CHART INDUSTRIES INC
Form 10-K
February 22, 2019

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

Form 10-K

x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018
OR
o 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)	(IRS 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	Name of Each Exchange on Which Registered
Common Stock, par value $0.01	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 x No o
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 o No x
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 x No o
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to submitted and posted 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 and post such files). Yes x No o
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. x

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

Large accelerated filer	x	Accelerated filer	o
Non-accelerated filer	o (Do not check if a smaller reporting company)	Smaller reporting company	o
		Emerging growth company	o

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 x

The aggregate market value of the voting common equity held by non-affiliates computed by reference to the price of $61.68 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 $1,909,931,501.

As of February 18, 2019, there were 31,597,161 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 22, 2019 (the “2019 Proxy Statement”).

Except as otherwise stated, the information contained in this Annual Report on Form 10-K is as of December 31, 2018.

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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 here refers to Chart Industries, Inc. and our consolidated subsidiaries, unless the context indicates otherwise), is a leading diversified global manufacturer of highly engineered equipment, packaged solutions, and value-add services used throughout the gas to liquid cycle in all industries that require gases as cryogenic liquids or alternative equipment for gas generation, generally for the industrial gas and energy industries. 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, and ambient temperature fans.

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, Praxair, 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, Central Europe, China and India. For the years ended December 31, 2018, 2017 and 2016, we generated sales of $1,084.3 million, $842.9 million, and $722.0 million, respectively.

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 and D&S East segments from the date of acquisition. For further discussion refer to "Note 12, Business Combinations," to our consolidated financial statements included elsewhere in this report.

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

To support the VRV acquisition as well as our expanded focus on geographic expansion outside of North America, we executed a strategic realignment of our segment structure during the third quarter and divided our Distribution & Storage segment into two segments: Distribution & Storage Western Hemisphere ("D&S West") and Distribution & Storage Eastern Hemisphere ("D&S East"). Likewise, the former BioMedical segment was eliminated in connection with the CAIRE Divestiture, with the remaining Cryobiological Business now managed by and part of D&S West. We believe this strategic realignment of our segment structure will facilitate our growth strategies, better align with our customer needs, and provide improved transparency of business results to our shareholders. As a result of these changes, we now operate in two major end-market applications: Energy and Industrial Gas, through our three business segments: (i) Energy & Chemicals ("E&C"), (ii) D&S East, and (iii) D&S West. While each segment manufactures and markets different cryogenic and gas processing equipment and systems to distinct end-users, they all share a reliance on our heat transfer, vacuum insulation, low temperature storage, and gas processing know-how and expertise. Each of our segments manufacture products used primarily in energy-related and industrial applications, such as the separation, liquefaction, distribution, and storage of hydrocarbon and industrial gases. The recent VRV acquisition was complementary to our D&S East and E&C end markets and technologies, while expanding our presence in

Europe and India and expanding our end market into the “warm” side of energy and petrochemical processing. Further information about these segments is located in Note 4 of our consolidated financial statements included in Item 8 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, 2018:

Energy & Chemicals Segment

E&C (36% of sales for the year ended December 31, 2018) facilitates major natural gas, petrochemical processing, petroleum refining, power generation and industrial gas companies in the production of their products. E&C 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, petroleum refining and industrial gas applications. Our principal products include brazed aluminum heat exchangers, Core-in-Kettle® heat exchangers, air cooled heat exchangers, cold boxes, shell & tube heat exchangers, reactors and process systems as well as axial cooling fans for power, HVAC, and refining end user applications. Brazed aluminum heat exchangers accounted for 6.1%, 6.3%, and 9.4% of consolidated sales for the years ended December 31, 2018, 2017 and 2016, respectively. Process systems accounted for 3.1%, 3.6%, and 6.9% of consolidated sales for the years ended December 31, 2018, 2017 and 2016, respectively.

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 24.2%, 18.1%, and 14.6% of consolidated sales for the years ended December 31, 2018, 2017, and 2016, respectively. Primary products used in these applications include brazed aluminum heat exchangers, cold boxes and air cooled heat exchangers. 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 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 a number of 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 LNG, including small to mid-scale facilities, floating LNG applications, and large base-load export facilities, which accounted for 3.7%, 3.5%, and 5.3% of consolidated sales for the years ended December 31, 2018, 2017, and 2016, respectively. 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 brazed aluminum heat exchangers, Core-in-Kettle® heat exchangers, cold boxes, pressure vessels, pipe work, and 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. Our proprietary IPSMR® (Integrated Pre-cooled Single Mixed Refrigerant) liquefaction process technology offers lower capital expenditure rates than competing processes per ton of LNG produced and 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 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, 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 (BAHX) 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 BAHX 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.

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 refining processing to condense and cool fluids. Worldwide power use is projected to grow 48% through 2040, 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 Lifecycle 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. Lifecycle 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, air cooled heat exchangers, fans, cold boxes, etc.

D&S West

D&S West (42% of sales for the year ended December 31, 2018) 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. On a product line basis, cryogenic bulk storage systems, which include LNG cryogenic systems and after market services, accounted for 35.6% of D&S West segment sales in 2018, and represented 15.0%, 18.8% and 24.1% of consolidated sales for the years ended December 31, 2018, 2017 and 2016, respectively. Cryogenic packaged gas systems, which include LNG cryogenic systems and after market services, accounted for 46.4% of D&S West segment sales in 2018, and represented 19.5%, 19.6% and 18.4% of consolidated sales for the years ended December 31, 2018, 2017 and 2016, respectively. We service industrial gas and LNG applications as follows:

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 27.8%, 31.5%, and 36.2% of consolidated sales for the years ended December 31, 2018, 2017, and 2016, 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 are able to 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 tend to 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, which accounted for 6.6%, 6.9%, and 6.4% of consolidated sales for the years ended December 31, 2018, 2017, and 2016, respectively. 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 West and D&S East 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 business.

Demand for LNG applications is driven by the spread in price between oil and gas, 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 are able to 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.

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 our competitors primarily in North America. We provide services for storage vessels, VIP, reconfigurations, relocation, trailers, ISO containers, vaporizers, and other

gas to liquid equipment. With the acquisition of Skaff on January 2, 2018, we expanded our direct regional presence for service and aftermarket support in the Northeast United States. Skaff provides quality repair service and remanufacturing 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.

Cryobiological Storage

Our cryobiological storage products, which were part of our former BioMedical segment, 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 significant competitors for cryobiological storage products include a number of 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.

D&S East

D&S East (22% of sales for the year ended December 31, 2018) 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). The distribution and storage portion of the recent VRV acquisition is included in this segment. With the exception of Cryobiological Storage, which is contained solely within D&S West, D&S East utilizes the same technologies and product lines as those employed by and disclosed with respect to D&S West, except for a valves business acquired as part of the VRV acquisition. Product lines within D&S East which represent significant consolidated sales in any of the three years ending December 31, 2018 are as follows:

- Cryogenic bulk storage systems (including LNG cryogenic systems and after market services) accounted for 16.4%, 18.0% and 19.6% of consolidated sales for the years ended December 31, 2018, 2017 and 2016 respectively.
- Cryogenic packaged gas systems (including LNG cryogenic systems and after market services) accounted for 6.3%, 9.5% and 7.8% of consolidated sales for the years ended December 31, 2018, 2017 and 2016 respectively.

Within Industrial Gas Applications

- Bulk and packaged gas cryogenic solutions for the storage, distribution, vaporization and application of industrial gases accounted for 16.7%, 18.0% and 18.1% of consolidated sales for the years ended December 31, 2018, 2017 and 2016 respectively.

Within LNG Applications

- Cryogenic solutions for the storage, distribution, regasification and use of LNG accounted for 6.0%, 9.5% and 9.3% of consolidated sales for the years ended December 31, 2018, 2017 and 2016 respectively.

After Market Services

D&S East operates multiple service locations in Europe and Asia. The recent VRV acquisition expanded the service and repair access and offerings in these regions. 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.

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. 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, although we believe we rank among the leaders in each of the markets we serve. 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, 2018, 2017 and 2016 was $568.2 million, $446.4 million, and $326.2 million, respectively. Backlog as of December 31, 2018 included $81.6 million related to our November 15, 2018 acquisition of VRV. Backlog as of December 31, 2017 included $65.8 million related to our September 20, 2017 acquisition of RCHPH Holdings, Inc. (“Hudson”). We expect to recognize revenue on approximately 91.8% of the remaining performance obligations over the next 12 months and 0.4% 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 segment, and the amount of backlog at December 31, 2018 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 39%, 38%, and 41% of consolidated sales in 2018, 2017 and 2016, 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 and E&C segments. Sales to Air Liquide, exceeded 10% of consolidated sales in 2016, and represented approximately $90.6 million or 12.5% of consolidated sales in 2016 and is primarily attributable to the D&S West segment, along with the D&S East and E&C segments.

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 2019 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, 2019, we had 4,605 employees, including 2,244 domestic employees and 2,361 international employees.

We are party to one collective bargaining agreement with the International Association of Machinists and Aerospace Workers (“IAM”) covering 238 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 2019 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