre-acquisition Hudson U.S. federal tax returns. We have completed our analysis to determine the effect of the Tax Cuts and Jobs Act, and as such, we have recorded an additional tax benefit of $1.8.

(10) Includes $7.6 and $7.2 of non-cash interest accretion expense related to the carrying amount of the 1.00% Convertible Senior Subordinated Notes due November 2024 (the “2024 Notes”), representing 0.6% and 0.7% of sales for the years ended December 31, 2019 and 2018, respectively.

(11) Includes $1.9 and $11.8 of non-cash interest accretion expense related to the carrying amount of the 2.00% Convertible Senior Subordinated Notes due August 2018 (the “2018 Notes”), representing 0.2%, and 1.4% of sales, for the years ended December 31, 2018 and 2017, respectively.

(12) During the year ended December 31, 2017, we recorded a $4.9 loss on extinguishment of debt associated with the repurchase of $192.9 principal amount of our 2018 Notes and refinance of our senior secured revolving credit facility.

Consolidated Results for the Years Ended December 31, 2019, 2018 and 2017

The following table includes key metrics used to evaluate our business and measure our performance and represents selected financial data for our operating segments for the years ended December 31, 2019, 2018 and 2017 (dollars in millions). Further detailed information regarding our operating segments is presented in Note 4, "Segment and Geographic Information," of the consolidated financial statements included under Item 15 "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K.

Selected Segment Financial Information

	Year Ended December 31,		
	2019	2018	2017
Sales			
D&S East	$ 293.4	$ 246.3	$ 232.3
D&S West	461.7	455.5	400.6
E&C Cryogenics	190.2	136.9	125.5
E&C FinFans	361.7	253.6	100.1
Intersegment eliminations	(7.9)	(8.0)	(15.6)
Consolidated	$ 1,299.1	$ 1,084.3	$ 842.9
Gross Profit			
D&S East	$ 45.2	$ 52.4	$ 48.3
D&S West [1]	157.9	156.8	141.8
E&C Cryogenics	33.5	28.6	23.6
E&C FinFans	102.5	60.6	21.5
Intersegment eliminations	(2.3)	(2.5)	(3.6)
Consolidated	$ 336.8	$ 295.9	$ 231.6
Gross Profit Margin			
D&S East	15.4%	21.3%	20.8 %
D&S West	34.2%	34.4%	35.4 %
E&C Cryogenics	17.6%	20.9%	18.8 %
E&C FinFans	28.3%	23.9%	21.5 %
Consolidated	25.9%	27.3%	27.5 %
SG&A Expenses			
D&S East	$ 34.7	$ 31.6	$ 33.0
D&S West	48.7	51.0	52.0
E&C Cryogenics	28.7	23.3	23.4
E&C FinFans	33.6	24.8	10.9
Corporate	70.4	51.2	61.6
Consolidated	$ 216.1	$ 181.9	$ 180.9
SG&A Expenses (% of Sales)			
D&S East	11.8%	12.8%	14.2 %
D&S West	10.5%	11.2%	13.0 %
E&C Cryogenics	15.1%	17.0%	18.6 %
E&C FinFans	9.3%	9.8%	10.9 %
Consolidated	16.6%	16.8%	21.5 %
Operating Income (Loss) [1] [2]			
D&S East	$ 6.9	$ 19.3	$ 14.2
D&S West	104.5	101.2	85.2
E&C Cryogenics	1.6	1.8	(2.1)
E&C FinFans	40.6	23.7	7.2
Corporate [3] [4] [5] [6]	(70.4)	(51.4)	(62.4)
Intersegment eliminations	(2.3)	(2.5)	(3.6)
Consolidated	$ 80.9	$ 92.1	$ 38.5
Operating Margin			
D&S East	2.4%	7.8%	6.1 %
D&S West	22.6%	22.2%	21.3 %
E&C Cryogenics	0.8%	1.3%	(1.7)%
E&C FinFans	11.2%	9.3%	7.2 %
Consolidated	6.2%	8.5%	4.6 %

(1) Includes an expense of $4.0 recorded to cost of sales in D&S West related to the estimated costs of the aluminum cryobiological tank recall for the year ended December 31, 2018.

(2) Restructuring costs for the years ended:

- December 31, 2019 were $15.6 ($8.5 - D&S East, $0.9 - D&S West, $2.5 - E&C Cryogenics, $3.5 - E&C FinFans, and $0.2 - Corporate);
- December 31, 2018 were $4.4 ($1.4 - D&S East, $0.6 - E&C Cryogenics, $0.1 - E&C FinFans, and $2.3 - Corporate); and
- December 31, 2017 were $11.2 ($1.7 - D&S East, $1.1 - D&S West, $2.1 - E&C Cryogenics, $0.3 - E&C FinFans, and $6.0 - Corporate).

(3) Includes transaction-related costs of $5.4 in Corporate for the year ended December 31, 2019, which were mainly related to the AXC acquisition. Includes integration costs of $1.6 in Corporate related to the AXC acquisition for the year ended December 31, 2019.

(4) Includes transaction-related costs of $2.1 in Corporate for the year ended December 31, 2018, which were mainly related to the VRV acquisition. Includes integration costs of $2.7 and $0.8 in Corporate related to the VRV acquisition for the years ended December 31, 2019 and 2018 respectively.

(5) Includes transaction-related costs of $10.1 for the year ended December 31, 2017.

(6) During the year ended December 31, 2018, we recorded net severance costs of $2.3 in Corporate primarily related to headcount reductions associated with the strategic realignment of our segment structure, which includes $1.8 in payroll severance costs partially offset by a $0.9 credit due to related share-based compensation forfeitures for 2018. Includes net severance costs of $1.4 in Corporate related to the departure of our former CEO, which includes $3.2 in payroll severance costs partially offset by a $1.8 credit due to related share-based compensation forfeitures for 2018.

Results of Operations for the Years Ended December 31, 2019 and 2018

Sales in 2019 increased $214.8 million from $1,084.3 million to $1,299.1 million, or 19.8% (2.0% organically), with increases across all segments as compared to 2018. AXC sales of $103.1 million are included in the E&C FinFans segment results since the July 1, 2019 acquisition date. Sales for VRV in 2019, included in both the D&S East and E&C Cryogenics segment results since the November 15, 2018 acquisition date were $104.0 million (D&S East: $57.1 million, E&C Cryogenics: $46.9 million) as compared to $14.1 million (D&S East: $10.3 million, E&C Cryogenics: $3.8 million) in 2018. Excluding the impact of AXC and VRV, sales growth was primarily driven by axial flow fans sales in our E&C FinFans segment and an increase in sales within our D&S West segment related to systems and cryobiological storage products, which was partially offset by a decline in packaged gas.

Gross profit in 2019 increased $40.9 million or 13.8% (1.4% organically) compared to 2018. AXC gross profit of $29.2 million is included in 2019, and gross profit for VRV was $8.5 million and $1.0 million in 2019 and 2018, respectively. Excluding AXC and VRV, gross profit increased by $4.2 million. Gross profit included restructuring costs of $12.2 million and $0.8 million for the year ended December 31, 2019 and 2018, respectively, which during 2019 were related to cost reduction or avoidance actions, including facility consolidations in D&S West, E&C Cryogenics and E&C FinFans and a streamlining of the commercial activities surrounding our after market services business in E&C Cryogenics, geographic realignment of our manufacturing capacity and a facility closure in D&S East, as well as departmental restructuring, including headcount reductions in each of these segments. We anticipate these restructuring actions will result in incremental annualized savings of $14.3 million. Excluding the impact of the AXC and VRV acquisitions and restructuring costs, gross profit increased by $15.6 million primarily driven by higher volume of axial flow fans sales within our E&C FinFans segment. Gross margin as a percent of sales was 25.9% for the year ended December 31, 2019 which decreased from 27.3% in 2018. Excluding the impact of the AXC and VRV acquisitions and restructuring costs, gross margin as a percent of sales was 28.5% for the year ended December 31, 2019 which increased from 27.6% in the same period in 2018.

SG&A expenses increased by $34.2 million ($11.5 million organically), or 18.8% (6.4% organically), in 2019 compared to 2018, AXC SG&A expenses of $7.8 million is included in 2019, and VRV SG&A expenses of $16.9 million and $2.0 million for 2019 and 2018, respectively. Furthermore, restructuring costs related to the acquisitions of AXC and VRV were $3.4 million for the year ended December 31, 2019. Excluding the impact of restructuring costs, SG&A expenses were 16.4% of sales for the year ended December 31, 2019 compared to 16.4% for the year ended December 31, 2018.

Interest Expense, Net and Financing Costs Amortization

Net interest expense for the year ended December 31, 2019 and 2018 was $25.3 million and $21.4 million, respectively. Interest expense for the year ended December 31, 2019 included $2.6 million of 1.0% cash interest and $7.6 million of non-cash interest accretion expense related to the carrying value of the convertible notes due 2024, and $15.9 million in interest related to borrowings on our previous and current senior secured revolving credit facility and term loan. For 2019 and 2018, financing costs amortization was $3.0 million and $1.3 million, respectively. The increase of $1.7 million was primarily due to higher financing costs amortization as a result of debt restructuring actions in 2019.

Foreign Currency (Gain) Loss

For 2019 foreign currency gains were $0.2 million as compared to foreign currency losses of $0.4 million for 2018. Gains increased by $0.6 million during 2019 due to exchange rate volatility, especially with respect to the euro and Chinese yuan.

Income Tax Expense

Income tax expense of $6.0 million and $13.4 million for the years ended December 31, 2019 and 2018 represents taxes on both U.S. and foreign earnings at a combined effective income tax rate of 11.4% and 19.4%, respectively. The effective income tax rate of 11.4% for the year ended December 31, 2019 differed from the U.S. federal statutory rate of 21% primarily due to tax benefits associated with share-based compensation and a reduction in our state tax rate partially offset by the effect of income earned by certain of our foreign entities being taxed at higher rates than the federal statutory rate as well as losses incurred by certain of our Chinese operations for which no benefit was recorded.

The effective income tax rate of 19.4% for the year ended December 31, 2018 differed from the U.S. federal statutory rate of 21% primarily due to tax benefits related to certain share-based compensation, partially offset by the effect of income earned by certain of our foreign entities being taxed at higher rates than the federal statutory rate as well as losses incurred by certain of our Chinese operations for which no benefit was recorded.

Net Income from Continuing Operations

As a result of the foregoing, net income from continuing operations attributable to Chart was $46.4 million and $53.6 million for 2019 and 2018, respectively.

Results of Operations for the Years Ended December 31, 2018 and 2017

Sales in 2018 increased by $241.4 million or 28.6% compared to 2017. Driving the sales growth were positive trends in both our E&C Cryogenics and E&C FinFans segments, especially in our air cooled heat exchangers product offering, as well as stronger sales in D&S West. Sales for Hudson, included in the E&C FinFans segment results since the September 20, 2017 acquisition date, were $180.3 million and $58.0 million for the years ended December 31, 2018 and 2017, respectively. Sales for VRV, included in both the D&S East and E&C Cryogenics segment results since the November 15, 2018 acquisition date, were $14.1 million for the year ended December 31, 2018.

Gross profit increased while the related margin decreased slightly during 2018 compared to 2017. Excluding gross profit added from the Hudson acquisition (2018: $49.5 million, 2017: $15.4 million) and the VRV acquisition (2018: $1.0 million), gross profit increased organically by $29.2 million as a result of higher volume in our D&S East and D&S West segments and project mix in both our E&C Cryogenics and E&C FinFans segments. Gross margin as a percent of sales of 27.3% for 2018 was impacted by an expense of $4.0 million recorded to cost of sales related to the estimated costs of the aluminum cryobiological tank recall for 2018, which negatively impacted consolidated gross margin as a percent of consolidated sales by 0.4 percentage points.

Restructuring costs of $4.4 million for 2018 were recorded in cost of sales ($0.8 million) and SG&A ($3.6 million), which were related to certain cost reduction or avoidance actions, primarily related to departmental restructuring, including our strategic realignment of our segment structure, and including headcount reductions resulting in associated severance costs. Restructuring costs of $11.2 million for 2017 were recorded in cost of sales ($2.7 million) and SG&A ($8.5 million), which were related to costs to relocate the corporate office from Garfield Heights, Ohio to Ball Ground, Georgia and consolidation of certain facilities in China.

Interest Expense, Net and Financing Costs Amortization

Net interest expense for 2018 and 2017 was $21.4 million and $17.3 million, respectively. Interest expense for 2018 included $1.0 million of 2.0% cash interest and $1.9 million of non-cash interest accretion expense related to the carrying value of the 2018 Notes and $2.6 million of 1.0% cash interest and $7.2 million of non-cash interest accretion expense related to the carrying value

of the 2024 Notes. Interest expense also included $11.8 million and $2.7 million in interest related to borrowings on our senior secured revolving credit facility for 2018 and 2017, respectively. For 2018 and 2017, financing costs amortization was $1.3 million for both periods.

Foreign Currency Loss

Foreign currency losses were $0.4 million and $3.9 million for 2018 and 2017, respectively. Losses decreased by $3.5 million during 2018 due to exchange rate volatility, especially with respect to the euro and Chinese yuan.

Income Tax (Benefit) Expense

Income tax expense for 2018 was $13.4 million compared to income tax benefit of $16.6 million for 2017 and represents taxes on both U.S. and foreign earnings at a combined effective income tax rate of 19.4% and (149.5)%, respectively. The effective income tax rate of 19.4% for 2018 differed from the U.S. federal statutory rate of 21% primarily due to tax benefits related to certain share-based compensation, partially offset by the effect of income earned by certain of our foreign entities being taxed at higher rates than the federal statutory rate as well as losses incurred by certain of our Chinese operations for which no benefit was recorded.

Income tax benefit in 2017 was mainly driven by a one-time $22.5 million net favorable tax benefit that was recorded during the fourth quarter of 2017, which resulted from the enactment of the Tax Cuts and Jobs Act. This benefit mainly consisted of a one-time, provisional benefit of $26.9 million related to the remeasurement of certain of our deferred tax liabilities using the lower U.S. federal corporate tax rate of 21%. This was partially offset by (i) a one-time, provisional charge of $8.7 million related to the deemed repatriation transition tax, which is a tax on previously untaxed accumulated earnings and profits of certain of our foreign subsidiaries, and (ii) a one-time tax expense and tax benefit of $4.5 million and $8.7 million, respectively, related to our intent to amend pre-acquisition Hudson U.S. federal tax returns. The 2017 effective income tax rate was also impacted by transaction costs incurred with the acquisition of Hudson, a portion of which were non-deductible for U.S. federal income tax purposes. We have completed our analysis to determine the effect of the Tax Cuts and Jobs Act, and as such, we have recorded an additional tax benefit of $1.8 million.

Net Income from Continuing Operations

As a result of the foregoing, net income from continuing operations attributable to Chart was $53.6 million and $26.2 million for 2018 and 2017, respectively.

Segment Results for the Years Ended December 31, 2019, 2018 and 2017

Our reportable and operational segments include: D&S East, D&S West, E&C Cryogenics and E&C FinFans. Corporate includes operating expenses for executive management, accounting, tax, treasury, corporate development, human resources, information technology, investor relations, legal, internal audit, and risk management. Corporate support functions are not currently allocated to the segments. For further information, refer to Note 4, "Segment and Geographic Information." of our consolidated financial statements included under Item 15, "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K. The following tables include key metrics used to evaluate our business and measure our performance and represents selected financial data for our operating segments for the years ended December 31, 2019, 2018 and 2017 (dollars in millions):

D&S East

Results of Operations for the Years Ended December 31, 2019 and 2018

	Year Ended December 31,		2019 vs. 2018	
	2019	2018	Variance ($)	Variance (%)
Sales	$ 293.4	$ 246.3	$ 47.1	19.1 %
Gross Profit	45.2	52.4	(7.2)	(13.7)%
Gross Profit Margin	15.4%	21.3%		
SG&A Expenses	$ 34.7	$ 31.6	$ 3.1	9.8 %
SG&A Expenses (% of Sales)	11.8%	12.8%		
Operating Income	$ 6.9	$ 19.3	$ (12.4)	(64.2)%
Operating Margin	2.4%	7.8%		

For the year 2019, D&S East segment sales increased $47.1 million as compared to 2018. Sales for VRV, included in the D&S East segment results since the acquisition date, November 15, 2018, were $57.1 million and $10.3 million for the years ended December 31, 2019 and 2018, respectively. Excluding the impact of VRV, sales increased across all product applications in Europe partially offset by lower sales in China largely relative to a decline in LNG and bulk products.

For the year 2019, D&S East segment gross profit and the related margin percentage decreased by $7.2 million (decreased by $7.8 million, organically) as compared to 2018. Excluding restructuring charges of $7.8 million and $0.5 million in 2019 and 2018 respectively, gross profit increased by $0.1 million as compared to 2018. The restructuring charges that negatively impacted the D&S East gross profit and the related margin percentage were primarily due to the closing of two production lines in China.

D&S East segment SG&A expenses increased during the year 2019 as compared to 2018 primarily driven by the $9.8 million related to VRV included in 2019 compared to $1.3 million since the acquisition date, November 15, 2018. Excluding the impact of the VRV acquisition, SG&A expenses decreased by $5.4 million or 17.8%, mainly driven by lower employee-related costs in China due to workforce reductions.

Results of Operations for the Years Ended December 31, 2018 and 2017

	Year Ended December 31,		2018 vs. 2017	
	2018	2017	Variance ($)	Variance (%)
Sales	$ 246.3	$ 232.3	$ 14.0	6.0 %
Gross Profit	52.4	48.3	4.1	8.5 %
Gross Profit Margin	21.3%	20.8%		
SG&A Expenses	$ 31.6	$ 33.0	$ (1.4)	(4.2)%
SG&A Expenses (% of Sales)	12.8%	14.2%		
Operating Income	$ 19.3	$ 14.2	$ 5.1	35.9 %
Operating Margin	7.8%	6.1%		

For the full year 2018, D&S East segment sales increased $14.0 million compared to 2017, which was primarily driven by the inclusion of VRV sales of $10.3 million for the six weeks of ownership, and the remaining increase driven by strength across all product applications.

During the full year 2018, D&S East segment gross profit increased $4.1 million as compared to 2017 primarily due to the increase in volume, and the related margin increased mainly due to favorable product mix, primarily in China, which was operating income positive for the first time since 2014.

D&S East segment SG&A expenses decreased during the year 2018 as compared to 2017 by $1.4 million primarily due to the inclusion of additional commissions expense as a result of a litigation award in China, which are reflected in 2017 results.

D&S West

Results of Operations for the Years Ended December 31, 2019 and 2018

	Year Ended December 31,		2019 vs. 2018	
	2019	2018	Variance ($)	Variance (%)
Sales	$ 461.7	$ 455.5	$ 6.2	1.4 %
Gross Profit	157.9	156.8	1.1	0.7 %
Gross Profit Margin	34.2%	34.4%		
SG&A Expenses	$ 48.7	$ 51.0	$ (2.3)	(4.5)%
SG&A Expenses (% of Sales)	10.5%	11.2%		
Operating Income	$ 104.5	$ 101.2	$ 3.3	3.3 %
Operating Margin	22.6%	22.2%		

D&S West segment sales increased $6.2 million during the full year 2019 as compared to 2018 primarily due to an increase in sales related to systems and cryobiological storage products which was partially offset by a decline in packaged gas sales.

D&S West segment gross profit increased $1.1 million during the full year as compared to 2018 mainly driven by higher volume in cryobiological storage tanks while the related margin percentage decreased by 0.2 percentage points primarily driven by lower margins in industrial gas and systems partially offset by higher margin within cryobiological systems.

D&S West segment SG&A expenses decreased $2.3 million during the year 2019 as compared to 2018 primarily due to lower employee related expenses.

Results of Operations for the Years Ended December 31, 2018 and 2017

	Year Ended December 31,		2018 vs. 2017	
	2018	2017	Variance ($)	Variance (%)
Sales	$ 455.5	$ 400.6	$ 54.9	13.7 %
Gross Profit	156.8	141.8	15.0	10.6 %
Gross Profit Margin	34.4%	35.4%		
SG&A Expenses	$ 51.0	$ 52.0	$ (1.0)	(1.9)%
SG&A Expenses (% of Sales)	11.2%	13.0%		
Operating Income	$ 101.2	$ 85.2	$ 16.0	18.8 %
Operating Margin	22.2%	21.3%		

D&S West segment sales increased during the full year 2018 as compared to 2017 primarily due to an increase in sales within packaged gas industrial applications.

D&S West segment gross profit increased during the full year 2018 as compared to 2017 mainly driven by higher volume in both packaged gas industrial applications and cryobiological storage. The 2018 year-to-date gross margin percentage was negatively impacted 0.9 percentage points due to the estimated costs of the aluminum cryobiological tank recall of $4.0 million recorded in cost of sales during 2018.

D&S West segment SG&A expenses decreased during the full year 2018 as compared to 2017 mainly due to cost based saving measures taken during the period as well as share-based compensation forfeiture credits related to the strategic realignment of our segment structure. All severance costs related to the strategic realignment of our segment structure were recorded in restructuring within SG&A at Corporate. Additionally, the full year of 2017 included a reduction in a contingent consideration liability associated with a prior acquisition, which partially offset the decrease in D&S West segment SG&A expenses.

Energy & Chemicals Cryogenics

Results of Operations for the Years Ended December 31, 2019 and 2018

	Year Ended December 31,		2019 vs. 2018	
	2019	2018	Variance ($)	Variance (%)
Sales	$ 190.2	$ 136.9	$ 53.3	38.9 %
Gross Profit	33.5	28.6	4.9	17.1 %
Gross Profit Margin	17.6%	20.9%		
SG&A Expenses	$ 28.7	$ 23.3	$ 5.4	23.2 %
SG&A Expenses (% of Sales)	15.1%	17.0%		
Operating Income	$ 1.6	$ 1.8	$ (0.2)	(11.1)%
Operating Margin	0.8%	1.3%		

For the year 2019, E&C Cryogenics segment sales increased $53.3 million as compared to 2018. Sales for VRV, included in the E&C Cryogenics segment results since the acquisition date, November 15, 2018, were $46.9 million and $3.8 million for the years ended December 31, 2019 and 2018, respectively. Excluding the impact of VRV, sales increased mainly due to higher volume in brazed aluminum heat exchangers and cold box projects partially offset by lower sales relative to field services work.

For the year 2019, E&C Cryogenics segment gross profit increased by $4.9 million (decreased by $2.0 million, organically) as compared to 2018. The increase in gross profit was primarily due to VRV sales included in 2019 as compared to 2018. The decrease in organic gross profit was primarily due to the less favorable brazed aluminum heat exchangers product mix. The related margin decreased 3.3 percentage points (2.9 percentage points organically), primarily due to higher volume in high margin short lead-time replacement equipment in 2018 as compared to 2019.

E&C Cryogenics segment SG&A expenses increased during the year 2019 as compared to 2018 primarily driven by SG&A expenses of $7.1 million and $0.7 million related to the VRV acquisition for the years ended December 31, 2019 and 2018, respectively. Excluding VRV costs, SG&A expenses decreased as a percent of sales by 1.9 percent.

Results of Operations for the Years Ended December 31, 2018 and 2017

	Year Ended December 31,		2018 vs. 2017	
	2018	2017	Variance ($)	Variance (%)
Sales	$ 136.9	$ 125.5	$ 11.4	9.1 %
Gross Profit	28.6	23.6	5.0	21.2 %
Gross Profit Margin	20.9%	18.8 %		
SG&A Expenses	$ 23.3	$ 23.4	$ (0.1)	(0.4)%
SG&A Expenses (% of Sales)	17.0%	18.6 %		
Operating Income	$ 1.8	$ (2.1)	$ 3.9	(185.7)%
Operating Margin	1.3%	(1.7)%		

For the year 2018, E&C Cryogenics segment sales increased as compared to 2017. Sales for VRV included in E&C Cryogenics segment results since the November 15, 2018 acquisition date were $3.8 million for the year ended December 31, 2018. Excluding the impact from VRV, sales increased by $7.6 million, which was driven primarily by increased sales in brazed aluminum heat exchangers offset by a decrease in sales associated with our previous Lifecycle business.

Excluding the impact of the VRV acquisition, E&C Cryogenics segment gross profit increased by $6.0 million mainly driven by increased sales volume in NGL and petrochemical applications. The related margin increased 2.1 percentage points (3.4 percentage points organically), primarily due to an increase in high margin short lead-time replacement equipment.

E&C Cryogenics segment SG&A expenses for 2018 as compared to 2017 were relatively flat. Excluding the impact of the VRV acquisition, SG&A expenses decreased $0.8 million during 2018.

Energy & Chemicals FinFans

Results of Operations for the Years Ended December 31, 2019 and 2018

	Year Ended December 31,		2019 vs. 2018	
	2019	2018	Variance ($)	Variance (%)
Sales	$ 361.7	$ 253.6	$ 108.1	42.6%
Gross Profit	102.5	60.6	41.9	69.1%
Gross Profit Margin	28.3%	23.9%		
SG&A Expenses	$ 33.6	$ 24.8	$ 8.8	35.5%
SG&A Expenses (% of Sales)	9.3%	9.8%		
Operating Income	$ 40.6	$ 23.7	$ 16.9	71.3%
Operating Margin	11.2%	9.3%		

For the year 2019, E&C FinFans segment sales increased $108.1 million as compared to 2018. Sales for AXC, included in the E&C FinFans segment results since the acquisition date, July 1, 2019, were $103.1 million for the year ended December 31, 2019. Excluding the impact of AXC, sales increased by $5.0 million mainly due to higher axial flow fan sales partially offset by lower sales of air cooled heat exchangers from our Cooler Service and Smithco businesses.

For the year 2019, E&C FinFans segment gross profit increased by $41.9 million (increased by $12.7 million, organically) as compared to 2018. Gross profit increased primarily due to higher volume for axial flow fans and the related margin increased mainly due to product mix.

E&C FinFans segment SG&A expenses increased by $8.8 million during the year 2019 as compared to 2018 mainly due to acquisition of AXC.

Results of Operations for the Years Ended December 31, 2018 and 2017

	Year Ended December 31,		2018 vs. 2017	
	2018	2017	Variance ($)	Variance (%)
Sales	$ 253.6	$ 100.1	$ 153.5	153.3%
Gross Profit	60.6	21.5	39.1	181.9%
Gross Profit Margin	23.9%	21.5%		
SG&A Expenses	$ 24.8	$ 10.9	$ 13.9	127.5%
SG&A Expenses (% of Sales)	9.8%	10.9%		
Operating Income	$ 23.7	$ 7.2	$ 16.5	229.2%
Operating Margin	9.3%	7.2%		

For the year 2018, E&C FinFans segment sales increased as compared to 2017. Sales for Hudson, included in the E&C FinFans segment results since the September 20, 2017 acquisition date were $180.3 million and $58.0 million for 2018 and 2017, respectively. Excluding the impact from Hudson, sales increased by $31.2 million, which was driven primarily by growth in air cooled heat exchangers within NGL and petrochemical applications.

Excluding the impact of the Hudson acquisition, E&C FinFans segment gross profit increased by $5.0 million during 2018 as compared to 2017, mainly due to improved productivity driven by increased sales volume in NGL and petrochemical applications. The related margin increased 2.4 percentage points (0.6 percentage points organically), primarily due to favorable product mix.

E&C FinFans segment SG&A expenses increased during 2018 as compared to 2017 primarily driven by the Hudson acquisition, which added $12.8 million in incremental SG&A expenses during the year (2018: $18.5 million, 2017: $5.7 million). Excluding the impact of the Hudson acquisition, SG&A expenses increased by $1.0 million during 2018.

Corporate

Corporate SG&A expenses increased by $19.2 million during 2019 as compared to 2018 primarily due to $7.3 million in transaction-related costs, $4.3 million in integration costs related to the VRV and AXC acquisitions and an increase in share-based compensation, which were partially offset by a decrease in employee-related costs.

Corporate SG&A expenses decreased by $10.4 million during 2018 as compared to 2017 primarily due to prior restructuring activities and lower transaction-related costs. Corporate SG&A expenses in 2018 included transaction-related costs of $2.1 million for the year ended December 31, 2018, which were mainly related to the VRV acquisition. This compares favorably to transaction-related costs of $10.1 million in 2017 driven by the Hudson acquisition.

Orders and Backlog

We consider orders to be those for which we have received a firm signed purchase order or other written contractual commitment from the customer. Backlog is comprised of the portion of firm signed purchase orders or other written contractual commitments from customers for which work has not been performed, or is partially completed, that we have not recognized as revenue and excludes unexercised contract options and potential orders. Backlog can be significantly affected by the timing of orders for large projects, particularly in the E&C segment, and is not necessarily indicative of future backlog levels or the rate at which backlog will be recognized as sales. Orders included in our backlog may include customary cancellation provisions under which the customer could cancel part or all of the order, potentially subject to the payment of certain costs and/or fees. Backlog may be negatively impacted by the ability or likelihood of customers to fulfill their obligations. Our backlog as of December 31, 2019, 2018 and 2017 was $762.3 million, $568.2 million and $446.4 million, respectively.

The tables below represent orders received and backlog by segment for the periods indicated (dollar amounts in millions):

	Year Ended December 31,		
	2019	2018	2017
Orders			
D&S East	$ 330.3	$ 277.0	$ 210.8
D&S West	479.9	477.4	407.1
E&C Cryogenics	333.8	119.9	146.5
E&C FinFans	268.9	268.1	97.1
Consolidated	$ 1,412.9	$ 1,142.4	$ 861.5

	As of December 31,		
	2019	2018	2017
Backlog			
D&S East	$ 224.0	$ 185.4	$ 116.9
D&S West	147.1	129.8	118.6
E&C Cryogenics	285.3	139.7	108.9
E&C FinFans	105.9	113.3	102.0
Consolidated	$ 762.3	$ 568.2	$ 446.4

Orders and Backlog for the Year Ended and As of December 31, 2019 Compared to the Year Ended and As of December 31, 2018

Orders for 2019 were $1,412.9 million compared to $1,142.4 million for 2018, representing an increase of $270.5 million, or 23.7% (10.8% organically), and set multiple annual order records. Consolidated orders include $52.2 million in orders related to AXC for the year ended December 31, 2019. Consolidated backlog includes $31.5 million in backlog related to AXC as of December 31, 2019.

D&S East segment orders for 2019 were $330.3 million compared to $277.0 million for 2018, an increase of $53.3 million. D&S East segment orders include $54.7 million and $8.7 million in orders related to VRV for 2019 and 2018, respectively. The increase in D&S East segment orders over the prior year was mainly driven by increases in bulk standard tanks within bulk industrial gas applications and cryogenic trailers, primarily in Europe as demand for LNG fueling stations in Europe is increasing and key customers continue to order trailers and LNG fuel systems for over the road trucking. D&S East segment backlog totaled $224.0 million at December 31, 2019, compared to $185.4 million as of December 31, 2018, an increase of $38.6 million. D&S East segment backlog for 2019 and 2018 includes $40.4 million and $42.3 million related to VRV, respectively.

D&S West segment orders for 2019 were $479.9 million compared to $477.4 million for 2018, an increase of $2.5 million driven by an increase in systems, offset by lower orders in industrial gas. D&S West segment backlog totaled $147.1 million at December 31, 2019 compared to $129.8 million as of December 31, 2018, an increase of $17.3 million mainly driven by a $21.0 million LNG by rail order, the first of its magnitude for our Gas By Rail ("GBR") unique offering.

E&C Cryogenics segment orders for 2019 were $333.8 million compared to $119.9 million for 2018, an increase of $213.9 million. E&C Cryogenics segment orders include $53.1 million and $2.5 million in orders related to VRV for 2019 and 2018, respectively. E&C Cryogenics segment orders in 2019 include a $23 million order for a propane dehydrogenation plant. E&C Cryogenics segment backlog totaled $285.3 million as of December 31, 2019, compared to $139.7 million as of December 31, 2018, an increase of $145.6 million. E&C Cryogenics segment backlog for 2019 and 2018 includes $47.0 million and $39.3 million related to VRV, respectively. Excluding VRV, the increase in backlog from 2019 as compared to 2018 was primarily driven by Venture Global's Calcasieu Pass LNG export terminal project and petrochemical and natural gas processing applications. Included in E&C Cryogenics segment's backlog for 2019 and 2018 is approximately $40 million related to the previously announced Magnolia LNG order where production release is delayed until 2020. Order flow in the E&C Cryogenics segment is historically volatile due to project size and it is not unusual to see order intake change significantly year over year.

E&C FinFans segment orders for 2019 were $268.9 million compared to $268.1 million for 2018, an increase of $0.8 million. E&C FinFans segment orders include $52.2 million in orders related to AXC for the year ended December 31, 2019. Excluding AXC, orders decreased by $51.4 million. Included in 2018 orders was a $28 million order for our Hudson Products air cooled heat exchangers on a large LNG project. E&C Fin Fans segment backlog totaled $105.9 million at December 31, 2019, compared to $113.3 million as of December 31, 2018, a decrease of $7.4 million. E&C FinFans segment backlog as of December 31, 2019 includes $31.5 million for AXC. Order flow in the E&C FinFans segment is driven by customer demand for energy related expenditures and it is not unusual for order intake to fluctuate year over year.

Orders and Backlog for the Year Ended and As of December 31, 2018 Compared to the Year Ended and As of December 31, 2017

Orders for 2018 were $1,142.4 million compared to $861.5 million for 2017, representing an increase of $280.9 million, or 32.6% (11.7% organically). Consolidated orders include $11.2 million in orders related to VRV (D&S East: $8.7 million, E&C Cryogenics: $2.5 million) for the year ended December 31, 2018. Consolidated backlog includes $81.6 million related to VRV (D&S East: $42.3 million, E&C Cryogenics: $39.3 million) as of December 31, 2018.

D&S East segment orders for 2018 were $277.0 million compared to $210.8 million for 2017, an increase of $66.2 million or 31.4%. The increase in D&S East segment orders was mainly driven by increases in bulk standard tanks within bulk industrial gas applications and cryogenic trailers, primarily in Europe. Orders also increased in Asia, especially engineered tanks within bulk industrial gas applications. D&S East segment backlog totaled $185.4 million at December 31, 2018, compared to $116.9 million as of December 31, 2017.

D&S West segment orders for 2018 were $477.4 million compared to $407.1 million for 2017, an increase of $70.3 million, or 17.3%. The increase in D&S West segment orders over the prior year was driven by increases across all product applications, especially LNG vehicle tanks within packaged gas industrial applications. D&S West segment backlog totaled $129.8 million at December 31, 2018 compared to $118.6 million as of December 31, 2017.

E&C Cryogenics segment orders for 2018 were $119.9 million compared to $146.5 million for 2017, a decrease of $26.6 million. E&C Cryogenics segment backlog totaled $139.7 million at December 31, 2018, compared to $108.9 million as of December 31, 2017, an increase of $30.8 million. E&C Cryogenics segment orders included $2.5 million in orders related to VRV for the year ended December 31, 2018. Excluding VRV orders, E&C Cryogenics orders decreased by $29.1 million. The decrease was primarily driven by inclusion of large equipment orders within both our Systems business and our previous Lifecycle business related to work for a large plant, which were reflected in 2017 E&C Cryogenics segment orders. Order flow in the E&C Cryogenics segment is historically volatile due to project size and it is not unusual to see order intake change significantly year over year.

E&C FinFans segment orders for 2018 were $268.1 million compared to $97.1 million for 2017, an increase of $171.0 million. E&C FinFans segment backlog totaled $113.3 million at December 31, 2018, compared to $102.0 million as of December 31, 2017, an increase of $11.3 million. E&C FinFans segment orders includes $203.7 million and $31.3 million in orders related to Hudson for the years ended December 31, 2018 and 2017, respectively. As discussed above, included in 2018 orders was a $28 million order for our Hudson Products air cooled heat exchangers on a large LNG project. This order shipped partially in 2018, and the remainder shipped in 2019. Excluding Hudson orders, E&C FinFans orders decreased by $1.4 million.

Liquidity and Capital Resources

Our debt and related covenants are further described in Note 10, "Debt and Credit Arrangements," of our consolidated financial statements included under Item 15, "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K.

Sources and Uses of Cash

Our cash and cash equivalents totaled $119.0 million as of December 31, 2019, an increase of $0.9 million from the balance at December 31, 2018. Our foreign subsidiaries held cash of approximately $75.9 million and $71.4 million at December 31, 2019 and December 31, 2018, respectively, to meet their liquidity needs. No material restrictions exist to accessing cash held by our foreign subsidiaries. We expect to meet our U.S. funding needs without repatriating non-U.S. cash and incurring incremental U.S. taxes. Cash equivalents are primarily invested in money market funds that invest in high quality, short-term instruments, such as U.S. government obligations, certificates of deposit, repurchase obligations, and commercial paper issued by corporations that have been highly rated by at least one nationally recognized rating organization, and in the case of cash equivalents in China, obligations of local banks. We believe that our existing cash and cash equivalents, funds available under our SSRCF or other financing alternatives, and cash provided by operations will be sufficient to meet our normal working capital needs and investments in properties, facilities, and equipment for the foreseeable future.

Years Ended December 31, 2019 and 2018

Cash provided by operating activities during 2019 was $133.9 million, an increase of $14.9 million from 2018, mainly due to lower inventory levels.

Cash used in investing activities during 2019 and 2018 was $642.7 million and $260.6 million, respectively. During 2019, we used $603.9 million of cash primarily for the acquisition of AXC with proceeds from a common stock offering and borrowings under our SSRCF and term loan due November 2024 and paid $36.2 million for capital expenditures mainly related to maintenance capital spending at VRV, investment in the LNG fuel systems production line in Europe, and automation projects in our New Prague, Minnesota facility. See below for discussion regarding the composition of cash used in investing activities during 2018.

Cash provided by financing activities during 2019 and 2018 was $511.6 million and $38.2 million, respectively. During 2019, we borrowed $450.0 million under the term loan and received proceeds of $295.8 million from the 2019 Equity Offering to fund the AXC acquisition. During 2019, we borrowed $235.8 million on our SSRCF to fund working capital needs and to fund a portion of the AXC acquisition and repaid $451.1 million in SSRCF borrowings. We received $9.4 million in proceeds from stock option exercises and used $2.0 million for the purchase of common stock which was surrendered to cover tax withholding elections during the year. See below for discussion regarding the composition of cash provided by financing activities during 2018.

Years Ended December 31, 2018 and 2017

Cash provided by operating activities during 2018 was $119.0 million, an increase of $74.7 million from 2017, largely due to higher net income.

Cash used in investing activities was $260.6 million and $477.8 million during 2018 and 2017, respectively. During 2018, we used $225.8 million of cash for the VRV and Skaff acquisitions (euro 188.7 million or $213.3 million equivalent and $12.5, respectively) and $35.6 million for capital expenditures mainly related to the capacity expansion of the brazed aluminum heat exchanger facility in La Crosse, Wisconsin and the capacity increase in Ball Ground, Georgia, to support demand for LNG vehicle tanks. Cash used in investing activities in 2017 was primarily for acquisitions including $419.5 million used for the Hudson acquisition.

Cash provided by financing activities during 2018 and 2017 was $38.2 million and $275.2 million, respectively. During 2018, we borrowed $405.4 million on our previous senior secured revolving credit facility (euro 140.0 million or $160.3 million equivalent plus $245.1 million) mainly to fund the VRV and Skaff acquisitions, the settlement of the 2018 Notes and working capital needs. We repaid $315.1 million in borrowings on our previous senior secured revolving credit facility during 2018 (euro 55.0 million or $63.0 million equivalent plus $252.1 million). We also borrowed 40.0 million Chinese yuan (equivalent to $6.3 million) and repaid 11.5 million Chinese yuan (equivalent to $1.7 million) on certain of our China facilities. We repaid 40.0 million Chinese yuan (equivalent to $5.9 million) on certain of our China term loans. We received $10.8 million in proceeds from stock option exercises and used $2.7 million for the purchase of common stock which was surrendered to cover tax withholding elections during 2018. Cash provided by financing activities in 2017 mainly included borrowings on our previous senior secured revolving credit facility, proceeds from the issuance of convertible notes partially offset by the majority repurchase of our 2018 Notes.

Cash Requirements

We do not currently anticipate any unusual cash requirements for working capital needs for the year ending December 31, 2020. Management anticipates we will be able to satisfy cash requirements for our ongoing business for the foreseeable future with cash generated by operations, existing cash balances and available borrowings under our credit facilities. We expect capital expenditures for 2020 to be in the range of $35.0 million to $40.0 million.

Contractual Obligations

Our known contractual obligations as of December 31, 2019 and cash requirements resulting from those obligations are as follows (all dollar amounts in millions):

	Payments Due by Period				
	Total	**Less Than 1 Year**	**1 – 3 Years**	**3 – 5 Years**	**More Than 5 Years**
Gross debt [1]	$ 829.4	$ 15.7	$ 39.3	$ 774.4	$ —
Contractual convertible notes interest	12.5	2.6	5.2	4.7	—
Operating leases	39.1	7.8	12.5	10.9	7.9
Pension obligations [2]	4.5	0.6	1.7	2.2	—
Total contractual cash obligations	$ 887.7	$ 27.0	$ 59.2	$ 792.7	$ 8.8

(1) The $258.8 million principal balance of the 2024 Notes will mature on November 15, 2024.

(2) The planned funding of the pension obligations is based upon actuarial and management estimates taking into consideration the current status of the plan.

Our commercial commitments as of December 31, 2019, which include standby letters of credit and bank guarantees, represent potential cash requirements resulting from contingent events that require performance by us or our subsidiaries pursuant to funding commitments, and are as follows (all dollar amounts in millions):

	Total	**Expiring in 2020**	**Expiring in 2021 and beyond**
Standby letters of credit	$ 56.3	$ 4.5	$ 51.8
Bank guarantees	27.8	0.9	26.9
Total commercial commitments	$ 84.1	$ 5.4	$ 78.7

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements.

Contingencies

We are involved with environmental compliance, investigation, monitoring, and remediation activities at certain of our operating facilities or formerly owned manufacturing facilities and accrue for these activities when commitments or remediation plans have been developed and when costs are probable and can be reasonably estimated. Historical annual cash expenditures for these activities have been charged against the related environmental reserves. Future expenditures relating to these environmental remediation efforts are expected to be made over the next 7 years as ongoing costs of remediation programs. Management believes that any additional liability in excess of amounts accrued, which may result from the resolution of such matters, should not have a material adverse effect on our financial position, liquidity, cash flows or results of operations.

We are occasionally subject to various legal claims related to performance under contracts, product liability, taxes, employment matters, environmental matters, intellectual property, and other matters, several of which claims assert substantial damages, in the ordinary course of our business. Based on our historical experience in litigating these claims, as well as our current assessment of the underlying merits of the claims and applicable insurance, if any, we believe the resolution of these legal claims will not have a material adverse effect on our financial position, liquidity, cash flows or results of operations. Future developments may, however, result in resolution of these legal claims in a way that could have a material adverse effect. See Item 1A. “Risk Factors” and Item 3, “Legal Proceedings” for further information.

Foreign Operations

During 2019, we had operations in Asia, Australia, Europe, and Latin America, which accounted for approximately 47% of consolidated sales and 31% of total assets at December 31, 2019. Functional currencies used by these operations include the U.S. dollar, Chinese yuan, the euro, the British pound, the Japanese yen and the Indian rupee. We are exposed to foreign currency exchange risk as a result of transactions by these subsidiaries in currencies other than their functional currencies, and from transactions by our domestic operations in currencies other than the U.S. dollar. The majority of these functional currencies and the other currencies in which we record transactions are fairly stable, although we experienced variability in the current year as more fully discussed in Item 7A. The use of these currencies, combined with the use of foreign currency forward purchase and sale contracts, has enabled us to be sheltered from significant gains or losses resulting from foreign currency transactions. This situation could change if these currencies experience significant fluctuations or the volume of forward contracts changes.

Application of Critical Accounting Policies

Our consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles and are based on the selection and application of significant accounting policies, which require management to make estimates and assumptions about future events that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ materially from those estimates. Management believes the following are the more critical judgmental areas in the application of its accounting policies that affect its financial position and results of operations.

Goodwill and Indefinite-Lived Intangible Assets. We evaluate goodwill and indefinite-lived intangible assets for impairment on an annual basis, as of October 1 or whenever events or changes in circumstances indicate that an evaluation should be completed. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include deterioration in general economic conditions, negative developments in equity and credit markets, a decline in stock price and market capitalization, adverse changes in the markets in which we operate, and a trend of negative or declining cash flows over multiple periods. The fair value that could be realized in an actual transaction may differ from that used to evaluate the impairment of goodwill.

Goodwill is analyzed on a reporting unit basis. The reporting units are the same as our operating and reportable segments: D&S East, D&S West, E&C Cryogenics, and E&C FinFans. We first evaluate qualitative factors, such as macroeconomic conditions and our overall financial performance to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount, including goodwill. We then evaluate how significant each of the identified factors could be to the fair value or carrying amount of a reporting unit and weigh these factors in totality in forming a conclusion of whether or not it is more likely than not that the fair value of a reporting unit is less than its carrying amount (the “Step 0 Test”). If we determine that it is not more likely than not that the fair value of a reporting unit is less than its carrying amount, the first step of the goodwill impairment test is not necessary. Otherwise, we would proceed to the first step of the goodwill impairment test.

Alternatively, we may also bypass the Step 0 Test and proceed directly to the first step of the goodwill impairment test. Under the first step (“Step 1”), we estimate the fair value of our reporting units by considering income and market approaches to develop fair value estimates, which are weighted to arrive at a fair value estimate for each reporting unit. With respect to the income approach, a model has been developed to estimate the fair value of each reporting unit. This fair value model incorporates estimates of future cash flows, estimates of allocations of certain assets and cash flows among reporting units, estimates of future growth rates, and management’s judgment regarding the applicable discount rates to use to discount such estimates of cash flows. With respect to the market approach, a guideline company method is employed whereby pricing multiples are derived from companies with similar assets or businesses to estimate fair value of each reporting unit. If the fair value of the reporting unit exceeds the carrying amount of the net assets assigned to that reporting unit, then goodwill is not impaired, and no further testing is required. However, if the fair value of the reporting unit is less than its carrying amount, the impairment charge is based on the excess of a reporting unit’s carrying amount over its fair value (i.e., we would measure the charge based on the result from Step 1).

In order to assess the reasonableness of the calculated fair values of our reporting units, we also compare the sum of the reporting units’ fair values to our market capitalization and calculate an implied control premium (the excess of the sum of the reporting units’ fair values over the market capitalization). We evaluate the control premium by comparing it to control premiums of recent comparable transactions. If the implied control premium is not reasonable in light of this assessment, we reevaluate our fair value estimates of the reporting units by adjusting the discount rates and other assumptions as necessary.

Changes to the assumptions and estimates used throughout the steps described above may result in a significantly different estimate of the fair value of the reporting units, which could result in a different assessment of the recoverability of goodwill and result in future impairment charges.

With respect to indefinite-lived intangible assets, we first evaluate relevant events and circumstances to determine whether it is more likely than not that the fair value of an indefinite-lived intangible asset is less than its carrying amount. If, in weighing all relevant events and circumstances in totality, we determine that it is not more likely than not that an indefinite-lived intangible asset is impaired, no further action is necessary. Otherwise, we would determine the fair value of indefinite-lived intangible assets and perform a quantitative impairment assessment by comparing the indefinite-lived intangible asset's fair value to its carrying amount. We may bypass such a qualitative assessment and proceed directly to the quantitative assessment. We estimate the fair value of our indefinite-lived assets using the income approach. This may include the relief from royalty method or use of a model similar to the one described above related to goodwill which estimates the future cash flows attributed to the indefinite-lived intangible asset and then discounting these cash flows back to a present value. Under the relief from royalty method, fair value is estimated by discounting the royalty savings, as well as any tax benefits related to ownership to a present value. The fair value from either approach is compared to the carrying value and an impairment is recorded if the fair value is determined to be less than the carrying value.

2019 and 2018 Goodwill and Indefinite-Lived Intangible Assets Impairment Assessments

As of October 1, 2019 and 2018 ("annual assessment dates") we elected to bypass the Step 0 test and based on our Step 1 test, we determined that the fair value of each of our reporting units was greater than its respective carrying value at each annual assessment date and, therefore, no further action was necessary. Furthermore, as of the annual assessment dates, we also elected to bypass the qualitative assessment for the indefinite-lived intangible assets and based on our quantitative assessments, we determined that the fair value of each of the indefinite-lived intangible assets was greater than its respective carrying value, therefore, no further action was necessary.

Goodwill at December 31, 2019 and 2018 was $844.9 million and $520.7 million, respectively, attributed to the segments as follows:

- D&S East: 2019: $117.0 million (2018: $73.6 million);
- D&S West: 2019: $152.1 million and (2018: $151.3 million);
- E&C Cryogenics: 2019: $176.2 million; and
- E&C FinFans: 2019: $399.6 million

Note: Goodwill at December 31, 2018 included $295.8 million attributable to our prior E&C segment.

Long-Lived Assets. We monitor our property, plant and equipment, and finite-lived intangible assets for impairment indicators on an ongoing basis. If impairment indicators exist, assets are grouped and tested at the lowest level for which identifiable cash flows are available and we perform the required analysis and record impairment charges if applicable. In conducting its analysis, we compare the undiscounted cash flows expected to be generated from the long-lived assets to the related net book values. If the undiscounted cash flows exceed the net book value, the long-lived assets are considered not to be impaired. If the net book value exceeds the undiscounted cash flows, an impairment loss is measured and recognized. An impairment loss is measured as the difference between the net book value and the fair value of the long-lived assets. Fair value is estimated from discounted future net cash flows (for assets held for use) or net realizable value (for assets held for sale). In assessing the recoverability of our long-lived assets, a significant amount of judgment is involved in estimating the future cash flows, discount rates and other factors necessary to determine the fair value of the respective assets. If these estimates or the related assumptions change in the future, we may be required to record impairment charges for these assets in the period such determination was made. We amortize intangible assets that have finite lives over their estimated useful lives. We had no long-lived asset impairments in the last three years.

Convertible Debt. We determined that the conversion option within our 1.00% Convertible Senior Subordinated Notes due November 2024 (the "2024 Notes") was not clearly and closely related to the debt instrument host, however, the conversion option met a scope exception to derivative instrument accounting since the conversion feature is indexed to our common stock and meets equity classification criteria. Convertible debt instruments exempt from derivative accounting and subject to cash settlement of the conversion option are recognized by bifurcating the principal balance into a liability component and an equity component where the fair value of the liability component is estimated by calculating the present value of its cash flows discounted at an interest rate that we would have received for similar debt instruments that have no conversion rights (the "straight-debt rate"), and the equity component is the residual amount, net of tax, which creates a discount on the 2024 Notes. We recognize non-cash interest accretion expense related to the carrying amount of the 2024 Notes which is accreted back to its principal amount over the expected life of the debt, which is also the stated life of the debt.

Business Combinations. We account for business combinations in accordance with Accounting Standards Codification ("ASC") 805, "Business Combinations." We recognize and measure identifiable assets acquired and liabilities assumed based on their estimated fair values. The excess of the consideration transferred over the fair value of the net assets acquired, including identifiable intangible assets, is assigned to goodwill. As additional information becomes available, we may further revise the preliminary acquisition consideration allocation during the remainder of the measurement period, which shall not exceed twelve months from the closing of the acquisition.

Identifiable finite-lived intangible assets generally consist of customer relationships, unpatented technology, patents and trademarks and trade names and are amortized over their estimate useful lives which generally range from 2 to 15 years. Identifiable indefinite-lived intangible assets generally consist of trademarks and trade names and are subject to impairment testing on at least an annual basis. We estimate the fair value of identifiable intangible assets under income approaches where the fair value models incorporate estimates of future cash flows, estimates of allocations of certain assets and cash flows, estimates of future growth rates, and management's judgment regarding the applicable discount rates to use to discount such estimates of cash flows.

We expense transaction-related costs, including legal, consulting, accounting and other costs, in the periods in which the costs are incurred.

Revenue Recognition: Revenue is recognized when (or as) we satisfy performance obligations by transferring a promised good or service, an asset, to a customer. An asset is transferred to a customer when, or as, the customer obtains control over that asset. In most contracts, the transaction price includes both fixed and variable consideration. The variable consideration contained within our contracts with customers includes discounts, rebates, refunds, credits, price concessions, incentives, performance bonuses, penalties and other similar items. When a contract includes variable consideration, we evaluate the estimate of the variable consideration to determine whether the estimate needs to be constrained; therefore, we include the variable consideration in the transaction price only to the extent that it is probable that a significant reversal of the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. Variable consideration estimates are updated at each reporting date. When a contract includes multiple performance obligations, the contract price is allocated among the performance obligations based upon the stand alone selling prices. When the period between when we transfer a promised good or service to a customer and when the customer pays for that good or service is expected, at contract inception, to be one year or less, we do not adjust for the effects of a significant financing component.

For brazed aluminum heat exchangers, air cooled heat exchangers, cold boxes, liquefied natural gas fueling stations, engineered tanks, and repair services, most contracts contain language that transfers control to the customer over time. For these contracts, revenue is recognized as we satisfy the performance obligations by an allocation of the transaction price to the accounting period computed using input methods such as costs incurred. Input methods recognize revenue on the basis of the entity's efforts or inputs to the satisfaction of a performance obligation relative to the total expected inputs to the satisfaction of that performance obligation. The costs incurred input method measures progress toward the satisfaction of the performance obligation by multiplying the transaction price of the performance obligation by the percentage of incurred costs as of the balance sheet date to the total estimated costs at completion after giving effect to the most current estimates. Timing of amounts billed on contracts varies from contract to contract and could cause significant variation in working capital needs. Revisions to estimated cost to complete that result from inefficiencies in our performance that were not expected in the pricing of the contract are expensed in the period in which these inefficiencies become known. Contract modifications can change a contract's scope, price, or both. Approved contract modifications are accounted for as either a separate contract or as part of the existing contract depending on the nature of the modification.

For standard industrial gas and LNG tanks and some products identified in the prior paragraph with contract language that does not meet the over time recognition requirements, the contract with the customer contains language that transfers control to the customer at a point in time. For these contracts, revenue is recognized when we satisfy our performance obligation to the customer. Timing of amounts billed on contracts varies from contract to contract. The specific point in time when control transfers depends on the contract with the customer, contract terms that provide for a present obligation to pay, physical possession, legal title, risk and rewards of ownership, acceptance of the asset, and bill-and-hold arrangements may impact the point in time when control transfers to the customer. We recognize revenue under bill-and-hold arrangements when control transfers and the reason for the arrangement is substantive, the product is separately identified as belonging to the customer, the product is ready for physical transfer and we do not have the ability to use the product or direct it to another customer.

Incremental contract costs are expensed when incurred when the amortization period of the asset that would have been recognized is one year or less; otherwise, incremental contract costs are recognized as an asset and amortized over time as promised goods and services are transferred to a customer. When losses are expected to be incurred on a contract, we recognize the entire anticipated loss in the accounting period when the loss becomes evident. The loss is recognized when the current estimate of the consideration we expect to receive, modified to include unconstrained variable consideration instead of constrained variable consideration, is less than the current estimate of total costs for the contract.

Taxes assessed by a governmental authority that are both imposed on and concurrent with a specific revenue-producing transaction, that are collected by us from a customer, are excluded from revenue.

Shipping and handling fee revenues and the related expenses are reported as fulfillment revenues and expenses for all customers because we have adopted the practical expedient contained in ASC 606-10-25-18B. Therefore, all shipping and handling costs associated with outbound freight are accounted for as a fulfillment costs and are included in cost of sales.

Income Taxes. The Company and its U.S. subsidiaries file a consolidated federal income tax return. Deferred income taxes are provided for temporary differences between financial reporting and the consolidated tax return in accordance with the liability method. A valuation allowance is provided against net deferred tax assets when conditions indicate that it is more likely than not that the benefit related to such assets will not be realized. In assessing the need for a valuation allowance against deferred tax assets, we consider all available evidence, including past operating results, estimates of future taxable income, and the feasibility of tax planning strategies. In the event that we change our determination as to the amount of deferred tax assets that can be realized, the valuation allowance will be adjusted with a corresponding impact to the provision for income taxes in the period in which such determination is made.

We utilize a two-step approach for the recognition and measurement of uncertain tax positions. The first step is to evaluate the tax position and determine whether it is more likely than not that the position will be sustained upon examination by tax authorities. The second step is to measure the tax benefit as the largest amount that is more likely than not of being realized upon settlement.

Interest and penalties related to income taxes are accounted for as income tax expense (benefit), net on the consolidated statements of income.

We have accounted for the tax effects of the Tax Cuts and Jobs Act ("Tax Act"), which was signed into law on December 22, 2017. The Tax Act, among other things, reduced the U.S. federal corporate tax rate from 35% to 21%, requires companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries, requires a current inclusion in U.S. federal taxable income of certain earnings of foreign corporations, and creates a new limitation on deductible interest expense. In 2017, we accounted for the tax effects of the Tax Cuts and Jobs Act under the guidance of SAB 118, on a provisional basis. In 2018, we finalized our analyses under SAB 118. For further information, see Note 16, "Income Taxes" included under Item 15, "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K. We are subjected to a tax on Global Intangible Low Taxed Income ("GILTI"), which we record as a period cost as incurred.

Recent Accounting Standards

For disclosures regarding recent accounting standards, refer to Note 2, "Significant Accounting Policies," of our consolidated financial statements included under Item 15, "Exhibits and Financial Statement Schedules" of this Annual Report on Form 10-K.

Forward-Looking Statements

We are making this statement in order to satisfy the “safe harbor” provisions contained in the Private Securities Litigation Reform Act of 1995. This Annual Report includes “forward-looking statements.” These forward-looking statements include statements relating to our business, including statements regarding revenues, cost synergies, accretion and earnings related to our recently completed acquisitions. In some cases, forward-looking statements may be identified by terminology such as “may,” “will”, “should,” “expects,” “anticipates,” “believes,” “projects,” “forecasts,” “outlook,” “guidance,” “target,” “continue” or the negative of such terms or comparable terminology. Forward-looking statements contained herein (including future cash contractual obligations, liquidity, cash flow, orders, results of operations, projected revenues, margins, capital expenditures, industry and business, trends, cost synergies and savings objectives, and government initiatives among other matters) or in other statements made by us are made based on management’s expectations and beliefs concerning future events impacting us and are subject to uncertainties and factors relating to our operations and business environment, all of which are difficult to predict and many of which are beyond our control, that could cause our actual results to differ materially from those matters expressed or implied by forward-looking statements.

The risk factors discussed in Item 1A. “Risk Factors” and the factors discussed in Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” among others, could affect our future performance and liquidity and value of our securities and could cause our actual results to differ materially from those expressed or implied by forward-looking statements made by us or on our behalf. These factors should not be construed as exhaustive and there may also be other risks that we are unable to predict at this time. All forward-looking statements included in this Annual Report are expressly qualified in their entirety by these cautionary statements.

All forward-looking statements attributable to us or persons acting on our behalf apply only as of the date of this Annual Report and are expressly qualified in their entirety by the cautionary statements included in this Annual Report. We undertake no obligation to update or revise forward-looking statements which may be made to reflect events or circumstances that arise after the filing date of this document or to reflect the occurrence of unanticipated events, except as otherwise required by law.

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

In the normal course of business, our operations are exposed to fluctuations in interest rates and foreign currency values that can affect the cost of operating and financing. Accordingly, we address a portion of these risks through a program of risk management.

Interest Rate Risk: Our primary interest rate risk exposure results from the SSRCF's various floating rate pricing mechanisms. If interest rates were to increase 100 basis points (1 percent) from the weighted-average interest rate of 2.6% at December 31, 2019, and assuming no changes in the $119.0 million of borrowings outstanding under the SSRCF at December 31, 2019, our additional annual expense would be approximately $1.2 million on a pre-tax basis. For future quarters, we expect that the interest expense will increase as a result of our $450.0 million in borrowings under a new term loan on July 1, 2019 in connection with the closing of the AXC acquisition.

Foreign Currency Exchange Rate Risk: We operate in the United States and other foreign countries, which creates exposure to foreign currency exchange fluctuations in the normal course of business, which can impact our financial position, results of operations, cash flow, and competitive position. The financial statements of foreign subsidiaries are translated into their U.S. dollar equivalents at end-of-period exchange rates for assets and liabilities, while income and expenses are translated at average monthly exchange rates. Translation gains and losses are components of other comprehensive (loss) income as reported in the consolidated statements of comprehensive income. Translation exposure is primarily with the euro, the Czech koruna, the Chinese yuan, and the Japanese yen. During 2019, both the Chinese yuan and euro decreased in relation to the U.S. dollar by less than 2%. At December 31, 2019, a hypothetical further 10% strengthening of the U.S. dollar would not materially affect our financial statements.

Transaction gains and losses arising from fluctuations in currency exchange rates on transactions denominated in currencies other than the functional currency are recognized in the consolidated statements of income as a component of foreign currency loss. We enter into foreign exchange forward contracts to hedge anticipated and firmly committed foreign currency transactions. We do not use derivative financial instruments for speculative or trading purposes. The terms of the contracts are generally one year or less. At December 31, 2019, a hypothetical 10% weakening of the U.S. dollar would not materially affect our outstanding foreign exchange forward contracts.

Market Price Sensitive Instruments

In connection with the pricing of the 2024 Notes, we entered into privately negotiated convertible note hedge transactions (the "Note Hedge Transactions") with certain parties, including affiliates of the initial purchasers of the 2024 Notes (the "Option Counterparties"). These Note Hedge Transactions are expected to reduce the potential dilution upon any future conversion the 2024 Notes.

We also entered into separate, privately negotiated warrant transactions with the Option Counterparties to acquire up to 4.41 million shares of our common stock. The warrant transactions will have a dilutive effect with respect to our common stock to the extent that the price per share of our common stock exceeds the strike price of the warrants unless we elect, subject to certain conditions, to settle the warrants in cash. The strike price of the warrant transactions related to the 2024 Notes was initially $71.775 per share. Further information is located in Note 10, "Debt and Credit Arrangements," of our consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Item 8. *Financial Statements and Supplementary Data*

Our Financial Statements and the accompanying Notes that are filed as part of this Annual Report are listed under Item 15. "Exhibits and Financial Statement Schedules" and are set forth beginning on page F-1 immediately following the signature page of this Form 10-K and are incorporated into this Item 8 by reference.

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

None.

Item 9A. *Controls and Procedures*

Evaluation of Disclosure Controls and Procedures

As of December 31, 2019, an evaluation was performed under the supervision and with the participation of our management including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures pursuant to Rule 13a-15 under the Securities and Exchange Act of 1934, as amended (the "Exchange Act"). Based upon that evaluation, such officers concluded that our disclosure controls and procedures are effective to ensure that information required to be disclosed by us in the reports we file or submit under the Exchange Act (1) is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and (2) is accumulated and communicated to our management including the Chief Executive Officer and Chief Financial Officer, as appropriate to allow for timely decisions regarding required disclosure.

Management's Report on Internal Control Over Financial Reporting

Management's Report on Internal Control Over Financial Reporting is set forth on page F-1 of this Annual Report on Form 10-K and incorporated herein by reference. Management used the updated Internal Control-Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission to perform the evaluation.

The effectiveness of our internal control over financial reporting as of December 31, 2019 has been audited by Deloitte LLP, an independent registered public accounting firm, as stated in our report which is set forth in Item 8. "Financial Statements and Supplementary Data," on page F-3 under the caption "Report of Independent Registered Public Accounting Firm" and incorporated herein by reference.

We did not include an evaluation of the internal control over financial reporting of AXC which was acquired during 2019 and which constituted $593.8 million and $108.9 million of total and net assets, respectively, as of December 31, 2019, and $103.1 million, $4.6 million and $16.8 million of revenues, operating income, and intangible assets amortization expense, respectively, for the year then ended.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during our most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. *Other Information*

Not applicable.

PART III

Item 10. *Directors, Executive Officers and Corporate Governance*

Information required by this item as to the Directors of the Company appearing under the caption "Election of Directors" in our 2020 Proxy Statement is incorporated herein by reference. Information required by this item as to the Executive Officers of the Company is included as Item 4A of this Annual Report on Form 10-K as permitted by Instruction 3 to Item 401(b) of Regulation S-K. Information required by Item 405 is set forth in the 2020 Proxy Statement under the heading "Delinquent section 16(a) Reports," which information is incorporated herein by reference. Information required by Items 406 and 407(c)(3), (d)(4) and (d)(5) of Regulation S-K is set forth in the 2020 Proxy Statement under the headings "Information Regarding Meetings and Committees of the Board of Directors," "Code of Ethical Business Conduct and Officer Code of Ethics" and "Stockholder Communications with the Board," which information is incorporated herein by reference.

The Charters of the Audit Committee, Compensation Committee and Nominations and Corporate Governance Committee and the Corporate Governance Guidelines, Officer Code of Ethics and Code of Ethical Business Conduct are available free of charge on our website at www.chartindustries.com and in print to any stockholder who requests a copy. Requests for copies should be directed to Secretary, Chart Industries, Inc., 3055 Torrington Drive, Ball Ground, Georgia 30107. We intend to disclose any amendments to the Code of Ethical Business Conduct or Officer Code of Ethics and any waiver of the Code of Ethical Business Conduct or Officer Code of Ethics granted to any Director or Executive Officer of the Company on our website.

Set forth below is a list of the members of our Board of Directors as of February 14, 2020:

Directors

STEVEN W. KRABLIN (2) (3)
Chairman of the Board
Retired President, Chief Executive Officer and Chairman of the Board
T-3 Energy Services, Inc.
Oilfield services company that manufactures products used in the drilling, production and transportation of oil and gas

JILLIAN C. EVANKO
Chief Executive Officer, President, Chief Financial Officer and Treasurer
Chart Industries, Inc.

W. DOUGLAS BROWN (1) (2)
Retired Vice President, General Counsel and Secretary
Air Products and Chemicals, Inc.
Supplier of industrial gases, performance materials, and equipment and services

CAREY CHEN (2) (3)
Executive Chairman and President of Cincinnati Incorporated
Manufacturer of advanced equipment for the metal fabrication industry

SINGLETON MCALLISTER (1) (2)
Of Counsel and Senior Advisor
Husch Blackwell and Husch Blackwell Strategies
Law firm and affiliated lobbying and governmental affairs counseling firm

MICHAEL L. MOLININI (1) (3)
Retired Chief Executive Officer and President
Airgas, Inc.
Supplier of gases, welding equipment and supplies, and safety products

DAVID M. SAGEHORN [(1)(3)]
Executive Vice President and Chief Financial Officer
Oshkosh Corporation
Global producer of specialty trucks, truck bodies, and access equipment used in defense, construction and service markets

ELIZABETH G. SPOMER [(1)(2)]
Retired Executive Vice President
Veresen Inc. (former owner of Jordan Cove LNG LLC)
Retired President and Chief Executive Officer
Jordan Cove LNG LLC, a wholly owned subsidiary of Pembina Pipeline Corporation
Diversified energy infrastructure company

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(1) Compensation Committee
(2) Nominations and Corporate Governance Committee
(3) Audit Committee

Item 11. *Executive Compensation*

The information required by Item 402 of Regulation S-K is set forth in the 2020 Proxy Statement under the heading "Executive and Director Compensation," which information is incorporated herein by reference. The information required by Items 407(e)(4) and 407(e)(5) of Regulation S-K is set forth in the 2020 Proxy Statement under the headings "Compensation Committee Interlocks and Insider Participation" and "Compensation Committee Report," respectively, which information is incorporated herein by reference.

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

The information required by this item is set forth in the 2020 Proxy Statement under the headings "Security Ownership of Certain Beneficial Owners" and "Equity Compensation Plan Information," which information is incorporated herein by reference.

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

The information required by this item is set forth in the 2020 Proxy Statement under the headings "Related Party Transactions" and "Director Independence," which information is incorporated herein by reference.

Item 14. *Principal Accounting Fees and Services*

The information required by this item is set forth in the 2020 Proxy Statement under the heading "Principal Accounting Fees and Services," which information is incorporated herein by reference.

PART IV

Item 15. ***Exhibits and Financial Statement Schedules***

(a) The following documents are filed as part of this 2019 Annual Report on Form 10-K:

1. *Financial Statements.* The following consolidated financial statements of the Company and its subsidiaries and the reports of the Company's independent registered public accounting firm are incorporated by reference in Item 8:

   Management's Report on Internal Control over Financial Reporting

   Report of Independent Registered Public Accounting Firm

   Consolidated Balance Sheets at December 31, 2019 and 2018

   Consolidated Statements of Income for the Years Ended December 31, 2019, 2018 and 2017

   Consolidated Statements of Comprehensive Income for the Years Ended December 31, 2019, 2018 and 2017

   Consolidated Statements of Cash Flows for the Years Ended December 31, 2019, 2018 and 2017

   Consolidated Statements of Equity for the Years Ended December 31, 2019, 2018 and 2017

   Notes to Consolidated Financial Statements

2. *Financial Statement Schedules*. The following additional information should be read in conjunction with the consolidated financial statements:

   Schedule II Valuation and Qualifying Accounts for the Years Ended December 31, 2019, 2018 and 2017

   All other financial statement schedules have been omitted since they are either not required, not applicable, or the information is otherwise included.

3. *Exhibits*. See the Index to Exhibits at page E-1 of this Annual Report on Form 10-K.

Item 16. ***Form 10–K Summary***

None.

SIGNATURES

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

Chart Industries, Inc.

By: /s/ Jillian C. Evanko

Jillian C. Evanko
Chief Executive Officer, President, Chief Financial Officer and Treasurer
(Principal Executive Officer)

Date: February 14, 2020

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

By:

Signature	Title
/s/ Steven W. Krablin **Steven W. Krablin**	Chairman of the Board, Director
/s/ Jillian C. Evanko **Jillian C. Evanko**	Chief Executive Officer, President, Chief Financial Officer and Treasurer and Director (Principal Executive Officer and Principal Financial Officer)
/s/ Scott W. Merkle **Scott W. Merkle**	Vice President and Chief Accounting Officer (Principal Accounting Officer)
/s/ W. Douglas Brown **W. Douglas Brown**	Director
/s/ Carey Chen **Carey Chen**	Director
/s/ Singleton McAllister **Singleton McAllister**	Director
/s/ Michael L. Molinini **Michael L. Molinini**	Director
/s/ David M. Sagehorn **David M. Sagehorn**	Director
/s/ Elizabeth G. Spomer **Elizabeth G. Spomer**	Director

Date: February 14, 2020

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MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management of Chart Industries, Inc. and its subsidiaries (the "Company") is responsible for establishing and maintaining adequate internal control over financial reporting. The Company's internal control over financial reporting is a process designed under the supervision of the Company's principal executive and financial officers to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the Company's financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles.

The Company's internal control over financial reporting includes policies and procedures that:

- Pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect transactions and dispositions of assets of the Company;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and the 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 Company's 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 and procedures may deteriorate.

Management has assessed the effectiveness of its internal control over financial reporting as of December 31, 2019 based on the framework established in Internal Control — Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 Framework) (the "COSO criteria"). Management did not include an evaluation of the internal control over financial reporting of AXC, which constituted $593.8 million and $108.9 million of total and net assets, respectively, as of December 31, 2019, and $103.1 million and $11.1 million of sales and net loss, respectively, for the year then ended.

Based on this assessment, management has determined that the Company's internal control over financial reporting is effective as of December 31, 2019.

The effectiveness of the Company's internal control over financial reporting as of December 31, 2019 has been audited by Deloitte & Touche, LLP, an independent registered public accounting firm, as stated in their report appearing below, which expresses an unqualified opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2019.

/s/ Jillian C. Evanko

Jillian C. Evanko
Chief Executive Officer, President, Chief Financial Officer and Treasurer

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of Chart Industries, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of Chart Industries, Inc. and subsidiaries (the "Company") as of December 31, 2019, the related consolidated statements of income, comprehensive income, equity, and cash flows, for the year ended December 31, 2019, and the related notes and the schedule listed in the Index at Item 15 (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019, and the results of its operations and its cash flows for the year ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 14, 2020, expressed an unqualified opinion on the Company's internal control over financial reporting.

Adoption of New Accounting Standard

As discussed in Note 1 to the financial statements, the Company has changed its method for accounting for leases as a result of the adoption of Accounting Standards Update (ASU) No. 2016-02, *Leases (Topic 842)*, and other subsequent amendments collectively identified as ASC 842 effective January 1, 2019 using the modified retrospective transition method.

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 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 the financial statements are free of material misstatement, whether due to error or fraud. Our audit 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 audit 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 audit provides a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current-period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Revenue - Contracts Recognized Over Time - Refer to Notes 2 and 5 to the financial statements

Critical Audit Matter Description

As of December 31, 2019, net sales were $1,299.1 million, of which $530.4 million was recognized over time. For contracts that contain language that transfers control to the customer over time, revenue is recognized as the Company satisfies the performance obligations by an allocation of the transaction price to the accounting period computed using input methods such as costs incurred. The input method measures progress toward the satisfaction of the performance obligation by multiplying the transaction price allocated to the performance obligation by the percentage of incurred inputs as of the balance sheet date to the total estimated inputs at completion after giving effect to the most current estimates.

We identified revenue associated with in-process contracts recognized over time as a critical audit matter because of the judgments necessary for management to estimate total inputs used to recognize revenue for these contracts. Management's estimates of total inputs are subjective in nature resulting in a higher degree of audit effort and judgment. Changes in estimated inputs could have a significant impact on the timing of revenue recognition.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to estimates of total inputs used to recognize revenue for contracts over time included the following, among others:

- We tested the effectiveness of controls over certain revenue contracts recognized over time, including management's controls over the estimates of total inputs,
- We selected a sample of in process revenue contracts recognized over time and performed the following:
  - Tested the accuracy and completeness of the inputs incurred to date.
  - Evaluated the estimates of total inputs by:
    - Comparing estimates of total inputs to the original project budget and understanding changes in estimates.
    - Evaluating management's ability to achieve the estimates of total inputs by performing corroborating inquiries with the Company's project managers, engineers, and/or other relevant site personnel to understand the progress to date and the estimate of total inputs.
    - Comparing management's estimates for the selected contracts to inputs of similar contracts, when applicable.
- We evaluated management's ability to estimate total inputs accurately by comparing actual inputs to management's historical estimates for contracts that have been fulfilled.

Business Combinations - Refer to Notes 2 and 13 to the financial statements

Critical Audit Matter Description

The Company completed the acquisition of Air-X-Changers ("AXC") for $599.7 million on July 1, 2019. The Company accounted for this acquisition under the acquisition method of accounting for business combinations. Accordingly, the purchase price was allocated to the assets acquired and liabilities assumed based on their respective fair values, including customer relationships of $139.1 million, trademarks and trade names of $55.0 million, and unpatented technology of $42.1 million. The determination of fair value of these assets involved management making significant estimates and assumptions related to future cash flows, discount rate, and royalty rate.

We identified the initial valuation of the customer relationship, trademarks and trade names, and unpatented technology intangible assets for AXC as a critical audit matter. A high degree of auditor judgment and an increased extent of effort, including the need to involve our fair value specialists, was required when performing audit procedures to evaluate the reasonableness of management's forecasts of future cash flows and the selection of the discount rate and royalty rate used in determining the fair value of these assets.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the forecasts of future cash flows and the selection of the discount rate and royalty rate for these assets included the following, among others:

- We tested the effectiveness of controls over the valuation of the customer relationship, trademarks and trade names, and unpatented technology, including management's controls over forecasts of future cash flows and selection of the discount rate and royalty rate for these assets.
- We assessed the reasonableness of management's forecasts of future cash flows by comparing the projections to historical results, certain peer companies, and industry projections.
- With the assistance of our fair value specialists, we evaluated the reasonableness of the (1) valuation methodology and (2) valuation assumptions, including discount rate and royalty rate by:
  - Testing the source information underlying the determination of the discount rate and royalty rate and testing the mathematical accuracy of the calculation.
  - Developing a range of independent estimates and comparing those to the discount rate and royalty rate selected by management.
- We evaluated whether the estimated future cash flows were consistent with evidence obtained in other areas of the audit.

Goodwill - Refer to Notes 2 and 9 to the financial statements

Critical Audit Matter Description

The Company's evaluation of goodwill for impairment involves the comparison of the fair value of each reporting unit to its carrying value annually in the fourth quarter or whenever events or changes in circumstances indicate that an evaluation should be completed. The Company determines the fair value of its reporting units using the income and market approaches. The determination of the fair value using the income approach requires management to make significant estimates and assumptions related to forecasts of future cash flows and discount rates. The determination of the fair value using the market approach requires management to make significant assumptions related to pricing multiples derived from similar companies. Changes to the assumptions and estimates may result in a significantly different estimate of the fair value of the reporting units, which could result in a different assessment of the recoverability of goodwill. The goodwill balance was $844.9 million as of December 31, 2019, of which $117.0 million, $152.1 million, $176.2 million, and $399.6 million was allocated to the Distribution and Storage Eastern Hemisphere ("D&S East"), Distribution and Storage Western Hemisphere ("D&S West"), Energy and Chemicals Cryogenics ("E&C Cryogenics"), and Energy and Chemicals FinFans ("E&C FinFans") reporting units, respectively. The fair values of D&S East, D&S West, E&C Cryogenics, and E&C FinFans reporting units exceeded their carrying values as of the measurement date and, therefore, no impairment was recognized.

We identified goodwill for D&S East,, E&C Cryogenics, and E&C FinFans as a critical audit matter because of the significant estimates and assumptions management makes to estimate the fair value of each reporting unit and the sensitivity of valuations to changes in the assumptions specifically related to forecasts of future revenue and cash flows and selection of the discount rate used in the income approach, and the selection of pricing multiples for similar companies used in the market approach. This required a high degree of auditor judgment and an increased extent of effort, including the need to involve our fair value specialists, when performing audit procedures to evaluate the reasonableness of these assumptions.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the forecasts of future revenues and cash flows ("forecasts") , and the selection of pricing multiples and discount rate included the following, among others:

- We tested the effectiveness of controls over management's impairment evaluation, including those over the determination of the fair value of each reporting unit, such as controls related to management's forecasts and selection of the pricing multiples and discount rate.
- We evaluated management's ability to accurately forecast by comparing actual results to management's historical forecasts.
- We evaluated the reasonableness of management's forecasts by comparing the forecasts to (1) historical results, (2) internal communications to management and the Board of Directors, and (3) forecasted information included in the Company press releases as well as in analyst and industry reports of the Company and companies in its peer group.
- We considered the impact of changes in the industry on management's forecasts.
- With the assistance of our fair value specialists, we evaluated the reasonableness of the (1) valuation methodology and (2) valuation assumptions, including discount rate and pricing multiples by:
    - Testing the source information underlying the determination of the discount rate and pricing multiples and testing the mathematical accuracy of the calculation.
    - Developing a range of independent estimates and comparing those to the discount rate and pricing multiples selected by management.

/s/ Deloitte & Touche LLP

Atlanta, Georgia

February 14, 2020

We have served as the Company's auditor since 2019.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of Chart Industries, Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Chart Industries, Inc. and subsidiaries (the "Company") as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2019, of the Company and our report dated February 14, 2020, expressed an unqualified opinion on those financial statements and included an explanatory paragraph regarding the Company's adoption of a new accounting standard.

As described in Management's Report on Internal Control Over Financial Reporting, management excluded from its assessment the internal control over financial reporting at Air-X-Changers, which was acquired on July 1, 2019, and whose financial statements constitute $593.8 million of total assets as of December 31, 2019, and $103.1 million of revenues for the year then ended. Accordingly, our audit did not include the internal control over financial reporting at Air-X-Changers.

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/ Deloitte & Touche LLP

Atlanta, Georgia
February 14, 2020

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of
Chart Industries, Inc. and Subsidiaries

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Chart Industries, Inc. and Subsidiaries (the Company) as of December 31, 2018, the related consolidated statements of operations, comprehensive income (loss), equity and cash flows for each of the two years in the period ended December 31, 2018, and the related notes and the 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 the results of its operations and its cash flows for each of the two years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

Adoption of New Accounting Standard

As discussed in Note 2 to the consolidated financial statements, the Company changed its method for accounting for revenue in 2018 as a result of the adoption of Accounting Standards Update (ASU) No. 2014-09, Revenue from Contracts with Customers (Topic 606), and the amendments in ASUs 2015-14, 2016-08, 2016-10 and 2016-12 effective January 1, 2018.

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 1991.

Atlanta, Georgia
February 22, 2019
except for Notes 4, 5 and 21, as to which the date is
February 14, 2020

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(Dollars in millions, except per share amounts)

	December 31,	
	2019	2018
ASSETS		
Current Assets		
Cash and cash equivalents	$ 119.0	$ 118.1
Accounts receivable, less allowances of $8.8 and $8.5	202.6	194.8
Inventories, net	219.4	233.1
Unbilled contract revenue	86.1	54.5
Prepaid expenses	17.8	14.0
Other current assets	28.7	47.2
Total Current Assets	673.6	661.7
Property, plant and equipment, net	404.6	361.1
Goodwill	844.9	520.7
Identifiable intangible assets, net	529.1	330.4
Investments	13.4	2.8
Other assets	15.8	21.0
TOTAL ASSETS	$ 2,481.4	$ 1,897.7
LIABILITIES AND EQUITY		
Current Liabilities		
Accounts payable	$ 125.0	$ 125.5
Customer advances and billings in excess of contract revenue	127.8	130.0
Accrued salaries, wages and benefits	41.5	46.6
Accrued income taxes	11.8	3.3
Current portion of warranty reserve	10.4	8.6
Short-term debt and current portion of long-term debt	16.3	11.2
Operating lease liabilities, current	6.3	—
Other current liabilities	39.2	41.4
Total Current Liabilities	378.3	366.6
Long-term debt	761.0	533.2
Long-term deferred tax liabilities	52.1	76.4
Accrued pension liabilities	10.2	11.7
Operating lease liabilities, non-current	27.8	—
Other long-term liabilities	19.6	20.8
Total Liabilities	1,249.0	1,008.7
Equity		
Common stock, par value $0.01 per share — 150,000,000 shares authorized, 35,799,994 and 31,363,650 shares issued and outstanding at December 31, 2019 and 2018, respectively	0.4	0.3
Additional paid-in capital	762.8	460.2
Retained earnings	500.3	453.9
Accumulated other comprehensive loss	(35.9)	(29.9)
Total Chart Industries, Inc. Shareholders' Equity	1,227.6	884.5
Noncontrolling interests	4.8	4.5
Total Equity	1,232.4	889.0
TOTAL LIABILITIES AND EQUITY	$ 2,481.4	$ 1,897.7

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

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF INCOME
(Dollars and shares in millions, except per share amounts)

	Year Ended December 31,		
	2019	**2018**	**2017**
Sales	$ 1,299.1	$ 1,084.3	$ 842.9
Cost of sales	962.3	788.4	611.3
Gross profit	336.8	295.9	231.6
Selling, general and administrative expenses	216.1	181.9	180.9
Amortization expense	39.8	21.9	12.2
Operating expenses	255.9	203.8	193.1
Operating income	80.9	92.1	38.5
Other expenses:			
Interest expense, net	25.3	21.4	17.3
Loss on extinguishment of debt	—	—	4.9
Financing costs amortization	3.0	1.3	1.3
Foreign currency (gain) loss	(0.2)	0.4	3.9
Other expenses, net	28.1	23.1	27.4
Income from continuing operations before income taxes	52.8	69.0	11.1
Income tax expense (benefit):			
Current	22.2	8.4	14.8
Deferred	(16.2)	5.0	(31.4)
Income tax expense (benefit), net	6.0	13.4	(16.6)
Net income from continuing operations	46.8	55.6	27.7
Income from discontinued operations, net of tax	—	34.4	1.8
Net income	46.8	90.0	29.5
Less: Income attributable to noncontrolling interests of continuing operations, net of taxes	0.4	2.0	1.5
Net income attributable to Chart Industries, Inc.	$ 46.4	$ 88.0	$ 28.0
Net income attributable to Chart Industries, Inc.			
Income from continuing operations	46.4	53.6	26.2
Income from discontinued operations	—	34.4	1.8
Net income attributable to Chart Industries, Inc.	$ 46.4	$ 88.0	$ 28.0
Basic earnings per common share attributable to Chart Industries, Inc.			
Income from continuing operations	$ 1.37	$ 1.73	$ 0.85
Income from discontinued operations	—	1.10	0.06
Net income attributable to Chart Industries, Inc.	$ 1.37	$ 2.83	$ 0.91
Diluted earnings per common share attributable to Chart Industries, Inc.			
Income from continuing operations	$ 1.32	$ 1.67	$ 0.84
Income from discontinued operations	—	1.06	0.05
Net income attributable to Chart Industries, Inc.	$ 1.32	$ 2.73	$ 0.89
Weighted-average number of common shares outstanding:			
Basic	33.91	31.05	30.74
Diluted	35.17	32.20	31.34

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

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(Dollars in millions)

	Year Ended December 31,		
	2019	2018	2017
Net income	$ 46.8	$ 90.0	$ 29.5
Other comprehensive (loss) income:			
Foreign currency translation adjustments	(7.5)	(19.7)	26.9
Defined benefit pension plan:			
Actuarial gain (loss) on remeasurement	0.3	(3.5)	2.4
Amortization of net loss	1.3	0.9	1.2
Defined benefit pension plan	1.6	(2.6)	3.6
Other comprehensive (loss) income, before tax	(5.9)	(22.3)	30.5
Income tax (expense) benefit related to defined benefit pension plan	(0.1)	0.5	(3.3)
Other comprehensive (loss) income, net of taxes	(6.0)	(21.8)	27.2
Comprehensive income	40.8	68.2	56.7
Less: Comprehensive income attributable to noncontrolling interests, net of taxes	(0.4)	(2.0)	(1.6)
Comprehensive income attributable to Chart Industries, Inc.	$ 40.4	$ 66.2	$ 55.1

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

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Dollars in millions)

	Year Ended December 31,		
	2019	**2018**	**2017**
OPERATING ACTIVITIES			
Net income	$ 46.8	$ 90.0	$ 29.5
Less: Income from discontinued operations	—	34.4	1.8
Income from continuing operations	46.8	55.6	27.7
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	78.8	50.8	37.6
Interest accretion of convertible notes discount	7.6	9.1	12.8
Loss on extinguishment of debt	—	—	4.9
Financing costs amortization	3.0	1.3	1.3
Employee share-based compensation expense	9.0	4.9	10.6
Unrealized foreign currency transaction loss (gain)	0.6	(2.2)	0.3
Deferred income tax (benefit) expense	(16.2)	5.0	(31.4)
Other non-cash operating activities	0.9	(2.5)	2.3
Changes in assets and liabilities, net of acquisitions:			
Accounts receivable	23.6	25.5	(32.8)
Inventory	9.4	(14.1)	(22.0)
Unbilled contract revenues and other assets	(1.6)	(9.1)	3.5
Accounts payable and other liabilities	(20.9)	(10.2)	13.6
Customer advances and billings in excess of contract revenue	(7.1)	4.9	15.9
Net Cash Provided By Operating Activities	133.9	119.0	44.3
INVESTING ACTIVITIES			
Acquisition of businesses, net of cash acquired	(603.9)	(225.8)	(446.1)
Capital expenditures	(36.2)	(35.6)	(33.0)
Investments [1]	(3.3)	—	—
Government grants	0.7	0.8	0.4
Proceeds from sale of assets	—	—	0.9
Net Cash Used In Investing Activities	(642.7)	(260.6)	(477.8)
FINANCING ACTIVITIES			
Borrowings on revolving credit facilities	235.8	411.7	302.2
Repayments on revolving credit facilities	(451.1)	(316.8)	(66.1)
Repurchase of convertible notes	—	(57.1)	(194.9)
Proceeds from issuance of convertible notes	—	—	258.8
Proceeds from issuance of warrants	—	—	46.0
Payments for call options related to convertible notes	—	—	(59.5)
Borrowings on term loan	450.0	—	—
Repayments on term loan	(2.8)	(5.9)	(3.1)
Payments for debt issuance costs	(13.6)	(1.4)	(8.2)
Issuance of Shares	295.8	—	—
Payments for equity issuance costs	(9.5)	—	—
Proceeds from exercise of stock options	9.4	10.8	2.0
Common stock repurchases	(2.0)	(2.7)	(2.0)
Dividend distribution to noncontrolling interests	(0.4)	(0.4)	—
Net Cash Provided By Financing Activities	511.6	38.2	275.2

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS — (Continued)
(Dollars in millions)

	Year Ended December 31,		
	2019	**2018**	**2017**
DISCONTINUED OPERATIONS			
Cash (Used In) Provided By Operating Activities	—	(30.2)	2.7
Cash Provided By (Used In) Investing Activities [(2)]	—	132.7	(2.2)
Cash Provided By Discontinued Operations	—	102.5	0.5
Effect of exchange rate changes on cash and cash equivalents	(1.9)	(11.4)	7.2
Net increase (decrease) in cash, cash equivalents, restricted cash, and restricted cash equivalents	0.9	(12.3)	(150.6)
Cash, cash equivalents, restricted cash, and restricted cash equivalents at beginning of period	119.1	131.4	282.0
CASH, CASH EQUIVALENTS, RESTRICTED CASH, AND RESTRICTED CASH EQUIVALENTS AT END OF PERIOD [(3)]	$ 120.0	$ 119.1	$ 131.4

(1) Non-cash investing activities of $7.0 related to the conversion of a note receivable into an investment in equity securities during the year ended December 31, 2019. Refer to Note 6, "Investments" for further information.

(2) Includes proceeds from the sale of CAIRE of $133.5 for the year ended December 31, 2018.

(3) Refer to Note 10, "Debt and Credit Arrangements," for further information regarding restricted cash and restricted cash equivalents balances.

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

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF EQUITY
(Dollars and shares in millions)

	Common Stock		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive (Loss) Income	Non-controlling Interests	Total Equity
	Shares Outstanding	Amount					
Balance at January 1, 2017	30.61	$ 0.3	$ 395.8	$ 336.3	$ (35.2)	$ 1.4	$ 698.6
Net income	—	—	—	28.0	—	1.5	29.5
Other comprehensive income	—	—	—	—	27.1	0.1	27.2
Equity component of convertible notes issuance, net of deferred financing fees and deferred taxes	—	—	36.6	—	—	—	36.6
Proceeds from issuance of warrants	—	—	46.0	—	—	—	46.0
Purchase of call options, net of deferred taxes	—	—	(38.1)	—	—	—	(38.1)
Repurchase of convertible notes	—	—	(5.8)	—	—	—	(5.8)
Share-based compensation expense	—	—	11.1	—	—	—	11.1
Common stock issued from share-based compensation plans	0.25	—	2.0	—	—	—	2.0
Common stock repurchases	(0.05)	—	(2.0)	—	—	—	(2.0)
Other	—	—	0.1	—	—	—	0.1
Balance at December 31, 2017	30.81	0.3	445.7	364.3	(8.1)	3.0	805.2
Net income	—	—	—	88.0	—	2.0	90.0
Cumulative effect of accounting change	—	—	—	1.6	—	—	1.6
Other comprehensive loss	—	—	—	—	(21.8)	—	(21.8)
Share-based compensation expense	—	—	6.9	—	—	—	6.9
Common stock issued from share-based compensation plans	0.60	—	10.3	—	—	—	10.3
Common stock repurchases	(0.05)	—	(2.7)	—	—	—	(2.7)
Dividend distribution to noncontrolling interest	—	—	—	—	—	(0.4)	(0.4)
Other	—	—	—	—	—	(0.1)	(0.1)
Balance at December 31, 2018	31.36	0.3	460.2	453.9	(29.9)	4.5	889.0
Net income	—	—	—	46.4	—	0.4	46.8
Other comprehensive loss	—	—	—	—	(6.0)	—	(6.0)
Common stock issuance, net of equity issuance costs [1]	4.03	0.1	286.2	—	—	—	286.3
Share-based compensation expense	—	—	9.0	—	—	—	9.0
Common stock issued from share-based compensation plans	0.30	—	9.4	—	—	—	9.4
Common stock repurchases	0.11	—	(2.0)	—	—	—	(2.0)
Dividend distribution to noncontrolling interest	—	—	—	—	—	(0.4)	(0.4)
Other	—	—	—	—	—	0.3	0.3
Balance at December 31, 2019	35.80	$ 0.4	$ 762.8	$ 500.3	$ (35.9)	$ 4.8	$ 1,232.4

(1) Equity issuance costs were $9.5 during the year ended December 31, 2019.

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

NOTE 1 — Nature of Operations and Principles of Consolidation

Nature of Operations: Chart Industries, Inc. and its consolidated subsidiaries (herein referred to as the "Company," "Chart," "we," "us," or "our"), is a leading diversified global manufacturer of highly engineered equipment servicing multiple market applications in energy and industrial gas. Chart's equipment and engineered systems are primarily used for low-temperature and cryogenic applications utilizing our expertise in cryogenic systems and equipment which operate at low temperatures sometimes approaching absolute zero (0 Kelvin; -273° Centigrade; -459° Fahrenheit). We have domestic operations located across the United States, including principal executive offices located in Georgia, and an international presence in Asia, Australia, Europe and the Americas.

On July 1, 2019, we completed the acquisition of Harsco Corporation's Industrial Air-X-Changers business ("AXC"). AXC is a leading supplier of custom engineered and manufactured air cooled heat exchangers ("ACHX") for the natural gas compression and processing industry and refining and petrochemical industry in the United States.

On December 20, 2018, we closed the sale of our oxygen-related products business to NGK SPARK PLUG CO., LTD. The strategic decision to divest the oxygen-related products business reflects our strategy and capital allocation approach to focus on our core capabilities and offerings. Refer to Note 3, "Discontinued Operations," for further information.

On November 15, 2018, we completed the previously announced acquisition of VRV S.r.l. and its subsidiaries (collectively "VRV"). VRV, which has operations in Italy, France and India, is a diversified multinational corporation with highly automated, purpose-built facilities for the design and manufacture of pressure equipment serving the industrial gas and energy end markets.

On January 2, 2018, we completed the acquisition of Skaff Cryogenics and Cryo-Lease, LLC (together "Skaff"). Skaff provides quality repair service and re-manufacturing of cryogenic and liquefied natural gas storage tanks and trailers and also maintains a portfolio of cryogenic storage equipment that is rented to customers for temporary and permanent needs. Skaff is headquartered in Brentwood, New Hampshire and provides services and equipment to customers in North America.

For further information regarding the AXC, VRV and Skaff acquisitions, refer to Note 13, "Business Combinations."

Principles of Consolidation: The consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles ("GAAP") and include the accounts of Chart Industries, Inc. and its subsidiaries. Intercompany accounts and transactions are eliminated in consolidation.

Reclassifications: Certain reclassifications have been made to the 2018 consolidated balance sheet in order to conform to the 2019 presentation.

NOTE 2 — Significant Accounting Policies

Use of Estimates: The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements. These estimates may also affect the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates and assumptions.

Cash, Cash Equivalents, Restricted Cash, and Restricted Cash Equivalents: We consider all investments with an initial maturity of three months or less when purchased to be cash equivalents. See Note 10, "Debt and Credit Arrangements" for additional information about restricted cash and restricted cash equivalents, which are included in other current assets and other assets in the accompanying consolidated balance sheets.

Accounts Receivable, Net of Allowances: Accounts receivable includes amounts billed and currently due from customers. The amounts due are stated at their net estimated realizable value. We maintain an allowance for doubtful accounts to provide for the estimated amount of receivables that will not be collected. The allowance is based upon an assessment of customer creditworthiness, historical payment experience, the age of outstanding receivables and collateral to the extent applicable. Past-due trade receivable balances are written off when our internal collection efforts have been unsuccessful. As a practical expedient, we do not adjust the promised amount of consideration for the effects of a significant financing component when we expect, at contract inception, that the period between our transfer of a promised product or service to a customer and when the customer

pays for that product or service will be one year or less. We do not typically include extended payment terms in our contracts with customers.

Inventories: Inventories are stated at the lower of cost or net realizable value with cost being determined by the first-in, first-out ("FIFO") method. We determine inventory valuation reserves based on a combination of factors. In circumstances where we are aware of a specific problem in the valuation of a certain item, a specific reserve is recorded to reduce the item to its net realizable value. We also recognize reserves based on the actual usage in recent history and projected usage in the near-term.

Unbilled Contract Revenue: Unbilled contract revenue represents contract assets resulting from revenue recognized over time in excess of the amount billed to the customer and the amount billed to the customer is not just subject to the passage of time. Billing requirements vary by contract but are generally structured around the completion of certain milestones. These contract assets are generally classified as current.

Property, Plant and Equipment: Capital expenditures for property, plant and equipment are recorded at cost. Expenditures for maintenance and repairs are charged to expense as incurred, whereas major improvements that extend the useful life are capitalized. The cost of applicable assets is depreciated over their estimated useful lives. Depreciation is computed using the straight-line method for financial reporting purposes and accelerated methods for income tax purposes.

Lease Accounting: At lease inception, we determine if an arrangement is a lease and if it includes options to extend or terminate the lease if it is reasonably certain that the options will be exercised. Lease expense for lease payments is recognized on a straight-line basis over the lease term. Operating leases are recognized as right-of-use ("ROU") assets and are included within property, plant and equipment, net and lease liabilities are included in operating lease liabilities, current and operating lease liabilities, non-current in our consolidated balance sheet as of January 1, 2019 (the "Commencement Date") and at December 31, 2019. ROU assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities were recognized on the Commencement Date based on the present value of lease payments over the lease term. As most of our leases do not provide an implicit rate, we used our incremental borrowing rate based on the information available on the Commencement Date in determining the present value of lease payments.

Long-lived Assets: We monitor our property, plant, equipment, and finite-lived intangible assets for impairment indicators on an ongoing basis. Assets are grouped and tested at the lowest level for which identifiable cash flows are available. If impairment indicators exist, we perform the required analysis and record impairment charges, if applicable. In conducting our analysis, we compare the undiscounted cash flows expected to be generated from the long-lived assets to the related net book values. If the undiscounted cash flows exceed the net book value, the long-lived assets are considered not to be impaired. If the net book value exceeds the undiscounted cash flows, an impairment loss is measured and recognized. An impairment loss is measured as the difference between the net book value and the fair value of the long-lived assets. Fair value is estimated from discounted future net cash flows (for assets held and used) or net realizable value (for assets held for sale). Changes in economic or operating conditions impacting these estimates and assumptions could result in the impairment of long-lived assets. We amortize intangible assets that have finite lives over their estimated useful lives.

Goodwill and Indefinite-Lived Intangible Assets: Goodwill is recognized as the excess cost of an acquired entity over the net amount assigned to assets acquired and liabilities assumed. We do not amortize goodwill or indefinite-lived intangible assets, but review them for impairment annually in the fourth quarter or whenever events or changes in circumstances indicate that an evaluation should be completed.

Goodwill is analyzed on a reporting unit basis. The reporting units are the same as the operating and reportable segments: Distribution & Storage Eastern Hemisphere ("D&S East"), Distribution & Storage Western Hemisphere ("D&S West"), Energy & Chemicals Cryogenics ("E&C Cryogenics"), and Energy & Chemicals FinFans ("E&C FinFans"). We first evaluate qualitative factors, such as macroeconomic conditions and our overall financial performance to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount, including goodwill. We then evaluate how significant each of the identified factors could be to the fair value or carrying amount of a reporting unit and weigh these factors in totality in forming a conclusion of whether or not it is more likely than not that the fair value of a reporting unit is less than its carrying amount (the "Step 0 Test"). If we determine that it is not more likely than not that the fair value of a reporting unit is less than its carrying amount, the first step of the goodwill impairment test is not necessary. Otherwise, we would proceed to the first step of the goodwill impairment test.

Alternatively, we may also bypass the Step 0 Test and proceed directly to the first step of the goodwill impairment test. Under the first step ("Step 1"), we estimate the fair value of the reporting units by considering income and market approaches to develop fair value estimates, which are weighted to arrive at a fair value estimate for each reporting unit. With respect to the income approach, a model has been developed to estimate the fair value of each reporting unit. This fair value model incorporates estimates of future cash flows, estimates of allocations of certain assets and cash flows among reporting units, estimates of future growth rates and management's judgment regarding the applicable discount rates to use to discount such estimates of cash flows. With respect to the market approach, a guideline company method is employed whereby pricing multiples are derived from companies with similar assets or businesses to estimate fair value of each reporting unit. If the fair value of the reporting unit exceeds the carrying amount of the net assets assigned to that reporting unit, then goodwill is not impaired and no further testing is required. However, if the fair value of the reporting unit is less than its carrying amount, the impairment charge is based on the excess of a reporting unit's carrying amount over its fair value (i.e., we would measure the charge based on the result from Step 1).

In order to assess the reasonableness of the calculated fair values of the reporting units, we also compare the sum of the reporting units' fair values to the market capitalization and calculate an implied control premium (the excess of the sum of the reporting units' fair values over the market capitalization). We evaluate the control premium by comparing it to control premiums of recent comparable transactions. If the implied control premium is not reasonable in light of this assessment, we reevaluate the fair value estimates of the reporting units by adjusting the discount rates and other assumptions as necessary.

Changes to the assumptions and estimates used throughout the steps described above may result in a significantly different estimate of the fair value of the reporting units, which could result in a different assessment of the recoverability of goodwill and result in future impairment charges.

With respect to indefinite-lived intangible assets, we first evaluate relevant events and circumstances to determine whether it is more likely than not that the fair value of an indefinite-lived intangible asset is less than its carrying amount. If, in weighing all relevant events and circumstances in totality, we determine that it is more likely than not that an indefinite-lived intangible asset is not impaired, no further action is necessary. Otherwise, we would determine the fair value of indefinite-lived intangible assets and perform a quantitative impairment assessment by comparing the indefinite-lived intangible asset's fair value to its carrying amount. We may bypass such a qualitative assessment and proceed directly to the quantitative assessment. We estimate the fair value of the indefinite-lived assets using the income approach. This may include the relief from royalty method or use of a model similar to the one described above related to goodwill which estimates the future cash flows attributed to the indefinite-lived intangible asset and then discounting these cash flows back to a present value. Under the relief from royalty method, fair value is estimated by discounting the royalty savings, as well as any tax benefits related to ownership to a present value. The fair value from either approach is compared to the carrying value and an impairment is recorded if the fair value is determined to be less than the carrying value.

See Note 9, "Goodwill and Intangible Assets," for more information relating to goodwill and indefinite-lived intangible assets.

Customer Advances and Billings in Excess of Contract Revenue: Our contract liabilities consist of advance customer payments, billings in excess of revenue recognized and deferred revenue. Our contract assets and liabilities are reported in a net position on a contract-by-contract basis at the end of each reporting period. We classify advance customer payments and billings in excess of revenue recognized as current. We classify deferred revenue as current or non-current based on the timing of when we expect to recognize revenue. The current portion of deferred revenue is included in customer advances and billings in excess of contract revenue in our consolidated balance sheets. Long-term deferred revenue is included in other long-term liabilities in our consolidated balance sheets.

Convertible Debt: We determined that the conversion option within our 1.00% Convertible Senior Subordinated Notes due November 2024 (the "2024 Notes") was not clearly and closely related to the debt instrument host, however, the conversion option met a scope exception to derivative instrument accounting since the conversion feature is indexed to our common stock and meets equity classification criteria. Convertible debt instruments exempt from derivative accounting and subject to cash settlement of the conversion option are recognized by bifurcating the principal balance into a liability component and an equity component where the fair value of the liability component is estimated by calculating the present value of its cash flows discounted at an interest rate that we would have received for similar debt instruments that have no conversion rights (the "straight-debt rate"), and the equity component is the residual amount, net of tax, which creates a discount on the 2024 Notes. We recognize non-cash interest accretion expense related to the carrying amount of the 2024 Notes which is accreted back to its principal amount over the expected life of the debt, which is also the stated life of the debt.

Financial Instruments: The fair values of cash equivalents, accounts receivable, accounts payable and short-term bank debt approximate their carrying amount because of the short maturity of these instruments.

To minimize credit risk from trade receivables, we review the financial condition of potential customers in relation to established credit requirements before sales credit is extended and monitor the financial condition and payment history of customers to help ensure timely collections and to minimize losses. Additionally, for certain domestic and foreign customers, particularly in the E&C segment, we require advance payments, letters of credit, bankers' acceptances, and other such guarantees of payment. Certain customers also require us to issue letters of credit or performance bonds, particularly in instances where advance payments are involved, as a condition of placing the order.

Fair Value Measurements: We measure our financial assets and liabilities at fair value on a recurring basis using a three-tier fair value hierarchy, which prioritizes the inputs used in the valuation methodologies. The three levels of inputs used to measure fair value are as follows:

Level 1 — Valuations based on quoted prices for identical assets and liabilities in active markets.

Level 2 — Valuations based on observable inputs other than quoted prices included in Level 1, such as quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets and liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data.

Level 3 — Valuations based on unobservable inputs reflecting our own assumptions, consistent with reasonably available assumptions made by other market participants. These valuations require significant judgment.

Derivative Financial Instruments: We utilize certain derivative financial instruments to enhance our ability to manage foreign currency risk that exists as part of ongoing business operations. Derivative instruments are entered into for periods consistent with related underlying exposures and do not constitute positions independent of those exposures. We do not enter into contracts for speculative purposes nor are we a party to any leveraged derivative instrument. We are exposed to foreign currency exchange risk as a result of transactions in currencies other than the functional currency of certain subsidiaries. We utilize foreign currency forward purchase and sale contracts to manage the volatility associated with foreign currency purchases and certain intercompany transactions in the normal course of business. Contracts typically have maturities of less than one year. Principal currencies include the U.S. dollar, the euro, the Chinese yuan, the Czech koruna, the Australian dollar, the British pound, the Canadian dollar, the Indian rupee and the Japanese yen. Our foreign currency forward contracts do not qualify as hedges as defined by accounting guidance. Foreign currency forward contracts are measured at fair value and recorded on the consolidated balance sheets as other current liabilities or assets. Changes in their fair value are recorded in the consolidated statements of income as foreign currency gains or losses. Our foreign currency forward contracts are not exchange traded instruments and, accordingly, the valuation is performed using Level 2 inputs as defined above. Gains or losses on settled or expired contracts are recorded in the consolidated statements of income as foreign currency gains or losses.

Product Warranties: We provide product warranties with varying terms and durations for the majority of our products. We estimate product warranty costs and accrue for these costs as products are sold with a charge to cost of sales. Factors considered in estimating warranty costs include historical and projected warranty claims, historical and projected cost-per-claim, and knowledge of specific product issues that are outside of typical experience. Warranty accruals are evaluated and adjusted as necessary based on actual claims experience and changes in future claim and cost estimates.

Business Combinations: We account for business combinations in accordance with Accounting Standards Codification ("ASC") ASC 805, "Business Combinations." We recognize and measure identifiable assets acquired and liabilities assumed based on their estimated fair values. The excess of the consideration transferred over the fair value of the net assets acquired, including identifiable intangible assets, is assigned to goodwill. As additional information becomes available, we may further revise the preliminary acquisition consideration allocation during the remainder of the measurement period, which shall not exceed twelve months from the closing of the acquisition.

Identifiable finite-lived intangible assets generally consist of customer relationships, unpatented technology, patents and trademarks and trade names and are amortized over their estimate useful lives which generally range from 2 to 15 years. Identifiable indefinite-lived intangible assets generally consist of trademarks and trade names and are subject to impairment testing on at least an annual basis. We estimate the fair value of identifiable intangible assets under income approaches where the fair value models incorporate estimates of future cash flows, estimates of allocations of certain assets and cash flows, estimates of future growth rates, and management's judgment regarding the applicable discount rates to use to discount such estimates of cash flows.

We expense transaction related costs, including legal, consulting, accounting and other costs, in the periods in which the costs are incurred.

Revenue Recognition: Revenue is recognized when (or as) we satisfy performance obligations by transferring a promised good or service, an asset, to a customer. An asset is transferred to a customer when, or as, the customer obtains control over that asset. In most contracts, the transaction price includes both fixed and variable consideration. The variable consideration contained within our contracts with customers includes discounts, rebates, refunds, credits, price concessions, incentives, performance bonuses, penalties and other similar items. When a contract includes variable consideration, we evaluate the estimate of the variable consideration to determine whether the estimate needs to be constrained; therefore, we include the variable consideration in the transaction price only to the extent that it is probable that a significant reversal of the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. Variable consideration estimates are updated at each reporting date. When a contract includes multiple performance obligations, the contract price is allocated among the performance obligations based upon the stand alone selling prices. When the period between when we transfer a promised good or service to a customer and when the customer pays for that good or service is expected, at contract inception, to be one year or less, we do not adjust for the effects of a significant financing component.

For brazed aluminum heat exchangers, air cooled heat exchangers, cold boxes, liquefied natural gas fueling stations, engineered tanks, and repair services, most contracts contain language that transfers control to the customer over time. For these contracts, revenue is recognized as we satisfy the performance obligations by an allocation of the transaction price to the accounting period computed using input methods such as costs incurred. Input methods recognize revenue on the basis of the entity's efforts or inputs to the satisfaction of a performance obligation relative to the total expected inputs to the satisfaction of that performance obligation. The costs incurred input method measures progress toward the satisfaction of the performance obligation by multiplying the transaction price of the performance obligation by the percentage of incurred costs as of the balance sheet date to the total estimated costs at completion after giving effect to the most current estimates. Timing of amounts billed on contracts varies from contract to contract and could cause significant variation in working capital needs. Revisions to estimated cost to complete that result from inefficiencies in our performance that were not expected in the pricing of the contract are expensed in the period in which these inefficiencies become known. Contract modifications can change a contract's scope, price, or both. Approved contract modifications are accounted for as either a separate contract or as part of the existing contract depending on the nature of the modification.

For standard industrial gas and LNG tanks and some products identified in the prior paragraph with contract language that does not meet the over time recognition requirements, the contract with the customer contains language that transfers control to the customer at a point in time. For these contracts, revenue is recognized when we satisfy our performance obligation to the customer. Timing of amounts billed on contracts varies from contract to contract. The specific point in time when control transfers depends on the contract with the customer, contract terms that provide for a present obligation to pay, physical possession, legal title, risk and rewards of ownership, acceptance of the asset, and bill-and-hold arrangements may impact the point in time when control transfers to the customer. We recognize revenue under bill-and-hold arrangements when control transfers and the reason for the arrangement is substantive, the product is separately identified as belonging to the customer, the product is ready for physical transfer and we do not have the ability to use the product or direct it to another customer.

Incremental contract costs are expensed when incurred when the amortization period of the asset that would have been recognized is one year or less; otherwise, incremental contract costs are recognized as an asset and amortized over time as promised goods and services are transferred to a customer. When losses are expected to be incurred on a contract, we recognize the entire anticipated loss in the accounting period when the loss becomes evident. The loss is recognized when the current estimate of the consideration we expect to receive, modified to include unconstrained variable consideration instead of constrained variable consideration, is less than the current estimate of total costs for the contract.

Taxes assessed by a governmental authority that are both imposed on and concurrent with a specific revenue-producing transaction, that are collected by us from a customer, are excluded from revenue.

Shipping and handling fee revenues and the related expenses are reported as fulfillment revenues and expenses for all customers because we have adopted the practical expedient contained in ASC 606-10-25-18B. Therefore, all shipping and handling costs associated with outbound freight are accounted for as fulfillment costs and are included in cost of sales. Amounts billed to customers for shipping are classified as sales, and the related costs are classified as cost of sales on the consolidated statements of income. Shipping revenue of $12.1, $11.4, and $8.5 for the years ended December 31, 2019, 2018 and 2017, respectively, are

included in sales. Shipping costs of $18.3, $16.9, and $11.1 for the years ended December 31, 2019, 2018 and 2017, respectively, are included in cost of sales.

Cost of Sales: Manufacturing expenses associated with sales are included in cost of sales. Cost of sales includes all materials, direct and indirect labor, inbound freight, purchasing and receiving, inspection, internal transfers, and distribution and warehousing of inventory. In addition, shop supplies, facility maintenance costs, manufacturing engineering, project management, and depreciation expense for assets used in the manufacturing process are included in cost of sales on the consolidated statements of income.

Selling, General and Administrative ("SG&A") Expenses: SG&A expenses include selling, marketing, customer service, product management, design engineering, and other administrative expenses not directly supporting the manufacturing process, as well as depreciation and amortization expense associated with non-manufacturing assets. In addition, SG&A expenses include corporate operating expenses for executive management, accounting, tax, treasury, corporate development, human resources, information technology, investor relations, legal, internal audit and risk management.

Advertising Costs: We incurred advertising costs of $4.3, $4.0, and $4.2 for the years ended December 31, 2019, 2018 and 2017, respectively. Such costs are expensed as incurred and included in SG&A expenses in the consolidated statements of income.

Research and Development Costs: We incurred research and development costs of $11.0, $11.1, and $7.1 for the years ended December 31, 2019, 2018 and 2017, respectively. Such costs are expensed as incurred and included in SG&A expenses in the consolidated statements of income.

Foreign Currency Translation: The functional currency for the majority of our foreign operations is the applicable local currency. The translation from the applicable foreign currencies to U.S. dollars is performed for asset and liability accounts using exchange rates in effect at the balance sheet date and for revenue and expense accounts using the average exchange rate during the period. The resulting translation adjustments are recorded as a component of other comprehensive (loss) income in the consolidated statements of comprehensive income. Remeasurement from local to functional currencies is included in cost sales or foreign currency loss in the consolidated statements of income. Gains or losses resulting from foreign currency transactions are charged to net income in the consolidated statements of income as incurred.

Income Taxes: The Company and its U.S. subsidiaries file a consolidated federal income tax return. Deferred income taxes are provided for temporary differences between financial reporting and the consolidated tax return in accordance with the liability method. A valuation allowance is provided against net deferred tax assets when conditions indicate that it is more likely than not that the benefit related to such assets will not be realized. In assessing the need for a valuation allowance against deferred tax assets, we consider all available evidence, including past operating results, estimates of future taxable income, and the feasibility of tax planning strategies. In the event that we change our determination as to the amount of deferred tax assets that can be realized, the valuation allowance will be adjusted with a corresponding impact to the provision for income taxes in the period in which such determination is made.

We utilize a two-step approach for the recognition and measurement of uncertain tax positions. The first step is to evaluate the tax position and determine whether it is more likely than not that the position will be sustained upon examination by tax authorities. The second step is to measure the tax benefit as the largest amount that is more likely than not of being realized upon settlement.

Interest and penalties related to income taxes are accounted for as income tax expense in the consolidated statements of income.

We have accounted for the tax effects of the Tax Cuts and Jobs Act ("Tax Act"), which was signed into law on December 22, 2017. The Tax Act, among other things, reduced the U.S. federal corporate tax rate from 35% to 21%, requires companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries, requires a current inclusion in U.S. federal taxable income of certain earnings of foreign corporations, and creates a new limitation on deductible interest expense. In 2017, we accounted for the tax effects of the Tax Cuts and Jobs Act under the guidance of SAB 118, on a provisional basis. In 2018, we finalized our analyses under SAB 118. For further information, see Note 16, "Income Taxes." We are subjected to a tax on Global Intangible Low Taxed Income ("GILTI"), which we record as a period cost as incurred.

Share-based Compensation: We measure share-based compensation expense for share-based payments to employees and directors, including grants of employee stock options, restricted stock, restricted stock units and performance units based on the

grant-date fair value. The fair value of stock options is calculated using the Black-Scholes pricing model and is recognized on an accelerated basis over the vesting period. The grant-date fair value calculation under the Black-Scholes pricing model requires the use of variables such as exercise term of the option, future volatility, dividend yield, and risk-free interest rate. The fair value of restricted stock and restricted stock units is based on Chart's market price on the date of grant and is generally recognized on an accelerated basis over the vesting period. The fair value of performance units is based on Chart's market price on the date of grant and pre-determined performance conditions as determined by the Compensation Committee of the Board of Directors and is recognized on a straight-line basis over the performance measurement period based on the probability that the performance conditions will be achieved. We reassess the vesting probability of performance units each reporting period and adjust share-based compensation expense based on our probability assessment. Share-based compensation expense for all awards considers estimated forfeitures.

During the year, we may repurchase shares of common stock from equity plan participants to satisfy tax withholding obligations relating to the vesting or payment of equity awards. All such repurchased shares are retired in the period in which the repurchases occur.

Defined Benefit Pension Plans: We sponsor two defined benefit pension plans including the Chart Pension Plan, which has been frozen since February 2006, and a noncontributory defined benefit plan that we acquired as part of the Hudson acquisition (the "Hudson Plan"). The Hudson Plan is closed to new participants and not considered significant to our consolidated financial statements.

The funded status is measured as the difference between the fair value of the plan assets and the projected benefit obligation. The change in the funded status of the plan is recognized in the year in which the change occurs through accumulated other comprehensive loss. Our funding policy is to contribute at least the minimum funding amounts required by law. Management has chosen policies according to accounting guidance that allow the use of a calculated value of plan assets, which generally reduces the volatility of expense (income) from changes in pension liability discount rates and the performance of the pension plan's assets.

Recently Issued Accounting Standards (Not Yet Adopted): In August 2018, the FASB issued ASU 2018-15, "Intangibles – Goodwill and Other – Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract." This ASU clarifies the accounting treatment for implementation costs for cloud computing arrangements (hosting arrangements) that is a service contract. This guidance is effective for fiscal years beginning after December 15, 2019, including interim periods within that fiscal year. Early adoption is permitted. We are currently assessing the effect that this ASU will have on our financial position, results of operations, and disclosures.

In August 2018, the FASB issued ASU 2018-14, "Compensation – Retirement Benefits – Defined Benefit Plans – General (Subtopic 715-20): Disclosure Framework—Changes to the Disclosure Requirements for Defined Benefit Plans." This ASU adds, modifies and clarifies several disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. This guidance is effective for fiscal years ending after December 15, 2020. Early adoption is permitted. We are currently assessing the effect that this ASU will have on our financial position, results of operations, and disclosures.

In August 2018, the FASB issued ASU 2018-13, "Fair Value Measurement (Topic 820): Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement." This ASU adds, modifies and removes several disclosure requirements relative to the three levels of inputs used to measure fair value in accordance with Topic 820, "Fair Value Measurement." This guidance is effective for fiscal years beginning after December 15, 2019, including interim periods within that fiscal year. Early adoption is permitted. We are currently assessing the effect that this ASU will have on our financial position, results of operations, and disclosures.

In June 2016, the FASB issued ASU 2016-13, "Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments" and subsequently issued additional guidance that modified ASU 2016-13. ASU 2016-13 and the subsequent modifications are identified as ASC 326." The standard requires an entity to change its accounting approach in determining impairment of certain financial instruments, including trade receivables, from an "incurred loss" to a "current expected credit loss" model. The standard will be effective for fiscal years beginning after December 15, 2019, including interim periods within such fiscal years. We are adopting the new standard effective January 1, 2020 using the required modified retrospective transition method with a cumulative-effect adjustment.

We intend to use a provision matrix in applying the new guidance to our trade receivables. Under this approach, we will estimate expected credit losses based on historical loss information then adjust the estimates based on current, reasonable and

supportable forecast economic conditions. In our current accounting policy, we maintain an allowance for doubtful accounts based on customer creditworthiness, historical payment experience and age of the outstanding receivable. Therefore, we do not anticipate a material impact on our financial position and results of operations. However, while we are substantially complete, we are still assessing the effect of this ASU and expect to complete our accounting assessment and determine the quantitative impact of adoption during the first quarter of 2020.

Recently Adopted Accounting Standards: In July 2018, the FASB issued ASU 2018-09, "Codification Improvements." This ASU makes amendments to multiple codification Topics. The transition and effective date guidance are based on the facts and circumstances of each amendment. Some of the amendments in this ASU do not require transition guidance and were effective upon issuance of this ASU. However, many of the amendments in this ASU had transition guidance with effective dates for annual periods beginning after December 15, 2018. The adoption of this guidance did not have a material impact on our financial position, results of operations or disclosures.

In March 2018, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2018-05, "Income Taxes (Topic 740), Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118." This ASU adds various Securities and Exchange Commission ("SEC") paragraphs pursuant to the issuance of the December 2017 SEC Staff Accounting Bulletin No. 118, *Income Tax Accounting Implications of the Tax Cuts and Jobs Act* ("SAB 118"), which was effective immediately. The SEC issued SAB 118 to address concerns about reporting entities' ability to timely comply with the accounting requirements to recognize all of the effects of the Tax Cuts and Jobs Act in the period of enactment. SAB 118 allowed disclosure that timely determination of some or all of the income tax effects from the Tax Cuts and Jobs Act were incomplete by the due date of the 2017 financial statements and if possible to provide a reasonable estimate. In 2017, we accounted for the tax effects of the Tax Cuts and Jobs Act under the guidance of SAB 118, on a provisional basis. In 2018, we finalized our analyses under SAB 118. For further information, see Note 16, "Income Taxes."

In February 2018, the FASB issued ASU 2018-02, "Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income." The FASB issued the update to provide amended guidance to "allow a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act." Additionally, under the new guidance an entity was required to provide certain disclosures regarding stranded tax effects. The guidance was effective for fiscal years beginning after December 15, 2018, including interim periods within those years. We adopted this guidance effective January 1, 2019. The adoption of this guidance did not impact our financial position, results of operations or disclosures.

In August 2017, the FASB issued ASU 2017-12, "Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities." The ASU expands and enhances hedge accounting to become more closely aligned with an entity's risk management activities through hedging strategies. The ASU provides changes to both the designation and measurement guidance for qualifying hedging relationships and the presentation of hedge results in the financial statements and creates more transparency and better understandability around how economic results are presented in the financial statements. In addition, the new guidance makes certain targeted improvements to ease the application of accounting guidance relative to hedge effectiveness. This guidance was applied prospectively for annual periods and interim periods beginning after December 15, 2018. We adopted this guidance effective January 1, 2019. The adoption of this guidance did not impact our financial position, results of operations or disclosures.

In May 2017, the FASB issued ASU 2017-09, "Compensation – Stock Compensation (Topic 718): Scope of Modification Accounting." The FASB issued this guidance to provide clarity as to when modification accounting should be applied when there is a change to the terms or conditions of a share-based payment award in order to prevent diversity in practice. This ASU requires modification accounting to be applied unless all of the following conditions exist: (1) the fair value of the modified award is the same as the fair value of the original award before the original award is modified; if the modification does not affect any of the inputs to the valuation, the entity is not required to estimate the value immediately before and after the modification; (2) the vesting conditions of the modified award are the same as the vesting conditions of the original award before it was modified; and (3) the classification of the modified award as an equity instrument or a liability instrument is the same as the classification of the original award before it was modified. This guidance is applied prospectively for annual periods and interim periods beginning after December 15, 2017. We adopted this guidance effective January 1, 2018. The adoption of this guidance did not have a material impact on our financial position, results of operations, and disclosures.

In March 2017, the FASB issued ASU 2017-07, "Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost." The new guidance requires companies

with sponsored defined benefit pension and/or other postretirement benefit plans to present the service cost component of net periodic benefit cost in the same income statement line item as other compensation costs. The other components of net periodic benefit cost will be presented separately and not included in operating income. In addition, only service costs are eligible to be capitalized as an asset. This standard is effective for fiscal years beginning after December 15, 2017, including interim periods within those years, and this guidance will generally be applied retrospectively, whereas the capitalization of the service cost component will be applied prospectively. We adopted this guidance effective January 1, 2018. The adoption of this guidance did not have a material impact on our financial position, results of operations, and disclosures.

In January 2017, the FASB issued ASU 2017-04, "Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment." The new guidance eliminates the requirement to calculate the implied fair value of goodwill (Step 2 of the current guidance's goodwill impairment test) to measure a goodwill impairment charge. Instead, entities will record an impairment charge based on the excess of a reporting unit's carrying amount over its fair value (i.e., measure the charge based on current guidance's Step 1). We have adopted this guidance as of January 1, 2018. This guidance will only have an impact on future periods' financial position, results of operations, and disclosures if a goodwill impairment occurs.

In January 2017, the FASB issued ASU 2017-01 "Business Combinations (Topic 805): Clarifying the Definition of a Business." This ASU provides guidance to evaluate whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. If substantially all of the fair value of the gross assets acquired (or disposed of) is concentrated in a single asset or a group of similar assets, the assets acquired (or disposed of) are not considered a business. This guidance is applied prospectively for annual periods and interim periods beginning after December 15, 2017. We adopted this guidance effective January 1, 2018. The adoption of this guidance did not have a material impact on our financial position, results of operations, and disclosures.

In August 2016, the FASB issued ASU 2016-15, "Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments." The FASB issued this update to clarify how entities should classify certain cash receipts and cash payments on the statement of cash flows. The new guidance also clarifies how the predominance principle should be applied when cash receipts and cash payments have aspects of more than one class of cash flows. This standard is effective for fiscal years beginning after December 15, 2017, including interim periods within those years, and this guidance will generally be applied retrospectively. We adopted this guidance effective January 1, 2018. The adoption of this guidance did not have a material impact on our financial position, results of operations, and disclosures.

In February 2016, the FASB issued ASU 2016-02, "Leases (Topic 842)" and other subsequent amendments collectively identified as ASC 842, related to leases to increase transparency and comparability among organizations by requiring the recognition of right-of-use ("ROU") assets and lease liabilities on the balance sheet. Effective January 1, 2019, (the "Commencement Date") we adopted the new lease accounting standard using the modified retrospective transition option of applying the new standard at the adoption date for all leases with terms greater than 12 months. The adoption of the new standard resulted in the recording of operating ROU assets, primarily consisting of leased facilities and equipment and operating lease liabilities of $34.8 as of the Commencement Date. The adoption did not have a material impact on our audited consolidated statement of income and comprehensive income or cash flows related to existing leases as of the Commencement Date. As a result, there was no cumulative-effect adjustment.

We elected certain practical expedients and as such did not reassess the following: 1) whether any expired or existing contracts are or contain leases, 2) lease classification for any expired or existing leases, 3) initial direct costs for any expired or existing leases and 4) whether existing or expired land easements are or contain leases. However, we will evaluate new or modified land easements under the new guidance after the Commencement Date. We also elected the practical expedient to not separate lease and non-lease components. In addition, we implemented internal controls and key system functionality to enable the preparation of financial information on adoption.

In May 2014, the FASB issued ASU 2014-09, "Revenue from Contracts with Customers (Topic 606)" and subsequently issued additional guidance that modified ASU 2014-09. ASU 2014-09 and the subsequent modifications are identified as ASC 606. ASC 606 replaces existing revenue recognition rules with a comprehensive revenue measurement and recognition standard and provides for expanded disclosure requirements. This update requires entities to recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. ASC 606 applies to all contracts with customers except those that are within the scope of other topics in the FASB Accounting Standards Codification.

On January 1, 2018, we adopted ASC 606 using the modified retrospective method to contracts that were not completed as of January 1, 2018. Results for reporting periods beginning after January 1, 2018 are presented under ASC 606, while prior period amounts are not adjusted and continue to be reported under the previous accounting standards. We recorded a net increase to opening retained earnings of $1.6 million, net of tax, as of January 1, 2018, due to the cumulative impact of adopting ASC 606.

NOTE 3 — Discontinued Operations

On December 20, 2018, we closed the sale of our oxygen-related products business, which was formerly within our BioMedical segment prior to our strategic realignment in the third quarter of 2018 discussed in Note 4, "Segment and Geographic Information," to NGK SPARK PLUG CO., LTD. for $133.5 (the "Divestiture"). The strategic decision to divest the oxygen-related products business reflects our strategy and capital allocation approach to focus on our core capabilities and offerings. We recorded a gain on the Divestiture of $34.3 for the year ended December 31, 2018.

As a result of the Divestiture, the asset group, which included our respiratory and on-site generation systems businesses, met the criteria to be held for sale in the balance sheet as of December 31, 2017. Furthermore, we determined that the assets held for sale qualified for discontinued operations for the years ended December 31, 2018 and 2017. As such, the financial results of the respiratory therapy and on-site generation systems businesses are reflected in our consolidated statements of income and consolidated statements of comprehensive income as discontinued operations for all periods presented. Interest expense of $3.2 and $2.1 was allocated to discontinued operations for the years ended December 31, 2018 and 2017, respectively, based on the net assets of the discontinued operations as a percentage of the net assets of Chart.

Summarized Financial Information of Discontinued Operations

The following table represents income from discontinued operations, net of tax:

	Year Ended December 31,	
	2018	2017
Sales	$ 157.0	$ 145.9
Cost of sales	115.8	105.4
Selling, general and administrative expenses	32.7	34.2
Amortization expense	2.3	2.8
Operating income [(1)]	6.2	3.5
Interest expense, net	3.2	2.1
Other expense (income), net	0.1	(1.1)
Income before income taxes	2.9	2.5
Income tax expense	2.8	0.7
Income from discontinued operations before gain on sale of business	0.1	1.8
Gain on sale of business, net of taxes of $2.6	34.3	—
Income from discontinued operations, net of tax	$ 34.4	$ 1.8

(1) Includes depreciation expense of $1.7 and $1.6 for the years ended December 31, 2018 and 2017, respectively.

NOTE 4 — Segment and Geographic Information

As previously reported in our Annual Report on Form 10-K for the year ended December 31, 2018, the structure of our internal organization was divided into the following reportable segments, which were also our operating segments: D&S East, D&S West and Energy & Chemicals ("E&C").

Upon closing of our acquisition of AXC (see Note 13, "Business Combinations" for more information), effective July 1, 2019, we changed our reportable segments from three segments to four segments: D&S East, D&S West, E&C Cryogenics, and E&C FinFans. AXC was combined with our Hudson Products and Chart Cooler Service businesses from the prior E&C segment to create a new segment called E&C FinFans.

Our D&S East segment has principal operations in Europe and Asia and primarily serves the geographic regions of Europe,

Middle East and Asia. Our D&S West segment has principal operations in the United States and Latin America and primarily serves the Americas geographic region. Our D&S West segment also includes cryobiological storage manufacturing and distribution operations in the U.S., Europe and Asia, which serve customers around the world. E&C Cryogenics supplies mission critical engineered equipment and systems used in the separation, liquefaction, and purification of hydrocarbon and industrial gases that span gas-to-liquid applications. The E&C FinFans segment is focused on our unique and broad product offering and capabilities in air cooled heat exchangers ("ACHX") and fans. Corporate includes operating expenses for executive management, accounting, tax, treasury, corporate development, human resources, information technology, investor relations, legal, internal audit, and risk management. Corporate support functions are not currently allocated to the segments. All prior period amounts presented in the tables below have been reclassified based on our current reportable segments.

We evaluate performance and allocate resources based on operating income as determined in our consolidated statements of income.

Segment Financial Information

	Year Ended December 31, 2019						
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Intersegment Eliminations	Corporate	Consolidated
Sales to external customers	$ 293.4	$ 461.7	$ 190.2	$ 361.7	$ (7.9)	$ —	$ 1,299.1
Depreciation and amortization expense	16.6	11.6	14.5	34.5	—	1.6	78.8
Operating income (loss) [(1)] [(2)]	6.9	104.5	1.6	40.6	(2.3)	(70.4)	80.9
Capital expenditures	14.8	8.7	4.5	3.1	—	5.1	36.2

	Year Ended December 31, 2018						
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Intersegment Eliminations	Corporate	Consolidated
Sales to external customers	$ 246.3	$ 455.5	$ 136.9	$ 253.6	$ (8.0)	$ —	$ 1,084.3
Depreciation and amortization expense	11.1	11.2	10.9	16.1	—	1.5	50.8
Operating income (loss) [(1)] [(3)] [(4)] [(5)]	19.3	101.2	1.8	23.7	(2.5)	(51.4)	92.1
Capital expenditures	10.4	6.0	12.1	3.4	—	3.7	35.6

	Year Ended December 31, 2017						
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Intersegment Eliminations	Corporate	Consolidated
Sales to external customers	$ 232.3	$ 400.6	$ 125.5	$ 100.1	$ (15.6)	$ —	$ 842.9
Depreciation and amortization expense	9.5	10.6	10.3	5.0	—	2.2	37.6
Operating income (loss) [(1)] [(3)] [(5)]	14.2	85.2	(2.1)	7.2	(3.6)	(62.4)	38.5
Capital expenditures	11.1	4.1	14.1	1.4	—	2.3	33.0

[(1)] Restructuring costs for the years ended:

- December 31, 2019 were $15.6 ($8.5 - D&S East, $0.9 - D&S West, $2.5 - E&C Cryogenics, $3.5 - E&C FinFans, and $0.2 - Corporate);
- December 31, 2018 were $4.4 ($1.4 - D&S East, $0.6 - E&C Cryogenics, $0.1 - E&C FinFans, and $2.3 - Corporate); and
- December 31, 2017 were $11.2 ($1.7 - D&S East, $1.1 - D&S West, $2.1 - E&C Cryogenics, $0.3 - E&C FinFans, and $6.0 - Corporate).

[(2)] Includes transaction-related costs of $5.4 recorded in Corporate for the year ended December 31, 2019, which were mainly related to the AXC acquisition. Includes integration costs of $1.6 recorded in Corporate related to the AXC acquisition for the year ended December 31, 2019.

(3) Includes an expense of $4.0 recorded to cost of sales related to the estimated costs of the aluminum cryobiological tank recall for the year ended December 31, 2018.

(4) During the year ended December 31, 2018, we recorded net severance costs of $2.3 in Corporate primarily related to headcount reductions associated with the strategic realignment of our segment structure, which includes $1.8 in payroll severance costs partially offset by a $0.9 credit due to related share-based compensation forfeitures for 2018. Includes net severance costs of $1.4 related to the departure of our former CEO, which includes $3.2 in payroll severance costs partially offset by a $1.8 credit due to related share-based compensation forfeitures for 2018.

(5) Includes transaction-related costs of $2.1 and $10.1 recorded in Corporate for the years ended December 31, 2018 and 2017, respectively.

Product Sales Information

	Year Ended December 31, 2019					
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Intersegment Eliminations	Consolidated
Natural gas processing (including petrochemical) applications	$ —	$ —	$ 80.9	$ 263.6	$ (0.2)	$ 344.3
Liquefied natural gas (LNG) applications	72.7	73.1	53.4	42.1	(0.9)	240.4
Industrial gas production applications	—	—	25.2	—	—	25.2
HVAC, power and refining applications	—	—	30.7	56.0	(0.9)	85.8
Bulk industrial gas applications	168.7	156.0	—	—	(2.3)	322.4
Packaged gas industrial applications	52.0	149.0	—	—	(3.5)	197.5
Cryobiological storage	—	83.6	—	—	(0.1)	83.5
Total	$ 293.4	$ 461.7	$ 190.2	$ 361.7	$ (7.9)	$ 1,299.1

	Year Ended December 31, 2018					
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Intersegment Eliminations	Consolidated
Natural gas processing (including petrochemical) applications	$ —	$ —	$ 79.5	$ 182.6	$ —	$ 262.1
Liquefied natural gas (LNG) applications	65.3	71.7	15.2	25.4	(2.0)	175.6
Industrial gas production applications	—	—	13.6	—	—	13.6
HVAC, power and refining applications	—	—	28.6	45.6	—	74.2
Bulk industrial gas applications	126.1	148.5	—	—	(1.0)	273.6
Packaged gas industrial applications	54.9	153.4	—	—	(3.5)	204.8
Cryobiological storage	—	81.9	—	—	(1.5)	80.4
Total	$ 246.3	$ 455.5	$ 136.9	$ 253.6	$ (8.0)	$ 1,084.3

	Year Ended December 31, 2017					
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Intersegment Eliminations	Consolidated
Natural gas processing (including petrochemical) applications	$ —	$ —	$ 75.5	$ 77.4	$ —	$ 152.9
Liquefied natural gas (LNG) applications	80.2	58.0	18.8	10.7	(0.2)	167.5
Industrial gas production applications	—	—	22.4	—	—	22.4
HVAC, power and refining applications	—	—	8.8	12.0	—	20.8
Bulk industrial gas applications	93.4	129.6	—	—	(0.5)	222.5
Packaged gas industrial applications	58.7	136.0	—	—	(14.9)	179.8
Cryobiological storage	—	77.0	—	—	—	77.0
Total	$ 232.3	$ 400.6	$ 125.5	$ 100.1	$ (15.6)	$ 842.9

In both 2019 and 2017, no single customer accounted for more than 10% of consolidated sales. Sales to Praxair and Linde, which combined in 2018, exceeded 10% of consolidated sales in 2018 on a combined basis and represented approximately $121.6 or 11.2% of consolidated sales in 2018 (attributable to all of our segments).

	Total Assets as of December 31,	
	2019	2018
D&S East	$ 528.6	$ 496.1
D&S West	414.9	420.3
E&C Cryogenics	430.3	455.0
E&C FinFans [1]	1,028.0	434.2
Corporate	79.6	92.1
Consolidated	$ 2,481.4	$ 1,897.7

[1] Total assets at December 31, 2019 includes $593.8 related to AXC of which $287.5 and $256.4 represented acquired goodwill and identifiable intangible assets, net, respectively. See Note 13, "Business Combinations," for further information related to the AXC acquisition.

Geographic Information

Net sales by geographic area are reported by the destination of sales. Net property, plant and equipment by geographic area are reported by country of domicile.

	Sales for the Year Ended December 31,		
	2019	2018	2017
United States	$ 688.6	$ 604.8	$ 475.0
Foreign			
China	89.7	115.1	101.3
Other foreign countries	520.8	364.4	266.6
Total Foreign	610.5	479.5	367.9
Total	$ 1,299.1	$ 1,084.3	$ 842.9

	Property, plant and equipment, net as of December 31,	
	2019	2018
United States	$ 224.8	$ 176.8
Foreign		
Italy	56.4	52.9
China	67.8	77.2
Czech Republic	25.8	21.5
Germany	15.6	12.9
India	13.7	19.8
Other foreign countries	0.5	—
Total Foreign	179.8	184.3
Total	$ 404.6	$ 361.1

NOTE 5 — Revenue

Disaggregation of Revenue

The following tables represent a disaggregation of revenue by timing of revenue along with the reportable segment for each category:

	Year Ended December 31, 2019					
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Intersegment Eliminations	Consolidated
Point in time	$ 272.2	$ 415.1	$ 0.3	$ 87.9	$ (6.8)	$ 768.7
Over time	21.2	46.6	189.9	273.8	(1.1)	530.4
Total	$ 293.4	$ 461.7	$ 190.2	$ 361.7	$ (7.9)	$ 1,299.1

	Year Ended December 31, 2018					
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Intersegment Eliminations	Consolidated
Point in time	$ 222.9	$ 405.3	$ 1.0	$ 135.2	$ (6.2)	$ 758.2
Over time	23.4	50.2	135.9	118.4	(1.8)	326.1
Total	$ 246.3	$ 455.5	$ 136.9	$ 253.6	$ (8.0)	$ 1,084.3

Refer to Note 4, “Segment and Geographic Information,” for a table of revenue disaggregated by product application along with the reportable segment for each category.

Contract Balances

The following table represents changes in our contract assets and contract liabilities balances:

	December 31, 2019	January 1, 2019	Year-to-date Change ($)	Year-to-date Change (%)
Contract assets				
Accounts receivable, net of allowances	$ 202.6	$ 194.8	$ 7.8	4.0 %
Unbilled contract revenue	86.1	54.5	31.6	58.0 %
Contract liabilities				
Customer advances and billings in excess of contract revenue	$ 127.8	$ 130.0	$ (2.2)	(1.7)%
Long-term deferred revenue	0.8	1.4	(0.6)	(42.9)%

Revenue recognized for the years ended December 31, 2019 and 2018, that was included in the contract liabilities balance at the beginning of each year was $113.2 and $83.7, respectively. The amount of revenue recognized during the year ended December 31, 2019 from performance obligations satisfied or partially satisfied in previous periods as a result of changes in the estimates of variable consideration related to long-term contracts, was not significant.

Remaining Performance Obligations

Remaining performance obligations represent the transaction price of firm signed purchase orders or other written contractual commitments from customers for which work has not been performed, or is partially completed, and excludes unexercised contract options and potential orders. As of December 31, 2019, the estimated revenue expected to be recognized in the future related to remaining performance obligations was $762.3. We expect to recognize revenue on approximately 83.4% of the remaining performance obligations over the next 12 months and 10% of the remaining performance obligations over the next 13 to 24 months, with the remaining balance recognized thereafter.

NOTE 6 — Investments

The following table summarizes the components of investments:

	December 31,	
	2019	2018
Investment in equity securities	$ 6.9	$ —
Equity investments	6.5	2.8
Total investments	$ 13.4	$ 2.8

Investment in equity securities

During the third quarter of 2019, we made an investment in Stabilis Energy, Inc. ("Stabilis") by converting $7.0 of a note receivable from Stabilis into an investment in their company stock. As of December 31, 2019, the value of the investment was $6.9, which reflects a $0.1 unrealized loss upon conversion and subsequent mark-to-market. Gains and losses for this investment in equity securities were recorded in other expenses, net on the consolidated statement of income and comprehensive income during the year ended December 31, 2019.

We categorize our financial assets and liabilities that are recorded at fair value into a hierarchy based on whether the inputs to valuation techniques are observable to unobservable. As defined in our significant policies for fair value measurements in Note 2, Level 2 inputs represent other than quoted prices included in Level 1, such as quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets and liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data. The Stabilis investment is measured at fair value in the consolidated balance sheet as of December 31, 2019 using Level 2 inputs.

Equity method accounting investments

Our equity investments accounted for under the equity method of accounting include a 50% ownership interest in a joint venture with Hudson Products de Mexico, S.A. de C.V., which totaled $2.9 and $2.8 for the years ended December 31, 2019 and 2018, respectively. This investment is operated and managed by our joint venture partner and as such, we do not have control over the joint venture and therefore is not consolidated. Our equity in earnings from this investment was $0.2, $0.6 and $0.3 for the years ended December 31, 2019, 2018 and 2017, respectively. Additionally, we have a 25% ownership interest in Liberty LNG which we invested in during the third quarter of 2019 which totaled $3.3 at December 31, 2019. Earnings for 2019 were not material.

NOTE 7 — Inventories

The following table summarizes the components of inventory:

	December 31,	
	2019	2018
Raw materials and supplies	$ 104.0	$ 97.7
Work in process	47.5	53.0
Finished goods	67.9	82.4
Total inventories, net	$ 219.4	$ 233.1

The allowance for excess and obsolete inventory balance at December 31, 2019 and 2018 was $10.8 and $9.0, respectively.

NOTE 8 — Property, Plant and Equipment

The following table summarizes the components of property, plant and equipment:

		December 31,	
Classification	Estimated Useful Life	2019	2018
Land and buildings	20-35 years	$ 329.7	$ 287.0
Machinery and equipment	3-12 years	208.2	214.7
Computer equipment, furniture and fixtures	3-7 years	47.7	38.5
Right-of-use assets		42.4	—
Construction in process		21.4	30.9
Total property, plant and equipment, gross		649.4	571.1
Less: accumulated depreciation		(244.8)	(210.0)
Total property, plant and equipment, net		$ 404.6	$ 361.1

Depreciation expense was $39.0, $28.9 and $25.3 for the years ended December 31, 2019, 2018 and 2017, respectively.

NOTE 9 — Goodwill and Intangible Assets

Goodwill

The following table represents the changes in goodwill by segment:

	D&S East	D&S West	E&C	E&C Cryogenics	E&C FinFans	Consolidated
Balance at January 1, 2018	$ 37.3	$ 147.3	$ 275.1	$ —	$ —	$ 459.7
Foreign currency translation adjustments and other	0.2	(0.7)	(1.1)	—	—	(1.6)
Goodwill acquired during the year	36.1	4.7	27.1	—	—	67.9
Purchase price adjustments [1]	—	—	(5.3)	—	—	(5.3)
Balance at December 31, 2018	73.6	151.3	295.8	—	—	520.7
Reallocation [2]	—	—	(295.8)	183.5	112.3	—
Foreign currency translation adjustments and other	(0.9)	—	—	(0.6)	(0.2)	(1.7)
Goodwill acquired during the year	—	—	—	—	287.5	287.5
Purchase price adjustments [3]	44.3	0.8	—	(6.7)	—	38.4
Balance at December 31, 2019	$ 117.0	$ 152.1	$ —	$ 176.2	$ 399.6	$ 844.9
Accumulated goodwill impairment loss at December 31, 2018 and January 1, 2018	$ —	$ 82.5	$ 64.6	$ —	$ —	$ 147.1
Accumulated goodwill impairment loss at December 31, 2019	$ —	$ 82.5	$ —	$ 40.9	$ 23.7	$ 147.1

(1) During 2018, we recorded purchase price adjustments the decrease goodwill by $5.3 related to the Hudson acquisition. For further information, see Note 13, “Business Combinations.”

(2) The prior E&C segment goodwill and accumulated goodwill impairment loss at December 31, 2018 was reallocated to the two new segments, E&C Cryogenics and E&C FinFans, based on their relative fair values as of July 1, 2019.

(3) During 2019, we recorded purchase price adjustments that increased goodwill by $38.4 (including, an increase of $44.3 in D&S East and a decrease of $6.7 in E&C Cryogenic) related to the VRV acquisition and an increase of $0.8 in D&S West related to the Skaff acquisition. For further information, see Note 13, “Business Combinations.”

Intangible Assets

The following table displays the gross carrying amount and accumulated amortization for finite-lived intangible assets and indefinite-lived intangible assets (exclusive of goodwill) [(1)]:

		December 31, 2019				December 31, 2018			
	Weighted-average Estimated Useful Life	Gross Carrying Amount		Accumulated Amortization		Gross Carrying Amount		Accumulated Amortization	
Finite-lived intangible assets:									
Customer relationships	14 years	$	380.3	$	(115.0)	$	254.0	$	(92.0)
Unpatented technology	11 years		90.1		(13.0)		39.4		(5.1)
Patents and other	6 years		20.9		(9.8)		14.0		(1.5)
Trademarks and trade names	14 years		2.4		(1.2)		13.5		(1.1)
Land rights	50 years		12.0		(1.5)		12.2		(1.3)
Total finite-lived intangible assets	13 years	$	505.7	$	(140.5)	$	333.1	$	(101.0)
Indefinite-lived intangible assets:									
Trademarks and trade names			163.9		—		98.3		—
Total intangible assets		$	669.6	$	(140.5)	$	431.4	$	(101.0)

(1) Amounts include the impact of foreign currency translation. Fully amortized or impaired amounts are written off.

Amortization expense for intangible assets subject to amortization was $39.8, $21.9 and $12.2 for the years ended December 31, 2019, 2018 and 2017, respectively. We estimate amortization expense to be recognized during the next five years as follows:

For the Year Ending December 31,		
2020	$	49.2
2021		34.9
2022		34.7
2023		34.5
2024		34.3

See Note 13, “Business Combinations,” for further information related to intangible assets acquired during 2019 and 2018.

Government Grants

We received certain government grants related to land use rights for capacity expansion in China (“China Government Grants”). China Government Grants are generally recorded in other current liabilities and other long-term liabilities in the consolidated balance sheets and generally recognized into income over the useful life of the associated assets (10 to 50 years).

China Government Grants are presented in our consolidated balance sheets as follows:

	December 31,			
	2019		2018	
Current	$	0.5	$	0.5
Long-term		7.2		7.7
Total China Government Grants	$	7.7	$	8.2

We also received government grants from certain local jurisdictions within the United States, which are recorded in other assets in the consolidated balance sheets and were not significant for the periods presented.

NOTE 10 — Debt and Credit Arrangements

Summary of Outstanding Borrowings

The following table represents the components of our borrowings:

	December 31,	
	2019	2018
Senior secured revolving credit facilities and term loan:		
Term loan due June 2024 [1]	$ 447.2	$ —
Senior secured revolving credit facility due June 2024 [2]	119.0	—
Senior secured revolving credit facility due November 2022	—	329.3
Unamortized debt issuance costs	(5.5)	—
Senior secured revolving credit facility and term loan, net of debt issuance costs	560.7	329.3
Convertible notes due November 2024:		
Principal amount	258.8	258.8
Unamortized discount	(42.8)	(50.4)
Unamortized debt issuance costs	(3.8)	(4.5)
Convertible notes due November 2024, net of unamortized discount and debt issuance costs	212.2	203.9
Foreign facilities	4.4	11.2
Total debt, net of unamortized discount and debt issuance costs	777.3	544.4
Less: current maturities	15.7	11.2
Less: current portion of unamortized debt issuance costs	0.6	—
Long-term debt	$ 761.0	$ 533.2

(1) As of December 31, 2019, there was $447.2 in borrowings outstanding under the term loan bearing an interest rate of 3.99%. The term loan is repayable annually in quarterly installments of 2.5% of the loan amount over the first two years, 5.0% for the third year, 7.5% for the fourth year and 10.0% for the fifth and final year.

(2) The senior secured revolving credit facility due 2024 includes $100.0 sub limit for letters of credit, a $250.0 sub limit for discretionary letters of credit and a $50.0 sub-limit for swingline loans. As of December 31, 2019, there was $119.0 in borrowings outstanding under the senior secured revolving credit facility due 2024 bearing a weighted-average interest rate of 2.57% and $71.5 in letters of credit and bank guarantees outstanding supported by the senior secured revolving credit facility due 2024. As December 31, 2019, the senior secured revolving credit facility due 2024 had availability of $359.5.

Scheduled Annual Maturities

The scheduled annual maturities of debt at December 31, 2019, are as follows:

Year	Amount	
2020 [(1)]	$	15.7
2021		14.0
2022		25.3
2023		36.6
2024		737.8
Total	$	829.4

(1) Includes $4.4 current maturities related to foreign facilities.

Cash paid for interest during the years ended December 31, 2019, 2018 and 2017 was $17.7, $15.9, and $9.3, respectively.

Senior Secured Revolving Credit Facilities and Term Loan

On June 14, 2019, we entered into the Fourth Amended and Restated Credit Agreement, which includes a senior secured revolving credit facility (the "SSRCF") and a term loan (together, the "2019 Credit Facilities"). The 2019 Credit Facilities mature on June 14, 2024.

- The SSRCF has a borrowing capacity of $550.0.
- The term loan has a borrowing capacity of $450.0.
- The 2019 Credit Facilities bear interest at a base rate margin determined on a leveraged-based scale which ranges from 25 to 125 basis points for alternative base rate loans and 125 to 225 basis points for LIBOR loans.
- Interest and fees are payable on a quarterly basis (or if earlier, at the end of each interest period for LIBOR loans).

Significant financial covenants for the 2019 Credit Facilities include financial maintenance covenants that, as of the last day of any fiscal quarter ending on and after June 30, 2019, (i) require the ratio of the amount of Chart and its subsidiaries' consolidated total net indebtedness to consolidated EBITDA to be less than specified maximum ratio levels and (ii) require the ratio of the amount of Chart and its subsidiaries' consolidated EBITDA to consolidated cash interest expense to be greater than a specified minimum ratio level. The 2019 Credit Facilities include a number of other customary covenants including, but not limited to, restrictions on our ability to incur additional indebtedness, create liens or other encumbrances, sell assets, enter into sale and lease-back transactions, make certain payments, investments, loans, advances or guarantees, make acquisitions and engage in mergers or consolidations and pay dividends or distributions. At December 31, 2019, we were in compliance with all covenants.

The 2019 Credit Facilities also contain customary events of default. If such an event of default occurs, the lenders thereunder would be entitled to take various actions, including the acceleration of amounts due and all actions permitted to be taken by a secured creditor. The 2019 Credit Facilities are guaranteed by Chart and substantially all of its U.S. subsidiaries and secured by substantially all of the assets of Chart and our U.S. subsidiaries and 65% of the capital stock of our material non-U.S. subsidiaries (as defined by the Fourth Amended and Restated Credit Agreement) that are owned by U.S. subsidiaries.

We recorded $6.1 in deferred debt issuance costs, which is included in long-term debt in the consolidated balance sheet at December 31, 2019, associated with the term loan, which is being amortized over its five-year term beginning in July 2019.

We paid $7.5 in deferred debt issuance costs related to the amended SSCRF and included $2.5 of the unamortized debt issuance costs from the previous senior secured revolving credit facility, which are presented in other assets in the consolidated balance sheet at December 31, 2019 and are being amortized over the five-year term of the SSRCF. At December 31, 2019, unamortized debt issuance costs associated with the SSRCF were $9.5. In conjunction with the amendment of our credit facilities, we wrote off $0.2 in unamortized deferred debt issuance costs which related to the previous senior secured revolving credit facility.

The following table summarizes interest expense and financing costs amortization related to the 2019 Credit Facilities and our previous senior secured revolving credit facility:

	Year Ended December 31,		
	2019	2018	2017
Interest expense, term loan due June 2024	$ 8.4	$ —	$ —
Interest expense, senior secured revolving credit facilities	7.5	11.8	2.7
Interest expense, senior secured revolving credit facilities and term loan due June 2024	$ 15.9	$ 11.8	$ 2.7
Financing costs amortization, senior secured revolving credit facilities and term loan due 2024	$ 2.0	$ 0.6	$ 0.6

2024 Convertible Notes

On November 6, 2017, we issued 1.00% Convertible Senior Subordinated Notes due November 2024 (the "2024 Notes") in the aggregate principal amount of $258.8, pursuant to an Indenture, dated as of such date (the "Indenture"). The 2024 Notes bear interest at an annual rate of 1.00%, payable on May 15 and November 15 of each year, beginning on May 15, 2018, and will mature on November 15, 2024 unless earlier converted or repurchased.

The 2024 Notes are senior subordinated unsecured obligations of the Company and are not guaranteed by any of our subsidiaries. The 2024 Notes are senior in right of payment to our future subordinated debt, equal in right of payment with the Company's future senior subordinated debt and are subordinated in right of payment to our existing and future senior indebtedness, including indebtedness under our existing credit agreement.

A conversion of the 2024 Notes may be settled in cash, shares of our common stock or a combination of cash and shares of our common stock, at our election (subject to, and in accordance with, the settlement provisions of the Indenture). The initial conversion rate for the 2024 Notes is 17.0285 shares of common stock (subject to adjustment as provided for in the Indenture) per $1,000 principal amount of the 2024 Notes, which is equal to an initial conversion price of approximately $58.725 per share, representing a conversion premium of approximately 35% above the closing price of our common stock of $43.50 per share on October 31, 2017. In addition, following certain corporate events that occur prior to the maturity date as described in the Indenture, we will pay a make-whole premium by increasing the conversion rate for a holder who elects to convert its 2024 Notes in connection with such a corporate event in certain circumstances. For purposes of calculating earnings per share, if the average market price of our common stock exceeds the applicable conversion price during the periods reported, shares contingently issuable under the 2024 Notes will have a dilutive effect with respect to our common stock. Because our closing common stock price of $67.49 at the end of the period exceeded the conversion price of $58.725, the if-converted value exceeded the principal amount of the 2024 Notes by approximately $38.6 at December 31, 2019. As described below, we entered into convertible note hedge transactions, which are expected to reduce the potential dilution with respect to our common stock upon conversion of the 2024 Notes.

Holders of the 2024 Notes may convert their 2024 Notes at their option at any time prior to the close of business on the business day immediately preceding August 15, 2024 only under the following circumstances: (1) during any fiscal quarter commencing after December 31, 2017 (and only during such fiscal quarter), if the last reported sale price of our common stock for at least 20 trading days (whether or not consecutive) during the period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding fiscal quarter is greater than or equal to 130% of the applicable conversion price for the 2024 Notes on each applicable trading day; (2) during the five business day period after any 10 consecutive trading day period (the "measurement period") in which the "trading price" (as defined in the Indenture) per one thousand U.S. dollar principal amount of Notes for each trading day of such measurement period was less than 97% of the product of the last reported sale price of our common stock and the applicable conversion rate for the 2024 Notes on each such trading day; or (3) upon the occurrence of specified corporate events described in the Indenture.

On or after August 15, 2024 until the close of business on the second scheduled trading day immediately preceding November 15, 2024, holders may convert their 2024 Notes at the option of the holder regardless of the foregoing circumstances. Upon conversion, we may settle the conversion by paying or delivering either shares of our common stock, solely cash, or a combination of cash and shares of our common stock, at our election. It is our intention to settle the principal amount of the 2024 Notes in cash and excess conversion value in shares of our common stock.

We reassess the convertibility of the 2024 Notes and the related balance sheet classification on a quarterly basis. As of December 31, 2019, events for early conversion were not met, and thus the 2024 Notes were not convertible as of and for the fiscal quarter beginning January 1, 2020. There have been no conversions as of the date of this filing.

We allocated the gross proceeds of the 2024 Notes between the liability and equity components of the 2024 Notes. The initial liability component of $200.1, which was recorded as long-term debt, represents the fair value of similar debt instruments that have no conversion rights. The initial equity component of $58.7, which was recorded as additional paid-in capital, represents the debt discount and was calculated as the difference between the fair value of the liability component and gross proceeds of the 2024 Notes. The liability component was recognized at the present value of its associated cash flows using a 4.8% straight-debt rate (as defined in Note 2) and is being accreted to interest expense over the term of the 2024 Notes.

We recorded $5.3 in deferred debt issuance costs associated with the 2024 Notes, which are being amortized over the term of the 2024 Notes using the effective interest method. We also recorded $1.5 in equity issuance costs, which was recorded as a reduction to additional paid-in capital in the December 31, 2017 consolidated balance sheet.

The following table summarizes interest accretion of the 2024 Notes discount, 1.0% contractual interest coupon and financing costs amortization associated with the 2024 Notes:

	Year Ended December 31,	
	2019	2018
2024 Notes, interest accretion of convertible notes discount	$ 7.6	$ 7.2
2024 Notes, 1.0% contractual interest coupon	2.6	2.6
2024 Notes, total interest expense	$ 10.2	$ 9.8
2024 Notes, financing costs amortization	$ 0.7	$ 0.6

Convertible Note Hedge and Warrant Transactions Associated with the 2024 Notes

In connection with the pricing of the 2024 Notes, we entered into convertible note hedge transactions (the "Note Hedge Transactions") with certain parties, including the initial purchasers of the 2024 Notes (the "Option Counterparties"). The Note Hedge Transactions are expected generally to reduce the potential dilution upon any future conversion of the 2024 Notes. Payments for the Note Hedge Transactions totaled approximately $59.5 and were recorded as a reduction to additional paid-in capital in the December 31, 2017 consolidated balance sheet.

We also entered into separate, privately negotiated warrant transactions (the "Warrant Transactions") with the Option Counterparties to acquire up to 4.41 shares of our common stock. Proceeds received from the issuance of the Warrant Transactions totaled approximately $46.0 and were recorded as an addition to additional paid-in capital in the December 31, 2017 consolidated balance sheet. The strike price of the Warrant Transactions will initially be $71.775 per share (subject to adjustment), which is approximately 65% above the last reported sale price of our common stock on October 31, 2017. The Warrant Transactions could have a dilutive effect to our stockholders to the extent that the market price per share of our common stock, as measured under the terms of the Warrant Transactions, exceeds the applicable strike price of the warrants.

The Note Hedge Transactions and Warrant Transactions effectively increased the conversion price of the 2024 Notes. The net cost of the Note Hedge Transactions and Warrant Transactions was approximately $13.5.

2018 Convertible Notes

On August 1, 2018, our 2.00% Convertible Senior Subordinated Notes due August 2018 (the "2018 Notes") matured. The aggregate outstanding principal was $57.1 at August 1, 2018. During the nine months ended September 30, 2018, we settled upon maturity the 2018 Notes for total cash consideration of $57.1. Additionally, $0.6 of interest, which had previously been accrued, was paid at settlement.

The following table summarizes interest accretion of the 2018 Notes discount, 2.0% contractual interest coupon, loss on extinguishment of debt and financing costs amortization associated with the 2018 Notes:

	Year Ended December 31,	
	2018	2017
2018 Notes, interest accretion of convertible notes discount	$ 1.9	$ 11.8
2018 Notes, 2.0% contractual interest coupon	1.0	4.3
2018 Notes, total interest expense	$ 2.9	$ 16.1
2018 Notes, loss on extinguishment of debt, bond cost portion	—	4.3
2018 Notes, write off of unamortized debt issuance costs	—	0.4
2018 Notes, total loss on extinguishment of debt [(1)]	$ —	$ 4.7
2018 Notes, financing costs amortization	$ 0.1	$ 0.6

(1) During the year ended December 31, 2017, we wrote off $0.2 of unamortized debt issuance costs related to our senior secured revolving credit facility. When combined with the total loss on extinguishment associated with the 2018 Notes, consolidated loss on extinguishment was $4.9.

Convertible Note Hedge, Capped Call and Warrant Transactions Associated with the 2018 Notes

The convertible note hedge and capped call transactions associated with the 2018 Notes expired in August 2018, with immaterial exercises. Approximately 90% of the separate warrants associated with the 2018 Notes expired without exercise. Prior to the expiration date of February 26, 2019, a portion of the separate warrants were exercised. These exercises were not material.

Foreign Facilities

In various markets where we do business, we have local credit facilities to meet local working capital demands, fund letters of credit and bank guarantees, and support other short-term cash requirements. The facilities generally have variable interest rates and are denominated in local currency but may, in some cases, facilitate borrowings in multiple currencies. As of December 31, 2019 and 2018, respectively, we had U.S. dollar ("USD") equivalent $4.4 and $11.2 in borrowing outstanding under these facilitates, with additional capacity of USD equivalent $23.1 and $65.6, respectively. Chart has foreign letters of credit and bank guarantees totaling USD equivalent $12.6 and $17.1 as of December 31, 2019 and 2018, respectively. The weighted-average interest rate on these borrowings was 1.3% and 4.8% as of December 31, 2019 and 2018, respectively.

Letters of Credit

Chart Energy & Chemicals, Inc., a wholly-owned subsidiary of the Company, had $1.0 in deposits in a bank outside of the SSRCF to secure letters of credit at both December 31, 2019 and 2018. The deposits are treated as restricted cash and restricted cash equivalents in the consolidated balance sheets ($1.0 in other assets at both December 31, 2019 and 2018).

Fair Value Disclosures

The fair value of the 2024 Notes was approximately 132% and 124% of their par value as of December 31, 2019 and 2018, respectively. The fair value of the 2018 Notes was approximately 99% of their par value as of December 31, 2018. The 2024 Notes are and the 2018 Notes were actively quoted instruments and, accordingly, the fair values of the 2024 Notes and 2018 Notes were determined using Level 1 inputs.

NOTE 11 — Financial Instruments and Derivative Financial Instruments

Concentrations of Credit Risks: We sell our products to gas producers, distributors and end-users across the industrial gas, hydrocarbon, chemical processing, respiratory therapy, and cryobiological storage industries in countries all over the world. Approximately 47%, 44%, and 44% of sales were to customers in foreign countries in 2019, 2018 and 2017, respectively.

In 2019, no single customer accounted for more than 10% of consolidated sales. Sales to Praxair and Linde, which combined in 2018, exceeded 10% of consolidated sales in 2018 on a combined basis and represented approximately $121.6 or 11.2% of consolidated sales in 2018 (attributable to all of our segments). In 2017, no single customer accounted for more than 10% of consolidated sales. Sales to our top ten customers accounted for 32%, 39% and 38% of consolidated sales in 2019, 2018 and 2017, respectively. Our sales to particular customers fluctuate from period to period, but the large industrial gas producer and distributor customers of ours tend to be a consistently large source of revenue for us.

We are subject to concentrations of credit risk with respect to our cash and cash equivalents, restricted cash and restricted cash equivalents and forward foreign currency exchange contracts. To minimize credit risk from these financial instruments, we enter into arrangements with major banks and other quality financial institutions and invest only in high-quality instruments. We do not expect any counterparties to fail to meet their obligations.

The changes in fair value with respect to our foreign currency forward contracts generated a net gain of $0.7 for the year ended December 31, 2019, a net loss of $0.8 for the year ended December 31, 2018 and a net gain of $0.5 for the year ended December 31, 2017.

NOTE 12 — Product Warranties

We provide product warranties with varying terms and durations for the majority of our products. We estimate our warranty reserve by considering historical and projected warranty claims, historical and projected cost-per-claim, and knowledge of specific product issues that are outside our typical experience. We record warranty expense in cost of sales in the consolidated statements of income. Product warranty claims not expected to occur within one year are included as part of other long-term liabilities in the consolidated balance sheets.

The following table represents changes in our consolidated warranty reserve:

	Year Ended December 31,		
	2019	2018	2017
Beginning balance	$ 8.9	$ 11.6	$ 11.6
Issued - warranty expense	7.8	5.1	3.1
Acquired - warranty reserve	—	—	0.9
Change in estimate - warranty expense	—	(1.6)	1.5
Warranty usage	(5.0)	(6.2)	(5.5)
Ending balance	$ 11.7	$ 8.9	$ 11.6

During the second quarter of 2018, we established a reserve related to a recall notice issued for certain aluminum cryobiological tanks in our D&S West segment manufactured in our New Prague, Minnesota facility during a limited time period. See Note 20, “Commitments and Contingencies,” for additional information.

NOTE 13 — Business Combinations

Air-X-Changers Acquisition

On July 1, 2019, we completed the acquisition of AXC pursuant to the previously disclosed Asset Purchase Agreement dated as of May 8, 2019 (the “AXC acquisition”). The purchase price for AXC was $599.7, including post-closing purchase price adjustments with respect to working capital. We paid $592.0 of the purchase price at closing and the final working capital adjustment of $7.7 was paid during the third quarter of 2019. We financed the purchase price for the AXC acquisition with proceeds from borrowings under the 2019 Credit Facilities and a public offering of Chart’s common stock in 2019. See Note 10, “Debt and Credit Arrangements” and Note 14 “Equity and Accumulated Other Comprehensive Loss” for further information.

AXC is a leading supplier of custom engineered and manufactured ACHX for the natural gas compression and processing industry and refining and petrochemical industry in the United States. The ACHX offered by AXC is used in conditioning natural gas during recovery, compression and transportation from underground reserves through major pipeline distribution channels. In addition to natural gas compression and processing, AXC’s products are also used in the turbine lube oil cooling, landfill gas compression and liquids cooling industries. AXC’s end markets include process industries, power generation and refineries. AXC was combined with Chart’s Hudson Products and Chart Cooler Service businesses from the prior E&C segment to create a new

segment called E&C FinFans. The E&C FinFans segment is focused on our unique and broad product offering and capabilities in ACHX and fans.

As defined in our significant policies for fair value measurements in Note 2, we preliminarily allocated the acquisition consideration to tangible and identifiable intangible assets acquired and liabilities assumed based on their preliminary estimated fair values as of the acquisition date. The preliminary fair value of the acquired tangible and identifiable intangible assets were determined based on inputs that are unobservable and significant to the overall fair value measurement. It is also based on estimates and assumptions made by management at the time of the acquisition. As such, this was classified as Level 3 fair value hierarchy measurements and disclosures.

We estimated the preliminary fair value of acquired unpatented technology and trademarks and trade names using the relief from royalty method. The preliminary fair values of acquired customer backlog and customer relationships were estimated using the multi-period excess earnings method. Under both the relief from royalty and multi-period excess earnings methods, the fair value models incorporated estimates of future cash flows, estimates of allocations of certain assets and cash flows, estimates of future growth rates, and management's judgment regarding the applicable discount rates to use to discount such estimates of cash flows. The preliminary estimated useful lives of identifiable finite-lived intangible assets range from one to 14 years.

The excess of the purchase price over the estimated fair values is assigned to goodwill. The preliminary estimated goodwill was established due to benefits including the combination of strong engineering and manufacturing cultures which will continue to further develop full service solutions for our worldwide customer base, as well as the benefits derived from the anticipated synergies of AXC integrating with our E&C FinFans segment. Goodwill recorded for the AXC acquisition is expected to be deductible for tax purposes.

The acquisition consideration allocation below has been updated based on this valuation but remains preliminary. As additional information becomes available, we may further revise the preliminary acquisition consideration allocation during the remainder of the measurement period, which shall not exceed twelve months from the closing of the acquisition. Areas that are subject to change include finalizing the evaluation of the income tax accounting considerations. We do not believe such revisions or changes will be material.

The following table summarizes the preliminary estimated fair values of the assets acquired and liabilities assumed in the AXC acquisition as of the acquisition date:

	Preliminary Estimated Fair Value
Net assets acquired:	
Identifiable intangible assets	$ 256.4
Goodwill	287.5
Property, plant and equipment	34.2
Other assets	53.1
Liabilities	(31.5)
Net assets acquired	$ 599.7

Information regarding preliminary identifiable intangible assets acquired in the AXC acquisition is presented below:

	Weighted-average Estimated Useful Life	Preliminary Estimated Asset Fair Value
Finite-lived intangible assets:		
Customer relationships	14.0 years	$ 139.1
Unpatented technology	10.0 years	42.1
Backlog [(1)]	1.0 year	19.2
Other identifiable intangible assets [(1)]	4.0 years	1.0
Total finite-lived intangible assets acquired	11.0 years	201.4
Indefinite-lived intangible assets:		
Trademarks and trade names		55.0
Total identifiable intangible assets acquired		$ 256.4

(1) Backlog and other identifiable intangible assets is included in "Patents and other" in Note 9, "Goodwill and Intangible Assets."

For the year ended December 31, 2019, net sales, operating income and intangible assets amortization expense attributed to the acquired AXC operations was $103.1, $4.6, and $16.8, respectively. During the year ended December 31, 2019, we incurred $5.4 in transaction related costs related to the AXC acquisition which were recorded in selling, general and administrative expenses in Corporate in the consolidated statements of income.

Unaudited Supplemental Pro Forma Information

The following unaudited supplemental pro forma financial information is based on our historical consolidated financial statements and AXC's historical consolidated financial statements as adjusted to give effect to the July 1, 2019 AXC acquisition. The unaudited supplemental pro forma financial information for the periods presented gives effect to the acquisition as if it had occurred on January 1, 2017.

The following adjustments are reflected in the pro forma financial table below:

- Adjustment for depreciation related to the step-up in basis of the acquired property, plant and equipment and change in estimated useful lives.
- Adjustment for amortization of acquired intangible assets.
- Adjustment for the change from last in, first out (LIFO) to weighted-average cost for the acquired inventory and the associated reduction of cost of sales.
- Adjustment to reflect an increase in interest expense resulting from interest on the term loan under the 2019 Credit Facilities to finance the AXC acquisition and amortization of related debt issuance costs.
- Adjustment to reflect the change in the estimated income tax rate for federal and state purposes.
- Adjustment to reflect the increase in weighted-average shares in connection with the equity issuance.

This unaudited pro forma financial information is presented for informational purposes only and is not necessarily indicative of the results of operations that actually would have resulted had the acquisition been in effect at the beginning of the periods presented. In addition, the unaudited pro forma results are not intended to be a projection of future results and do not reflect any operating efficiencies or cost savings that might be achievable.

The following table presents pro forma sales, net income attributable to Chart Industries, Inc., and net income attributable to Chart Industries, Inc. per common share data assuming AXC was acquired at the beginning of the 2017 fiscal year:

	Year Ended December 31,		
	2019	2018	2017
Pro forma sales	$ 1,447.9	$ 1,291.5	$ 987.8
Pro forma net income attributable to Chart Industries, Inc.	56.3	72.0	(2.5)
Pro forma net income attributable to Chart Industries, Inc. per common share, basic	$ 1.66	$ 2.05	$ (0.07)
Pro forma net income attributable to Chart Industries, Inc. per common share, diluted	1.60	1.99	(0.07)

VRV Acquisition

On November 15, 2018, Chart completed the previously announced acquisition VRV pursuant to the terms of the Amended and Restated Share Purchase Agreement (the "Amendment") with the original parties as well as VRV that replaces in full the original Purchase Agreement. Immediately thereafter, we assigned all of our rights and obligations under the Amendment to VRV Holdings S.r.l. ("Holdings"), a newly formed Italian subsidiary of Chart. The Amendment provides for a revised transaction structure pursuant to which Holdings acquired VRV Technoservice S.r.l. ("VRV Technoservice"), a newly formed Italian company wholly owned by VRV (the "VRV acquisition"). Prior to the VRV acquisition, as contemplated in the Amendment, VRV contributed substantially all of its business to VRV Technoservice. VRV Technoservice changed its name to VRV S.r.l. following the VRV acquisition.

The VRV acquisition purchase price was euro 191.1 million (equivalent to $216.1), net of cash assumed of 1.3 million euros (equivalent to $1.4), is inclusive of the base purchase price of euro 125.0 million (equivalent to $141.3) in cash and assumed indebtedness of VRV, which was paid off immediately at closing or shortly thereafter, of euro 63.7 million (equivalent to $72.0), and net working capital and other agreed-upon purchase price adjustments finalized during the first half of 2019 of 3.7 million euros (equivalent to $4.2) which was settled early in the second quarter of 2019. Additional indebtedness of VRV of euro 4.4 million (equivalent to $4.9) was assumed at the acquisition date and was paid off during the first and second quarters of 2019. All U.S. dollar equivalent dollar amounts are based on the exchange rate as of the acquisition date. We funded the VRV acquisition, including the subsequent payoff of assumed indebtedness, with borrowings of euro 140.0 million (equivalent to $160.3) from our senior secured revolving credit facility and the remainder with cash on hand.

VRV, which has operations in Italy, France and India, is a diversified multinational corporation with highly automated, purpose-built facilities for the design and manufacture of pressure equipment serving the cryogenic and energy & petrochemical end markets. VRV's results are included in our E&C Cryogenics and D&S East segments from the date of VRV acquisition.

We allocated the acquisition consideration to tangible and identifiable intangible assets acquired and liabilities assumed based on their estimated fair values as of the acquisition date. The fair value of the acquired tangible and identifiable intangible assets were determined based on inputs that are unobservable and significant to the overall fair value measurement. It is also based on estimates and assumptions made by management at the time of the acquisition. As such, this was classified as Level 3 fair value hierarchy measurements and disclosures.

We estimated the fair value of acquired unpatented technology and trademarks and trade names using the relief from royalty method. The fair values of acquired customer backlog and customer relationships were estimated using the multi-period excess earnings method. Under both the relief from royalty and multi-period excess earnings methods, the fair value models incorporate estimates of future cash flows, estimates of allocations of certain assets and cash flows, estimates of future growth rates, and management's judgment regarding the applicable discount rates to use to discount such estimates of cash flows. The estimated useful lives of identifiable finite-lived intangible assets range from 2 to 12 years.

The excess of the purchase price over the estimated fair values is assigned to goodwill. The estimated goodwill was established due to benefits including the combination of strong engineering and manufacturing cultures which will continue to further develop full service solutions for our worldwide customer base, as well as the benefits derived from the anticipated synergies of VRV integrating with Chart's E&C Cryogenics and D&S East segments. Goodwill recorded for the VRV acquisition is not expected to be deductible for tax purposes.

The purchase price allocation reported at December 31, 2018 was preliminary and was based on provisional fair values. During 2019 (and prior to November 15, 2019), we received and analyzed new information about certain assets and liabilities, primarily related to identifiable intangible assets, other net assets and property, plant and equipment as of the November 15, 2018 acquisition date and subsequently decreased identifiable intangible assets by $16.0, other net assets by $15.3 and property, plant and equipment by $3.0. Net assets acquired, including goodwill, was also adjusted to reflect the net working capital and other agreed-upon purchase price adjustments of $4.2 negotiated during the year ended December 31, 2019.

The following table summarizes the estimated fair values of the assets acquired and liabilities assumed in the VRV acquisition as of the acquisition date:

	December 31, 2019	Adjustments	As Previously Reported December 31, 2018
Net assets acquired:			
Identifiable intangible assets	$ 50.6	$ (16.0)	$ 66.6
Property, plant and equipment	67.5	(3.0)	70.5
Goodwill	101.7	38.5	63.2
Other net assets	2.6	(15.3)	17.9
Debt	(4.9)	—	(4.9)
Debt extinguished in close proximity to acquisition date [(1)]	(72.0)	—	(72.0)
Net assets acquired	$ 145.5	$ 4.2	$ 141.3

(1) As described above, we assumed indebtedness of VRV of euro 63.7 million (equivalent to $72.0), which was paid off immediately at closing or shortly thereafter. The fair value of the net assets acquired and liabilities assumed reflects this indebtedness and differs from the fair value of the consideration transferred due to the nature and timing of the debt extinguishment.

Information regarding identifiable intangible assets acquired in the VRV acquisition is presented below:

	Weighted-average Estimated Useful Life	Estimated Asset Fair Value
Finite-lived intangible assets:		
Customer relationships	12.0 years	$ 16.3
Unpatented technology	12.0 years	23.0
Other identifiable intangible assets [(1)]	4.0 years	0.5
Total finite-lived intangible assets acquired	9.0 years	39.8
Indefinite-lived intangible assets:		
Trademarks and trade names		10.8
Total identifiable intangible assets acquired		$ 50.6

(1) Other identifiable intangible assets is included in "Patents and other" in Note 9, "Goodwill and Intangible Assets."

The following unaudited supplemental pro forma sales are based on our historical consolidated financial statements and VRV's historical consolidated financial statements as adjusted to give effect to the November 15, 2018 acquisition of VRV. The unaudited supplemental pro forma sales information for the periods presented gives effect to the VRV acquisition as if it had occurred on January 1, 2017. The unaudited supplemental pro forma sales for the years ended December 31, 2018 and 2017 for Chart Industries including VRV would have been approximately $1,200.0 and $950.0, respectively. It is impracticable to disclose the pro forma net income and pro forma net income per share information because of significant differences between Chart accounting policies following U.S. GAAP and those followed by VRV.

The unaudited pro forma sales information is presented for informational purposes only and is not necessarily indicative of the results of operations that actually would have resulted had the VRV acquisition been in effect at the beginning of the periods

presented. In addition, the unaudited pro forma sales results are not intended to be a projection of future results and do not reflect any operating efficiencies or cost savings that might be achievable.

Skaff Acquisition

On January 2, 2018, we acquired 100% of the equity interests of Skaff Cryogenics and Cryo-Lease, LLC (together "Skaff") for an approximate purchase price of $12.5, net of cash acquired. Skaff provides quality repair service and re-manufacturing of cryogenic and liquefied natural gas storage tanks and trailers and also maintains a portfolio of cryogenic storage equipment that is leased to customers for temporary and permanent needs. Skaff is headquartered in Brentwood, New Hampshire and provides services and equipment to customers in North America. Skaff's results are included in the D&S West operating segment. During the first quarter of 2019, the Skaff purchase price was finalized which resulted in an adjustment to the opening balance sheet increasing long-term deferred tax liabilities and goodwill each by $0.8.

Additional information related to the Skaff acquisition has not been presented because the impact on our consolidated results of income and financial position is not material.

Contingent Consideration

The estimated fair value of contingent consideration related to our D&S West segment's 2015 Thermax acquisition, was $1.8 at the date of acquisition and was valued according to a discounted cash flow approach, which included assumptions regarding the probability of achieving certain earnings targets and a discount rate applied to the potential payments. Potential payments were due to be paid before July 1, 2019 based on the attainment of certain earnings targets. The earnings targets for Thermax were below the minimum threshold so no contingent consideration was paid for the final year of the four year earn-out period.

NOTE 14 — Equity and Accumulated Other Comprehensive Loss

Public Stock Offering

On June 14, 2019, we completed a public offering (the "2019 Equity Offering"), through which Chart issued and sold 4.025 shares of common stock, $0.01 par value per share, which included the full exercise of the underwriters' option to purchase additional shares, at a price of $73.50 per share, before underwriting discounts and commissions. We received proceeds of $295.8 from the issuance of shares and incurred $9.5 of equity issuance costs. A portion of the proceeds from the 2019 Equity Offering was used to retire existing debt.

Accumulated Other Comprehensive Loss

The components of accumulated other comprehensive loss are as follows:

	December 31, 2019		
	Foreign currency translation adjustments	Pension liability adjustments, net of taxes	Accumulated other comprehensive loss
Beginning Balance	$ (17.5)	$ (12.4)	$ (29.9)
Other comprehensive (loss) income	(7.5)	1.1	(6.4)
Amounts reclassified from accumulated other comprehensive loss, net of income taxes	—	0.4	0.4
Net current-period other comprehensive loss, net of taxes	(7.5)	1.5	(6.0)
Ending Balance	$ (25.0)	$ (10.9)	$ (35.9)

	December 31, 2018		
	Foreign currency translation adjustments	Pension liability adjustments, net of taxes	Accumulated other comprehensive loss
Beginning Balance	$ 2.2	$ (10.3)	$ (8.1)
Other comprehensive loss	(21.6)	(3.0)	(24.6)
Amounts reclassified from accumulated other comprehensive loss, net of income taxes [(1)]	1.9	0.9	2.8
Net current-period other comprehensive loss, net of taxes	(19.7)	(2.1)	(21.8)
Ending Balance	$ (17.5)	$ (12.4)	$ (29.9)

(1) For the year ended December 31, 2018, $1.9 was reclassified from accumulated other comprehensive loss to foreign currency loss in the consolidated statements of income related to the Divestiture. This reclassification reduced the gain on sale of CAIRE. Refer to Note 3, "Discontinued Operations," for further discussion.

NOTE 15 — Earnings Per Share

The following table presents calculations of net income per share of common stock:

	Year Ended December 31,		
	2019	2018	2017
Net income attributable to Chart Industries, Inc.			
Income from continuing operations	$ 46.4	$ 53.6	$ 26.2
Income from discontinued operations	—	34.4	1.8
Net income attributable to Chart Industries, Inc.	$ 46.4	$ 88.0	$ 28.0
Earnings per common share – basic:			
Income from continuing operations	$ 1.37	$ 1.73	$ 0.85
Income from discontinued operations	—	1.10	0.06
Net income attributable to Chart Industries, Inc.	$ 1.37	$ 2.83	$ 0.91
Earnings per common share – diluted:			
Income from continuing operations	$ 1.32	$ 1.67	$ 0.84
Income from discontinued operations	—	1.06	0.05
Net income attributable to Chart Industries, Inc.	$ 1.32	$ 2.73	$ 0.89
Weighted average number of common shares outstanding — basic	33.91	31.05	30.74
Incremental shares issuable upon assumed conversion and exercise of share-based awards	0.42	0.77	0.60
Incremental shares issuable due to dilutive effect of the Convertible Notes	0.82	0.38	—
Incremental shares issuable due to dilutive effect of warrants	0.02	—	—
Weighted average number of common shares outstanding — diluted	35.17	32.20	31.34

Diluted earnings per share does not consider the following potential common shares as the effect would be anti-dilutive:

	Year Ended December 31,		
	2019	2018	2017
Share-based awards	0.15	0.22	0.40
Convertible note hedge and capped call transactions [1]	0.82	0.38	—
Warrants	—	5.18	5.18
Total anti-dilutive securities	0.97	5.78	5.58

(1) The convertible note hedge offsets any dilution upon actual conversion of the 2024 Notes up to a common stock price of $71.775 per share. For further information, refer to Note 10, "Debt and Credit Arrangements."

NOTE 16 — Income Taxes

Income from Continuing Operations Before Income Taxes

Income from continuing operations before income taxes consists of the following:

	Year Ended December 31,		
	2019	2018	2017
United States	$ 39.4	$ 32.0	$ 5.5
Foreign	13.4	37.0	5.6
Income before from continuing operations before income taxes	$ 52.8	$ 69.0	$ 11.1

Provision

Significant components of income tax expense (benefit), net are as follows:

	Year Ended December 31,		
	2019	2018	2017
Current:			
Federal	$ 6.9	$ 1.5	$ 8.7
State and local	3.0	0.5	0.2
Foreign	12.3	6.4	5.9
Total current	22.2	8.4	14.8
Deferred:			
Federal	(2.0)	3.8	(30.7)
State and local	(5.5)	1.5	(0.2)
Foreign	(8.7)	(0.3)	(0.5)
Total deferred	(16.2)	5.0	(31.4)
Total income tax expense (benefit), net	$ 6.0	$ 13.4	$ (16.6)

Effective Tax Rate Reconciliation

The reconciliation of income taxes computed at the U.S. federal statutory tax rate to income tax expense (benefit) is as follows:

	Year Ended December 31,		
	2019	2018	2017
Income tax expense at U.S. statutory rate	$ 11.2	$ 14.1	$ 3.6
State income taxes, net of federal tax benefit	(2.1)	1.7	0.2
Foreign income, net of credit on foreign taxes	(2.3)	0.7	8.5
Effective tax rate differential of earnings outside of U.S.	0.1	2.6	(0.3)
Change in valuation allowance	1.0	38.4	7.6
Research & experimentation credits	(0.9)	(0.9)	(0.5)
Foreign derived intangible income	(0.9)	(0.8)	—
Net non-deductible items	2.3	1.2	0.7
Change in uncertain tax positions	—	0.2	0.1
Share-based compensation	(3.0)	(3.3)	—
Domestic production activities deduction	—	—	(0.4)
Capital loss carryover	—	(29.7)	—
Tax effect of 2017 tax reform federal rate change	—	(11.3)	(26.7)
Tax effect of carryforward foreign tax credits	—	(0.6)	(9.4)
Other items	0.6	1.1	—
Income tax expense (benefit)	$ 6.0	$ 13.4	$ (16.6)

Deferred Taxes

Deferred income taxes reflect the net tax effect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of our deferred tax assets and liabilities are as follows:

	December 31,	
	2019	2018
Deferred tax assets:		
Accruals and reserves	$ 19.4	$ 15.9
Pensions	2.9	3.3
Inventory	2.3	2.2
Share-based compensation	5.3	6.5
Tax credit carryforwards	15.5	16.2
Foreign net operating loss carryforwards	24.4	11.2
State net operating loss carryforwards	0.3	0.6
Capital loss carryover	29.4	29.7
Convertible notes	0.7	0.4
Other – net	5.5	13.5
Total deferred tax assets before valuation allowances	105.7	99.5
Valuation allowances	(68.2)	(65.2)
Total deferred tax assets, net of valuation allowances	$ 37.5	$ 34.3
Deferred tax liabilities:		
Property, plant and equipment	$ 13.7	$ 15.4
Goodwill and intangible assets	74.9	88.9
Other – net	1.0	1.6
Total deferred tax liabilities	$ 89.6	$ 105.9
Net deferred tax liabilities	$ 52.1	$ 71.6
The net deferred tax liability is classified as follows:		
Other assets	$ —	$ (4.8)
Long-term deferred tax liabilities	52.1	76.4
Net deferred tax liabilities	$ 52.1	$ 71.6

As of December 31, 2019, we have $104.5 of state and foreign net operating losses, of which approximately $61.9 expire between 2020 and 2029. Additionally, we have a U.S. capital loss carryforward of $140.3, which expires in 2023.

We routinely review valuation allowances recorded against deferred tax assets on a more likely than not basis as to whether we have the ability to realize the deferred tax assets. As of December 31, 2019, we have valuation allowances totaling $68.2 consisting primarily of $30.0 related to U.S. capital loss carryforwards and $27.1 associated with our operations in China.

Other Tax Information

On December 22, 2017, the Tax Cuts and Jobs Act ("Tax Act") was signed into law. The Tax Act, among other things, reduced the U.S. federal corporate tax rate from 35% to 21%, requires companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries, requires a current inclusion in U.S. federal taxable income of certain earnings of foreign corporations, and created a new limitation on deductible interest expense. Consequently, we recorded a $22.5 net favorable tax benefit during the year ended December 31, 2017 primarily due to the remeasurement of deferred tax assets to the 21% federal corporate tax rate. In accordance with SAB 118, we recorded an additional tax benefit $1.8 during the year ended December 31, 2018 primarily related to the remeasurement of deferred tax assets to the 21% federal corporate tax rate based on the completion of our analysis to determine the effect of the Tax Act.

We previously considered the earnings in our non-U.S. subsidiaries to be indefinitely reinvested and, accordingly, recorded no deferred income taxes. We have analyzed our global working capital and cash requirements as of December 31, 2019 and have determined that we do not plan to repatriate any earnings at this time.

Cash paid for income taxes during the years ended December 31, 2019, 2018 and 2017 was $16.8, $13.2, and $15.4, respectively.

Unrecognized Income Tax Benefits

The reconciliation of beginning to ending unrecognized tax benefits is as follows:

	Year Ended December 31,		
	2019	2018	2017
Unrecognized tax benefits at beginning of the year	$ 2.3	$ 0.8	$ 0.8
Additions for tax positions of prior years	(0.1)	0.9	0.1
Additions for tax positions acquired	0.2	1.4	—
Reductions for tax positions of prior years	—	(0.8)	(0.1)
Unrecognized tax benefits at end of the year	$ 2.4	$ 2.3	$ 0.8

Included in the balance of unrecognized tax benefits at December 31, 2019 and 2018 were $1.7 and $0.1 of income tax (benefit)/expenses, respectively, which, if ultimately recognized, would impact our annual effective tax rate.

We accrued approximately $0.4 and $0.1 of interest and penalties at December 31, 2019 and 2018, respectively. Due to the expiration of various statutes of limitation, it is reasonably possible our unrecognized tax benefits at December 31, 2019 may decrease within the next twelve months by $0.4. We are subject to income taxes in the U.S. federal jurisdiction and various state and foreign jurisdictions. With few exceptions, we are no longer subject to U.S. federal, state and local or non-U.S. income tax examinations by tax authorities for years prior to 2014.

NOTE 17 — Employee Benefit Plans

Defined Benefit Plan

We have a defined benefit pension plan which is frozen, that covers certain U.S. hourly and salary employees. The defined benefit plan provides benefits based primarily on the participants' years of service and compensation.

The components of net periodic pension expense (income) are as follows:

	Year Ended December 31,		
	2019	2018	2017
Interest cost	$ 2.2	$ 2.1	$ 2.2
Expected return on plan assets	(2.9)	(3.3)	(2.8)
Amortization of net loss	1.3	0.9	1.2
Total net periodic pension expense (income)	$ 0.6	$ (0.3)	$ 0.6

The changes in the projected benefit obligation and plan assets, the funded status of the plans and the amounts recognized in the consolidated balance sheets are as follows:

	December 31,	
	2019	2018
Change in projected benefit obligation:		
Projected benefit obligation at beginning of year	$ 53.6	$ 57.0
Interest cost	2.2	2.1
Assumption changes	5.4	—
Benefits paid	(2.5)	(2.4)
Actuarial gains	(0.2)	(3.1)
Projected benefit obligation at year end	$ 58.5	$ 53.6
Change in plan assets:		
Fair value of plan assets at beginning of year	$ 42.8	$ 48.5
Actual return	8.4	(3.3)
Employer contributions	0.4	—
Benefits paid	(2.5)	(2.4)
Fair value of plan assets at year end	$ 49.1	$ 42.8
Funded status (Accrued pension liabilities) [1]	$ (9.4)	$ (10.8)
Unrecognized actuarial loss recognized in accumulated other comprehensive loss	$ 14.2	$ 15.8

(1) Accrued pension liabilities on the the consolidated balance sheets for both December 31, 2019 and 2018 were $0.8, respectively, related to Hudson, which is not included in the table above.

The estimated net periodic pension income for the defined benefit pension plan that will be amortized from accumulated other comprehensive loss over the next fiscal year is $0.3.

The actuarial assumptions used in determining pension plan information are as follows:

	December 31,		
	2019	2018	2017
Assumptions used to determine benefit obligation at year end:			
Discount rate	3.2%	4.2%	3.7%
Assumptions used to determine net periodic benefit cost:			
Discount rate	4.2%	3.7%	4.0%
Expected long-term weighted-average rate of return on plan assets	7.0%	7.0%	7.0%

The discount rate reflects the current rate at which the pension liabilities could be effectively settled at year end. In estimating this rate, we look to rates of return on high quality, fixed-income investments that receive one of the two highest ratings given by a recognized rating agency and the expected timing of benefit payments under the plan.

The expected return assumptions were developed using an averaging formula based upon the plans' investment guidelines, mix of asset classes, historical returns of equities and bonds, and expected future returns. We employ a total return investment approach whereby a mix of equities and fixed income investments are used to maximize the long-term return of plan assets for a prudent level of risk. Risk tolerance is established through careful consideration of short and long-term plan liabilities, plan funded status and corporate financial condition. The investment portfolio contains a diversified blend of equity and fixed-income investments. Furthermore, equity investments are diversified across U.S. and non-U.S. stocks, as well as growth, value, and small and large capitalizations. Investment risk is measured and monitored on an ongoing basis through quarterly investment portfolio reviews, annual liability measurements, and periodic asset/liability studies.

The target allocations by asset category and fair values of the plan assets by asset class at December 31 are as follows:

		Fair Value					
		Total		Level 2		Level 3	
Plan Assets:	**Target Allocations by Asset Category**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**
Equity funds	60% – 70%	$ 36.0	$ 30.0	$ 36.0	$ 30.0	$ —	$ —
Fixed income funds	26% – 30%	12.8	12.6	12.8	12.6	—	—
Other investments	3% – 6%	0.3	0.2	—	—	0.3	0.2
Total		$ 49.1	$ 42.8	$ 48.8	$ 42.6	$ 0.3	$ 0.2

The plan assets are primarily invested in pooled separate funds. The fair values of equity securities and fixed income securities held in pooled separate funds are based on net asset value of the units of the funds as determined by the fund manager. These funds are similar in nature to retail mutual funds, but are typically more efficient for institutional investors. The fair value of pooled funds is determined by the value of the underlying assets held by the fund and the units outstanding. The value of the pooled funds is not directly observable, but is based on observable inputs. As such, these plan assets are valued using Level 2 inputs. Certain plan assets in the other investments asset category are invested in a general investment account where the fair value is derived from the liquidation value based on an actuarial formula as defined under terms of the investment contract. These plan assets were valued using unobservable inputs and, accordingly, the valuation was performed using Level 3 inputs.

The following table represents changes in the fair value of plan assets categorized as Level 3 from the preceding table:

Balance at January 1, 2018	$ 2.9
Purchases, sales and settlements, net	(2.8)
Transfers, net	0.1
Balance at December 31, 2018	$ 0.2
Purchases, sales and settlements, net	(3.1)
Transfers, net	3.2
Balance at December 31, 2019	$ 0.3

Our funding policy is to contribute at least the minimum funding amounts required by law. Based upon current actuarial estimates, we do not expect to contribute to our defined benefit pension plan until 2020. The following benefit payments are expected to be paid by the plan in each of the next five years and in the aggregate for the subsequent five years:

2020	$ 3.0
2021	3.1
2022	3.2
2023	3.3
2024	3.3
In aggregate during five years thereafter	17.2

Hudson Defined Benefit Plan

As part of the Hudson acquisition (see Note 13, "Business Combinations") we acquired a noncontributory defined benefit plan (the "Hudson Plan") covering certain employees at a Hudson subsidiary who meet the plan's eligibility requirements. The Hudson Plan is closed to new participants. Our funding policy is to make the minimum annual contribution that is required by applicable regulations, plus such amounts as we may determine to be appropriate from time to time. At December 31, 2019 and 2018, the projected benefit obligation of the Hudson Plan was $2.9 and $2.5, respectively, and the fair value of plan assets was $2.0 and $1.7, respectively. Consequently, at both December 31, 2019 and 2018, a liability of $0.8 was included in accrued pension liabilities on the consolidated balance sheets for the underfunded status of the Hudson Plan. Pension expense in 2019 and 2018 was not significant.

Multi-Employer Plan

We contribute to a multi-employer plan for certain collective bargaining U.S. employees. The risks of participating in this multi-employer plan are different from a single employer plan in the following aspects:

(a) Assets contributed to the multi-employer by one employer may be used to provide benefits to employees of other participating employers.

(b) If a participating employer ceases contributing to the plan, the unfunded obligations of the plan may be inherited by the remaining participating employers.

(c) If we choose to stop participating in the multi-employer plan, we may be required to pay those plans an amount based on the underfunded status of the plan, referred to as a withdrawal liability.

We have assessed and determined that the multi-employer plan to which we contribute is not significant to our financial statements. We do not expect to incur a withdrawal liability or expect to significantly increase our contribution over the remainder of the current contract period, which ends in February 2023. We made contributions to the bargaining unit supported multi-employer pension plan resulting in expense of $0.5, $0.4, and $0.3 for the years ended December 31, 2019, 2018 and 2017, respectively. The reduction in contributions is due to fewer employees participating in this plan.

Defined Contribution Savings Plan

We have a defined contribution savings plan that covers most of our U.S. employees. Company contributions to the plan are based on employee contributions, and include a Company match and discretionary contributions. Expenses under the plan totaled $9.2, $8.7, and $8.2 for the years ended December 31, 2019, 2018 and 2017, respectively.

Voluntary Deferred Income Plan

We provide additional retirement plan benefits to certain members of management under the Amended and Restated Chart Industries, Inc. Voluntary Deferred Income Plan. This is an unfunded plan. We recorded $0.3, $0.4, and $0.5 of expense associated with this plan for the years ended December 31, 2019, 2018 and 2017, respectively.

NOTE 18 — Share-based Compensation

Under the 2017 Omnibus Equity Plan (the "2017 Omnibus Equity Plan") officers and employees (including our principal executive officer, principal financial officer and other "named executive officers") are eligible to be granted stock options, stock appreciation rights ("SARs"), restricted stock, restricted stock units ("RSUs"), performance shares and common shares. The maximum number of shares available for issuance is 1.70, which may be treasury shares or unissued shares. As of December 31, 2019, 0.20 stock options, 0.19 shares of restricted stock and RSUs, and 0.03 performance units were outstanding under the 2017 Omnibus Equity Plan.

Under the Amended and Restated 2009 Omnibus Equity Plan ("2009 Omnibus Equity Plan") which was originally approved by our shareholders in May 2009 and re-approved by shareholders in May 2012 as amended and restated, we could grant stock options, SARs, RSUs, restricted stock, performance shares, leveraged restricted shares, and common shares to employees and directors. The maximum number of shares available for issuance is 3.35, which could be treasury shares or unissued shares. As of December 31, 2019, 0.44 stock options, 0.04 shares of restricted stock and RSUs, and 0.01 performance units were outstanding under the 2009 Omnibus Equity Plan.

We recognized share-based compensation expense of $9.0, $4.9, and $10.6 for the years ended December 31, 2019, 2018 and 2017, respectively. This expense is included in selling, general and administrative expenses in the consolidated statements of income. The tax benefit related to share-based compensation, which was recorded in net income in the consolidated statement of income during the year ended December 31, 2019 and 2018 was $2.8 and $1.3, respectively, which was recorded in net income in the consolidated statements of income (the tax benefit for 2017 was insignificant). As of December 31, 2019, total share-based compensation expense of $9.5 is expected to be recognized over the remaining weighted-average period of approximately 1.9 years.

Stock Options

We use a Black-Scholes option pricing model to estimate the fair value of stock options. The expected volatility is based on historical information. The risk-free rate is based on the U.S. Treasury yield in effect at the time of the grant. Weighted-average grant-date fair values of stock options and the assumptions used in estimating the fair values are as follows:

	Year Ended December 31,		
	2019	2018	2017
Weighted-average grant-date fair value per share	$ 30.66	$ 26.67	$ 20.11
Expected term (years)	5.0	5.5	5.4
Risk-free interest rate	2.24%	2.30%	2.00%
Expected volatility	50.94%	59.41%	60.31%

Stock options generally have a four-year graded vesting period, an exercise price equal to the fair market value of a share of common stock on the date of grant, and a contractual term of 10 years. The following table summarizes our stock option activity from continuing operations:

	December 31, 2019			
	Number of Shares	Weighted-average Exercise Price	Aggregate Intrinsic Value	Weighted-average Remaining Contractual Term
Outstanding at beginning of year	0.79	$ 38.46		
Granted	0.13	66.50		
Exercised	(0.26)	32.09		
Forfeited / Cancelled	(0.03)	54.90		
Outstanding at end of year	0.63	$ 46.01	$ 15.0	5.2 years
Vested and expected to vest at end of year	0.62	$ 45.71	$ 6.9	5.1 years
Exercisable at end of year	0.28	$ 47.12	$ 14.9	3.3 years

As of December 31, 2019, total unrecognized compensation cost related to stock options expected to be recognized over the weighted-average period of approximately 2.3 years is $2.7.

The total intrinsic value of options exercised during the years ended December 31, 2019, 2018 and 2017 was $13.1, $18.8, and $1.2, respectively. The total fair value of stock options vested during the years ended December 31, 2019, 2018 and 2017 was $3.1, $3.7, and $3.3, respectively.

Restricted Stock and RSUs

Restricted stock and RSUs generally vest ratably over a three-year period and are valued based on our market price on the date of grant. The following table summarizes our unvested restricted stock and RSUs activity from continuing operations:

	December 31, 2019	
	Number of Shares	Weighted-Average Grant-Date Fair Value
Unvested at beginning of year	0.27	$ 41.01
Granted	0.09	67.64
Forfeited	(0.02)	61.42
Vested	(0.12)	30.05
Unvested at end of year	0.22	$ 55.46

As of December 31, 2019, total unrecognized compensation cost related to unvested restricted stock and RSUs expected to be recognized over the weighted-average period of approximately 1.7 years is $5.4.

The weighted-average grant-date fair value of restricted stock and RSUs granted during the years ended December 31, 2019, 2018, and 2017 was $67.64, $51.99, and $37.14, respectively. The total fair value of restricted stock and RSUs that vested during the years ended December 31, 2019, 2018, and 2017 was $7.7, $7.3, and $4.6, respectively.

Performance Units

Performance units are earned over a three-year period. Based on the attainment of pre-determined performance condition targets as determined by the Compensation Committee of the Board of Directors, performance units earned may be in the range of between 0% and 200%. The following table, which is stated at a 100% earned percentage, summarizes our performance units activity from continuing operations:

	December 31, 2019	
	Number of Shares	Weighted-Average Grant-Date Fair Value
Unvested at beginning of year	0.04	$ 27.49
Granted	0.03	69.53
Vested	(0.02)	18.62
Forfeited	(0.01)	73.30
Unvested at end of year	0.04	$ 61.71

As of December 31, 2019, total unrecognized compensation cost related to performance units expected to be recognized over a weighted-average period of approximately 1.9 years is $1.4.

The weighted-average grant-date fair value of performance units granted during the years ended December 31, 2019, 2018, and 2017 was $69.53, $49.38, and $37.34, respectively. The total fair value of performance units that vested during the years ended December 31, 2019, 2018, and 2017 was $1.1, $0.1, and $0.8, respectively.

Directors' Stock Grants

In 2019, 2018 and 2017, we granted the non-employee directors stock awards covering 0.01, 0.01, and 0.02 shares of common stock, respectively, which had fair values of $0.6, $0.7, and $0.7, respectively. These stock awards were fully vested on the grant date. Likewise, the fair values were recognized immediately on the grant date.

NOTE 19 — Leases

As of December 31, 2019, operating ROU assets and lease liabilities were $34.0 and $34.1 ($6.3 of which was current), respectively. The weighted-average remaining term for lease contracts was 6.7 years at December 31, 2019, with maturity dates ranging from May 2020 to February 2029. The weighted-average discount rate was 4.7% at December 31, 2019.

We incurred $11.1, $8.0, and $9.3 of rental expense under operating leases for the years ended December 31, 2019, 2018 and 2017, respectively. Certain operating leases contain rent escalation clauses and lease concessions that require additional rental payments in the later years of the term. Rent expense for these types of leases is recognized on a straight-line basis over the minimum lease term. Adjustments for straight-line rental expense for the respective periods was not material and as such, the majority of expense recognized was reflected in cash used in operating activities for the respective periods. This expense consisted primarily of payments for base rent on building and equipment leases. Payments related to short-term lease costs and taxes and variable service charges on leased properties were immaterial. In addition, we have the right, but no obligation, to renew certain leases for various renewal terms.

The following table summarizes future minimum lease payments for non-cancelable operating leases as of December 31, 2019:

2020	$ 7.8
2021	6.4
2022	6.1
2023	5.6
2024	5.3
Thereafter [(1)]	7.9
Total future minimum lease payments	$ 39.1

(1) As of December 31, 2019, future minimum lease payments for non-cancelable operating leases for period subsequent to 2024 relate to 7 leased facilities.

NOTE 20 — Commitments and Contingencies

Environmental

We are subject to federal, state, local, and foreign environmental laws and regulations concerning, among other matters, waste water effluents, air emissions, and handling and disposal of hazardous materials, such as cleaning fluids. We are involved with environmental compliance, investigation, monitoring, and remediation activities at certain of our owned and formerly owned manufacturing facilities and at one owned facility that is leased to a third party, and, except for these continuing remediation efforts, believes we are currently in substantial compliance with all known environmental regulations. At December 31, 2019 and 2018, we had undiscounted accrued environmental reserves of $0.6 and $1.3, respectively. We accrue for certain environmental remediation-related activities for which commitments or remediation plans have been developed and for which costs can be reasonably estimated. These estimates are determined based upon currently available facts and circumstances regarding each facility. Actual costs incurred may vary from these estimates due to the inherent uncertainties involved. Future expenditures relating to these environmental remediation efforts are expected to be made over the next 7 years as ongoing costs of remediation programs.

Although we believe we have adequately provided for the cost of all known environmental conditions, the applicable regulatory agencies could insist upon different and more costly remediation than those we believe are adequate or required by existing law or third parties may seek to impose environmental liabilities on us. We believe that any additional liability in excess of amounts accrued which may result from the resolution of such matters will not have a material adverse effect on our financial position, liquidity, cash flows or results of operations.

Aluminum Cryobiological Tank Recall

In April 2018, we received several customer inquiries regarding the performance of certain aluminum cryobiological tanks (in the D&S West segment) manufactured at our New Prague, Minnesota facility. An investigation has determined that certain aluminum tanks manufactured at the facility during a limited certain period should be repaired or replaced. As such, on April 23, 2018, we issued a recall notice for the impacted product lines. Our D&S West segment recorded an expense of $4.0 to cost of sales during 2018 related to the estimated costs of the recall. As of December 31, 2019, there is no remaining liability related to the tank recall.

Legal Proceedings

Stainless Steel Cryobiological Tank Legal Proceedings

During the second quarter of 2018, Chart was named in lawsuits (including a class action lawsuit filed in the U.S. District Court for the Northern District of California) filed against Chart and other defendants with respect to the alleged failure of a stainless steel cryobiological storage tank (model MVE 808AF-GB) at the Pacific Fertility Center in San Francisco, California. We continue to evaluate the merits of such claims in light of the information available to date regarding use, maintenance and operation of the tank which has been out of our custody for the past six years when it was sold to the Pacific Fertility Center through an independent distributor. Accordingly, an accrual related to any damages that may result from the lawsuits has not been recorded because a potential loss is not currently probable or estimable.

We have asserted various defenses against the claims in the lawsuits, including a defense that since manufacture, we were not in any way involved with the installation, ongoing maintenance or monitoring of the tank or related fertility center cryogenic systems at any time since the initial delivery of the tank.

Aluminum Cryobiological Tank Legal Proceeding

Chart has been named in a purported class action lawsuits filed in the Ontario Superior Court of Justice against the Company and other defendants with respect to the alleged failure of an aluminum cryobiological storage tank (model FNL XC 47/11-6 W/11) at The Toronto Institute for Reproductive Medicine in Etobicoke, Ontario. We have confirmed that the tank in question was part of the aluminum cryobiological tank recall commenced on April 23, 2018. A settlement has been reached by the parties in the lawsuit with no material effect on the Company's financial position, results of operations or cash flows.

We are occasionally subject to various legal claims related to performance under contracts, product liability, taxes, employment matters, environmental matters, intellectual property, and other matters incidental to the normal course of our business. Based on our historical experience in litigating these claims, as well as our current assessment of the underlying merits of the claims and applicable insurance, if any, management believes that the final resolution of these matters will not have a material adverse effect on our financial position, liquidity, cash flows, or results of operations. Future developments may, however, result in resolution of these legal claims in a way that could have a material adverse effect.

NOTE 21 — Restructuring Activities

During 2019, we implemented certain cost reduction or avoidance actions, including facility consolidations in D&S West, E&C Cryogenics and E&C FinFans, and a streamlining of the commercial activities surrounding our Lifecycle business in E&C Cryogenics, geographic realignment of our manufacturing capacity and a facility closure in D&S East, as well as departmental restructuring, including headcount reductions in each of these segments. These actions resulted in total restructuring costs of $15.6, consisting of employee severance costs, disposals of property, plant and equipment and other costs. Restructuring costs for 2019 reflect a $1.6 credit to E&C Cryogenics restructuring costs recorded in the second quarter of 2019 due to the successful negotiation of a lease termination for a facility for our previous Lifecycle business. These restructuring activities were substantially completed by the end of the year.

During 2018, we implemented certain cost reduction or avoidance actions, primarily related to departmental restructuring, including headcount reductions resulting in associated severance costs. We executed a strategic realignment of our segment structure, which resulted in severance charges during 2018.

During 2017, we implemented a number of cost reduction or avoidance actions, including headcount reductions and facility closures and relocations primarily relating to the consolidation of certain of our facilities in China and relocation of the corporate headquarters. All of these actions were completed in the first half of 2018.

The following table is a summary of the severance and other restructuring costs, which included employee-related costs, facility rent and exit costs, relocation, recruiting, travel and other, for the years ended December 31, 2019, 2018 and 2017:

	Year Ended December 31,		
	2019	2018	2017
Severance:			
Cost of sales	$ 2.9	$ —	$ 0.4
Selling, general, and administrative expenses	1.4	3.2	3.2
Total severance costs	$ 4.3	$ 3.2	$ 3.6
Other restructuring:			
Cost of sales	$ 9.3	$ 0.8	$ 2.3
Selling, general, and administrative expenses	2.0	0.4	5.3
Total other restructuring costs	$ 11.3	$ 1.2	$ 7.6
Total restructuring costs	$ 15.6	$ 4.4	$ 11.2

We are closely monitoring our end markets and order rates and will continue to take appropriate and timely actions as necessary.

The following tables represent changes in our consolidated restructuring reserve:

	Year Ended December 31, 2019					
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Corporate	Consolidated
Balance as of December 31, 2018	$ 0.8	$ —	$ —	$ —	$ 0.1	$ 0.9
Restructuring charges	8.5	0.9	2.5	3.5	0.2	15.6
Property, plant and equipment impairment	(4.0)	—	(1.6)	—	—	(5.6)
Cash payments and other	(4.9)	(0.8)	(0.7)	(3.5)	(0.1)	(10.0)
Balance as of December 31, 2019	$ 0.4	$ 0.1	$ 0.2	$ —	$ 0.2	$ 0.9

	Year Ended December 31, 2018					
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Corporate	Consolidated
Balance as of December 31, 2017	$ 0.2	$ 1.2	$ 0.1	$ 0.1	$ 1.1	$ 2.7
Restructuring charges	1.4	—	0.6	0.1	2.3	4.4
Cash payments and other	(0.8)	(1.2)	(0.7)	(0.2)	(3.3)	(6.2)
Balance as of December 31, 2018	$ 0.8	$ —	$ —	$ —	$ 0.1	$ 0.9

	Year Ended December 31, 2017					
	D&S East	D&S West	E&C Cryogenics	E&C FinFans	Corporate	Consolidated
Balance as of December 31, 2016	$ —	$ 3.2	$ 0.1	$ —	$ 3.0	$ 6.3
Restructuring charges	1.7	1.1	2.1	0.3	6.0	11.2
Cash payments and other	(1.5)	(3.1)	(2.1)	(0.2)	(7.9)	(14.8)
Balance as of December 31, 2017	$ 0.2	$ 1.2	$ 0.1	$ 0.1	$ 1.1	$ 2.7

NOTE 22 — Quarterly Data (Unaudited)

Selected quarterly data for the years ended December 31, 2019 and 2018 are as follows:

	Year Ended December 31, 2019				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Sales	$ 289.3	$ 309.6	$ 357.8	$ 342.4	$ 1,299.1
Gross profit	67.1	82.8	101.2	85.7	336.8
Operating income [1]	4.6	25.3	29.9	21.1	80.9
Net income	1.0	14.6	18.7	12.5	46.8
Net income attributable to Chart Industries, Inc. [5]	0.9	14.4	18.7	12.4	46.4
Net income attributable to Chart Industries, Inc. — basic [2]	$ 0.03	$ 0.44	$ 0.52	$ 0.35	$ 1.37
Net income attributable to Chart Industries, Inc. — diluted [2]	$ 0.03	$ 0.41	$ 0.51	$ 0.34	$ 1.32

(1) Includes transaction-related costs of $5.4 for the year ended December 31, 2019, which were mainly related to the AXC acquisition. Includes integration costs of $1.6 related to the AXC acquisition for the year ended December 31, 2019.

(2) Basic and diluted earnings per share are computed independently for each of the quarters presented. As such, the sum of quarterly basic and diluted earnings per share may not equal reported annual basic and diluted earnings per share.

	Year Ended December 31, 2018				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Sales	$ 244.1	$ 277.9	$ 272.2	$ 290.1	$ 1,084.3
Gross profit	66.9	72.8	82.3	73.9	295.9
Operating income [1] [2]	15.0	19.3	31.5	26.3	92.1
Income from continuing operations	$ 4.2	$ 9.9	$ 21.5	$ 18.0	$ 53.6
Income from discontinued operations	1.6	2.4	0.7	29.7	34.4
Net income attributable to Chart Industries, Inc. [3] [4]	$ 5.8	$ 12.3	$ 22.2	$ 47.7	$ 88.0
Basic earnings per common share attributable to Chart Industries, Inc. [5] [6]					
Income from continuing operations	$ 0.14	$ 0.32	$ 0.69	$ 0.58	$ 1.73
Income from discontinued operations	0.05	0.08	0.03	0.94	1.10
Net income attributable to Chart Industries, Inc.	$ 0.19	$ 0.40	$ 0.72	$ 1.52	$ 2.83
Diluted earnings per common share attributable to Chart Industries, Inc. [5] [6]					
Income from continuing operations	$ 0.13	$ 0.31	$ 0.65	$ 0.56	$ 1.67
Income from discontinued operations	0.05	0.07	0.02	0.91	1.06
Net income attributable to Chart Industries, Inc.	$ 0.18	$ 0.38	$ 0.67	$ 1.47	$ 2.73

(1) Includes an expense of $3.8 recorded to the cost of sales related to the estimated costs of the aluminum cryobiological tank recall for the second quarter of 2018 and an additional expense of $0.2 recorded to the cost of sales for the fourth quarter of 2018.

(2) During the year ended December 31, 2018, we recorded net severance costs of $2.3 primarily related to headcount reductions associated with the strategic realignment of our segment structure, which includes $1.8 in payroll severance costs partially offset by a $0.9 credit due to related share-based compensation forfeitures for the third quarter of 2018. Includes net severance

costs of $1.4 related to the departure of our former CEO, which includes $3.2 in payroll severance costs partially offset by a $1.8 credit due to related share-based compensation forfeitures for the second quarter of 2018.

(3) Includes transaction-related costs of $2.1 for the year ended December 31, 2018, which were mainly related to the VRV acquisition. Includes integration costs of $0.8 related to the VRV acquisition for the fourth quarter of 2018.

(4) Includes gain on sale of the CAIRE business of $34.3 for the fourth quarter of 2018.

(5) We have completed our analysis to determine the effect of the Tax Cuts and Jobs Act, and as such, we have recorded an additional tax benefit of $1.8.

(6) Basic and diluted earnings per share are computed independently for each of the quarters presented. As such, the sum of quarterly basic and diluted earnings per share may not equal reported annual basic and diluted earnings per share.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
SCHEDULE II – VALUATION AND QUALIFYING ACCOUNTS
(Dollars in millions)

	Balance at beginning of period	Additions: Charged to costs and expenses	Additions: Charged to other accounts	Deductions	Translations	Balance at end of period
Year Ended December 31, 2019						
Allowance for doubtful accounts	$ 8.5	$ —	$ —	$ —	$ 0.3	$ 8.8
Allowance for excess and obsolete inventory	9.0	7.8	—	(5.6) [3]	(0.4)	10.8
Deferred tax assets valuation allowance	65.2	5.4	5.3 [1]	(5.9) [4]	(1.8)	68.2
Year Ended December 31, 2018						
Allowance for doubtful accounts	$ 9.1	$ —	$ —	$ (0.8) [2]	$ 0.2	$ 8.5
Allowance for excess and obsolete inventory	7.1	4.8	—	(3.5) [3]	0.6	9.0
Deferred tax assets valuation allowance	26.8	38.7	—	—	(0.3)	65.2
Year Ended December 31, 2017						
Allowance for doubtful accounts	$ 9.0	$ 0.5	$ —	$ (0.9) [2]	$ 0.5	$ 9.1
Allowance for excess and obsolete inventory	9.1	4.2	—	(6.3) [3]	0.1	7.1
Deferred tax assets valuation allowance	14.9	10.9	—	—	1.0	26.8

(1) Deferred tax assets valuation allowance related to the VRV acquisition.

(2) Reversal of amounts previously recorded as bad debt and uncollectible accounts written off.

(3) Inventory items written off against the allowance.

(4) Deductions to the deferred tax assets valuation allowance relate to decreased deferred tax assets and the release of the valuation allowance.

INDEX TO EXHIBITS

Exhibit No.	*Description*
2.1	Agreement and Plan of Merger, among Chart Industries, Inc., Chart Sully Corporation, RCHPH Holdings, Inc., and R/C Hudson Holdings, L.P., solely in its capacity as the Initial Holder Representative under the Merger Agreement, dated as of June 30, 2017 (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed with the SEC on June 30, 2017 (File No. 001-11442)).**
2.1.1	Amendment No. 1, dated September 19, 2017, to Agreement and Plan of Merger, among Chart Industries, Inc., Chart Sully Corporation, RCHPH Holdings, Inc., and R/C Hudson Holdings, L.P., solely in its capacity as the Initial Holder Representative under the Merger Agreement, dated as of June 30, 2017 (incorporated by reference to Exhibit 2.2 to the Registrant's Current Report on Form 8-K filed with the SEC on September 21, 2017 (File No. 001-11442)).**
2.2	Share Purchase Agreement, by and among Chart Industries, Inc., Alessandro Spada, Elena Spada and Federico Spada, dated as of September 26, 2018 (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed with the SEC on September 27, 2018 (File No. 001-11442)).**
2.2.1	Amended and Restated Share Purchase Agreement, by and among Chart Industries, Inc., Alessandro Spada, Elena Spada, Federico Spada and VRV S.p.a., dated as of November 13, 2018 (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed with the SEC on November 15, 2018 (File No. 001-11442)).**
2.3	Stock Purchase Agreement, by and among Chart Inc., Chart Industries Luxembourg S.à r.l., Chart Asia Investment Company Limited and NGK Spark Plug Co., Ltd., dated as of September 28, 2018 (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed with the SEC on October 1, 2018 (File No. 001-11442)).**
2.4	Asset Purchase Agreement, dated as of May 8, 2019, by and among Chart Industries, Inc., E&C FinFan, Inc. and Harsco Corporation (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K, filed with the Securities and Exchange Commission on May 9, 2019 (File No. 001-11442)).
3.1	Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to Amendment No. 5 to the Registrant's Registration Statement on Form S-1 (File No. 333-133254)).
3.2	Amended and Restated By-Laws, as amended (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on December 19, 2008 (File No. 001-11442)).
4.1	Form of Certificate (incorporated by reference to Exhibit 4.1 to Amendment No. 4 to the Registrant's Registration Statement on Form S-1 (File No. 333-133254)).
4.2	Indenture, dated as of November 6, 2017, by and between Chart Industries, Inc. and Wells Fargo Bank, National Association (including the form of the 1.00% Convertible Senior Subordinated Notes due 2024) (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed with the SEC on November 6, 2017 (File No. 001-11442)).
4.3	Description of Securities (x).
10.1	Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Appendix A to the Registrant's definitive proxy statement filed with the SEC on April 10, 2012 (File No. 001-11442)).*
10.1.1	Amendment No. 1 to the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2012 (File No. 001-11442)).*
10.1.2	Form of Nonqualified Stock Option Agreement (2010 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.4.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-11442)).*
10.1.3	Forms of Stock Award Agreement and Deferral Election Form (for eligible directors) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.4.3 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-11442)).*
10.1.4	Form of Nonqualified Stock Option Agreement (2011 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.4 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 (File No. 001-11442)).*

10.1.5	Form of Restricted Stock Agreement (2011 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.5 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 (File No. 001-11442)).*
10.1.6	Form of Performance Unit Agreement (2011 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.6 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 (File No. 001-11442)).*
10.1.7	Form of Nonqualified Stock Option Agreement (2012 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.8 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2011 (File No. 001-11442)).*
10.1.8	Form of Leveraged Restricted Share Unit Agreement (2013 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.5 to the Registrant's Current Report on Form 8-K filed with the SEC on January 5, 2012 (File No. 001-11442)).*
10.1.9	Form of Nonqualified Stock Option Agreement (2013 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.11 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2012 (File No. 001-11442)).*
10.1.10	Form of Performance Unit Agreement (2013 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.12 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2012 (File No. 001-11442)).*
10.1.11	Form of Nonqualified Stock Option Agreement (2014 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.13 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2013 (File No. 001-11442)).*
10.1.12	Form of Performance Unit Agreement (2014 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.14 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2013 (File No. 001-11442)).*
10.1.13	Form of Leveraged Restricted Share Unit Agreement (2014 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.15 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2013 (File No. 001-11442)).*
10.1.14	Form of Nonqualified Stock Option Agreement (2015 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.16 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2014 (File No. 001-11442)).*
10.1.15	Form of Performance Unit Agreement (2015 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.17 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2014 (File No. 001-11442)).*
10.1.16	Form of Restricted Share Unit Agreement (2015 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.18 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2014 (File No. 001-11442)).*
10.1.17	Form of Nonqualified Stock Option Agreement (2016 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.18 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015 (File No. 001-11442)).*
10.1.18	Form of Performance Unit Agreement (2016 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.19 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015 (File No. 001-11442)).*
10.1.19	Form of Restricted Share Unit Agreement (2016 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.21 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015 (File No. 001-11442)).*
10.1.20	Form of Nonqualified Stock Option Agreement (2017 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.21 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2016 (File No. 001-11442)).*
10.1.21	Form of Performance Unit Agreement (2017 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.22 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2016 (File No. 001-11442)).*
10.1.22	Form of Restricted Share Unit Agreement (2017 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.23 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2016 (File No. 001-11442)).*

10.2	Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Appendix B to the Registrant's definitive proxy statement filed with the Securities and Exchange Commission on April 11, 2017 (File No. 001-11442)).*
10.2.1	Form of Nonqualified Stock Option Agreement (2018 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.25 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2017 (File No. 001-11442)).*
10.2.2	Form of Performance Unit Agreement (2018 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.26 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2017 (File No. 001-11442)).*
10.2.3	Form of Restricted Share Unit Agreement (2018 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.27 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2017 (File No. 001-11442)).*
10.2.4	Form of Stock Award Agreement and Deferral Election Form (for eligible directors) under the Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.4 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018 (File No. 001-1442)).*
10.2.5	Form of Nonqualified Stock Option Agreement (2019 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.5 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018 (File No. 001-1442)).*
10.2.6	Form of Performance Unit Agreement (2019 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.6 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018 (File No. 001-1442)).*
10.2.7	Form of Restricted Share Unit Agreement (2019 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.7 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018 (File No. 001-1442)).*
10.2.8	Form of Restricted Share Unit Agreement (2018 Evanko Grant) under the Chart Industries, Inc. 2017 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.8 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018 (File No. 001-1442)).*
10.2.9	Form of Nonqualified Stock Option Agreement (2020 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan.* (x)
10.2.10	Form of Performance Unit Agreement (2020 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan.* (x)
10.2.11	Form of Restricted Share Unit Agreement (2020 grants) under the Chart Industries, Inc. 2017 Omnibus Equity Plan.* (x)
10.2.12	Form of Restricted Share Unit Agreement (2019 Bishop Grant) under the Chart Industries, Inc. 2017 Omnibus Equity Plan. (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K as amended, filed with the Securities and Exchange Commission on August 23, 2019 (File No. 001-11442)).*
10.3	Amended and Restated Chart Industries, Inc. Voluntary Deferred Income Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on June 28, 2010 (File No. 001-11442)).*
10.3.1	Amendment No. 1 to the Amended and Restated Chart Industries, Inc. Voluntary Deferred Income Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2016 (File No. 001-11442)).*
10.3.2	Amendment No. 2 to the Amended and Restated Chart Industries, Inc. Voluntary Deferred Income Plan (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K, filed with the SEC on July 14, 2016 (File No. 001-11442)).*
10.4	Chart Industries, Inc. Cash Incentive Plan (incorporated by reference to Appendix A to the Registrant's definitive proxy statement filed with the Securities and Exchange Commission on April 8, 2014 (File No. 001-11442)).*
10.5	Chart Industries, Inc. Cash Incentive Plan (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on March 29, 2019 (File No. 001-11442)).*
10.6	Amended and Restated Employment Agreement, dated effective June 12, 2018, by and between Chart Industries, Inc. and Jillian C. Evanko (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K/A filed with the SEC on July 10, 2018 (File No. 001-11442)).*

10.7	Employment Agreement, dated October 26, 2017, by and between Chart Industries, Inc. and Gerald F. Vinci (incorporated by reference to Exhibit 10.14 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2017 (File No. 001-11442)).*
10.8	Employment Agreement, dated effective August 21, 2019, by and between Chart Industries, Inc. and John Bishop (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K as amended, filed with the Securities and Exchange Commission on August 23, 2019 (File No. 001-11442)).*
10.9	Employment Agreement, dated March 26, 2019, by and between Chart Industries, Inc. and Herbert G. Hotchkiss. (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 10-Q for the quarter ended March 31, 2019 (File No. 001-11442)).*
10.10.1	Employment Agreement, dated effective January 14, 2019, by and between Chart Industries, Inc. and Jeffrey Lass (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed with the Securities and Exchange Commission on March 29, 2019 (File No. 001-11442)).*
10.10.2	Mutual Agreement of Separation and Release, dated effective August 29, 2019, by and between Chart Industries, Inc. and Jeffrey R. Lass (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed with the Securities and Exchange Commission on August 29, 2019 (File No. 001-11442)).*
10.11	Form of Indemnification Agreement (incorporated by reference to Exhibit 10.20 to the Registrant's Registration Statement on Form S-1 (File No. 333-133254)).
10.12	Base Call Option Transaction Confirmation, dated October 31, 2017, by and between Chart Industries, Inc. and Morgan Stanley & Co. International plc (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.1	Base Warrants Confirmation, dated October 31, 2017, by and between Chart Industries, Inc. and Morgan Stanley & Co. International plc (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.2	Base Call Option Transaction Confirmation, dated October 31, 2017, by and between Chart Industries, Inc. and JPMorgan Chase Bank, National Association, London Branch (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.3	Base Warrants Confirmation, dated October 31, 2017, by and between Chart Industries, Inc. and JPMorgan Chase Bank, National Association, London Branch (incorporated by reference to Exhibit 10.4 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.4	Base Call Option Transaction Confirmation, dated October 31, 2017, by and between Chart Industries, Inc. and Bank of America, N.A. (incorporated by reference to Exhibit 10.5 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.5	Base Warrants Confirmation, dated October 31, 2017, by and between Chart Industries, Inc. and Bank of America, N.A. (incorporated by reference to Exhibit 10.6 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.6	Additional Call Option Transaction Confirmation, dated November 1, 2017, by and between Chart Industries, Inc. and Morgan Stanley & Co. International plc (incorporated by reference to Exhibit 10.7 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.7	Additional Warrants Confirmation, dated November 1, 2017, by and between Chart Industries, Inc. and Morgan Stanley & Co. International plc (incorporated by reference to Exhibit 10.8 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.8	Additional Call Option Transaction Confirmation, dated November 1, 2017, by and between Chart Industries, Inc. and JPMorgan Chase Bank, National Association, London Branch (incorporated by reference to Exhibit 10.9 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.9	Additional Warrants Confirmation, dated November 1, 2017, by and between Chart Industries, Inc. and JPMorgan Chase Bank, National Association, London Branch (incorporated by reference to Exhibit 10.10 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).

10.13.10	Additional Call Option Transaction Confirmation, dated November 1, 2017, by and between Chart Industries, Inc. and Bank of America, N.A. (incorporated by reference to Exhibit 10.11 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.13.11	Additional Warrants Confirmation, dated November 1, 2017, by and between Chart Industries, Inc. and Bank of America, N.A. (incorporated by reference to Exhibit 10.12 to the Registrant's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 6, 2017 (File No. 001-11442)).
10.14	Fourth Amended and Restated Credit Agreement, dated June 14, 2019, by and among Chart Industries, Inc., Chart Industries Luxembourg S.à.r.l, Chart Asia Investment Company Limited, the other foreign borrowers from time to time party thereto, the lenders from time to time party thereto and JPMorgan Chase Bank, N.A. (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed with the Securities and Exchange Commission on June 18, 2019 (File No. 001-11442)).
21.1	List of Subsidiaries. (x)
23.1	Consent of Independent Registered Public Accounting Firm - Deloitte & Touche. (x)
23.2	Consent of Independent Registered Public Accounting Firm - Ernst & Young. (x)
31.1	Rule 13a-14(a) Certification of the Company's Chief Financial Officer and Chief Executive Officer. (x)
32.1	Section 1350 Certification of the Company's Chief Financial Officer and Chief Executive Officer. (xx)
101.INS	XBRL Instance Document (x)
101.SCH	XBRL Taxonomy Extension Schema Document (x)
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document (x)
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document (x)
101.LAB	XBRL Taxonomy Extension Label Linkbase Document (x)
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document (x)

(x) Filed herewith.

(xx) Furnished herewith.

* Management contract or compensatory plan or arrangement.

** Certain exhibits and schedules have been omitted and Chart agrees to furnish supplementally to the Securities and Exchange Commission a copy of any omitted exhibits and schedules upon request.