AMETEK INC/
Form 10-K
February 21, 2019
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2018

or

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

For the transition period from to

Commission File Number 1-12981

AMETEK, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**14-1682544**
(State or other jurisdiction of	**(I.R.S. Employer**
incorporation or organization)	**Identification No.)**
1100 Cassatt Road	
Berwyn, Pennsylvania	**19312-1177**
(Address of principal executive offices)	**(Zip Code)**

Registrant s telephone number, including area code: (610) 647-2121

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

Title of each class	**Name of each exchange on which registered**
Common Stock, $0.01 Par Value (voting)	**New York Stock Exchange**

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

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

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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 stock held by non-affiliates of the registrant was approximately $16.7 billion as of June 29, 2018, the last business day of the registrant s most recently completed second fiscal quarter.

The number of shares of the registrant s Common Stock outstanding as of January 31, 2019 was 227,131,830.

Documents Incorporated by Reference

Part III incorporates information by reference from the Proxy Statement for the Annual Meeting of Stockholders on May 9, 2019.

AMETEK, Inc.

2018 Form 10-K Annual Report

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PART I

Item 1. Business
General Development of Business

AMETEK, Inc. (AMETEK or the Company) is incorporated in Delaware. Its predecessor was originally incorporated in Delaware in 1930 under the name American Machine and Metals, Inc. AMETEK is a leading global manufacturer of electronic instruments and electromechanical devices with operations in North America, Europe, Asia and South America. AMETEK maintains its principal executive offices in suburban Philadelphia at 1100 Cassatt Road, Berwyn, Pennsylvania, 19312. Listed on the New York Stock Exchange (symbol: AME), the common stock of AMETEK is a component of the Standard and Poor s 500 and the Russell 1000 Indices.

Website Access to Information

AMETEK s annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and all amendments to those reports filed or furnished pursuant to Section 13(a) of the Securities Exchange Act of 1934 are made available free of charge on the Company s website at www.ametek.com in the Investors Financial Information section as soon as reasonably practicable after such material is electronically filed with, or furnished to, the U.S. Securities and Exchange Commission. AMETEK has posted free of charge on the investor information portion of its website its corporate governance guidelines, Board committee charters and codes of ethics. Those documents also are available in published form free of charge to any stockholder who requests them by writing to the Investor Relations Department at AMETEK, Inc., 1100 Cassatt Road, Berwyn, Pennsylvania, 19312.

Products and Services

AMETEK s products are marketed and sold worldwide through two operating groups: Electronic Instruments (EIG) and Electromechanical (EMG). Electronic Instruments is a leader in the design and manufacture of advanced instruments for the process, power and industrial, and aerospace markets. Electromechanical is a differentiated supplier of precision motion control solutions, thermal management systems, specialty metals and electrical interconnects. Its end markets include aerospace and defense, medical, automation and other industrial markets.

Competitive Strengths

Management believes AMETEK has significant competitive advantages that help strengthen and sustain its market positions. Those advantages include:

Significant Market Share. AMETEK maintains significant market share in a number of targeted niche markets through its ability to produce and deliver high-quality products at competitive prices. EIG has significant market positions in niche segments of the process, power and industrial, and aerospace markets. EMG holds significant positions in niche segments of the aerospace and defense, automation and medical markets.

Technological and Development Capabilities. AMETEK believes it has certain technological advantages over its competitors that allow it to maintain its leading market positions. Historically, it has demonstrated an ability to develop innovative new products and solutions that anticipate customer needs. It has consistently added to its investment in research, development and engineering, and improved its new product development efforts with the adoption of Design for Six Sigma and Value Analysis/Value Engineering methodologies. These have improved the pace and quality of product innovation and resulted in the introduction of a steady stream of new products across all of AMETEK s lines of business.

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Efficient and Low-Cost Manufacturing Operations. Through its Operational Excellence initiatives, AMETEK has established a lean manufacturing platform for its businesses. In its effort to achieve best-cost manufacturing, AMETEK had plants, as of December 31, 2018, in Brazil, China, the Czech Republic, Malaysia, Mexico, and Serbia. These plants offer proximity to customers and provide opportunities for increasing international sales. Acquisitions also have allowed AMETEK to reduce costs and achieve operating synergies by consolidating operations, product lines and distribution channels, benefitting both of AMETEK s operating groups.

Experienced Management Team. Another component of AMETEK s success is the strength of its management team and that team s commitment to improving Company performance. AMETEK senior management has extensive industry experience and an average of approximately 26 years of AMETEK service. The management team is focused on achieving results, building stockholder value and continually growing AMETEK. Individual performance is tied to financial results through Company-established stock ownership guidelines and equity incentive programs.

Business Strategy

AMETEK is committed to achieving earnings growth through the successful implementation of a Corporate Growth Plan. The goal of that plan is double-digit annual percentage growth in sales and earnings per share over the business cycle and a superior return on total capital. In addition, other financial initiatives have been or may be undertaken, including public and private debt or equity issuance, bank debt refinancing, local financing in certain foreign countries and share repurchases.

AMETEK s Corporate Growth Plan consists of four key strategies:

Operational Excellence. Operational Excellence is AMETEK s cornerstone strategy for accelerating growth, improving profit margins and strengthening its competitive position across its businesses. Operational Excellence focuses on initiatives to drive increased organic sales growth, improvements in operating efficiencies and sustainable practices. It emphasizes team building and a participative management culture. AMETEK s Operational Excellence strategies include lean manufacturing, global sourcing, Design for Six Sigma, Value Engineering/Value Analysis and growth kaizens. Each plays an important role in improving efficiency, enhancing the pace and quality of innovation and driving profitable sales growth. Operational Excellence initiatives have yielded lower operating and administrative costs, shortened manufacturing cycle times, resulted in higher cash flow from operations and increased customer satisfaction. They also have played a key role in achieving synergies from newly acquired companies.

Strategic Acquisitions. Acquisitions are a key to achieving the goals of AMETEK s Corporate Growth Plan. Since the beginning of 2014 through December 31, 2018, AMETEK has completed 21 acquisitions with annualized sales totaling more than $1.2 billion, including six acquisitions in 2018 (see Recent Acquisitions). AMETEK targets companies that offer the right strategic, technical and cultural fit. It seeks to acquire businesses in adjacent markets with complementary products and technologies. It also looks for businesses that provide attractive growth opportunities, often in new and emerging markets. Through these and prior acquisitions, AMETEK s management team has developed considerable skill in identifying, acquiring and integrating new businesses. As it has executed its acquisition strategy, AMETEK s mix of businesses has shifted toward those that are more highly differentiated and, therefore, offer better opportunities for growth and profitability.

Global & Market Expansion. AMETEK has experienced strong growth outside the United States, reflecting an expanding international customer base, investments in its global infrastructure and the attractive growth potential of its businesses in overseas markets. While Europe remains its largest overseas market, AMETEK has pursued growth opportunities worldwide, especially in key emerging markets. It has grown sales in Latin America and Asia by strategically building, acquiring and expanding manufacturing

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facilities. AMETEK also has expanded its sales and service capabilities in China and enhanced its sales presence and engineering capabilities in India. Elsewhere in Asia and the Middle East, it has expanded sales, service and technical support. Recently acquired businesses have further added to AMETEK s international presence.

New Products. New products are essential to AMETEK s long-term growth. As a result, AMETEK has maintained a consistent investment in new product development and engineering. In 2018, AMETEK added to its highly differentiated product portfolio with a range of new products across many of its businesses. They included:

- Vision Research launched several new cameras, including the Phantom® v2610 and v1840 ultrahigh-speed camera and the SS990, S200 and S210 cameras for machine vision applications

- Taylor Hobson s new Form Talysurf® PGI NOVUS is the most-advanced system available for 3D nanometric surface, contour, and dimension measurement

- The new Series 9200 PetroAlert gas analyzer from MOCON, a leader in gas testing and analysis, is a rugged, compact, highly versatile instrument used to monitor gas wells and drilling sites

- TMC introduced its latest breakthrough for laboratory workstations the CleanBench Aktiv with Everstill active vibration cancellation technology

- Reichert Technologies now offers the most-advanced and easiest-to-use tonometer the new Tono-PEN AVIA, for more reliable and accurate vision diagnosis and treatment

- Creaform s CUBE-R coordinate measurement machine is an automated, fully integrated inspection tool used by the automotive and other industries for parts analysis and quality control

- AMETEK Powervar launched its 3400 Series uninterruptible power supply system for power-critical applications such as data centers and medical imaging

- Zygo Corporation introduced its next-generation optical and non-contact profilers, Nexview NX2, NewView 9000, and ZeGage Pro and Pro HD, that perform highly precise surface measurement

- AMETEK Land, a leader in infrared, non-contact temperature measurement, has developed an innovative new pyrometer designed specifically for the steel and metal foundry industry

- New Windjammer® PRO Series from AMETEK Dynamic Fluid Solutions are the most powerful air-moving blowers for high-flow applications

CAMECA introduced the first electron probe microanalyzer with a touch-screen interface with the launch of its SXFive-TACTIS high-end microanalytical instrument

ORTEC® Products Group released the DSPEC-50A and DSPEC 502A advanced digital spectrometers for high-resolution gamma spectroscopy applications

SPECTRO Analytical Instruments added a new, more rugged SPECTRO GENESIS to its line of inductively coupled, optical emission spectrometers for industrial and environmental lab analyses

New AC Secondary Power Distribution Units from AMETEK PDS give air framers a lightweight, configurable, low-noise option for aircraft power distribution, control and protection

AMETEK Programmable Power expanded its popular Asterion® power supply platform and added a touch-screen display to its Sorensen SGX Series of power supplies

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2018 OVERVIEW

Operating Performance

In 2018, the Company posted record backlog, orders, sales, operating income, net income, diluted earnings per share and operating cash flow. The Company achieved these results from organic sales growth in both EIG and EMG, contributions from recent acquisitions, as well as from the Company s Operational Excellence initiatives. See Results of Operations in Part II, Item 7 Management s Discussion and Analysis of Financial Condition and Results of Operations for further details.

In 2018, AMETEK achieved sales of $4,845.9 million, an increase of 12.7% from 2017 due to 7% organic sales growth, a 5% increase from the 2018 and 2017 acquisitions and favorable 1% effect of foreign currency translation. Diluted earnings per share for 2018 were $3.34, an increase of $0.40 or 13.6%, compared with $2.94 per diluted share in 2017.

Recent Acquisitions

AMETEK spent $1,129.3 million in cash, net of cash acquired, to acquire six businesses in 2018.

In January 2018, AMETEK acquired FMH Aerospace (FMH), a provider of complex, highly engineered solutions for the aerospace, defense and space industries. FMH is part of EMG.

In April 2018, AMETEK acquired SoundCom Systems (SoundCom), a provider of design, integration, installation and support of clinical workflow and communication systems for healthcare facilities, educational institutions and corporations. SoundCom also serves as a value-added reseller in the Midwestern United States for Rauland-Borg Corporation (Rauland), which is a business unit of AMETEK. SoundCom is part of EIG.

In June 2018, AMETEK acquired Motec GmbH, a provider of integrated vision systems that serve the high growth mobile machine vision market. Motec s ruggedized vision products and integrated software solutions provide customers with improved operational efficiency and enhanced safety across a variety of critical mobile machine applications in transportation, agriculture, logistics and construction. Motec is part of EIG.

In October 2018, AMETEK acquired Forza Silicon Corporation (Forza), a leader in the design and production of high-performance imaging sensors used in medical, defense and industrial applications. Forza is part of EIG.

In October 2018, AMETEK acquired Telular Corporation, a provider of communication solutions for logistics management, tank monitoring and security applications. Telular is part of EIG.

In November 2018, AMETEK acquired Spectro Scientific Corporation, a provider of machine condition monitoring solutions for critical assets in high-value industrial applications. Spectro Scientific is part of EIG.

Financing

In the third quarter of 2018, the Company paid in full, at maturity, $80 million in aggregate principal amount of 6.35% private placement senior notes and $160 million in aggregate principal amount of 7.08% private placement senior notes.

In the fourth quarter of 2018, the Company paid in full, at maturity, $65 million in aggregate principal amount of 7.18% private placement senior notes.

In October 2018, the Company along with certain of its foreign subsidiaries amended and restated its credit agreement dated as of September 22, 2011, as amended and restated as of March 10, 2016 (the Credit

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Agreement). The Credit Agreement amends and restates the Company s existing $850 million revolving credit facility, which was due to expire in March 2021. The amended Credit Agreement now consists of a five-year revolving credit facility in an aggregate principal amount of $1.5 billion with a final maturity date in October 2023. The revolving credit facility total borrowing capacity excludes an accordion feature that permits the Company to request up to an additional $500 million in revolving credit commitments at any time during the life of the Credit Agreement under certain conditions. The revolving credit facility provides the Company with additional financial flexibility to support its growth plans, including its acquisition strategy.

In December 2018, the Company completed a private placement agreement to sell $575 million and 75 million Euros in senior notes to a group of institutional investors (the 2018 Private Placement). There are two funding dates under the 2018 Private Placement. The first funding occurred in December 2018 for $475 million and 75 million Euros ($85.1 million). The second funding will be in January 2019 for $100 million. The proceeds from the fundings of the 2018 Private Placement were used to pay down domestic borrowings under the Company s revolving credit facility. See Note 10 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.

Recent Accounting Pronouncements

Effective January 1, 2018, the Company adopted the requirements of Financial Accounting Standards Board Accounting Standards Update (ASU) No. 2014-09 (Topic 606), *Revenue from Contracts with Customers* using the modified retrospective method. Also, effective January 1, 2018, the Company retrospectively adopted ASU No. 2017-07, *Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*. Certain reclassifications and disclosures of prior period amounts have been made to conform to the current year presentation. See Note 2 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.

Financial Information About Reportable Segments, Foreign Operations and Export Sales

Information with respect to reportable segments and geographic areas is set forth in Note 3 and Note 15 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

AMETEK s international sales increased 10.6% to $2,448.5 million in 2018. International sales represented 50.5% of consolidated net sales in 2018 compared with 51.5% in 2017. The increase in international sales was primarily driven by organic sales growth.

Description of Business

Described below are the products and markets of each reportable segment:

EIG

EIG is a leader in the design and manufacture of advanced instruments for the process, aerospace, power and industrial markets. Its growth is based on the four strategies outlined in AMETEK s Corporate Growth Plan. In many instances, its products differ from or are technologically superior to its competitors products. It has achieved competitive advantage through continued investment in research, development and engineering to develop market-leading products and solutions that serve niche markets. It also has expanded its sales and service capabilities globally to serve its customers.

EIG is a leader in many of the specialized markets it serves. Products supplied to these markets include process control instruments for the oil and gas, petrochemical, pharmaceutical, semiconductor, automation, and food and beverage industries. It provides a growing range of instruments to the laboratory equipment, ultraprecision manufacturing, medical, and test and measurement markets. It is a leader in power quality

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monitoring and metering, uninterruptible power systems, programmable power equipment, electromagnetic compatibility (EMC) test equipment, sensors for gas turbines, dashboard instruments for heavy trucks and other vehicles, and instrumentation and controls for the food and beverage industries. It supplies the aerospace industry with aircraft and engine sensors, monitoring systems, power supplies, fuel and fluid measurement systems, and data acquisition systems.

In 2018, 52% of EIG s net sales were to customers outside the United States. At December 31, 2018, EIG employed approximately 10,100 people, of whom approximately 1,000 were covered by collective bargaining agreements. At December 31, 2018, EIG had 93 operating facilities: 59 in the United States: nine in the United Kingdom; eight in Germany; three each in Canada and China; two each in Denmark, Finland, France and Switzerland; and one each in Argentina, Austria and Mexico. EIG also shares operating facilities with EMG in Brazil, China and Mexico.

Process and Analytical Instrumentation Markets and Products

Process and analytical instrumentation sales represented 70% of EIG s 2018 net sales. These businesses include process analyzers, emission monitors and spectrometers; elemental and surface analysis instruments; level, pressure and temperature sensors and transmitters; radiation measurement devices; level measurement devices; precision manufacturing systems; materials- and force-testing instruments; contact and non-contact metrology products; and clinical and educational communication solutions. Among the industries it serves are oil, gas and petrochemical refining; power generation; pharmaceutical manufacturing; medical and healthcare; water and waste treatment; natural gas distribution; and semiconductor manufacturing. Its instruments are used for precision measurement in a number of applications, including radiation detection, trace element and materials analysis, nanotechnology research, ultraprecise manufacturing, and test and measurement.

Acquired in November 2018, Spectro Scientific is a provider of machine condition monitoring solutions for critical assets in high-value industrial applications. Spectro Scientific s differentiated solutions serve an increasing need for predictive maintenance in a broad and growing set of end markets, including military and defense, process, power generation and transportation. Spectro Scientific expands the Company s strategy to integrate instrumentation data with cloud-based software and analytics.

Acquired in October 2018, Telular is a provider of communication solutions for logistics management, tank monitoring and security applications. Telular s end-to-end solutions include purpose-built hardware, proprietary software and wireless connectivity services to enhance the efficiency and safety of critical assets. The combination of Telular s IoT capabilities and the Company s highly differentiated measurement technology provides additional growth opportunities for its businesses.

Acquired in October 2018, Forza is a leader in the design and production of high-performance imaging sensors used in medical, defense and industrial applications. Forza provides the Vision Research business with custom sensor design and production capability, allowing for accelerated development of next-generation sensor technology for use across the Company s market-leading, high-speed cameras.

Acquired in April 2018, SoundCom is a provider of design, integration, installation and support of clinical workflow and communication systems for healthcare facilities, educational institutions and corporations. SoundCom expands Rauland s presence in the healthcare and education markets in the Midwest while providing customers with expanded value-added solutions and services.

Acquired in June 2017, MOCON, Inc. is a leading provider of detectors, instruments, systems and consulting services to research laboratories, production facilities, and quality control and safety departments in the medical, pharmaceutical, food and beverage, packaging, environmental, oil and gas and other industries worldwide. MOCON s products and technologies complement the Company s existing gas analysis instrumentation business and provide it with opportunities to expand into the growing food and pharmaceutical package testing market.

Acquired in February 2017, Rauland is a global provider of enterprise clinical and education communications solutions for hospitals, healthcare systems and educational facilities. Rauland provides the Company with attractive new growth opportunities within the medical technology market, strong growth opportunities in its core markets and incremental growth opportunities through acquisitions and international expansion.

Aerospace and Power Instrumentation Markets and Products

Aerospace and Power Instrumentation sales represented 30% of EIG s 2018 net sales. These businesses produce a wide array of instrumentation, systems and sensors for applications in the aerospace, power and industrial markets.

These businesses produce power monitoring and metering instruments, uninterruptible power supply systems and programmable power supplies used in a wide range of industrial settings. It is a leader in the design and manufacture of power measurement, quality monitoring and event recorders for use in power generation, transmission and distribution. It provides uninterruptible power supply systems, multifunction electric meters, annunciators, alarm monitoring systems and highly specialized communications equipment for smart grid applications. It also offers precision power supplies and power conditioning products, and electrical immunity and EMC test equipment, sensors for gas turbines, dashboard instruments for heavy trucks and other vehicles, and instrumentation and controls for the food and beverage industries.

AMETEK s aerospace products are designed to customer specifications and manufactured to stringent operational and reliability requirements. These products include airborne data systems, turbine engine temperature measurement products, vibration-monitoring systems, cockpit instruments and displays, fuel and fluid measurement products, and sensors and switches. AMETEK serves all segments of the commercial and military aerospace market, including commercial airliners, business jets, regional aircraft and helicopters.

AMETEK operates in highly specialized aerospace market segments in which it has proven technological or manufacturing advantages versus its competition. Among its more significant competitive advantages is its 70-year-plus reputation as an established aerospace supplier. It has long-standing relationships with the world s leading commercial and military aircraft, jet engine and original equipment manufacturers and aerospace system integrators. AMETEK also is a leading provider of spare part sales, repairs and overhaul services to commercial aerospace.

Acquired in June 2018, Motec is a provider of integrated vision systems serving the high-growth mobile machine vision market. Motec s ruggedized vision products and integrated software solutions provide customers with improved operational efficiency and enhanced safety across a variety of critical mobile machine applications in transportation, agriculture, logistics and construction which complement the Company s existing instrumentation businesses by expanding its portfolio of solutions to its customers.

Acquired in December 2017, Arizona Instrument is a provider of differentiated, high-precision moisture and gas measurement instruments for use in the food, pharmaceutical and environmental markets. Arizona Instrument complements the Company s existing Brookfield Engineering Laboratories (Brookfield) viscosity measurement business. Its high-quality products support its customers increasingly complex production processes and more stringent environmental and safety standards.

Customers

EIG is not dependent on any single customer such that the loss of that customer would have a material adverse effect on EIG s operations. Approximately 6% of EIG s 2018 net sales were made to its five largest customers.

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EMG

EMG is a differentiated supplier of automation solutions, thermal management systems, specialty metals and electrical interconnects. EMG is a leader in many of the niche markets in which it competes. Products supplied to these markets include its advanced precision motion control products, which are used in a wide range of automation applications across the medical, semiconductor, aerospace, defense, and food and beverage industries, as well as its highly engineered electrical connectors and electronics packaging used in aerospace and defense, medical, and industrial applications.

EMG supplies high-purity powdered metals, strip and foil, specialty clad metals and metal matrix composites. Its blowers and heat exchangers provide electronic cooling and environmental control for the aerospace and defense industries. Its motors are widely used in commercial appliances, fitness equipment, food and beverage machines, hydraulic pumps and industrial blowers. Additionally, it operates a global network of aviation maintenance, repair and overhaul (MRO) facilities.

EMG designs and manufactures products that, in many instances, are significantly different from or technologically superior to competitors products. It has achieved competitive advantage through continued investment in research, development and engineering, efficiency improvements from operational excellence, acquisition synergies and improved supply chain management.

In 2018, 48% of EMG s net sales were to customers outside the United States. At December 31, 2018, EMG employed approximately 7,800 people, of whom approximately 1,700 were covered by collective bargaining agreements. At December 31, 2018, EMG had 66 operating facilities: 38 in the United States; 10 in the United Kingdom; three each in China and Germany; two each in France, Italy, Mexico and Serbia; and one each in Brazil, the Czech Republic, Malaysia and Taiwan.

Automation and Engineered Solutions Markets and Products

Automation and Engineered Solution sales represented 75% of EMG s 2018 net sales. These businesses produce precision motion control solutions, brushless motors, blowers and pumps, heat exchangers and other electromechanical systems. These products are used in a wide variety of automation applications, semiconductor equipment, computer equipment, medical equipment and power industries among others. Additionally, these businesses produce specialty motors which are used in a wide range of products, such as household, commercial and personal care appliances, fitness equipment, food and beverage machines, lawn and garden equipment, material handling equipment, hydraulic pumps and industrial blowers.

AMETEK is a leader in highly engineered electrical connectors and electronics packaging used to protect sensitive devices and mission-critical electronics. Its electrical connectors, terminals, headers and packaging are designed specifically for harsh environments and highly customized applications. In addition, AMETEK is an innovator and market leader in specialized metal powder, strip, wire and bonded products used in medical, aerospace and defense, telecommunications, automotive and general industrial applications.

Aerospace Markets and Products

Aerospace sales represented 25% of EMG s 2018 net sales. These businesses produce motor-blower systems and heat exchangers used in thermal management and other applications on a variety of military and commercial aircraft and military ground vehicles. In addition, these businesses provide the commercial and military aerospace industry with third-party MRO services on a global basis with facilities in the United States, Europe and Asia.

Acquired in January 2018, FMH is a provider of complex, highly engineered solutions for the aerospace, defense and space industries. FMH s products and solutions further broaden the Company s differentiated product offerings in the aerospace and defense markets.

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Customers

EMG is not dependent on any single customer such that the loss of that customer would have a material adverse effect on EMG s operations. Approximately 10% of EMG s 2018 net sales were made to its five largest customers.

Marketing

AMETEK s marketing efforts generally are organized and carried out at the business unit level. EIG makes use of distributors and sales representatives to market its products along with a direct sales force for its more technically sophisticated products. Within aerospace, the specialized customer base of aircraft and jet engine manufacturers is served primarily by direct sales engineers. Given the technical nature of its many products, as well as its significant worldwide market share, EMG conducts much of its domestic and international marketing activities through a direct sales force and makes some use of sales representatives and distributors, both in the United States and in other countries.

Competition

In general, AMETEK s markets are highly competitive with competition based on technology, performance, quality, service and price.

In EIG s markets, AMETEK believes it ranks as a leader in certain analytical measuring and control instruments, and power and industrial markets. It also is a major instrument and sensor supplier to commercial aviation. In process and analytical instruments, numerous companies compete in each market on the basis of product quality, performance and innovation. In power and industrial and in aerospace, AMETEK competes with a number of companies depending on the specific market segment.

EMG s businesses compete with a number of companies in each of its markets. Competition is generally based on product innovation, performance and price. There also is competition from alternative materials and processes.

Availability of Raw Materials

AMETEK s reportable segments obtain raw materials and supplies from a variety of sources and generally from more than one supplier. For EMG, however, certain items, including various base metals and certain steel components, are available from only a limited number of suppliers. AMETEK believes its sources and supplies of raw materials are adequate for its needs.

Backlog and Seasonal Variations of Business

AMETEK s backlog of unfilled orders by reportable segment was as follows at December 31:

	2018	**2017**	**2016**
		(In millions)	
Electronic Instruments	**$ 765.5**	$ 718.1	$ 587.0
Electromechanical	**836.6**	678.0	569.5

Total	**$ 1,602.1**	$ 1,396.1	$ 1,156.5

Of the total backlog of unfilled orders at December 31, 2018, approximately 88% is expected to be shipped by December 31, 2019. The Company believes that neither its business as a whole, nor either of its reportable segments, is subject to significant seasonal variations, although certain individual operations experience some seasonal variability.

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Research, Development and Engineering

AMETEK is committed to, and has consistently invested in, research, development and engineering activities to design and develop new and improved products and solutions. Research, development and engineering costs before customer reimbursement were $230.2 million in 2018, $221.2 million in 2017 and $200.8 million in 2016, respectively. Customer reimbursements in 2018, 2017 and 2016 were $5.2 million, $5.4 million and $7.2 million, respectively. These amounts included research and development expenses of $141.0 million, $130.4 million and $112.0 million in 2018, 2017 and 2016, respectively. All such expenditures were directed toward the development of new products and solutions and the improvement of existing products and solutions.

Environmental Matters

Information with respect to environmental matters is set forth in Part II, Item 7 Management s Discussion and Analysis of Financial Condition and Results of Operations section entitled Environmental Matters and in Note 13 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Patents, Licenses and Trademarks

AMETEK owns numerous unexpired U.S. and foreign patents, including counterparts of its more important U.S. patents, in the major industrial countries of the world. It is a licensor or licensee under patent agreements of various types, and its products are marketed under various registered and unregistered U.S. and foreign trademarks and trade names. AMETEK, however, does not consider any single patent or trademark, or any group of them, essential either to its business as a whole or to either one of its reportable segments. The annual royalties received or paid under license agreements are not significant to either of its reportable segments or to AMETEK s overall operations.

Employees

At December 31, 2018, AMETEK employed approximately 18,200 people at its EIG, EMG and corporate operations, of whom approximately 2,700 employees were covered by collective bargaining agreements. AMETEK has four collective bargaining agreements that expire in 2019, which cover fewer than 250 employees. It expects no material adverse effects from these pending labor contract negotiations.

Working Capital Practices

AMETEK does not have extraordinary working capital requirements in either of its reportable segments. Its customers generally are billed at normal trade terms that may include extended payment provisions. Inventories are closely controlled and maintained at levels related to production cycles and normal delivery requirements of customers.

Item 1A. Risk Factors

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

A downturn in the economy generally or in the markets we serve could adversely affect our business.

A number of the industries in which we operate are cyclical in nature and therefore are affected by factors beyond our control. A downturn in the U.S. or global economy, and, in particular, in the aerospace and defense, oil and gas, process instrumentation or power markets could have an adverse effect on our business, financial condition and results of operations.

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Our growth could suffer if the markets into which we sell our products and services decline, do not grow as anticipated or experience cyclicality.

Our growth depends in part on the growth of the markets which we serve. Visibility into the future performance of certain of our markets is limited (particularly for markets into which we sell through distribution). Our quarterly sales and profits depend substantially on the volume and timing of orders received during the fiscal quarter, which are difficult to forecast. Any decline or lower than expected growth in our served markets could diminish demand for our products and services, which would adversely affect our financial statements. A number of our businesses operate in industries that may experience periodic, cyclical downturns. In addition, in certain of our businesses, demand depends on customers capital spending budgets, as well as government funding policies. Matters of public policy and government budget dynamics, as well as product and economic cycles, can affect the spending decisions of these customers. Demand for our products and services is also sensitive to changes in customer order patterns, which may be affected by announced price changes, changes in incentive programs, new product introductions and customer inventory levels. Any of these factors could adversely affect our growth and results of operations in any given period.

Our growth strategy includes strategic acquisitions. We may not be able to consummate future acquisitions or successfully integrate recent and future acquisitions.

A portion of our growth has been attributed to acquisitions of strategic businesses. Since the beginning of 2014, through December 31, 2018, we have completed 21 acquisitions. We plan to continue making strategic acquisitions to enhance our global market position and broaden our product offerings. Although we have been successful with our acquisition strategy in the past, our ability to successfully effectuate acquisitions will be dependent upon a number of factors, including:

- Our ability to identify acceptable acquisition candidates;

- The impact of increased competition for acquisitions, which may increase acquisition costs, affect our ability to consummate acquisitions on favorable terms, and result in us assuming a greater portion of the seller s liabilities;

- Successfully integrating acquired businesses, including integrating the management, technological and operational processes, procedures and controls of the acquired businesses with those of our existing operations;

- Adequate financing for acquisitions being available on terms acceptable to us;

- Unexpected losses of key employees, customers and suppliers of acquired businesses;

- Mitigating assumed, contingent and unknown liabilities; and

- Challenges in managing the increased scope, geographic diversity and complexity of our operations.

The process of integrating acquired businesses into our existing operations may result in unforeseen operating difficulties and may require additional financial resources and attention from management that would otherwise be available for the ongoing development or expansion of our existing operations. Furthermore, even if successfully integrated, the acquired business may not achieve the results we expected or produce expected benefits in the time frame planned. Failure to continue with our acquisition strategy and the successful integration of acquired businesses could have an adverse effect on our business, financial condition, results of operations and cash flows.

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The indemnification provisions of acquisition agreements by which we have acquired companies may not fully protect us and as a result we may face unexpected liabilities.

Certain of the acquisition agreements by which we have acquired companies require the former owners to indemnify us against certain liabilities related to the operation of the company before we acquired it. In most of these agreements, however, the liability of the former owners is limited and certain former owners may be unable to meet their indemnification responsibilities. We cannot assure you that these indemnification provisions will protect us fully or at all, and as a result we may face unexpected liabilities that adversely affect our financial statements.

We may not properly execute, or realize anticipated cost savings or benefits from, our Operational Excellence initiatives.

Our success is partly dependent upon properly executing and realizing cost savings or other benefits from our ongoing production and procurement initiatives. These initiatives are primarily designed to make the Company more efficient, which is necessary in the Company s highly competitive industries. These initiatives are often complex, and a failure to implement them properly may, in addition to not meeting projected cost savings or benefits, adversely affect our business and operations.

Foreign and domestic economic, political, legal, compliance and business factors could negatively affect our international sales and operations.

International sales for 2018 and 2017 represented 50.5% and 51.5% of our consolidated net sales, respectively. As a result of our growth strategy, we anticipate that the percentage of sales outside the United States will increase in the future. Approximately half of our international sales are of products manufactured outside the United States. As of December 31, 2018, we have manufacturing operations in 17 countries outside the United States, with significant operations in China, the Czech Republic, Germany, Mexico, Serbia and the United Kingdom. A disruption of our ability to obtain a supply of goods from these countries or a change in the cost to purchase, manufacture, or distribute these products could have an adverse effect on our sales and operations. International sales and operations are subject to the customary risks of operating in an international environment, including:

- Imposition of trade or foreign exchange restrictions, including in the United States;
- Overlap of different tax structures;
- Unexpected changes in regulatory requirements, including in the United States;
- Trade protection measures, such as the imposition of or increase in tariffs and other trade barriers, including in the United States;
- The difficulty and/or costs of designing and implementing an effective control environment across diverse regions and employee bases;

Restrictions on currency repatriation;

General economic conditions;

Unstable political situations;

Nationalization of assets; and

Compliance with a wide variety of international and U.S. laws and regulatory requirements.

Furthermore, fluctuations in foreign currency exchange rates, including changes in the relative value of currencies in the countries where we operate, subject us to exchange rate exposure and may adversely affect our financial statements. For example, increased strength in the U.S. dollar will increase the effective price of our products sold overseas, which may adversely affect sales or require us to lower our prices. In addition, our consolidated financial statements are presented in U.S. dollars, and we must translate our assets, liabilities, sales and expenses into U.S. dollars for external reporting purposes. As a result, changes in the value of the U.S. dollar due to fluctuations in currency exchange rates or currency exchange controls may materially and negatively affect the value of these items in our consolidated financial statements, even if their value has not changed in their local currency.

Our international sales and operations may be adversely impacted by compliance with export laws.

We are required to comply with various import, export, export control and economic sanctions laws, which may affect our transactions with certain customers, business partners and other persons, including in certain cases dealings with or between our employees and subsidiaries. In certain circumstances, export control and economic sanctions regulations may prohibit the export of certain products, services and technologies and in other circumstances, we may be required to obtain an export license before exporting a controlled item. In addition, failure to comply with any of these regulations could result in civil and criminal, monetary and non-monetary penalties, disruptions to our business, limitations on our ability to import and export products and services and damage to our reputation.

Our reputation, ability to do business and financial statements may be impaired by improper conduct by any of our employees, agents or business partners.

We cannot provide assurance that our internal controls and compliance systems will always protect us from acts committed by employees, agents or business partners of ours (or of businesses we acquire or partner with) that would violate U.S. and/or non-U.S. laws, including the laws governing payments to government officials, bribery, fraud, kickbacks and false claims, pricing, sales and marketing practices, conflicts of interest, competition, export and import compliance, money laundering and data privacy. In particular, the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act and similar anti-bribery laws in other jurisdictions generally prohibit companies and their intermediaries from making improper payments to government officials for the purpose of obtaining or retaining business, and we operate in many parts of the world that have experienced governmental corruption to some degree. Any such improper actions or allegations of such acts could damage our reputation and subject us to civil or criminal investigations in the U.S. and in other jurisdictions and related shareholder lawsuits could lead to substantial civil and criminal, monetary and non-monetary penalties and could cause us to incur significant legal and investigatory fees. In addition, we rely on our suppliers to adhere to our supplier standards of conduct and material violations of such standards of conduct could occur that could have a material effect on our financial statements.

Any inability to hire, train and retain a sufficient number of skilled officers and other employees could impede our ability to compete successfully.

If we cannot hire, train and retain a sufficient number of qualified employees, we may not be able to effectively integrate acquired businesses and realize anticipated results from those businesses, manage our expanding international operations and otherwise profitably grow our business. Even if we do hire and retain a sufficient number of employees, the expense necessary to attract and motivate these officers and employees may adversely affect our results of operations.

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

We believe that our future success depends, in part, on our ability to develop, on a timely basis, technologically advanced products that meet or exceed appropriate industry standards. Maintaining our existing

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technological advantages will require us to continue investing in research and development and sales and marketing. There can be no assurance that we will have sufficient resources to make such investments, that we will be able to make the technological advances necessary to maintain such competitive advantages or that we can recover major research and development expenses. We are not currently aware of any emerging standards or new products which could render our existing products obsolete, although there can be no assurance that this will not occur or that we will be able to develop and successfully market new products.

Our technology is important to our success and our failure to protect this technology could put us at a competitive disadvantage.

Many of our products rely on proprietary technology; therefore, we endeavor to protect our intellectual property rights through patents, copyrights, trade secrets, trademarks, confidentiality agreements and other contractual provisions. Despite our efforts to protect proprietary rights, unauthorized parties or competitors may copy or otherwise obtain and use our products or technology. In addition, our ability to protect and enforce our intellectual property rights may be limited in certain countries outside the U.S. Actions to enforce our rights may result in substantial costs and diversion of resources and we make no assurances that any such actions will be successful.

A disruption in, shortage of, or price increases for, supply of our components and raw materials may adversely impact our operations.

While we manufacture certain parts and components used in our products, we require substantial amounts of raw materials and purchase some parts and components from suppliers. The availability and prices for raw materials, parts and components may be subject to curtailment or change due to, among other things, supplier s allocation to other purchasers, interruptions in production by suppliers, changes in exchange rates and prevailing price levels. In addition, our facilities, supply chains, distribution systems, and products may be impacted by natural or man-made disruptions, including armed conflict, damaging weather or other acts of nature, pandemics or other public health crises. A shutdown of, or inability to utilize, one or more of our facilities, our supply chain, or our distribution system could significantly disrupt our operations, delay production and shipments, our relationships and reputation with customers, suppliers, employees, stockholders and others, result in lost sales, result in the misappropriation or corruption of data, or result in legal exposure and large remediation or other expenses. Furthermore, certain items, including base metals and certain steel components, are available only from a limited number of suppliers and are subject to commodity market fluctuations. Shortages in raw materials or price increases therefore could affect the prices we charge, our operating costs and our competitive position, which could adversely affect our business, financial condition, results of operations and cash flows.

Certain environmental risks may cause us to be liable for costs associated with hazardous or toxic substance clean-up which may adversely affect our financial condition.

Our businesses, operations and facilities are subject to a number of federal, state, local and foreign environmental and occupational health and safety laws and regulations concerning, among other things, air emissions, discharges to waters and the use, manufacturing, generation, handling, storage, transportation and disposal of hazardous substances and wastes. Environmental risks are inherent in many of our manufacturing operations. Certain laws provide that a current or previous owner or operator of property may be liable for the costs of investigating, removing and remediating hazardous materials at such property, regardless of whether the owner or operator knew of, or was responsible for, the presence of such hazardous materials. In addition, the Comprehensive Environmental Response, Compensation and Liability Act generally imposes joint and several liability for clean-up costs, without regard to fault, on parties contributing hazardous substances to sites designated for clean-up under the Act. We have been named a potentially responsible party at several sites, which are the subject of government-mandated clean-ups. As the result of our ownership and operation of facilities that use, manufacture, store, handle and dispose of various hazardous materials, we may incur substantial costs for investigation, removal, remediation and capital expenditures related to compliance with environmental laws.

While it is not possible to precisely quantify the potential financial impact of pending environmental matters, based on our experience to date, we believe that the outcome of these matters is not likely to have a material adverse effect on our financial position or future results of operations. In addition, new laws and regulations, new classification of hazardous materials, stricter enforcement of existing laws and regulations, the discovery of previously unknown contamination or the imposition of new clean-up requirements could require us to incur costs or become the basis for new or increased liabilities that could have a material adverse effect on our business, financial condition and results of operations. There can be no assurance that future environmental liabilities will not occur or that environmental damages due to prior or present practices will not result in future liabilities.

We are subject to numerous governmental regulations, which may be burdensome or lead to significant costs.

Our operations are subject to numerous federal, state, local and foreign governmental laws and regulations. In addition, existing laws and regulations may be revised or reinterpreted and new laws and regulations, including with respect to privacy legislation and climate change, may be adopted or become applicable to us or customers for our products. For example, we are subject to federal, state and international privacy laws relating to the collection, use, retention, security and transfer of personally identifiable information. In many cases, these laws apply not only to third-party transactions, but also to transfers of information between the Company and its subsidiaries, and among the Company, its subsidiaries and other parties with which the Company has commercial relations. Several jurisdictions have passed laws in this area, and other jurisdictions are considering imposing additional restrictions. These laws continue to develop and may be inconsistent from jurisdiction to jurisdiction. Complying with emerging and changing international requirements may cause the Company to incur substantial costs or require the Company to change its business practices. We cannot predict the form any such new laws or regulations will take or the impact any of these laws and regulations will have on our business or operations.

We are subject to a variety of litigation and other legal and regulatory proceedings in the course of our business that could adversely affect our financial statements.

We are subject to a variety of litigation and other legal and regulatory proceedings incidental to our business (or the business operations of previously owned entities), including claims for damages arising out of the use of products or services and claims relating to intellectual property matters, employment matters, tax matters, commercial disputes, competition and sales and trading practices, environmental matters, personal injury, insurance coverage and acquisition-related matters, as well as regulatory investigations or enforcement. These lawsuits may include claims for compensatory damages, punitive and consequential damages and/or injunctive relief. The defense of these lawsuits may divert our management s attention, we may incur significant expenses in defending these lawsuits, and we may be required to pay damage awards or settlements or become subject to equitable remedies that could adversely affect our operations and financial statements. Moreover, any insurance or indemnification rights that we may have may be insufficient or unavailable to protect us against such losses. In addition, developments in proceedings in any given period may require us to adjust the loss contingency estimates that we have recorded in our financial statements, record estimates for liabilities or assets previously not susceptible of reasonable estimates or pay cash settlements or judgments. Any of these developments could adversely affect our financial statements in any particular period. We cannot assure you that our liabilities in connection with litigation and other legal and regulatory proceedings will not exceed our estimates or adversely affect our financial statements and reputation. However, based on our experience, current information and applicable law, we do not believe that any amounts we may be required to pay in connection with litigation and other legal and regulatory proceedings in excess of our reserves as of the date of this information statement will have a material effect on our financial statements.

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We operate in highly competitive industries, which may adversely affect our results of operations or ability to expand our business.

Our markets are highly competitive. We compete, domestically and internationally, with individual producers, as well as with vertically integrated manufacturers, some of which have resources greater than we do. The principal elements of competition for our products are product technology, quality, service, distribution and price. Although we believe EIG is a market leader, competition is strong and could intensify in the markets served by EIG. In the aerospace markets served by EIG, a limited number of companies compete on the basis of product quality, performance and innovation. EMG s competition in specialty metal products stems from alternative materials and processes. Our competitors may develop new or improve existing products that are superior to our products or may adapt more readily to new technologies or changing requirements of our customers. There can be no assurance that our business will not be adversely affected by increased competition in the markets in which it operates or that our products will be able to compete successfully with those of our competitors.

Restrictions contained in our revolving credit facility and other debt agreements may limit our ability to incur additional indebtedness.

Our existing revolving credit facility and other debt agreements (each a Debt Facility and collectively, Debt Facilities) contain restrictive covenants, including restrictions on our ability to incur indebtedness. These restrictions could limit our ability to effectuate future acquisitions, limit our ability to pay dividends, limit our ability to make capital expenditures or restrict our financial flexibility. Our Debt Facilities contain covenants requiring us to achieve certain financial and operating results and maintain compliance with specified financial ratios. Our ability to meet the financial covenants or requirements in our Debt Facilities may be affected by events beyond our control, and we may not be able to satisfy such covenants and requirements. A breach of these covenants or our inability to comply with the financial ratios, tests or other restrictions contained in a Debt Facility could result in an event of default under one or more of our other Debt Facilities. Upon the occurrence of an event of default under a Debt Facility, and the expiration of any grace periods, the lenders could elect to declare all amounts outstanding under one or more of our other Debt Facilities, together with accrued interest, to be immediately due and payable. If this were to occur, our assets may not be sufficient to fully repay the amounts due under our Debt Facilities or our other indebtedness.

Our business and financial performance could be adversely impacted by a significant disruption in, or breach in security of, our information technology systems.

We rely on information technology systems, some of which are managed by third-parties, to process, transmit and store electronic information (including sensitive data such as confidential business information and personally identifiable data relating to employees, customers, other business partners and patients), and to manage or support a variety of critical business processes and activities (such as receiving and fulfilling orders, billing, collecting and making payments, shipping products, providing services and support to customers and fulfilling contractual obligations). These systems, products and services may be damaged, disrupted or shut down due to attacks by computer hackers, computer viruses, ransomware, human error or malfeasance, power outages, hardware failures, telecommunication or utility failures, catastrophes or other unforeseen events. In any such circumstances our system redundancy and other disaster recovery planning may be ineffective or inadequate. Attacks may also target hardware, software and information installed, stored or transmitted in our products after such products have been purchased and incorporated into third-party products, facilities or infrastructure. Like most multinational corporations, our information technology systems have been subject to computer viruses, malicious codes, unauthorized access and other cyber-attacks and we expect the sophistication and frequency of such attacks to continue to increase. Any of the attacks, breaches or other disruptions or damage described above could interrupt our operations or the operations of our customers and partners, delay production and shipments, result in theft of intellectual property and trade secrets, damage customer and business partner relationships and

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our reputation or result in defective products or services, legal claims and proceedings, liability and penalties under privacy laws and increased costs for security and remediation, each of which could adversely affect our business, reputation and financial statements. Although we maintain cyber risk insurance, damages and claims arising from such incidents may not be covered or may exceed the amount of any insurance available.

Our goodwill and other intangible assets represent a substantial proportion of our total assets and the impairment of such substantial goodwill and intangible assets could have a negative impact on our financial condition and results of operations.

Our total assets include substantial amounts of intangible assets, primarily goodwill. At December 31, 2018, goodwill and other intangible assets, net of accumulated amortization, totaled $6,015.8 million or 69% of our total assets. The goodwill results from our acquisitions, representing the excess of cost over the fair value of the net tangible and other identifiable intangible assets we have acquired. At a minimum, we assess annually whether there has been impairment in the value of our intangible assets. If future operating performance at one or more of our reporting units were to fall significantly below current levels, we could record, under current applicable accounting rules, a non-cash charge to operating income for goodwill or other intangible asset impairment. Any determination requiring the impairment of a significant portion of goodwill or other intangible assets would negatively affect our financial condition and results of operations.

Item 1B. Unresolved Staff Comments

None.

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Item 2. Properties

At December 31, 2018, the Company had 159 operating facilities in 25 states and 17 foreign countries. Of these facilities, 60 are owned by the Company and 99 are leased. The properties owned by the Company consist of approximately 717 acres, of which approximately 5.3 million square feet are under roof. Under lease is a total of approximately 3.5 million square feet. The leases expire over a range of years from 2019 to 2082, with renewal options for varying terms contained in many of the leases. The Company s executive offices in Berwyn, Pennsylvania, occupy approximately 43,000 square feet under a lease that expires in September 2023.

The Company s machinery and equipment, plants and offices are in satisfactory operating condition and are adequate for the uses to which they are put. The operating facilities of the Company by reportable segment were as follows at December 31, 2018:

	Number of Operating Facilities		Square Feet Under Roof	
	Owned	Leased	Owned	Leased
Electronic Instruments	30	63	2,229,000	2,118,000
Electromechanical	30	36	3,045,000	1,346,000
Total	60	99	5,274,000	3,464,000

Item 3. Legal Proceedings

Please refer to Environmental Matters in Part II, Item 7 Management s Discussion and Analysis of Financial Condition and Results of Operations and Note 13 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for information regarding certain litigation matters.

The Company is subject to a variety of litigation and other legal and regulatory proceedings incidental to its business (or the business operations of previously owned entities), including claims for damages arising out of the use of the Company s products or services and claims relating to intellectual property matters, employment matters, tax matters, commercial disputes, competition and sales and trading practices, environmental matters, personal injury, insurance coverage and acquisition-related matters, as well as regulatory investigations or enforcement. Based upon the Company s experience, the Company does not believe that these proceedings and claims will have a material adverse effect on its results of operations, financial position or cash flows.

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PART II

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

The principal market on which the Company s common stock is traded is the New York Stock Exchange and it is traded under the symbol AME. On January 31, 2019, there were approximately 1,900 holders of record of the Company s common stock.

Market price and dividend information with respect to the Company s common stock is set forth below. Future dividend payments by the Company will be dependent on future earnings, financial requirements, contractual provisions of debt agreements and other relevant factors.

Under its share repurchase program, the Company repurchased approximately 5,079,000 shares of its common stock for $367.7 million in 2018 and approximately 114,000 shares of its common stock for $6.9 million in 2017.

The high and low sales prices of the Company s common stock on the New York Stock Exchange composite tape and the quarterly dividends per share paid on the common stock were:

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2018				
Dividends paid per share	**$ 0.14**	**$ 0.14**	**$ 0.14**	**$ 0.14**
Common stock trading range:				
High	**$ 79.32**	**$ 77.20**	**$ 81.92**	**$ 80.32**
Low	**$ 71.16**	**$ 68.57**	**$ 70.79**	**$ 63.14**
2017				
Dividends paid per share	$ 0.09	$ 0.09	$ 0.09	$ 0.09
Common stock trading range:				
High	$ 55.48	$ 62.89	$ 66.70	$ 73.06
Low	$ 48.55	$ 53.19	$ 60.50	$ 65.65

Issuer Purchases of Equity Securities

The following table reflects purchases of AMETEK, Inc. common stock by the Company during the three months ended December 31, 2018:

Period	Total Number of Shares Purchased (1)(2)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced	Approximate Dollar Value of Shares that May Yet Be Purchased Under

			Plan (2)	the Plan
October 1, 2018 to October 31, 2018		$		$ 364,693,122
November 1, 2018 to November 30, 2018	3,597,787	73.56	3,597,787	100,043,475
December 1, 2018 to December 31, 2018	1,426,020	69.42	1,426,020	1,049,618
Total	5,023,807	72.38	5,023,807	

(1) Represents shares surrendered to the Company to satisfy tax withholding obligations in connection with employees share-based compensation awards.

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(2) Consists of the number of shares purchased pursuant to the Company s Board of Directors $400 million authorization for the repurchase of its common stock announced in November 2016. Such purchases may be effected from time to time in the open market or in private transactions, subject to market conditions and at management s discretion.

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Securities Authorized for Issuance Under Equity Compensation Plan Information

The following table sets forth information as of December 31, 2018 regarding all of the Company s existing compensation plans pursuant to which equity securities are authorized for issuance to employees and nonemployee directors:

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders	5,628,984	$ 53.46	5,418,434
Equity compensation plans not approved by security holders			
Total	5,628,984	53.46	5,418,434

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Stock Performance Graph

The following graph and accompanying table compare the cumulative total stockholder return for AMETEK over the last five years ended December 31, 2018 with total returns for the same period for the Standard and Poor s (S&P) 500 Index, S&P Industrials and Russell 1000 Index. AMETEK s stock price is a component of all three indices. The performance graph and table assume a $100 investment made on December 31, 2013 and reinvestment of all dividends. The stock performance shown on the graph below is based on historical data and is not necessarily indicative of future stock price performance.

COMPARISON OF FIVE-YEAR CUMULATIVE TOTAL RETURN

	December 31,					
	2013	**2014**	**2015**	**2016**	**2017**	**2018**
AMETEK, Inc.	$ 100.00	$ 100.55	$ 103.08	$ 94.18	$ 141.25	$ 132.93
Russell 1000 Index	100.00	113.24	114.28	128.05	155.82	148.37
S&P 500 Index	100.00	113.69	115.26	129.05	157.22	150.33
S&P Industrials	100.00	109.83	107.04	127.23	153.99	133.53

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Item 6. Selected Financial Data

The following financial information for the five years ended December 31, 2018, has been derived from the Company s consolidated financial statements. This information should be read in conjunction with Management s Discussion and Analysis of Financial Condition and Results of Operations and the consolidated financial statements and related notes thereto included elsewhere in this Annual Report on Form 10-K.

	2018	2017	2016	2015	2014
		(In millions, except per share amounts)			
Consolidated Operating Results (Year Ended December 31):					
Net sales(1)	**$ 4,845.9**	$ 4,300.2	$ 3,840.1	$ 3,974.3	$ 4,022.0
Operating income(2)	**$ 1,075.5**	$ 903.6	$ 791.0	$ 907.7	$ 898.6
Interest expense	**$ 82.2**	$ 98.0	$ 94.3	$ 91.8	$ 79.9
Net income	**$ 777.9**	$ 681.5	$ 512.2	$ 590.9	$ 584.5
Earnings per share:					
Basic	**$ 3.37**	$ 2.96	$ 2.20	$ 2.46	$ 2.39
Diluted	**$ 3.34**	$ 2.94	$ 2.19	$ 2.45	$ 2.37
Dividends declared and paid per share	**$ 0.56**	$ 0.36	$ 0.36	$ 0.36	$ 0.33
Weighted average common shares outstanding:					
Basic	**230.8**	230.2	232.6	239.9	244.9
Diluted	**232.7**	231.8	233.7	241.6	247.1
Performance Measures and Other Data:					
Operating income Return on net sales(2)	**22.2%**	21.0%	20.6%	22.8%	22.3%
Return on average total assets(2)	**13.1%**	12.1%	11.5%	13.9%	14.6%
Net income Return on average total capital	**11.9%**	11.6%	9.5%	11.6%	12.3%
Return on average stockholders equity	**18.8%**	18.7%	15.7%	18.2%	18.3%
EBITDA(3)	**$ 1,267.7**	$ 1,076.0	$ 966.0	$ 1,046.9	$ 1,022.6
Ratio of EBITDA to interest expense(3)	**15.4x**	11.0x	10.2x	11.4x	12.8x
Depreciation and amortization	**$ 199.5**	$ 183.2	$ 179.7	$ 149.5	$ 138.6
Capital expenditures	**$ 82.1**	$ 75.1	$ 63.3	$ 69.1	$ 71.3
Cash provided by operating activities	**$ 925.5**	$ 833.3	$ 756.8	$ 672.5	$ 726.0
Free cash flow(4)	**$ 843.4**	$ 758.2	$ 693.5	$ 603.4	$ 654.7
Consolidated Financial Position (At December 31):					
Current assets(1)	**$ 1,836.1**	$ 1,934.7	$ 1,928.2	$ 1,618.8	$ 1,577.6
Current liabilities(1)	**$ 1,258.7**	$ 1,138.7	$ 924.4	$ 1,024.0	$ 934.5
Property, plant and equipment, net	**$ 554.1**	$ 493.3	$ 473.2	$ 484.5	$ 448.4
Total assets(1)	**$ 8,662.3**	$ 7,796.1	$ 7,100.7	$ 6,660.5	$ 6,415.9
Long-term debt, net	**$ 2,273.8**	$ 1,866.2	$ 2,062.6	$ 1,553.1	$ 1,424.4
Total debt, net	**$ 2,632.7**	$ 2,174.3	$ 2,341.6	$ 1,938.0	$ 1,709.0
Stockholders equity	**$ 4,241.9**	$ 4,027.6	$ 3,256.5	$ 3,254.6	$ 3,239.6

Stockholders equity per share	**$ 18.68**	$ 17.42	$ 14.20	$ 13.82	$ 13.42
Total debt as a percentage of capitalization	**38.3%**	35.1%	41.8%	37.3%	34.5%
Net debt as a percentage of capitalization(5)	**34.9%**	27.5%	33.3%	32.4%	29.1%

See Notes to Selected Financial Data on the following page.

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Notes to Selected Financial Data

(1) Effective January 1, 2018, the Company adopted the requirements of Financial Accounting Standards Board (FASB) Accounting Standards Update (ASU) No. 2014-09, *Revenue from Contracts with Customers* (ASU 2014-09) and modified the standard thereafter within Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers* (ASC 606) using the modified retrospective method. See Note 3 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K and Critical Accounting Policies herein for further details.

(2) Amounts prior to 2016 do not reflect the adoption of ASU No. 2017-07, *Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost* (ASU 2017-07). See Note 2 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.

(3) EBITDA represents earnings before interest, income taxes, depreciation and amortization. EBITDA is presented because the Company is aware that it is used by rating agencies, securities analysts, investors and other parties in evaluating the Company. It should not be considered, however, as an alternative to operating income as an indicator of the Company s operating performance or as an alternative to cash flows as a measure of the Company s overall liquidity as presented in the Company s consolidated financial statements. Furthermore, EBITDA measures shown for the Company may not be comparable to similarly titled measures used by other companies. The following table presents the reconciliation of net income reported in accordance with U.S. generally accepted accounting principles (GAAP) to EBITDA:

	Year Ended December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
			(In millions)		
Net income	**$ 777.9**	$ 681.5	$ 512.2	$ 590.9	$ 584.5
Add (deduct):					
Interest expense	**82.2**	98.0	94.3	91.8	79.9
Interest income	**(1.7)**	(2.0)	(1.1)	(0.8)	(0.8)
Income taxes	**209.8**	115.3	180.9	215.5	220.4
Depreciation	**85.4**	82.0	74.8	68.7	63.7
Amortization	**114.1**	101.2	104.9	80.8	74.9
Total adjustments	**489.8**	394.5	453.8	456.0	438.1
EBITDA	**$ 1,267.7**	$ 1,076.0	$ 966.0	$ 1,046.9	$ 1,022.6

(4) Free cash flow represents cash flow from operating activities less capital expenditures. Free cash flow is presented because the Company is aware that it is used by rating agencies, securities analysts, investors and other parties in evaluating the Company. (Also see note 3 above). The following table presents the reconciliation of cash flow from operating activities reported in accordance with U.S. GAAP to free cash flow:

	Year Ended December 31,				
	2018	**2017**	**2016**	**2015**	**2014**
			(In millions)		
Cash provided by operating activities	**$ 925.5**	$ 833.3	$ 756.8	$ 672.5	$ 726.0
Deduct: Capital expenditures	**(82.1)**	(75.1)	(63.3)	(69.1)	(71.3)
Free cash flow	**$ 843.4**	$ 758.2	$ 693.5	$ 603.4	$ 654.7

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(5) Net debt represents total debt, net minus cash and cash equivalents. Net debt is presented because the Company is aware that it is used by rating agencies, securities analysts, investors and other parties in evaluating the Company. (Also see note 3 above). The following table presents the reconciliation of total debt, net reported in accordance with U.S. GAAP to net debt:

			December 31,		
	2018	**2017**	**2016**	**2015**	**2014**
			(In millions)		
Total debt, net	**$ 2,632.7**	$ 2,174.3	$ 2,341.6	$ 1,938.0	$ 1,709.0
Less: Cash and cash equivalents	**(354.0)**	(646.3)	(717.3)	(381.0)	(377.6)
Net debt	**2,278.7**	1,528.0	1,624.3	1,557.0	1,331.4
Stockholders equity	**4,241.9**	4,027.6	3,256.5	3,254.6	3,239.6
Capitalization (net debt plus stockholders equity)	**$ 6,520.6**	$ 5,555.6	$ 4,880.8	$ 4,811.6	$ 4,571.0
Net debt as a percentage of capitalization	**34.9%**	27.5%	33.3%	32.4%	29.1%

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

This report includes forward-looking statements based on the Company s current assumptions, expectations and projections about future events. When used in this report, the words believes, anticipates, may, expect, in estimate, project and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain such words. In this report, the Company discloses important factors that could cause actual results to differ materially from management s expectations. For more information on these and other factors, see Forward-Looking Information herein.

The following Management s Discussion and Analysis of Financial Condition and Results of Operations should be read in conjunction with Item 1A. Risk Factors, Item 6. Selected Financial Data and the consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K.

Business Overview

AMETEK s operations are affected by global, regional and industry economic factors. However, the Company s strategic geographic and industry diversification, and its mix of products and services, have helped to mitigate the potential adverse impact of any unfavorable developments in any one industry or the economy of any single country on its consolidated operating results. In 2018, the Company posted record backlog, orders, sales, operating income, net income, diluted earnings per share and operating cash flow. Positive market trends, the Company s record backlog, contributions from recent acquisitions, and continued focus on and implementation of Operational Excellence initiatives, had a positive impact on 2018 results. The Company also benefited from its strategic initiatives under AMETEK s four key strategies: Operational Excellence, Strategic Acquisitions, Global & Market Expansion and New Products.

Highlights of 2018 were:

Orders for 2018 were $5,051.8 million, an increase of $512.0 million or 11.3%, compared with $4,539.8 million in 2017. As a result, the Company s backlog of unfilled orders at December 31, 2018 was $1,602.1 million.

Net sales for 2018 were $4,845.9 million, an increase of $545.7 million or 13%, compared with $4,300.2 million in 2017. The increase in net sales for 2018 was due to 7% organic sales growth, a 5% increase from the 2018 and 2017 acquisitions and favorable 1% effect of foreign currency translation.

Net income for 2018 was $777.9 million, an increase of $96.5 million or 14.2%, compared with $681.5 million in 2017.

Diluted earnings per share for 2018 were $3.34, an increase of $0.40 or 13.6%, compared with $2.94 per diluted share in 2017.

Cash flow provided by operating activities for 2018 was $925.5 million, an increase of $92.3 million or 11.1%, compared with $833.3 million in 2017.

During 2018, the Company spent $1,129.3 million in cash, net of cash acquired, to acquire six businesses:

In January 2018, acquired FMH Aerospace (FMH), a provider of complex, highly-engineered solutions for the aerospace, defense and space industries;

In April 2018, acquired SoundCom Systems (SoundCom), a provider of design, integration, installation and support of clinical workflow and communication systems for healthcare facilities, educational institutions and corporations. SoundCom also serves as a value-added reseller for Rauland-Borg Corporation (Rauland) in the Midwest portion of the United States;

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In June 2018, acquired Motec GmbH, a provider of integrated vision systems serving the high growth mobile machine vision market. Motec s ruggedized vision products and integrated software solutions provide customers with improved operational efficiency and enhanced safety across a variety of critical mobile machine applications in transportation, agriculture, logistics and construction;

In October 2018, acquired Forza Silicon Corporation (Forza), a leader in the design and production of high-performance imaging sensors used in medical, defense and industrial applications;

In October 2018, acquired Telular Corporation, a provider of communication solutions for logistics management, tank monitoring and security applications; and

In November 2018, acquired Spectro Scientific Corporation, a provider of machine condition monitoring solutions for critical assets in high-value industrial applications.

In the third quarter of 2018, the Company paid in full, at maturity, $80 million in aggregate principal amount of 6.35% private placement senior notes and $160 million in aggregate principal amount of 7.08% private placement senior notes.

In the fourth quarter of 2018, the Company paid in full, at maturity, $65 million in aggregate principal amount of 7.18% private placement senior notes.

In October 2018, the Company along with certain of its foreign subsidiaries amended and restated its credit agreement dated as of September 22, 2011, as amended and restated as of March 10, 2016 (the Credit Agreement). The Credit Agreement amends and restates the Company s existing $850 million revolving credit facility, which was due to expire in March 2021. The amended Credit Agreement consists of a five-year revolving credit facility in an aggregate principal amount of $1.5 billion with a final maturity date in October 2023. The revolving credit facility total borrowing capacity excludes an accordion feature that permits the Company to request up to an additional $500 million in revolving credit commitments at any time during the life of the Credit Agreement under certain conditions. The revolving credit facility provides the Company with additional financial flexibility to support its growth plans, including its acquisition strategy.

In December 2018, the Company completed a private placement agreement to sell $575 million and 75 million Euros in senior notes to a group of institutional investors (the 2018 Private Placement). There are two funding dates under the 2018 Private Placement. The first funding occurred in December 2018 for $475 million and 75 million Euros ($85.1 million). The second funding will be in January 2019 for $100 million. The proceeds from the fundings of the 2018 Private Placement were used to pay down domestic borrowings under the Company s revolving credit facility. For further details, see Liquidity and Capital Resources herein.

In 2018, the Company repurchased approximately 5,079,000 shares of its common stock for $367.7 million.

The Company continued its emphasis on investment in research, development and engineering, spending $230.2 million in 2018 before customer reimbursement of $5.2 million. Sales from products introduced in the past three years were $1,195.2 million or 24.7% of net sales.

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Results of Operations

The following table sets forth net sales and income by reportable segment and on a consolidated basis:

	Year Ended December 31, 2018	2017	2016
		(In thousands)	
Net sales[1]:			
Electronic Instruments	**$ 3,028,959**	$ 2,690,554	$ 2,360,285
Electromechanical	**1,816,913**	1,609,616	1,479,802
Consolidated net sales	**$ 4,845,872**	$ 4,300,170	$ 3,840,087
Operating income and income before income taxes:			
Segment operating income[2]:			
Electronic Instruments	**$ 782,144**	$ 671,646	$ 571,077
Electromechanical	**363,765**	306,779	274,234
Total segment operating income	**1,145,909**	978,425	845,311
Corporate administrative expenses[2]	**(70,369)**	(74,805)	(54,332)
Consolidated operating income[2]	**1,075,540**	903,620	790,979
Interest expense	**(82,180)**	(98,029)	(94,304)
Other expense, net[2]	**(5,615)**	(8,862)	(3,572)
Consolidated income before income taxes	**$ 987,745**	$ 796,729	$ 693,103

(1) Effective January 1, 2018, the Company adopted the requirements of Financial Accounting Standards Board (FASB) Accounting Standards Update (ASU) No. 2014-09, *Revenue from Contracts with Customers* (ASU 2014-09) and modified the standard thereafter within Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers* (ASC 606) using the modified retrospective method. See Note 3 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K and Critical Accounting Policies herein for further details.

(2) In accordance with the retrospective adoption of ASU No. 2017-07, *Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost* (ASU 2017-07), for the years ended December 31, 2017 and 2016, the consolidated statement of income was restated to increase Cost of sales by $9.9 million and $10.3 million, increase Selling, general and administrative expenses by $1.5 million and $0.6 million, and decrease Other expense, net by $11.5 million and $10.9 million, respectively, for net periodic benefit income components other than service cost. For the years ended December 31, 2017 and 2016, the $11.5 million and $10.9 million, respectively, of net periodic benefit income components other than service cost were originally reported in

operating income as follows: $5.8 million and $6.6 million in EIG, $4.1 million and $3.6 million in EMG, and $1.5 million and $0.6 million in Corporate administrative expense, respectively. For the year ended December 31, 2018, Other expense, net included $21.0 million for net periodic benefit income components other than service cost. See Note 2 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Results of Operations for the year ended December 31, 2018 compared with the year ended December 31, 2017

In 2018, the Company posted record backlog, orders, sales, operating income, net income, diluted earnings per share and operating cash flow. The Company achieved these results from organic sales growth in both EIG and EMG, contributions from the acquisitions completed in 2018 and the acquisitions of Arizona Instrument in December 2017, MOCON in June 2017 and Rauland in February 2017, as well as the Company s Operational Excellence initiatives.

Continuing positive market trends, the Company s record backlog, the full year impact of the 2018 acquisitions and continued focus on and implementation of Operational Excellence initiatives are expected to have a positive impact on the Company s 2019 results.

Net sales for 2018 were $4,845.9 million, an increase of $545.7 million or 13%, compared with net sales of $4,300.2 million in 2017. The increase in net sales for 2018 was due to 7% organic sales growth, a 5% increase from acquisitions and favorable 1% effect of foreign currency translation. EIG net sales were $3,029.0 million in 2018, an increase of 12.6%, compared with $2,690.6 million in 2017. EMG net sales were $1,816.9 million in 2018, an increase of 12.9%, compared with $1,609.6 million in 2017.

Total international sales for 2018 were $2,448.5 million or 50.5% of net sales, an increase of $234.5 million or 10.6%, compared with international sales of $2,214.0 million or 51.5% of net sales in 2017. The $234.5 million increase in international sales was primarily driven by organic sales growth. Both reportable segments of the Company maintain strong international sales presences in Europe and Asia. Export shipments from the United States, which are included in total international sales, were $1,269.4 million in 2018, an increase of $127.1 million or 11.1%, compared with $1,142.3 million in 2017. Export shipments increased primarily due to organic sales growth.

Orders for 2018 were $5,051.8 million, an increase of $512.0 million or 11%, compared with $4,539.8 million in 2017. The increase in orders for 2018 was due to 7% organic order growth, a 5% increase from acquisitions and a 1% unfavorable effect of foreign currency translation. As a result, the Company s backlog of unfilled orders at December 31, 2018 was $1,602.1 million, an increase of $206.0 million or 14.8%, compared with $1,396.1 million at December 31, 2017.

The Company recorded 2017 realignment costs totaling $16.8 million in the fourth quarter of 2017 (the 2017 realignment costs). The 2017 realignment costs were composed of $3.0 million in severance costs for a reduction in workforce, $7.8 million of asset write-downs and $6.0 million in costs to withdraw from a multiemployer defined benefit pension plan. The 2017 realignment costs better positioned the Company s long-term cost structure and included costs associated with the continued consolidation of the Company s floor care and specialty motors businesses into its precision motion control businesses.

The 2017 realignment costs were reported in the consolidated statement of income as follows (in millions):

	2017	
	Three Months Ended December 31,	Year Ended December 31,
Cost of sales	$ 16.8	$ 16.8
Selling, general and administrative expenses		
Total reported in the consolidated statement of income	$ 16.8	$ 16.8

The 2017 realignment costs were reported in segment operating income as follows (in millions):

	2017	
	Three Months Ended December 31,	**Year Ended December 31,**
EIG	$ 4.5	$ 4.5
EMG	12.3	12.3
Total reported in segment operating income	$ 16.8	$ 16.8

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The 2017 realignment costs negatively impacted segment operating margins as follows (in basis points):

	2017	
	Three Months Ended December 31,	Year Ended December 31,
EIG	(60)	(10)
EMG	(310)	(80)
Total impacting segment operating margins	(150)	(40)

Segment operating income for 2018 was $1,145.9 million, an increase of $167.5 million or 17.1%, compared with segment operating income of $978.4 million in 2017. Segment operating income, as a percentage of net sales, increased to 23.6% in 2018, compared with 22.8% in 2017. The increase in segment operating income and segment operating margins for 2018 resulted primarily from the increase in net sales and the impact of the 2017 realignment noted above, as well as the benefits of the Company s Operational Excellence initiatives.

Cost of sales for 2018 was $3,186.3 million or 65.8% of net sales, an increase of $324.9 million or 11.4%, compared with $2,861.4 million or 66.5% of net sales for 2017. Cost of sales increased primarily due to the increase in net sales noted above. Cost of sales in 2017 included the impact of the realignment costs detailed in the tables above.

Selling, general and administrative expenses for 2018 were $584.0 million or 12.1% of net sales, an increase of $48.8 million or 9.1%, compared with $535.2 million or 12.4% of net sales in 2017. Selling, general and administrative expenses increased primarily due to the increase in net sales noted above. For 2017, selling, general and administrative expenses included a fourth quarter of 2017 $5.0 million charitable donation and a second quarter of 2017 $2.5 million pre-tax charge in corporate administrative expenses related to the accelerated vesting of restricted stock grants in association with the retirement of the Company s Executive Chairman of the Board of Directors.

Consolidated operating income was $1,075.5 million or 22.2% of net sales for 2018, an increase of $171.9 million or 19.0%, compared with $903.6 million or 21.0% of net sales in 2017.

Interest expense was $82.2 million for 2018, a decrease of $15.8 million or 16.2%, compared with $98.0 million in 2017. Interest expense decreased primarily due to the repayment in full, at maturity, of $270 million in aggregate principal amount of 6.20% private placement senior notes in the fourth quarter of 2017, $80 million in aggregate principal amount of 6.35% private placement senior notes and $160 million in aggregate principal amount of 7.08% private placement senior notes in the third quarter of 2018, and $65 million in aggregate principal amount of 7.18% private placement senior notes in the fourth quarter of 2018.

Other expenses, net were $5.6 million for 2018, a decrease of $3.3 million, compared with $8.9 million in 2017. The Other expenses, net decrease for 2018 was primarily due to higher pension income included in Other expenses, partially offset by higher due diligence expense.

The effective tax rate for 2018 was 21.2%, compared with 14.5% in 2017. On December 22, 2017, the U.S. enacted the Tax Cuts and Jobs Act (the Tax Act). The Tax Act, which is also commonly referred to as U.S. tax reform, significantly changed U.S. corporate income tax laws by, among other things, reducing the U.S. corporate income tax rate to 21% starting in 2018 and creating a territorial tax system with a one-time mandatory tax on a deemed repatriation of previously deferred foreign earnings of U.S. subsidiaries.

During 2018 the Company finalized the calculations of the Tax Act transitional tax items and reported a favorable $11.8 million tax benefit of which $10.4 million relates to the one-time mandatory deemed repatriation tax and $1.4 million relates to the remeasurement of the net deferred tax liabilities in the U.S. for the impact of the lower tax rates. During 2017, the Company recorded a net benefit of $91.6 million in the consolidated statement of income as a component of Provision for income taxes. The $91.6 million net benefit consisted of a $185.8 million benefit resulting from the remeasurement of the Company s net deferred tax liabilities in the U.S. based on the new lower corporate income tax rate and a $94.2 million expense relating to the one-time mandatory tax on previously deferred earnings of certain non-U.S. subsidiaries that are owned either wholly or partially by a U.S. subsidiary of the Company.

The Company has evaluated the impact of the global intangible low-taxed income (GILTI) section of the Tax Act and has made a tax accounting policy election to record the annual tax cost of GILTI as a current period expense when incurred and, as such, will not be measuring an impact of GILTI in its determination of deferred taxes.

In addition to the Tax Act adjustments previously mentioned, the 2018 effective tax rate primarily reflects the ongoing impact of the Tax Act including the reduction of the U.S. corporate income tax rate and the current impact of GILTI and FDII provisions, as well as a $25.0 million net tax expense for a change in measurement of a prior year uncertain tax position stemming from the planned implementation of prospective tax planning related to hard to value intangible assets. The 2018 and 2017 effective tax rates also reflect the release of uncertain tax position liabilities primarily relating to statute expirations for U.S. Federal and State jurisdictions totaling $11.4 million and $8.1 million, respectively. See Note 9 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.

Net income for 2018 was $777.9 million, an increase of $96.5 million or 14.2%, compared with $681.5 million in 2017. The 2017 realignment costs reduced 2017 net income by $13.0 million and the net benefit related to the Tax Act increased 2018 and 2017 net income by $11.8 million and $91.6 million, respectively.

Diluted earnings per share for 2018 were $3.34, an increase of $0.40 or 13.6%, compared with $2.94 per diluted share in 2017.

Segment Results

EIG s net sales totaled $3,029.0 million for 2018, an increase of $338.4 million or 13%, compared with $2,690.6 million in 2017. The net sales increase was due to 6% organic sales growth, a 6% increase from the 2018 acquisitions of Spectro Scientific, Telular, Forza, Motec and SoundCom and 2017 acquisitions of MOCON and Rauland, and favorable 1% effect of foreign currency translation.

EIG s operating income was $782.1 million for 2018, an increase of $110.5 million or 16.5%, compared with $671.6 million in 2017. EIG s operating margins were 25.8% of net sales for 2018, compared with 25.0% of net sales in 2017. The increase in EIG s operating income and operating margins for 2018 resulted primarily from the increase in net sales noted above, as well as the benefits of the Group s Operational Excellence initiatives.

EMG s net sales totaled $1,816.9 million for 2018, an increase of $207.3 million or 13%, compared with $1,609.6 million in 2017. The net sales increase was due to 9% organic sales growth, a 3% increase from the 2018 acquisition of FMH and favorable 1% effect of foreign currency translation.

EMG s operating income was $363.8 million for 2018, an increase of $57.0 million or 18.6%, compared with $306.8 million in 2017. EMG s operating margins were 20.0% of net sales for 2018, compared with 19.1% of net sales in 2017. The increase in EMG s operating income in 2018 resulted primarily from the increase in net sales noted above, as well as the benefits of the Group s Operational Excellence initiatives. The increase in EMG s operating margins for 2018 resulted primarily from the net impact of the 2017 realignment costs detailed in the tables above.

Results of operations for the fourth quarter of 2018 compared with the fourth quarter of 2017

Net sales for the fourth quarter of 2018 were $1,271.3 million, an increase of $128.2 million or 11%, compared with net sales of $1,143.1 million for the fourth quarter of 2017. The increase in net sales for the fourth quarter of 2018 was due to 6% organic sales growth, a 7% increase from acquisitions and unfavorable (1%) effect of foreign currency translation.

Segment operating income for the fourth quarter of 2018 was $300.5 million, an increase of $50.1 million or 20.0%, compared with segment operating income of $250.4 million for the fourth quarter of 2017. The increase in segment operating income for the fourth quarter of 2018 resulted primarily from the increase in net sales noted above. Segment operating income, as a percentage of net sales, increased to 23.6% for the fourth quarter of 2018, compared with 21.9% for the fourth quarter of 2017. The increase in segment operating margins for the fourth quarter of 2018 resulted primarily from the net impact of the 2017 realignment costs noted above and their effect on the prior year margin.

Cost of sales for the fourth quarter of 2018 was $835.3 million or 65.7% of net sales, an increase of $65.6 million or 8.5%, compared with $769.7 million or 67.3% of net sales for the fourth quarter of 2017. Cost of sales increased primarily due to the increase in net sales noted above.

The effective tax rate for the fourth quarter of 2018 was 18.3%, compared with (20.8%) in the fourth quarter of 2017. The effective tax rate for the fourth quarter of 2018 includes a favorable $11.8 million tax adjustment related to the finalization of the Tax Act transitional tax items and $9.1 million net tax expense related to uncertain tax positions for certain hard to value intangible assets. In the fourth quarter of 2017, the Company recorded a net benefit of $91.6 million in the consolidated statement of income as a component of Provision for income taxes related to the Tax Act. The $91.6 million net benefit consisted of a $185.8 million benefit resulting from the remeasurement of the Company s net deferred tax liabilities in the U.S. based on the new lower corporate income tax rate and a $94.2 million expense primarily relating to the one-time mandatory tax on previously deferred earnings of certain non-U.S. subsidiaries that are owned either wholly or partially by a U.S. subsidiary of the Company.

Net income for the fourth quarter of 2018 was $211.5 million, a decrease of $27.0 million or 11.3%, compared with $238.5 million for the fourth quarter of 2017. The decrease in net income is primarily driven by the implementation of the 2017 Tax Act. The fourth quarter of 2017 realignment costs reduced the fourth quarter of 2017 net income by $13.0 million and the net benefit related to the Tax Act increased fourth quarter of 2017 net income by $91.6 million.

Diluted earnings per share for the fourth quarter of 2018 were $0.91, an decrease of $0.12 or 11.7%, compared with $1.03 per diluted share for the fourth quarter of 2017. The decrease is primarily related to the changes in the tax provision.

Segment Results

EIG s net sales totaled $826.0 million for the fourth quarter of 2018, an increase of $84.5 million or 11%, compared with $741.5 million for the fourth quarter of 2017. The net sales increase for the fourth quarter of 2018 was due to a 9% increase from the 2018 acquisitions of Spectro Scientific, Telular, Forza, Motec and SoundCom, 4% organic sales growth and unfavorable (1%) effect of foreign currency translation.

EIG s operating income was $214.6 million for the fourth quarter of 2018, an increase of $25.0 million or 13.2%, compared with $189.6 million for the fourth quarter of 2017. EIG s operating margins were 26.0% of net sales for the fourth quarter of 2018, compared with 25.6% of net sales for the fourth quarter of 2017. The increase in EIG s operating income for the fourth quarter of 2018 resulted primarily from the increase in net sales noted above, as well as the benefits of the Group s Operational Excellence initiatives. The increase in operating margins for the fourth quarter of 2018 resulted primarily from the net impact of the 2017 realignment costs noted above and their effect on prior year margins.

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EMG s net sales totaled $445.3 million for the fourth quarter of 2018, an increase of $43.7 million or 10.9%, compared with $401.6 million for the fourth quarter of 2017. The net sales increase for the fourth quarter of 2018 was due to 9% organic sales growth, a 3% increase from the 2018 acquisition of FMH and unfavorable (1%) effect of foreign currency translation.

EMG s operating income was $85.8 million for the fourth quarter of 2018, an increase of $25.1 million or 41.3%, compared with $60.8 million for the fourth quarter of 2017. EMG s operating margins were 19.3% of net sales for the fourth quarter of 2018, compared with 15.1% of net sales for the fourth quarter of 2017. The increase in EMG s operating income resulted primarily from the increase in net sales noted above, as well as the benefits of the Group s Operational Excellence initiatives. The increase in operating margins for the fourth quarter of 2018 resulted primarily from the net impact of the 2017 realignment costs noted above and their effect on prior year margins.

Results of Operations for the year ended December 31, 2017 compared with the year ended December 31, 2016

In 2017, the Company established records for orders, sales, operating income, net income, diluted earnings per share and operating cash flow. The continued strengthening global economic environment, contributions from the acquisitions completed in 2017 and the acquisitions of Laserage Technology Corporation (Laserage) in October 2016, HS Foils and Nu Instruments in July 2016, and Brookfield Engineering Laboratories (Brookfield) and ESP/SurgeX in January 2016, and continued focus on and implementation of Operational Excellence initiatives, including the 2017 and 2016 realignment actions (described further throughout the results of operations for the fourth quarter and year ended December 31, 2017), are expected to have a positive impact on the Company s 2018 results.

Net sales for 2017 were $4,300.2 million, an increase of $460.1 million or 12.0%, compared with net sales of $3,840.1 million in 2016. The increase in net sales for 2017 was due to 6% organic sales growth and a 6% increase from acquisitions. Foreign currency translation was essentially flat period over period. EIG net sales were $2,690.6 million in 2017, an increase of 14.0%, compared with $2,360.3 million in 2016. EMG net sales were $1,609.6 million in 2017, an increase of 8.8%, compared with $1,479.8 million in 2016.

Total international sales for 2017 were $2,214.0 million or 51.5% of net sales, an increase of $203.3 million or 10.1%, compared with international sales of $2,010.7 million or 52.4% of net sales in 2016. The $203.3 million increase in international sales was primarily driven by organic sales growth. Both reportable segments of the Company maintain strong international sales presences in Europe and Asia. Export shipments from the United States, which are included in total international sales, were $1,142.3 million in 2017, an increase of $104.3 million or 10.1%, compared with $1,036.0 million in 2016. Export shipments increased primarily due to organic sales growth.

Orders for 2017 were $4,539.8 million, an increase of $691.0 million or 18.0%, compared with $3,848.8 million in 2016. The increase in orders for 2017 was due to 10% organic order growth, a 6% increase from acquisitions and favorable 2% effect of foreign currency translation. As a result, the Company s backlog of unfilled orders at December 31, 2017 was a record $1,396.1 million, an increase of $239.6 million or 20.7%, compared with $1,156.5 million at December 31, 2016.

The Company recorded $16.8 million of 2017 realignment costs in the fourth quarter of 2017. The 2017 realignment costs were composed of $3.0 million in severance costs for a reduction in workforce, $7.8 million of asset write-downs and $6.0 million in costs to withdraw from a multiemployer defined benefit pension plan. The 2017 realignment costs better position the Company s long-term cost structure and included costs associated with the continued consolidation of the Company s floor care and specialty motors businesses into its precision motion control businesses. The Company recorded 2016 realignment costs totaling $25.6 million in the fourth quarter of 2016 (the 2016 realignment costs). The 2016 realignment costs primarily related to $19.3 million in severance costs for a reduction in workforce and $6.2 million of asset write-downs in response to the impact of a weak global economy on certain of the Company s businesses, as well as the effects of a continued strong

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U.S. dollar. See Note 18 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details. Also, in the fourth quarter of 2016, the Company recorded a $13.9 million non-cash impairment charge related to certain of the Company s trade names.

The 2017 and 2016 realignment costs and 2016 impairment charge were reported in the consolidated statement of income as follows (in millions):

	2017		2016	
	Three Months Ended December 31,	**Year Ended December 31,**	**Three Months Ended December 31,**	**Year Ended December 31,**
Realignment costs	**$ 16.8**	**$ 16.8**	$ 24.0	$ 24.0
Impairment charge			13.9	13.9
Cost of sales	**16.8**	**16.8**	37.9	37.9
Realignment costs			1.6	1.6
Impairment charge				
Selling, general and administrative expenses			1.6	1.6
Realignment costs	**16.8**	**16.8**	25.6	25.6
Impairment charge			13.9	13.9
Total reported in the consolidated statement of income	**$ 16.8**	**$ 16.8**	$ 39.5	$ 39.5

The 2017 and 2016 realignment costs and 2016 impairment charge were reported in segment operating income as follows (in millions):

	2017		2016	
	Three Months Ended December 31,	**Year Ended December 31,**	**Three Months Ended December 31,**	**Year Ended December 31,**
Realignment costs	**$ 4.5**	**$ 4.5**	$ 12.4	$ 12.4
Impairment charge			9.2	9.2
EIG	**4.5**	**4.5**	21.6	21.6
Realignment costs	**12.3**	**12.3**	11.6	11.6
Impairment charge			4.7	4.7
EMG	**12.3**	**12.3**	16.3	16.3

Realignment costs	**16.8**		**16.8**	24.0		24.0
Impairment charge				13.9		13.9
Total reported in segment operating income	**$ 16.8**	**$**	**16.8**	$ 37.9	$	37.9

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The 2017 and 2016 realignment costs and 2016 impairment charge negatively impacted segment operating margins as follows (in basis points):

	2017		2016	
	Three Months Ended December 31,	**Year Ended December 31,**	**Three Months Ended December 31,**	**Year Ended December 31,**
Realignment costs	**(60)**	**(10)**	(200)	(50)
Impairment charge			(150)	(40)
EIG	**(60)**	**(10)**	(350)	(90)
Realignment costs	**(310)**	**(80)**	(330)	(80)
Impairment charge			(130)	(30)
EMG	**(310)**	**(80)**	(460)	(110)
Realignment costs	**(150)**	**(40)**	(250)	(60)
Impairment charge			(140)	(40)
Total impacting segment operating margins	**(150)**	**(40)**	(390)	(100)

Segment operating income for 2017 was $978.4 million, an increase of $133.1 million or 15.7%, compared with segment operating income of $845.3 million in 2016. The increase in segment operating income for 2017 resulted primarily from the increase in net sales noted above. Segment operating income, as a percentage of net sales, increased to 22.8% in 2017, compared with 22.0% in 2016. The increase in segment operating margins for 2017 resulted primarily from the net impact of the 2017 versus the 2016 realignment costs and 2016 impairment charge noted above. Segment operating income and segment operating margins for 2017 and 2016 included the impact of the realignment costs and 2016 impairment charge detailed in the tables above.

Cost of sales for 2017 was $2,861.4 million or 66.5% of net sales, an increase of $275.9 million or 10.7%, compared with $2,585.5 million or 67.3% of net sales for 2016. The cost of sales increase for 2017 was affected by the net sales increase noted above. Cost of sales for 2017 and 2016 included the impact of the realignment costs and 2016 impairment charge detailed in the tables above.

Selling, general and administrative expenses for 2017 were $535.2 million or 12.4% of net sales, an increase of $71.6 million or 15.4%, compared with $463.6 million or 12.1% of net sales in 2016. The increase in selling, general and administrative expenses for 2017 was primarily due to the increase in net sales noted above, a fourth quarter of 2017 $5.0 million charitable donation and a second quarter of 2017 $2.5 million equity-based compensation charge related to the accelerated vesting of restricted stock grants in association with the retirement of the Company s Executive Chairman of the Board of Directors. For 2016, selling, general and administrative expenses included $1.6 million of realignment costs noted above.

Consolidated operating income was $903.6 million or 21.0% of net sales for 2017, an increase of $112.6 million or 14.2%, compared with $791.0 million or 20.6% of net sales in 2016.

Interest expense was $98.0 million for 2017, an increase of $3.7 million or 3.9%, compared with $94.3 million in 2016. The interest expense increase for 2017 was primarily due to the impact of private placement senior notes funded in the fourth quarter of 2016, partially offset by lower average borrowings under the Company s revolving credit facility period over period.

Other expenses, net were $8.9 million for 2017, an increase of $5.3 million, compared with $3.6 million in 2016. The other expenses, net increase for 2017 was primarily due to higher environmental-related expenses.

The effective tax rate for 2017 was 14.5%, compared with 26.1% in 2016. On December 22, 2017, the U.S. enacted the Tax Act. The Tax Act, which is also commonly referred to as U.S. tax reform, significantly changes U.S. corporate income tax laws by, among other things, reducing the U.S. corporate income tax rate to

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21% starting in 2018 and creating a territorial tax system with a one-time mandatory tax on previously deferred foreign earnings of U.S. subsidiaries. As a result, in the fourth quarter of 2017, the Company recorded a net benefit of $91.6 million in the consolidated statement of income as a component of Provision for income taxes. The $91.6 million net benefit consisted of a $185.8 million benefit resulting from the remeasurement of the Company s net deferred tax liabilities in the U.S. based on the new lower corporate income tax rate and a $94.2 million expense relating to the one-time mandatory tax on previously deferred earnings of certain non-U.S. subsidiaries that are owned either wholly or partially by a U.S. subsidiary of the Company. Also, included in the $94.2 million, the Company recorded additional deferred tax liabilities of $13.3 million related to state income and foreign withholding taxes expected to be incurred when the cash amounts related to the mandatory tax are ultimately repatriated to the U.S., offset by $1.0 million for a remeasurement of uncertain tax positions impacted by the mandatory tax inclusion.

The $91.6 million net benefit represents what the Company believed was a reasonable estimate of the impact of the income tax effects of the Tax Act on the Company s consolidated financial statements as of December 31, 2017, it was considered provisional. As additional guidance from the U.S. Department of Treasury was provided, the Company will adjust the provisional amounts after it finalizes the 2017 U.S. tax return and is able to conclude whether any further adjustments are required to its U.S. portion of net deferred tax liability of $390.4 million as of December 31, 2017, as well as to the liability associated with the one-time mandatory tax. The currently recorded amounts include a variety of estimates of taxable earnings and profits, estimated taxable foreign cash balances, differences between U.S. GAAP and U.S. tax principles and interpretations of many aspects of the Tax Act that may, if changed, impact the final amounts. Any adjustments to these provisional amounts will be reported as a component of Provision for income taxes in the reporting period in which any such adjustments are determined, which will be no later than the fourth quarter of 2018, and could result in significant impacts to the effective tax rate for the period. The Company is still evaluating the potential future impact of the GILTI section of the Tax Act and has not provided any provisional deferred tax liability for it. Under U.S. GAAP, the Company is permitted to make an accounting policy election to either treat taxes due on future inclusions in the U.S. taxable income related to GILTI as a current period expense when incurred or to factor such amounts into the Company s measurement of its deferred taxes. Due to the ongoing evaluation, the Company has not yet made the accounting policy decision. See Note 9 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.

The 2017 effective tax rate reflects $12.3 million of tax benefits related to share-based payment transactions in accordance with the January 1, 2017 adoption of the FASB ASU No. 2016-09, *Improvements to Employee Share-Based Payment Accounting*. See Notes 2 and 9 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.

The effective tax rates for 2017 and 2016 reflect the impact of foreign earnings, which are taxed at lower rates, tax benefits related to international and state tax planning initiatives and the release of uncertain tax position liabilities relating to certain statute expirations.

Net income for 2017 was $681.5 million, an increase of $169.3 million or 33.1%, compared with $512.2 million in 2016. The 2017 realignment costs reduced 2017 net income by $13.0 million and the net benefit related to the Tax Act increased 2017 net income by $91.6 million. The 2016 realignment costs and the 2016 impairment charge reduced 2016 net income by $17.0 million and $8.6 million, respectively.

Diluted earnings per share for 2017 were $2.94, an increase of $0.75 or 34.2%, compared with $2.19 per diluted share in 2016. The 2017 realignment costs had the effect of reducing 2017 diluted earnings per share by $0.05 and the net benefit related to the Tax Act had the effect of increasing 2017 diluted earnings per share by $0.39. The 2016 realignment costs and the 2016 impairment charge had the effect of reducing 2016 diluted earnings per share by $0.07 and $0.04, respectively.

Segment Results

EIG s net sales totaled $2,690.6 million for 2017, an increase of $330.3 million or 14.0%, compared with $2,360.3 million in 2016. The net sales increase for 2017 was due to a 9% increase from the 2017 acquisitions of MOCON and Rauland and 2016 acquisitions of Nu Instruments, Brookfield and ESP/SurgeX, and 5% organic sales growth. Foreign currency translation was essentially flat period over period.

EIG s operating income was $671.6 million for 2017, an increase of $100.5 million or 17.6%, compared with $571.1 million in 2016. The increase in EIG s operating income for 2017 resulted primarily from the increase in net sales noted above. EIG s operating margins were 25.0% of net sales for 2017, compared with 24.2% of net sales in 2016. The increase in EIG s operating margins for 2017 resulted primarily from the net impact of the 2017 versus the 2016 realignment costs and 2016 impairment charge noted above. EIG s operating income and operating margins for 2017 and 2016 included the impact of the realignment costs and 2016 impairment charge detailed in the tables above.

EMG s net sales totaled $1,609.6 million for 2017, an increase of $129.8 million or 8.8%, compared with $1,479.8 million in 2016. The net sales increase for 2017 was due to 8% organic sales growth and a 1% increase from the 2016 acquisition of Laserage. Foreign currency translation was essentially flat period over period.

EMG s operating income was $306.8 million for 2017, an increase of $32.6 million or 11.9%, compared with $274.2 million in 2016. EMG s operating margins were 19.1% of net sales for 2017, compared with 18.5% of net sales in 2016. The increase in EMG s operating income and operating margins for 2017 resulted primarily from the increase in net sales noted above, as well as the benefits of the Group s Operational Excellence initiatives. EMG s operating income and operating margins for 2017 and 2016 included the impact of the realignment costs and 2016 impairment charge detailed in the tables above.

Results of operations for the fourth quarter of 2017 compared with the fourth quarter of 2016

Net sales for the fourth quarter of 2017 were $1,143.1 million, an increase of $170.1 million or 17.5%, compared with net sales of $973.0 million for the fourth quarter of 2016. The increase in net sales for the fourth quarter of 2017 was due to 9% organic sales growth, a 6% increase from acquisitions and favorable 2% effect of foreign currency translation.

Segment operating income for the fourth quarter of 2017 was $250.4 million, an increase of $65.2 million or 35.2%, compared with segment operating income of $185.2 million for the fourth quarter of 2016. The increase in segment operating income for the fourth quarter of 2017 resulted primarily from the increase in net sales noted above. Segment operating income, as a percentage of net sales, increased to 22.1% for the fourth quarter of 2017, compared with 19.3% for the fourth quarter of 2016. The increase in segment operating margins for the fourth quarter of 2017 resulted primarily from the net impact of the 2017 versus the 2016 realignment costs and 2016 impairment charge noted above. Segment operating income and segment operating margins for the fourth quarter of 2017 and 2016 included the impact of the realignment costs and 2016 impairment charge detailed in the tables above.

Cost of sales for the fourth quarter of 2017 was $769.7 million or 67.3% of net sales, an increase of $86.0 million or 12.6%, compared with $683.7 million or 70.2% of net sales for the fourth quarter of 2016. The cost of sales increase for the fourth quarter of 2017 was affected by the net sales increase noted above. Cost of sales for the fourth quarter of 2017 and 2016 included the impact of the realignment costs and 2016 impairment charge detailed in the tables above.

The effective tax rate for the fourth quarter of 2017 was (20.8)%, compared with 24.9% in the fourth quarter of 2016. In the fourth quarter of 2017, the Company recorded a net benefit of $91.6 million in the consolidated statement of income as a component of Provision for income taxes related to the Tax Act. The $91.6 million net benefit consisted of a $185.8 million benefit resulting from the remeasurement of the Company s net deferred tax liabilities in the U.S. based on the new lower corporate income tax rate and a $94.2 million expense primarily relating mostly to the one-time mandatory tax on previously deferred earnings of certain non-U.S. subsidiaries that are owned either wholly or partially by a U.S. subsidiary of the Company. The effective tax rates for the fourth quarter of 2017 and 2016 reflect the impact of foreign earnings, which are taxed at lower rates, tax benefits related to international and state tax planning initiatives and the release of uncertain tax position liabilities relating to certain statute expirations.

Net income for the fourth quarter of 2017 was $238.5 million, an increase of $129.4 million or 118.6%, compared with $109.1 million for the fourth quarter of 2016. The fourth quarter of 2017 realignment costs reduced the fourth quarter of 2017 net income by $13.0 million and the net benefit related to the Tax Act increased fourth quarter of 2017 net income by $91.6 million. The fourth quarter of 2016 realignment costs and fourth quarter of 2016 impairment charge reduced the fourth quarter of 2016 net income by $17.0 million and $8.6 million, respectively.

Diluted earnings per share for the fourth quarter of 2017 were $1.03, an increase of $0.56 or 119.1%, compared with $0.47 per diluted share for the fourth quarter of 2016. The fourth quarter of 2017 realignment costs had the effect of reducing the fourth quarter of 2017 diluted earnings per share by $0.05 and the net benefit related to the Tax Act had the effect of increasing the fourth quarter of 2017 diluted earnings per share by $0.39. The fourth quarter of 2016 realignment costs and fourth quarter of 2016 impairment charge had the effect of reducing the fourth quarter of 2016 diluted earnings per share by $0.07 and $0.04, respectively.

Segment Results

EIG s net sales totaled $741.5 million for the fourth quarter of 2017, an increase of $125.5 million or 20.4%, compared with $616.0 million for the fourth quarter of 2016. The net sales increase for the fourth quarter of 2017 was due to a 10% increase from the 2017 acquisitions of MOCON and Rauland and 2016 acquisitions of Nu Instruments, Brookfield and ESP/SurgeX, 9% organic sales growth and favorable 2% effect of foreign currency translation.

EIG s operating income was $189.6 million for the fourth quarter of 2017, an increase of $50.2 million or 36.0%, compared with $139.4 million for the fourth quarter of 2016. The increase in EIG s operating income for the fourth quarter of 2017 resulted primarily from the increase in net sales noted above. EIG s operating margins were 25.6% of net sales for the fourth quarter of 2017, compared with 22.6% of net sales for the fourth quarter of 2016. The increase in EIG s operating margins for the fourth quarter of 2017 resulted primarily from the net impact of the 2017 versus the 2016 realignment costs and 2016 impairment charge noted above, as well as the benefits of the Group s Operational Excellence initiatives. EIG s operating income and operating margins for the fourth quarter of 2017 and 2016 included the impact of the realignment costs and 2016 impairment charge detailed in the tables above.

EMG s net sales totaled $401.6 million for the fourth quarter of 2017, an increase of $44.7 million or 12.5%, compared with $356.9 million for the fourth quarter of 2016. The net sales increase for the fourth quarter of 2017 was due to 10% organic sales growth, a 1% increase from the 2016 acquisition of Laserage and favorable 2% effect of foreign currency translation.

EMG s operating income was $60.8 million for the fourth quarter of 2017, an increase of $15.0 million or 32.8%, compared with $45.8 million for the fourth quarter of 2016. EMG s operating margins were 15.1% of net sales for the fourth quarter of 2017, compared with 12.8% of net sales for the fourth quarter of 2016. The increase in EMG s operating income and operating margins for the fourth quarter of 2017 resulted primarily from the increase in net sales noted above, as well as the benefits of the Group s Operational Excellence initiatives. EMG s operating income and operating margins for the fourth quarter of 2017 and 2016 included the impact of the realignment costs and 2016 impairment charge detailed in the tables above.

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Liquidity and Capital Resources

Cash provided by operating activities totaled $925.5 million in 2018, an increase of $92.2 million or 11.1%, compared with $833.3 million in 2017. The increase in cash provided by operating activities for 2018 was primarily due to higher net income and a $49.7 million reduction in defined benefit pension plan contributions driven by a discretionary $50.1 million contribution to the Company s defined benefit pension plans in the first quarter of 2017, with $40.0 million contributed to U.S. defined benefit pension plans and $10.1 million contributed to foreign defined benefit pension plans.

Free cash flow (cash flow provided by operating activities less capital expenditures) was $843.4 million in 2018, compared with $758.2 million in 2017. EBITDA (earnings before interest, income taxes, depreciation and amortization) was $1,267.7 million in 2018, compared with $1,076.0 million in 2017. Free cash flow and EBITDA are presented because the Company is aware that they are measures used by third parties in evaluating the Company. (See the Notes to Selected Financial Data included in Item 6 in this Annual Report on Form 10-K for a reconciliation of U.S. GAAP measures to comparable non-GAAP measures).

Cash used for investing activities totaled $1,210.0 million in 2018, compared with $625.8 million in 2017. In 2018, the Company paid $1,129.3 million, net of cash acquired, to acquire Spectro Scientific in November 2018, Telular and Forza in October 2018, Motec in June 2018, SoundCom in April 2018 and FMH in January 2018. In 2017, the Company paid $556.6 million, net of cash acquired, to acquire Arizona Instrument in December 2017, MOCON in June 2017 and Rauland in February 2017. Additions to property, plant and equipment totaled $82.1 million in 2018, compared with $75.1 million in 2017.

Cash provided by financing activities totaled $13.0 million in 2018, compared with $329.2 million of cash used for financing activities in 2017. At December 31, 2018, total debt, net was $2,632.7 million, compared with $2,174.3 million at December 31, 2017. In 2018, short-term borrowings increased $258.3 million, compared with a decrease of $9.6 million in 2017. In 2018, long-term borrowings increased $255.1 million, compared with a decrease of $270.0 million in 2017.

In October 2018, the Company along with certain of its foreign subsidiaries amended and restated its Credit Agreement. The Credit Agreement amends and restates the Company s existing $850 million revolving credit facility, which was due to expire in March 2021. The amended Credit Agreement consists of a five-year revolving credit facility in an aggregate principal amount of $1.5 billion with a final maturity date in October 2023. The revolving credit facility total borrowing capacity excludes an accordion feature that permits the Company to request up to an additional $500 million in revolving credit commitments at any time during the life of the Credit Agreement under certain conditions. The revolving credit facility provides the Company with additional financial flexibility to support its growth plans, including its acquisition strategy. At December 31, 2018, the Company had available borrowing capacity of $1,705.1 million under its revolving credit facility, including the $500 million accordion feature.

In December 2018, the Company completed the 2018 private placement agreement to sell $575 million and 75 million Euros in senior notes to a group of institutional investors utilizing two funding dates. The first funding occurred in December 2018 for $475 million and 75 million Euros ($85.1 million). The second funding will be in January 2019 for $100 million. The 2018 Private Placement senior notes carry a weighted average interest rate of 3.93% and are subject to certain customary covenants, including financial covenants that, among other things, require the Company to maintain certain debt-to-EBITDA (earnings before interest, income taxes, depreciation and amortization) and interest coverage ratios. The proceeds from the fundings from the 2018 Private Placement were used to pay down domestic borrowings under the Company s revolving credit facility.

In the third quarter of 2018, $80 million of 6.35% senior notes and $160 million of 7.08% senior notes matured and were paid. In the fourth quarter of 2018, $65 million of 7.18% senior notes matured and were paid. The debt-to-capital ratio was 38.3% at December 31, 2018, compared with 35.1% at December 31, 2017. The net debt-to-capital ratio (total debt, net less cash and cash equivalents divided by the sum of net debt and stockholders equity) was 34.9% at December 31, 2018, compared with 27.5% at December 31, 2017. The net debt-to-capital ratio is presented because the Company is aware that this measure is used by third parties in evaluating the Company. (See the Notes to Selected Financial Data included in Item 6 in this Annual Report on Form 10-K for a reconciliation of U.S. GAAP measures to comparable non-GAAP measures).

In 2018, the Company repurchased approximately 5,079,000 shares of its common stock for $367.7 million, compared with $6.9 million used for repurchases of approximately 114,000 shares in 2017. At December 31, 2018, $1.0 million was available under the Company s Board of Directors authorization for future share repurchases. On February 12, 2019, the Company s Board of Directors approved an increase of $500 million in the authorization for the repurchase of the Company s common stock.

Additional financing activities for 2018 included cash dividends paid of $128.9 million, compared with $82.7 million in 2017. Effective February 1, 2018, the Company s Board of Directors approved a 56% increase in the quarterly cash dividend on the Company s common stock to $0.14 per common share from $0.09 per common share. Proceeds from the exercise of employee stock options were $30.0 million in 2018, compared with $40.0 million in 2017. In the fourth quarter of 2018, the Company made a $30.0 million contingent payment related to the Rauland acquisition. Cash provided by financing activities includes $25.5 million related to the acquisition date estimated fair value of the contingent payment liability, which was based on a probabilistic approach using level 3 inputs. See Note 6 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.

As a result of all of the Company s cash flow activities in 2018, cash and cash equivalents at December 31, 2018 totaled $354.0 million, compared with $646.3 million at December 31, 2017. At December 31, 2018, the Company had $311.2 million in cash outside the United States, compared with $569.4 million at December 31, 2017. The Company utilizes this cash to fund its international operations, as well as to acquire international businesses. The Company is in compliance with all covenants, including financial covenants, for all of its debt agreements. The Company believes it has sufficient cash-generating capabilities from domestic and unrestricted foreign sources, available credit facilities and access to long-term capital funds to enable it to meet its operating needs and contractual obligations in the foreseeable future.

The following table summarizes AMETEK s contractual cash obligations and the effect such obligations are expected to have on the Company s liquidity and cash flows in future years at December 31, 2018.

		Payments Due			
Contractual Obligations[1]	**Total**	**Less Than One Year**	**One to Three Years**	**Four to Five Years**	**After Five Years**
			(In millions)		
Long-term debt borrowings[2]	$ 2,378.8	$ 100.0	$ 158.0	$	$ 2,120.8
Revolving credit loans[3]	260.0	260.0			
Other indebtedness	2.3	2.3			
Total debt[4]	2,641.1	362.3	158.0		2,120.8
Interest on long-term fixed-rate debt	556.4	76.4	134.5	128.4	217.1
Noncancellable operating leases[5]	200.0	43.1	64.7	42.2	50.0
Purchase obligations[6]	470.2	454.2	15.7	0.2	0.1

Restructuring and other	24.1	24.1			
Total	$ 3,891.8	$ 960.1	$ 372.9	$ 170.8	$ 2,388.0

(1) The liability for uncertain tax positions was not included in the table of contractual obligations as of December 31, 2018 because the timing of the settlements of these uncertain tax positions cannot be reasonably estimated at this time. See Note 9 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.

(2) See Note 10 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.
(3) Although not contractually obligated, the Company expects to have the capability to repay the revolving credit loan within one year as permitted in the Credit Agreement. Accordingly, $260.0 million was classified as short-term debt at December 31, 2018.
(4) Excludes debt issuance costs of $8.4 million, of which $3.4 million is classified as current and $5.0 million is classified as long-term. See Note 10 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further details.
(5) The leases expire over a range of years from 2019 to 2082 with renewal or purchase options, subject to various terms and conditions, contained in most of the leases.
(6) Purchase obligations primarily consist of contractual commitments to purchase certain inventories at fixed prices.

Other Commitments

The Company has standby letters of credit and surety bonds of $56.7 million related to performance and payment guarantees at December 31, 2018. Based on experience with these arrangements, the Company believes that any obligations that may arise will not be material to its financial position.

Critical Accounting Policies

The Company has identified its critical accounting policies as those accounting policies that can have a significant impact on the presentation of the Company s financial condition and results of operations and that require the use of complex and subjective estimates based on the Company s historical experience and management s judgment. Because of the uncertainty inherent in such estimates, actual results may differ materially from the estimates used. The consolidated financial statements and related notes contain information that is pertinent to the Company s accounting policies and to Management s Discussion and Analysis. The information that follows represents additional specific disclosures about the Company s accounting policies regarding risks, estimates, subjective decisions or assessments whereby materially different financial condition and results of operations could have been reported had different assumptions been used or different conditions existed. Primary disclosure of the Company s significant accounting policies is in Note 1 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Revenue Recognition. The majority of the Company s revenues on product sales are recognized at a point in time when the customer obtains control of the product. The transfer in control of the product to the customer is typically evidenced by one or more of the following: the customer having legal title to the product, the Company s present right to payment, the customer s physical possession of the product, the customer accepting the product, or the customer has the benefits of ownership or risk of loss. Legal title transfers to the customer in accordance with the delivery terms of the order, usually upon shipment, which is the point that control transfers. For a small percentage of sales where title and risk of loss transfers at the point of delivery, the Company recognizes revenue upon delivery to the customer, which is the point that control transfers, assuming all other criteria for revenue recognition are met.

Under ASC 606, revenues from certain of the Company s customer contracts meet the criteria of satisfying its performance obligations over time, primarily in the areas of the manufacture of custom-made equipment and for service repairs of customer-owned equipment. Prior to the adoption of the new standard, these revenues were recorded upon shipment or, in the case of those sales where title and risk of loss passes at the point of delivery, the Company recognized revenue upon delivery to the customer. Recognizing revenue over time for custom-manufactured equipment is based on the Company s judgment that, in certain contracts, the product does not have an alternative use and the Company has an enforceable right to payment for performance completed to date. This change in revenue recognition accelerated the revenue recognition and costs on the impacted contracts.

Applying the practical expedient available under ASC 606, the Company recognizes incremental cost of obtaining contracts as an expense when incurred if the amortization period of the assets that the Company would have otherwise recognized is one year or less. These costs are included in Selling, general and administrative expenses in the consolidated statement of income.

Revenues associated with repairs of customer-owned assets were previously recorded upon completion and shipment of the repaired equipment to the customer. Under ASC 606, if the Company s performance enhances an asset that the customer controls as the asset is enhanced, revenue must be recognized over time. The revenue associated with the repair of a customer-owned asset meets this criterion.

The determination of the revenue to be recognized in a given period for performance obligations satisfied over time is based on the input method. The Company recognizes revenue over time as it performs on these contracts because the transfer of control to the customer occurs over time, revenue is recognized based on the extent of progress towards completion of the performance obligation. The Company generally uses the total cost-to-cost input method of progress because it best depicts the transfer of control to the customer that occurs as costs are incurred. Under the cost-to-cost method, the extent of progress towards completion is measured based on the proportion of costs incurred to date to the total estimated costs at completion of the performance obligation. On certain contracts, labor hours is used as the measure of progress when it is determined to be a better depiction of the transfer of control to the customer due to the timing and pattern of labor hours incurred.

Performance obligations also include post-delivery service, installation and training. Post-delivery service revenues are recognized over the contract term. Installation and training revenues are recognized over the period the service is provided. Warranty terms in customer contracts can also be considered separate performance obligations if the warranty provides services beyond assurance that a product complies with agreed-upon specification or if a warranty can be purchased separately. The Company does not incur significant obligations for customer returns and refunds. Accruals for sales returns, other allowances and estimated warranty costs are provided at the time revenue is recognized based on the Company s historical experience. At December 31, 2018 and 2017, the accrual for future warranty obligations was $23.5 million and $22.9 million, respectively. The Company s expense for warranty obligations was $13.9 million in 2018 and $16.0 million in both 2017 and 2016, respectively. The warranty periods for products sold vary among the Company s operations, but generally do not exceed one year. The Company calculates its warranty expense provision based on its historical warranty experience and adjustments are made periodically to reflect actual warranty expenses. If actual future sales returns and allowances and warranty amounts are higher than the Company s historical experience, additional accruals may be required.

Payment terms generally begin upon shipment of the product. The Company does have contracts with multiple billing terms that are all due within one year from when the product is delivered. No significant financing component exists. Payment terms are generally 30-60 days from the time of shipment or customer acceptance, but terms can be shorter or longer. For customer contracts that have revenue recognized over time, revenue is generally recognized prior to a payment being due from the customer. In such cases, the Company recognizes a contract asset at the time the revenue is recognized. When payment becomes due based on the contract terms, the Company reduces the contract asset and records a receivable. In contracts with billing milestones or in other instances with a long production cycle or concerns about credit, customer advance payments are received. The Company may receive a payment in excess of revenue recognized to that date. In these circumstances, a contract liability is recorded.

The Company has certain contracts with variable consideration in the form of volume discounts, rebates and early payment options, which may affect the transaction price used as the basis for revenue recognition. In these contracts, the amount of the variable consideration is not considered constrained and is allocated among the various performance obligations in the customer contract based on the relative standalone selling price of each performance obligation to the total standalone value of all the performance obligations.

Accounts Receivable. The Company maintains allowances for estimated losses resulting from the inability of specific customers to meet their financial obligations to the Company. A specific allowance for doubtful accounts is recorded against the amount due from these customers. For all other customers, the Company recognizes allowance for doubtful accounts based on the length of time specific receivables are past due based on its historical experience. If the financial condition of the Company s customers were to deteriorate, resulting in their inability to make payments, additional allowances may be required. The allowance for doubtful accounts was $9.3 million and $10.4 million at December 31, 2018 and 2017, respectively.

Inventories. The Company uses the first-in, first-out (FIFO) method of accounting, which approximates current replacement cost, for approximately 85% of its inventories at December 31, 2018. The last-in, first-out (LIFO) method of accounting is used to determine cost for the remaining 15% of the Company s inventory at December 31, 2018. For inventories where cost is determined by the LIFO method, the FIFO value would have been $28.4 million and $22.9 million higher than the LIFO value reported in the consolidated balance sheet at December 31, 2018 and 2017, respectively. The Company provides estimated inventory reserves for slow-moving and obsolete inventory based on current assessments about future demand, market conditions, customers who may be experiencing financial difficulties and related management initiatives. If these factors are less favorable than those projected by management, additional inventory reserves may be required.

Business Combinations. The Company allocates the purchase price of an acquired company, including when applicable, the acquisition date fair value of contingent consideration between tangible and intangible assets acquired and liabilities assumed from the acquired business based on their estimated fair values, with the residual of the purchase price recorded as goodwill. Third party appraisal firms and other consultants are engaged to assist management in determining the fair values of certain assets acquired and liabilities assumed. Estimating fair values requires significant judgments, estimates and assumptions, including but not limited to: discount rates, future cash flows and the economic lives of trade names, technology, customer relationships, property, plant and equipment, as well as income taxes. These estimates are based on historical experience and information obtained from the management of the acquired companies, and are inherently uncertain.

Goodwill and Other Intangible Assets. Goodwill and other intangible assets with indefinite lives, primarily trademarks and trade names, are not amortized; rather, they are tested for impairment at least annually. For the purpose of the goodwill impairment test, the Company can elect to perform a qualitative analysis to determine if it is more likely than not that the fair values of its reporting units are less than the respective carrying values of those reporting units. The Company elected to bypass performing the qualitative screen and performed the first step quantitative analysis of the goodwill impairment test in the current year. The Company may elect to perform the qualitative analysis in future periods. The first step in the quantitative process is to compare the carrying amount of the reporting unit s net assets to the fair value of the reporting unit. If the fair value exceeds the carrying value, no further evaluation is required and no impairment loss is recognized. An impairment charge would be recognized to the extent the carrying amount of goodwill exceeds the reporting unit fair value.
The Company identifies its reporting units at the component level, which is one level below its operating segments. Generally, goodwill arises from acquisitions of specific operating companies and is assigned to the reporting unit in which a particular operating company resides. The Company s reporting units are divisions that are one level below its operating segments and for which discrete financial information is prepared and regularly reviewed by segment management.

The Company principally relies on a discounted cash flow analysis to determine the fair value of each reporting unit, which considers forecasted cash flows discounted at an appropriate discount rate. The Company believes that market participants would use a discounted cash flow analysis to determine the fair value of its reporting units in a sale transaction. The annual goodwill impairment test requires the

Company to make a number of assumptions and estimates concerning future levels of revenue growth, operating margins, depreciation, amortization and working capital requirements, which are based on the Company s long-range plan and are considered level 3 inputs. The Company s long-range plan is updated as part of its annual planning process and is reviewed and approved by management. The discount rate is an estimate of the overall after-tax rate of return required by a market participant whose weighted average cost of capital includes both equity and debt, including a risk premium. While the Company uses the best available information to prepare its cash flow and discount rate assumptions, actual future cash flows or market conditions could differ significantly resulting in future impairment charges related to recorded goodwill balances. While there are always changes in assumptions to reflect changing business and market conditions, the Company s overall methodology and the population of assumptions used have remained unchanged. In order to evaluate the sensitivity of the goodwill impairment test to changes in the fair value calculations, the Company applied a hypothetical 10% decrease in fair values of each reporting unit. The 2018 results (expressed as a percentage of carrying value for the respective reporting unit) showed that, despite the hypothetical 10% decrease in fair value, the fair values of the Company s reporting units still exceeded their respective carrying values by 29% to 859% for each of the Company s reporting units.

The impairment test for indefinite-lived intangibles other than goodwill (primarily trademarks and trade names) consists of a comparison of the fair value of the indefinite-lived intangible asset to the carrying value of the asset as of the impairment testing date. The Company can elect to perform a qualitative analysis to determine if it is more likely than not that the fair values of its indefinite-lived intangible assets are less than the respective carrying values of those assets. The Company elected to bypass performing the qualitative screen. The Company may elect to perform the qualitative analysis in future periods. The Company estimates the fair value of its indefinite-lived intangibles using the relief from royalty method using level 3 inputs. The Company believes the relief from royalty method is a widely used valuation technique for such assets. The fair value derived from the relief from royalty method is measured as the discounted cash flow savings realized from owning such trademarks and trade names and not having to pay a royalty for their use.

The Company s acquisitions have generally included a significant goodwill component and the Company expects to continue to make acquisitions. At December 31, 2018, goodwill and other indefinite-lived intangible assets totaled $4,296.2 million or 49.6% of the Company s total assets. The Company completed its required annual impairment tests in the fourth quarter of 2018 and determined that the carrying values of the Company s goodwill were not impaired.

Other intangible assets with finite lives are evaluated for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. The carrying value of other intangible assets with finite lives is considered impaired when the total projected undiscounted cash flows from those assets are separately identifiable and are less than the carrying value. In that event, a loss is recognized based on the amount by which the carrying value exceeds the fair value of those assets. Fair value is determined primarily using present value techniques based on projected cash flows from the asset group.

Pensions. The Company has U.S. and foreign defined benefit and defined contribution pension plans. The most significant elements in determining the Company s pension income or expense are the assumed pension liability discount rate and the expected return on plan assets. The pension discount rate reflects the current interest rate at which the pension liabilities could be settled at the valuation date. At the end of each year, the Company determines the assumed discount rate to be used to discount plan liabilities. In estimating this rate for 2018, the Company considered rates of return on high-quality, fixed-income investments that have maturities consistent with the anticipated funding requirements of the plan. The discount rate used in determining the 2018 pension cost was 3.75% for U.S. defined benefit pension plans and 2.39% for foreign plans. The discount rate used for determining the funded status of the plans at December 31, 2018 and determining the 2019 defined benefit pension cost was 4.40% for U.S. plans and 2.59% for foreign plans. In estimating the U.S. and foreign discount rates, the Company s actuaries

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developed a customized discount rate appropriate to the plans projected benefit cash flow based on yields derived from a database of long-term bonds at consistent maturity dates. The Company used an expected long-term rate of return on plan assets for 2018 of 7.50% for U.S. defined benefit pension plans and 6.64% for foreign plans. In 2019, the Company will use 7.50% for the U.S. plans and 6.52% for the foreign plans. The Company determines the expected long-term rate of return based primarily on its expectation of future returns for the pension plans investments. Additionally, the Company considers historical returns on comparable fixed-income and equity investments and adjusts its estimate as deemed appropriate. The rate of compensation increase used in determining the 2018 pension income for the U.S. plans was 3.75% and was 2.50% for the foreign plans. The U.S. and foreign plans rate of compensation increase will remain unchanged in 2019. In 2018, the Company recognized consolidated pre-tax pension income of $14.7 million from its U.S. and foreign defined benefit pension plans, compared with pre-tax pension income of $4.3 million recognized for these plans in 2017. The Company estimates its 2019 U.S. and foreign defined benefit pension pre-tax income to be approximately $2.5 million.

All unrecognized prior service costs, remaining transition obligations or assets and actuarial gains and losses have been recognized, net of tax effects, as a charge to accumulated other comprehensive income in stockholders equity and will be amortized as a component of net periodic pension cost. The Company uses a measurement date of December 31 (its fiscal year end) for its U.S. and foreign defined benefit plans.

To fund the plans, the Company made cash contributions to its defined benefit pension plans in 2018, which totaled $5.1 million, compared with $54.8 million in 2017. The Company anticipates making approximately $3 million to $6 million in cash contributions to its defined benefit pension plans in 2019.

Income Taxes. The process of providing for income taxes and determining the related balance sheet accounts requires management to assess uncertainties, make judgments regarding outcomes and utilize estimates. The Company conducts a broad range of operations around the world and is therefore subject to complex tax regulations in numerous international taxing jurisdictions, resulting at times in tax audits, disputes and potential litigation, the outcome of which is uncertain. Management must make judgments currently about such uncertainties and determine estimates of the Company s tax assets and liabilities. To the extent the final outcome differs, future adjustments to the Company s tax assets and liabilities may be necessary.

The Company assesses the realizability of its deferred tax assets, taking into consideration the Company s forecast of future taxable income, available net operating loss carryforwards and available tax planning strategies that could be implemented to realize the deferred tax assets. Based on this assessment, management must evaluate the need for, and the amount of, valuation allowances against the Company s deferred tax assets. To the extent facts and circumstances change in the future, adjustments to the valuation allowances may be required.

The Company assesses the uncertainty in its tax positions, by applying a minimum recognition threshold which a tax position is required to meet before a tax benefit is recognized in the financial statements. Once the minimum threshold is met, using a more likely than not standard, a series of probability estimates is made for each item to properly measure and record a tax benefit. The tax benefit recorded is generally equal to the highest probable outcome that is more than 50% likely to be realized after full disclosure and resolution of a tax examination. The underlying probabilities are determined based on the best available objective evidence such as recent tax audit outcomes, published guidance, external expert opinion, or by analogy to the outcome of similar issues in the past. There can be no assurance that these estimates will ultimately be realized given continuous changes in tax policy, legislation and audit practice. The Company recognizes interest and penalties accrued related to uncertain tax positions in income tax expense.

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Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2014-09 (Topic 606), *Revenue from Contracts with Customers* (ASU 2014-09) and modified the standard thereafter within Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers* (ASC 606). ASU 2014-09 established a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and superseded most of the existing revenue recognition guidance. The Company adopted ASU 2014-09 effective January 1, 2018 using the modified retrospective method. The adoption of ASU 2014-09 did not have a significant impact on the Company s consolidated results of operations, financial position and cash flows. See Note 3 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

In February 2016, the FASB issued ASU No. 2016-02, *Leases* (ASU 2016-02) and modified the standard in July 2018 with ASU No. 2018-11, *Leases* (ASU 2018-11). The new standard establishes a right-of-use model that requires a lessee to record a right-of-use asset and a lease liability on the balance sheet for all leases. Leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the income statement. ASU 2016-02 is effective for interim and annual reporting periods beginning after December 15, 2018 and early adoption is permitted. ASU 2016-02 and ASU 2018-11 include transitional guidance, that allows for a modified retrospective approach with optional transition relief , which the Company expects to elect.

The Company expects the adoption of ASU 2016-02 to have a material effect on our balance sheet. The adoption of ASU 2016-02 is not expected to have a significant impact on the Company s consolidated results of operations or cash flows. The Company is primarily a lessee. While we continue to design internal controls and assess all the effects of adoption, the Company currently believes the most significant effects be the recognition of new right-of-use assets and lease liabilities on our balance sheet related to real estate, machinery and equipment operating leases and providing significant new disclosures about our leasing activities.

In January 2017, the FASB issued ASU No. 2017-01, *Clarifying the Definition of a Business* (ASU 2017-01). ASU 2017-01 provides a more robust framework to use in determining when a set of assets and activities is a business. ASU 2017-01 requires an entity to evaluate if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets; if so, the set of assets is not a business. ASU 2017-01 requires that, to be a business, the set must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs. The Company prospectively adopted ASU 2017-01 effective January 1, 2018 and the adoption did not have a significant impact on the Company s consolidated results of operations, financial position, cash flows and financial statement disclosures.

In March 2017, the FASB issued ASU 2017-07, which changes how employers that sponsor defined benefit pension and/or other postretirement benefit plans present the net periodic benefit cost in the income statement. ASU 2017-07 requires employers to present the service cost component of net periodic benefit cost in the same income statement line item as other employee compensation costs. All other components of the net periodic benefit cost will be presented outside of operating income. The Company retrospectively adopted ASU 2017-07 effective January 1, 2018. For the years ended December 31, 2017 and 2016, the consolidated statement of income was restated to increase Cost of sales by $9.9 million and $10.3 million, increase Selling, general and administrative expenses by $1.5 million and $0.6 million, and decrease Other expense, net by $11.5 million and $10.9 million, respectively, for net periodic benefit income components other than service cost. For the years ended December 31, 2017 and 2016, the $11.5 million and $10.9 million, respectively, of net periodic benefit income components other than service cost were originally reported in operating income as follows: $5.8 million and $6.6 million in EIG, $4.1 million and $3.6 million in EMG, and $1.5 million and $0.6 million in Corporate administrative expense, respectively. The adoption of ASU 2017-07 did not have a significant impact on the Company s consolidated results of operations, financial position, cash flows and financial statement disclosures.

In May 2017, the FASB issued ASU No. 2017-09, *Scope of Modification Accounting* (ASU 2017-09). ASU 2017-09 clarifies which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. The Company prospectively adopted ASU 2017-09 effective January 1, 2018 and the adoption did not have a significant impact on the Company s consolidated results of operations, financial position, cash flows and financial statement disclosures.

In February 2018, the FASB issued ASU No. 2018-02, *Income Statement Reporting Comprehensive Income (Topic 220), Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income* (ASU 2018-02). ASU 2018-02 addresses a specific consequence of the Tax Act by allowing a reclassification from accumulated other comprehensive income (loss) to retained earnings for stranded tax effects resulting from the Tax Act s reduction of the U.S federal corporate income tax rate. ASU 2018-02 is effective for all entities for annual reporting periods beginning after December 15, 2018, with early adoption permitted, and is to be applied either in the period of adoption or retrospectively to each period in which the effect of the change in the U.S. federal income tax rate in the Tax Act is recognized. Upon adoption, the Company does not expect to elect to reclassify the stranded income tax effects of the Tax Act from accumulated other comprehensive income to retained earnings.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement* (ASU 2018-13), which changes the fair value measurement disclosure requirements of ASC Topic 820, *Fair Value Measurement* (ASC 820), by eliminating, modifying and adding to those requirements. ASU 2018-13 also modifies the disclosure objective paragraphs of ASC 820 to eliminate (1) at a minimum from the phrase an entity shall disclose at a minimum and (2) other similar open ended disclosure requirements to promote the appropriate exercise of discretion by entities. ASU 2018-13 is effective for fiscal years beginning after December 15, 2019, including interim periods therein. Early adoption is permitted upon issuance of this ASU. The Company has not determined the impact ASU 2018-13 may have on the Company s consolidated financial statement disclosures.

In August 2018, the FASB issued ASU No. 2018-14, *Compensation Retirement Benefits Defined Benefit Plans General* (ASU 2018-14), which changes the disclosure requirements of ASC Topic 715, *Compensation Retirement Benefits*, by eliminating, modifying and adding to those requirements. ASU 2018-14 is effective for fiscal years beginning after December 15, 2020. Early adoption is permitted and the amendments in this ASU should be applied on a retrospective basis to all periods presented. The Company has not determined the impact ASU 2018-14 may have on the Company s consolidated financial statement disclosures.

In August 2018, the FASB issued ASU No. 2018-15, *Intangibles Goodwill and Other Internal-Use Software* (ASU 2018-15), that requires implementation costs incurred by customers in cloud computing arrangements to be deferred and recognized over the term of the arrangement, if those costs would be capitalized by the customer in a software licensing arrangement under the internal-use software guidance in ASC Topic 350, *Intangibles Goodwill and Other*. ASU 2018-15 requires a customer to disclose the nature of its hosting arrangements that are service contracts and provide disclosures as if the deferred implementation costs were a separate, major depreciable asset class. ASU 2018-15 is effective for interim and annual periods beginning after December 15, 2019. Early adoption is permitted. The Company has not determined the impact ASU 2018-15 may have on the Company s consolidated results of operations, financial position, cash flows and financial statement disclosures.

Internal Reinvestment

Capital Expenditures

Capital expenditures were $82.1 million or 1.7% of net sales in 2018, compared with $75.1 million or 1.7% of net sales in 2017. In 2018, approximately 62% of capital expenditures were for improvements to existing equipment or additional equipment to increase productivity and expand capacity. Capital expenditures in 2019 are expected to approximate 2% of net sales, with a continued emphasis on spending to improve productivity.

Research, Development and Engineering

The Company is committed to, and has consistently invested in, research, development and engineering activities to design and develop new and improved products and solutions. Research, development and engineering costs before customer reimbursement were $230.2 million in 2018, $221.2 million in 2017 and $200.8 million in 2016. Customer reimbursements in 2018, 2017 and 2016 were $5.2 million, $5.4 million and $7.2 million, respectively. These amounts included research and development expenses of $141.0 million, $130.4 million and $112.0 million in 2018, 2017 and 2016, respectively. All such expenditures were directed toward the development of new products and solutions and the improvement of existing products and solutions.

Environmental Matters

Certain historic processes in the manufacture of products have resulted in environmentally hazardous waste by-products as defined by federal and state laws and regulations. The Company believes these waste products were handled in compliance with regulations existing at that time. At December 31, 2018, the Company is named a Potentially Responsible Party (PRP) at 13 non-AMETEK-owned former waste disposal or treatment sites (the non-owned sites). The Company is identified as a de minimis party in 12 of these sites based on the low volume of waste attributed to the Company relative to the amounts attributed to other named PRPs. In eight of these sites, the Company has reached a tentative agreement on the cost of the de minimis settlement to satisfy its obligation and is awaiting executed agreements. The tentatively agreed-to settlement amounts are fully reserved. In the other four sites, the Company is continuing to investigate the accuracy of the alleged volume attributed to the Company as estimated by the parties primarily responsible for remedial activity at the sites to establish an appropriate settlement amount. At the remaining site where the Company is a non-de minimis PRP, the Company is participating in the investigation and/or related required remediation as part of a PRP Group and reserves have been established sufficient to satisfy the Company s expected obligations. The Company historically has resolved these issues within established reserve levels and reasonably expects this result will continue. In addition to these non-owned sites, the Company has an ongoing practice of providing reserves for probable remediation activities at certain of its current or previously owned manufacturing locations (the owned sites). For claims and proceedings against the Company with respect to other environmental matters, reserves are established once the Company has determined that a loss is probable and estimable. This estimate is refined as the Company moves through the various stages of investigation, risk assessment, feasibility study and corrective action processes. In certain instances, the Company has developed a range of estimates for such costs and has recorded a liability based on the best estimate. It is reasonably possible that the actual cost of remediation of the individual sites could vary from the current estimates and the amounts accrued in the consolidated financial statements; however, the amounts of such variances are not expected to result in a material change to the consolidated financial statements. In estimating the Company s liability for remediation, the Company also considers the likely proportionate share of the anticipated remediation expense and the ability of the other PRPs to fulfill their obligations.

Total environmental reserves at December 31, 2018 and 2017 were $27.8 million and $30.1 million, respectively, for both non-owned and owned sites. In 2018, the Company recorded $4.5 million in reserves. Additionally, in 2018 the Company spent $6.6 million on environmental matters and the reserve decreased $0.2 million due to foreign currency translation . The Company s reserves for environmental liabilities at December 31, 2018 and 2017 included reserves of $9.6 million and $11.6 million, respectively, for an owned site acquired in connection with the 2005 acquisition of HCC Industries (HCC). The Company is the designated performing party for the performance of remedial activities for one of several operating units making up a Superfund site in the San Gabriel Valley of California. The Company has obtained indemnifications and other financial assurances from the former owners of HCC related to the costs of the required remedial activities. At December 31, 2018, the Company had $12.1 million in receivables related to HCC for probable recoveries from third-party escrow funds and other committed third-party funds to support the required remediation. Also, the Company is indemnified by HCC s former owners for approximately $19 million of additional costs.

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The Company has agreements with other former owners of certain of its acquired businesses, as well as new owners of previously owned businesses. Under certain of the agreements, the former or new owners retained, or assumed and agreed to indemnify the Company against, certain environmental and other liabilities under certain circumstances. The Company and some of these other parties also carry insurance coverage for some environmental matters. To date, these parties have met their obligations in all material respects.

The Company believes it has established reserves for the environmental matters described above, which are sufficient to perform all known responsibilities under existing claims and consent orders. The Company has no reason to believe that other third parties would fail to perform their obligations in the future. In the opinion of management, based on presently available information and the Company s historical experience related to such matters, an adequate provision for probable costs has been made and the ultimate cost resulting from these actions is not expected to materially affect the consolidated results of operations, financial position or cash flows of the Company.

The Company has been remediating groundwater contamination for several contaminants, including trichloroethylene (TCE), at a formerly owned site in El Cajon, California. Several lawsuits have been filed against the Company alleging damages resulting from the groundwater contamination, including property damages and personal injury, and seeking compensatory and punitive damages. Given the state of uncertainty inherent in these litigations, the Company does not believe it is possible to develop estimates of reasonably possible loss in regard to these matters. The Company believes that it has good and valid defenses to each of these claims and intends to defend them vigorously. The Company does not expect the outcome of these matters, either individually or in the aggregate, to materially affect the consolidated results of operations, financial position or cash flows of the Company.

Market Risk

The Company s primary exposures to market risk are fluctuations in interest rates, foreign currency exchange rates and commodity prices, which could impact its financial condition and results of operations. The Company addresses its exposure to these risks through its normal operating and financing activities. The Company s differentiated and global business activities help to reduce the impact that any particular market risk may have on its operating income as a whole.

The Company s short-term debt carries variable interest rates and generally its long-term debt carries fixed rates. These financial instruments are more fully described in the Notes to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

The foreign currencies to which the Company has the most significant exchange rate exposure are the Euro, the British pound, the Japanese yen, the Chinese renminbi, the Canadian dollar, the Mexican peso and the Swiss franc. Exposure to foreign currency rate fluctuation is modest, monitored, and when possible, mitigated through the use of local borrowings and occasional derivative financial instruments in the foreign currency affected. The effect of translating foreign subsidiaries balance sheets into U.S. dollars is included in other comprehensive income within stockholders equity. Foreign currency transactions have not had a significant effect on the operating results reported by the Company because revenues and costs associated with the revenues are generally transacted in the same foreign currencies.

The primary commodities to which the Company has market exposure are raw material purchases of nickel, aluminum, copper, steel, titanium, vanadium and gold. Exposure to price changes in these commodities are generally mitigated through adjustments in selling prices of the ultimate product and purchase order pricing arrangements, although forward contracts are sometimes used to manage some of those exposures.

Based on a hypothetical ten percent adverse movement in interest rates, commodity prices or foreign currency exchange rates, the Company s best estimate is that the potential losses in future earnings, fair value of risk-sensitive financial instruments and cash flows are not material, although the actual effects may differ materially from the hypothetical analysis.

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Forward-Looking Information

Certain matters discussed in this Form 10-K are forward-looking statements as defined in the Private Securities Litigation Reform Act of 1995 (PSLRA), which involve risk and uncertainties that exist in the Company s operations and business environment and can be affected by inaccurate assumptions, or by known or unknown risks and uncertainties. Many such factors will be important in determining the Company s actual future results. The Company wishes to take advantage of the safe harbor provisions of the PSLRA by cautioning readers that numerous important factors, in some cases have caused, and in the future could cause, the Company s actual results to differ materially from those expressed in any forward-looking statements made by, or on behalf of, the Company. Some, but not all, of the factors or uncertainties that could cause actual results to differ from present expectations are set forth above and under Item 1A. Risk Factors. The Company undertakes no obligation to publicly update any forward-looking statements, whether as a result of new information, subsequent events or otherwise, unless required by the securities laws to do so.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Information concerning market risk is set forth under the heading Market Risk in Management s Discussion and Analysis of Financial Condition and Results of Operations herein.

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Item 8. Financial Statements and Supplementary Data

Financial statement schedules have been omitted because either they are not applicable or the required information is included in the financial statements or the notes thereto.

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Management s Responsibility for Financial Statements

Management has prepared and is responsible for the integrity of the consolidated financial statements and related information. The statements are prepared in conformity with U.S. generally accepted accounting principles consistently applied and include certain amounts based on management s best estimates and judgments. Historical financial information elsewhere in this report is consistent with that in the financial statements.

In meeting its responsibility for the reliability of the financial information, management maintains a system of internal accounting and disclosure controls, including an internal audit program. The system of controls provides for appropriate division of responsibility and the application of written policies and procedures. That system, which undergoes continual reevaluation, is designed to provide reasonable assurance that assets are safeguarded and records are adequate for the preparation of reliable financial data.

Management is responsible for establishing and maintaining adequate internal control over financial reporting. AMETEK, Inc. maintains a system of internal controls that is designed to provide reasonable assurance as to the fair and reliable preparation and presentation of the consolidated financial statements; however, there are inherent limitations in the effectiveness of any system of internal controls.

Management recognizes its responsibility for conducting the Company s activities according to the highest standards of personal and corporate conduct. That responsibility is characterized and reflected in a code of business conduct for all employees and in a financial code of ethics for the Chief Executive Officer and Senior Financial Officers, as well as in other key policy statements publicized throughout the Company.

The Audit Committee of the Board of Directors, which is composed solely of independent directors who are not employees of the Company, meets with the independent registered public accounting firm, the internal auditors and management to satisfy itself that each is properly discharging its responsibilities. The report of the Audit Committee is included in the Company s Proxy Statement for the 2019 Annual Meeting of Stockholders. Both the independent registered public accounting firm and the internal auditors have direct access to the Audit Committee.

The Company s independent registered public accounting firm, Ernst & Young LLP, is engaged to render an opinion as to whether management s financial statements present fairly, in all material respects, the Company s financial position and operating results. This report is included herein.

Management s Report on Internal Control over Financial Reporting

Management of the Company is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in the Exchange Act Rules 13a-15(f) and 15d-15(f). Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, AMETEK, Inc. conducted an evaluation of the effectiveness of the Company s internal control over financial reporting as of December 31, 2018 based on criteria established in Internal Control Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on that evaluation, our management concluded that the Company s internal control over financial reporting was effective as of December 31, 2018.

The Company acquired FMH Aerospace (FMH) in January 2018, SoundCom Systems (SoundCom) in April 2018, Motec GmbH in June 2018, Forza Silicon Corporation (Forza) and Telular Corporation in October 2018, and Spectro Scientific Corporation in November 2018. As permitted by the U.S. Securities and Exchange Commission staff interpretative guidance for newly acquired businesses, the Company excluded FMH, SoundCom, Motec, Forza, Telular and Spectro Scientific from management s assessment of the effectiveness of the Company s internal control over financial reporting as of December 31, 2018. In the aggregate, FMH, SoundCom and Motec, Forza, Telular and Spectro Scientific constituted 13.6% of total assets as of December 31, 2018 and 3.1% of net sales for the year then ended.

The Company s internal control over financial reporting as of December 31, 2018 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in their report, which is included herein.

/s/ David A. Zapico	/s/ William J. Burke
Chairman of the Board and Chief Executive Officer	Executive Vice President Chief Financial Officer
February 21, 2019	

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

ON INTERNAL CONTROL OVER FINANCIAL REPORTING

To the Board of Directors and Stockholders of AMETEK, Inc.:

Opinion on Internal Control over Financial Reporting

We have audited AMETEK, Inc. s internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), (the COSO criteria). In our opinion, AMETEK, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

As indicated in the accompanying *Management s Report on Internal Control Over Financial Reporting*, management s assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of FMH Aerospace, SoundCom Systems, Motec GmbH, Forza Silicon Corporation, Telular Corporation and Spectro Scientific Corporation**,** which are included in the 2018 consolidated financial statements of the Company and constituted 13.6% of total assets as of December 31, 2018 and 3.1% of net sales for the year then ended. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of FMH, SoundCom and Motec, Forza, Telular and Spectro Scientific.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of AMETEK, Inc. as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, stockholders equity and cash flows for each of the three years in the period ended December 31, 2018 and the related notes and our report dated February 21, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

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

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company s assets that could have a material effect on the financial statements.

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

/s/ ERNST & YOUNG LLP

Philadelphia, Pennsylvania

February 21, 2019

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

ON FINANCIAL STATEMENTS

To the Board of Directors and Stockholders of AMETEK, Inc.:

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of AMETEK, Inc. (the Company) as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, stockholders equity and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), AMETEK, Inc. s internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 21, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures include 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 1930.

Philadelphia, Pennsylvania

February 21, 2019

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AMETEK, Inc.

Consolidated Statement of Income

(In thousands, except per share amounts)

	Year Ended December 31,		
	2018	**2017**	**2016**
Net sales	**$ 4,845,872**	$ 4,300,170	$ 3,840,087
Cost of sales	**3,186,310**	2,861,370	2,585,499
Selling, general and administrative	**584,022**	535,180	463,609
Total operating expenses	**3,770,332**	3,396,550	3,049,108
Operating income	**1,075,540**	903,620	790,979
Interest expense	**(82,180)**	(98,029)	(94,304)
Other expense, net	**(5,615)**	(8,862)	(3,572)
Income before income taxes	**987,745**	796,729	693,103
Provision for income taxes	**209,812**	115,259	180,945
Net income	**$ 777,933**	$ 681,470	$ 512,158
Basic earnings per share	**$ 3.37**	$ 2.96	$ 2.20
Diluted earnings per share	**$ 3.34**	$ 2.94	$ 2.19
Weighted average common shares outstanding:			
Basic shares	**230,823**	230,229	232,593
Diluted shares	**232,712**	231,845	233,730

See accompanying notes.

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AMETEK, Inc.

Consolidated Statement of Comprehensive Income

(In thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Net income	**$ 777,933**	$ 681,470	$ 512,158
Other comprehensive (loss) income:			
Amounts arising during the period gains (losses), net of tax (expense) benefit:			
Foreign currency translation:			
Translation adjustments	**(72,112)**	159,507	(68,774)
Change in long-term intercompany notes	**(16,569)**	36,320	(7,597)
Net investment hedge instruments gain (loss), net of tax of ($12,384), $41,178 and $6,558 in 2018, 2017 and 2016, respectively	**38,452**	(109,412)	(12,179)
Defined benefit pension plans:			
Net actuarial (loss) gain, net of tax of $(18,825), ($8,384) and $17,450 in 2018, 2017 and 2016, respectively	**(75,253)**	16,518	(55,259)
Amortization of net actuarial loss, net of tax of ($2,716), ($4,680) and ($2,090) in 2018, 2017 and 2016, respectively	**9,313**	9,910	6,618
Amortization of prior service costs, net of tax of $1,154, $4 and $25 in 2018, 2017 and 2016, respectively	**(5,639)**	(41)	(79)
Unrealized holding gain (loss) on available-for-sale securities:			
Unrealized gain (loss), net of tax of $ -, ($221) and ($275) in 2018, 2017 and 2016, respectively	**(104)**	411	512
Other comprehensive (loss) income	**(121,912)**	113,213	(136,758)
Total comprehensive income	**$ 656,021**	$ 794,683	$ 375,400

See accompanying notes.

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AMETEK, Inc.

Consolidated Balance Sheet

(In thousands, except share amounts)

	December 31, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	**$ 353,975**	$ 646,300
Receivables, net	**732,839**	668,176
Inventories, net	**624,744**	540,504
Other current assets	**124,586**	79,675
Total current assets	**1,836,144**	1,934,655
Property, plant and equipment, net	**554,130**	493,296
Goodwill	**3,612,033**	3,115,619
Other intangibles, net	**2,403,771**	2,013,365
Investments and other assets	**256,210**	239,129
Total assets	**$ 8,662,288**	$ 7,796,064
LIABILITIES AND STOCKHOLDERS EQUITY		
Current liabilities:		
Short-term borrowings and current portion of long-term debt, net	**$ 358,876**	$ 308,123
Accounts payable	**399,571**	437,329
Customer advanced payments	**137,229**	
Income taxes payable	**48,597**	34,660
Accrued liabilities	**314,431**	358,551
Total current liabilities	**1,258,704**	1,138,663
Long-term debt, net	**2,273,837**	1,866,166
Deferred income taxes	**528,336**	512,526
Other long-term liabilities	**359,489**	251,076
Total liabilities	**4,420,366**	3,768,431
Stockholders equity:		
Preferred stock, $0.01 par value; authorized 5,000,000 shares; none issued		
Common stock, $0.01 par value; authorized 800,000,000 shares; issued: 2018 263,645,489 shares; 2017 262,947,829 shares	**2,640**	2,631
Capital in excess of par value	**706,743**	660,894
Retained earnings	**5,653,811**	5,002,419
Accumulated other comprehensive loss	**(551,088)**	(429,176)

Treasury stock: 2018 36,534,802 shares; 2017 31,754,106 shares	**(1,570,184)**	(1,209,135)
Total stockholders equity	**4,241,922**	4,027,633
Total liabilities and stockholders equity	**$ 8,662,288**	$ 7,796,064

See accompanying notes.

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AMETEK, Inc.

Consolidated Statement of Stockholders Equity

(In thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Capital stock			
Preferred stock, $0.01 par value	$	$	$
Common stock, $0.01 par value			
Balance at the beginning of the year	2,631	2,615	2,608
Shares issued	**9**	16	7
Balance at the end of the year	**2,640**	2,631	2,615
Capital in excess of par value			
Balance at the beginning of the year	660,894	604,143	568,286
Issuance of common stock under employee stock plans	**18,534**	31,660	8,484
Share-based compensation costs	**27,315**	25,091	22,030
Excess tax benefits from exercise of stock options			5,343
Balance at the end of the year	**706,743**	660,894	604,143
Retained earnings			
Balance at the beginning of the year	5,002,419	4,403,683	3,974,793
Net income	**777,933**	681,470	512,158
Cash dividends paid	**(128,911)**	(82,735)	(83,267)
Other	**2,370**	1	(1)
Balance at the end of the year	**5,653,811**	5,002,419	4,403,683
Accumulated other comprehensive (loss) income			
Foreign currency translation:			
Balance at the beginning of the year	(251,909)	(338,324)	(249,774)
Translation adjustments	**(72,112)**	159,507	(68,774)
Change in long-term intercompany notes	**(16,569)**	36,320	(7,597)
Net investment hedge instruments (loss) gain, net of tax of ($12,384), $41,178 and $6,558 in 2018, 2017 and 2016, respectively	**38,452**	(109,412)	(12,179)
Balance at the end of the year	**(302,138)**	(251,909)	(338,324)

Defined benefit pension plans:			
Balance at the beginning of the year	(177,371)	(203,758)	(155,038)
Net actuarial (loss) gain, net of tax of ($18,825), ($8,384) and $17,450 in 2018, 2017 and 2016, respectively	**(75,253)**	16,518	(55,259)
Amortization of net actuarial loss, net of tax of ($2,716), ($4,680) and ($2,090) in 2018, 2017 and 2016, respectively	**9,313**	9,910	6,618
Amortization of prior service costs, net of tax of $1,154, $4 and $25 in 2018, 2017 and 2016, respectively	**(5,639)**	(41)	(79)
Balance at the end of the year	**(248,950)**	(177,371)	(203,758)
Unrealized holding gain (loss) on available-for-sale securities:			
Balance at the beginning of the year	104	(307)	(819)
Increase (decrease) during the year, net of tax	**(104)**	411	512
Balance at the end of the year		104	(307)
Accumulated other comprehensive loss at the end of the year	**(551,088)**	(429,176)	(542,389)
Treasury stock			
Balance at the beginning of the year	(1,209,135)	(1,211,539)	(885,430)
Issuance of common stock under employee stock plans	**6,629**	9,271	10,031
Purchase of treasury stock	**(367,678)**	(6,867)	(336,140)
Balance at the end of the year	**(1,570,184)**	(1,209,135)	(1,211,539)
Total stockholders equity	**$ 4,241,922**	$ 4,027,633	$ 3,256,513

See accompanying notes.

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AMETEK, Inc.

Consolidated Statement of Cash Flows

(In thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Cash provided by (used for):			
Operating activities:			
Net income	**$ 777,933**	$ 681,470	$ 512,158
Adjustments to reconcile net income to total operating activities:			
Depreciation and amortization	**199,490**	183,227	179,716
Deferred income taxes	**(73,682)**	(91,205)	(5,632)
Share-based compensation expense	**27,315**	25,091	22,030
Loss (gain) on sale of facilities	**127**	(1,213)	(743)
Changes in assets and liabilities, net of acquisitions:			
Decrease (increase) in receivables	**(13,383)**	(24,581)	14,773
(Increase) decrease in inventories and other current assets	**(59,472)**	(6,087)	38,666
Increase in payables, accruals and income taxes	**36,547**	124,399	2,657
Increase (decrease) in other long-term liabilities	**42,814**	2,787	(4,298)
Pension contributions	**(5,063)**	(54,796)	(6,775)
Other, net	**(7,108)**	(5,833)	4,283
Total operating activities	**925,518**	833,259	756,835
Investing activities:			
Additions to property, plant and equipment	**(82,076)**	(75,074)	(63,280)
Purchases of businesses, net of cash acquired	**(1,129,305)**	(556,634)	(391,419)
Proceeds from sale of facilities	**2,570**	6,290	1,832
Other, net	**(1,233)**	(399)	500
Total investing activities	**(1,210,044)**	(625,817)	(452,367)
Financing activities:			
Net change in short-term borrowings	**258,349**	(9,616)	(315,674)
Proceeds from long-term borrowings	**560,050**		820,900
Repayments of long-term borrowings	**(305,000)**	(270,000)	(48,724)
Repurchases of common stock	**(367,678)**	(6,867)	(336,140)
Cash dividends paid	**(128,911)**	(82,735)	(83,267)
Acquisition contingent consideration	**(25,500)**		
Excess tax benefits from share-based payments			5,343
Proceeds from stock option exercises	**30,021**	40,047	17,622
Other, net	**(8,291)**		(3,006)

Total financing activities	**13,040**	(329,171)	57,054
Effect of exchange rate changes on cash and cash equivalents	**(20,839)**	50,770	(25,268)
(Decrease) increase in cash and cash equivalents	**(292,325)**	(70,959)	336,254
Cash and cash equivalents:			
Beginning of year	646,300	717,259	381,005
End of year	**$ 353,975**	$ 646,300	$ 717,259

See accompanying notes.

AMETEK, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Significant Accounting Policies

Basis of Consolidation

The accompanying consolidated financial statements reflect the results of operations, financial position and cash flows of AMETEK, Inc. (the Company), and include the accounts of the Company and subsidiaries, after elimination of all intercompany transactions in the consolidation.

Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles (GAAP) requires management to make estimates and assumptions that affect amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates and assumptions.

Prior Period Reclassifications

Certain reclassifications and disclosures of prior period amounts have been made to conform to the current year presentation. See Note 2.

Cash Equivalents, Securities and Other Investments

All highly liquid investments with maturities of three months or less when purchased are considered cash equivalents. At December 31, 2018 and 2017, the Company s investment in a fixed-income mutual fund (held by its captive insurance subsidiary). The aggregate fair value of the fixed-income mutual fund at December 31, 2018 and 2017 was $7.7 million ($8.5 million cost basis) and $8.1 million ($8.2 million cost basis), respectively. In 2018, the unrealized gain or loss on the fixed-income mutual fund was recorded in the income statement and was not significant. In 2017, the unrealized gain or loss was recorded as a separate component of accumulated other comprehensive income (in stockholders equity).

Accounts Receivable

The Company maintains allowances for estimated losses resulting from the inability of specific customers to meet their financial obligations to the Company. A specific allowance for doubtful accounts is recorded against the amount due from these customers. For all other customers, the Company recognizes allowance for doubtful accounts based on the length of time specific receivables are past due based on its historical experience. The allowance for doubtful accounts was $9.3 million and $10.4 million at December 31, 2018 and 2017, respectively. See Note 8.

Inventories

The Company uses the first-in, first-out (FIFO) method of accounting, which approximates current replacement cost, for approximately 85% of its inventories at December 31, 2018. The last-in, first-out (LIFO) method of accounting is used to determine cost for the remaining 15% of the Company s inventory at December 31, 2018. For inventories where cost is determined by the LIFO method, the FIFO value would have been $28.4 million and $22.9 million higher than the LIFO value reported in the consolidated balance sheet at December 31, 2018 and 2017, respectively.

The Company provides estimated inventory reserves for slow-moving and obsolete inventory based on current assessments about future demand, market conditions, customers who may be experiencing financial difficulties and related management initiatives. See Note 8.

AMETEK, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Business Combinations

The Company allocates the purchase price of an acquired company, including when applicable, the acquisition date fair value of contingent consideration between tangible and intangible assets acquired and liabilities assumed from the acquired business based on their estimated fair values, with the residual of the purchase price recorded as goodwill. The results of operations of the acquired business are included in the Company s operating results from the date of acquisition. See Note 6.

Property, Plant and Equipment

Property, plant and equipment are stated at cost. Expenditures for additions to plant facilities, or that extend their useful lives, are capitalized. The cost of minor tools, jigs and dies, and maintenance and repairs is charged to expense as incurred. Depreciation of plant and equipment is calculated principally on a straight-line basis over the estimated useful lives of the related assets. The range of lives for depreciable assets is generally three to ten years for machinery and equipment, five to 27 years for leasehold improvements and 25 to 50 years for buildings. Depreciation expense was $85.4 million, $82.0 million and $74.8 million for the years ended December 31, 2018, 2017 and 2016, respectively. See Note 8.

Goodwill and Other Intangible Assets

Goodwill and other intangible assets with indefinite lives, primarily trademarks and trade names, are not amortized; rather, they are tested for impairment at least annually.

The Company identifies its reporting units at the component level, which is one level below its operating segments. Generally, goodwill arises from acquisitions of specific operating companies and is assigned to the reporting unit in which a particular operating company resides. The Company s reporting units are divisions that are one level below its operating segments and for which discrete financial information is prepared and regularly reviewed by segment management.

The Company principally relies on a discounted cash flow analysis to determine the fair value of each reporting unit, which considers forecasted cash flows discounted at an appropriate discount rate. The Company believes that market participants would use a discounted cash flow analysis to determine the fair value of its reporting units in a sale transaction. The annual goodwill impairment test requires the Company to make a number of assumptions and estimates concerning future levels of revenue growth, operating margins, depreciation, amortization and working capital requirements, which are based on the Company s long-range plan and are considered level 3 inputs. The Company s long-range plan is updated as part of its annual planning process and is reviewed and approved by management. The discount rate is an estimate of the overall after-tax rate of return required by a market participant whose weighted average cost of capital includes both equity and debt, including a risk premium. While the Company uses the best available information to prepare its cash flow and discount rate assumptions, actual future cash flows or market conditions could differ significantly resulting in future impairment charges related to recorded goodwill balances.

The impairment test for indefinite-lived intangibles other than goodwill (primarily trademarks and trade names) consists of a comparison of the fair value of the indefinite-lived intangible asset to the carrying value of the asset as of the impairment testing date. The Company estimates the fair value of its indefinite-lived intangibles using the relief from royalty method using level 3 inputs. The fair value derived from the relief from royalty method is measured as the discounted cash flow savings realized from owning such trademarks and trade names and not having to pay a royalty for their use.

The Company completed its required annual impairment tests in the fourth quarter of 2018, 2017 and 2016 and determined that the carrying values of the Company s goodwill were not impaired. The Company completed

AMETEK, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

its required annual impairment tests in the fourth quarter of 2018 and 2017 and determined that the carrying values of the Company s other intangible assets with indefinite lives were not impaired. The Company completed its required annual impairment tests in the fourth quarter of 2016 and determined that the carrying values of certain of the Company s trademarks and trade names with indefinite lives were impaired. During 2016, the Company recorded a $13.9 million non-cash impairment charge related to certain of the Company s trade names.

Other intangible assets with finite lives are evaluated for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. The carrying value of other intangible assets with finite lives is considered impaired when the total projected undiscounted cash flows from the asset group are less than the carrying value. In that event, a loss is recognized based on the amount by which the carrying value exceeds the fair value of those assets. Fair value is determined primarily using present value techniques based on projected cash flows from the asset group.

Intangible assets, other than goodwill, with definite lives are amortized over their estimated useful lives. Patents and technology are being amortized over useful lives of five to 20 years, with a weighted average life of 16 years. Customer relationships are being amortized over a period of five to 20 years, with a weighted average life of 19 years. Miscellaneous other intangible assets are being amortized over a period of two to 20 years. On a quarterly basis, the Company evaluates the reasonableness of the estimated useful lives of these intangible assets. See Note 7.

Financial Instruments and Foreign Currency Translation

Assets and liabilities of foreign operations are translated using exchange rates in effect at the balance sheet date and their results of operations are translated using average exchange rates for the year. Certain transactions of the Company and its subsidiaries are denominated in currencies other than their functional currency. Exchange gains and losses from those transactions are included in operating results for the year.

The Company makes infrequent use of derivative financial instruments. Forward contracts are entered into from time to time to hedge certain inventory purchases, export sales, debt or foreign currency transactions, thereby minimizing the Company s exposure to raw material commodity price or foreign currency fluctuation.

In instances where transactions are designated as hedges of an underlying item, the gains and losses on those transactions are included in accumulated other comprehensive income within stockholders equity to the extent they are effective as hedges. An evaluation of hedge effectiveness is performed by the Company on an ongoing basis and any changes in the hedge are made as appropriate. See Note 5.

Revenue Recognition

Revenue is derived from sales of products and services. The Company s products and services are marketed and sold worldwide through two operating groups: EIG and EMG. See Note 15 *Descriptive Information about Reportable Segments*. See Note 3 for the Company s revenue recognition policy under ASC 606, adopted January 1, 2018.

Related to revenue recognition in 2017 and 2016, the majority of the Company s revenues on product sales were recognized at a point in time when the customer obtains control of the product. The transfer in control of the product to the customer was typically evidenced by one or more of the following: the customer having legal title to the product, the Company s present right to payment, the customer s physical possession of the product, the customer accepting the product, or the customer having the benefits of ownership or risk of loss. For a small percentage of sales where title and risk of loss transfers at the point of delivery, the Company recognized revenue upon delivery to the customer, which is the point that control transferred, assuming all other criteria for revenue recognition were met.

AMETEK, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Research and Development

Research and development costs are included in Cost of sales as incurred and were $141.0 million in 2018, $130.4 million in 2017 and $112.0 million in 2016.

Shipping and Handling Costs

Shipping and handling costs are included in Cost of sales and were $62.7 million in 2018, $53.1 million in 2017 and $47.9 million in 2016.

Share-Based Compensation

The Company expenses the fair value of share-based awards made under its share-based plans in the consolidated financial statements over their requisite service period of the grants. See Note 11.

Income Taxes

The Company s process of providing for income taxes and determining the related balance sheet accounts requires management to assess uncertainties, make judgments regarding outcomes and utilize estimates. The Company conducts a broad range of operations around the world and is therefore subject to complex tax regulations in numerous international taxing jurisdictions, resulting at times in tax audits, disputes and potential litigation, the outcome of which is uncertain. Management must make judgments currently about such uncertainties and determine estimates of the Company s tax assets and liabilities. To the extent the final outcome differs, future adjustments to the Company s tax assets and liabilities may be necessary. The Company recognizes interest and penalties accrued related to uncertain tax positions in income tax expense.

The Company assesses the realizability of its deferred tax assets, taking into consideration the Company s forecast of future taxable income, available net operating loss carryforwards and available tax planning strategies that could be implemented to realize the deferred tax assets. Based on this assessment, management must evaluate the need for, and amount of, valuation allowances against the Company s deferred tax assets. To the extent facts and circumstances change in the future, adjustments to the valuation allowances may be required. See Note 9.

Pensions

The Company has U.S. and foreign defined benefit and defined contribution pension plans. The most significant elements in determining the Company s pension income or expense are the assumed pension liability discount rate and the expected return on plan assets. All unrecognized prior service costs, remaining transition obligations or assets and actuarial gains and losses have been recognized, net of tax effects, as a charge to accumulated other comprehensive income in stockholders equity and will be amortized as a component of net periodic pension cost. The Company uses a measurement date of December 31 (its fiscal year end) for its U.S. and foreign defined benefit plans. See Note 12.

Earnings Per Share

The calculation of basic earnings per share is based on the weighted average number of common shares considered outstanding during the periods. The calculation of diluted earnings per share reflects the effect of all potentially dilutive securities (principally outstanding stock options and restricted stock grants). The number of

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AMETEK, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

weighted average shares used in the calculation of basic earnings per share and diluted earnings per share was as follows for the years ended December 31:

	2018	2017	2016
		(In thousands)	
Weighted average shares:			
Basic shares	**230,823**	230,229	232,593
Equity-based compensation plans	**1,889**	1,616	1,137
Diluted shares	**232,712**	231,845	233,730

2. Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) No. 2014-09 (Topic 606), *Revenue from Contracts with Customers* (ASU 2014-09) and modified the standard thereafter within Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers* (ASC 606). ASU 2014-09 established a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and superseded most of the existing revenue recognition guidance. The Company adopted ASU 2014-09 effective January 1, 2018 using the modified retrospective method. The adoption of ASU 2014-09 did not have a significant impact on the Company s consolidated results of operations, financial position and cash flows. See Note 3.

In February 2016, the FASB issued ASU No. 2016-02, *Leases* (ASU 2016-02) and modified the standard in July 2018 with ASU No. 2018-11, *Leases* (ASU 2018-11). The new standard establishes a right-of-use model that requires a lessee to record a right-of-use asset and a lease liability on the balance sheet for all leases. Leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the income statement. ASU 2016-02 is effective for interim and annual reporting periods beginning after December 15, 2018. The Company adopted ASU 2016-02 on January 1, 2019. ASU 2016-02 and ASU 2018-11 include transitional guidance, that allows for a modified retrospective approach with optional transition relief , which the Company expects to elect.

The Company expects the adoption of ASU 2016-02 to have a material effect on our balance sheet. The adoption of ASU 2016-02 is not expected to have a significant impact on the Company s consolidated results of operations or cash flows. The Company is primarily a lessee. While we continue to design internal controls and assess all the effects of adoption, the Company currently believes the most significant effects to be the recognition of new right-of-use assets and lease liabilities on our balance sheet related to real estate, machinery and equipment operating leases and providing significant new disclosures about our leasing activities.

In January 2017, the FASB issued ASU No. 2017-01, *Clarifying the Definition of a Business* (ASU 2017-01). ASU 2017-01 provides a more robust framework to use in determining when a set of assets and activities is a business. ASU 2017-01 requires an entity to evaluate if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets; if so, the set of assets is not a business. ASU 2017-01 requires that, to be a business, the set must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs. The Company prospectively adopted ASU 2017-01 effective January 1, 2018 and the adoption did not have a significant impact on the Company s consolidated results of operations, financial position, cash flows and financial statement disclosures.

In March 2017, the FASB issued ASU 2017-07, which changes how employers that sponsor defined benefit pension and/or other postretirement benefit plans present the net periodic benefit cost in the income statement.

AMETEK, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

ASU 2017-07 requires employers to present the service cost component of net periodic benefit cost in the same income statement line item as other employee compensation costs. All other components of the net periodic benefit cost are presented outside of operating income. The Company retrospectively adopted ASU 2017-07 effective January 1, 2018. For twelve months ended December 31, 2017 and 2016, the consolidated statement of income was restated to increase Cost of sales by $9.9 million and $10.3 million, increase Selling, general and administrative expenses by $1.5 million and $0.6 million, and decrease Other expense, net by $11.5 million and $10.9 million, respectively, for net periodic benefit income components other than service cost. For the twelve months ended December 31, 2017 and 2016, the $11.5 million and $10.9 million, respectively, of net periodic benefit income components other than service cost were originally reported in operating income as follows: $5.8 million and $6.6 million in Electronic Instruments (EIG), $4.1 million and $3.6 million in Electromechanical (EMG), and $1.5 million and $0.6 million in Corporate administrative expense, respectively. The adoption of ASU 2017-07 did not have a significant impact on the Company s consolidated results of operations, financial position, cash flows and financial statement disclosures.

In May 2017, the FASB issued ASU No. 2017-09, *Scope of Modification Accounting* (ASU 2017-09). ASU 2017-09 clarifies which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. The Company prospectively adopted ASU 2017-09 effective January 1, 2018 and the adoption did not have a significant impact on the Company s consolidated results of operations, financial position, cash flows and financial statement disclosures.

In February 2018, the FASB issued ASU No. 2018-02, *Income Statement Reporting Comprehensive Income (Topic 220), Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income* (ASU 2018-02). ASU 2018-02 addresses a specific consequence of the Tax Act by allowing an election to reclassify from accumulated other comprehensive income (loss) to retained earnings for stranded tax effects resulting from the Tax Act s reduction of the U.S federal corporate income tax rate. ASU 2018-02 is effective for all entities for annual reporting periods beginning after December 15, 2018, with early adoption permitted, and is to be applied either in the period of adoption or retrospectively to each period in which the effect of the change in the U.S. federal income tax rate in the Tax Act is recognized. Upon adoption, the Company does not expect to elect to reclassify the stranded income tax effects of the Tax Act from accumulated other comprehensive income to retained earnings.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement* (ASU 2018-13), which changes the fair value measurement disclosure requirements of ASC Topic 820, *Fair Value Measurement* (ASC 820), by eliminating, modifying and adding to those requirements. ASU 2018-13 also modifies the disclosure objective paragraphs of ASC 820 to eliminate (1) at a minimum from the phrase an entity shall disclose at a minimum and (2) other similar open ended disclosure requirements to promote the appropriate exercise of discretion by entities. ASU 2018-13 is effective for fiscal years beginning after December 15, 2019, including interim periods therein. Early adoption is permitted. The Company has not determined the impact ASU 2018-13 may have on the Company s consolidated financial statement disclosures.

In August 2018, the FASB issued ASU No. 2018-14, *Compensation Retirement Benefits Defined Benefit Plans General* (ASU 2018-14), which changes the disclosure requirements of ASC Topic 715, *Compensation Retirement Benefits*, by eliminating, modifying and adding to those requirements. ASU 2018-14 is effective for fiscal years beginning after December 15, 2020. Early adoption is permitted and the amendments in this ASU should be applied on a retrospective basis to all periods presented. The Company has not determined the impact ASU 2018-14 may have on the Company s consolidated financial statement disclosures.

In August 2018, the FASB issued ASU No. 2018-15, *Intangibles Goodwill and Other Internal-Use Software* (ASU 2018-15), that requires implementation costs incurred by customers in cloud computing

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arrangements to be deferred and recognized over the term of the arrangement, if those costs would be capitalized by the customer in a software licensing arrangement under the internal-use software guidance in ASC Topic 350, *Intangibles Goodwill and Other*. ASU 2018-15 requires a customer to disclose the nature of its hosting arrangements that are service contracts and provide disclosures as if the deferred implementation costs were a separate, major depreciable asset class. ASU 2018-15 is effective for interim and annual periods beginning after December 15, 2019. Early adoption is permitted. The Company has not determined the impact ASU 2018-15 may have on the Company s consolidated results of operations, financial position, cash flows and financial statement disclosures.

3. Revenues

As discussed in Note 2, the Company adopted ASC 606 as of January 1, 2018 using the modified retrospective method. The cumulative adjustment made to the January 1, 2018 consolidated balance sheet for the adoption of ASC 606 was to increase Retained earnings by $4.2 million, increase Total assets by $7.9 million and increase Total liabilities by $3.7 million. For the year ended December 31, 2018, the effect of the changes in all financial statement line items impacted by ASC 606 was immaterial from the amount that would have been reported under the previous guidance.

Under ASC 606, the Company determined that revenues from certain of its customer contracts met the criteria of satisfying its performance obligations over time, primarily in the areas of the manufacture of custom-made equipment and for service repairs of customer-owned equipment. Prior to the adoption of the new standard, these revenues were recorded upon shipment or, in the case of those sales where title and risk of loss passes at the point of delivery, the Company recognized revenue upon delivery to the customer. Recognizing revenue over time for custom-manufactured equipment is based on the Company s judgment that, in certain contracts, the product does not have an alternative use and the Company has an enforceable right to payment for performance completed to date. This change in revenue recognition accelerated the revenue recognition and costs on the impacted contracts.

Applying the practical expedient available under ASC 606, the Company recognizes incremental cost of obtaining contracts as an expense when incurred if the amortization period of the contract cost assets that the Company would have otherwise recognized is one year or less. These costs are included in Selling, general and administrative expenses in the consolidated statement of income.

Revenues associated with repairs of customer-owned assets were previously recorded upon completion and shipment of the repaired equipment to the customer. Under ASC 606, if the Company s performance enhances an asset that the customer controls as the asset is enhanced, revenue must be recognized over time. The revenue associated with the repair of a customer-owned asset meets this criterion.

The determination of the revenue to be recognized in each period for performance obligations satisfied over time is based on the input method. The Company recognizes revenue over time as it performs on these contracts because the transfer of control to the customer occurs over time. Revenue is recognized based on the extent of progress towards completion of the performance obligation. The Company generally uses the total cost-to-cost input method of progress because it best depicts the transfer of control to the customer that occurs as costs are incurred. Under the cost-to-cost method, the extent of progress towards completion is measured based on the proportion of costs incurred to date to the total estimated costs at completion of the performance obligation. On certain contracts, labor hours are used as the measure of progress when it is determined to be a better depiction of the transfer of control to the customer due to the timing and pattern of labor hours incurred.

Performance obligations also include post-delivery service, software as a service, managed services, installation and training. Post-delivery service revenues are recognized over the contract term. Installation and

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training revenues are recognized over the period the service is provided. Warranty terms in customer contracts can also be considered separate performance obligations if the warranty provides services beyond assurance that a product complies with agreed-upon specification or if a warranty can be purchased separately. The Company does not incur significant obligations for customer returns and refunds.

The Company has certain contracts with variable consideration in the form of volume discounts, rebates and early payment options, which may affect the transaction price used as the basis for revenue recognition. In these contracts, the amount of the variable consideration is allocated among the various performance obligations in the customer contract based on the relative standalone selling price of each performance obligation to the total standalone value of all the performance obligations.

Payment terms generally begin upon shipment of the product. The Company does have contracts with multiple billing terms that are all due within one year from when the product is delivered. No significant financing component exists. Payment terms are generally 30-60 days from the time of shipment or customer acceptance, but terms can be shorter or longer, not exceeding one year. For customer contracts that have revenue recognized over time, revenue is generally recognized prior to a payment being due from the customer. In such cases, the Company recognizes a contract asset at the time the revenue is recognized. When payment becomes due based on the contract terms, the Company reduces the contract asset and records a receivable. In contracts with billing milestones or in other instances with a long production cycle or concerns about credit, customer advance payments are received. The Company may receive a payment in excess of revenue recognized to that date. In these circumstances, a contract liability is recorded. Contract liabilities are derecognized when the performance obligations are satisfied and revenue is recognized.

The outstanding contract asset and (liability) accounts were as follows: